

Unifour Regional Hazard Mitigation Plan Update 2024

Alexander County, Burke County, Caldwell County, Catawba County



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Acronyms

ADFP – Agricultural Development & Farmland Preservation
AM – Morning
ATSDR – Agency for Toxic Substances and Disease Registry
BFE – Base Flood Elevation
BRIC – Building Resilient Infrastructure and Communities
CAPE – Convective Available Potential Energy
CCC&TI – Caldwell Community College and Technical Institute
CDC – Center for Disease Control and Prevention
CFM – Certified Floodplain Manager
CFR – Code of Federal Regulations
CHADME – Community Health and Disaster Mitigation Explorer
CIP – Continuous Improvement Program
COOP – Continuity of Operations Plan
CRF – Coronavirus Relief Fund
CFM – Construction and Facilities Manager
CRS – Community Rating System
CWMTF – Clean Water Management Trust Fund
CY – cubic yards
DA – drainage area
DEQ – Department of Environmental Quality
DFIRM – Digital Flood Insurance Rate Map
DMA 2000 – Disaster Mitigation Act of 2000
DR – major disaster
DWI Grant – Division of Water Infrastructure Grant
EAL – Expected Annual Loss
EM – Emergency Management
EMPG – Emergency Management Performance Grant
EMS – Emergency Medical Services
EOC – Emergency Operations Center
EPA – Environmental Protection Agency
FD – Fire Department
FEMA – Federal Emergency Management Agency
FIMAN – Flood Inundation Mapping and Alert Network

FIRM – Flood Insurance Rate Map

FIS – Fire Intensity Scale

ft – feet

GIS – Geographic Information System

I- – Interstate

ID – Identification

IPAWS – Integrated Public Alert and Warning System

iRISK – An interactive, Web-based risk-assessment tool

Hailstorm Intensity Scale – H0 to H10

HLR – Historic Loss Ratio

HMA – Hazard Mitigation Assistance

HMGP – Hazard Mitigation Grant Program

HMPC – Hazard Mitigation Planning Committee

HMP – Hazard Mitigation Plan

HPOWEB – Historic Preservation Office GIS Web Service

HUC-8 – Hydrological Unit Codes

HVRI BRIC – Hazards and Vulnerability Research Institute Baseline Resilience Indicators for
Communities

HVRI – Hazards and Vulnerability Research Institute

LEPC – Local Emergency Planning Commission

LRB – Loss/Exposure

MAC – Mitigation Advisory Committee

MMI – Modified Mercalli Intensity

MPO – Metropolitan Planning Organization

NASA – National Aeronautics Space Administration

NC – North Carolina

NC- – North Carolina Highway

NCDC – National Climatic Data Center

NCDOT – North Carolina Department of Transportation

NCDPS – North Carolina Department of Public Safety

NCEI – National Centers for Environmental Information

NCDEQ – North Carolina Department of Environmental Quality

NCEM – North Carolina Emergency Management

NCDENR – North Carolina Department of Environment and Natural Resources

NCDFR – North Carolina Division of Forest Resources

NCEM – NC Emergency Management

NCHMP – North Carolina Hazard Mitigation Plan

NEIC – National Earthquake Information Center

NFIP – National Flood Insurance Program

NGO – non-governmental organization

NGVD – National Geodetic Vertical Datum

NGVD29 – National Geodetic Vertical Datum of 1929

NAVD88 – North American Vertical Datum of 1988

NOAA – National Oceanic and Atmospheric Administration

NRHD – National Register of Historic Districts

NRI – National Risk Index

NR – National Register

PARTF – Parks and Recreation Trust Fund

PDM – Pre-Disaster Mitigation

PDSI – Palmer Drought Severity Index

PIO – Public Information Officer

Plan – Hazard Mitigation Plan

PM – Evening

R20 – “R” stands for residential. “20” is the minimum lot size of typically 20,000 square feet for each dwelling unit within the designated area. Specific requirements may vary depending on local ordinances and geographical factors.

RMT – Risk Management Tool

RV – Recreational Vehicle

SERA – State Emergency Response Application

SFHA – Safety Flood Hazard Area

SPC – Storm Prediction Center

Stafford Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act

Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act

SVI – Social Vulnerability Index

SWRA – Southern Wildfire Risk Assessment

TDP – Total Distribution Points

TORRO – Tornado and Storm Research Organization

U.S.C. – United States Code

UNC – University of North Carolina
US – United States
US- – US Highway
USDA – United States Department of Agriculture
USD – United States Dollar
USDOT – U.S. Department of Transportation
USGS – U.S. Geological Survey
WDS – World Data Service
WFSI – Wild Fire Science Initiative
WPCOG – West Piedmont Council of Governments
WUI – Wildland Urban Interface
WWTP – Waste Water Treatment Plant

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Section 1. Introduction

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

1.1 Background

1.2 Purpose and Vision

1.3 Scope

1.4 Authority

1.5 Plan Overview

1.1. Background

Natural hazards, such as floods, tornadoes, and severe winter storms 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 region, comprised of Alexander, Burke, Caldwell and Catawba counties, is vulnerable to a wide range of natural hazards. These hazards threaten the life and safety of the Region's residents and have the potential to damage or destroy both public and private property and disrupt the local economy and overall quality of life.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen their potential impact upon our community and our citizens. By minimizing the damaging effects of natural 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 called hazard mitigation. Hazard mitigation is defined by the Federal Emergency Management Agency (FEMA) as, "Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques include structural measures and non-structural measures. Structural measures include activities such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards. Non-structural measures include activities like adopting sound land use policies and creating 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 made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and soon. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease overall hazard vulnerability in the planning area.

One of the most effective means that a community can use to implement a comprehensive approach to hazard mitigation is to develop, adopt, and update, as needed, a local hazard mitigation plan. A mitigation plan establishes the broad local vision and guiding principles for reducing hazard risk, and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities. The Unifour Regional HMP (hereinafter referred to as “Hazard Mitigation Plan” or “Plan”) is an effective means to incorporate hazard mitigation principles and practices into the routine government activities and functions of the 4 counties and 28 municipalities participating in this Plan. At its most inner core, the Plan recommends specific actions to protect our built environment from the forces of nature and to protect the residents of the region 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 future vulnerability to identified hazards.

The Plan is designed to be a living document, with implementation and evaluation procedures included to help achieve meaningful objectives and successful outcomes over time.

1.1.1. Disaster Mitigation Act of 2000

To reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act by invoking new and revitalized approaches to mitigation planning. Section 322 of the Act 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. 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 declared disaster. This Plan was prepared in coordination with FEMA and the North Carolina Division of Emergency Management (NCEM) to ensure that it meets all applicable planning requirements. This includes conformance with FEMA’s latest Local Mitigation Planning Handbook (released May 2023) and Local Mitigation Planning Policy Guide (released April 2022, effective April 2023). A Local Hazard Mitigation Plan Update Checklist, found in Appendix E, has been incorporated to ensure comprehensive compliance. A Local Hazard Mitigation Plan Update Checklist, found in Appendix E, provides a summary of FEMA and NCEM’s current minimum standards of acceptability and notes the location within the Plan where each planning requirement is met.

1.2. Purpose and Vision

The general purpose of this Hazard Mitigation Plan is:

- To protect life and property by reducing the potential for future damages and economic losses that result from natural hazards;
- To qualify for additional grant funding, in both the pre-disaster and post-disaster environment;

- To speed recovery and redevelopment following future disaster events;
- To sustain and enhance existing governmental coordination in the Plan Region and demonstrate a firm local commitment to hazard mitigation principles; and
- To comply with federal and state requirements for local hazard mitigation plans.

A Unifour Hazard Mitigation Planning Committee was created, consisting of representatives from each of the 28 participating jurisdictions, to develop a regional plan. This committee made a vision statement to guide the regional planning process and give all participating jurisdictions a common focal point for discussion, coordination, and development of the Plan.

1.2.1. Vision Statement

Through a coordinated regional planning effort, create and implement an effective hazard mitigation plan that will identify and prioritize risk reduction measures for natural hazards to protect the health, safety, quality of life, environment, and economy of the planning area.

The general purpose of this Hazard Mitigation Plan is:

1. To protect life and property by reducing the potential for future damages and economic losses that result from natural hazards;
2. To qualify for additional grant funding, in both the pre-disaster and post-disaster environment;
3. To speed recovery and redevelopment following future disaster events;
4. To sustain and enhance existing governmental coordination in the planning area and demonstrate a firm local commitment to hazard mitigation principles; and
5. To comply with federal and state requirements for local hazard mitigation plans.

1.3. Scope

This Hazard Mitigation Plan will be updated and maintained to continually address those hazards determined to be of high and moderate risk through the detailed vulnerability assessment for the plan area (see Section 4: 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 to the plan area. The geographic scope (i.e., the “planning area”) for the Plan includes all incorporated and unincorporated areas of Alexander, Burke, Caldwell and Catawba counties. This includes the following 28 local government jurisdictions:

1.3.1.1. Alexander County

- Town of Taylorsville

1.3.1.2. Burke County

- City of Morganton
- Town of Connelly Springs
- Town of Drexel
- Town of Glen Alpine

- Town of Hildebran
- Town of Rutherford College
- Town of Valdese

1.3.1.3. Caldwell County

- City of Lenoir
- Town of Cahah's Mountain
- Town of Gamewell
- Town of Granite Falls
- Town of Hudson
- Town of Rhodhiss
- Town of Sawmills
- Village of Cedar Rock

1.3.1.4. Catawba County

- City of Claremont
- City of Conover
- City of Hickory
- City of Newton
- Town of Brookford
- Town of Catawba
- Town of Long View
- Town of Maiden

1.4. Authority

This Hazard Mitigation Plan has been/will be adopted by all participating counties in accordance with the authority and police powers granted to counties as defined by the State of North Carolina. This Hazard Mitigation Plan has also been/will be adopted by all participating incorporated municipal jurisdictions under the authority granted to cities and towns as defined by the State of North Carolina. Copies of all local resolutions to adopt the Plan are included in Appendix F. This plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 United States Code (U.S.C.) 5165, enacted under Section 104 of the Disaster Mitigation Act of 2000, (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented at Code of Federal Regulations (CFR) 201.6 and 201.7 dated October 2007.

1.5. Plan Overview

This HMP is divided into eight major sections, each of which is described briefly below. The Plan also includes several appendices for additional or supplemental items not included in the main body of the Plan, including multiple appendices with various detailed tables of natural hazard impacts which can be seen in the list of tables within each appendix.

This Introduction (Section 1) provides background on hazard mitigation planning and the Disaster Mitigation Act of 2000, and defines the purpose, scope, and authority of the Plan as adopted by all participating jurisdictions. It also provides the following outline of each section making up the Plan.

The Planning Process, (Section 1) provides background on hazard mitigation planning and the Disaster Mitigation Act of 2000, and defines the purpose, scope, and authority of the Plan as adopted by all participating jurisdictions. It also provides the following outline of each section making up the Plan.

The Planning Process, found in Section 2, fully documents the process by which the region prepared this regional hazard mitigation plan as an update to its four existing county level plans. This includes a description of the key steps involved in the processes followed, who was involved (i.e., the members of the Hazard Mitigation Planning Committee) and full descriptions of community meetings and workshops, how the public and other stakeholders were notified and involved, and how each of the municipal jurisdictions participated in the process.

The Planning Area Profile, located in Section 3, describes the general makeup of the region, including its counties and local municipalities, including relevant geographic, demographic, and economic characteristics. In addition, building characteristics and land use patterns are discussed along with general historical disaster data. This baseline information provides context for the region-wide planning area and thereby assists the planning team in recognizing the social, environmental, and economic factors that play a role in determining community vulnerability to natural hazards.

The Risk Assessment, found in Section 4, serves to identify, analyze, and assess the region's overall risk to natural hazards. The Risk Assessment also attempts to define any hazard risks that may uniquely or exclusively affect the individual municipal jurisdictions. The Risk Assessment, builds on available historical data from past hazard occurrences, establishes detailed profiles for each hazard, and culminates in a hazard risk ranking based on conclusions about the frequency of occurrence, spatial extent, and potential impact of each hazard. In essence, the information generated through the Risk Assessment, serves a critical function as communities seek to determine the most appropriate mitigation actions to pursue and implement—enabling communities to prioritize and focus their efforts on those hazards of greatest concern and those structures or areas facing the greatest risk(s).

The Capability Assessment, located in Section 5, provides a comprehensive examination of the Plan Area and the participating municipalities' capacity to implement meaningful mitigation strategies and identifies existing 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 detailed survey questionnaires for local officials 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 (such as participation in the National Flood Insurance Program) in establishing a successful and sustainable community hazard mitigation program. The Community Profile, Risk Assessment, and Capability Assessment collectively serve as a basis for determining the goals for the Hazard Mitigation Plan, each contributing to the development, adoption, and implementation of a meaningful plan.

The Mitigation Strategy, found in Section 6, consists of regional goal statements as well as specific mitigation actions for each local government jurisdiction participating in the planning process, along with a set of regional mitigation actions to be implemented by the Hazard Mitigation Planning Committee. The Mitigation Strategy provides the foundation for detailed Mitigation Action Plans, found in Section 7, that link specific mitigation actions for each jurisdiction 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 short-term and immediate actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of mitigation projects, emphasis is placed on the use of program and policy alternatives to help make the Plan Area less vulnerable to the damaging forces of nature 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 hazard mitigation policies and programs with complimentary community goals related to housing, economic development, downtown revitalization, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

The Plan Maintenance Procedures, found in Section 8, includes the measures each participating jurisdiction will take to ensure the Plan's continuous long-term implementation. The procedures also include how the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

Section 2. Planning Process

This section of the Plan describes the mitigation planning process undertaken by the region in preparing the Hazard Mitigation Plan (HMP or Plan). It consists of the following eight subsections:

- 2.1 Overview of Hazard Mitigation Planning
- 2.2 History of Hazard Mitigation Planning in the Plan Region
- 2.3 Preparing the Regional Plan
- 2.4 Hazard Mitigation Planning Committee
- 2.5 Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Involving 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 results in a HMP that identifies specific mitigation actions, each designed to achieve short-term planning objectives and a long-term community vision. To ensure the functionality of each mitigation action, responsibility is assigned to a specific individual, department, or agency along with a schedule for its implementation. 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.

2.1.1. Mitigation planning offers many benefits, including:

- Saving lives and 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, mitigation planning is described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that pre-disaster investments 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 residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track more quickly and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. 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 consider other existing community goals or initiatives that will help complement or hinder their future implementation.

2.2. History of Hazard Mitigation Planning in the Plan Region

All four counties participated in the update of the Unifour Regional HMP in 2020 and four counties participated in the update of the Unifour Regional HMP that is set to be approved in 2025. All participating counties and municipalities are listed below:

2.2.1.1. *Alexander County*

- Alexander County
- Town of Taylorsville

2.2.1.2. *Burke County*

- Burke County
- Town of Connelly Springs
- Town of Drexel
- Town of Glen Alpine
- Town of Hildebran
- City of Morganton
- Town of Valdese
- Town of Rutherford College

2.2.1.3. *Caldwell County*

- Caldwell County
- Town of Cahah's Mountain
- Village of Cedar Rock

- Town of Gamewell
- Town of Granite Falls
- Town of Hudson
- City of Lenoir
- Town of Rhodhiss
- Town of Sawmills

2.2.1.4. Catawba County

- Catawba County
- Town of Brookford
- Town of Catawba
- City of Claremont
- City of Conover
- City of Hickory
- Town of Long View
- Town of Maiden
- City of Newton

No new jurisdictions have joined the planning process since the plan was adopted, and all jurisdictions that participated in previous planning efforts have agreed to participate in this regional planning effort. The specific process of moving forward with one regional approach is described in more detail in the following subsections.

2.3. How the Regional Plan Was Prepared

HMP are required by FEMA to be updated every five years for the jurisdictions covered under them to remain eligible for federal mitigation and public assistance funding.

Element A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?
(Requirement 44 CFR § 201.6(c)(1))

HMPs are required by FEMA to be updated every five years for the jurisdictions covered under them to remain eligible for federal mitigation and public assistance funding. To simplify and enhance planning efforts for the jurisdictions in the Unifour Region, Alexander, Burke, Caldwell, and Catawba counties made the decision to move forward with the creation of the Unifour Regional HMP. This regional approach allows resources to be shared amongst the participating jurisdictions and eases the administrative duties of all the participants by combining the four existing county level plans, and the requirements for the five-year plan update, into one coordinated regional planning process.

To help prepare the Unifour Regional HMP, AECOM was hired as a consultant to provide professional mitigation planning services. To meet requirements of the National Flood Insurance Program’s (NFIP’s) Community Rating System, the region ensured that the planning process was facilitated under the direction of a professional planner, Kelly Keefe, Construction and Facilities Manager (CFM), from AECOM who served as the lead planner for this project.

Per the contractual scope of work, the consultant team followed the mitigation planning process recommended by FEMA and recommendations provided by North Carolina Division of Emergency Management (NCEM) mitigation planning staff. The *Local Hazard Mitigation Plan Review Tool*, found in Appendix E, provides a detailed summary of FEMA’s current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA’s Interim Final Rule as published in the Federal Register on February 26, 2002, in Part 201 of the Code of Federal Regulations (CFR). The planning team used FEMA’s *Local Mitigation Planning Handbook* (released May 2023) for reference as they completed the Plan along with the Planning Policy Guide (effective April 2023).

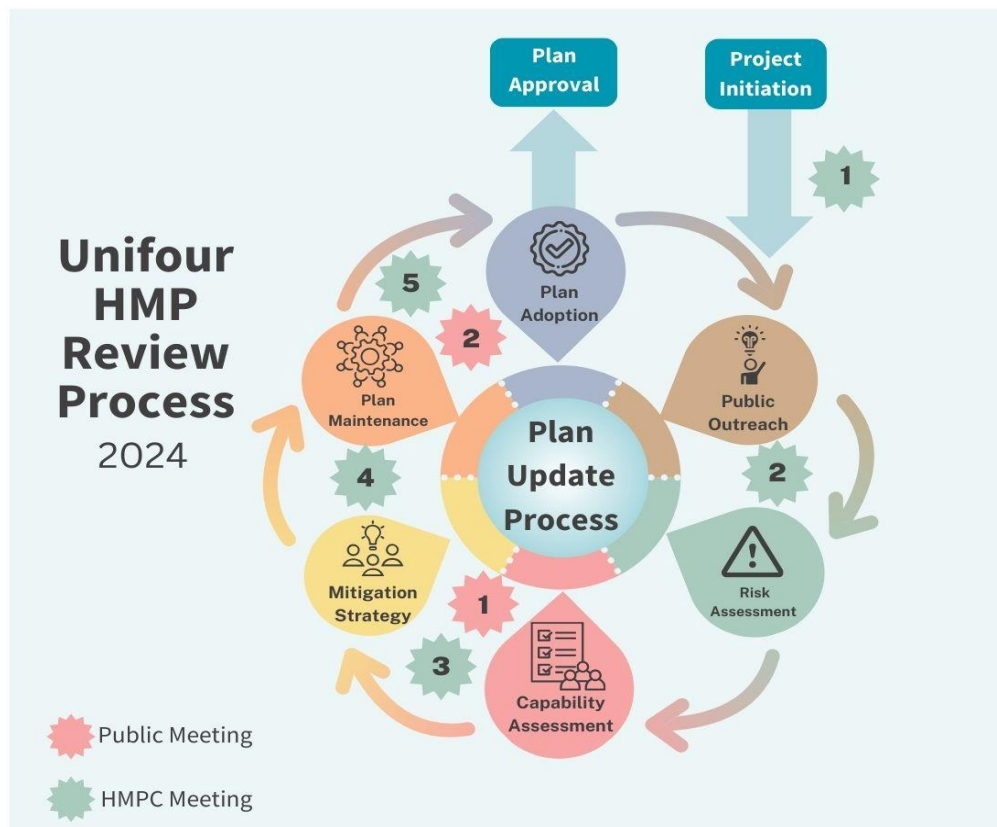


Figure 2-1: Mitigation Planning Process for the Plan Area

The process used to prepare this Plan included six major steps completed over about nine months beginning in March 2024. Each of these planning steps resulted in critical work products and outcomes that collectively make up the Plan.

Table 2-1: Meetings Schedule

Task Type	Task	Date Completed
Meeting	HMPC County Kickoff Meeting	February 7, 2024
Public Meeting	Kickoff	February 16, 2024
Meeting	Planning Overview	April 11, 2024
Workshop	Capabilities Assessment	May 13, 2024
Deadline	Capabilities Assessments	August 14, 2024
Public Meeting	Mitigation Goal & Stakeholder Review	June 12, 2024
Workshop	Mitigation Actions	July 9, 2024
Deadline	Mitigation Actions	August 14, 2024
Meeting/Deadline	HMP Draft Review & Distribution Public Meeting	September 18, 2024
Deadline	Stakeholder Review Deadline	October 2, 2024
Submit	Final Draft Submitted to the State for Review	October 15, 2024

HMP = Hazard Mitigation Plan

HMPC = Hazard Mitigation Planning Committee

Element A1-a: *Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan's development, as well as who was involved?*

Table 2-2: Participation Summary by Jurisdiction

Jurisdiction	HMP Meeting Attendance	Alternate Participation	Mitigation Action Updates	Capabilities Assessment	NFIP Participation Questionnaire	Participation Details
Alexander County	Yes	---	Updated	Updated	Yes	Meeting Attendance: 2/7/2024, 2/16/2024, 4/11/2024, 6/12/2024, 7/9/2024, 9/18/2024. NFIP Questionnaire Completed
Town of Taylorsville	Yes	---	Updated	Updated	See County Status	Meeting Attendance: 2/16/2024. NFIP Questionnaire Completed
Burke County	Yes	---	Updated	Updated	Yes	Meeting Attendance: 2/7/2024, 2/16/2024, 4/11/2024, 7/9/2024, 9/18/2024
Town of Connelly Springs	Yes*	One-on-One Participation	Unchanged	Unchanged	Yes	Mitigation Actions and Capabilities Assessment Responses were used in this plan from the 2019 Unifour HMP Update

Jurisdiction	HMP Meeting Attendance	Alternate Participation	Mitigation Action Updates	Capabilities Assessment	NFIP Participation Questionnaire	Participation Details
Town of Drexel	Yes	---	Updated	Updated	Yes	Meeting Attendance: 4/11/2024. NFIP Questionnaire Completed
Town of Glen Alpine	Yes*	One on One Participation	Yes	Yes	Yes	Participated in the update process via email (See Appendix G).
Town of Hildebran	Yes	---	Updated	Updated	Yes	Meeting Attendance: 4/11/2024, 6/12/2024, 7/9/2024, 9/18/2024
City of Morganton	Yes	---	Updated	Updated	Yes	Meeting Attendance: 7/9/2024
Town of Rutherford College	Yes	---	Updated	Updated	Yes	Meeting Attendance: 6/12/2024
Town of Valdese	Yes	---	Updated	Updated	Yes	Meeting Attendance: 4/11/2024, 7/9/2024, 9/18/2024. NFIP Questionnaire Completed
Catawba County	Yes	---	Updated	Updated	Yes	Meeting Attendance: 2/7/2024, 2/16/2024, 4/11/2024, 6/12/2024, 7/9/2024, 9/18/2024. NFIP Questionnaire Completed
Town of Brookford	Yes*	One-on-One Participation	Updated	Unchanged	See County Status	One-on-one Participation in the update process via email (See Appendix G); Capabilities Assessment responses used in this HMP were from the 2019 Unifour HMP Update.
Town of Catawba	Yes	---	Unchanged	Unchanged	See County Status	Meeting Attendance: 4/11/2024, 6/12/2024, 7/9/2024. Mitigation Actions and Capabilities Assessment Responses in this plan are from the 2019 Unifour HMP Updates.

Section 2: Planning Process

Jurisdiction	HMP Meeting Attendance	Alternate Participation	Mitigation Action Updates	Capabilities Assessment	NFIP Participation Questionnaire	Participation Details
City of Claremont	Yes*	One-on-One Participation	Updated	Updated	Yes	One-on-one Participation in the update process via email (See Appendix G); NFIP Questionnaire Completed
City of Conover	Yes*	One-on-One Participation	Updated	Unchanged	See County Status	Capabilities Assessment responses used in this HMP were from the 2019 Unifour HMP Update; No correspondence with Jurisdiction
City of Hickory	Yes	---	Updated	Updated	Yes	Meeting Attendance: 2/16/2024, 4/11/2024, 6/12/2024, 7/9/2024, 9/18/2024. NFIP Questionnaire Completed
Town of Long View	Yes	---	Updated	Updated	Yes	Meeting Attendance: 4/11/2024, 6/12/2024, 9/18/2024. NFIP Questionnaire Completed
Town of Maiden	Yes	---	Updated	Updated	See County Status	Meeting Attendance: 6/12/2024, 9/18/2024
City of Newton	Yes	---	Updated	Updated	See County Status	Meeting Attendance: 6/12/2024, 7/9/2024; 9/18/2024
Caldwell County	Yes	---	Updated	Updated	Yes	Meeting Attendance: 2/7/2024, 4/11/2024, 6/12/2024, 7/9/202. NFIP Questionnaire Completed
Town of Cajah's Mountain	Yes*	One-on-One Participation	Updated	Unchanged	See County Status	Mitigation Actions and Capabilities Assessment Responses in this plan are from the 2019 Unifour HMP Update. One-on-one Participation in the update process via email (See Appendix G);
Village of Cedar Rock	Yes	---	Updated	Updated	Yes	Meeting Attendance: 6/12/2024. NFIP Questionnaire Completed

Jurisdiction	HMP Meeting Attendance	Alternate Participation	Mitigation Action Updates	Capabilities Assessment	NFIP Participation Questionnaire	Participation Details
Town of Gamewell	Yes	---	Updated	Updated	Yes	Meeting Attendance: 4/11/2024. NFIP Questionnaire Completed
Town of Granite Falls	Yes	---	Updated	Updated	Yes	Meeting Attendance: 6/12/2024, 9/18/2024, 9/25/2024 (Office Hours) NFIP Questionnaire Completed
Town of Hudson	Yes	---	Updated	Updated	Yes	Meeting Attendance: 2/16/2024, 4/11/2024, 6/12/2024, 7/9/2024. NFIP Questionnaire Completed
City of Lenoir	Yes	---	Updated	Updated	Yes	Meeting Attendance: 7/9/2024, 9/18/2024, 9/25/2024 (Office Hours); NFIP Questionnaire Completed
Town of Rhodhiss	Yes	---	Updated	Updated	Yes	Meeting Attendance: 4/11/2024. NFIP Questionnaire Completed
Town of Sawmills	Yes	---	Updated	Unchanged	Yes	Meeting Attendance: 6/12/2024. Capabilities Assessment Responses in this plan are from the 2019 Unifour HMP Updates.

**Indicates where Alternative Participation was conducted by completing one-on-one planning sessions with AECOM Planners*

--- = not applicable

HMP = Hazard Mitigation Plan

NFIP = National Flood Insurance Program

2.3.1. Plans, Studies, Reports, and Technical Information

This plan was developed utilizing a wide range of technical information, plans, studies, and reports which helped inform the updates to the Unifour Regional HMP. Each source was utilized in varying capacities, but information is cited throughout each section of the Unifour Regional HMP where applicable. Some of the Plans, Studies, Reports, and Technical Information used to guide and inform this HMP update include, but not limited to:

- Federal Emergency Management Administration (FEMA) National Risk Index (NRI) and NRI Technical Documentation
- North Carolina Historic Preservation Office & North Carolina Department of Natural and Cultural Resources: HPOWEB 2.0

- National Oceanic and Atmospheric Administration’s (NOAA) National Weather Service 80-Year List of Severe Weather Fatalities
- NOAA and National Center for Environmental Information (NCEI) Storm Events Database
- National Interagency Fire Center Wildland Fire Interagency Geospatial Services
- State of North Carolina 2023 HMP
- U.S. Geological Survey Earthquake Catalog (USGS)
- U.S. Census Bureau Census Information
- Alexander County 2045 Comprehensive Plan
- Blueprint Burke Strategic Use Plan
- Caldwell County Comprehensive Plan
- Catawba County Comprehensive Plan
- National Register of Historic Places (U.S. National Park Service) Database
- FEMA Local Mitigation Planning Handbook
- FEMA Community Status Book
- North Carolina Risk Management Tool (RMT)

A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))

2.4. Hazard Mitigation Planning Committee

To guide the development of this Plan, the Unifour counties (Alexander County, Burke County, Caldwell County, and Catawba County) created the Unifour Hazard Mitigation Planning Committee (HMPC). This committee represented a community-based planning team made up of representatives from various county departments and municipalities and other key stakeholders identified to serve as critical partners in the planning process.

Beginning in March 2024, the 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, including an email campaign to invite various stakeholders such as local/regional agencies and neighboring communities to participate in the planning process. This working group coordinated all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, committee members routinely communicated and were kept informed through an email distribution list.

Element A1. *Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))*

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

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

Table 2-3 lists the members of the HMPC responsible for participating in the development of the Plan. Committee members are listed by jurisdiction in Table 2-3 for ease of organizing and presenting the information, but it should be noted that the committee worked extremely well as one regional unit thinking beyond traditional jurisdictional boundaries to focus on the mitigation planning issues and tasks at hand. For all jurisdictions unable to attend the meetings in person, they were represented by their County Lead Coordinator and maintained communication to participate, review and make decisions about plan data. The County Lead Coordinators are Daniel Fox and Amy Bucknum, Alexander County; Michael Willis and Marti Blanton, Burke County; Vic Misenheimer, Caldwell County; Jason Williams, Catawba County.

Table 2-3: Members of the Hazard Mitigation Planning Committee

Jurisdiction	Organization	Name	Title
ALEXANDER COUNTY			
Alexander County	Alexander County	Daniel Fox (County Lead)	Emergency Management Coordinator
Alexander County	Alexander County	Greg Foster	Telecommunications Manager
Town of Taylorsville	Town of Taylorsville	Doug Gillispie	Town Assistant
Town of Taylorsville	Taylorsville Police Dept.	Mike Millsaps	Chief of Police
BURKE COUNTY			
Burke County	Burke County	Mike Willis (County Lead)	Emergency Management Director
Burke County	Burke County	Marti Blanton (County Lead)	Emergency Management Planner
Burke County	Town of Drexel	Bill Carroll	Town Manager

Jurisdiction	Organization	Name	Title
City of Morganton	City of Morganton	Mario Sclarandis	Director of Development and City Engineering
City of Morganton	City of Morganton	Wendy Smith	Director of Development and Design Services
Town of Connelly Springs	Town of Connelly Springs	Tamara Brooks	Town Clerk
Town of Glen Alpine	Town of Glen Alpine	Sherri Farris	Town Clerk
Town of Hilderbran	Town of Hilderbran	Thomas Drum	Town Manager
Town of Rutherford College	WPCOG	Johnny Wear	Planner
Burke County	Burke County	Teresa Kinney	WPCOG
Town of Valdese	Town of Valdese	Larry Johnson	Town Planner
Town of Valdese	Town of Valdese	Truman Walton	Fire Chief/Emergency Management
Town of Drexel	Town Drexel	Bill Carroll	Manager
CALDWELL COUNTY			
Caldwell County	Caldwell County	Vic Misenheimer (County Lead)	Emergency Management Director
Caldwell County	Caldwell County	Trevor Key	Collettsville Fire
Caldwell County	Caldwell County EMS	Jonathan Cook	Caldwell County EMS Paramedic
Caldwell County	Caldwell County	Kim McGee	Planner
Caldwell County	Grace Chapel Fire Department	Travis Davenport	Grace Chapel Firefighter Department
Caldwell County	Caldwell County Sheriffs Office	Kevin Bean	Major
Caldwell County	Caldwell County Environmental Health	Jordan Cramer	UNC Healthcare Administrator
Caldwell County	UNC Health Department	Chaiyo Vang	Public Health Educator/ Preparedness Coordinator
Caldwell County	Caldwell County Environmental Health	James Stewart	Administrator
Caldwell County	Caldwell County	Shelley Stevens	Planning Director
Caldwell County	Yokefellow Inc.	Sharon Harmon	Minister
Caldwell County	Caldwell County Schools	Andy Puhl	Assistant Superintendent for Auxiliary Services
City of Lenoir	Lenoir Fire	Kenny Nelson	Deputy Chief
City of Lenoir	City of Lenoir	Hannah Williams	Planning Director

Jurisdiction	Organization	Name	Title
Town of Cajahs Mountain	Town of Cajahs Mountain	Randy Feierbend	Town Manager
Town of Gamewell	Town of Gamewell	Bonnie Cauldle	Town Administrator
Town of Granite Falls	Town of Granite Falls	Greg Wilson	Planner
Town of Granite Falls	Town of Granite Falls	Brian Bennet	Fire Chief
Town of Hudson	Town of Hudson	Jonathan Greer	Town Manager
Town of Rhodhiss	Town of Rhodhiss	Rick Justice	Town Manager
Town of Sawmills	Town of Sawmills	Chase Winebarger	Manager
Village of Cedar Rock	Village of Cedar Rock	Daniel Odom	WPCOG
CATAWBA COUNTY			
Catawba County	Catawba County	Jason Williams (County Lead)	Emergency Management Coordinator
Catawba County	Catawba County	Chris Timberlake	Assistant Planning Director
Catawba County	Emergency Services	Bryan Blanton	Emergency Services Director
Catawba County	Emergency Services	Frank Ballentine	Emergency Management Project Specialist
Catawba County	Catawba County Schools	Dan Moore	Assist. Supervisor of Operations
Catawba County	Catawba County Schools	Devin Houston	Assist. Director of Maintenance
City of Claremont	City of Claremont	Jason Brown	City Manager
City of Conover	City of Conover	Tom Hart	City Manager
City of Hickory	City of Hickory	Sam Abernethy	Civil Engineer
City of Hickory	City of Hickory	Caleb Bynum (City Lead)	Utilities Engineer
City of Hickory	City of Hickory	Cal Overby	Principal Planner
City of Newton	City of Newton	Alex Fulbright	Planning Director
Town of Brookford	Town of Brookford	Marshall Eckard	Manager
Town of Catawba	Town of Catawba	Danny Hipps	Manager
Town of Long View	Town of Long View	Charles Mullis	Planner
Town of Maiden	Town of Maiden	Blake Wright	Planning Director
	Western Council of Governments	Curt Willis	Emergency Management Coordinator for WPCOG
	Appalachian State University	Jason Marshburn	Director of Environmental Health, Safety, and Emergency Management
	Samaritans Purse	Jodi Yoder	Program Manager

Jurisdiction	Organization	Name	Title
Hickory and High The High Country	Salvation Army	Majors Karla and Ricky Perez	Corps Officers
Hickory and High The High Country	Salvation Army	Sindy Connell	High Country Service Center Director
	Red Cross	Scott Loudermelt	Executive Director Blue Ridge Piedmont
	Ashure Ministry	Kristal Manning	Executive Director

EMS = Emergency Medical Services
 UNC = University of North Carolina
 WPCOG = West Piedmont Council of Governments

2.4.1.1. Multi-jurisdictional Participation

The Plan Area HMP includes four counties and 24 incorporated municipalities. To satisfy multi-jurisdictional participation requirements, each county and its participating jurisdictions were required to perform the following tasks via in person engagements and/or electronic data exchanges:

- Participate in mitigation planning meetings and workshops;
- Complete the Local Capability Assessment Survey;
- Provide an update on previously adopted mitigation actions;
- Review drafts of the Plan Area HMP; and
- Adopt their updated local Mitigation Action Plan.

Each jurisdiction participated in the planning process and each jurisdiction has developed and adopted a local Mitigation Action Plan that will be updated over time per the Plan Maintenance Procedures described in Section 8.

2.4.1.2. Alternate Participation and Ensuring Complete Participation in the Planning Process

Throughout the planning process, all jurisdictions were invited to participate through invitations to designated representatives and HMPC members listed in Table 2-3 to virtual, in-person, and hybrid HMPC meetings described below. All jurisdictions in Table 2-2 and listed in Section 2.2 were invited and contributed to the plan update process by attending meetings, but the jurisdictions of Connelly Springs, Glen Alpine, Brookford, Claremont, Conover, and Cahah’s Mountain were unable to attend the scheduled meetings and were involved in the planning process by engaging and actively participating in the development of the plan by providing input and editing plan content as the representative of the participating jurisdictions with one-on-one communications and plan edits with AECOM planners, also referred to in this plan as **Alternate Participation**. This was the preferred method of participation for the jurisdictions mentioned as opposed to meeting attendance.

*One-on-one communication and **Alternate Participation** and verification of participation can be found in Appendix G.*

2.5. Meetings and Workshops

The preparation of this Plan required a series of meetings and workshops for facilitating discussion, gaining consensus, and initiating data collection efforts with local government staff, community officials, and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the Plan. Meeting sign-in sheets, images and other attachments for each meeting below can be found in Appendix F.

The following is a summary of the key meetings and workshops held by the HMPC during the Plan's development. In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency. For example, completing the *Local Capability Assessment Survey* or seeking approval of specific mitigation actions for their department or agency to undertake and include in their *Mitigation Action Plan*. Public meetings are summarized in Section 2.6.

1. HMPC County Kickoff Meeting: February 7, 2024

This meeting was held to start the hazard mitigation planning process to the planning area leads, NCEM representatives, Emergency Management Leads, and the AECOM planning team. This meeting was to introduce the AECOM Planning team to the planning area leads, outline the HMP update process, outline the responsibilities of the planning team, and responsibilities of the planning area leads. The February 16, 2024 meeting date was given to attendees along with information about what the next meeting would entail.

2. HMPC Meeting: February 16, 2024

The Project Kickoff meeting was initiated by Jason Williams, Catawba County Emergency Management Coordinator, and was led by Kelly Keefe (AECOM Lead Planner) and McKenzie Houston (AECOM Mitigation Planner). This meeting consisted of a detailed overview of the project, a review and discussion of the previous regional mitigation plan, an explanation of the process to be followed for updating the previous plan and integrating content from other resources, an open discussion session, and an explanation of next steps.

The meeting began with a brief welcome and opportunity for each of the attendees to introduce themselves to the group. Emphasis was placed on identifying what jurisdiction or organization each participant was there to represent, as there were representatives from the participating jurisdictions, the WPCOG, other state and local stakeholders, and AECOM. As part of this recognition process, a spreadsheet was passed around for representatives to designate one "Designated Local Jurisdiction Lead" to serve as a primary point of contact for each participating jurisdiction for the duration of the project.

The project overview explained the purpose of the planning process. It also covered the geographic scope of the project, the proposed schedule for the project, and a detailed

breakdown of the key project tasks. The roles and responsibilities for AECOM, Caldwell County as the lead local agency, and for all participating jurisdictions were also covered. These roles and responsibilities were presented as follows:

2.5.1.1. AECOM

- Oversee, manage, and document the completion of all key project tasks
- Monthly progress reports

2.5.1.2. Catawba County

- Serving as lead coordinating agency
- Designation of local project manager
- Assistance with the collection of documents, data, and other information
- Coordination for project meetings
- Hosting and managing project website
- Responding to frequent questions or inquiries from the public or stakeholders
- Coordinating with participating jurisdictions

2.5.1.3. All participating jurisdictions

- Designate local jurisdiction lead
- Attend Hazard Mitigation Planning Committee meetings
- Coordination between counties, municipalities, and local stakeholders
- Data collection and information sharing
- Mitigation strategy development (*Mitigation Action Plans*)
- Assist with public outreach
- Review and comment on draft plan materials
- Adopt the plan

A discussion was also facilitated to discuss ways that existing resources could be leveraged, such as existing plans, studies, and reports; existing data and information; local knowledge sharing; and other resources. Three primary planning resources were also introduced to the HMPC at this time: The *Local Mitigation Planning Handbook*, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, and *Integrating Hazard Mitigation into Local Planning*, all recent publications from FEMA providing mitigation planning guidance.

Emphasis was also placed on the need for effective communication throughout the project. This included an overview of the planning team's organization and the idea that municipal jurisdictions would coordinate first through their Designated Local Jurisdiction Lead who would in turn coordinate with the Designated Local Jurisdiction Lead for that county, who would in turn coordinate with the overall local project leads, Jason Williams with Catawba County. Active participation and responsiveness were also stressed due to the aggressive schedule to complete the plan in the desired time.

A detailed discussion also centered on GIS data collection needs and the process to be followed for collecting and submitting the needed data (which was to follow the chain of communication described in the paragraph above). Emphasis was placed on the need for the GIS data to be submitted in a readily usable format and to be the best data readily available.

The committee was also given an overview of a Public Outreach Strategy that would be developed between HMPC Meeting #1 and HMPC Meeting #2. The goals of the Public Outreach Strategy were stated as:

- Generate public interest;
- Solicit citizen input; and
- Engage additional partners in the planning process.

Specific opportunities for public participation were identified as being two in-person open public meetings, the creation of a public project information website, a web-based public participation survey, and use of social media (Facebook, Twitter, RSS, and other assorted options).

Next steps were defined as assignment of Designated Local Jurisdiction Leads (to be completed as soon as possible); open the online Public Participation Survey (to be completed as soon as possible); finalize Public Outreach Strategy (to be completed as soon as possible); prepare preliminary risk assessment decisions, analysis, and map templates (to be completed as soon as possible); and prepare for HMPC Meeting #2 (to be held April 11, 2024).

3. HMPC Meeting: April 11, 2024

This meeting was held in Newton, NC at 25 Government Drive and was available for In-person or remote attendance. The meeting was led by McKenzie Houston and Kelly Keefe from AECOM.

The meeting started with a brief introduction and was followed by discussions concerning the need for a designated leader for each community that can coordinate with the Core Planning Team, which will be sent on a spreadsheet by AECOM. The goal is that the planning team spreadsheet should be filled out by the end of next week. It was announced that Marti Blanton will be the lead for Burke County.

In the meantime, attendees were asked to consider stakeholders to invite and suggestions for the upcoming public survey. The live survey will contain 18 questions and will need to be pushed out to the residents and the market for each jurisdiction. It was suggested that we initially try to gather responses to the survey for 4-6 weeks (about 1 and a half months) to determine the response level and adjust the survey if necessary to reduce the number of questions to improve responses. AECOM will contact each county lead to put the survey out on social media to improve public outreach.

Next, the public outreach strategy was discussed along with the goal, which is to engage additional partners in the planning process by identifying specific opportunities for participation. There will need to be two meetings that follow FEMA guidelines for stakeholder engagement, and changes to the previous methods of compliance will be discussed. Previous methods of engagement that adhered to FEMA guidelines included online meetings through Facebook during the pandemic, but it was proposed that the next meeting would be a hybrid format with an in-person option. For the in-person meeting location, we need to identify a central location for a meeting place in the region and determine the mode of delivery for the online option that is

most compatible with everybody's jurisdiction. For this meeting, there needs to be a one-page fact sheet that can inform residents and stakeholders who attend the public meetings about the Plan and the revision process.

The guidance for stakeholders has been updated by FEMA and will need to include a wider range of stakeholders during the public outreach process than in previous reviews. Additional required stakeholder groups will include neighboring communities, businesses, academia, and nonprofit groups. The public participation survey will go live for the public on 4/12/24 and the community representatives were asked what the best way to disperse the survey would be. One county suggested adding a raffle for survey participants to incentivize responses to the survey as an example of a way to increase engagement.

AECOM will meet with the HMPC to gather input on each section of the Plan, and the planning team will receive feedback by dividing the plan into sections, allowing community representatives to make the reviewing process less intense or tedious. The HMPC members and stakeholders will also provide perspectives on the hazard mitigation issues that face the community along with potential resolutions for the issues discussed.

The Unifour Hazards were then discussed and included an overview of Hazard ID & Risk Assessment, Capability Assessment, and Risks summary processes. These were described as including the following elements:

- Factual basis for prioritizing mitigation activities
- Identification and Description of Hazards
- Identification of assets
- Risk assessment
- Vulnerability summary

The mitigation projects that are included in the HMP are extensive and may include projects that aren't currently in progress or feasible. Capability assessments will be sent out to every county and the number of questions has been reduced by AECOM. Virtual online workshops to assist jurisdictions with completing the capability assessment will not be required but will be dedicated to helping the representatives understand and complete the questions, while also having a designated time to have specific questions answered that will assist with completing the capability assessment.

Next in the meeting, the 2019 Plan maintenance procedures were described to involve yearly plan updates which happened sometimes but not all the time. To be able to complete yearly plan updates there were questions asked to get an idea of what adjustments could be made to improve the procedures in the future. This included:

- Asking whether there are times when the four counties get together or if there could be a procedure update on the agenda for meetings where the four counties are already together, instead of organizing an entirely separate meeting.

- Potentially holding meetings after each natural disaster event
- Annual status plan updates that can be sent to the Core Planning Team for each jurisdiction's Mitigation Action Plan to evaluate the effectiveness of its implementation.

It was noted that there would be an Excel spreadsheet that includes all existing mitigation actions so that they can be filtered to the area of interest when reviewing. There was discussion of the need to reevaluate how often and when there should be plan maintenance meetings in the future.

Next, there was an update on the plan sections, draft review, and questions for open discussion. It was requested that while reviewing and commenting reviewers should leave on the track changes feature so that reviewers can see what changes or suggested changes are being made. Other discussion points included:

- Are there potential opportunities for this plan update?
- Are there potential barriers or obstacles to the plan update?
- If a representative can't be at a meeting it is requested that the representative reach out to the Core Team which will provide the information by email. This is because FEMA occasionally goes through and checks the attendance sheet and will ask how they participated if they were not included in a meeting.

NCEM recommends that each community not limit the mitigation actions they will include in the plan, because often NCEM and FEMA will look at the HMP for prioritization when communities seek funding for projects. It is also recommended that each area should conduct outreach to other municipalities or counties to make sure that they are accounting for everything that should be in the plan in terms of mitigation actions. Additionally, there is new funding that is set aside for BRIC for community and capacity building, so communities do not need to be as worried about the pool of funding about the higher costs of larger projects and the higher costs associated with planning larger projects.

NCEM also expressed that it is trying to do a better job of reaching out to historically underserved populations and that the county representatives should think about underserved populations in their jurisdictions. Art organizations were mentioned as an excellent way to engage underserved populations and usually have facilities that can be used for meetings or protection from hazards. FEMA and NCEM will not judge based on the success of outreach, but each jurisdiction will be judged based on the level of effort put into outreach attempts. It was also recommended that having state grant representatives attend the mitigation actions discussions at the next meetings could be an excellent opportunity to start building out some of the grant applications for mitigation actions while maximizing the use of time.

Next data needs and next steps were discussed. Data needs highlighted the following categories:

- Critical Facilities Assets

- Repetitive Loss Property Data
- Dam inundation zones and high-hazard dams
- Local capability assessments
- Data discrepancies from previous HMPs to identify what can be improved
- Hazard history costs and impacts
- Picture and video of hazards, damages, and mitigation projects

The next steps were discussed, and the following were highlighted as priority actions:

- Designated local leads are to serve as the primary point of contact for each jurisdiction for the duration of the project
- Identification of additional stakeholder invitations to represent underserved populations and a broader range of stakeholder groups
- Capability assessments should be completed, but it was emphasized that it is acceptable to not have specific plans or ordinances for each category within the assessment.
- There is a possibility for a virtual capability workshop in May where we go over 68 questions on the capability assessment, what they mean, and how to answer each one.
- The next hybrid meeting in June 2024 could become a public meeting.
- The HMPC Actions Workshop in July 2024 means that each jurisdiction:
 - Should Provide edits for the HMPC
 - Is encouraged to review other communities' HMPC actions to get a perspective of regional activities.
 - It is recommended that each jurisdiction link its HMP on its website to increase accessibility to the plan
 - FEMA will often check that links are live
 - FEMA will often require proof that public meetings were available and that they all had a chance to comment on the plan.

4. HMPC Meeting: June 12, 2024

The Mitigation Strategy Workshop was initiated by Jason Williams, Catawba County Emergency Management Coordinator, and was led by Kelly Keefe (AECOM Lead Planner) with assistance from McKenzie Houston and Peyton Campbell. This meeting consisted of a detailed overview of the draft risk assessment and draft capability assessment results, an update on public outreach, discussion of the regional vision statement, an exercise to formulate regional mitigation goals and regional mitigation actions, and an explanation of next steps.

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

The meeting continued with an overview of the draft risk assessment findings. The hazards addressed included: flood; erosion; dam/levee failure; drought/extreme heat; thunderstorm, lightning, and hail; tornado; winter weather; hurricane and tropical storm; landslide; earthquake; sinkhole; and wildfire. For each hazard the following information was shared: hazard maps, tables of at-risk buildings and infrastructure, and historical hazard occurrences. Complete inventories and maps were shown for demographic data, parcels and buildings, critical facilities, infrastructure elements, high potential loss properties, and historic properties. The technical information shared during this portion of the presentation is too extensive to share in this section.

The next portion of the presentation consisted of an overview of the draft capability assessment findings. Participation in the Local Capability Assessment Survey was the results centered on findings in the areas of planning and regulatory capability, administrative and technical capability, fiscal capability, education and outreach capability, political capability, and a community self-assessment. The point system and overall capability assessment score for the Region were presented to the group along with a ranking of local capability by jurisdiction. All this information is presented in its final form in the Capability Assessment section (Section 5).

An update on the Public Participation Survey was also provided just before a working lunch. At the time of the meeting, 579 online surveys had been started and preliminary notes and indications from these surveys were presented to the group. In general, the input being provided by the public was consistent and in-line with the discussions and decisions being made by the HMPC.

5. Plan Public Participation Summary September 18, 2024

This meeting was held online and was initiated to go present the public and HMPC with the final Unifour HMP Draft to allow the public and each jurisdiction to participate in the comment and review process. To inform all attendees about the progress made throughout the planning process, the planning process overview was recapped and the Unifour mitigation goals were restated. The instructions about how to access the draft plan PDF were explained, the public comment survey form was distributed, and the timeline for review was outlined which includes the October 1st deadline for comments and review of the draft before the final plan is prepared and submitted to the NCEM and FEMA for final approval.

As the plan update process concludes, it was restated that the most important ways the community can help with the HMP includes identifying vulnerabilities, verifying hazards, updating hazard events information, and verifying community capabilities. Emphasizing the need for community members to verify and update information regarding critical facilities, Keefe highlighted the significance of review of critical data to ensure its accuracy.

Towards the end of the meeting, the AECOM team discussed the importance of effective communication and participation among counties and towns regarding mitigation actions. The need for thoroughness in reviewing the large plan and the importance of timely updates of any outstanding capabilities assessments or mitigation actions was highlighted as a reminder to avoid discrepancies. Plans were made to set up office hours, gather comments before the

October 1st deadline, and ensure the draft plan is accessible to the public. The meeting concluded with a commitment to reconvene the following day to address any outstanding questions and to continue prioritizing important tasks.

6. *Optional Office Hours September 25, 2024*

There was an open meeting held on 9/25/2024 for any of the jurisdictions to attend to get assistance with plan components, ask questions, provide feedback, or discuss anything related to the HMP process. This was an open opportunity for any of the jurisdictions to join the meeting.

2.6. Involving the Public

A key component of any mitigation planning process is public participation. Individual citizen and community-based input provides the entire planning team with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community “buy-in” from those directly affected by the decisions of public officials.

As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community’s overall mitigation strategy aimed at making a home, neighborhood, school, business, or entire planning area safer from the potential effects of hazards.

Element A3. *Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))*

Public involvement in the development of the Unifour Regional HMP was sought using various methods including open public meetings, an interactive public information website, a project information fact sheet with contact information, a public participation survey, and by making copies of draft Plan documents available for public review on county websites. Public meetings were held 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 plan adoption. These public meetings were held at a central location to the planning area to ensure that citizens from each of the four participating counties had reasonable access to the opportunity to participate in-person in the planning process. The public participation survey (discussed in greater detail in subsection 2.6.1) was made available online via the project information website, each county’s website, through web links forwarded via email and newspaper articles, Facebook, Twitter, etc. For more information about meeting invitations, see Appendix F.

Additionally, the Public were given the opportunity to provide input about their preferences in terms of hazard mitigation actions in the public survey (Section 2.6.1), which was presented to the representatives of each jurisdiction to consider and incorporate into their planning when updating and or adding mitigation actions for the HMP update.

7. *Public Meeting: June 12, 2024*

The Public Meeting was held at 25 Government Drive in Newton, NC and was open to in-person and online attendees. This meeting went over the additional stakeholder and engagement

requirements for this plan update, the Unifour Regional Mitigation Goals, Public Survey Results, and an overview of the remainder of the HMP update process. The meeting also went over the mitigation action goals and the social equity questionnaire. No members of the public attended, though there was robust participation in the online survey.

2.6.1. Public Participation Survey

The Unifour Natural Hazard Mitigation Public Participation Survey was made available and remained available until August 16, 2024, per the Public Outreach Strategy, and there were 579 responses as of August 16, 2024. The survey results are in a summary report found in Appendix D. The results of the public feedback were presented to representatives of each jurisdiction that attended the HMPC meeting on June 12, 2024, where preliminary results were presented before the survey response deadline on August 16, 2024. From this, representatives were given the opportunity to further review the results to understand how the public survey results could be involved in the planning process and how their feedback could be considered or included in the plan.

The following list is a high-level summary of the dominant responses obtained from the survey:

- 1. 72.44% of respondents said they have been personally impacted by a disaster.**
- 2. The percentage of respondents that stated that they had been impacted by natural disaster(s) in the following graph**
- 3. Respondents reported that the most difficult factors in recovering from natural disasters that they have experienced were:**
 1. Direct Damage to Property – **35.90%**
 2. Financial – **27.75%**
 3. Emotional – **16.42%**
 4. Other – **10.83%**
 5. Long Recovery Time – **10.05%**
 6. Loss of Possessions – **5.69%**
- 4. The percentage of respondents said that they were “very concerned” about the following hazards are:**
 1. Thunderstorm/Hail/Lightning – **44.44%**
 2. Flood – **21.83%**
 3. Wildfire – **25.40%**
 4. Drought/Extreme Heat – **19.29%**
 5. Winter Weather – **17.08%**
 6. Hurricane – **16.31%**

- 7. Sinkhole – **9.21%**
- 8. Erosion – **7.19%**
- 9. Dam/Levee Failure – **3.97%**
- 10. Landslide – **3.09%**
- 11. Earthquake – **3.24%**

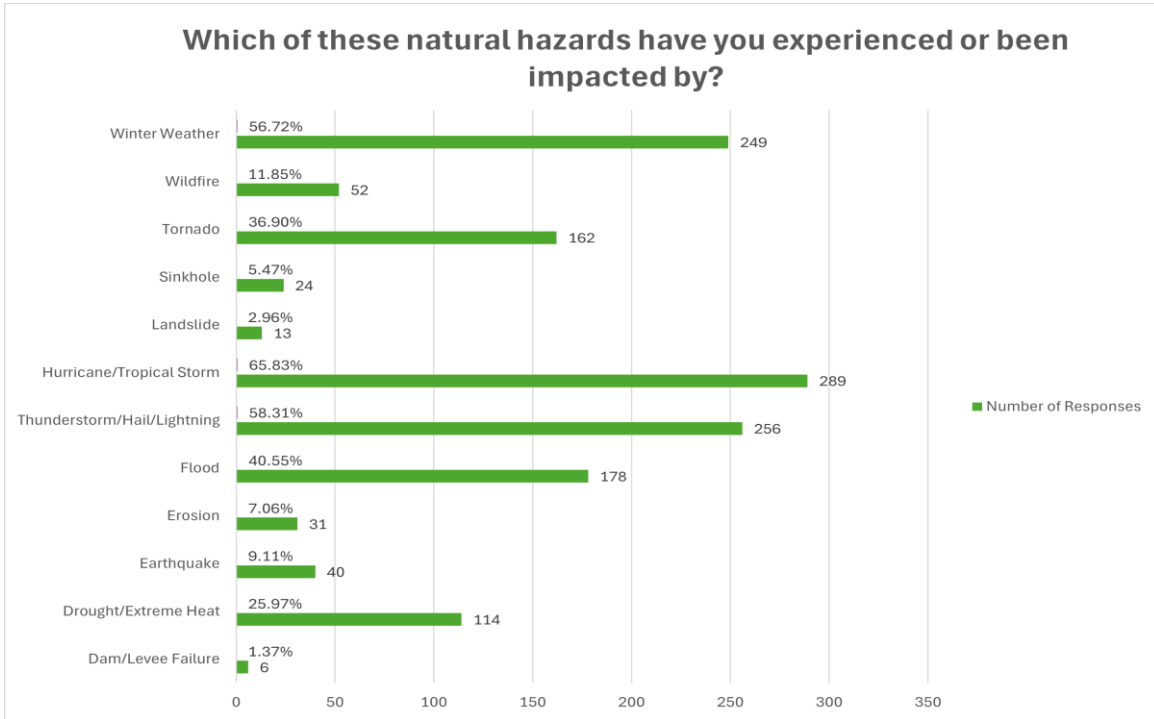


Figure 2-2: Hazards experienced by respondents in the public participation survey

5. The following percentage of respondents said that they considered the following community assets to be the “most vulnerable” to natural hazards:

- 1. People: Loss of Life and/or Injuries – **52.41%**
- 2. Infrastructure – **17.53%**
- 3. Economic – **11%**
- 4. Cultural and Historic – **5.31%**
- 5. Governance: (Ability to maintain order and/or provide public amenities and services) – **5.79%**

6. The percentage below represents the portion of respondents that the statement was “very important”:

- 1. Protecting critical facilities (For example, hospitals, police stations, and fire stations etc.) – **91.10%**
- 2. Strengthening emergency services – **84.79%**

3. Protecting and reducing damage to utilities – **74.87%**
4. Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses – **56.79%**
5. Preventing development in hazard areas – **52.88%**
6. Enhancing the function of natural features (For example, streams, wetlands, etc.) – **36.84%**
7. Protecting historical and cultural landmarks – **18.31%**

7. The following represents the portion of respondents who think the local government should take that step to reduce or eliminate risks of future natural hazard damages:

1. Protect Power Lines – **82.14%**
2. Keep storm drains clear – **76.88%**
3. Education and Awareness Activities – **77.06%**
4. Emergency Preparedness Kits – **74.26%**
5. Assist Vulnerable Populations - **67.78%**
6. Restrict Development in Floodplain Areas – **68.13%**
7. Reduce Stormwater Runoff – **54.47%**
8. Floodproof Your Home or Business – **33.63%**
9. Elevate Your Home or Business – **13.49%**

8. The following percentages represents the portion of respondents that consider the following community-wide activities as “Very Important” to reduce natural hazard risks:

1. Local Plans and Regulations (Government policies or codes that influence the way land and buildings are developed and built.) – **72.90%**
2. Education and Awareness Programs (Actions that inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them) – **72.11%**
3. Structure and Infrastructure Projects (Modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area) – **70.00%**
4. Natural Systems Protection (Actions that minimize damage and losses and preserve or restore the functions of natural systems) – **68.89%**
5. Other Types of Actions (Actions that are related to mitigation in ways that make sense to the local government that do not fall into one of the categories above) – **38.08%**

9. When asked what the most effective ways to receive information about how to make your home or neighborhood more resistant to natural hazards, the most results were the following answers in order of most to least percentage of respondents:

1. Internet (Social Media) – **76.49%**
2. Mobile Messages/Alerts – **68.42%**

3. Internet (Web Pages) – **54.74%**
4. Mail – **42.68%**
5. Television News – **37.19%**
6. Public Meetings/Workshops – **31.05%**
7. Radio Programs – **21.23%**
8. Television Ads – **18.42%**
9. Newspaper – **22.46%**
10. Local Government Channel – **18.95%**
11. Radio Ads – **17.02%**

10. Of all survey takers, only 9.39% reported that they had flood insurance, while 81.57% reported that they did not and 9.04% reported that they didn't know if they had flood insurance or not.

11. Respondents who reported they did not have flood insurance were asked why they did not have flood insurance, and the following were the most common responses:

1. The house isn't located in a floodplain - **66.12%**
2. Flood insurance is too expensive – **10.06%**
3. I don't think its necessary because it never floods – **1.64%**
4. I don't think it's necessary because I'm elevated or otherwise protected – **12.32%**
5. I don't think it's necessary because I have homeowners' insurance – **2.67%**
6. I never really considered it – **7.19%**

12. The following are responses to the activities that respondents have done in the last year to prepare for natural hazards:

1. Prepared your home by installing smoke detectors on each level of the house – **92.48%**
2. Talked with members in your household about what to do in the case of a natural disaster – **74.96%**
3. Developed a "Household/Family Emergency Plan" to decide what everyone would do in the event of a disaster – **53.32%**
4. In the last year, someone in your household has been trained in first aid or CPR – **54.36%**
5. Attended meetings or received written information on natural disasters or emergency preparedness – **41.46%**
6. Prepared a "Disaster Supply Kit" with extra food, water, batteries, or other emergency supplies – **40.77%**
7. Discussed or created a utility shutoff procedure in the event of a natural disaster – **31.82%**

13. Most respondents reported that they lived in a

1. Single Family Home – **84.75%**
2. Manufactured Home – **10.46%**
3. Apartment (5 or more units in structure) – **2.30%**
4. Apartment (3-4 units in the structure) – **0.89%**
5. Condominium – **0.53%**
6. Duplex – **1.06%**

The results of the survey were presented to members of the HMPC at HMPC Meeting on June 12, 2024, so that public opinion could be factored into changes and additions to each jurisdiction’s Mitigation Action Plan; especially considering vulnerable populations. Some examples include:

- “I feel that there are not enough community locations for the homeless in times of extreme weather conditions.”
- “Older adults need help recovering from a disaster. They are physically unable to do so.”

2.6.2. Social Equity Questionnaire

To consider social equity when reviewing capabilities, there was a social equity questionnaire that was distributed to understand how each jurisdiction in the planning area could be best represented and included in the planning process. This was to understand how underserved communities can be included in the planning process and how the planning process can create equity in participation. By reducing barriers for participation for underserved communities and vulnerable populations, the planning process can support a whole-community approach to planning that represents a wide range of perspectives, preferences, and experiences. For more detailed information about the social equity questionnaire, see Section 5.

2.7. Involving Stakeholders

The Unifour Hazard Mitigation Planning Committee included various stakeholders beyond the representatives from each participating jurisdiction. Representatives from the American Red Cross, Salvation Army, Samaritan’s Purse, University of North Carolina (UNC) Health, Appalachian State University, and the State of North Carolina Forest Service were invited to participate. Input from additional stakeholders, including neighboring communities, was welcomed through the open public meetings and online survey. Neighboring communities included: Watauga, Rutherford, McDowell, Lincoln, Iredell, and Cleveland counties. If any additional stakeholders representing other agencies and organizations participated in the Public Participation Survey, that information is unknown due to the anonymous nature of the survey.

Required stakeholders were invited to comment on the HMP draft and were also invited to all public meetings held throughout the review process. Required stakeholders invited to participate in the planning process include, but are not limited to, the following (See Appendix F for

correspondence and invitations for stakeholders and Table 2-3 for the representatives of each organization):

2.7.1.1. Local and Regional Agencies Involved in Hazard Mitigation Activities

- Alexander County Emergency Management
- Alexander County Emergency Services
- Caldwell County EMS
- Catawba County Emergency Management
- NCEM Area Coordinators
- NCEM Hazard Mitigation Planning
- Caldwell County Emergency Management
- Burke County Emergency Management
- FEMA Region 4 Community Planning

2.7.1.2. Agencies that regulate development

- Catawba County Planning Department
- Alexander County Planning Department
- Caldwell County Planning Department
- Burke County Planning Department
- WPCOG Planning Department
- City of Hickory Utilities
- Town of Rutherford College Planning
- Town of Granite Falls Planning
- Town of Sawmills Planning
- Town of Long View Planning
- Lenoir Planning
- City of Newton Planning
- Town of Maiden Planning
- City of Hickory Planning
- Town of Valdese Planning

2.7.1.3. Neighboring communities

- Iredell County
- Cleveland County

- McDowell County
- Lincoln County
- Rutherford County
- Watauga County

2.7.1.4. *Businesses, academia, and other private interests*

- Catawba County Schools
- Appalachian State University
- Western Piedmont Community College in Morganton
- Catawba Valley Community College in Hickory
- Caldwell Community College and Technical Institute (CCC&TI)
- Duke Energy

2.7.1.5. *Non-profit organizations including community-based organizations may include Faith Based Organizations, Disability services agencies, non-governmental organizations (NGOs), Rural Support Agencies, Health and Social Services Departments, Housing agencies and housing advocacy groups*

- Ashure Ministry
- Salvation Army
- Red Cross
- Samaritans Purse
- Greater Hickory Cooperative Christian Ministry
- Caldwell County Environmental Health
- Caldwell County Health Department
- Yokefellow Inc.
- UNC Healthcare

2.8. Documentation of Plan Progress

Progress in hazard mitigation planning for the participating jurisdictions in the Unifour Region is documented in this plan update. Since hazard mitigation planning efforts officially began in the participating counties with the development of the initial HMPs in the early 2000s, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions will help reduce the overall risk of natural hazards for the people and property in the Unifour Region. The completed actions are documented in the Capability Assessment in Section 5 and completed actions can also be found in the Mitigation Action Plans Section 7.

In addition, community capability continues to improve with the implementation of new plans, policies, and programs that help to promote hazard mitigation at the local level. The current state of local capabilities for the participating jurisdictions is captured in Section 5: *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by reconvening the Hazard Mitigation Planning Committee to update and combine the previous HMPs into this regional plan and by continuing to involve the public in the hazard mitigation planning process.

Section 3. Planning Area Profile

This section gives an overview of the planning region defined as the planning area for this Plan. It consists of the following five subsections:

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

3.1. Geography and the Environment

The Unifour Region is comprised of the four counties in the Catawba Valley region of western North Carolina: Alexander County, Burke County, Caldwell County, and Catawba County. The Unifour Region is the same as the “Hickory-Lenoir-Morganton Metropolitan Statistical Area” as defined by the U.S. Census Bureau.

Alexander County’s main geographic feature is the Brushy Mountains, a deeply eroded spur of the Blue Ridge Mountains to the west. They rise from 300 to 1,000 feet (about the height of the Empire State Building) above the surrounding countryside and dominate the county’s northern horizon. The highest point in Alexander County is Hickory Knob with an elevation of 2,560 feet (about twice the height of the Empire State Building) above sea level. Barrett Mountain, an isolated mountain ridge, is in the western portion of the county. The remainder of Alexander County’s terrain consists of gently rolling countryside.

The varied landscape of Burke County ranges from the Blue Ridge escarpment to the rolling plains of the western piedmont. Table Rock, a prominent peak in Burke County in the east rim of Linville Gorge, is part of the Pisgah National Forest and has been described as “the most visible symbol in the region.” The county has abundant natural resources including South Mountains State Park, Pisgah National Forest and the Linville Gorge Wilderness Area, the Catawba River, the Johns River, the Henry River, Table Rock Mountain, the Blue Ridge Parkway, and the 3,000-acre expansion of the Lake James State Park. These natural resources offer excellent recreational opportunities and attract visitors from across the southeastern United States.

Caldwell County is divided into three distinct geographic sections: the Blue Ridge Mountains, which dominate the northern and western parts of the county; the gently rolling Piedmont country in the middle and southern parts of the county; and the Brushy Mountains, an isolated remnant of the Blue Ridge Mountains. The Brushy Mountains run across much of Caldwell County’s eastern section. Hibriten Mountain, located within the city limits of Lenoir, the county’s

largest city, marks the western end of the Brushy Mountain range. In the western part of the county is the Wilson Creek area.

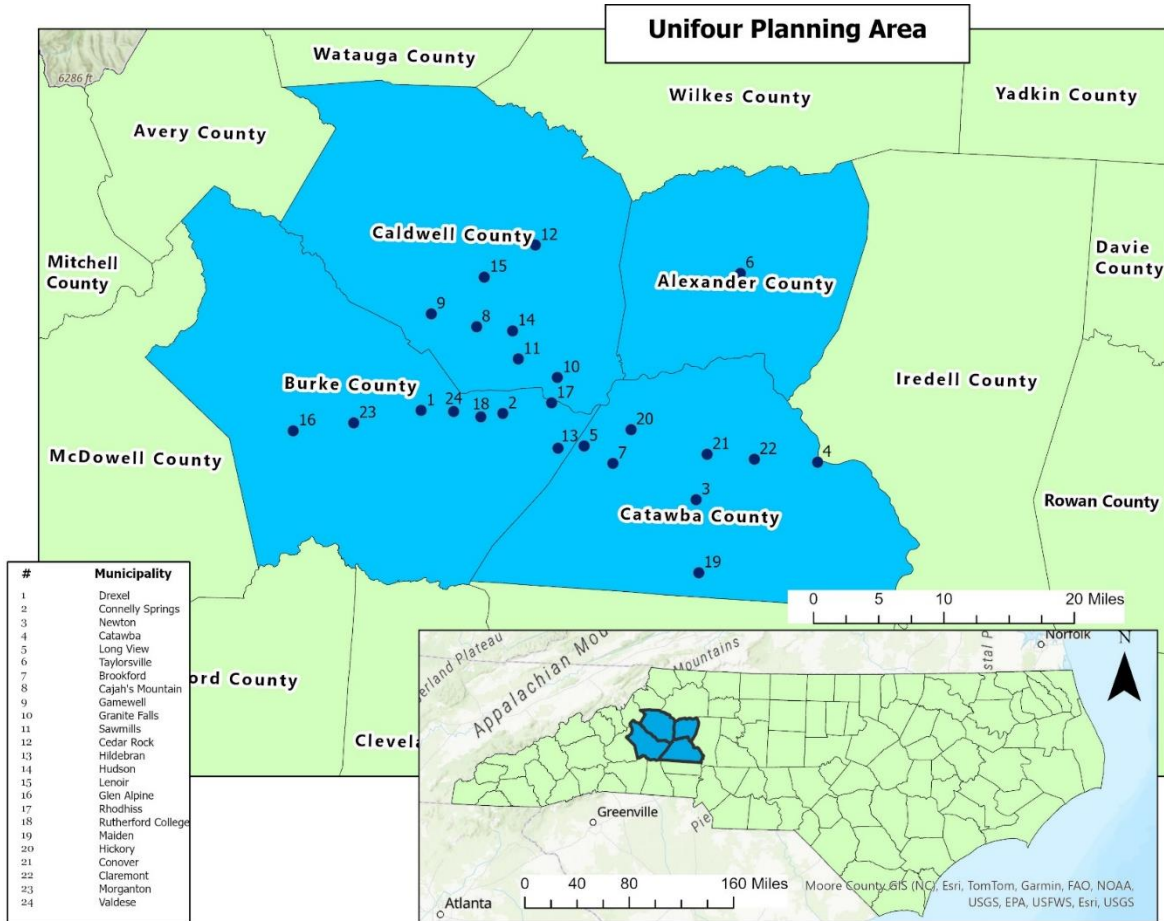


Figure 3-1: Unifour Planning Area

Catawba County is in the foothills of the Blue Ridge Mountains. It is in the region referred to as the Upper Piedmont Plateau, more commonly known as the “foothills.” The county’s elevation averages 995 feet, ranging from a high of 1,780 feet at Bakers Mountain in the west-central portion of the county to a low of 705 feet where the Catawba River leaves the county. The county’s landscape can be described as “rolling” with broad ridges and some short steep slopes. Geologically, Catawba County lies within the Inner Piedmont Belt comprised mostly of metamorphic and intrusive rocks. About 45.5% of the county’s acreage is wooded, of which 98% is privately owned.

The Catawba River, which is influential to all four counties in the planning area, begins in the Blue Ridge Mountains and flows 225 miles into Lake Wateree in South Carolina. The river is an extraordinary eco-system that provides habitat for 50 fish species, 160 bird species, and 120 tree species. The river also serves as a source of electric power, provides recreational opportunities for residents and tourists, and is one of the major economic foundations of the

region. It transects Burke County, creates the southern borders of Caldwell and Alexander counties, and the northern and eastern borders of Catawba County.

This section of the plan is intended to highlight the changes in development in the planning area in to best portray increased or decreased vulnerability and composition of the planning area since the last plan update in 2019.

Table 3-1: Total Land and Water Area for the Planning Area

County	Total Land Area (sq mi)	Total Water Area (sq mi)	Total Area (sq mi)
Alexander	260	3	263
Burke	506	8	514
Caldwell	472	3	475
Catawba	401	15	416
TOTAL PLAN AREA	1,639	29	1,668

sq mi = square miles

3.2. Basin Description

Table 3-2, “Basin Description”, contains a description of the characteristics of the Hydrological Unit Codes (HUC-8) sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 3-2: Basin Descriptions

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin #	Primary Flooding Source	Description of Affected Area	DA (sq mi)
South Fork Catawba	03050102	South Fork Catawba River	The South Fork Catawba River Basin begins in the southeast portion of Burke County and continues to drain portions of Catawba, Gaston, and Lincoln Counties before ending at the Catawba River.	660.7
South Yadkin	03040102	South Yadkin River	The South Yadkin River Basin begins in Alexander and Wilkes Counties and drains southeast through Yadkin and Iredell Counties and ends in Davie and Rowan Counties at the confluence with the Yadkin River.	906.4
Upper Broad	03050105	Broad River	The Upper Broad River Basin begins with the Green River in the southwest corner of Henderson County and drains significant portions of Buncombe, Cleveland, McDowell, Polk, and Rutherford Counties before following the Broad River into South Carolina.	2,477.9

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin #	Primary Flooding Source	Description of Affected Area	DA (sq mi)
Upper Catawba	03050101	Catawba River	The Upper Catawba River Basin headwaters are in the Appalachian Mountains (Avery, Caldwell, McDowell, and Watauga Counties) and drains through the Piedmont region (Gaston and Mecklenburg Counties) of North Carolina, ending in York County, South Carolina.	2,357
Upper New	05050001	New River	The Upper New River Basin headwaters begin with the North and South Fork of the New River in Watauga County and then drains northeast through Ashe and Alleghany Counties and into Virginia, where the New River continues to Ohio.	2,943.7
Upper Yadkin	03040101	Yadkin River	The Upper Yadkin River Basin headwaters are in Caldwell and Watauga County. The basin then follows the Yadkin River east, draining Surry and Yadkin Counties before turning south and draining Davidson and Davie Counties.	2,454.8
Watauga, North Carolina, Tennessee	06010103	Watauga River	The Watauga River Basin drains Avery and Watauga Counties and follows the Watauga River west into Tennessee and into Boone Lake.	868.4

DA = drainage area

HUC-8 – Hydrological Unit Codes

sq mi = square miles

3.3. Population and Demographics

Catawba County, Alexander County, Caldwell County, and Burke County have a total population size of 372,203 according to the 2023 population estimate¹. Catawba County has the largest population of the four participating counties with 164,645 residents and the City of Hickory is the largest city in the planning area with 44,415 residents². Alexander County has an estimated 38,746 residents with the largest Town being the Town of Taylorsville (2,273 residents), Burke County has 88,338 residents with largest jurisdiction as the City of Morganton (17,708 residents), and Caldwell County with 80,574 residents and the largest jurisdiction is the City of Lenoir³. Between 2010 and 2020 Catawba County experienced a 3.68% population increase, Alexander County has had a 4.22% population increase, Burke County has had decrease of 3.96%, and Caldwell County a decrease of 2.76%. The jurisdictions that had the largest population decrease between 2010 and 2020 was the Town of Taylorsville with a 44.49% decrease in population. The three jurisdictions that experienced the most population growth between 2010 and 2020 were the Town of Rhodhiss (158.96%), the Town of Hudson (70.13%), and the Town of Long View (21.69%). Population counts from the U.S. Census

¹ US Census Bureau. (2024, August 14). *Census.gov | U.S. Census Bureau homepage*. Census.gov. <https://www.census.gov/>

² US Census Bureau. (2024, August 14). *Census.gov | U.S. Census Bureau homepage*. Census.gov. <https://www.census.gov/>

³ US Census Bureau. (2024, August 14). *Census.gov | U.S. Census Bureau homepage*. Census.gov. <https://www.census.gov/>

Bureau for 2000, 2010, 2020, and 2023 population estimate for each of the participating counties and jurisdictions are presented in Table 3-3.

Table 3-3: Population Counts for Participating Jurisdictions

Jurisdiction	2000 Census Population	2010 Census Population	2020 Census Population	2023 Population Estimate	% Change 2010-2020
Alexander County					
Alexander County (Unincorporated Area)	29,712	33,016	36,444	36,473	0.08%
Town of Taylorsville	3,904	4,180	2,320	2,273	-44.49%
Subtotal Alexander	33,616	37,196	38,764	38,746	4.22%
Burke County					
Burke County (Unincorporated Area)	47,174	49,470	58,221	58,207	0.02%
City of Morganton	23,049	22,546	17,474	17,708	-24.96%
Town of Connelly Springs	1,861	1,659	1,529	1,538	-7.84%
Town of Drexel	5,641	5,506	1,760	1,769	-0.45%
Town of Glen Alpine	1,574	1,964	1,529	1,525	-22.15%
Town of Hildebran	1,742	1,945	1,679	1,678	-13.68%
Town of Rutherford College	1,426	1,502	1,226	1,217	-18.38%
Town of Valdese	4,901	4,387	4,689	4,699	6.88%
Subtotal Burke	89,148	90,912	87,570	88,338	-3.69%
Caldwell County					
Caldwell County (Unincorporated Area)	31,638	34,680	39,813	40,945	14.8%
City of Lenoir	20,691	20,837	19,352	18,238	-7.67%
Town of Cahah's Mountain	2,748	2,789	2,722	2,698	-2.4%
Town of Gamewell	3,794	4,043	3,702	3,704	-8.43%
Town of Granite Falls	6,742	7,104	4,965	4,914	-30.11%
Town of Hudson	5,253	6,431	3,780	3,767	70.13%
Town of Rhodhiss	62	385	997	985	158.96%
Town of Sawmills	6,082	6,380	5,020	5,025	-21.32%
Village of Cedar Rock	312	294	301	298	2.38%
Subtotal Caldwell	77,322	82,943	80,652	80,574	-2.76%

Section 3: Planning Area Profile

Jurisdiction	2000 Census Population	2010 Census Population	2020 Census Population	2023 Population Estimate	% Change 2010-2020
Catawba County					
Catawba County (Unincorporated Area)	61,731	70,017	83,891	86,265	19.82%
City of Claremont	1,720	1,957	1,692	1,729	-13.54%
City of Conover	7,958	9,669	8,421	8,635	-12.91%
City of Hickory	46,238	48,481	43,490	44,415	-10.29%
City of Newton	13,737	14,214	13,148	13,399	-7.5%
Town of Brookford	444	371	442	431	19.14%
Town of Catawba	1,324	1,152	702	719	-39.06%
Town of Long View	4,134	4,181	5,088	5,207	21.69%
Town of Maiden	4,910	4,964	3,736	3,845	-24.74%
Subtotal Catawba	141,685	155,006	160,610	164,645	3.62%
TOTAL PLAN AREA	340,502	364,124	374,495	372,203	2.85%

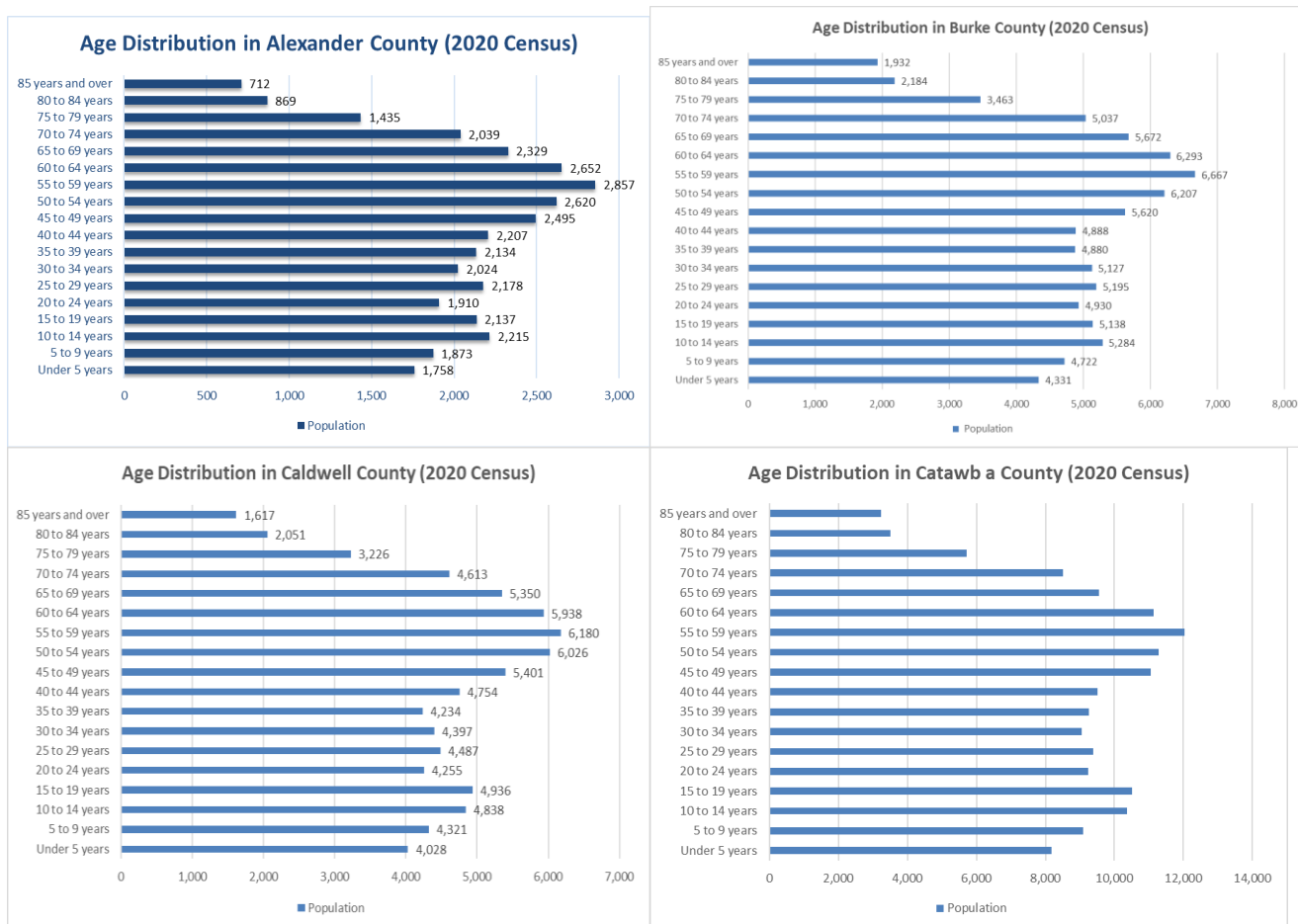


Figure 3-2: Age Distributions in the Unifour Counties from the 2020 Census

Based on the 2020 Census, the median age for residents is 42.7 years in Catawba County, 45.1 years in Caldwell County, 44.2 years in Burke County, and 44.5 years in Alexander County. The racial characteristics of the participating counties are presented in Table 3-4. Generally, whites make up most of the population of the Region, accounting for almost 89% percent of the Region’s population.

Table 3-4: Demographics of Participating Counties from the 2020 Census⁴

County	White Persons	Black Persons	Other Race	Persons of Hispanic Origin*
Alexander	90.3%	5.9%	1.9%	5.5%
Burke	85.9%	6.5%	5.5%	7%
Caldwell	90.9%	5.4%	1.7%	6.5%
Catawba	83.1%	9%	5.7%	10.8%

⁴ US Census Bureau. (2024, August 14). Census.gov | U.S. Census Bureau homepage. Census.gov. <https://www.census.gov/>

Table 3-5: Housing Characteristics from the 2022 American Community Survey 5-year Estimates⁵

County	% of Households with Internet	% Population over 65 Years Old	% Population that Speak English “less than very well”	% of Households with a Computer	% of Population with a Disability	% Housing Units that are Mobile Homes, Boats, RVs, or Vans	% Housing units without Telephone Service	% Housing Units without Complete Plumbing	% Housing Units with No Vehicle Available
Alexander	83.6%	39.9%	1.6%	89.5%	17.1%	25.9%	1.3%	0.7%	2.8%
Burke	79.7%	41.9%	3.2%	88.8%	20.4%	20.4%	1.1%	0.8%	4.6%
Caldwell	83.2%	38.1%	1.7%	87.1%	18.8%	17.1%	1.6%	0.3%	4.8%
Catawba	86.4%	32.1%	4.6%	92.5%	14.0%	13.1%	1.3%	0.4%	4.9%

⁵ American Community Survey. (n.d.). DP02: Selected Social Characteristics in the United States—Census Bureau Table [Dataset]. Retrieved October 1, 2024, from <https://data.census.gov/table/ACSDP5Y2022.DP02?q=alexander%20county&q=050XX00US37023,37027,37035&d=ACS%205-Year%20Estimates%20Data%20Profiles&moe=false>

3.4. Housing, Infrastructure, and Land Use

3.4.1. Housing

According to the U.S. Census Bureau, there are 163,144 housing units in the Unifour Region, most of which are single family homes (according to the 2020 census). Housing information for the four participating counties is presented in Table 3-5. As shown in Table 3-5, Catawba County has the highest number of housing units compared to the other counties. Alexander County has the least. In terms of median home value, Catawba County has the highest and Caldwell County has the lowest.

Table 3-6: Housing Characteristics from the 2020 U.S. Census Bureau and the American Community Survey 2018 5-year estimates⁶

County	Housing Units (2018)	Housing Units (2023)	% Change Housing Units (2018 to 2023)	Median Home Value (2018-2022)
Alexander	16,399	16,349	0.30%	\$169,300
Burke	41,092	40,862	-0.56%	\$155,500
Caldwell	37,950	37,647	-0.80%	\$158,300
Catawba	68,693	74,397	8.30%	\$194,000
TOTAL	164,134	169,255	7.24%	\$169,275

3.4.2. Infrastructure

Major roads in the planning area include Interstate (I-)40, US Highway (US-)64, US-70, US-221, US-321, North Carolina Highway (NC-)10, NC-16, NC-18, NC-90, NC-114, NC-126, NC-127, NC-150, NC-181, and NC-268. Hickory Regional Airport is the primary commercial aviation airport in the region. It was served by commercial airlines until 2005.

National protected areas in the planning area include Blue Ridge Parkway and Pisgah National Forest. Colleges and universities in the planning area include Appalachian Center at Hickory, Appalachian Center at Lenoir, Appalachian Center at Morganton, Catawba Valley Community College Alexander Campus, Catawba Valley Community College in Hickory, Gardner-Webb University Hickory Center, Lenoir-Rhyne University in Hickory, N.C. Center for Engineering Technologies, and Western Piedmont Community College in Morganton.

⁶ American Community Survey. (2018). DP04: Selected Housing Characteristics (No. DP04) [Dataset]. US Census Bureau. <https://data.census.gov/table/ACSDP5Y2018.DP04?q=alexander%20county&q=050XX00US37023,37027,37035&d=ACS%205-Year%20Estimates%20Data%20Profiles&moe=false>

3.4.3. Current and Future Land Use

3.4.3.1. Alexander County

Current land use in Alexander County can be characterized as being mainly “residential” or “vacant.” Given the county’s rural and agricultural history, these land use patterns are not surprising. Unlike other counties in the Unifour Region, Alexander County is the only county with a single municipality. Taylorsville, the County seat, is the center of its local government services and its low population also reflects the county’s rural heritage. Most of the land in Alexander County is devoted to residential uses. Of the nearly 160,800 acres (about twice the area of Athens, Georgia) in the county, 96% is occupied by residential uses or is vacant and could be used for residential purposes. To state the opposite, only slightly more than 1,000 of the county’s 24,300 land parcels are designated for uses other than residential, mostly industrial or commercial. In terms of future land use in Alexander County, future policymakers should continue to think about the amount of land currently zoned residential, especially in the RA-20 Zoning District⁷, and used primarily for agriculture. These parcels represent land that could potentially be subdivided into residential uses in the coming decades. While market forces drive these decisions, existing data provides some indication of development pressures across the Unifour Region.

The population of Alexander County is expected to decrease by 0.3% between 2022 and 2042, with the largest percentage of the population (38.2%) within the 25-54 age range, the second largest in the 65 and older range (20.9%), the third largest between 0 and 17 (18.9%), followed by the 55-64 range (14.2%), and the lowest percentage between ages 18 and 24 (7.8%). According to the County Comprehensive Plan⁸, an increased population and new residents can provide benefits such as a larger tax base, increased workforce, and attract new businesses and industries. To support the growth and development of the County, the Comprehensive Plan outlines future use goals to improve coordination between land use and transportation planning, affordable housing options, and increase the amount of natural resource protection and open spaces. Therefore, the land development policies will be designed to encourage necessary growth and concentrated development where appropriate while protecting environmentally sensitive areas, rural communities, and agricultural land.

Some of the goals of development that relate to future and current land use for Alexander County include the following:

- **Land Use:** Adopt land use regulations that are clear, equitable, and reasonably focused on addressing the needs of Alexander County; Promote the development of a diversified and balanced mix of land uses in the County; Direct growth to areas where essential services and infrastructure are present, and protect sensitive natural areas and key historic/cultural resources from extensive development; Aim to mitigate common

⁷ “R” stands for residential. “20” is the minimum lot size of typically 20,000 square feet for each dwelling unit within the designated area. Specific requirements may vary depending on local ordinances and geographical factors.

⁸ Alexander County. (2024). Alexander County 2045 Comprehensive Plan. <https://alexandercountync.gov/pdf/comprehensive-plan.pdf>

negative impacts of new development; Encourage and develop land use regulations that help to promote and preserve Alexander County's sense of place.

- **Transportation:** Improve aesthetics, function, and capacity of community gateways and corridors; Enhance the county's infrastructure to support active transportation, such as walking and biking; Enhance public transportation options in appropriate areas of Alexander County; Make strategic investments and secure North Carolina Department of Transportation (NCDOT) funding for known transportation issues throughout the County.
- **Economic Development:** Increase the number of job opportunities and increase the employment rate in the county; Diversify the county's economic base to reduce reliance on a single industry; Enhance the County's infrastructure and facilities to support economic development; Work to make Alexander County more competitive when attracting industry
- **Housing:** Promote safe, stable housing opportunities for County residents to support upward mobility and reduce homelessness/houselessness; Preserve and improve the quality of existing housing units in the County; Encourage the development of a range of housing types and densities in the County.

3.4.3.2. *Burke County*

According to the Burke County Blueprint Burke Strategic Use Plan⁹, growth and development in Burke County are projected to be predominantly located around the incorporated areas along the I-40 corridor and US-70 urban corridor, where there is water and sewer infrastructure in place to support further development. The County aims to encourage the tourism industry by developing destinations and enhancing the existing natural and historic locations in collaboration with the Burke County Tourism Board and municipalities. To promote mixed-use development and attract various business types, Burke County aims to promote mixed development in urban areas along with promoting single-family development around NC-126, NC-18, and NC-64. Conditional zoning options will be considered to allow a wide range of uses within the region where there is already sufficient infrastructure available to support future development. Additionally, Burke County seeks to promote the use of vacant or underutilized structures by developing an inventory of vacant structures to encourage the expansion or relocation of businesses within or into Burke County.

To encourage people to relocate to Burke County, the County aims to develop policies that encourage higher-density development projects along I-40 and US-70 or places with existing infrastructure that can readily support the development of new housing. To encourage relocation and attract new arrivals, new housing and convenient housing options, such as short-term rental apartments, should be at or above 2% growth per year along with the increase in affordable home-ownership programs. There is also a growing trend of second home development in the area around Lake James and the Jonas Ridge Community in the northwest portion of the county. Small area plans have been completed for the I-40 corridor and the watershed around

⁹ Burke County. (2022). Blueprint Burke Strategic Use Plan. In Burke County. Retrieved July 24, 2024, from <https://www.burkenc.org/DocumentCenter/View/298/Blueprint-Burke--Burke-County-Land-Use-Plan?bidId=>

Lake James. In some cases, growth and development result in the alteration of natural topographic features that affect the extent of flooding and the floodplain's boundary.

To accommodate population growth, Burke County aims to bring the I-40 interchanges up to U.S. Department of Transportation (USDOT) standards with funding from the NCDOT and Metropolitan Planning Organization (MPO). Public transportation options should be expanded by extending passenger and cargo rail services between Burke County and areas in western NC, along with planning to offer fixed-rail public transportation services that coordinate with the expansion of pedestrian and bike infrastructure within the County and linkage between activity centers. Infrastructure expansion should be enhanced by the expansion of broadband and network infrastructure which will be encouraged by reducing construction costs of service extension and development of policies that promote higher-density development where adequate infrastructure exists.

To support the development of agriculture, Burke County aims to develop a voluntary agricultural district and encourage a local food movement, aiming to attract young farmers or encourage smaller farms to remain in production and preserve farmland. To encourage the utilization of recreation opportunities, the County aims to expand the existing trails and greenways while encouraging the development of multi-use facilities to appeal to a wider range of residents and visitors. The County also wishes to expand its inter-jurisdictional and local recreation opportunities and expand the existing programs.

3.4.3.3. *Caldwell County*

According to the Caldwell County Comprehensive Plan¹⁰, the County is expected to increase its population by 11.7% between 2017 and 2037, but the loss of 24- to 44-year-olds between 2000 and 2010 will lead to a decline in the 45-59 age groups by 2037. Caldwell County aims to attract new residents through various goals that will support development and alter current and future land use goals. In terms of undeveloped land in Caldwell County that could potentially be developed for allowable uses, as of January 2020 there were approximately 116,458.49 acres of agricultural or undeveloped land, 7.6 acres of commercial land, 1,168.52 acres of industrial land, 2,410.03 acres of institutional or office land, 1,130.3 acres of open space or parks, 67,736.2 acres of residential land, and 57,338.34 acres of undeveloped land under local, State, or Federal Ownership.

Some of the County's recommendations for future development include:




- **Transportation:** Maintain a good working relationship with NCDOT and the WPCOG to coordinate land use and transportation planning for new and updated roadway corridors; Incorporate adopted plans to create a community-oriented environment that encourages walking, while also supporting other modes of transportation.



¹⁰ Caldwell County & Western Piedmont Council of Governments. (2020). Caldwell County Comprehensive Plan. In *Caldwell County, NC*. Caldwell County. Retrieved July 24, 2024, from <https://caldwellcountync.org/DocumentCenter/View/490/Comprehensive-Plan-PDF>

- **Resources and services:** Incorporate adopted plans to create a community-oriented environment that encourages walking, while also supporting other modes of transportation; Maintain relationships with water and sewer providers on future public water and sewer projects to demonstrate cooperation for prospective industries such as housing developments which increase revenue and/or property values.
- **Economic Development:** Promote economic development strategies to help recruit viable businesses and service industry activities; Create amenities that attract new residents, tourism and young adult populations back into the region; Inventory available properties throughout the County and encourage commercial development projects in appropriate areas.
- **Land Use:** Update zoning and subdivision regulations to ensure they are compatible for the designated land uses outlined in this plan; Incorporate land use design standards that enhance the aesthetics along Highway 321 and the gateways into the County; Update zoning regulations to encourage a diversity of housing options to better house the new and existing workforce and attract multiple incomes and generations.

To encourage centralized development, Caldwell County has developed a Future Land Use Node pattern to encourage single or multi-family housing, commercial, and industrial development. The location of the nodes can be found in Table 3-7.

Table 3-7: Caldwell County Land Use Node Types

Land Use Node Icon Color	Land Use Node	Description
	Countryside	The Countryside node is intended to be a low-development intensity node that provides limited, basic services to residents in rural areas of the County. These nodes are largely located in areas where conservation of natural areas and farmland is highly valued, such as Wilson Creek.
	Crossroads	The Crossroads node is a low-development intensity node that focuses commercial development around the main corners of the intersection. This node also encourages residential development extending out from the intersection. These nodes are largely located in more populated areas of the County between more heavily developed areas and incorporated jurisdictions
	Village Neighborhood	The Village Neighborhood node is a medium-development intensity node that is intended to allow for “community” development in unincorporated areas. This node largely focuses on encouraging residential development along with supporting centralized commercial, civic and park space. These nodes are anchored by a school and include areas such as Happy Valley and Collettsville.

Land Use Node Icon Color	Land Use Node	Description
	Commercial Corridor	The Commercial Corridor node is a high-development intensity node that is intended to provide primary commercial development along established transportation corridors with large traffic volumes. This node also encourages the development of multi-family residential units. These nodes are in areas along major highways such as U.S. Highway 321 and U.S. Highway 64.
	Industrial Center	The Industrial Center node is a high development intensity node that is intended for light and heavy industrial parks or campuses. These nodes are in areas of existing industrial development or have access to major highways.






3.4.3.4. Catawba County

The goal of the Catawba County Comprehensive Plan¹¹ is to “establish a balanced and deliberate approach to future development in Catawba County that preserves those aspects of life which make it a desirable place to live while supporting quality, focused development in appropriate areas.” The population has been steadily increasing with a percent change of population between 2010 and 2022 at 5.3% and is projected to increase by 15.8% between 2022 and 2042. The age group that is projected to increase the most between 2022 and 2042 is the 85 years and over category, expected to increase by 136.1%, followed by the 75 years to 84 years category which is expected to increase by 66.3% between 2022 and 2042. The age groups that are expected to decrease the most between 2022 and 2042 are the 20 to 24 years (-6.5% projection) category and the 55 to 59 years of age category (-6.2% projection).

The current land use of Catawba County, encompassing 177,557 acres, includes 94% residential use zoning, with the remaining 6% of land zoned for industrial, commercial, planned development, and other uses. Between 2019 and 2023 there were 296 non-residential construction permits issued, 156 of which were new construction and 140 were additions to existing structures. To determine where development should be centralized, the County utilized a Future Land Use Node planning system which is aimed to establish key areas of development and organize future development.

¹¹ Catawba County. (2024). Catawba County Comprehensive Plan. Retrieved July 25, 2024, from https://www.catawbacountync.gov/site/assets/files/10579/catawba_county_draft_03_28_2024.pdf

Table 3-8: Future Land Use Nodes for Catawba County from the Catawba County Comprehensive Plan (March 2024)

Land Use Node Icon Color	Land Use Node	Description
	Rural Commercial	This district provides small areas for offices, services, and retail uses, all designed in scale with surrounding residential uses.
	Office Institutional	This district provides small areas for offices, schools, and lightly traveled commercial uses, all designed in scale with surrounding residential uses.
	Mixed-Use	The Mixed-Use nodes is intended for multifamily, mixed use and commercial development around specific locations with standards for building form, design, signage, landscaping, parking access management and appearance related to pedestrian-scale development.
	Highway Commercial	This district provides areas for regional highway-oriented business, office, service and civic uses.
	US 321 Transition	This district provides areas for regional highway-oriented business to transition with a focus on maintaining compatibility between different land uses.

While Catawba County is becoming more developed and urban, it still consists of many rural and farmlands. As described in Catawba County’s Farm & Food Sustainability Plan (2013), Catawba County has a cropland acreage of approximately 36,600 acres with 14,100 acres of woodland. The total “farmland” of 71,906 acres represents approximately 28 percent of the county’s land area. These non-urban uses represent approximately 210 square miles: roughly half of the county. Furthermore, nearly half of the county’s population is now located within incorporated areas. These numbers seem to paint a picture of a changing county; one with a generous amount of rural, undisturbed land and one with several emerging centers of human activity. Catawba County has seven small area plans completed from 2000 to 2005, which serve as County long-range plans. All have a goal of rural preservation which came from citizen input during a series of community meetings.

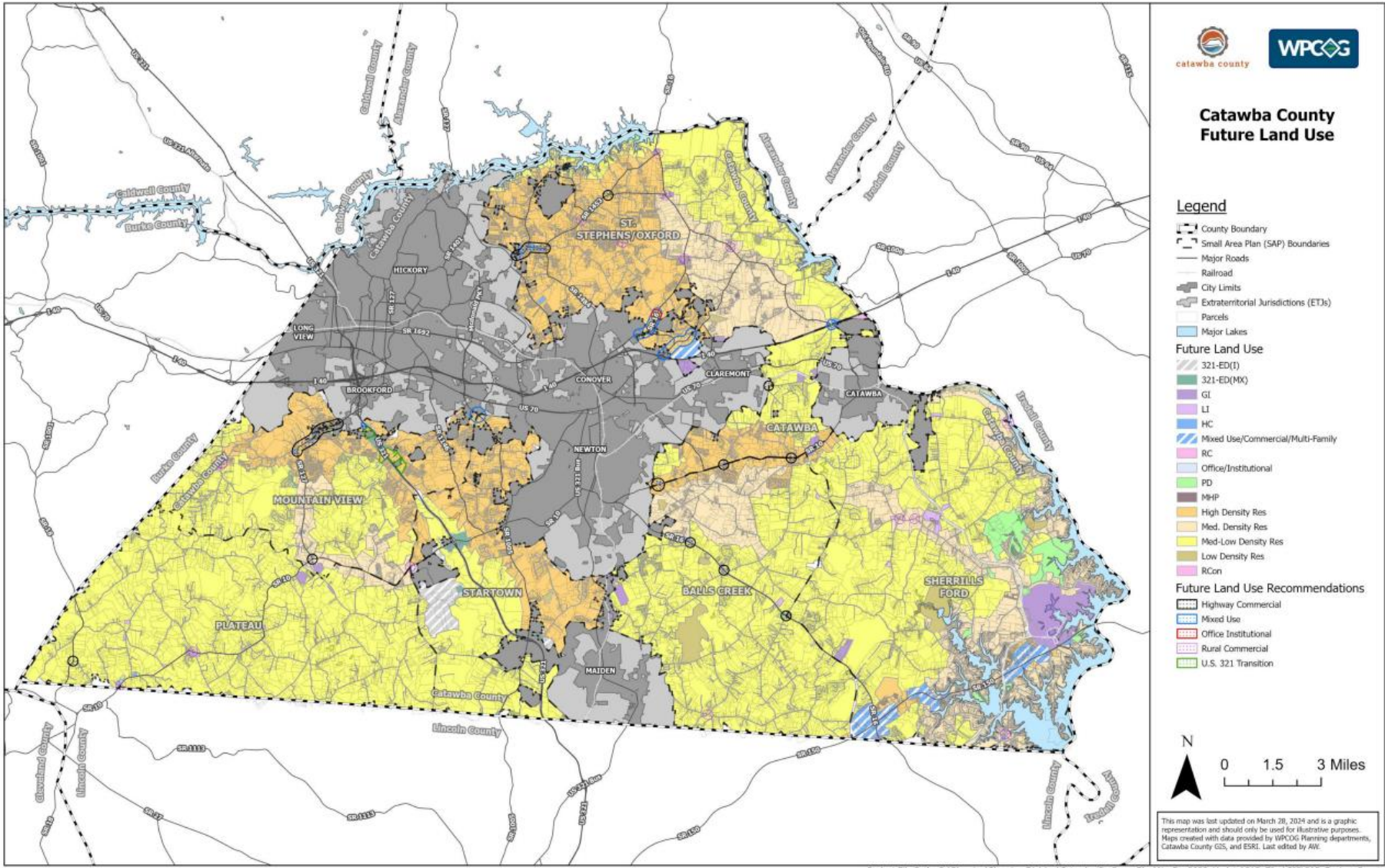


Figure 3-3: Catawba County Comprehensive Plan Future Land use Map from the Comprehensive Plan (March 2024)

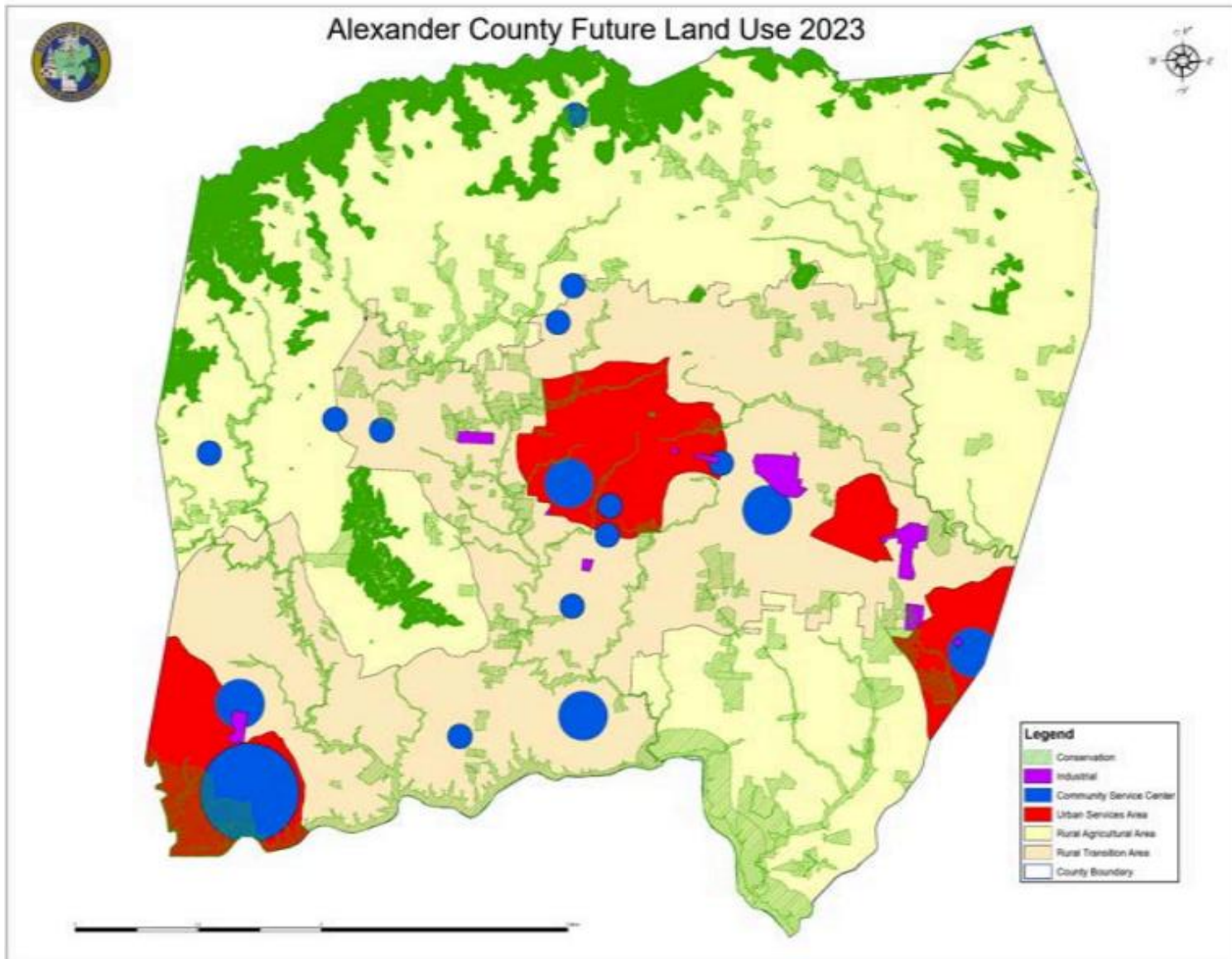


Figure 3-4: Alexander County Future Land Use Plan from the 2045 Comprehensive Plan

The Future Land Use Map

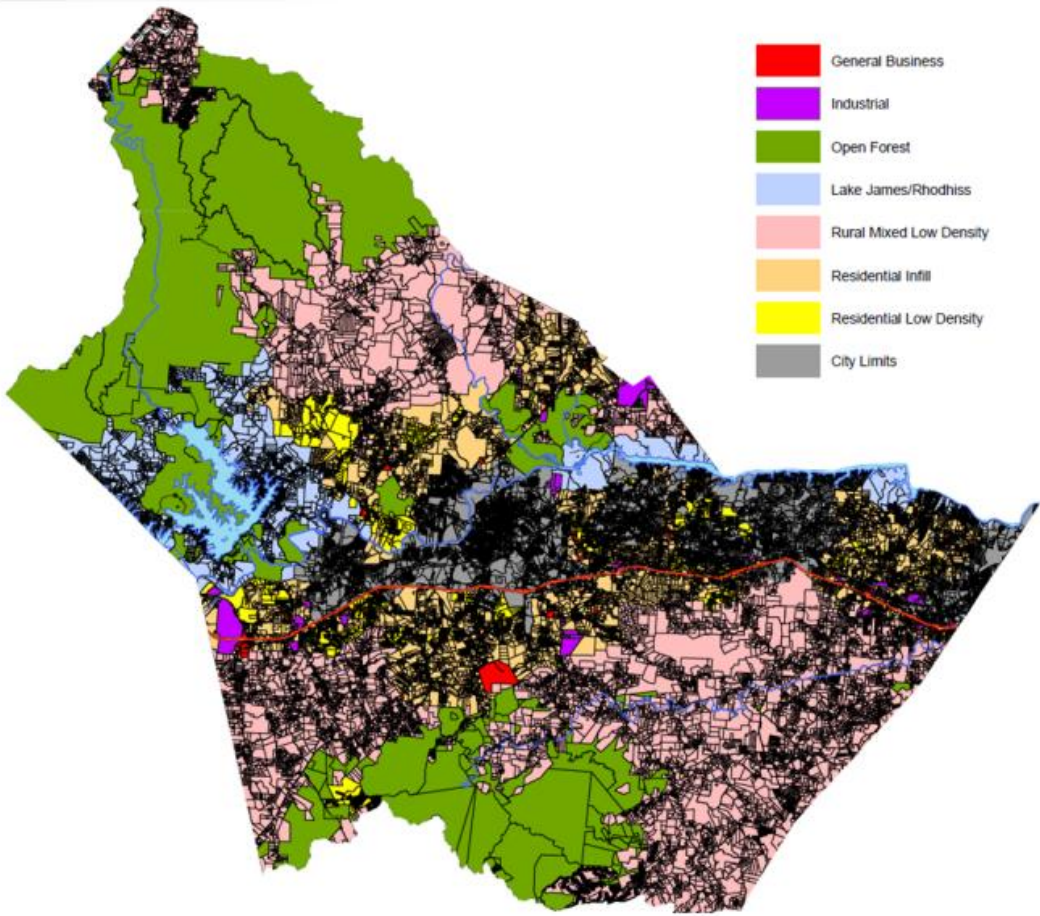


Figure 3-5: Future Land Use Map from the Blueprint Burke Strategic Use Plan 2022-2023

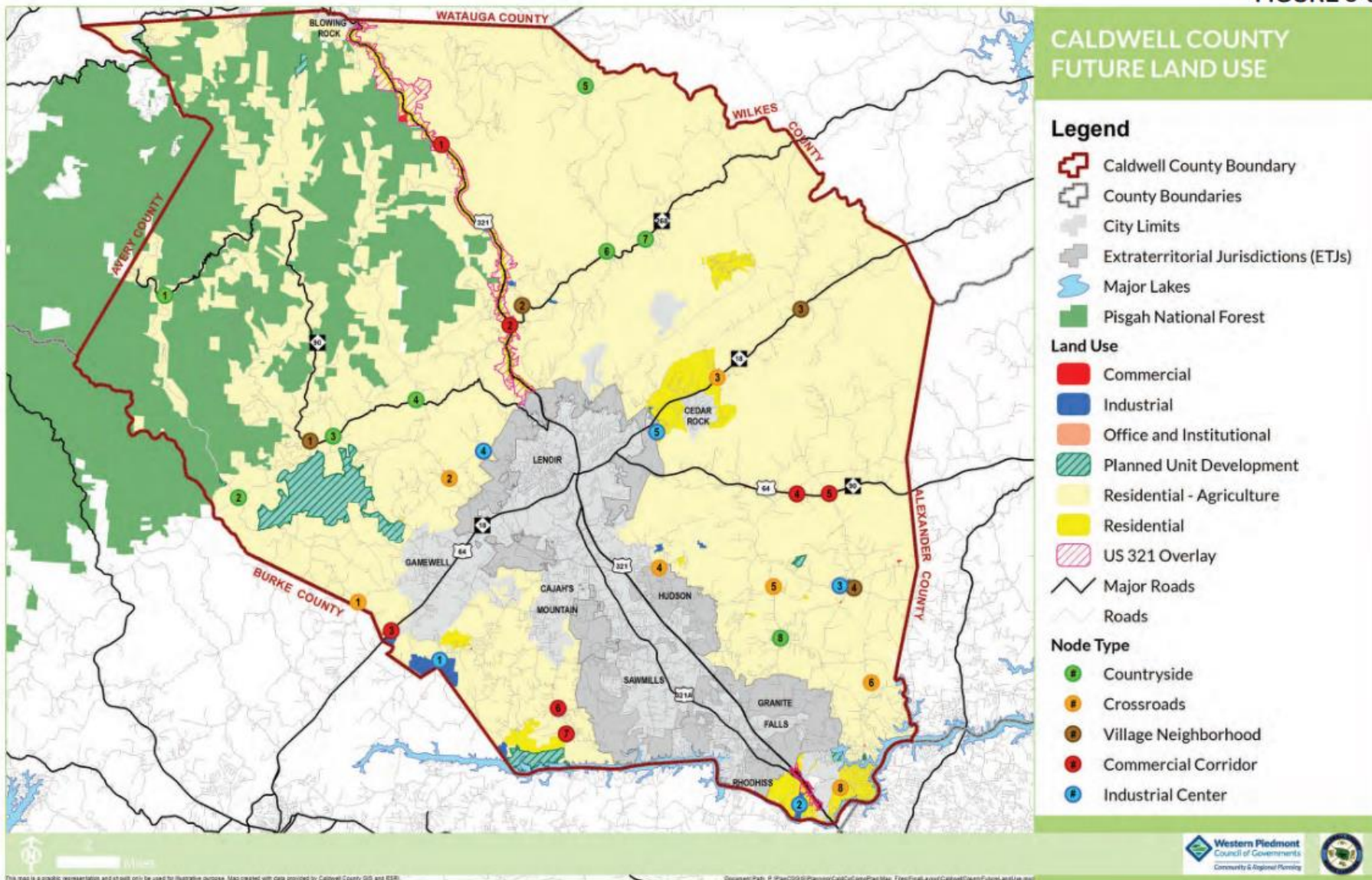


Figure 3-6: From the Caldwell County Comprehensive Plan 2020

3.4.4. Historic Properties

Historic property counts including districts, buildings, and other cultural resources as shown in Table 3-9 were derived from a combination of sources consisting of the NC Historic Preservation Office and participating jurisdictions. A full list of historic districts, properties, structures, and buildings can be found in Appendix B.

Table 3-9: Historic Property Counts by Jurisdiction¹²

Jurisdiction	Districts	Buildings and Landmarks	Structure or Other	Total Acres
Alexander County	0	2	0	1.35
Burke County	31	32	1	1,219.45
Caldwell County	15	17	1	1,941.66
Catawba County	28	37	2	1,501.9
TOTAL	74	88	4	4,664.36

3.5. Employment and Industry

The Hickory area in Catawba County is home to many leading manufacturers of furniture, fiber optic cable, and pressure-sensitive tape. It is estimated that 60% of the nation's furniture used to be produced within a 200-mile radius of the City of Hickory. 40% of the world's fiber optic cable is made in the Hickory area. The Hickory area is additionally known as a datacenter corridor and is home to large datacenters operated by Apple and Google. Hickory is the retail hub of the foothills and Unifour Region and is home to the largest shopping mall in the region, Valley Hills Mall.

¹² National Register Database and Research - National Register of Historic Places (U.S. National Park Service). (n.d.). <https://www.nps.gov/subjects/nationalregister/database-research.htm#table>

Section 4. Risk Assessment

This section comprises the risk assessment portion of the Plan Area Hazard Mitigation Plan, including identification of hazards, hazard profiling and analysis, and assessment of vulnerability. It consists of the following six subsections:

4.1 Overview

4.2 Hazard Selection

4.3 Methodologies and Assumptions

4.4 Inventory of Community Assets

4.5 Hazard Profiles, Analysis, and Vulnerability

4.1. Overview

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

Each hazard is profiled in the following format:

Hazard Description

This section provides a description of the hazard, including discussion of its speed of onset and duration, as well as any secondary effects followed by details specific to the Unifour planning area. It also includes details about hazard characteristics, types of the hazards, causes, and affected areas.

Location

This section includes information on the hazard's physical extent, with mapped boundaries where applicable. This includes location description, and maps where applicable, for reported natural hazard events and where the hazards are likely to occur.

Extent

This section includes information on the hazard extent in terms of magnitude, describe how the severity of the hazard can be measured. Where available, the most severe event on record used as a frame of reference. This also includes historical occurrences of the hazard, extent of events, and the definition of the extent of the hazard within the planning area.

Historical Occurrences

This section contains information on historical events, including the location and consequences of all past events on record within or near the planning area. This includes records from local sources and national sources such as the NCDC Storm Events Database Records, National Geophysical Data Center/World Data Service (NGDC/WDS) Significant Earthquake Database, FEMA's National Inventory of Dams, and the US Drought Monitor.

Probability of Future Occurrence

This section gauges the likelihood of future occurrences based on past events and existing data. National Risk Index (NRI) Data was used in conjunction with other data sources such as RMT where applicable. This was to provide a wide range of vulnerability analyses and provide a standardized comparison to other communities across the United States to compare the levels of vulnerability to other communities.

A risk assessment is performed to determine the potential impacts of hazards on the people, built and natural environments, and economy of a given planning area. The Risk Assessment provides the foundation for the rest of the mitigation planning process, which is focused on identifying and prioritizing actions to reduce risk to hazards. In addition to informing the Mitigation Strategy, the Risk Assessment can also be used to establish emergency preparedness and response priorities, for land use and comprehensive planning, and for decision making by elected officials, city and county departments, businesses, and organizations in the community.

A typical risk assessment consists of three primary components. Some form of hazard identification process needs to take place, followed by a detailed profiling of the hazards that will be addressed in the plan. Then the profiled hazards are assessed to determine the vulnerability of the planning area to each hazard being addressed. It is also important to document key details regarding the methodologies and assumptions used to perform the risk assessment, the asset inventories used to perform the risk assessment, and finally conclusions on hazard risk. The conclusions on hazard risk essentially consist of a prioritized ranking of hazards of concern.

This risk assessment was completed using data from North Carolina Emergency Management's (NCEM) Risk Management Tool Suite (RMT): The power of a centralized data clearinghouse realized. NCEM's Risk Management Tool (RMT) is a web-based suite of tools designed to provide enhanced mitigation planning, preparedness assessment, and resiliency assessment capabilities to communities. This web-enabled system is three unique tools in one, all based on the same core geodatabase. This RMT functions as a data clearinghouse feeding multiple unique applications such as the Hazard Mitigation Planning Tool, the Resiliency Assessment Tool, and the Preparedness Assessment Tool. In the following sections of the plan, all data pulled from the NCEM iRISK database is listed as "GIS Analysis".

**All probabilities reflect data collected before September 2024 and do not account for impacts associated with Hurricane Helene.*

Vulnerability and NRI Risk Index Values

In addition to other methods of probability calculations and analysis, the NRI Risk Index was used to demonstrate vulnerability to various natural hazards. The NRI quantifies types of vulnerabilities for avalanches, coastal flooding, cold wave, drought, earthquake, hail, heat wave, hurricane, ice storm, landslide, lightning, riverine flooding, strong wind, tornado, tsunami, volcanic activity, wildfire, and winter weather in terms of Expected Annual Loss (EAL), Exposure, Historic Loss Ratio (HLR), and Frequency. The NRI Risk Index Values were used to represent each county's vulnerability to natural hazards.

The NRI also uses risk ratings to describe a community's relative risk of hazards in relation to all other communities at the same level. The risk ratings range between very high, relatively high, relatively moderate, relatively low, and very low, but can also be rated with no Expected Annual Losses or not applicable if there isn't enough data to accurately determine the community's risk of hazards. The scores a community receives to quantify its risks of hazards range from 0 to 100, where the higher the risk score, the higher the risk of the community to experience that natural hazard.

This risk assessment will also utilize data from FEMA's National Risk Index (NRI) to represent a generalized measure of risk and potential negative impacts of a natural hazard event based on the Expected Annual Loss of a community, the social vulnerability value of a community, and a community's resilience value. These components help define risk based on a community's risk relative to other communities at the same level, utilizing the variables that represent the susceptibility of social groups to negative impacts of natural hazards and variables that represent the community's ability to prepare, adapt, and recover from disruptions related to natural hazards. The NRI dataset is an online tool built by FEMA in collaboration with stakeholders and partners in academia, state governments, local governments, federal agencies, and private industries. The NRI is used by decision makers and the public to improve understanding of natural hazard risks and actions that can reduce risk in a specific community. More information about the NRI can be found in Section 4.3.1 and Section 4.7.

Problem Statements: *Changes in development or housing, climate change (see below), the natural environment, first responders, and continuity of operations.*

These are area specific potential vulnerabilities that were considered to address people, changes in development or housing, the natural environment, first responders, and continuity of operations. These statements outline potential specific vulnerabilities for each hazard and how the unique nature of each hazard may impact the planning area and vulnerability.

Climate Change

These are problem statements that are aimed to reflect potential vulnerabilities associated with each hazard in terms of climate change. Climate change implications were described from the

NC State Climate Science Report¹ and the Climate Science Special Report from the 4th National Climate Assessment².

4.2. Hazard Selection

The Plan Area is vulnerable to a wide range of natural hazards that threaten life and property. Current regulations and interim guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards.

Upon a thorough review of the full range of natural hazards covered in the existing mitigation plans for the four participating counties in the Plan area, the hazards suggested under FEMA mitigation planning guidance, and the hazards addressed in the North Carolina State Hazard Mitigation Plan, the participating jurisdictions in the Plan Area have identified 15 hazards that are to be addressed in the Plan Area. These hazards were identified through an extensive process that included input from Hazard Mitigation Planning Committee (HMPC) members.

Table 4-1 lists the full range of natural hazards initially considered for inclusion in the Plan. This table includes a total of 15 individual hazards and documents the evaluation process used for determining which of the initially identified hazards were considered significant enough for further evaluation in the Risk Assessment. For each hazard considered, the table indicates whether the hazard was identified as a significant hazard to be assessed further, 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).

Table 4-1: Documentation of the Hazard Selection Process

Hazard Considered	Hazard Type (Natural, Intentional, Accidental)	Was this hazard considered significant/appropriate enough to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Riverine Flooding	Natural	Yes	The threat of damage and loss of life is of sufficient concern to warrant study.	By consensus of the planning committee
Levee Failure	Natural	Yes	The threat of damage and loss of life from the failure of a dam or levee is of sufficient concern to warrant study.	By consensus of the planning committee

¹Kunkel, K.E., D.R. Easterling, A. Ballinger, S. Bilaligh, S.M. Champion, D.R. Corbett, K.D. Dello, J. Dissen, G.M. Lackmann, R.A. Luettich, Jr., L.B. Perry, W.A. Robinson, L.E. Stevens, B.C. Stewart, and A.J. Terando, 2020: North Carolina Climate Science Report. North Carolina Institute for Climate Studies, 233 pp. <https://ncics.org/nccsr>

²Jay, A., D.R. Reidmiller, C.W. Avery, D. Barrie, B.J. DeAngelo, A. Dave, M. Dzaugis, M. Kolian, K.L.M. Lewis, K. Reeves, and D. Winner, 2018: Overview. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 33–71. doi: 10.7930/NCA4.2018.CH1

Hazard Considered	Hazard Type (Natural, Intentional, Accidental)	Was this hazard considered significant/appropriate enough to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Wildfire	Natural	Yes	The threat of damage and loss of life is of sufficient concern to warrant study.	By consensus of the planning committee
Tornado	Natural	Yes	The threat of damage and loss of life is of sufficient concern to warrant study.	By consensus of the planning committee
Earthquake	Natural	Yes	The threat of damage and loss of life is of sufficient concern to warrant study.	By consensus of the planning committee
Landslide	Natural	Yes	The threat of damage and loss of life is of sufficient concern to warrant study.	By consensus of the planning committee
Snow	Natural	Yes	The threat of damage and loss of life from winter weather is of sufficient concern to warrant study.	By consensus of the planning committee
Dam Failure	Natural	Yes	The threat of damage and loss of life from the failure of a dam or levee is of sufficient concern to warrant study.	By consensus of the planning committee
Hail	Natural	Yes	The threat of property damage from hail is of sufficient concern to warrant study.	By consensus of the planning committee
Drought	Natural	Yes	The threat of damage and loss of life is of sufficient concern to warrant study.	By consensus of the planning committee
Hurricane Winds	Natural	Yes	Despite the inland location of the planning area, hurricanes and tropical storms are of sufficient concern to warrant study.	By consensus of the planning committee
Ice	Natural	Yes	The threat of damage and loss of life from winter weather is of sufficient concern to warrant study.	By consensus of the planning committee
Thunderstorm Winds	Natural	Yes	The threat of damage from thunderstorms is of sufficient concern to warrant study.	By consensus of the planning committee
Erosion	Natural	Yes	The threat of damage from erosion is of sufficient concern to warrant study.	By consensus of the planning committee
Sinkholes	Natural	Yes	Due to local concerns and recent occurrences.	By consensus of the planning committee

The final list of hazards to be presented in the Plan, as agreed upon by the HMPC, is as follows:

Natural Hazard

- Riverine Flooding
- Levee Failure
- Wildfire
- Tornado
- Earthquake
- Landslide
- Snow
- Dam Failure
- Hail
- Drought
- Hurricane Winds
- Ice
- Thunderstorm Winds
- Erosion
- Sinkholes

The table below represents how hazards are listed in the NC State HMP compared to how they are listed in this Plan.

Unifour Regional HMP Hazard List	NC State HMP Hazard List
Riverine Flooding	Flooding
Levee Failure	Dam/Levee Failure
Wildfire	Wildfires
Tornado	Tornadoes/Thunderstorm
Earthquake	Earthquakes
Landslide	Landslide/Rock Fall
Snow	Severe Winter Weather
Dam Failure	Dam/Levee Failure
Hail	Tornadoes/Thunderstorm
Drought	Drought
Hurricane Winds	Hurricanes and Coastal Hazards
Ice	Severe Winter Weather
Thunderstorm Winds	Tornadoes/Thunderstorm
Erosion	Not Listed
Sinkholes	Sinkholes

HMP = Hazard Mitigation Plan
 NC = North Carolina

Another consideration in the selection of the hazards to be addressed in the Plan is the history of major disaster declarations in the planning area. According to the FEMA Disaster Declarations web page, there have been 46 major disaster declarations issued in the state of North Carolina since 1974 (see Table 4-2).

Table 4-2: Major Disaster Declarations for Burke, Caldwell, Catawba, and Alexander counties from 1974 to 2024 from the Federal Emergency Management Agency.

Event	Declaration Date	Declaration Number	County(s) in the Planning Area Declared
Tornadoes	4/12/1974	DR-428	Burke, Caldwell
Drought And Freezing	3/2/1977	EM-3033	Catawba
Drought	8/11/1977	EM-3049	Alexander, Burke, Caldwell, Catawba
Severe Storms, Flooding	11/9/1977	DR-542	Burke, Caldwell, Catawba
Tornadoes	5/17/1989	DR-827	Catawba
Hurricane Hugo	9/25/1989	DR-844	Alexander, Burke, Caldwell Catawba
Severe Snowfall and Winter Storm	3/17/1993	EM-3110	Alexander, Burke, Caldwell, Catawba
Blizzard	1/13/1996	DR-1087	Alexander, Burke, Caldwell, Catawba
Storms/Flooding	2/23/1996	DR-1103	Alexander, Burke, Caldwell, Catawba
Severe Ice Storm	12/12/2002	DR-1448	Alexander, Burke, Caldwell, Catawba
Tropical Storm Frances	9/10/2004	DR-1546	Alexander, Burke, Caldwell, Catawba
Hurricane Ivan	9/18/2004	DR-1553	Burke, Caldwell
Hurricane Katrina Evacuation	9/5/2005	EM-3222	Alexander, Burke, Caldwell, Catawba
Severe Winter Storms and Flooding	2/2/2010	DR-1871	Burke, Caldwell
Severe Storms, Flooding, Landslides, and Mudslides	9/25/2013	DR-4146	Burke, Caldwell
Severe Storms, Flooding, Landslides, and Mudslides	10/29/2013	DR-4153	Catawba
Chestnut Knob Fire	11/19/2016	DR-5164	Burke
Hurricane Florence	4/15/2018	EM-3401	Burke, Caldwell, Catawba, Alexander
Hurricane Dorian	9/3/2019	EM-3423	Burke, Caldwell, Catawba, Alexander
Covid-19	3/13/2020	EM-3471	Burke, Caldwell, Catawba, Alexander
Covid-19 Pandemic	1/20/2020	DR-4487	Burke, Caldwell, Catawba, Alexander
Severe Storms, Tornadoes, and Flooding	5/8/2020	DR-4543	Alexander
Hurricane Isaias	7/31/2020	EM-3534	Burke, Caldwell, Catawba, Alexander
Tropical Storm Eta	3/3/2021	DR-4588	Burke, Caldwell, Alexander
Hurricane Ian	10/1/2022	EM-3586	Burke, Caldwell, Catawba, Alexander
Tropical Storm Helene	9/28/2024	DR-4827	Alexander, Burke, Caldwell, Catawba

DR = major disaster

EM = emergency management

As shown in Table 4-2, the earliest major disaster declaration to occur in the planning area was in 1974 and the last was in 2024. The 26 major disaster declarations shown above cover the

hazards of flood, hurricane/tropical storm, severe storms, severe winter weather, and tornado relevant to the planning area. This history of disaster declarations is consistent with the hazards identified by the HMPC to be addressed in the Plan.

4.2.1. Hurricane Helene

Due to the catastrophic damage that impacted the planning area after the HMP draft was completed, the full updates of events that transpired in the planning area are not currently available for incorporation into the current draft. The federally declared disaster was not fully incorporated into the risk assessment of the hazard mitigation plan because the disaster occurred after the draft of the plan had already been submitted. Hazard mitigation plans are typically developed based on historical data, existing risk assessments, and known vulnerabilities at the time of drafting. Once a draft is submitted, it undergoes a review and approval process, which can be lengthy.

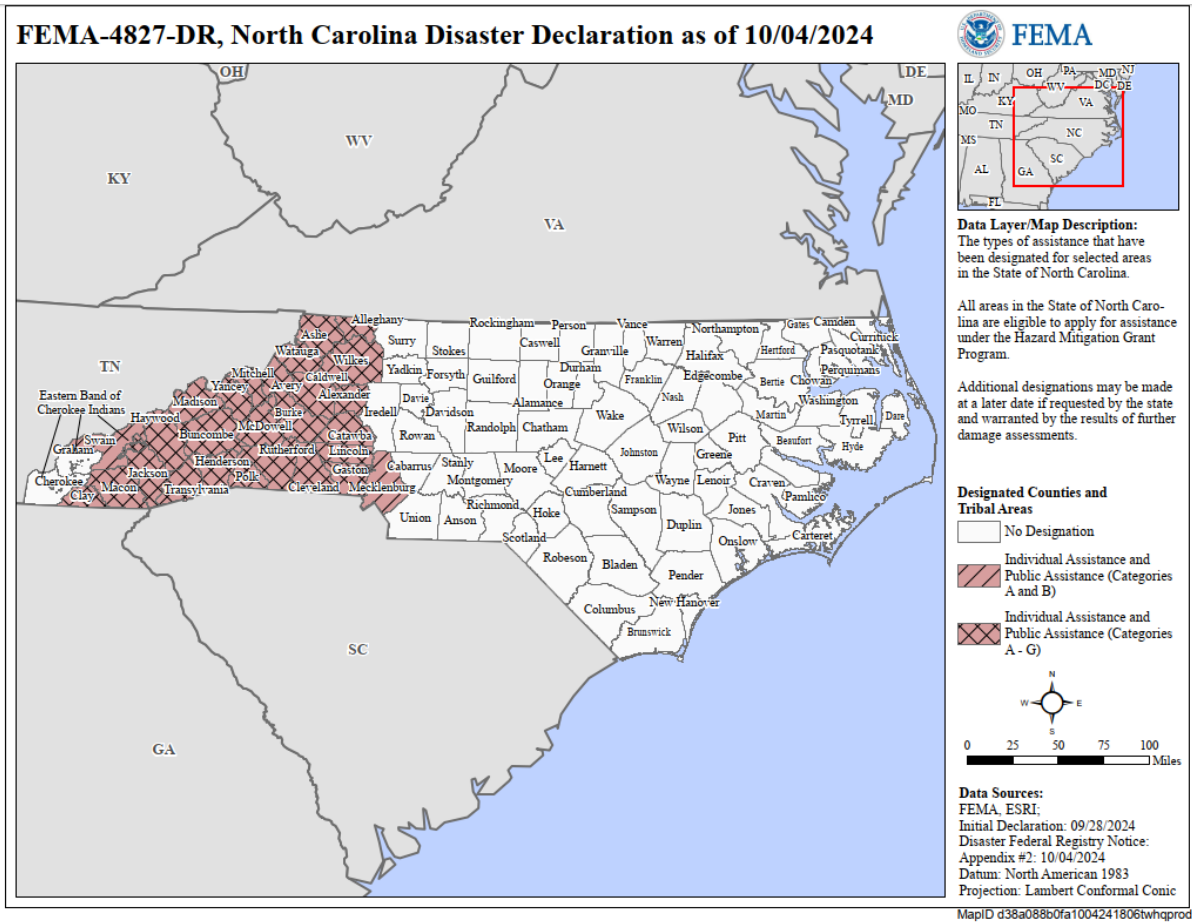


Figure 4-1: FEMA Disaster Declaration Areas for Hurricane Helene



Figure 4-2: Morganton, Buke County after Hurricane Helene from the Winston Salem Journal by Walt Unks published on September 29, 2024.

As a result, the new data and insights from this recent disaster were not available to be included in the initial risk assessment. This means that the plan did not account for the specific impacts, lessons learned, and potential mitigation strategies that could have been derived from the recent event. To address this gap, it is important to update the hazard mitigation plan as soon as possible to reflect the new information. This ensures that future risk assessments are more comprehensive and that the plan remains relevant and effective in mitigating risks from similar disasters in the future.

By October 11th, more than \$77 Million in FEMA individual assistance have been allocated and 152,000 people have registered for individual assistance³. Preliminary damage reports include the following: Alexander County had 19 roads completely blocked and three roads partially closed around 58% of all homes were without power at the height of the outage on September 26th, and in NC a reported 400,000 residents were without power on October 1st in the region⁴. Catawba County Emergency Management reported that there were approximately 100 homes that were affected by catastrophic flooding, and an additional 50 homes sustained major storm-related damage⁵. In the planning area, 1 death has been reported in Burke County and 1 death has been reported in Catawba County as of October 14th⁶. Damage, fatalities, and extent of the impact of Hurricane Helene is not known at the moment.

³ PHOTOS AVAILABLE: Governor Cooper travels to Transylvania and Henderson counties, visits local businesses and thanks volunteers and responders. (2024, October 11). NC DPS. <https://www.ncdps.gov/news/press-releases/2024/10/11/photos-available-governor-cooper-travels-transylvania-and-henderson-counties-visits-local-businesses>

⁴ *Helene's aftermath: outages, road closures, damage.* (2024, October 2). The Taylorsville Times. <https://www.taylorsvilletimes.com/2024/10/02/helenes-aftermath-outages-road-closures-damage/>

⁵ Catawba County. (2024b, October 4). Catawba County Completes Hurricane Damage Assessment. CatawbaCountyNC.gov. Retrieved October 15, 2024, from <https://www.catawbacountync.gov/news/catawba-county-completes-hurricane-damage-assessment/>

⁶ Chrisman, S. (2024, October 14). Hurricane Helene death toll reaches 95 in North Carolina, department says. <https://www.wbtv.com>. <https://www.wbtv.com/2024/10/14/hurricane-helene-death-toll-reaches-95-north-carolina-department-says/>

4.2.2. NRI Overview

The overall scores for the counties within Unifour for the FEMA National Risk Index (NRI) can be found in Table 4-3 and more information about the NRI can be found in Section 4.3.1. with the NRI Data and Methodology Overview. EAL represents the total loss of agriculture, population, and building values unless otherwise indicated in this report.

Table 4-3: Overview of Risk Ratings, Risk Scores, and Expected Annual Loss for Hazards based on the NRI Data

Hazard	Component	Catawba County	Burke County	Caldwell County	Alexander County
Riverine Flooding	Risk Score	57.6	72.2	47.6	14.9
	Risk Rating	Relatively Low	Relatively Low	Relatively Low	Very Low
	EAL	\$541,000	\$934,000	\$312,000	\$37,000
	Population Exposure	1,130.28	732.92	1,559.81	192.58
Wildfire	Risk Score	59.2	60	62.2	47.6
	Risk Rating	Very Low	Very Low	Very Low	Very Low
	EAL	\$62,000	\$57,000	\$312,000	\$27,000
	Population Exposure	14,105.36	2,861.79	3,339.27	2,180.76
Tornado	Risk Score	89.2	74.8	66.7	48.2
	Risk Rating	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low
	EAL	\$5.2 Million	\$2.2 Million	\$1.6 Million	\$872,000
	Population Exposure	160,509	87,532	80,586	36,437
Earthquake	Risk Score	83.6	69.1	72.6	54.7
	Risk Rating	Relatively Low	Relatively Low	Relatively Low	Very Low
	EAL	\$1.1 Million	\$338,000	\$407,000	\$145,000
	Population Exposure	160,610	87,570	80,652	36,444
Landslide	Risk Score	92.3	94	98	49
	Risk Rating	Relatively Moderate	Relatively Moderate	Relatively High	Relatively Low
	EAL	\$150,000	\$182,000	\$560,000	\$22,000
	Population Exposure	58,367.72	45,828.35	43,002.41	12,408.76
Snow / Winter Weather	Risk Score	68.7	56.5	54.8	33.8
	Risk Rating	Relatively Moderate	Relatively Low	Relatively Low	Relatively Low
	EAL	\$62,000	\$57,000	\$55,000	\$24,000
	Population Exposure	160,509	87,524	80,475.24	36,437
Hail	Risk Score	91.1	70.9	67.7	68.2

Hazard	Component	Catawba County	Burke County	Caldwell County	Alexander County
	Risk Rating	Relatively Moderate	Relatively Low	Relatively Low	Relatively Low
	EAL	\$992,000	\$224,000	\$198,000	\$205,000
	Population Exposure	160,509	27,532	80,586	36,437
Drought	Risk Score	86.1	86	76.6	73.8
	Risk Rating	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low
	EAL	\$379,000	\$342,000	\$183,000	\$140,000
	Population Exposure	N/A	N/A	N/A	N/A
Hurricane	Risk Score	75.1	63.8	63.9	61
	Risk Rating	Relatively Low	Relatively Low	Relatively Low	Very Low
	EAL	\$1.9 Million	\$537,000	\$555,000	\$430,000
	Population Exposure	160,502	87,510.90	80,586	36,437
Ice / Ice Storm	Risk Score	98.2	97.2	96.4	92
	Risk Rating	Very High	Very High	Very High	Relatively High
	EAL	\$2 Million	\$1.4 Million	\$1.3 Million	\$612,000
	Population Exposure	160,494.15	87,528.66	80,586	36,437
Strong Wind	Risk Score	86.9	62.4	86	64.2
	Risk Rating	Relatively Moderate	Relatively Moderate	Relatively Moderate	Relatively Moderate
	EAL	\$1.1 Million	\$411,000	\$1 Million	\$464,000
	Population Exposure	160,509	87,532	80,586	36,437
Lightning	Risk Score	76.9	94.3	88.6	76
	Risk Rating	Relatively Moderate	Relatively High	Relatively Moderate	Relatively Moderate
	EAL	\$219,000	\$726,000	\$416,000	\$213,000
	Population Exposure	160,509	87,532	80,586	36,437

EAL = Expected Annual Loss

N/A = not applicable

NRI = National Risk Index

4.3. Methodologies and Assumptions

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

4.3.1. Vulnerability Assessment

This section quantifies, to the extent feasible using best available data, assets at risk to natural hazards and potential loss estimates. People, properties and critical facilities, and environmental assets that are vulnerable to the hazard are identified. Future development is also discussed in this section, including how exposure to the hazard may change in the future or how development may affect hazard risk. The vulnerability assessments followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (August 2001). The vulnerability assessment first describes the total vulnerability and values at risk and then discusses vulnerability by hazard. Data used to support this assessment included the following:

- Geographic Information System (GIS) datasets, including building footprints, topography, aerial photography, and transportation layers.
- Hazard layer GIS datasets from state and federal agencies.
- Written descriptions of inventory and risks provided by the State Hazard Mitigation Plan; and
- Written descriptions of inventory and risks provided by the previous Hazard Mitigation Plan.
- Exposure and vulnerability estimates provided by the North Carolina Emergency Management iRISK⁷ database.
- Crop insurance claims by cause from United States Department of Agriculture's (USDA's) Risk Management Agency

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

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

⁷ iRISK is an interactive, Web-based risk-assessment tool

within the 1-percent-annual-chance flood hazard area (5% of the total population for that census block).

Two distinct risk assessment methodologies were used in the formation of the vulnerability assessment. The first consists of a quantitative analysis that relies upon best available data and technology, while the second approach consists of a qualitative analysis that relies on local knowledge and rational decision making. The quantitative analysis involved the use of RMT iRISK database, which provides modeled damage estimates for flood, wind, and wildfire hazards.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Where hazard risk cannot be distinctly quantified and modeled, other information can be collected regarding the hazard area, such as the location of critical facilities.

NRI Data was used in conjunction with other data sources such as RMT where applicable. This was to provide a wide range of vulnerability analyses and provide a standardized comparison to other communities across the United States to compare the levels of vulnerability to other communities. Additionally, the NRI offers data at a county and census-tract level data. To supplement the jurisdictional level vulnerability, RMT was used for probability of future occurrences. Vulnerability analysis varies between hazards in terms of data sources, so the relevant data sources can be found in the end notes and within the text.

4.3.2. NRI Data and Methodology Overview

Each natural hazard that is included in the FEMA National Risk Index has associated risk values, risk scores, and risk ratings which are representative of the county or census tracts vulnerability to a natural hazard compares to other communities at the same level. In order to more thoroughly represent the risk to natural hazards that a community has compared to other communities at the same level, the NRI will be used to represent a community-based risk comparison outlined with risk values, ratings, and scores which are defined in Table 4-4 below. For more information about the methodology and datasets used in the NRI calculations, please refer to the NRI Technical Documentation⁸.

Table 4-4: NRI definitions from the NRI Technical Documentation.

Term	Definition or Equation
Annualized Frequency	Number of Recorded Events / Period of Record
	LRB = Loss / Exposure

⁸ Zuzak, C., Sheehan, A., Goodenough, E., McDougall, A., Stanton, C., McGuire, P., Mowrer, M., Roberts, B., & Rozelle, J. (2023). National Risk Index: Technical Documentation. In Federal Emergency Management Agency, FEMA.gov. Retrieved May 28, 2024, from https://www.fema.gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf

Term	Definition or Equation	
Historic Loss Ratio	Loss	Loss, by consequence type (Building, population, or agriculture), experienced from each hazard occurrence documented in the data source
	Exposure	The total value, by consequence type (Building, population number, or agriculture), estimated to be exposed to the hazard occurrence in United States Dollar (USD), or in population number or Population equivalent for population exposure.
Social Vulnerability	The susceptibility of social Groups to the adverse impacts of natural hazards including disproportionate death, injury, loss, or disruption of livelihood	
	Data Source	Center for Disease Control and Prevention (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (SVI)
Community Resilience	The ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.	
	Data Source	University of South Carolina's Hazards and Vulnerability Research Institute (HVRI)'s Baseline Resilience Indicators for Communities (HVRI BRIC)
Expected Annual Loss	Represents the average economic loss in dollars resulting from natural hazards each year. It is calculated for each hazard type and quantifies loss for relevant consequence types: buildings, people, and agriculture	
	Equation	Exposure X Annualized Frequency X Historic Loss Ratio
Risk Value	Values for Risk and EAL in dollars, representing the community's average economic loss from natural hazards each year.	
Risk Score	Scores represent the national percentile ranking of the community's component value compared to all other communities at the same level, at the county or census tract level.	
Risk Rating	Ratings in one of five qualitative categories that describe the community's component value in comparison to all the other communities at the same level. These range from "Very Low" to "Very High".	
	Very High	80 th to 100 th percentile
	Relatively High	60 th to 80 th percentile
	Relatively Moderate	40 th to 60 th percentile
	Relatively Low	20 th to 40 th percentile
	Very low	0 th to 20 th percentile

EAL = Expected Annual Loss

USD = United States Dollar



$$\text{Risk} = \text{EAL} \times \text{CRF}$$

$$\text{CRF} = f\left(\frac{\text{Social Vulnerability}}{\text{Community Resilience}}\right)$$



Illustration of Risk Component Scores

County	EAL	Social Vulnerability	Community Resilience	Risk
County 1	99.66	78.84	23.65	99.68
County 2	99.87	37.43	78.36	99.65
County 3	99.51	73.07	70.85	99.55
County 4	97.59	98.82	1.15	98.31
County 5	97.09	53.85	45.23	96.85
County 6	81.40	99.71	1.30	87.75
County 7	77.41	71.96	0.86	84.98
County 8	52.40	12.35	94.30	47.98
County 9	47.38	50.06	33.90	48.49
County 10	9.19	28.13	75.84	7.86

Figure 4-3: NRI rating legend and illustration of risk component scores from the NRI Technical Documentation

Table 4-5: NRI Overall Risk Index, Social Vulnerability, and Community Resilience Ratings and Scores

County	Risk Index EAL		Risk Index Social Vulnerability		Risk Index Community Resilience	
	Rating	Score	Rating	Score	Rating	Score
Alexander	Very Low	30.73	Relatively High	60.12	Relatively Low	27.63
Caldwell	Relatively Low	56.67	Relatively High	70.88	Relatively Low	37.65
Burke	Relatively Low	64.59	Relatively High	74.57	Relatively Low	35.2
Catawba	Relatively Low	77.73	Relatively High	68.08	Relatively Moderate	55.06

EAL = Expected Annual Loss
 NRI = National Risk Index

4.4. Inventory of Community Assets

Each participating jurisdiction assisted in the identification of assets to be used for analysis to determine what assets may be potentially at risk to the hazards covered in the Plan. These assets are defined broadly as anything that is important to the function and character of the community. For the purposes of this Risk Assessment, the individual types of assets include:

- Population
- Parcels and Buildings
- Critical Facilities
- Infrastructure
- High Potential Loss Properties
- Historic Properties

Although all assets may be affected by certain hazards (such as hail or tornadoes), some assets are more vulnerable because of their location (e.g., the floodplain), certain physical characteristics (e.g., slab-on-grade construction), or socioeconomic uses (e.g., major employers).

For more information about critical facilities, historical properties, and emergency services that are in the planning area, please see Appendix B. For more information about the buildings, people, and facilities that are vulnerable to hazard impacts, see Appendix H.

4.4.1. Population

The population counts shown in Table 4-6 are derived from 2020 census data and include a breakdown of two subpopulations assumed to be at greater risk to natural hazards than the “general” population: elderly (ages 65 and older) and children (under the age of 5). Density shows population density per square mile, along with the distribution of potentially at-risk populations, across the planning area.

Table 4-6: Population Counts with Vulnerable Population Breakdown from the 2020 Census.

Jurisdiction	2020 Census Population	Elderly (Age 65 and Over)	Children (Age 5 and Under)
Alexander			
Alexander County (Unincorporated Area)	25,330	7,384	1,758
Town of Taylorsville	11,114	1,971	537
Subtotal Alexander	36,444	9,355	2,295
Burke			
Burke County (Unincorporated Area)	57,684	11,959	2,724

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Jurisdiction	2020 Census Population	Elderly (Age 65 and Over)	Children (Age 5 and Under)
City of Morganton	17,474	3,430	1,058
Town of Connelly Springs	1,529	339	47
Town of Drexel	1,760	439	71
Town of Glen Alpine	1,529	300	78
Town of Hildebran	1,679	322	70
Town of Rutherford College	1,226	343	48
Town of Valdese	4,689	1,156	235
Subtotal Burke	87,570	18,288	4,331
Caldwell			
Caldwell County (Unincorporated Area)	40,813	8,664	1,931
City of Lenoir	18,352	3,723	1,056
Town of Cahah's Mountain	2,722	707	122
Town of Gamewell	3,702	806	192
Town of Granite Falls	4,965	961	275
Town of Hudson	3,780	765	203
Town of Rhodhiss	997	143	68
Town of Sawmills	5,020	966	275
Village of Cedar Rock	301	122	6
Subtotal Caldwell	80,652	16,857	4,028
Catawba			
Catawba County (Unincorporated Area)	83,891	15,901	4,088
City of Claremont	1,692	316	94
City of Conover	8,421	1,812	428
City of Hickory	43,490	8,275	2,242
City of Newton	13,148	2,498	753
Town of Brookford	442	101	23
Town of Catawba	702	138	25
Town of Long View	5,088	865	296
Town of Maiden	3,736	595	222
Subtotal Catawba	160,610	30,501	8,171
TOTAL PLAN AREA	365,276	75,001	18,825

Population Density

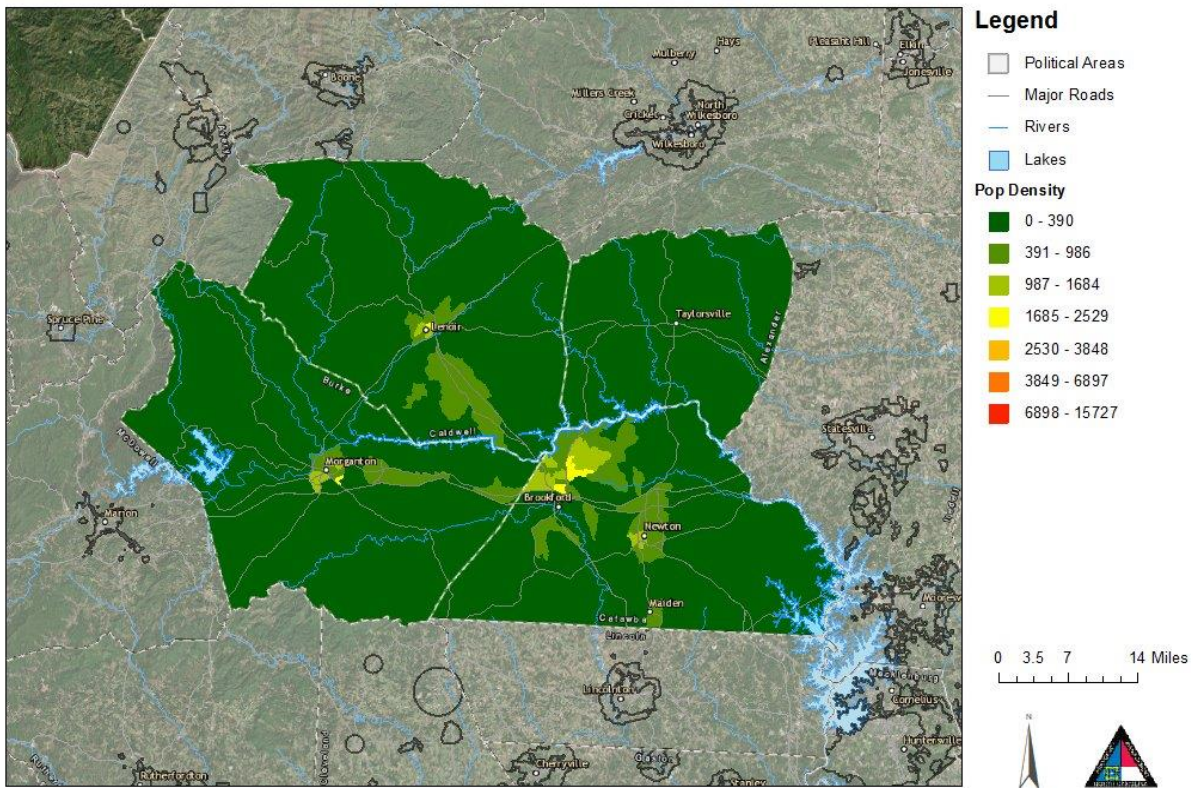


Figure 4-4: Population Density

Table 4-7: Change in population between 2018-2022 population estimates and 2013-2017 population estimates⁹

County	% Over 65 Estimate 2018-2022	% Over 65 Estimate 2013-2017	% Change from 2013-2017 to 2018-2022
Alexander	20.4%	18.8%	+79.6%
Burke	21.0%	18.8%	+79%
Caldwell	20.7%	18.4%	+79.3%
Catawba	18.3%	16.6%	+81.7%

4.4.2. Parcels and Buildings

The parcel counts, building counts, and building values shown in Table 4-8 represent the built environment inventories used for the analyses included in the Risk Assessment. To provide a more accurate reflection of buildings that contain livable space and/or commercial, industrial, or

⁹ CP05: Comparative Demographic Estimates - Census Bureau Table. (n.d.). Retrieved October 1, 2024, from https://data.census.gov/table/ACSCP5Y2022_CP05?q=alexander%20county&d=ACS%205-Year%20Estimates%20Comparison%20Profiles

other uses, all building footprints less than 500 square feet have been eliminated from the counts and analysis.

Table 4-8: Parcel and Building Counts and Values by Jurisdiction

Jurisdiction	Number of Developed Parcels	Number of Undeveloped Parcels	Building Count	Building Value	Number of Pre-FIRM Buildings
Alexander					
Alexander County (Unincorporated Area)	17,971	7,874	24,663	\$3,840,434,043	0
Town of Taylorsville	0	0	2,824	\$856,433,184	0
Subtotal Alexander	17,971	7,874	27,487	\$4,696,867,227	0
Burke					
Burke County (Unincorporated Area)	333	304	28,091	\$2,232,053,874	29
City of Morganton	195	144	10,727	\$1,772,443,185	4
Town of Connelly Springs	0	1	889	\$63,845,104	0
Town of Drexel	8	2	2,949	\$309,763,169	1
Town of Glen Alpine	5	10	1,086	\$81,890,752	0
Town of Hildebran	13	5	1,069	\$137,930,831	0
Town of Rutherford College	0	0	827	\$93,523,599	0
Town of Valdese	48	48	2,132	\$428,687,357	4
Subtotal Burke	18,573	8,388	75,257	\$9,817,005,098	38
Caldwell					
Caldwell County (Unincorporated Area)	477	335	20,774	\$1,707,933,363	19
City of Lenoir	407	171	10,316	\$1,482,757,665	58
Town of Cahah's Mountain	2	2	1,350	\$118,985,723	0
Town of Gamewell	37	29	2,062	\$145,493,182	1
Town of Granite Falls	13	22	3,394	\$601,795,107	0
Town of Hudson	41	40	3,116	\$349,667,781	1
Town of Rhodhiss	0	0	490	\$32,914,533	0
Town of Sawmills	45	29	3,234	\$266,030,835	0
Village of Cedar Rock	2	2	135	\$35,687,645	0
Subtotal Caldwell	19,597	9,018	120,128	\$14,558,270,932	117

Jurisdiction	Number of Developed Parcels	Number of Undeveloped Parcels	Building Count	Building Value	Number of Pre-FIRM Buildings
Catawba					
Catawba County (Unincorporated Area)	782	608	50,060	\$4,638,045,955	11
City of Claremont	11	8	1,351	\$188,796,219	0
City of Conover	112	58	5,089	\$738,362,172	4
City of Hickory	516	257	22,507	\$3,764,227,757	29
City of Newton	202	122	7,657	\$890,405,966	1
Town of Brookford	29	12	304	\$13,048,710	2
Town of Catawba	38	18	1,016	\$67,585,895	1
Town of Long View	50	24	2,716	\$186,187,111	3
Town of Maiden	25	18	3,230	\$508,315,681	0
Subtotal Catawba	21,362	10,143	214,058	\$25,553,246,398	168
TOTAL PLAN	21,362	10,143	214,058	\$25,553,246,398	168

4.4.3. Critical Facilities

Table 4-9: Critical Facilities Counts by Jurisdiction¹⁰

Jurisdiction	EMS	EOCs	Fire Stations	Hospitals	Law Enforcement	Schools	Senior Care	Shelters
Alexander County (Unincorporated Area)	3	0	4	0	0	4	0	3
Taylorsville	8	1	6	1	2	8	4	7
Subtotal Alexander	11	1	10	1	2	12	4	10
Burke County (Unincorporated Area)	2	0	4	0	1	2	1	3

¹⁰ State of North Carolina. (2023). *Nursing Homes* [Dataset]. NC One Map. https://www.nconemap.gov/datasets/978258aae1a44779adb479514f34008_3/explore; NC One Map. (2023). *Law Enforcement Locations* [Dataset]. NC One Map. https://www.nconemap.gov/datasets/99618bd65ab04dd2b0a6b0cd896e7113_1/explore; Adam Blythe. (2024). *NC Fire Stations* [Dataset]. NC One Map. <https://www.nconemap.gov/search?groupIds=2b0fd568b5234936a139f67a7ccdb014>; NC Non-Public Schools (Latest Version). (2024). [Dataset]. NC One Map. https://www.nconemap.gov/datasets/6f4fe0c55b0d4cbb92877e461d698c29_0/explore?location=34.621175%2C-80.017373%2C6.23; Law Enforcement Locations(2023). [Dataset]. NC One Map. https://www.nconemap.gov/datasets/99618bd65ab04dd2b0a6b0cd896e7113_1/explore; Potential Emergency Shelters. (2023). [Dataset]. NC One Map. https://www.nconemap.gov/datasets/2cf215c490b547a98d014fe6b8b4bc11_2/explore?location=35.554507%2C-80.963646%2C8.29

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Jurisdiction	EMS	EOCs	Fire Stations	Hospitals	Law Enforcement	Schools	Senior Care	Shelters
Connelly Springs	2	0	4	0	2	4	1	2
Drexel	0	0	1	0	1	2	1	2
Glen Alpine	0	0	1	0	0	19	1	
Hildebran	1	0	1	0	0	2	1	1
Morganton	3	1	16	1	5		9	17
Valdese	1	0	1	1	1	3	1	2
Rutherford College	0	0	1	0	0	1	0	1
Subtotal Burke	9	1	29	2	10	33	15	28
Caldwell County (Unincorporated Area)	1	0	2	0	0	1	2	1
Cajah's Mountain	0	0	0	0	0	0	0	
Cedar Rock	0	0	0	0	0	0	0	0
Gamewell	0	0	0	0	0	0	0	0
Granite Falls	4	0	3	0	1	6	1	6
Hudson	1	0	1	0	2	8	1	6
Lenoir	11	1	12	1	3	13	4	14
Rhodhiss	0	0	0	0	0	0	0	0
Sawmills	0	0	0	0	0	0	0	0
Subtotal Caldwell	17	1	18	1	6	28	8	27
Catawba County (Unincorporated Area)	4	0	5	0	0	2	0	
Brookford	0	0		0	0		0	
Catawba	3	0	2	0	1	3	0	2
Claremont	3	0	3	0	1	5	0	6
Conover	4	0	4	0	2	7	5	4
Hickory	9	0	12	2	6	24	9	18
Long View	1	0	0	0	0		0	
Maiden	1	0	4	0	1	4	0	3
Newton	7	1	4	0	4	11	3	10
Subtotal Catawba	32	1	34	2	15	56	17	45
TOTAL UNIFOUR	69	4	91	6	33	129	44	110

EMS = Emergency Medical Services
EOC = Emergency Operations Center

Critical Facilities - Alexander County

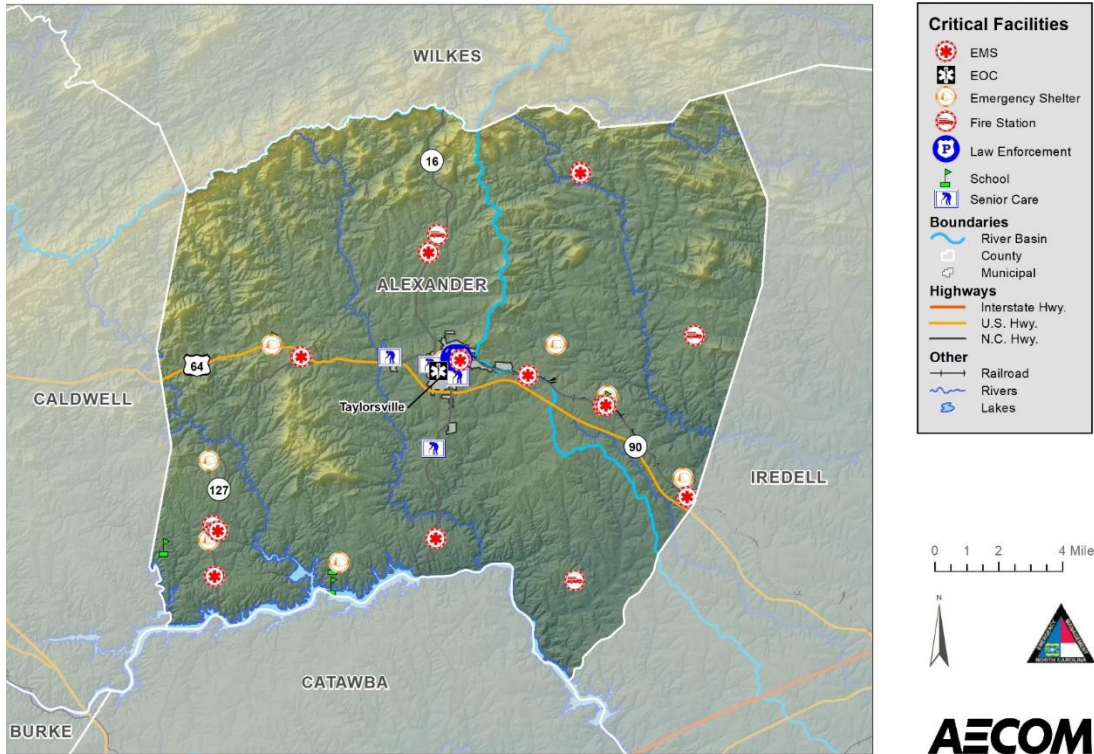


Figure 4-5: Critical Facilities in Alexander County

Critical Facilities - Caldwell County

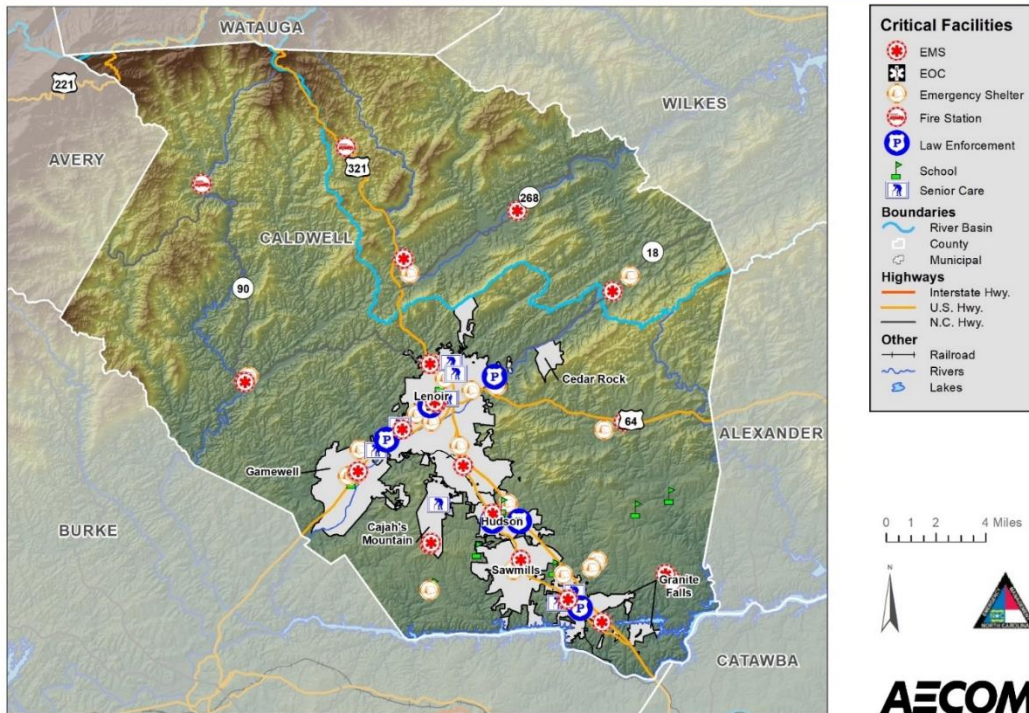


Figure 4-6: Critical Facilities in Caldwell County

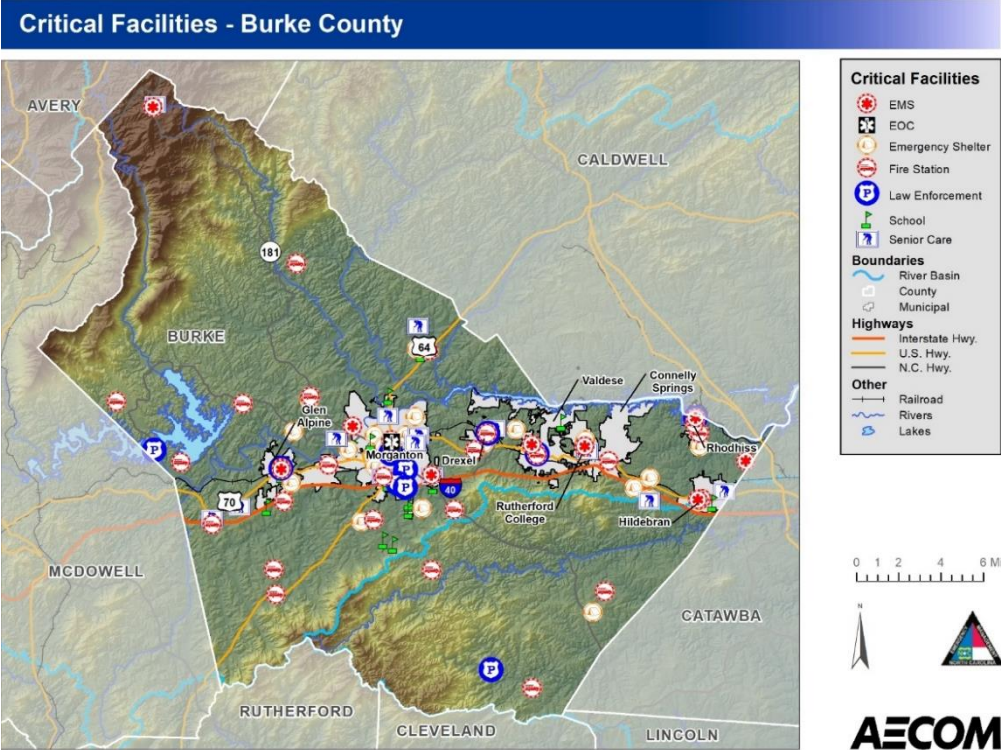


Figure 4-7: Critical Facilities in Burke County

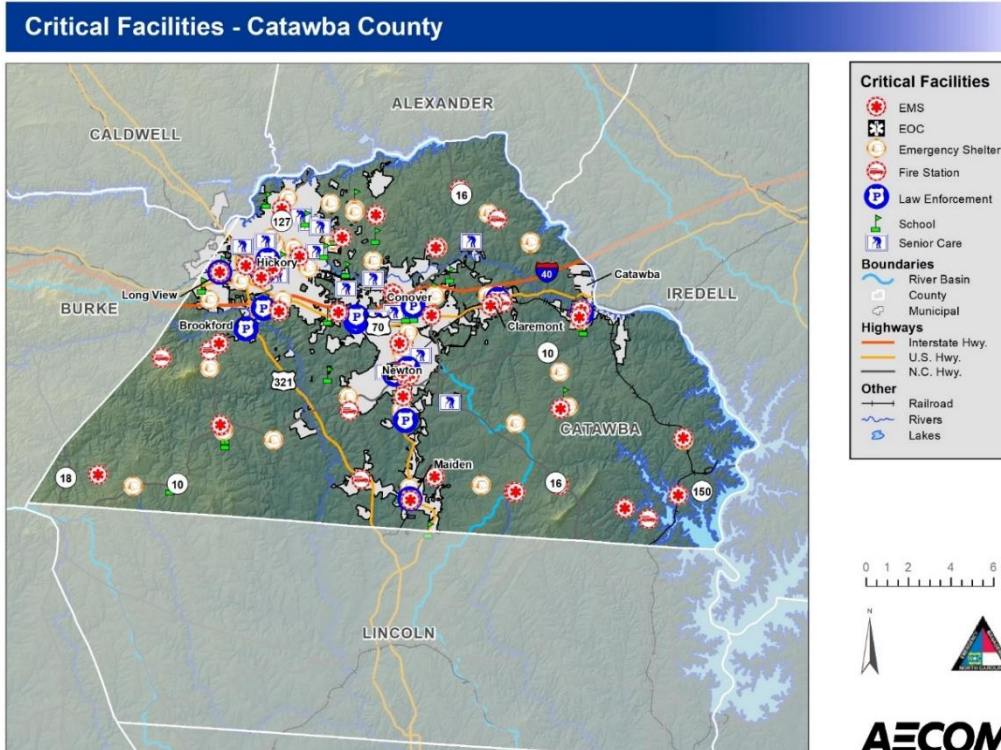


Figure 4-8: Critical Facilities in Catawba County

A table of healthcare facilities, names, addresses, and facility type is in Appendix B. Names and addresses of law enforcement, Fire stations, and EMS located in Appendix B.

4.4.4. Infrastructure

Certain infrastructure elements as shown in Table 4-10 were identified for analysis. These include major roads, railroads, power plants, water/wastewater facilities, and water/wastewater lines.

Table 4-10: Infrastructure Counts and Measurements (in Miles) by Jurisdiction

Jurisdiction	Major Roads ¹¹	Railroad ¹²	Energy (Power Plants)	Water (Treatment Facilities)	Water / Wastewater Lines
Alexander					
Alexander County (Unincorporated Area)	51.8	8.0	1	0	384.6
Town of Taylorsville	4.3	1.7	1	0	43.5
Subtotal Alexander	56.1	9.7	2	0	428.1
Burke					
Burke County (Unincorporated Area)	139.5	18.0	1	0	362.8
City of Morganton	31.4	7.7	1	0	307.2
Town of Connelly Springs	2.1	1.8	0	0	8.2
Town of Drexel	0.6	1.0	1	0	30.2
Town of Glen Alpine	1.2	1.3	0	0	15.6
Town of Hildebran	1.9	1.9	1	0	34.6
Town of Rutherford College	3.2	2.5	0	0	21.1
Town of Valdese	2.5	0.6	1	0	103.2
Subtotal Burke	182.4	34.8	5	0	882.9
Caldwell					
Caldwell County (Unincorporated Area)	95.8	1.5	1	0	317.6
City of Lenoir	21.2	12.1	1	1	337.1
Town of Cahah's Mountain	0.0	0.0	0	0	31.1
Town of Gamewell	3.2	0.0	0	0	9.8
Town of Granite Falls	6.1	3.2	1	1	96.2
Town of Hudson	7.5	2.5	0	0	72.9
Town of Rhodhiss	0.0	0.6	0	0	8.6
Town of Sawmills	4.4	2.4	0	0	20.1

²The major roads and railroads accounted for in this table are the same as those depicted on the "Community Profile" map found in Section 2.

³Does not include inactive/abandoned railroads.

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Jurisdiction	Major Roads ¹¹	Railroad ¹²	Energy (Power Plants)	Water (Treatment Facilities)	Water / Wastewater Lines
Village of Cedar Rock	0.0	0.0	0	0	6.3
Subtotal Caldwell	138.2	22.3	3	2	899.7
Catawba					
Catawba County (Unincorporated Area)	119.2	41.3	1	1	0.0
City of Claremont	2.6	3.9	0	0	0.0
City of Conover	17.8	9.1	1	0	0.0
City of Hickory	32.2	11.7	1	0	1,417.0
City of Newton	14.6	4.9	1	0	0.0
Town of Brookford	1.6	0.0	0	0	0.0
Town of Catawba	2.3	5.1	0	0	0.0
Town of Long View	5.0	2.2	0	0	11.1
Town of Maiden	6.0	0.0	1	1	0.0
Subtotal Catawba	201.3	78.2	5	2	1,428.1
TOTAL PLAN	578.0	145.0	15	4	3,638.8

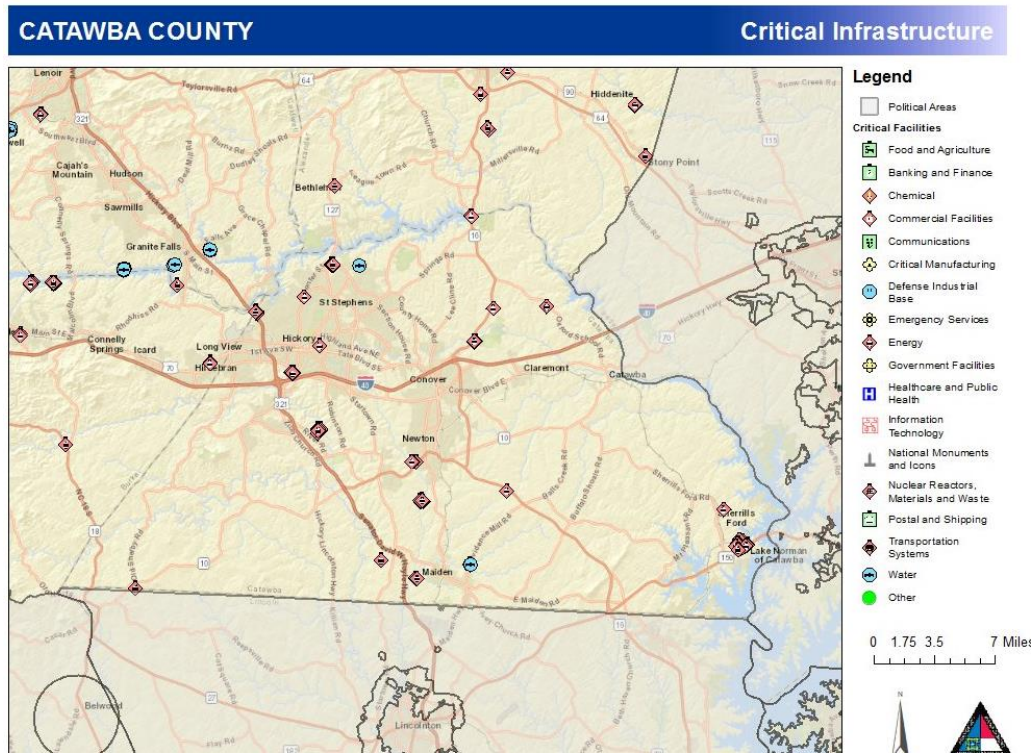


Figure 4-9: Critical Infrastructure in Catawba County

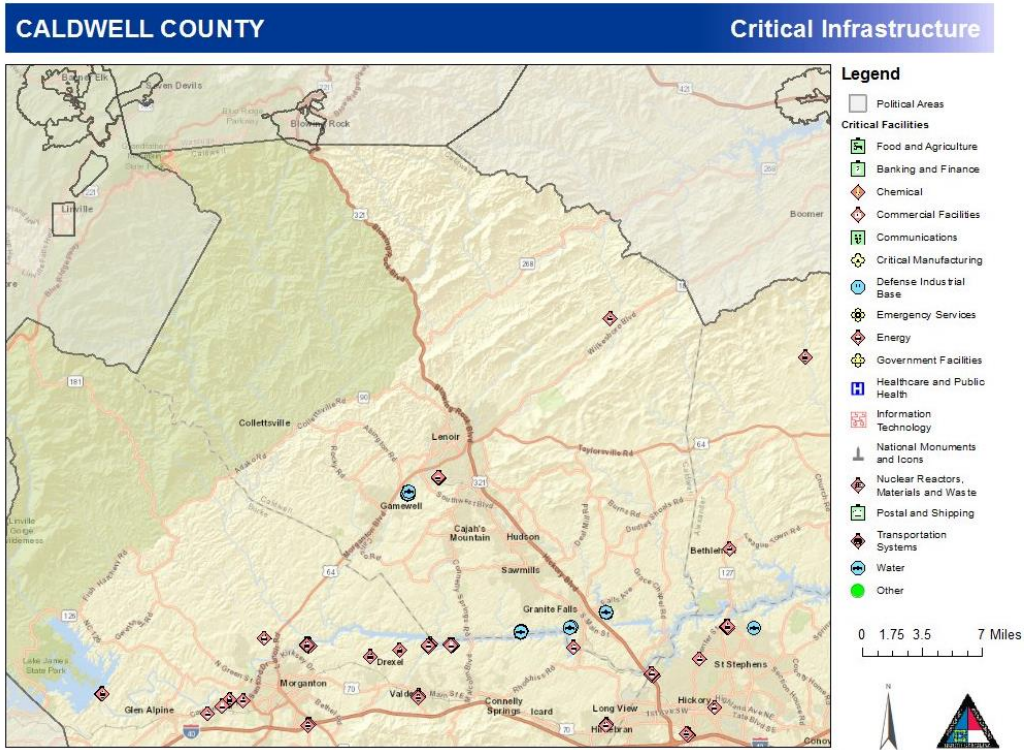


Figure 4-10: Critical Infrastructure in Caldwell County

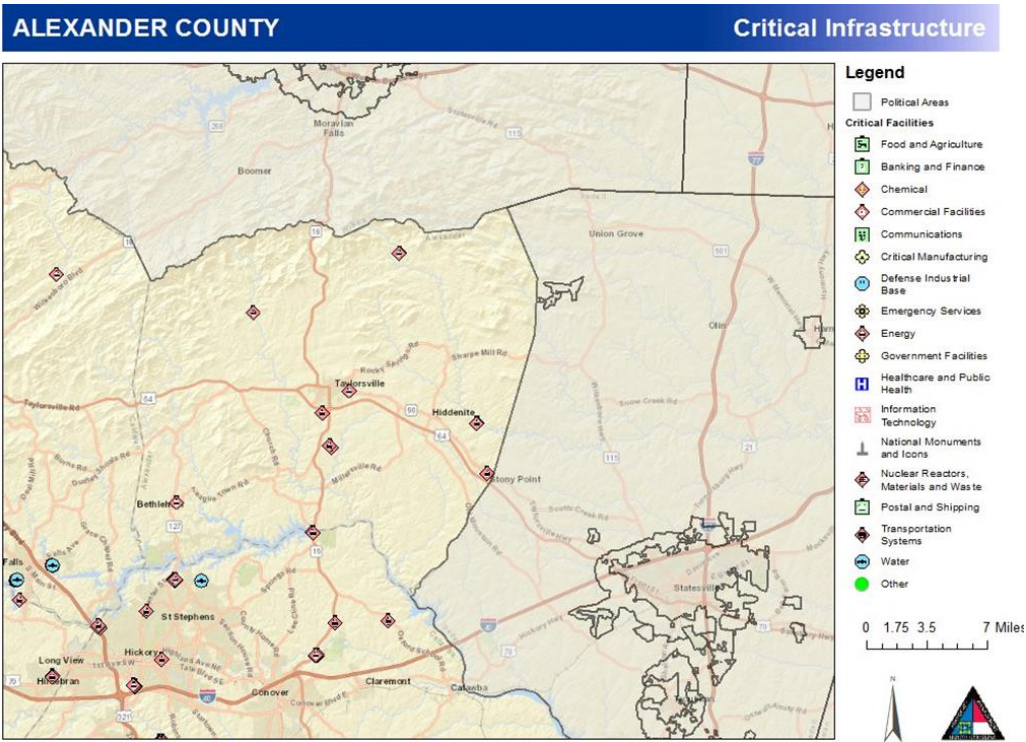


Figure 4-11: Critical Infrastructure in Alexander County

4.4.5. Historic Properties

Historic property counts including districts, buildings, and other cultural resources as shown in Table 4-11 were derived from a combination of sources consisting of the NC Historic Preservation Office and participating jurisdictions.

Table 4-11: Historic Property Counts by Jurisdiction

Jurisdiction	Districts	Buildings and Landmarks	Other
Alexander County	0	2	0
Burke County	10	2	0
Caldwell County	3	17	2
Catawba County	16	45	2
TOTAL PLAN	29	1	4

Source: NC Historic Preservation Office HPOWEB 2.0¹³ individual resources that have been listed on the National Register of Historic Places (NR) or district registered on the National Register of Historic Districts (NRHD).

4.4.6. NRI Social Vulnerability and Community Resilience

Table 4-12: NRI Social Vulnerability, Community Resilience, and overall Risk Ratings and Scores for Catawba, Alexander, Caldwell, and Burke County

County	Social Vulnerability Score (Percentile)	Social Vulnerability Rating	Community Resilience Score (Percentile)	Community Resilience Rating
Alexander	60.12	Relatively High	27.63	Relatively Low
Burke	74.57	Relatively High	35.2	Relatively Low
Caldwell	70.88	Relatively High	37.65	Relatively Low
Catawba	68.08	Relatively High	55.06	Relatively Moderate

4.5. Hazard Profiles, Analysis, and Vulnerability

As stated in subsection 4.2, the following hazards are addressed in this Risk Assessment and are presented in the following order in the subsections to follow:

¹³ North Carolina Historic Preservation Office & North Carolina Department of Natural and Cultural Resources. (2019). HPOWEB 2.0 (2.0) [Dataset]. NC Historic Preservation Office.
<https://nc.maps.arcgis.com/home/item.html?id=d2d04d8d7e03403f889419526e682529>

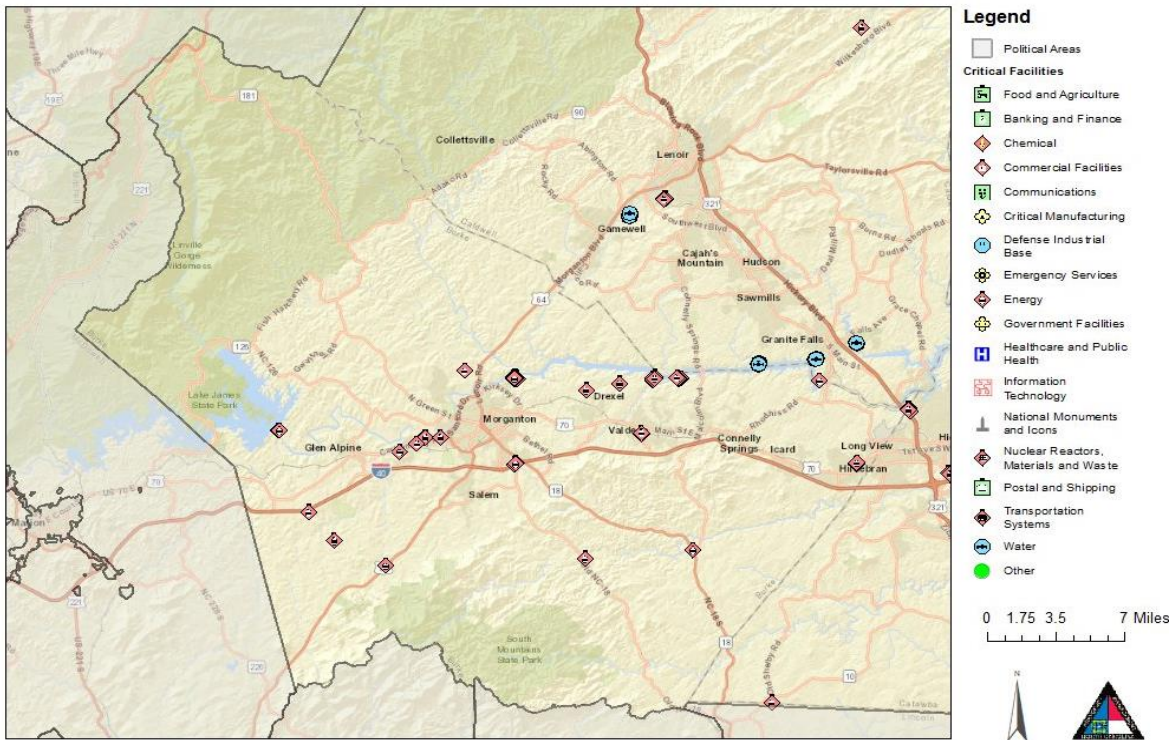


Figure 4-12: Critical Infrastructure in Burke County

4.5.1.1. Natural Hazard

- Riverine Flooding
- Levee Failure
- Wildfire
- Tornado
- Earthquake
- Landslide
- Snow
- Dam Failure
- Hail
- Drought
- Hurricane Winds
- Ice
- Thunderstorm Winds
- Erosion
- Sinkholes

4.5.2. Riverine Flooding

Flooding is the most frequent and costly of all the natural hazards in the United States and has caused 8,616 fatalities since 1940 and 103 deaths in the last 10 years¹⁴. Approximately 75 percent of presidentially declared disasters result from flood-related natural hazard events¹⁵. Taken as a whole, more frequent, localized flooding problems that do not meet federal disaster declaration thresholds ultimately cause most damages across the United States.

Floods are generally the result of excessive precipitation, and can be characterized as follows: general floods, in which precipitation occurs over a given river basin for a long period of time; and flash floods, which are the product of heavy localized precipitation falling in a short time over a given location. The severity of a flood event is determined by the following factors: a combination of stream and river basin topography and physiography, hydrology, precipitation and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing in and around flood-prone areas.

General floods may last for several days or even weeks. 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 a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, nor'easters, and other large coastal storms. Urban flooding occurs where man-made 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 localized area or by heavy rains associated with hurricanes and tropical storms. Flash flooding can also occur due to accelerated snow melt, a dam or levee failure, or from a sudden release of water held by an ice jam. Although flash flooding occurs often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces. Flash flood waters can move at very high speeds and "walls" of water have been known to reach heights of 10 to 20 feet. Flash flood waters and the accompanying debris can uproot trees, roll boulders, destroy buildings, and obliterate bridges and roads.

The periodic flooding of lands including and adjacent to rivers, streams, and shorelines, referred to as the 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. As the magnitude of a hypothetical flood scenario increases the recurrence interval increases. That is, the greater the magnitude of a given event, the less likely it will occur over time.

¹⁴ NOAA's National Weather Service. (n.d.). 80-Year List of Severe Weather Fatalities. https://www.weather.gov/hazstat/https://www.weather.gov/media/hazstat/80years_2023.pdf

¹⁵ NOAA's National Weather Service. (n.d.-b). Flood related hazards. <https://www.weather.gov/safety/flood-hazards>

4.5.2.1. Riverine Flooding Hazard Analysis

There are numerous rivers and streams flowing through the planning area. When heavy or prolonged rainfall events occur, these rivers and streams are susceptible to some degree of flooding. There have been several past flooding events throughout the planning area, ranging widely in terms of location, magnitude, and impact. The most frequent flooding events have been localized in nature, resulting from heavy rains in a short period of time over urbanized areas that are not able to adequately handle stormwater runoff. These events typically do not threaten lives or property and do not result in emergency or disaster declarations, therefore historical data is limited to the larger, most notable events.

Floodplains are delineated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by a 10-year flood (should it occur) 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 (expressed as a percent) each year of a flood event of a given magnitude. For example, the 100-year flood has a 1 percent chance of occurring in any given year.

For more information about flood hazards and historical flooding sources, please view Appendix C.

4.5.2.2. Methodologies and Assumptions

The following list provides key points by hazard type that are relevant to understanding the risk assessment presented in this section:

- Pre-FIRM buildings have been selected as a subset of at-risk buildings following the assumption that structures built prior to the community joining the National Flood Insurance Program (NFIP) are likely to be at greater risk than post-FIRM buildings.
- Effective FEMA DFIRM data was used for the flood hazard areas. Flood zones used in the analysis consist of Zone AE (1-percent-annual-chance flood), Zone AE Floodway, and the 0.2-percent-annual-chance flood hazard area.
- Building footprints were received from all four participating counties. To refine the results, footprints with an area less than 500 square feet were excluded from the analysis. To determine if a building is in a hazard area, the building footprints were intersected with each of the mapped hazard areas. If a building intersects two or more hazard areas (such as the 1-percent-annual-chance flood zone and the 0.2-percent-annual-chance flood zone), it is counted as being in the hazard area of highest risk.
- Parcels were received from all four participating counties. The parcel data provided building value and year built. Building value was used to determine the value of buildings at risk. Year built was used to determine if the building was constructed prior to or after the community had joined the NFIP and had an effective FIRM and building codes enforced.
- Census blocks and Summary File 1 from the 2020 Census were used to determine population at risk. This included the total population, as well as the vulnerable elderly and

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

- Limitations: There can be multiple buildings located on one parcel. However, the parcel only provides one value for building value and year built, and it is not known from the provided data if the building value is cumulative or for the primary structure on the parcel. For the analysis, building value was only counted once per parcel, regardless of the number of structures. This was done to prevent grossly over-estimating the value of buildings at risk. For example, a parcel has three buildings with a value of \$300,000. If two of those buildings intersect the 1-percent-annual-chance flood hazard area, the assumed building value at risk is \$300,000 not \$600,000. Even though only two out of three buildings are at risk, there is no way to determine the individual value of each building, so the building value for the whole parcel is counted.

4.5.2.3. Location within the Planning Area

The figures below show the boundaries of the floodway, 1-percent-annual-chance, and 0.2-percent-annual-chance floods, based on effective DFIRM data. These are the three mapped flood hazard areas used as the basis for this analysis.

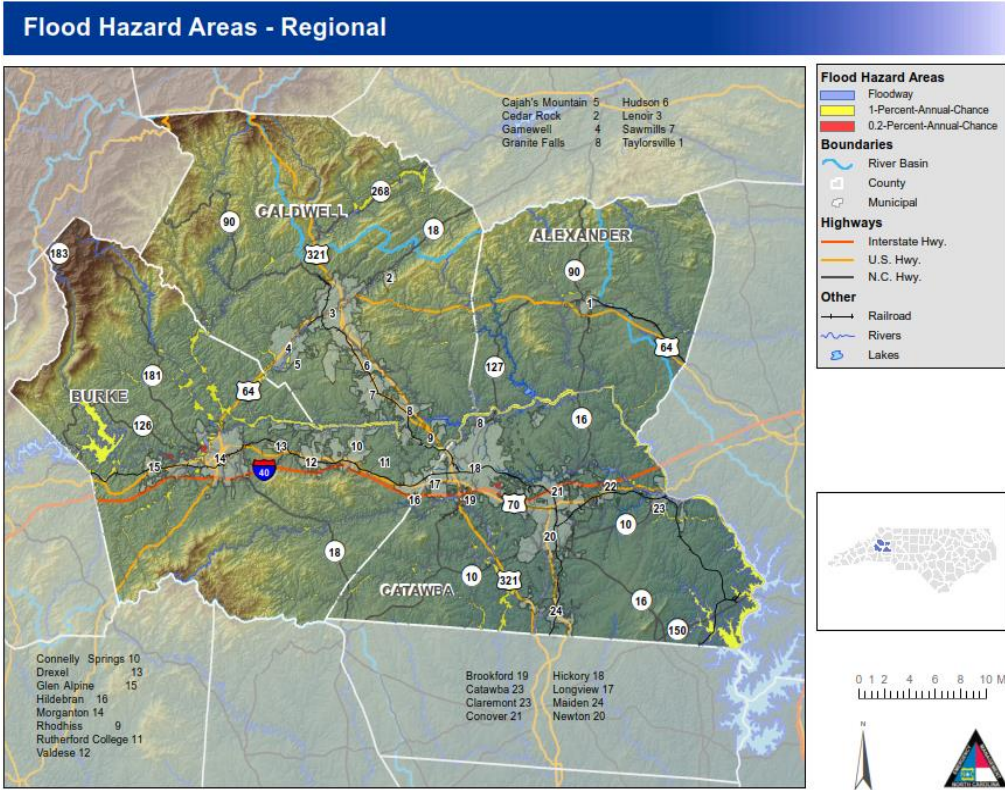


Figure 4-13: River Flooding Hazard Areas

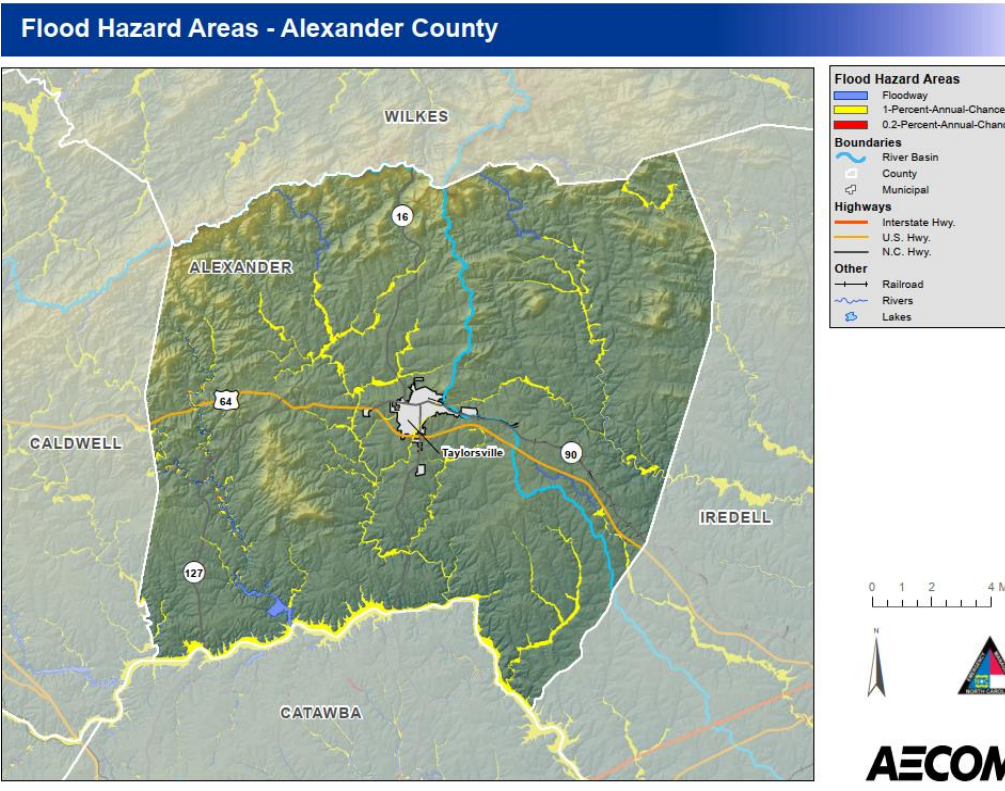


Figure 4-14: River Flooding Hazard Area for Alexander County

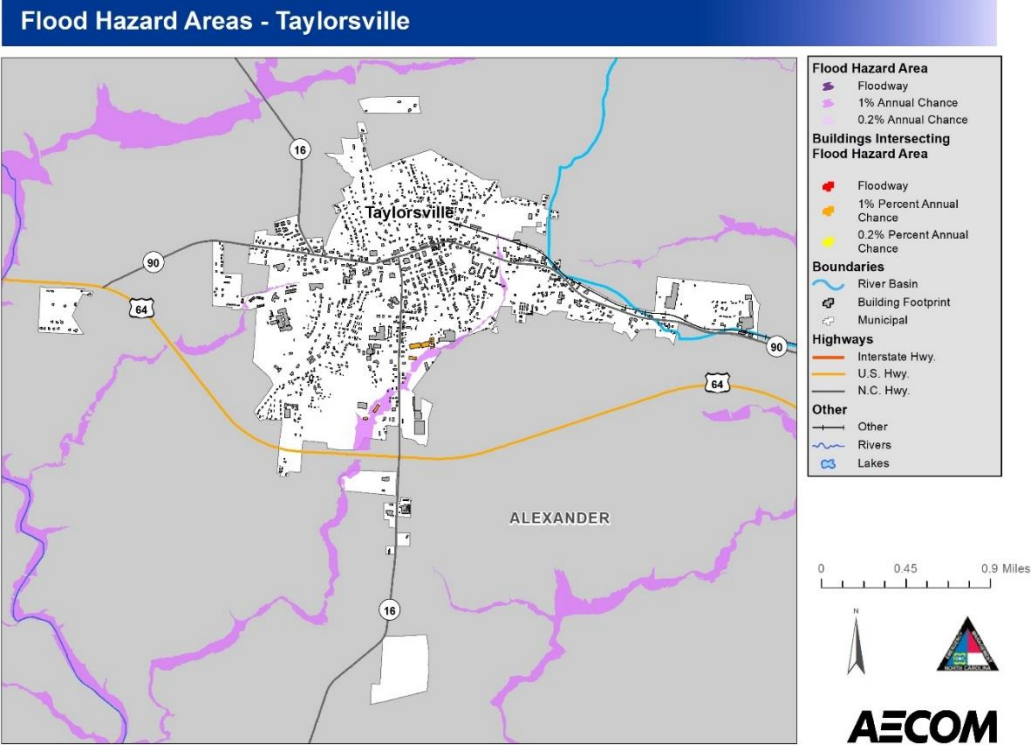


Figure 4-15: Riverine Flood Hazard Areas in Taylorsville

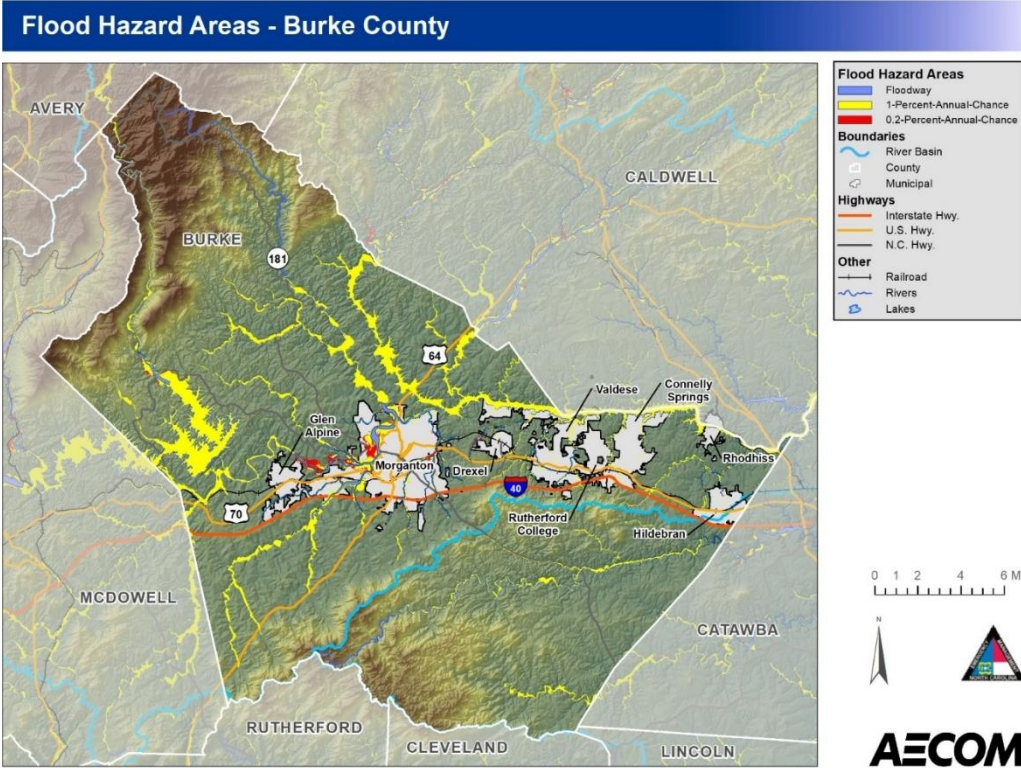


Figure 4-16: River Flooding Areas for Burke County

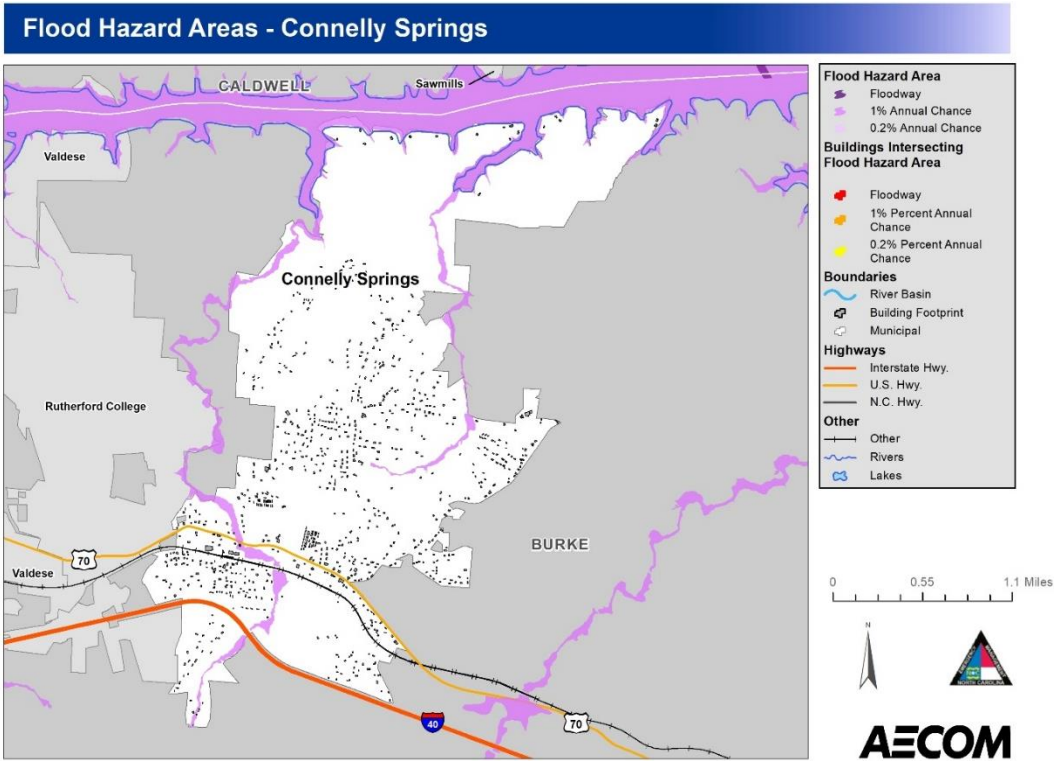


Figure 4-17: River Flooding Areas for Connelly Springs

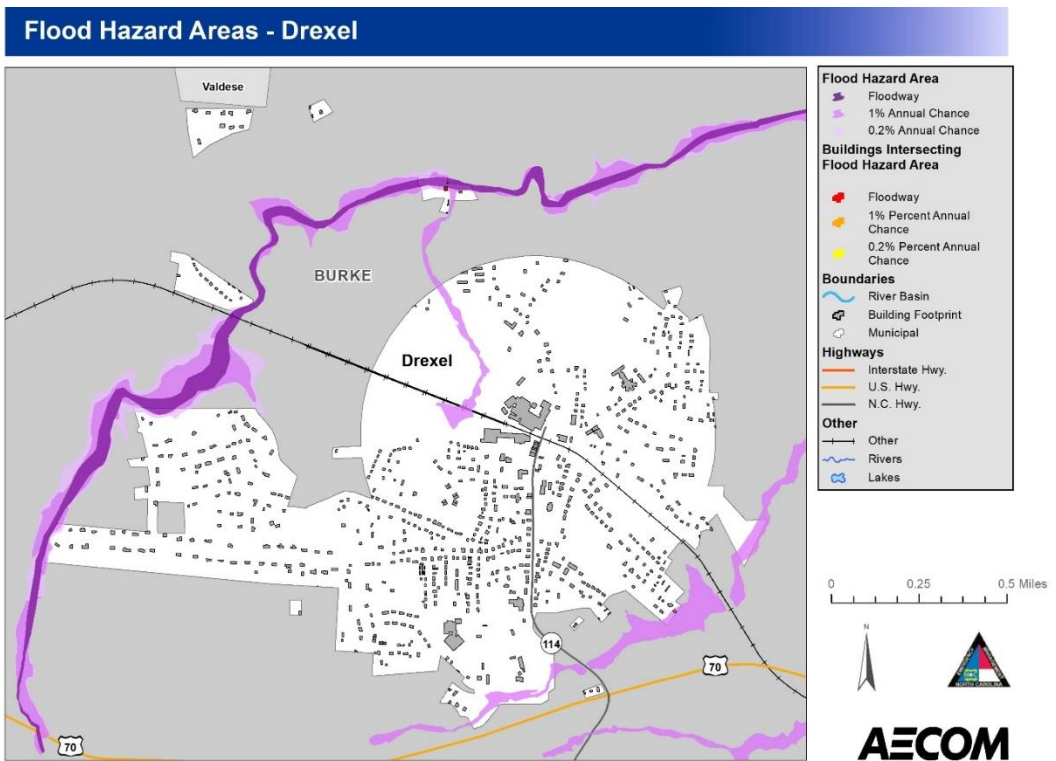


Figure 4-18: River Flooding Areas for Drexel

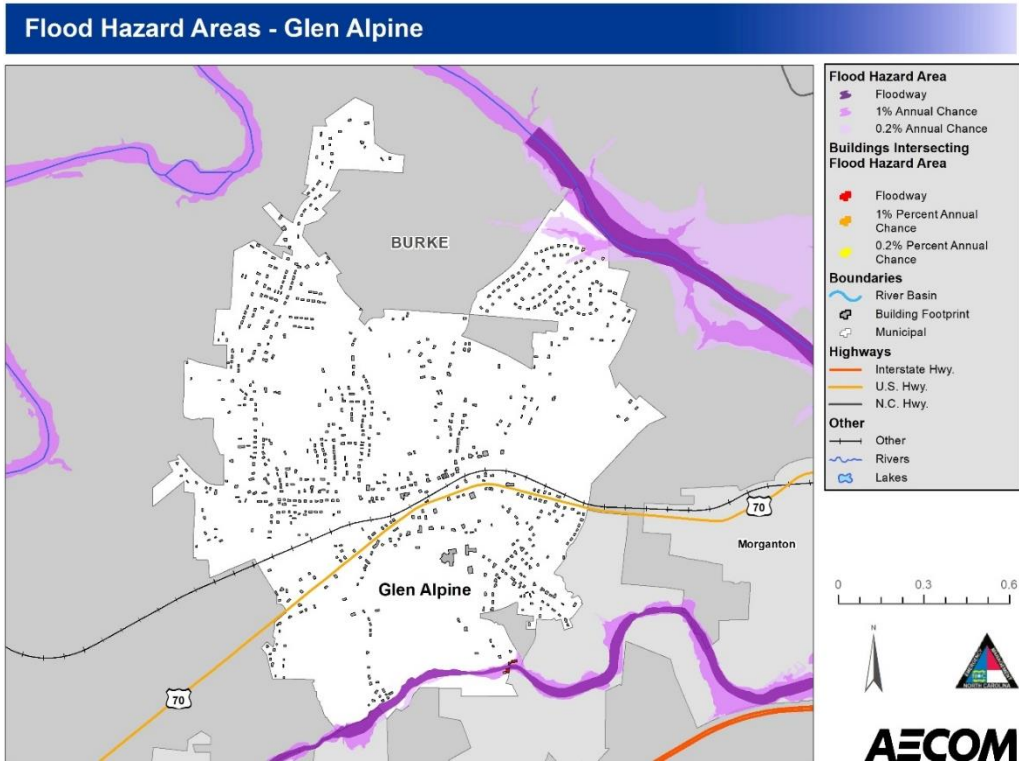


Figure 4-19: Riverine Flood Hazard Areas for Glen Alpine

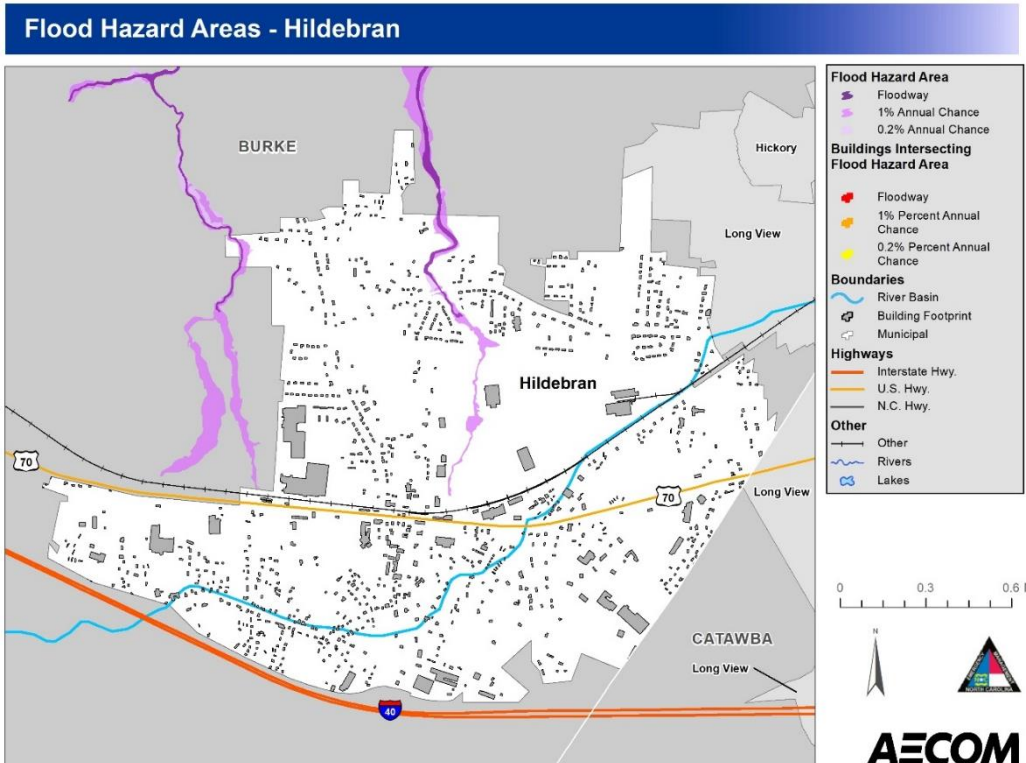


Figure 4-20: Riverine Flood Hazard Areas for Hildebran

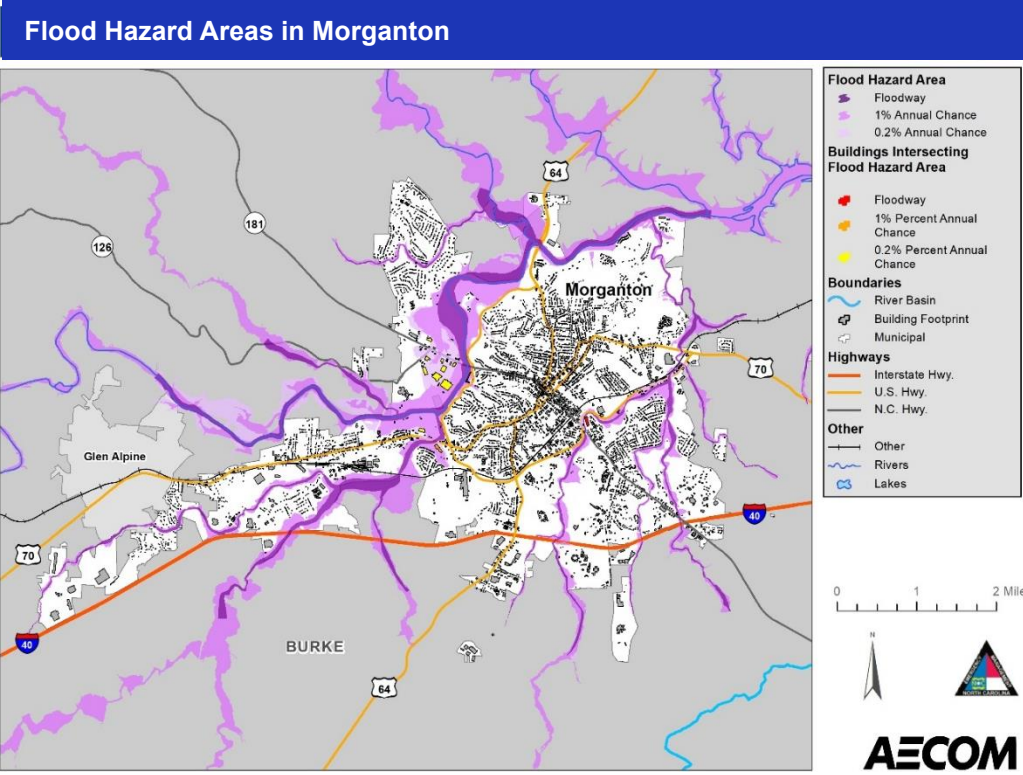


Figure 4-21: Riverine Flood Hazard Areas for Morganton

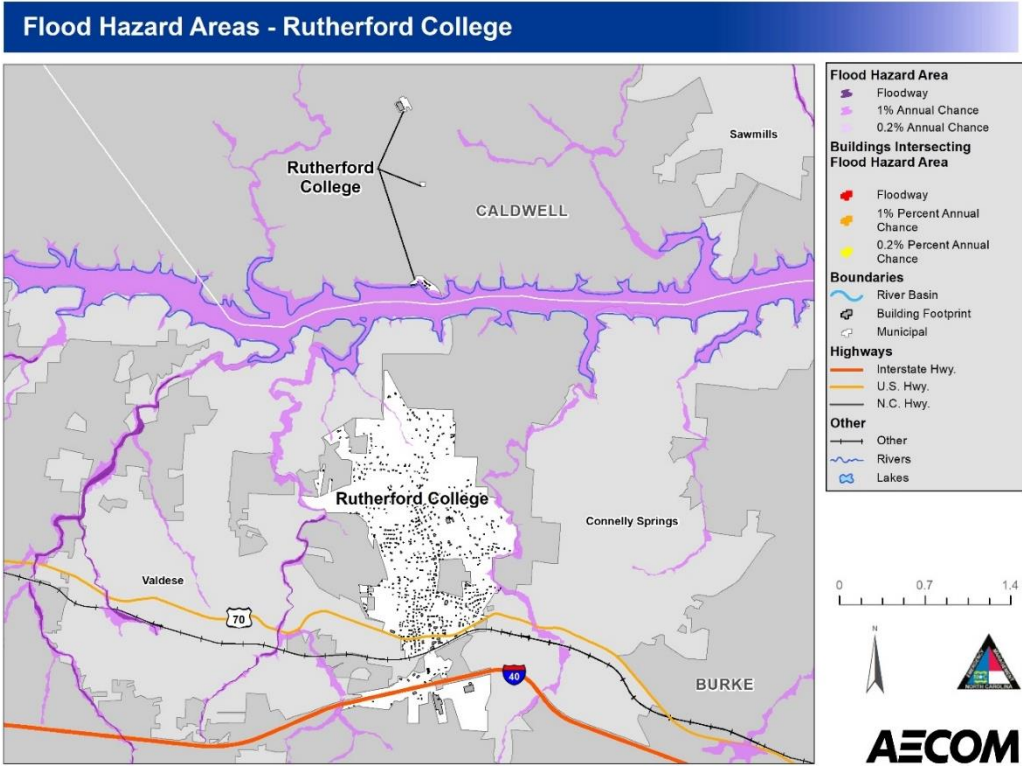


Figure 4-22: Riverine Flood Hazard Areas for Rutherford College.

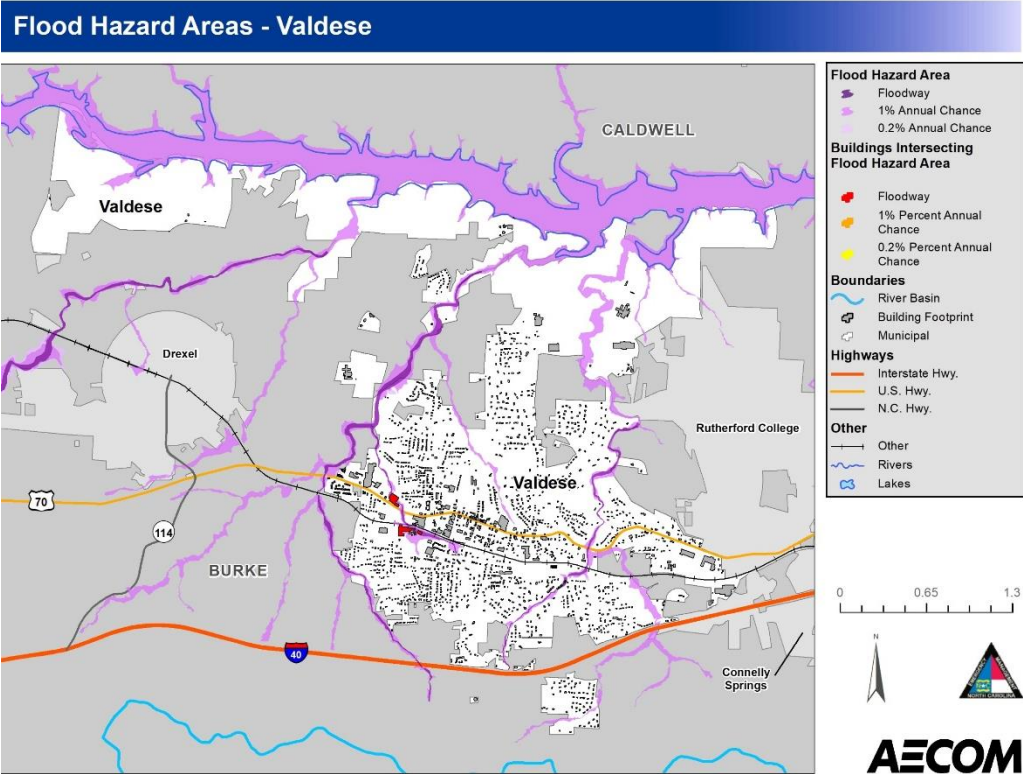


Figure 4-23: Riverine Flood Hazard Areas in Valdese

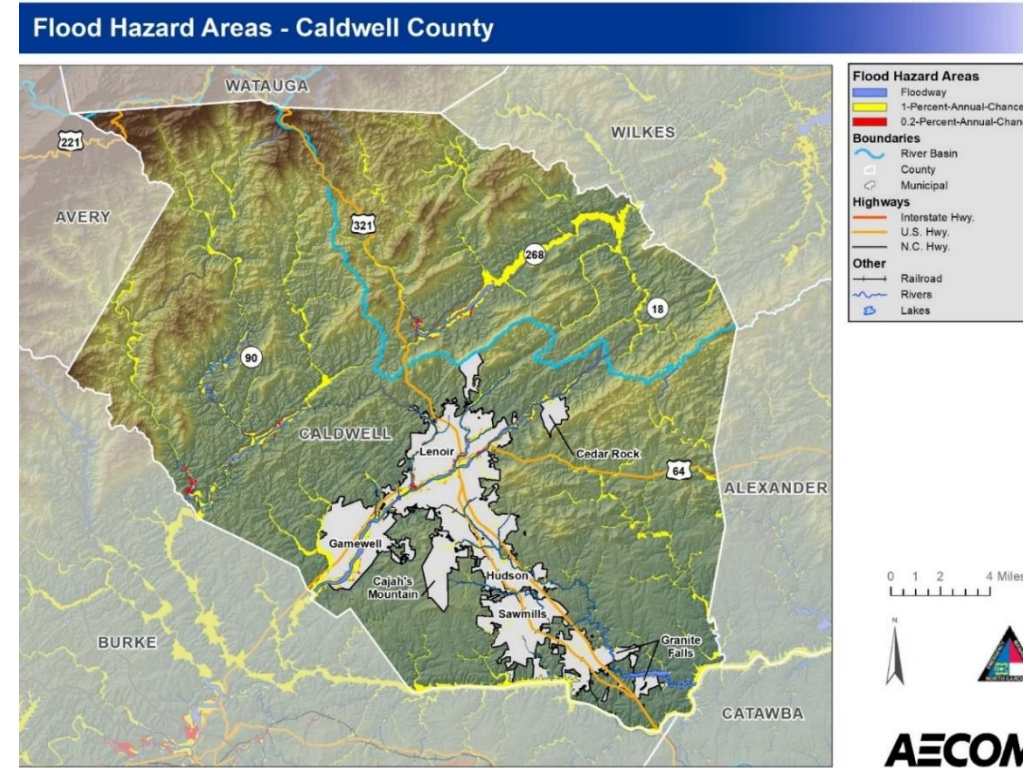


Figure 4-24: River Flooding Hazard Areas for Caldwell County

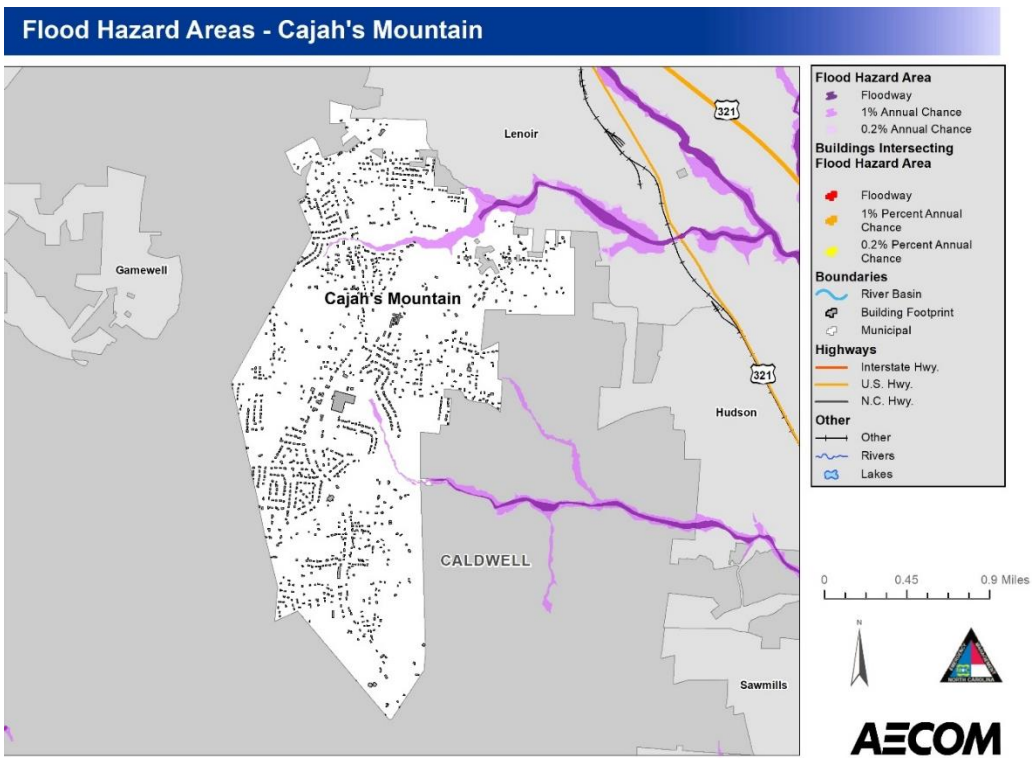


Figure 4-25: Riverine Flood Hazard Areas in Cajah's Mountain

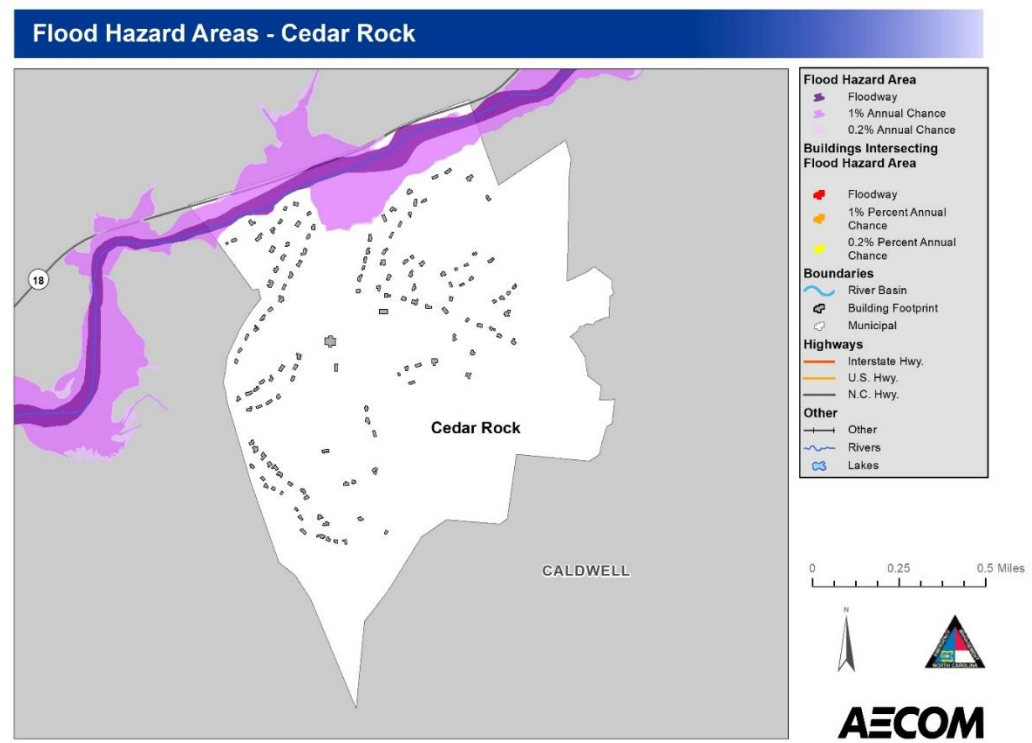


Figure 4-26: Riverine Flood Hazard Areas in Cedar Rock

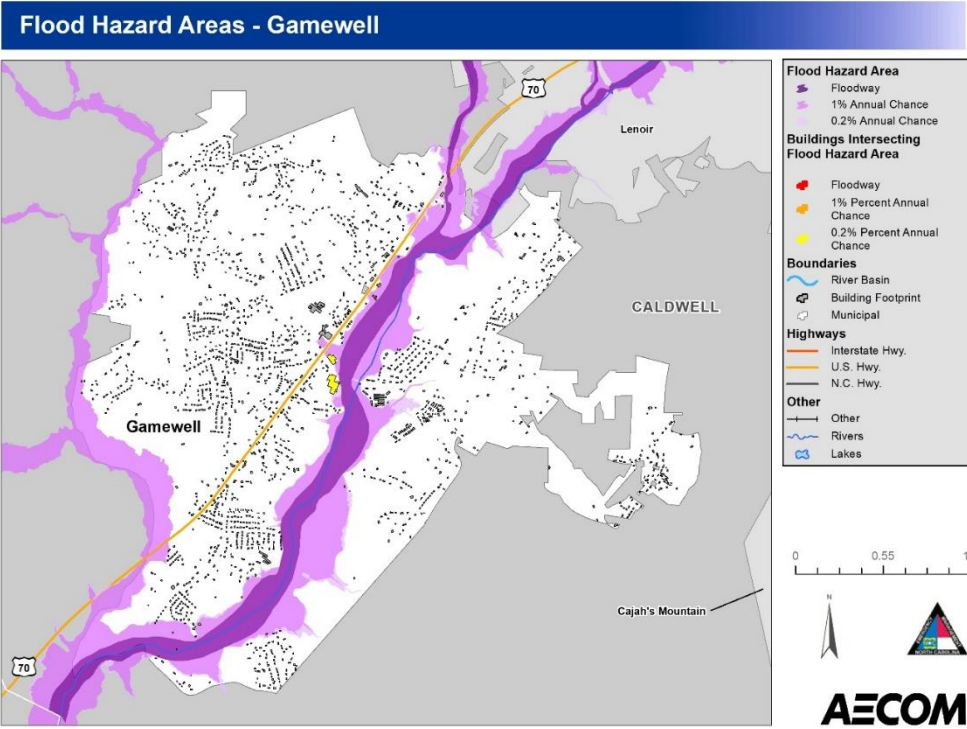


Figure 4-27: Riverine Flood Hazard Areas in Gamewell

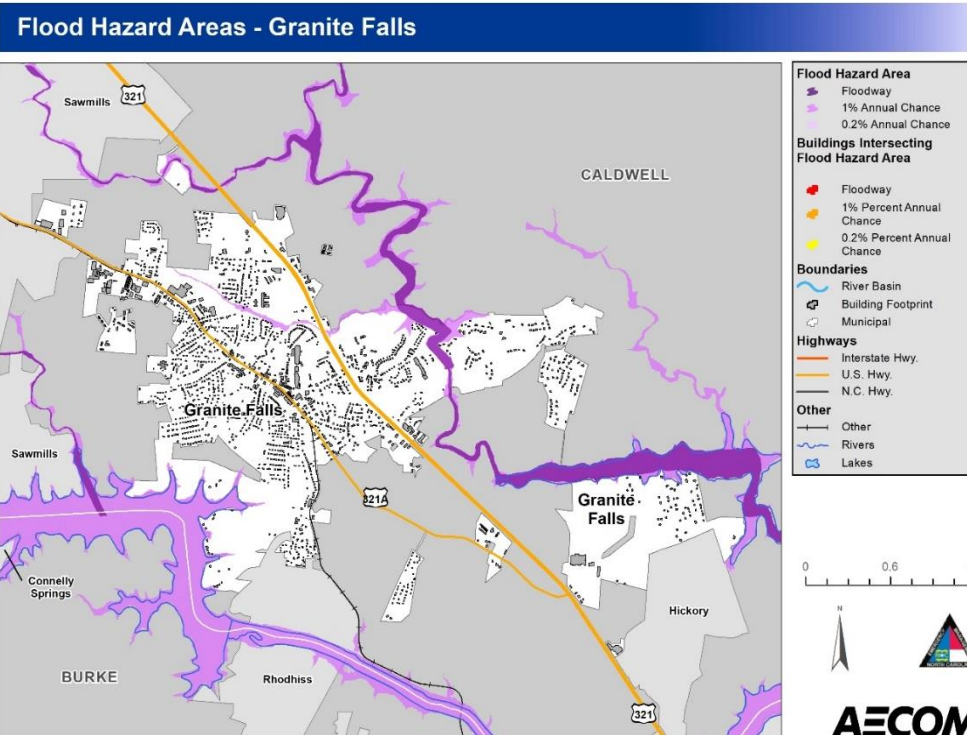


Figure 4-28: Riverine Flood Hazard Areas in Granite Falls

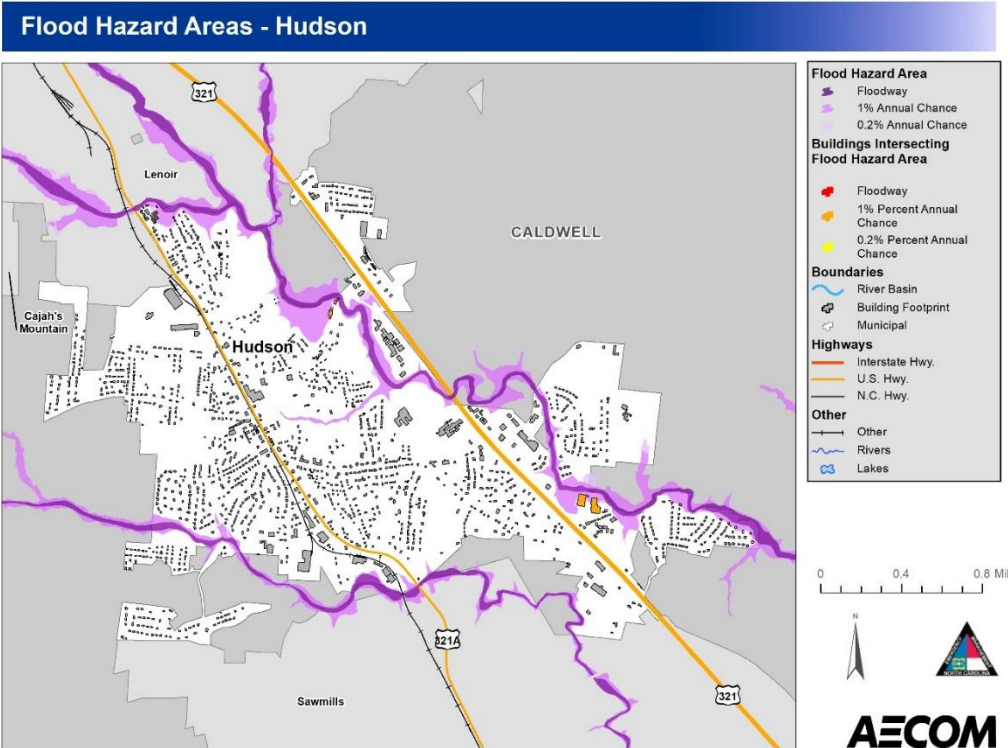


Figure 4-29: Riverine Flood Hazard Areas in Hudson

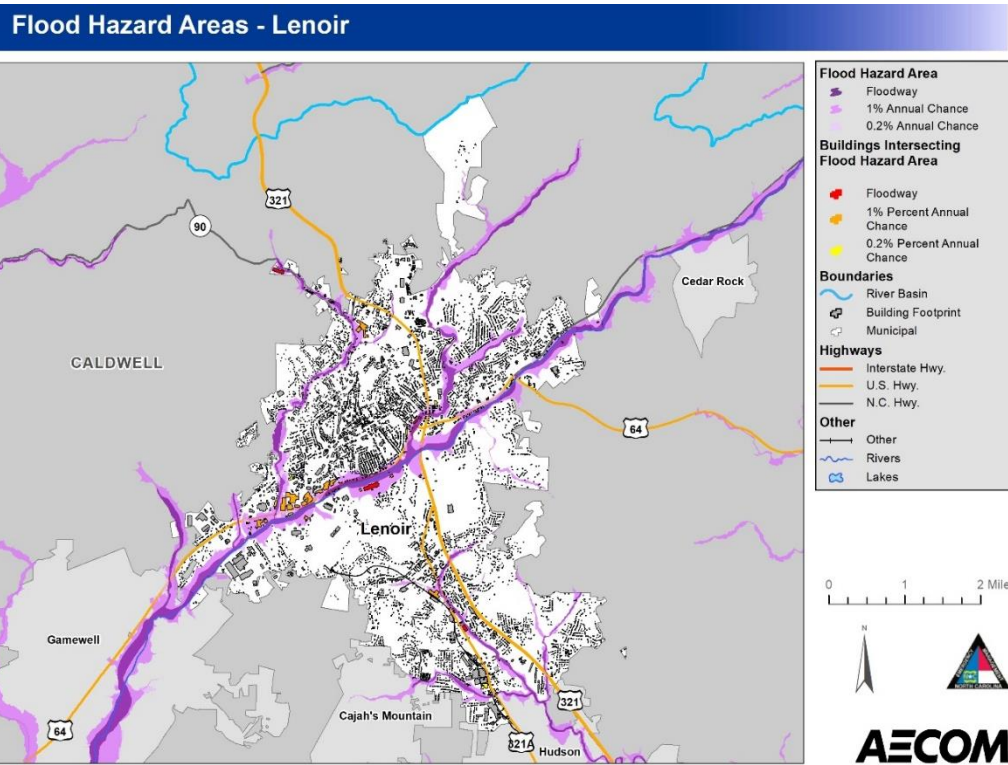


Figure 4-30: Riverine Flood Hazard Areas in Lenoir

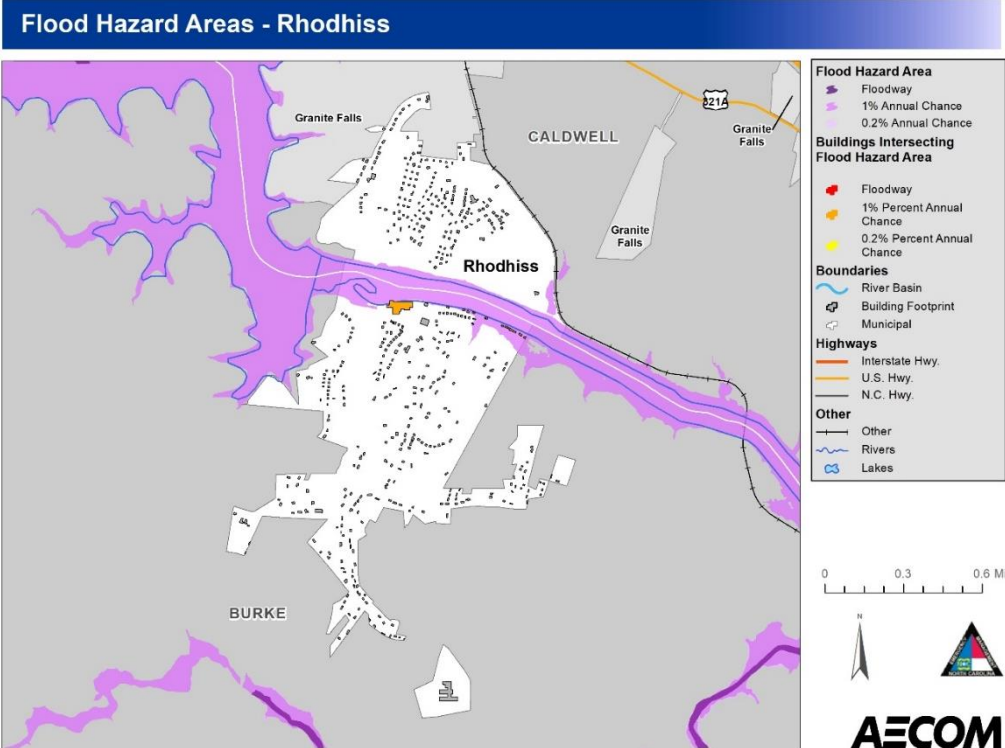


Figure 4-31: Riverine Flood Hazard Areas in Rhodhiss

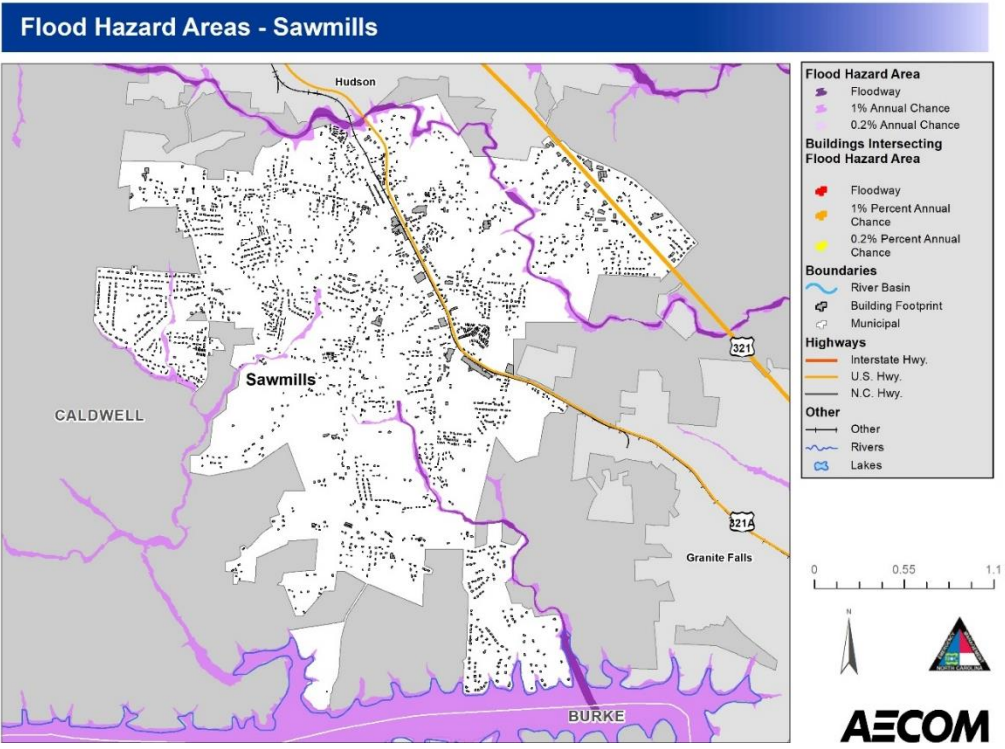


Figure 4-32: Riverine Flood Hazard Areas in Sawmills

Flood Hazard Areas - Catawba County

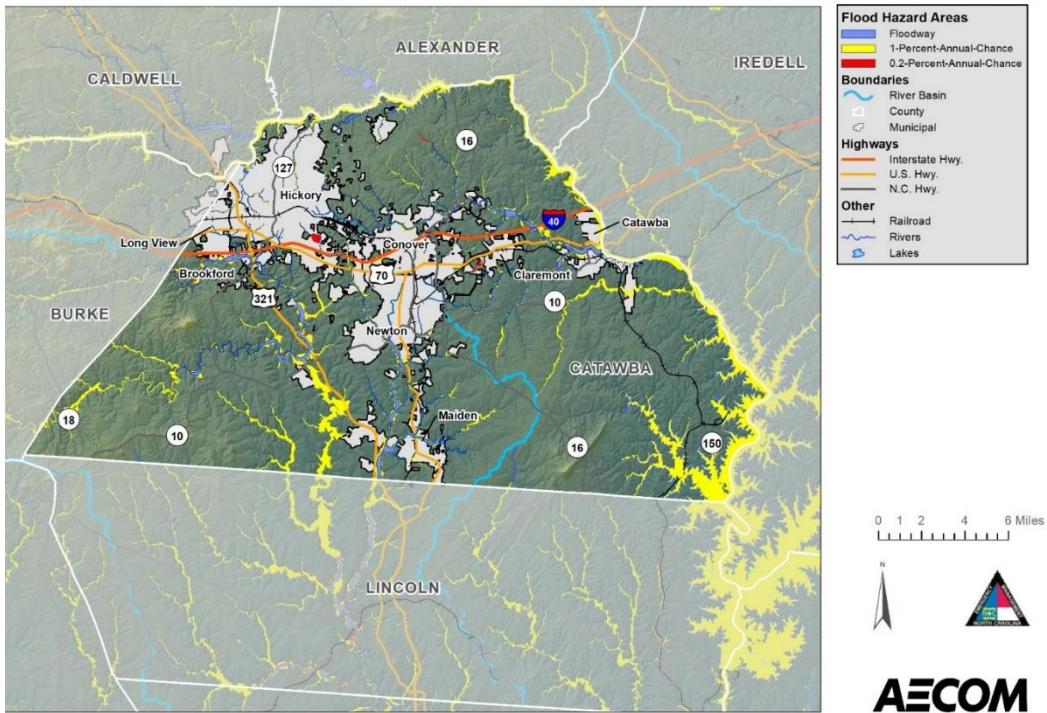


Figure 4-33: River Flooding Areas for Catawba County

Flood Hazard Areas - Brookford



Figure 4-34: Riverine Flood Hazard Areas in Brookford

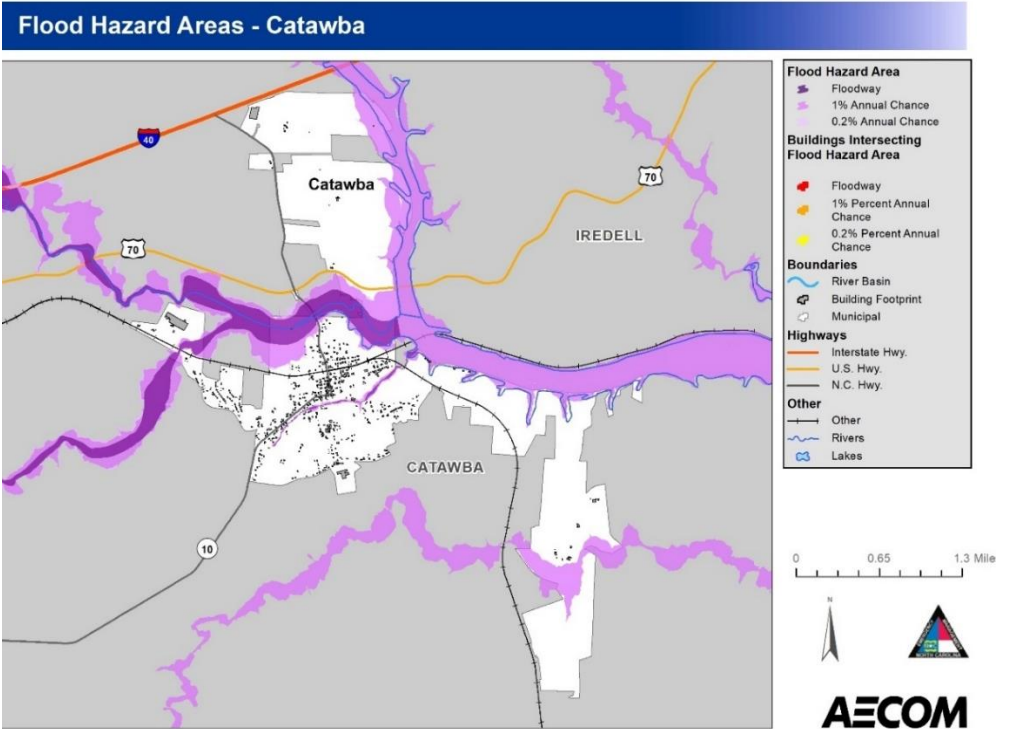


Figure 4-35: Riverine Flood Hazard Areas in Catawba

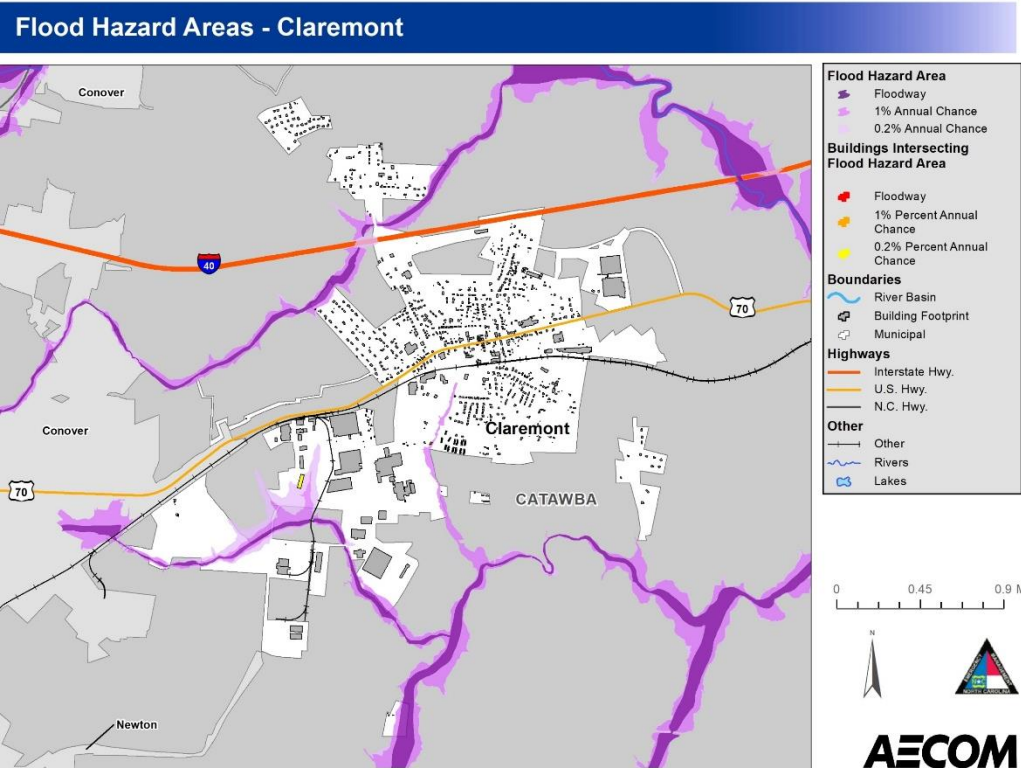


Figure 4-36: Riverine Flood Hazard Areas in Claremont

Flood Hazard Areas - Conover

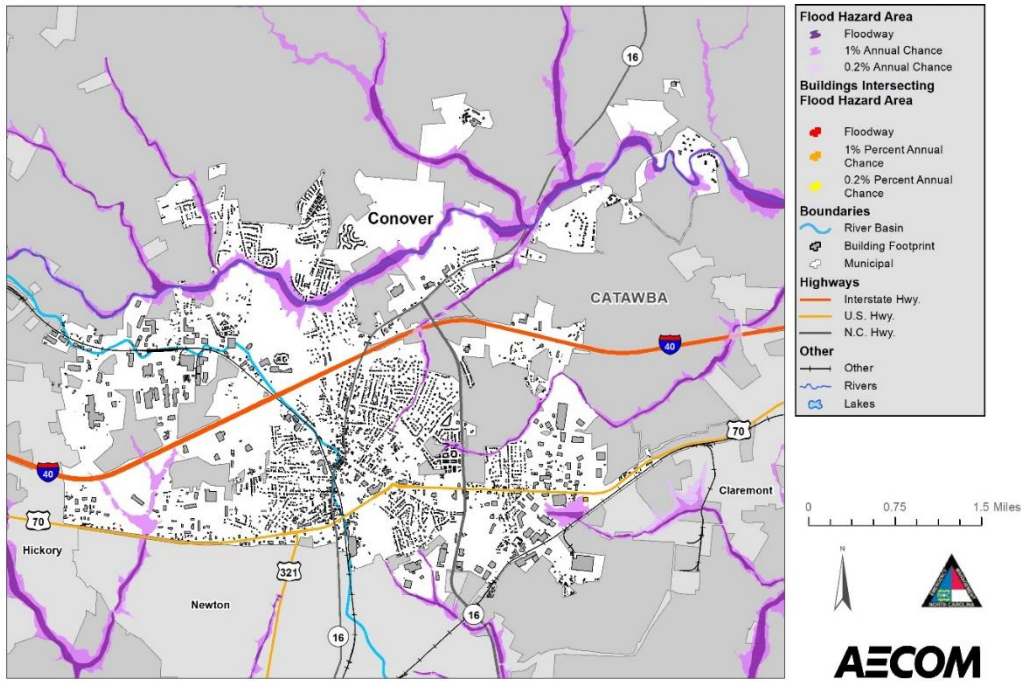


Figure 4-37: Riverine Flood Hazard Areas in Conover

Flood Hazard Areas - Long View

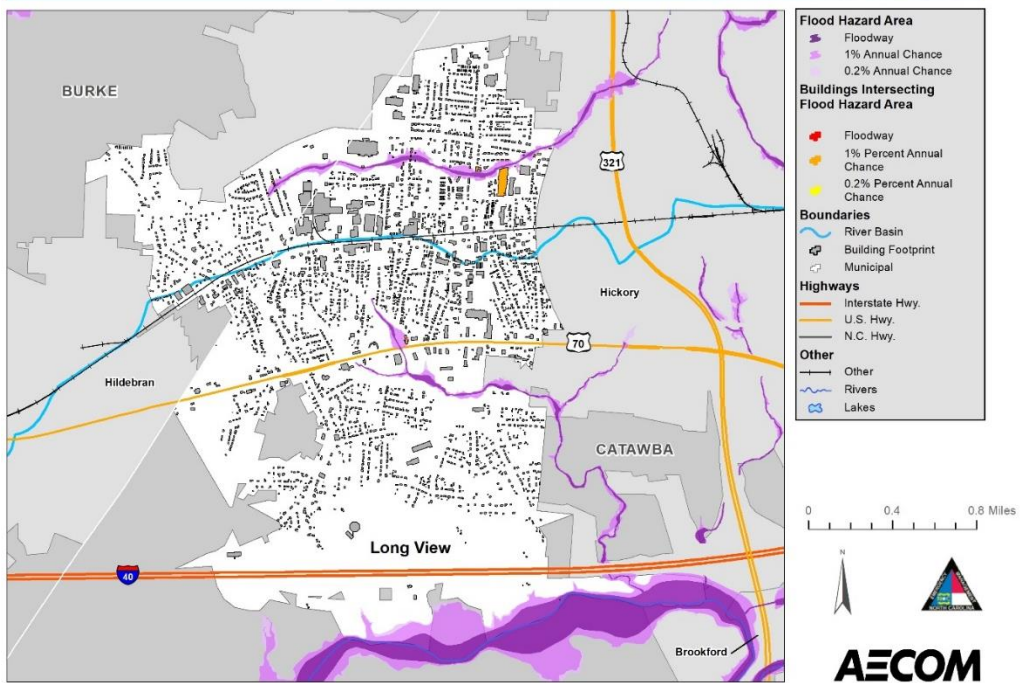


Figure 4-38: Riverine Flood Hazard Areas in Long View

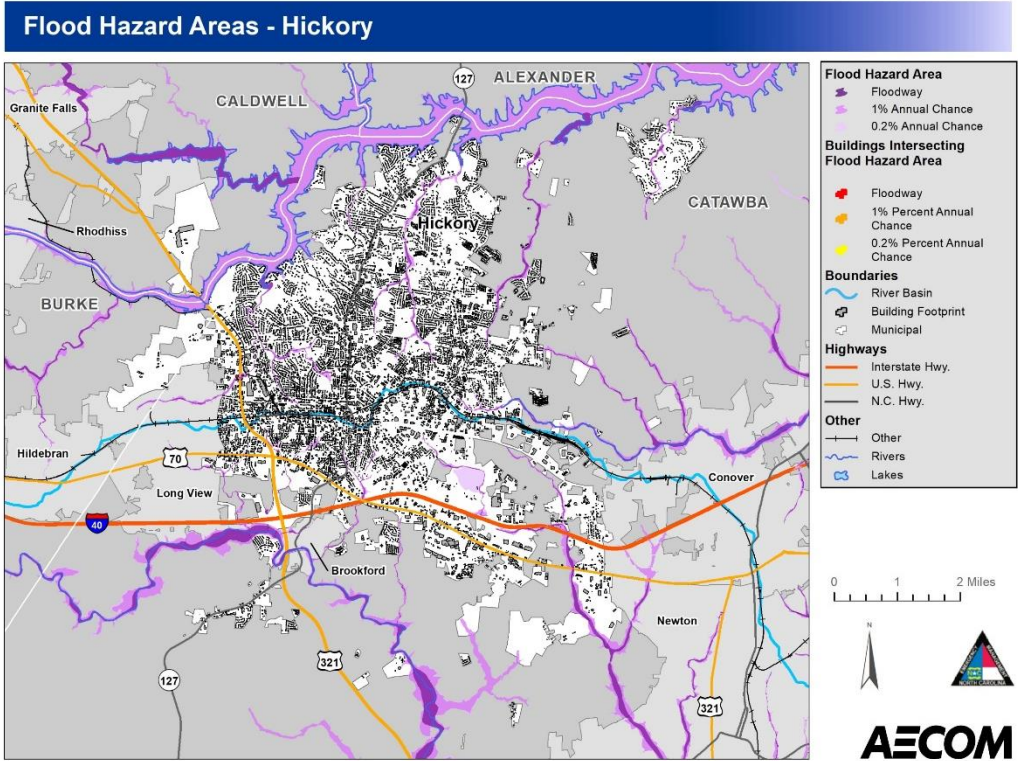


Figure 4-39: Riverine Flood Hazard Areas in Hickory

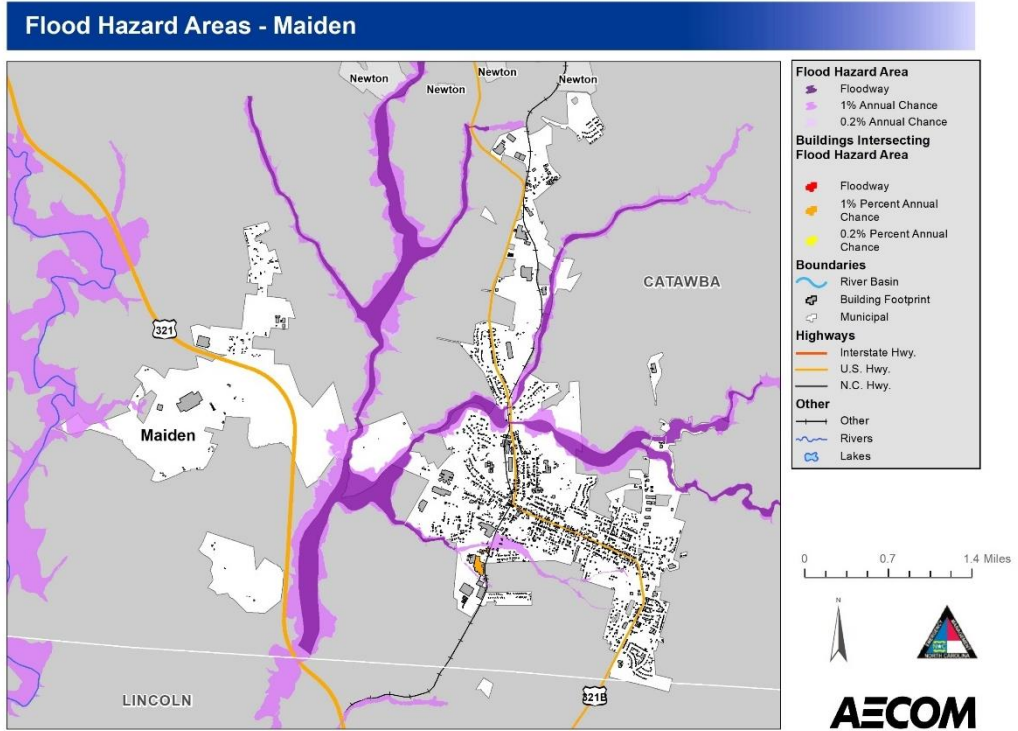


Figure 4-40: Riverine Flood Hazard Areas in Maiden

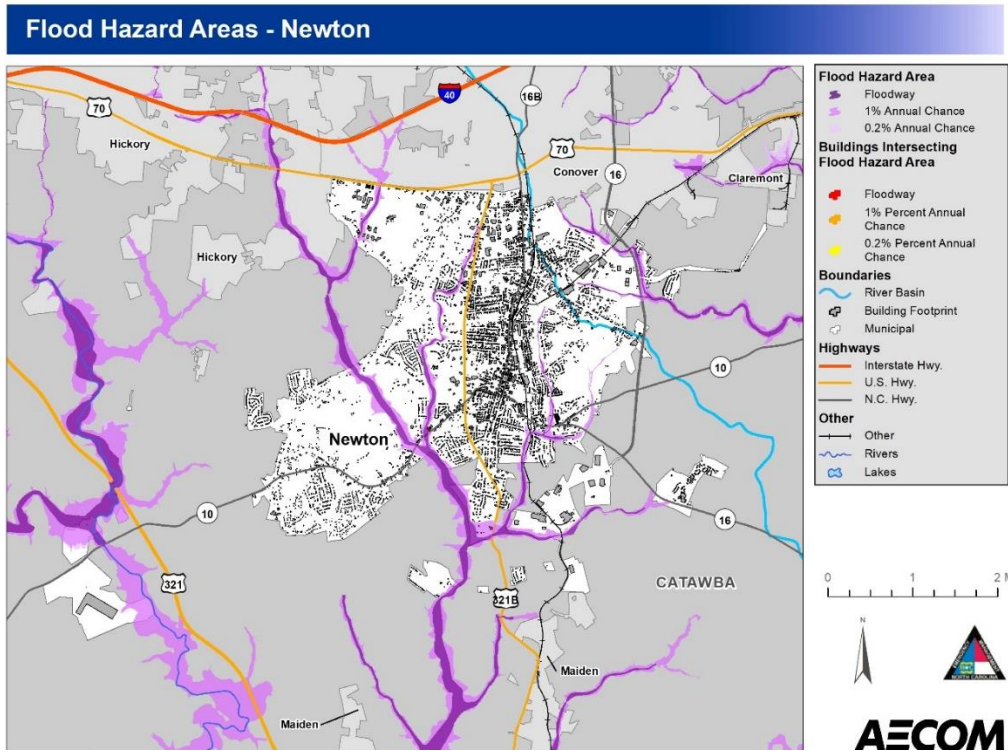


Figure 4-41: Riverine Flood Hazard Areas in Newton

4.5.2.4. Extent (Magnitude and Severity)

Definition:

Flood Extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. Flood depth and velocity are recorded via the USGS stream gages throughout the region.

Extent Event:

Table 4-13 provides peak river stage data according to USGS and Flood Inundation Mapping and Alert Network (FIMAN) which shows the highest recorded peak river stage for all jurisdictions as of December 2023.

Table 4-13: FIMAN and USGS Peak River Stage Data Flood Extent¹⁶

Jurisdiction	USGS Flood Extent	FIMAN
Alexander County	995.91 ft (19.91 ft NGVD29 Datum +976 ft, 10/16/1964, USGS)	1,088.6 ft (15.7 ft NAVD88 Datum +1,072.9 ft, 08/09/1970, USGS)

¹⁶ Statements in Table 4.12 marked by an “**” for municipalities where BFE data was used since no USGS data was available.

Jurisdiction	USGS Flood Extent	FIMAN
Town of Taylorsville	18.63 ft NGVD29 (no datum conversion listed, 8/10/1970, USGS)	No gages or no historical data available on FIMAN within jurisdictional boundary
Burke County	1028.7 ft (26.3 ft NGVD29 Datum +1002.4 ft, 9/9/2004, USGS)	1122.3 ft (19.7 ft NAVD88 + 1102.6 ft, 10/16/1975, USGS)
City of Morganton	No USGS Data, Highest BFE 1331.1 ft*	1059.4 ft (9.4 ft NAVD88 + 1050 ft, 9/12/2014, NCEM)
Town of Connelly Springs	No USGS Data, Highest BFE 1213 ft*	No gages or no historical data available on FIMAN
Town of Drexel	No USGS Data, Highest BFE 1037.9 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Glen Alpine	No USGS Data, Highest BFE 1103.4 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Hildebran	No USGS Data, Highest BFE 947 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Rutherford College	1028.7 ft (26.3 ft NGVD29 Datum +1002.4 ft, 9/9/2004, USGS)	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Valdese	No USGS Data, Highest BFE 1128.2 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Caldwell County	No USGS Data, Highest BFE 1277.9 ft*	1223.8 ft (12.8 ft NAVD88 + 1211 ft, 8/6/1973, USGS)
City of Lenoir	1,104.4 ft (22 ft NGVD29 Datum +1082.4 ft 8/13/1940, USGS)	1074.1 ft (11.4 ft NAVD88 + 1062.7 ft, 12/17/2018, NCEM)
Town of Cahah's Mountain	No USGS Data, Highest BFE 1259.5 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Gamewell	No USGS Data, Highest BFE 1160.6 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Granite Falls	No USGS Data, Highest BFE 1051.7 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Hudson	No USGS Data, Highest BFE 1161.4 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Rhodhiss	No USGS Data, Highest BFE 1181.7 ft*	Gage present, no historical data available on FIMAN
Town of Sawmills	24.14 ft NGVD29 (no datum conversion listed, 8/7/1973, USGS)	No gages or no historical data available on FIMAN within jurisdictional boundary.
Village of Cedar Rock	No USGS Data, Highest BFE 1140.7 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Catawba County	1,101.18 ft (23.18 ft NGVD29 Datum +1078 ft 8/10/1970, USGS)	919.31 ft (29.2 ft NGVD29 Datum + 890.11 ft 8/13/1940, USGS)

Jurisdiction	USGS Flood Extent	FIMAN
City of Claremont	919.31 ft (29.2 ft NGVD29 Datum + 890.11 ft 8/13/1940, USGS)	No gages or no historical data available on FIMAN within jurisdictional boundary.
City of Conover	No USGS Data, Highest BFE 921.3 ft*	Gage present, no historical data available on FIMAN
City of Hickory	790.59 ft (44.1 ft NGVD29 Datum +746.49 ft, 7/16/1916, USGS)	Gage present, no historical data available on FIMAN
City of Newton	No USGS Data, Highest BFE 936.1 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Brookford	No USGS Data, Highest BFE 1002.5 ft*	Gage present, no historical data available on FIMAN
Town of Catawba	No USGS Data, Highest BFE 1115.8 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Long View	No USGS Data, Highest BFE 1119.4 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.
Town of Maiden	No USGS Data, Highest BFE 857.5 ft*	No gages or no historical data available on FIMAN within jurisdictional boundary.

BFE = Base Flood Elevation

FIMAN = Flood Inundation Mapping and Alert Network

ft = feet

NAVD88 = North American Vertical Datum of 1988

NCEM = NC Emergency Management

NGVD29 = National Geodetic Vertical Datum of 1929

USGS = U.S. Geological Survey

It is worth noting that this is based on available records from existing river gages and may not represent the worst flooding in the Region's history. Similarly, a database of high-water marks is not available for all areas of the Region for comparison, validation, or further reliable research on the magnitude of historical occurrences.

4.5.2.5. *Historical Occurrences*

The following historical occurrences ranging from 2018 – 2023 have been summarized based on the National Climatic Data Center (NCDC) Storm Events database, and full event summaries appear in Appendix A in table along with a separate table of flooding events from 2018-2024 from the NCDC Storm Events Database¹⁷. It should be noted that only those historical occurrences listed in the NCDC database are shown here and that other, unrecorded or unreported events may have occurred within the planning area during this timeframe.

¹⁷ National Oceanic and Atmospheric Administration [NOAA]. (n.d.). Storm Events Database (By National Center for Environmental Information [NCEI]). National Center for Environmental Information. <https://www.ncdc.noaa.gov/stormevents/>

Table 4-14: Comparison of flooding and flash flooding property damage, reported injuries, and reported deaths from 2018-2023 to average total losses and total losses from 2012-2017 according to the NCDL Storm Events Database¹⁸. *Average Losses for the last 5 years

County	Jurisdiction	2018 - 2023		2012 - 2017		2018 - 2023			
		Total Losses	Average losses Per year +	Total Losses	Average Losses Per Year	Total Injuries	Total Deaths		
Alexander	Bethlehem	\$11,000	\$2,200	\$0		0	0		
	Taylorsville	\$2,000	\$400			0	0		
	Vashti	\$450,000	\$90,000			0	6		
	All Healing Springs	\$10,000	\$2,000			1	1		
	Taylorsville Airport	\$1,000	\$200			0	0		
	Total	\$474,000	\$94,800			\$0	1	7	
	% Change of Total Losses (2018 – 2023 vs 2012 -2017)					N/A			
Burke	Joy	\$56,000	\$11,200	\$30,000	\$6,000	0	0		
	Glen Alpine	\$1,000	\$200	\$60,000	\$12,000				
	Table Rock	\$3,000	\$600	\$0	\$0				
	Pleasant Grove	\$1,000	\$200	\$0	\$0				
	Calvin	\$50,000	\$10,000	\$0	\$0				
	Brindletown	\$25,000	\$5,000	\$0	\$0				
	Chesterfield	\$10,000	\$2,000	\$2,000	\$400				
	Enola	\$10,000	\$2,000	\$0	\$0				
	Morganton	\$0	\$0	\$110,000	\$22,000				
	Bridgewater	\$0	\$0	\$5,000	\$1,000				
	Oak Hill	\$0	\$0	\$500	\$100				
	Total	\$156,000	\$31,200	\$207,500	\$41,500			0	0
	% Change of Total Losses (2018 – 2023 vs 2012 -2017)				-24.82%				
Caldwell	Edgemont	\$96,000	\$19,200	\$80,000	\$16,000	0	0		
	Yadkin Valley	\$7,000	\$1,400	\$0	\$0				
	Collettsville	\$2,500	\$500	\$51,000	\$10,200				

¹⁸ National Oceanic and Atmospheric Administration [NOAA]. (n.d.). Storm Events Database (By National Center for Environmental Information [NCEI]). National Center for Environmental Information. <https://www.ncdc.noaa.gov/stormevents/>

County	Jurisdiction	2018 - 2023		2012 - 2017		2018 - 2023	
		Total Losses	Average losses Per year +	Total Losses	Average Losses Per Year	Total Injuries	Total Deaths
Catawba	Lenoir	\$12,000	\$2,400	\$0		0	0
	Globe	\$100,000	\$20,000	\$0			
	Whitnel	\$1,000	\$200	\$0			
	Richland	\$50,000	\$10,000	\$5,000	\$1,000		
	Valmead	\$5,000	\$1,000	\$0			
	Warrior	\$0		\$300,000	\$60,000	0	0
	Abingdon			\$0			
	Mortimer			\$300,000	\$60,000		
	Hartland			\$5,000	\$1,000		
	Total	\$273,500	\$54,700	\$741,000	\$148,200	0	0
	% Change of Total Losses (2018 – 2023 vs 2012 -2017)			-63.09%			
Catawba	Brookford	\$5,000	\$1,000	\$0		0	0
	Longview	\$51,000	\$10,200	\$3,000	\$600		
	Catawba	\$810,000	\$162,000	\$0			
	Oyama	\$11,000	\$2,200	\$900,500	\$180,100		
	Conover	\$10,000	\$2,000	\$0			
	Propst Crossroads	\$1,500	\$300	\$0			
	Drums Crossroads	\$500	\$100	\$0			
	Hickory	\$50,000	\$10,000	\$1,801,500	\$360,300		
	Claremont	\$0		\$3,020,000	\$604,000		
	Total	\$939,000	\$187,800	\$5,725,000	\$1,145,000		
	% Change of Total Losses (2018 – 2023 vs 2012 -2017)			-83.60%			
All Counties	Total	\$1,842,500	\$368,500	\$6,673,500	\$1,334,700	1	7
	Percent Change of Property Damages (2018-2023 Total vs 2012-2017 Total)			-72.39%			

Historical Occurrences of Riverine Flooding from 2005-2018 can be found in Appendix A.

Between 2012 and 2023, there have been \$8,516,000 in property damages reported, with most damages reported between 2012 to 2017 totaling \$6,673,500. The total property damages reported from 2018 to 2023 is 72.39% less than the property damages reported between 2012 to 2017, with the largest reduction of damages reported in Catawba county which had an 83.6% decrease in total flooding damages, which could be due to an unusually severe flooding event between 2012 and 2017.

4.5.2.6. Flooding Events from 2018-2024:

According to the NCDC Storm Events Database, there has been \$1,842,500 of damage in the Unifour counties between 2018 and 2024 attributed to flooding and flash flooding, with 7 deaths and 1 injury reported. Appendix A provides a summary of historical flood events from 2018-202 and historical information by participating jurisdiction for the 5 most notable events for each county. It is important to note that many of the events attributed to the county are countywide or cover large portions of the county. The individual counts by jurisdiction are for those events that are only attributed to that one jurisdiction.

The following events are summaries from the NCDC Storm Events Database¹⁹ and are the most destructive events of flash flooding or flooding between 2018 and 2023 for Alexander, Burke, Catawba, and Caldwell County:

4.5.2.6.1. Alexander County (11/12/2020)

Tropical Cyclone Eta moved from the eastern Gulf of Mexico, across the northern Florida peninsula, to off the South Carolina coast throughout the 11th and 12th. Tropical moisture streaming into the Carolinas throughout this time resulted in development of heavy rainfall, with widespread rainfall amounts of 4 to 6 inches, with locally higher amounts across the foothills and Piedmont of North Carolina. This resulted in areas of flash flooding and main stem Riverine flooding, some of which was significant, resulting in multiple fatalities and significant damage.

- Emergency manager reported major flash flooding developed throughout Alexander County after up to 9 inches of rain fell in 24 hours, with around half of that falling in a 3-hour period prior to daybreak on the 12th. The most significant flooding occurred along the South Yadkin River in the Hiddenite area. Multiple recreational vehicles and campers were swept down the river from a campground off Princess Ln. Five people, ages ranging from 1 to 76, drowned and 31 more people required rescue from rapidly rising flood water. Otherwise, most of the creeks and streams in the central and northeast part of the county overflowed onto at least one road, with more than 50 roads closed at some point during the event.
- Although heavy rainfall tapered off across Alexander County throughout the morning, runoff from the earlier excessive rain continued to cause elevated stream levels and localized high-water conditions to persist into the afternoon. A portion of a bridge over the South Yadkin collapsed on Cheatham Ford Rd during this time. Part of another bridge was washed out on

¹⁹ National Oceanic and Atmospheric Administration [NOAA]. (n.d.). Storm Events Database (By National Center for Environmental Information [NCEI]). National Center for Environmental Information. <https://www.ncdc.noaa.gov/stormevents/>

Hopewell Church Rd (over Mill Creek). A 64-year-old man was killed when he drove his vehicle over the collapsed bridge. At least two other bridges were also compromised.

- **Total Property Damage:** \$450,000
- **Total Deaths:** 6
- **Total Injuries:** 1

4.5.2.6.2. Burke County (6/8/2019)

A moist upslope flow developing north of a stationary front resulted in widespread showers and thunderstorms developing across western North Carolina during the evening of the 8th into the overnight and early morning hours of the ninth. Four to seven inches of rain, with locally higher amounts of 10 inches or more falling over the northern foothills resulted in flash flooding in multiple areas. The widespread nature of the excessive rainfall within the Catawba River watershed caused the river to rise to levels not seen in almost 80 years in the western Piedmont, with flooding persisting in some areas through the 10th. Meanwhile, a brief, weak tornado developed across Rutherford County.

- Although heavy rainfall began tapering off across Burke County during the late evening hours high water conditions persisted well into the overnight hours across central and eastern portions of the county. Meanwhile by the early morning hours a stream gauge on the Johns River in the northwest part of the county exceeded its established flood stage indicating flooding of several roads along the stream and some of its tributaries.
- Multiple sources reported flash flooding developed across portions of northern Burke County when as much as 6 inches of rain fell across the area in just a few hours. Flooding began on the Highway 64 corridor when a portion of the highway had to be closed in the Chesterfield community due to flood water. Antioch Rd was also flooded by Lower Creek in this same area. Water from Canoe Creek was also reportedly flowing over Highway 226. Smith Branch overflowed its banks in the Connelly Springs area, flooding some houses on Woodlawn Dr. A nursing home was evacuated in the Rutherford College area after a small unnamed tributary overflowed its banks. A tributary of Henry Fork flooded a portion of Woodland Hill Rd in Hildebrand, which undermined the structural integrity of the road and prompted voluntary evacuations.
- **Total Property Damage:** \$54,000

4.5.2.6.3. Caldwell County (4/13/2020)

A strong storm system impacted the Southeast, resulting in an area of widespread heavy rain and embedded strong to severe thunderstorms that moved across western North Carolina during the late night and early morning hours. Localized flash flooding, some of which was quite significant developed across the mountains. Isolated severe weather also occurred, mainly in the form of damaging wind gusts. Strong southerly gradient winds also caused some damage across mainly the high elevations of western North Carolina.

- Emergency manager reported flash flooding developed along multiple creeks across northwest Caldwell County after 4 to 6 inches of rain fell, mostly in less than 8 hours.

Anthony Creek overflowed its banks in the Globe community, washing out a low water crossing. Wilson Creek washed out several low waters crossing on Brown Mountain Beach Rd. Johns River inundated Old Johns River Rd in several locations. Buffalo Creek and several of its tributaries also inundated low water crossing in the far northern part of the county. A stream gauge on the Yadkin River near Patterson exceeded its established flood stage, indicating flooding of low-lying roads and minor flooding of some structures in the Happy Valley community.

- **Total Property Damage:** \$100,000

4.5.2.6.4. **Catawba County (11/12/2020)**

Tropical Cyclone Eta moved from the eastern Gulf of Mexico, across the northern Florida peninsula, to off the South Carolina coast throughout the 11th and 12th. Tropical moisture streaming into the Carolinas throughout this time resulted in development of heavy rainfall, with widespread rainfall amounts of 4 to 6 inches, with locally higher amounts across the foothills and Piedmont of North Carolina. This resulted in areas of flash flooding and main stem river flooding, some of which was significant, resulting in multiple fatalities and significant damage.

- A stream gauge on the Catawba River at Lookout Shoals Dam indicated major flash flooding developed just upstream of the dam after 5 to 8 inches of rain fell throughout the Catawba basin, with the bulk of that falling in only a 3-hour period between midnight and sunrise on the 12th. Numerous homes were inundated and damaged, with numerous residents evacuated along the western shores of Lookout Shoals Lake. This was the second major flood event along this portion of the Catawba in less than two years (June 2019), and the second highest crest on record at Lookout Shoals (August 1940).
- A stream gauge on Henry Fork exceeded its established flood stage after 3.5 to 5 inches of rain fell over Catawba County, with much of that falling during a three-hour period on the morning of the 12th. Several roads along the stream were inundated and closed.
- **Total Property Damage:** \$511,000

4.5.2.7. **NFIP Participation**

Communities can build their flood management capabilities by participating in the National Flood Insurance Program (NFIP) which supports flood risk reduction before and after disasters. The NFIP helps reduce the socioeconomic impact of flooding and allows property owners and renters in participating communities to purchase federal flood insurance policies to recover financially after flooding. To participate, communities adopt and enforce floodplain management policies to reduce the effects of flooding. Section 5: *Capability Assessment* lists the number of insured losses and total claims payments for historical flood damages in each jurisdiction as recorded under the NFIP.

Table 4-15 below provides the NFIP entry date and Initial Flood Insurance Rate Map (FIRM) date for each participating jurisdiction. As explained in subsection 4.3, the NFIP entry date for each jurisdiction was used to determine buildings that were built pre - FIRM and are therefore assumed to be at greater risk to the flood hazard.

Table 4-15: NFIP Entry Dates from Federal Emergency Management Agency Community Status Book Report: Communities Participating in the National Flood Program, August 2024

Jurisdiction	Initial FIRM Date	Date Joined NFIP
Alexander County (Unincorporated Area)	2/01/91	2/01/91
Town of Taylorsville	12/18/07	11/30/09
Burke County (Unincorporated Area)	6/17/91	6/17/91
City of Morganton	2/19/87	2/19/87
Town of Connelly Springs	6/17/91	2/20/08
Town of Drexel	8/19/86	8/19/86
Town of Glen Alpine	6/17/91	5/20/10
Town of Hildebran	9/05/07	9/05/07
Town of Rutherford College	6/17/91	4/22/11
Town of Valdese	7/03/86	7/03/86
Caldwell County (Unincorporated Area)	8/16/88	8/16/88
City of Lenoir	8/16/88	8/16/88
Town of Cahaj's Mountain	8/16/88	3/06/90
Town of Gamewell	8/16/88	2/15/00
Town of Granite Falls	8/16/88	8/16/88
Town of Hudson	8/16/88	3/06/90
Town of Rhodhiss	7/03/86	7/03/86
Town of Sawmills	8/16/88	3/21/13
Village of Cedar Rock	8/16/88	5/10/10
Catawba County (Unincorporated Area)	9/03/80	9/03/80
City of Claremont	9/05/07	9/05/07
City of Conover	9/03/80	9/03/80
City of Hickory	8/03/81	8/03/81
City of Newton	9/03/80	9/03/80
Town of Brookford	12/18/79	12/18/79
Town of Catawba	9/03/80	9/03/80
Town of Long View	9/03/80	9/03/80
Town of Maiden	9/03/80	9/03/80

FIRM = Flood Insurance Rate Map

NFIP = National Flood Insurance Program

4.5.2.8. Probability of Future Occurrences

According to the NRI, there is a Relatively Low Expected Annual Loss (EAL) when compared to the rest of the US for riverine flooding in Caldwell, Catawba, and Burke County. But there is a Very Low EAL in Alexander County compared to the rest of the US, with a risk score percentile of 14.8 and an expected annual frequency of 0.4 events per year. There is more variation in risk

scores and EAL scores at the census tract level when compared to the county level, which can be seen in Figure 4-42 below, where there is significantly more variation in risk index ratings and scores across each county within census tracts.

Table 4-16: NRI Risks of Riverine Flooding, Expected Annual Loss, and Risk Score Percentile²⁰

County	Expected Annual Loss	Risk Index Rating	Risk Score Percentile	Expected Annual Frequency (Events per Year)
Alexander	\$37,000	Very Low	14.9	0.4
Caldwell	\$310,000	Relatively Low	47.6	2.3
Catawba	\$541,000	Relatively Low	57.6	1
Burke	\$934,000	Relatively Low	72.2	2

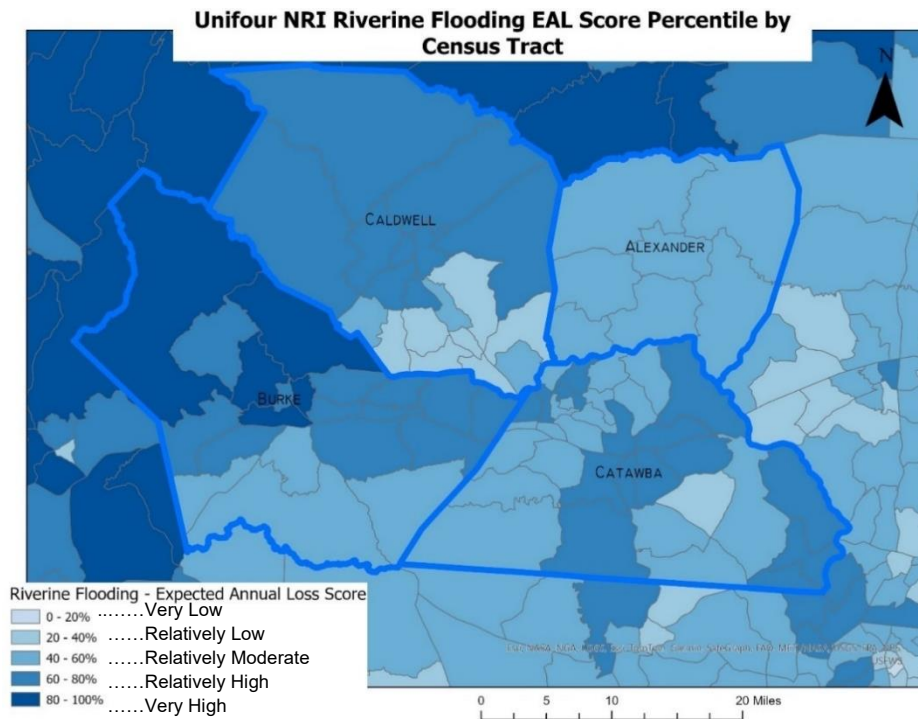


Figure 4-42: Expected Annual Loss Score Percentile by Census Tract for Riverine Flooding Risk
 Based on the analyses performed in iRISK, the probability of future River Flooding is shown in the table below, by jurisdiction.

²⁰ Federal Emergency Management Administration [FEMA]. (n.d.). National Risk Index Data Resources [Dataset]. In Department of Homeland Security [DHS], FEMA National Risk Index. <https://hazards.fema.gov/nri/data-resources#spatialTribal>

Definitions for Descriptors Used for Probability of Future Hazard Occurrences:

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-17: RMT iRisk Probability of Future Riverine Flooding Occurrence

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	High
Catawba County (Unincorporated Area)	Medium
City of Claremont	Low
City of Conover	Medium
City of Hickory	Medium
City of Lenoir	High
City of Morganton	Medium
City of Newton	Medium
Town of Brookford	Medium
Town of Cajah's Mountain	High
Town of Catawba	Medium
Town of Connelly Springs	Low
Town of Drexel	Medium
Town of Gamewell	High
Town of Glen Alpine	Medium
Town of Granite Falls	High
Town of Hildebran	Low
Town of Hudson	High
Town of Long View	Low
Town of Maiden	Medium
Town of Rhodhiss	High
Town of Rutherford College	Low
Town of Sawmills	High
Town of Taylorsville	Low
Town of Valdese	Medium
Village of Cedar Rock	High

iRISK = An interactive, Web-based risk-assessment tool

RMT = Risk Management Tool

4.5.2.9. Riverine Flooding Hazard Vulnerability

To quantify potential future flood hazard vulnerability, a similar detailed GIS analysis of the study area as completed for current flood vulnerability (described above) was performed using best available GIS data including the future Community 100-year Floodplain to identify the number and value of existing structures that may be located in future flood hazards areas as expanded due to anticipated “build-out” conditions (i.e., fully developed according to zoning and future land use projections). To quantify potentially at-risk properties, all buildings of at least 600 square feet (eliminating those that are likely accessory structures versus habitable buildings) that intersected with delineated future floodplain areas were identified. The exposure analysis does not include any estimates for new structures that will be constructed and located in the floodplain, as it is assumed that new construction will be protected against the 100-year flood according to local development regulations that include reference to future Community 100-year Floodplain maps. The result of this analysis can be found in Appendix H for buildings, high loss buildings, and population vulnerability.

4.5.2.10. Future Vulnerability: Problem Statement

People

Extreme Riverine flooding creates potential for damage to property, infrastructure, and critical facilities. The population in Catawba County and Alexander County have increased by 3.62% and 4.22%, respectively, between 2010 and 2020 whereas Burke County and Caldwell County have experienced a decreased of -3.69% and -2.76% respectively. This creates the potential for increased population growth without equivalent emergency capabilities expansion to accommodate for the increase in population growth. Additionally, an increase in population may create more barriers for underserved populations to recover from riverine flooding events.

There are several direct effects of flooding that may impact people located in areas that are at risk of flooding which includes impacts like property damage, severe injury or loss of life, and infrastructure damage. Floodwater can cause infiltration of sewer lines which can cause contamination of drinking water supply and damage utility lines. This creates a serious potential hazard for especially vulnerable groups such as elderly individuals, which account for 20.4% of Alexander County, 21.0% of Burke County, 20.7% of Caldwell County, and 18.3% of Catawba County’s total population, according to American Community Survey 2018-2022 estimates in Table 4-7.

This can also disproportionately impact those without adequate telephone service in their housing units (Alexander County at 1.3%, Burke County at 1.1%, Caldwell County at 1.6%, and Catawba County at 1.3% of the total population) who have limited ability to contact emergency services, those who reside in housing units with no vehicles available to evacuate during flood warnings (Alexander County at 2.8%, Burke County at 4.6%, Caldwell County at 4.8%, and Catawba County at 4.9% of the total population), or those who reside in housing units that are at increased risk of damage (RVs, mobile homes, or Vans) (Alexander County at 25.9%, Burke

County at 20.4%, Caldwell County at 17.1%, and Catawba County at 13.1% of the total housing units), from Table 3-5.

As a result of increased population or projected increased population as outlined in each jurisdiction's comprehensive plan, each jurisdiction should consider including mitigation actions which can assist with expanding preparedness and resilience to riverine flooding hazards. To address the impact of riverine flooding on vulnerable groups highlighted in the planning area and the potential increase in population, the following mitigation actions represent potential mitigation actions that could be considered:

- Conduct periodic review of flooding risk of vulnerable populations to address projected increases in population and development and appropriately prepare for flooding hazards in those areas.
- Evaluate and expand emergency response resources and capabilities to accommodate population growth, including additional shelters, supplies, and trained personnel.
- Expand emergency response resources to address population that have limited transportation ability and develop an organized evacuation plan that includes transportation services for residents without vehicles, vulnerable residents, or residents with limited ability to evacuate in the event of a time sensitive emergency.
- Seek financial assistance for low-income or vulnerable households to improve flood proofing and flood mitigation measures.
- Conduct regular evaluations to ensure all community members, particularly underserved populations, have equitable access to resources and support.
- Upgrade sewer and drainage systems to prevent infiltration and contamination of drinking water supplies during floods.
- Implement public health initiatives that educate residents about the risks of contaminated water and the importance of safe water sources.
- Collaborate with local nonprofits and community organizations to reach underserved populations with resources and information about flood preparedness.

Changes in Development or Housing Characteristics

Alexander County has reported a 4.33% increase and Catawba County has reported a 3.62% increase in total housing units between 2018 and 2023, (See Table 3-6). In addition, Catawba county has a projected increase in population of 15.8% between 2022 to 2042 and aims to increase housing units significantly to support an increase of residents. Burke County aims to develop policies that encourage higher density developments to support the development of new housing and encourage relocation or new arrivals. Caldwell County is updating their zoning and subdivision regulations to ensure they are compatible for land use and plans to expand their inventory of available properties through the county to encourage commercial development projects and new amenities that attract new residents.

The changes stated in the Comprehensive Plans of the planning area and projected increase in population demonstrate the potential for rapid growth, but also demonstrate that there may be challenges meeting the demand for emergency response and availability of community resources after flooding events and the need for emergency response capabilities to be reevaluated periodically to address the changing needs of the community.

Currently, the number of housing units that are Recreational Vehicles (RVs), Mobile Homes, Vans or similar are at Alexander County in 25.9%, Burke County in 20.4%, Caldwell County in 17.1%, and Catawba County in 13.1% (from Table 3-5) and these properties are at a disproportionate risk of damage during flooding events.

To accommodate and prepare for increased development and housing characteristics, the jurisdictions in the planning area are encouraged to consider the following mitigation actions to reduce vulnerability in the event of river flooding:

- Incorporate a growth management strategy which integrates development of housing into emergency response management and planning to minimize potential risk associated with increased development in the event of river flooding events.
- Assess emergency response capabilities annually and enhance emergency response capabilities to align with projected population growth and housing increases.
- Reduce vulnerability of new housing units by incentivizing flood-resistant housing in areas with high concentrations of vulnerable housing units such as RVs or mobile homes.
- Invest in flood mitigation infrastructure (e.g., retention ponds, improved drainage systems) in areas with high housing density, or projected high housing density, and flood risk.
- Implement a process for the periodic review and update of comprehensive plans to reflect changing demographics and housing trends while considering the flood risk areas.

Economy

Each County in the planning area aims to attract new residents and increase economic development. Catawba County is aiming to focus on organized development and future land use planning to accommodate future growth, including economic growth. Caldwell County aims to attract new residents through various goals that will support development and alter current and future land use goals. According to the Burke County Blueprint Burke Strategic Use Plan, growth and development in Burke County are projected to be predominantly located around the incorporated areas along the I-40 corridor and US-70 urban corridor, where there is water and sewer infrastructure in place to support further development. Alexander County aims to support increased population, and new residents can provide benefits such as a larger tax base, increased workforce, and attract new businesses and industries.

Each County in the planning area has a significant portion of land dedicated to agriculture and as a result, riverine flooding threatens to impact local crops and agricultural operations. In addition, as the area aims to see a general increase in development in the future, riverine flooding threatens to damage property, infrastructure, and environments that attracts tourists to

the area, and therefore could significantly impact the local economies. Additionally, property damage can have a negative impact for residents in the planning area who are impacted by the effects of flooding to replace property, repair damages, or restore property to its original state before being damaged by the flooding. To consider and prepare for the potential economic impacts of riverine flooding, each jurisdiction in the planning area should consider implementing the following mitigation actions:

- Allocate funds for the construction and enhancement of flood mitigation infrastructure (e.g., levees, retention basins) in key development areas.
- Develop resilient agriculture programs which provide resources about flood resilience, like crop insurance and flood resilient farming, to improve agricultural resilience to potential flooding.
- Encourage sustainable development with low environmental impacts and enhanced flood resilience to reduce potential negative economic impacts of flooding on the economy of the planning area or areas impacted.
- Invest in community infrastructure improvements that enhance flood resilience, such as upgraded drainage systems and stormwater management practices.

Natural Environment

Major flooding events create the potential for hazardous materials and chemicals to contaminate local water sources as well as generally disrupting ecosystems. As a result, the jurisdictions in the planning area should consider the following mitigation actions:

- Conduct a hazardous material inventory or confirm locations of hazardous materials in flood-prone areas.
- Reduce storage of hazardous materials in flood prone areas
- Develop post-flooding protocol to assess and clean up hazardous materials or contamination after flooding causes a release of hazardous materials.

First Responders

First Responders are at significant risk of serious injury and even potentially life-threatening injuries when rescuing people stuck in dangerous or life-threatening situations. Flood waters may also reduce the capacity of emergency services in their response and assistance during flooding events. Jurisdictions in the planning area are encouraged to consider the following mitigation actions to improve the emergency response capabilities for riverine flooding events:

- Review emergency response procedures regularly to update responsibilities, areas of risk, and protocol for flooding events.
- Implement and maintain advanced flood warning systems that utilize real-time data to alert communities of impending flood risks.
- Establish clear evacuation routes and procedures, including designated shelters and transportation options for vulnerable populations.

Continuity of Operations

Riverine flooding has the potential to disrupt the normal operations in the affected area, especially with loss of power, disruption of communication, and reduced ability to respond to emergencies. To improve resilience to riverine flooding in terms of continuity of operations, jurisdictions in the planning area should consider the following mitigation actions:

- Periodically review inventory of critical resources, including personnel, equipment, and supplies, necessary for continued operations during flooding.
- Develop robust communication plans to keep staff informed during flooding events, including alerts, updates, and instructions.
- Schedule regular reviews and updates of Continuity of Operations Plan (COOP) plans based on new risks, lessons learned from past flooding events, and changes in operations.

4.5.2.11. Climate Change

In the future, warmer temperatures and changes in frequency of heavy precipitation due to climate change are likely to increase the impacts and frequency of riverine flooding. The Climate Science Special Report, Fourth National Climate Assessment, stated with high confidence that the frequency and intensity of heavy precipitation events are projected to continue to increase over the 21st century. The increased likelihood of extreme precipitation events due to climate change will result in greater risks of flash flooding and impacts from stormwater runoff throughout the State of North Carolina. While there may be less precipitation overall, in the long term the rainfall that does occur will likely be during more intense events that may result in increasing number of inland flooding incidents.

Inland flooding depends not only on extreme precipitation but also on characteristics of the land surface, including land use and development, land cover, and soil moisture conditions. It also depends on whether deliberate adaptive measures are implemented proactively. While it is likely that the frequency and severity of inland flooding will increase because of increases in the frequency and intensity of extreme precipitation, the uncertainty associated with these additional factors tends to lower the level of certainty with which more detailed predictions can be made.

Appendix H has a more detailed inventory of people, buildings, and facilities that are vulnerable to riverine flood hazards retrieved from RMT iRisk.

Table 4-18: the NRI exposure, the representative value by category potentially exposed to a natural hazard occurrence, data for buildings, population, and agriculture for riverine flooding.

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Alexander	\$6,661,899	192.58	\$2,233,903,237	\$47,641,667	\$2,288,206,803
Burke	\$19,205,283	732.92	\$8,501,834,055	\$180,253,631	\$8,701,292,969

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Caldwell	\$10,472,371	1,559.81	\$18,093,831,226	\$568,843,914	\$18,673,147,511
Catawba	\$4,759,968	1,130.28	\$13,111,298,873	\$238,537,373	\$13,354,596,213
Total	\$41,099,521	3,615.59	\$41,940,867,391	\$1,035,276,585	\$43,017,243,496

Table 4-19: Total NFIP Repetitive Loss, Severe Repetitive Loss Properties, and Number of Total Losses.

County	Jurisdiction	Number of Repetitive Losses (NFIP)	Number of Severe Repetitive Loss Properties (NFIP)	Number of Total Losses	Most Recent Date of Loss
Alexander	Taylorsville	1	0	2	11/12/2020
Alexander County Total		1	0	2	-
Burke	Burke County	1	0	2	5/6/2013
Burke County Total		1	0	2	-
Caldwell	Lenoir	5	0	10	10/14/2014
	Granite Falls	1	0	3	11/12/2020
Caldwell County Total		9	0	22	-
Catawba	Newton		1	1	6/9/2019
	Hickory	6	0	18	8/15/2020
	Conover	4	1	10	11/11/2020
	Claremont	10	3	29	11/12/2020
	Catawba County	3	1	12	11/12/2020
Catawba County Total		23	6	70	-
		34	6	96	-

NFIP = National Flood Insurance Program

Table 4-20: Types of NFIP Multiple Loss Properties by Occupancy Type and by Loss Type

County	City	Single Family Resident		Non-Residential Building		Non-Residential Business		Single Family Residential Building (Apartment)	
		Repetitive Loss	Severe Repetitive Loss	Repetitive Loss	Severe Repetitive Loss	Repetitive Loss	Severe Repetitive Loss	Repetitive Loss	Severe Repetitive Loss
Caldwell County	Lenoir	2	0	3	0	0	0	1	0
	Collettsville	1	0	0	0	0	0	0	0
	Edgemont	1	0	0	0	0	0	0	0
	Granite Falls	1	0	0	0	0	0	0	0
Burke County	Nebo	0	0	0	0	1	0	0	0
Catawba County	Catawba	2	1	0	0	0	0	1	0
	Claremont	8	3	0	0	0	0	2	0
	Conover	2	1	0	0	0	0	2	0
	Hickory	6	0	0	0	0	0	0	0
	Newton	0	1	0	0	0	0	0	0
Alexander County	Taylorsville	0	0	1	0	0	0	0	0

4.5.3. Levee Failure

Levee failure is the collapse, breach, or other failure of a levee structure or system resulting in flooding. Levee failure can result from natural events, human-induced events, or a combination of the two. The most common cause of levee failure is prolonged rainfall that produces flooding. Failures due to other natural events such as hurricanes, earthquakes, or landslides are significant because there is generally little or no advance warning. Like dam failures, levee failure is the uncontrolled release of water due to failure or structural issues which can occur due to numerous factors such erosion on the levees surface, seepage through or under the levee, overtopping of water due to excessive water level, poor maintenance, or changes in the levee’s foundation leading to instability.

4.5.3.1. Location within the Planning Area

There are numerous levees and floodwalls within the planning area. When hurricanes and tropical storms occur, these areas are susceptible to some degree of flooding. There have been several past flooding events throughout the planning area, ranging widely in terms of location, magnitude, and impact. Levees are not currently mapped in this area, but the mitigation strategy and actions are aimed to include levee locations and mapping in future updates.

4.5.3.2. Extent (Magnitude and Severity)

Table 4-21: Hazard Classification of Levee Failures

Hazard Classification	Description	Quantitative Guidelines
Low	1) Interruption of road service, low volume roads 2) Economic damage	1) Less than 25 vehicles per day 2) Less than \$30,000
Intermediate	1) Damage to highways, interruption of service 2) Economic damage	1) 25 to less than 250 vehicles per day 2) \$30,000 to less than \$200,000
High	1) Probable loss of human life due to breached roadway or bridge on or below the dam 2) Economic damage	1) Probable loss of 1 or more human lives 2) More than \$200,000

4.5.3.3. Historical Occurrences

There are no records of historical levee failure occurrences in or affecting the planning area.

4.5.3.4. Probability of Future Occurrences

Based on the analyses performed in RMT iRISK, the probability of future Levee Failure is shown in the table below, by jurisdiction.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability

- **High:** More Than 10% Annual Probability

Table 4-22: iRisk Probability of Levee Failure

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Low
Caldwell County (Unincorporated Area)	Low
Catawba County (Unincorporated Area)	Low
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Low
City of Morganton	Low
City of Newton	Low
Town of Brookford	Low
Town of Cahaj's Mountain	Low
Town of Catawba	Low
Town of Connelly Springs	Low
Town of Drexel	Low
Town of Gamewell	Low
Town of Glen Alpine	Low
Town of Granite Falls	Low
Town of Hildebran	Low
Town of Hudson	Low
Town of Long View	Low
Town of Maiden	Low
Town of Rhodhiss	Low
Town of Rutherford College	Low
Town of Sawmills	Low
Town of Taylorsville	Low
Town of Valdese	Low
Village of Cedar Rock	Low

4.5.3.5. *Levee Failure Hazard Vulnerability*

The effects of a levee failure are exacerbated when the failure occurs abruptly or with little warning and if it results in deep, fast-moving water through highly developed areas. The worst-case scenario for a levee failure in Unifour Region would be the complete failure of the levee

systems. If this occurred during a flood with a 1 percent annual chance of occurrence, the failure would lead to effects consistent with those described in Section 4.5.1 (Riverine Flooding) There is a fundamental limitation in the data available for vulnerability assessment for the levee failure hazard in the planning area. Any mitigation actions developed for this hazard therefore should be based on addressing data limitations, education and awareness programs, and/or any jurisdiction-specific concerns that may be addressable through an appropriate mitigation project.

4.5.3.6. Future Vulnerability: Problem Statement

People

Levee Failure creates potential for catastrophic damage to property, infrastructure, and critical facilities, and requires rapid response time for residents in areas of potential or imminent levee failure. Those who do not have telephone service (Alexander County at 1.3%, Burke County at 1.1%, Caldwell County at 1.6%, and Catawba County at 1.3% of the total population) are at an increased risk of reduced ability to respond quickly to reverse 911 systems or other warning systems. The majority of residents reported that they have internet and computer access, with 83.6% in Alexander County, 79.7% in Burke County, 83.2% in Caldwell County, and 86.4% in Catawba County reporting that they have access to the internet. But, for those who do not have access to the internet or a computer, accessing critical information about hazards, warnings, and information about how to prepare for disasters could be limited.

Moreover, in Alexander, Burke, Caldwell, and Catawba County the percentage of residents without a vehicle available comprise 2.8%, 4.6%, 4.8%, and 4.9% of the residents, respectively. This creates a significant problem for residents who are in areas of potential levee failure with the reduced ability to evacuate in a timely manner in case of an emergency.

Other impacts of flooding resulting from levee failure is infiltration of sewer lines, which can cause contamination of drinking water supply and damage utility lines. This creates a serious potential hazard for especially vulnerable groups such as elderly individuals, which account for 20.4% of Alexander County, 21.0% of Burke County, 20.7% of Caldwell County, and 18.3% of Catawba County's total population, according to American Community Survey 2018-2022 estimates in Table 4-7. To improve resilience of residents in the planning area to potential Levee Failure, the jurisdictions in the planning area should consider the following mitigation actions:

- Conduct periodic review of levee failure risk areas with vulnerable populations to address projected increases in population and development and appropriately prepare for levee failure events in those areas.
- Evaluate and expand emergency response resources and capabilities to accommodate population growth, including additional shelters, supplies, and trained personnel.
- Expand emergency response resources in the event of levee failure to address population that have limited transportation ability and develop an organized evacuation plan that includes transportation services for residents without vehicles, vulnerable residents, or residents with limited ability to evacuate in the event of a time sensitive emergency.

- Conduct regular evaluations of levee failure preparedness to ensure all community members, particularly underserved populations, have equitable access to resources and support.
- Collaborate with local nonprofits and community organizations to reach underserved populations with resources and information about levee failure preparedness and safety.

Changes in Development or Housing Characteristics

Alexander County has reported a 4.33% increase and Catawba County has reported a 3.62% increase in total housing units between 2018 and 2023, (See Table 3-6). In addition, Catawba county has a projected increase in population of 15.8% between 2022 to 2042 and aims to increase housing units significantly to support an increase of residents.

Burke County aims to develop policies that encourage higher density developments to support the development of new housing and encourage relocation or new arrivals. Caldwell County is updating their zoning and subdivision regulations to ensure they are compatible for land use and plans to expand their inventory of available properties through the county to encourage commercial development projects and new amenities that attract new residents. Increased density development creates potential for areas with disproportionately impacted residents, so it is essential to continue monitoring and guiding development to avoid high density development in special hazard areas or areas of potential impacts.

The changes stated in the Comprehensive Plans of the planning area and projected increase in population demonstrate the potential for rapid growth, but also demonstrate that there may be challenges associated with preparing for area wide evacuations in the event of potential Levee Failure, which requires a rapid response from residents and emergency personnel. To increase resilience to potential levee failure events, the jurisdictions in the planning area should consider the following mitigation actions:

- Implement land use planning and floodplain management strategies that limit development in high-risk areas behind levees.

Economy

Levee Failure creates potential for catastrophic damage to property, infrastructure, and critical facilities. Each County in the planning area has a significant portion of land dedicated to agriculture and as a result, riverine flooding threatens to impact local crops and agricultural operations. In addition, as the area aims to see a general increase in development in the future, levee failure threatens to damage property, infrastructure, and disrupt environments that attract tourists to the area, and therefore could significantly impact the local economies. To increase resilience to potential levee failure events, the jurisdictions in the planning area should consider the following mitigation action:

- Encourage economic development and floodplain management strategies that limit development in high-risk areas behind levees and promote flooding resilient development practices.

Natural Environment

Levee Failure events create the potential for hazardous materials and chemicals to contaminate local water sources as well as disrupting ecosystems. Levee failure causes increased soil erosion, rapid sedimentation which clogs the waterways, decreases water quality by carrying pollutants downstream and contributing to contamination of rivers and lakes, and can destroy ecosystems downstream by destroying habitat for wildlife and plants. To increase resilience and or prevent potential levee failure events, the jurisdictions in the planning area should consider the following mitigation action:

- Implement a routine inspection and maintenance program for levees to identify and address vulnerabilities before failures occur.

First Responders

First Responders are at significant risk of serious injury and even potentially life-threatening injuries when rescuing people stuck in dangerous or life-threatening situations. Levee Failure may significantly reduce the capacity of emergency services in their response and assistance during levee failure events. To increase resilience of first responders and emergency response to potential levee failure events, the jurisdictions in the planning area should consider the following mitigation actions:

- Partner with local emergency management, public health, and environmental agencies to coordinate levee management and emergency responses.
- Conduct regular evacuation drills for communities living near levees to practice emergency procedures and familiarize residents with safe routes.
- Establish early warning systems that monitor levee conditions and potential failures, providing real-time alerts to communities at risk.

Continuity of Operations

Levee Failure has the potential to disrupt the normal operations in the affected area and create catastrophic barriers to recovery associated with damaged infrastructure, facilities, property, and critical facilities. Loss of power, disruption of communication, and reduced ability to respond to emergencies will significantly reduce capacity to continue normal operations in the event of Levee failure. To increase resilience to potential levee failure events, the jurisdictions in the planning area should consider the following mitigation actions:

- Maintain detailed inventory of critical facilities and critical infrastructure along with establishing clear response protocol which outlines rapid response to restore critical utilities, infrastructure, and facilities in the event of levee failure events.
- Develop training or awareness programs to ensure staff and residents are aware of procedures which follow potential levee failures in terms or limiting disruptions to normal operations.

4.5.3.7. *Climate Change*

Climate and weather pattern changes are expected to lead to more severe storm events, which are likely to increase the risk of levee overtopping, structural damage, or other failures. In addition, levee structures designed to current standards may not be sufficient to handle future climate change-driven conditions arising from more intense rainfall. Since the likelihood of levee failure depends on factors in addition to climate considerations, detailed projections of future changes in the frequency of levee failures cannot be made with any degree of confidence.

4.5.4. **Wildfire**

A wildfire is any fire occurring in a wildland area (i.e., grassland, forest, brush land) except for fire under prescription. Wildfires are part of the natural management of the Earth's ecosystems but may also be caused by natural or human factors. Over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.

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. Wildland fires are usually signaled by dense smoke that fills the area for miles around.

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.

Fire 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 disasters (hurricanes, tornadoes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings. Forest damage from hurricanes and tornadoes may block interior access roads and fire breaks, pull down overhead power lines, or damage pavement and underground utilities.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high fire hazard areas. 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 the inferno that can sweep through the brush and timber and destroy property in minutes.

Wildfire Hazard Areas - Regional

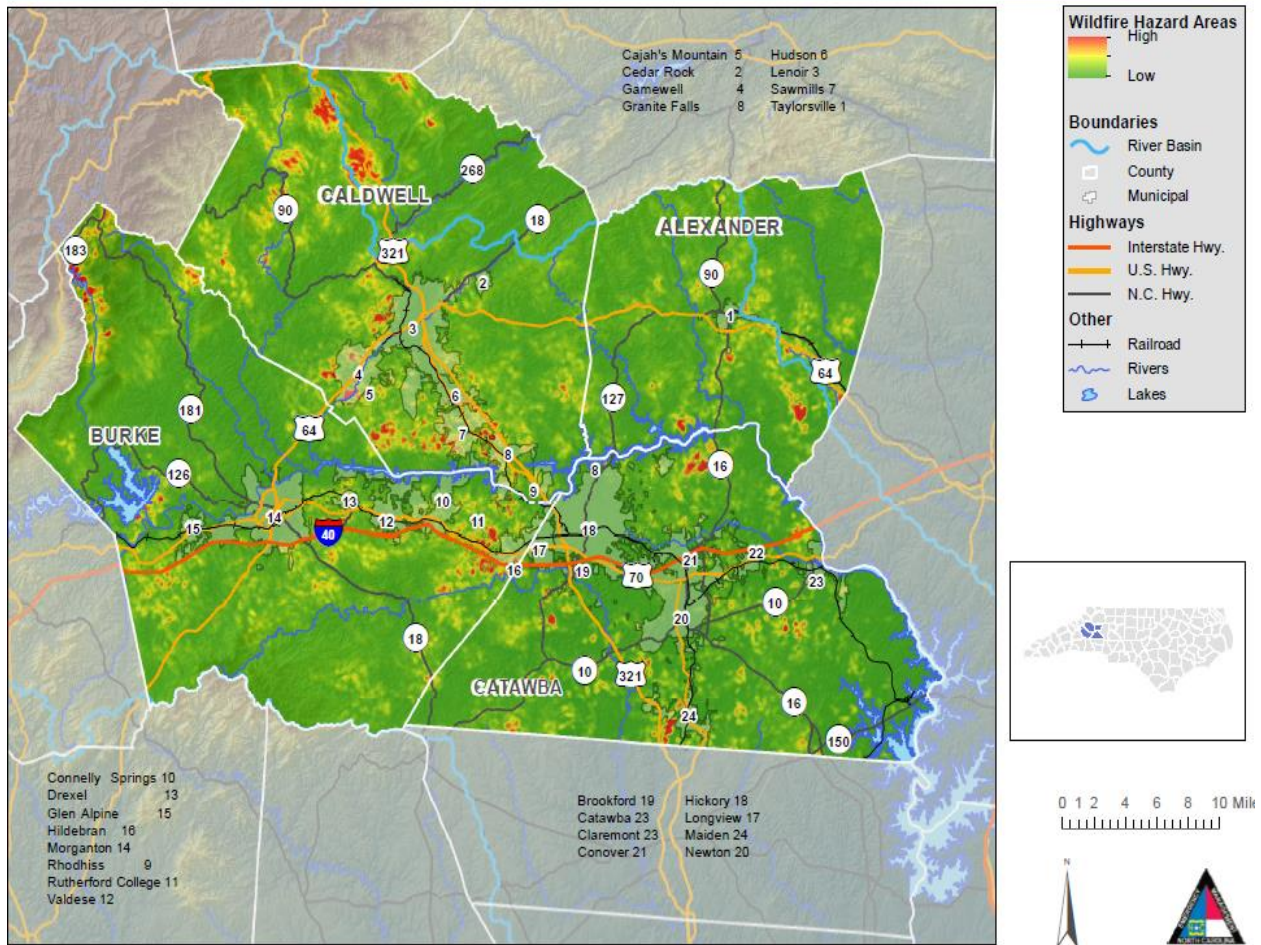


Figure 4-43: Wildfire Hazard Areas

4.5.4.1. Wildfire Hazard Analysis

Methodologies and Assumptions

The following list provides key points by hazard type that are relevant to understanding the risk assessment presented in this section:

To identify specific potential wildfire hazard areas within the planning area, a GIS-based data layer called the Wildland Fire Susceptibility Index (WFSI) was obtained from the North Carolina Division of Forest Resources (NCDFR). The WFSI is a component layer derived from the Southern Wildfire Risk Assessment (SWRA), a multi-year project to assess and quantify wildfire risk for the 13 Southern states. The WFSI is a value between 0 and 1. It was developed consistent with the mathematical calculation process for determining the probability of an acre burning. The WFSI integrates the probability of an acre igniting and the expected final fire size based on the rate of spread in four weather percentile categories into a single measure of wildland fire susceptibility. Due to some necessary assumptions, mainly fuel homogeneity, it is not the true probability. But since all areas of the planning area have this value determined

consistently, it allows for comparison and ordination of areas as to the likelihood of an acre burning.

Figure 4-44 illustrates the level of wildfire potential for the planning area based on the WFSI data provided by NCDFR. Areas with a WFSI value of 0.01–0.05 were at moderate risk to the wildfire hazard. Areas with a WFSI value greater than 0.05 were considered to be at high risk to the wildfire hazard. Areas with a WFSI value less than 0.01 were considered to not be at risk to the wildfire hazard.

The Characteristic Fire Intensity Scale (FIS)²¹ was used to represent the potential of wildfire hazards throughout the planning area and utilizes a standard scale to represent potential wildfire intensity. The categories used are:

1. **Very Low:** Very small, discontinuous flames less than 1 ft in length, low rate of spread. Easy to suppress with basic firefighting training
2. **Low:** Small flames less than 2 ft long, short range spotting possible.
3. **Moderate:** Flames up to 9 ft long, short range spotting possible, and trained firefighters would have difficulty suppressing these wildfires without aircraft support. This increases potential for harm, damage to property, and potentially life-threatening injuries.
4. **High:** Large flames up to 40 ft in length, medium range spotting is possible, and trained firefighters, engines, and dozers can be ineffective. Direct attack may be effective, and there is a significant potential for harm, serious injury, and damage to property.
5. **Very High:** Flames exceeding 200 ft in length with extreme fire behavior.

4.5.4.2. *Extent Event:*

Wildfire data was provided by the National Interagency Fire Center and is reported by county. The following maps represent the FIS data from the Southern Wildfire Risk Assessment Portal²²:

²¹ Pyrologix. (2023). Characteristic Fire Intensity Scale [Dataset]. In Southern Wildfire Risk Assessment Portal. Southern Wildfire Risk Assessment.

²² Southern Wildfire Risk Assessment Portal. (n.d.). Southern Group of State Forester. Retrieved November 1, 2024, from <https://www.southernwildfirerisk.com/>

Wildfire Hazard Areas - Alexander County

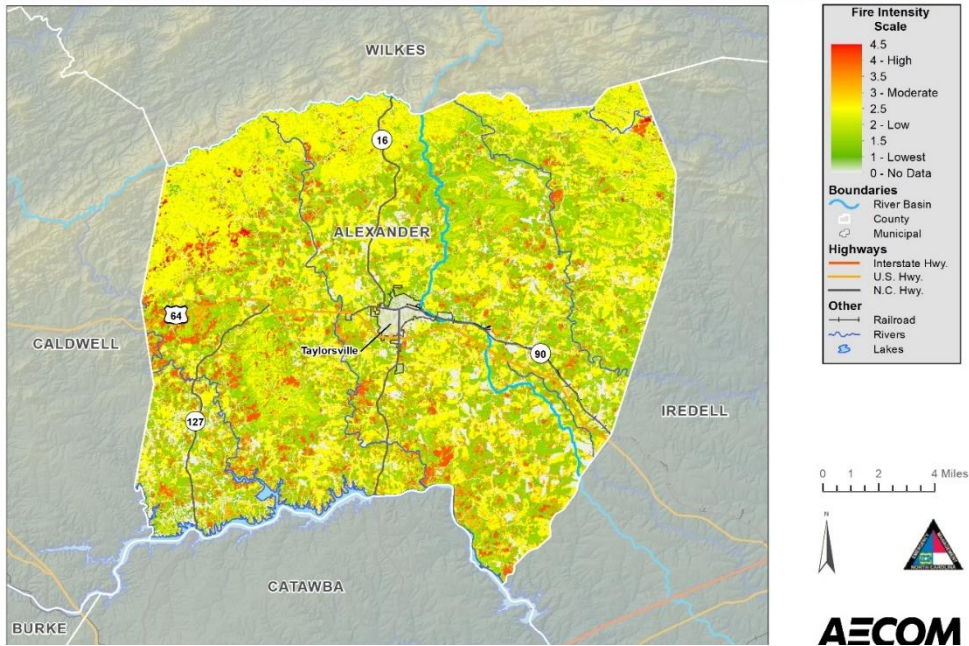


Figure 4-44: Wildfire Hazard Areas in Alexander County

Wildfire Hazard Areas - Taylorsville

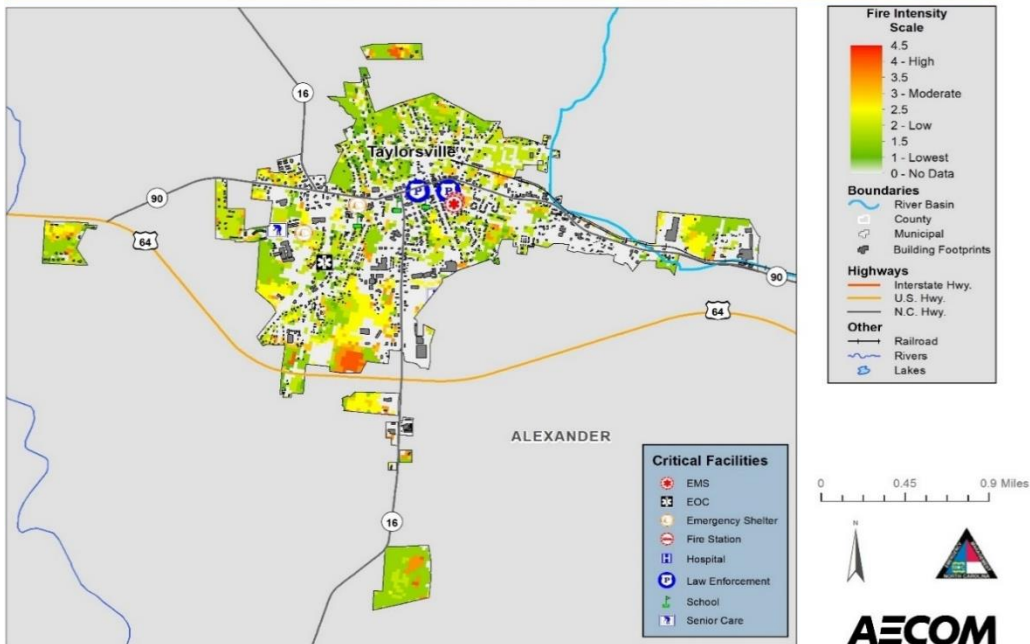


Figure 4-45: Wildfire Hazard Areas in Taylorsville

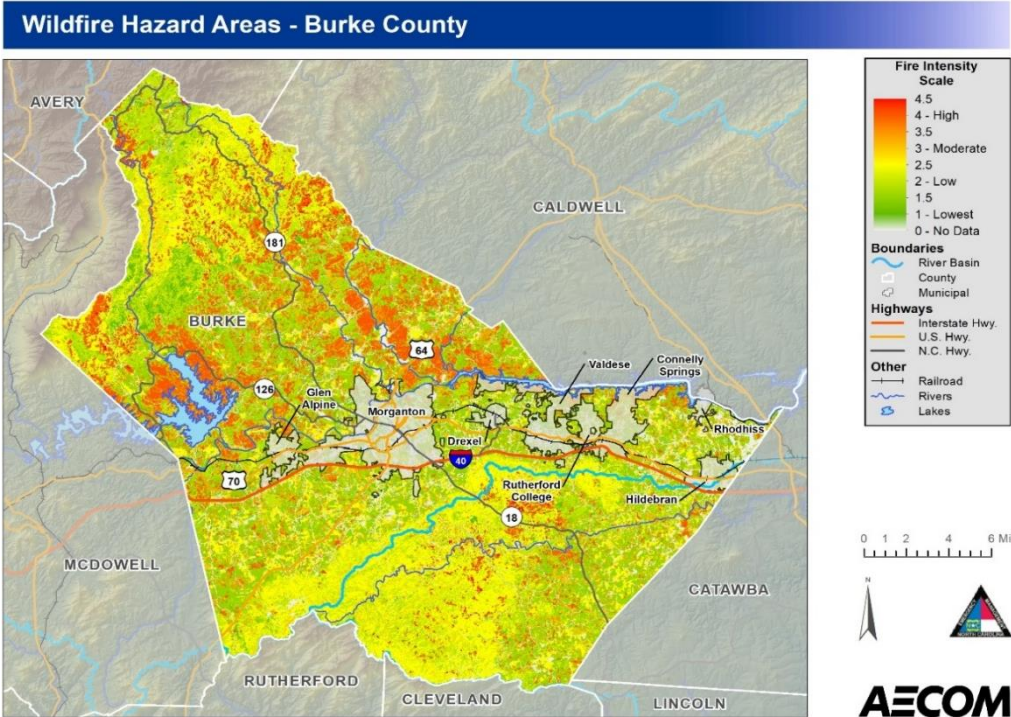


Figure 4-46: Wildfire Hazard Areas in Burke County

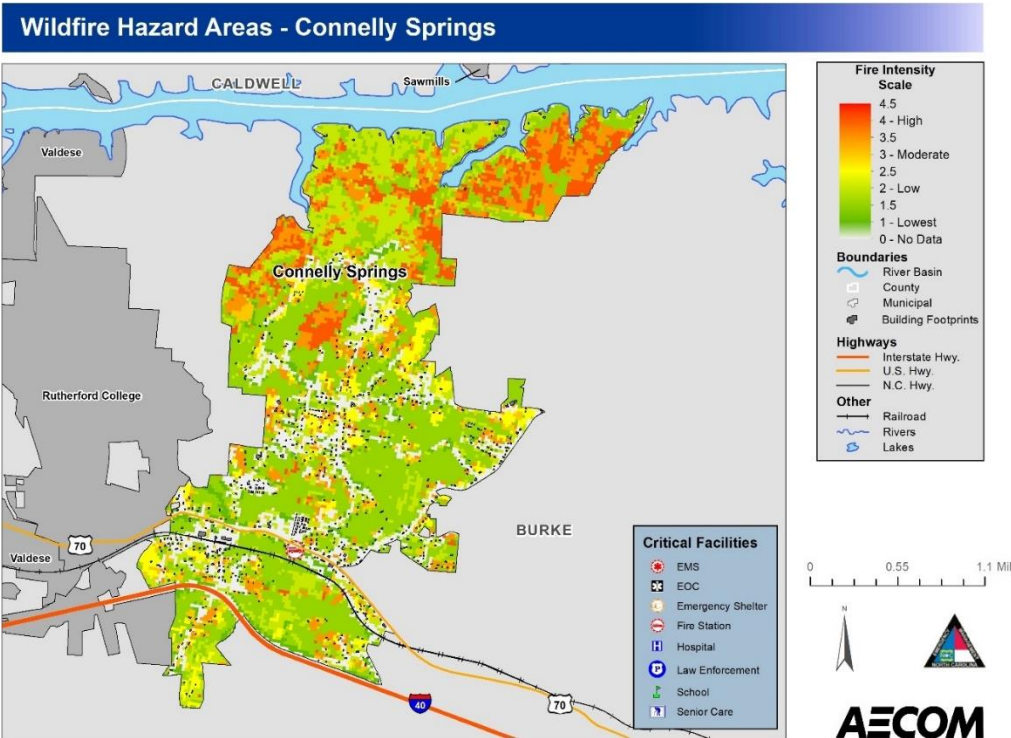


Figure 4-47: Wildfire Hazard Areas in Connelly Springs

Wildfire Hazard Areas - Drexel

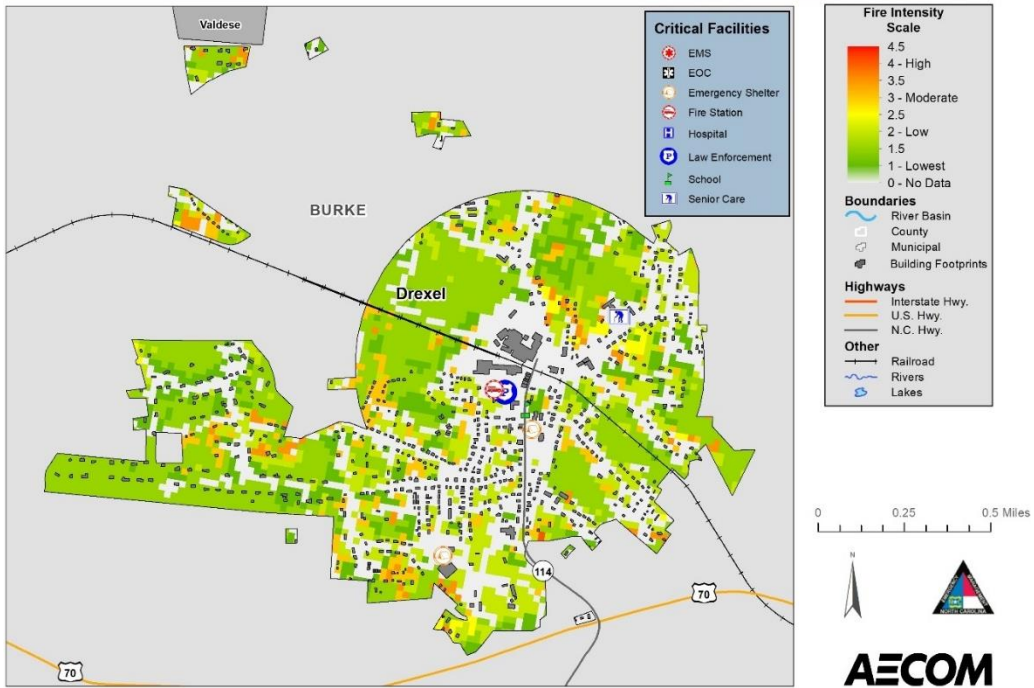


Figure 4-48: Wildfire Hazard Areas in Drexel

Wildfire Hazard Areas - Glen Alpine

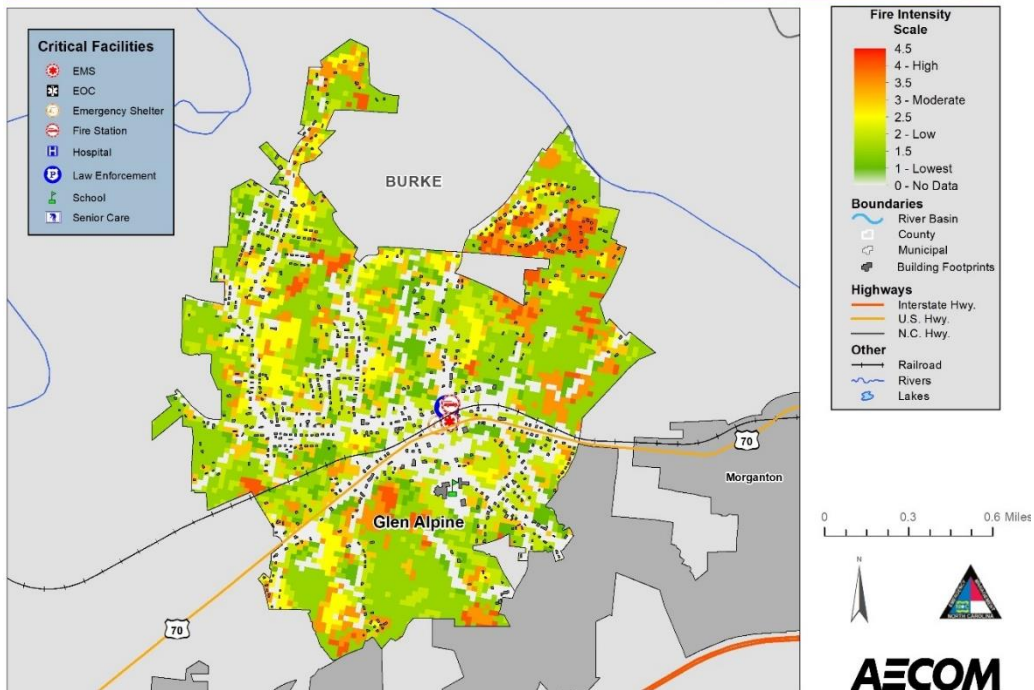


Figure 4-49: Wildfire Hazard Areas in Glen Alpine

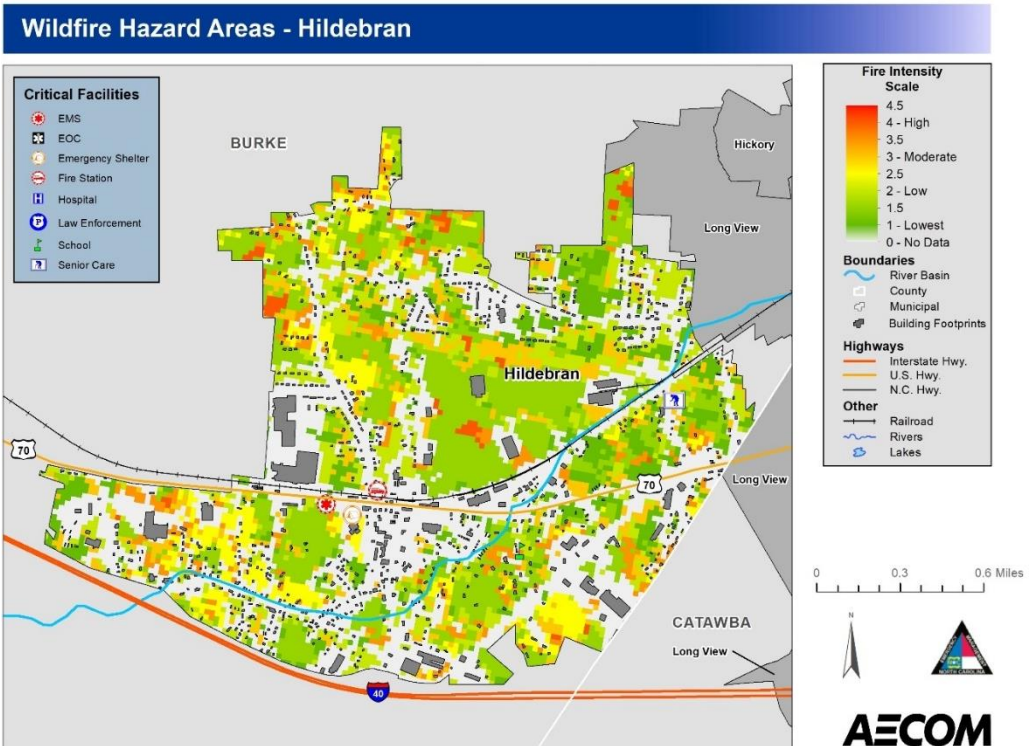


Figure 4-50: Wildfire Hazard Areas in Hildebran

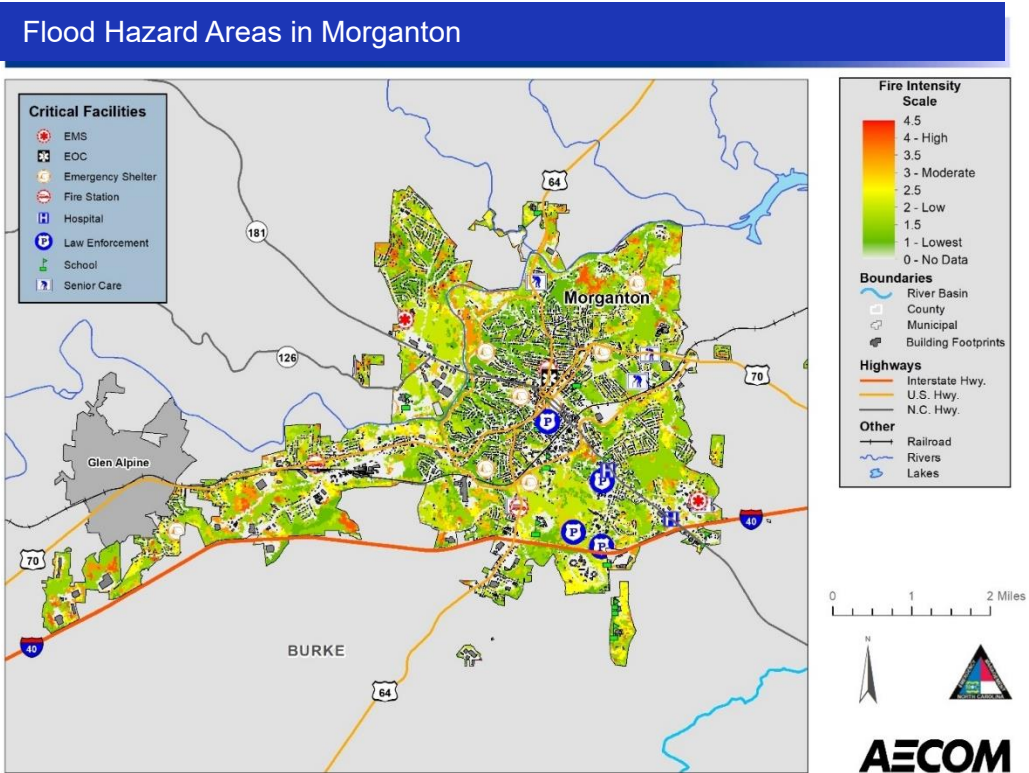


Figure 4-51: Wildfire Hazard Areas in Morganton

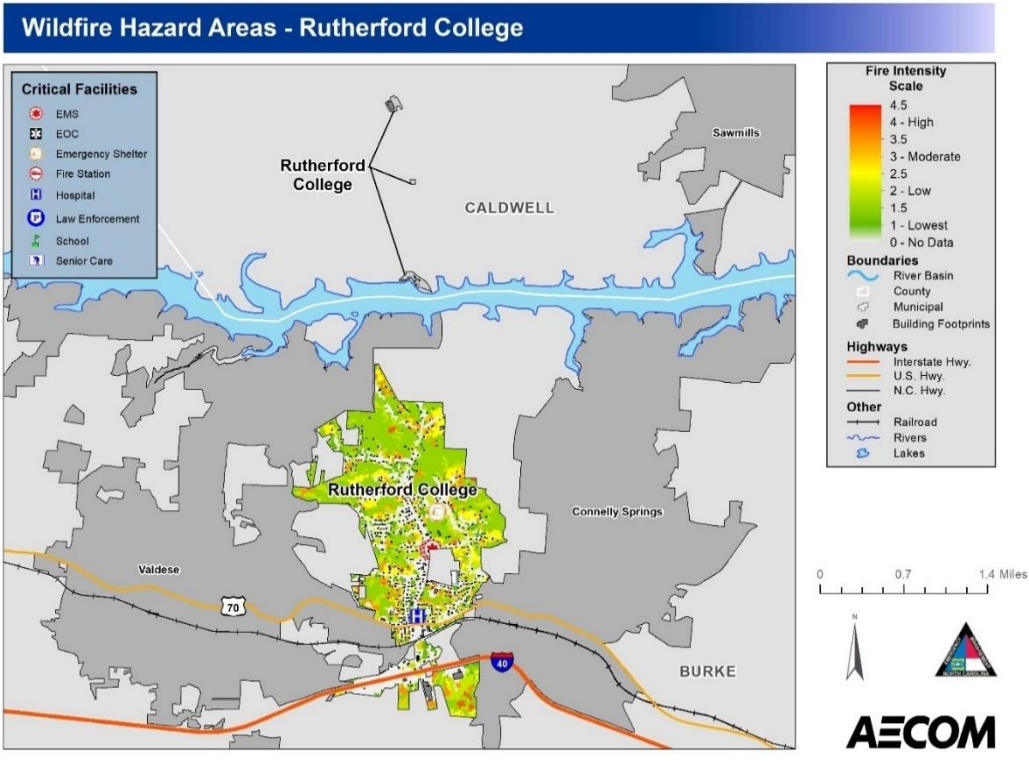


Figure 4-52: Wildfire Hazard Areas in Rutherford College

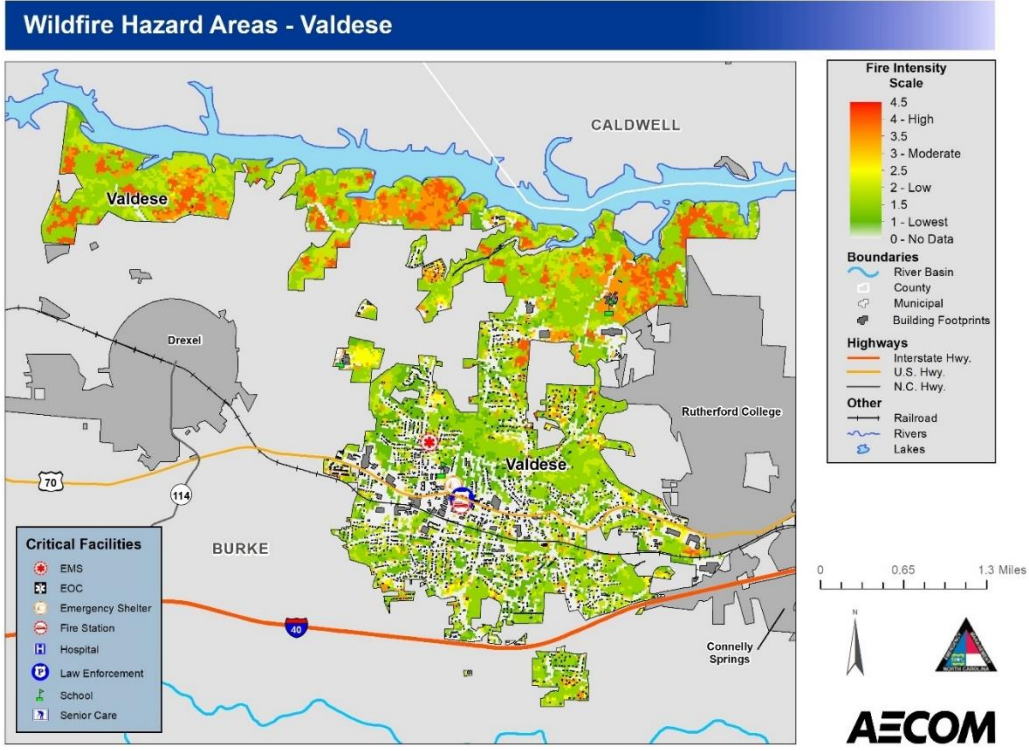


Figure 4-53: Wildfire Hazard Areas in Valdese

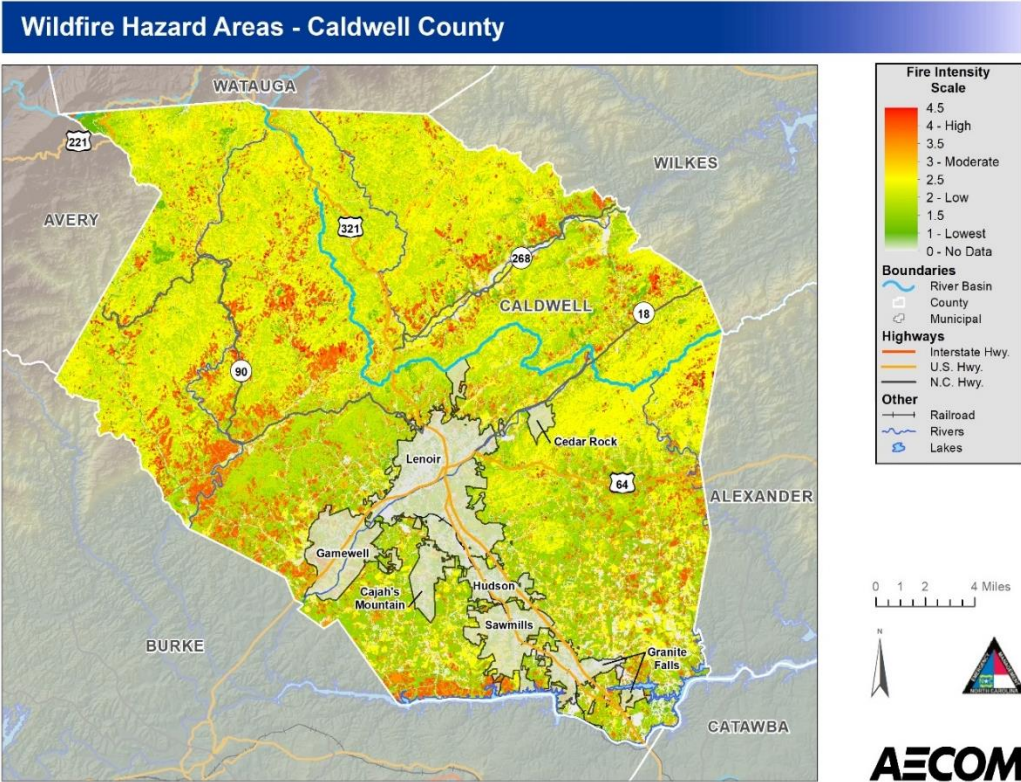


Figure 4-54: Wildfire Hazard Areas in Caldwell County

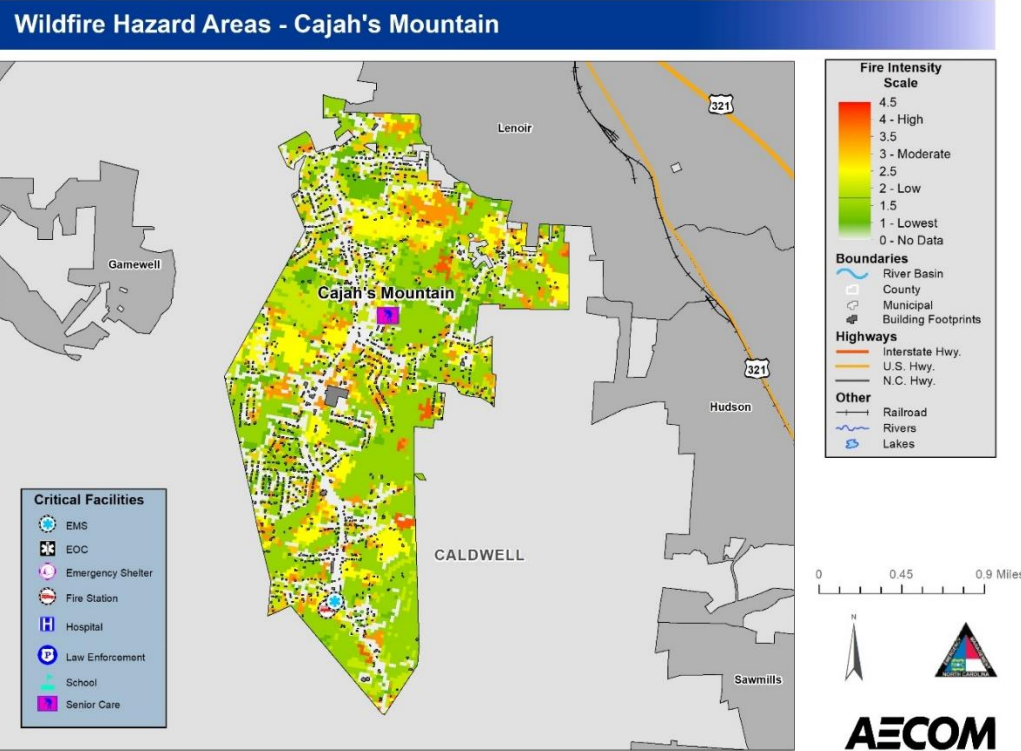


Figure 4-55: Wildfire Hazard Areas in Cahaj's Mountain

Wildfire Hazard Areas - Cedar Rock

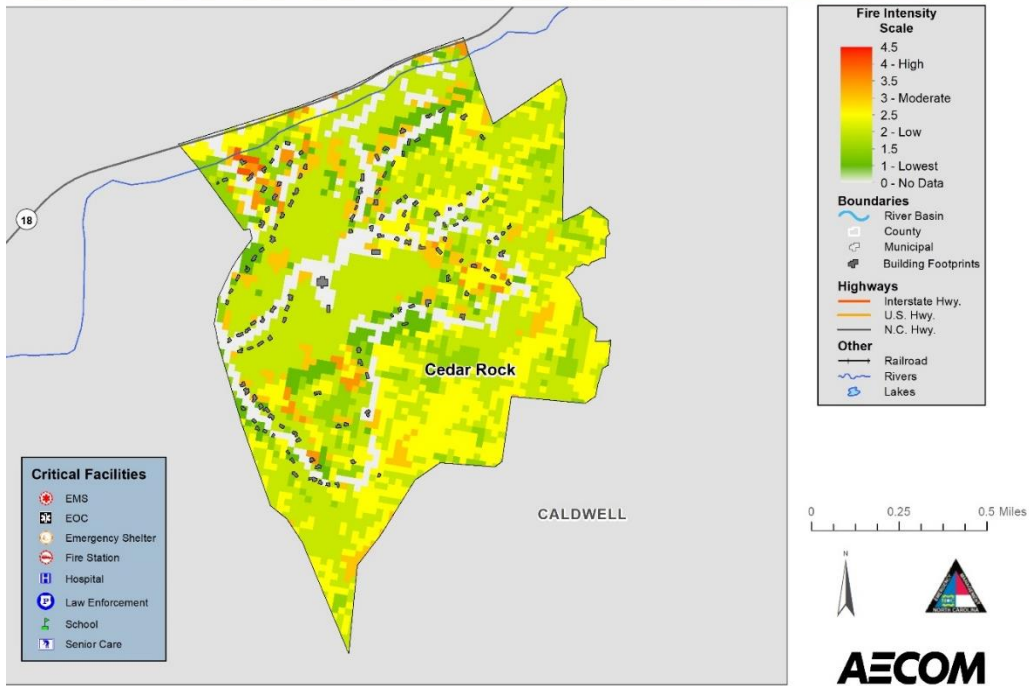


Figure 4-56: Wildfire Hazard Areas in Cedar Rock

Wildfire Hazard Areas - Gamewell

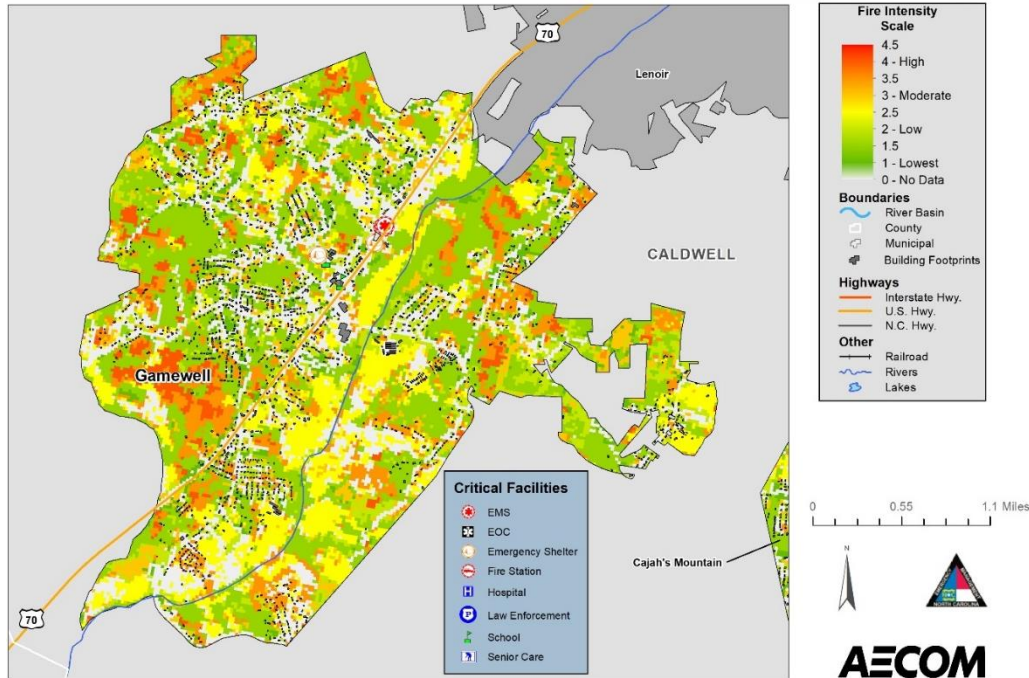


Figure 4-57: Wildfire Hazard Areas in Gamewell

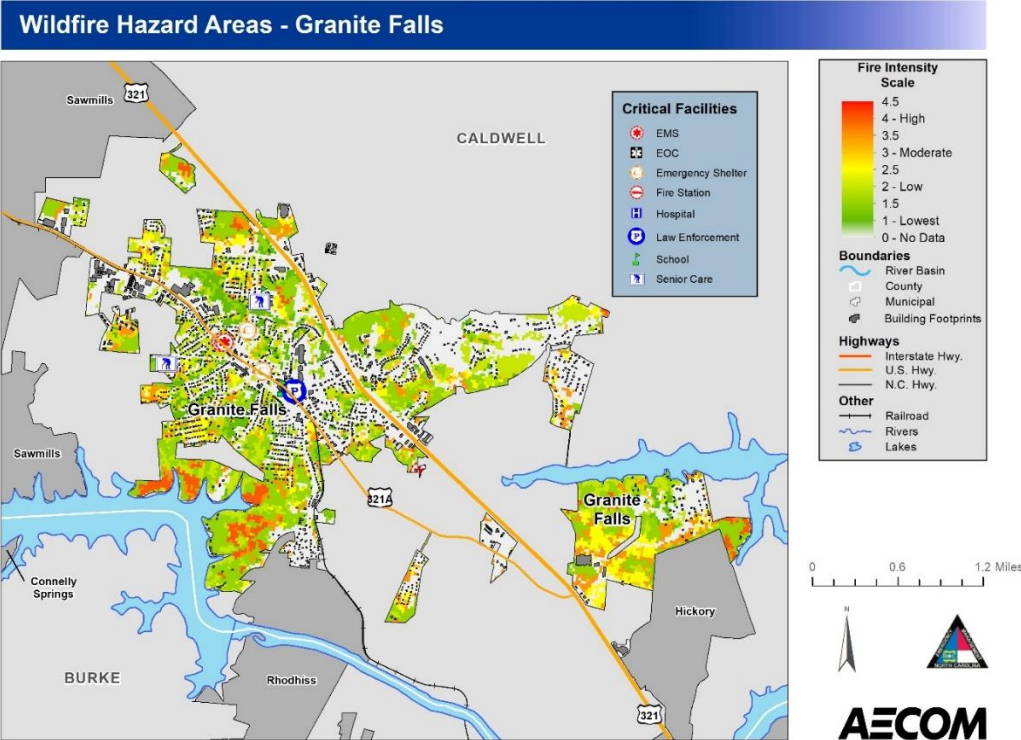


Figure 4-58: Wildfire Hazard Areas in Granite Falls

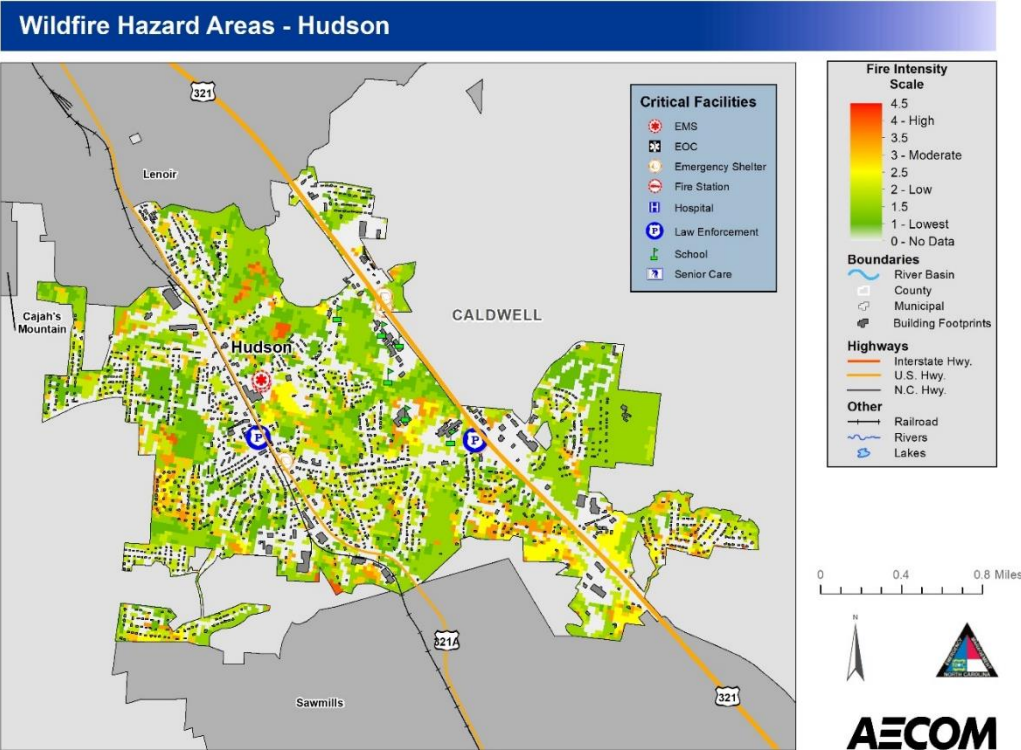


Figure 4-59: Wildfire Hazard Areas in Hudson

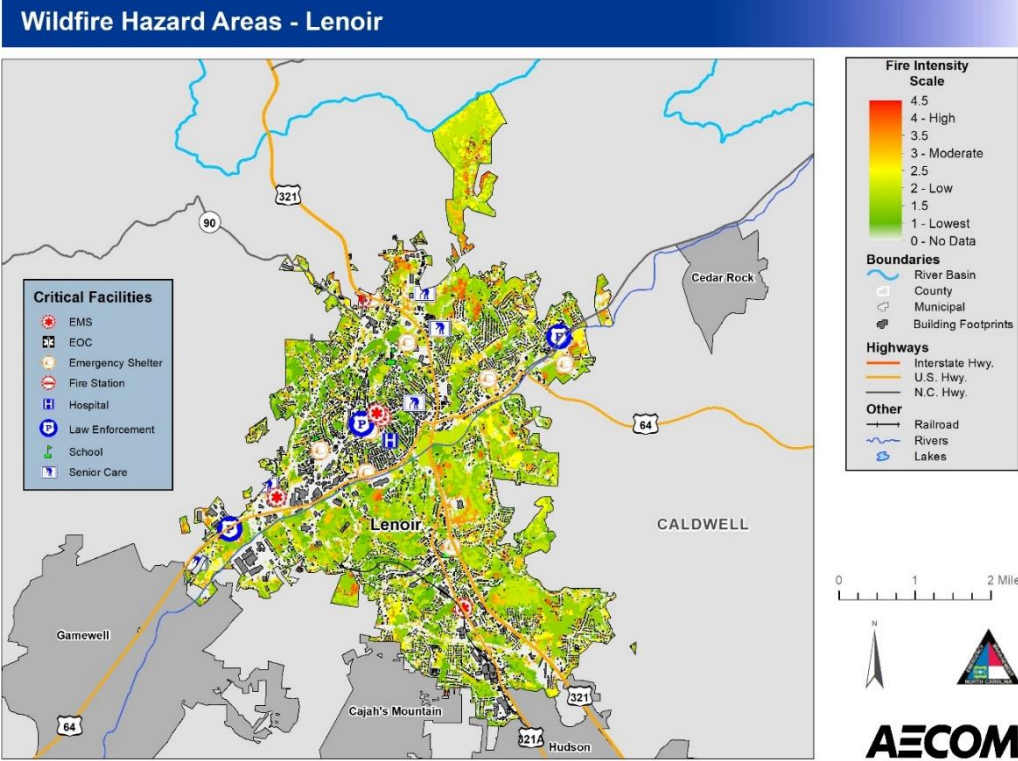


Figure 4-60: Wildfire Hazard Areas in Lenoir

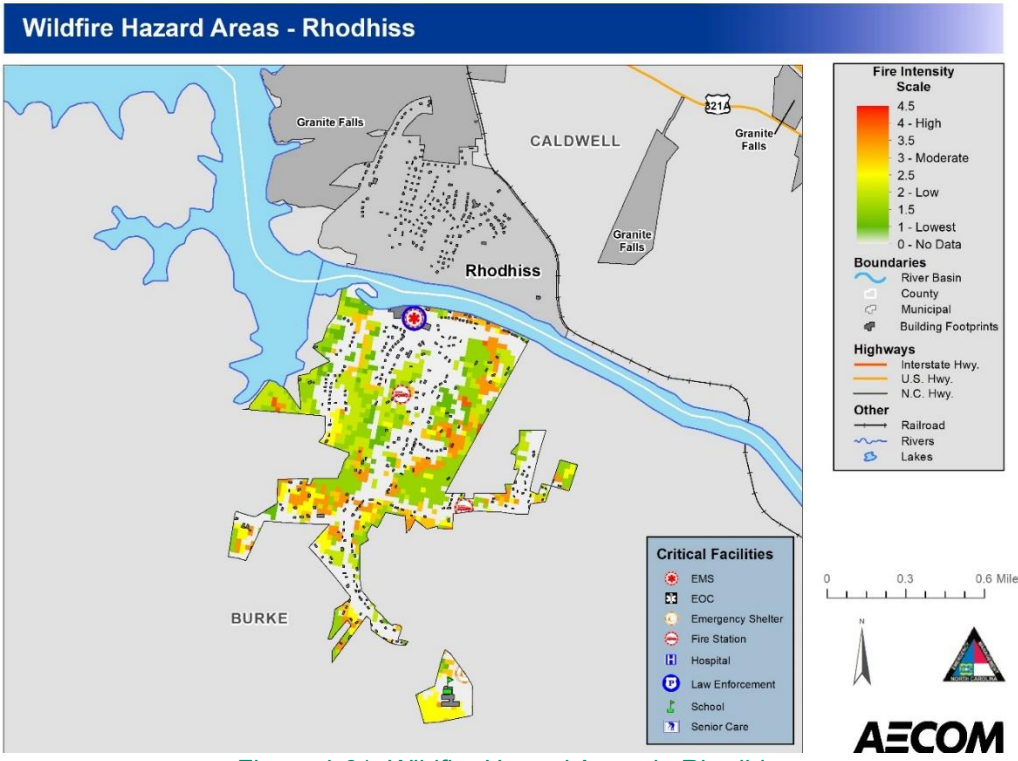


Figure 4-61: Wildfire Hazard Areas in Rhodhiss

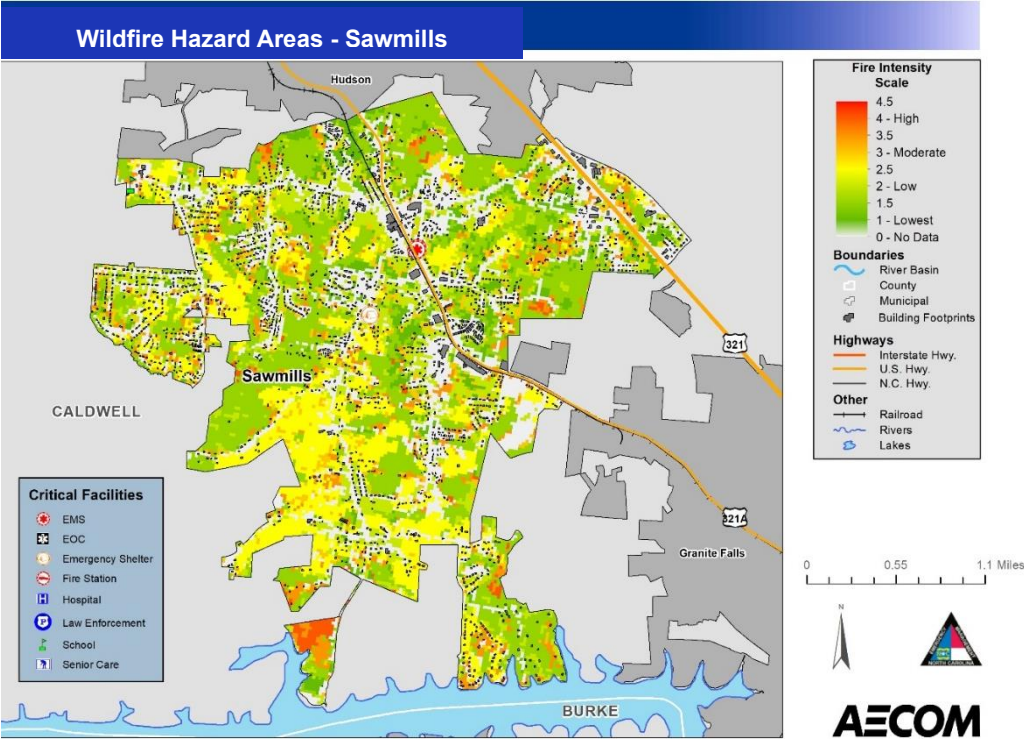


Figure 4-62: Wildfire Hazard Areas in Sawmills

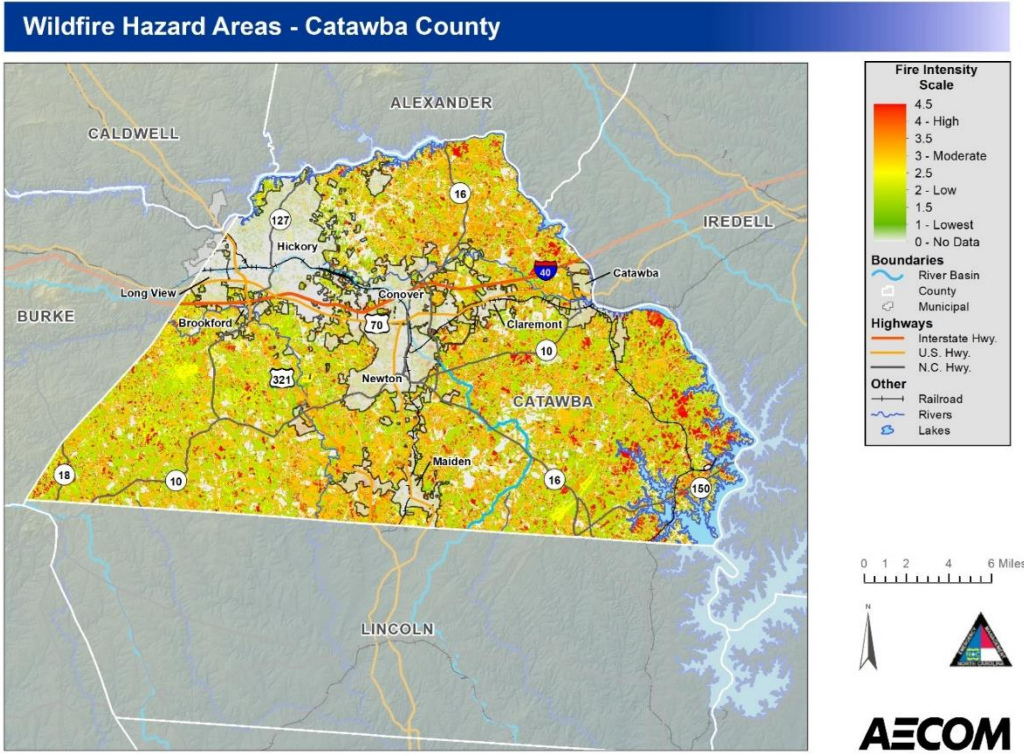


Figure 4-63: Wildfire Hazard Areas in Catawba County

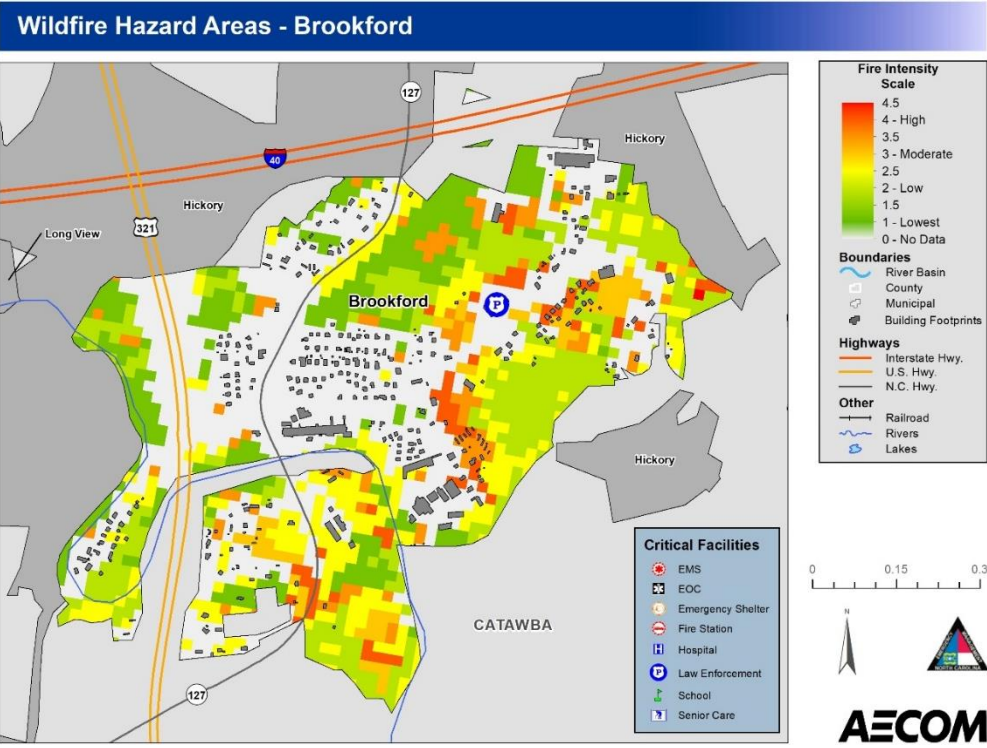


Figure 4-64: Wildfire Hazard Areas in Brookford

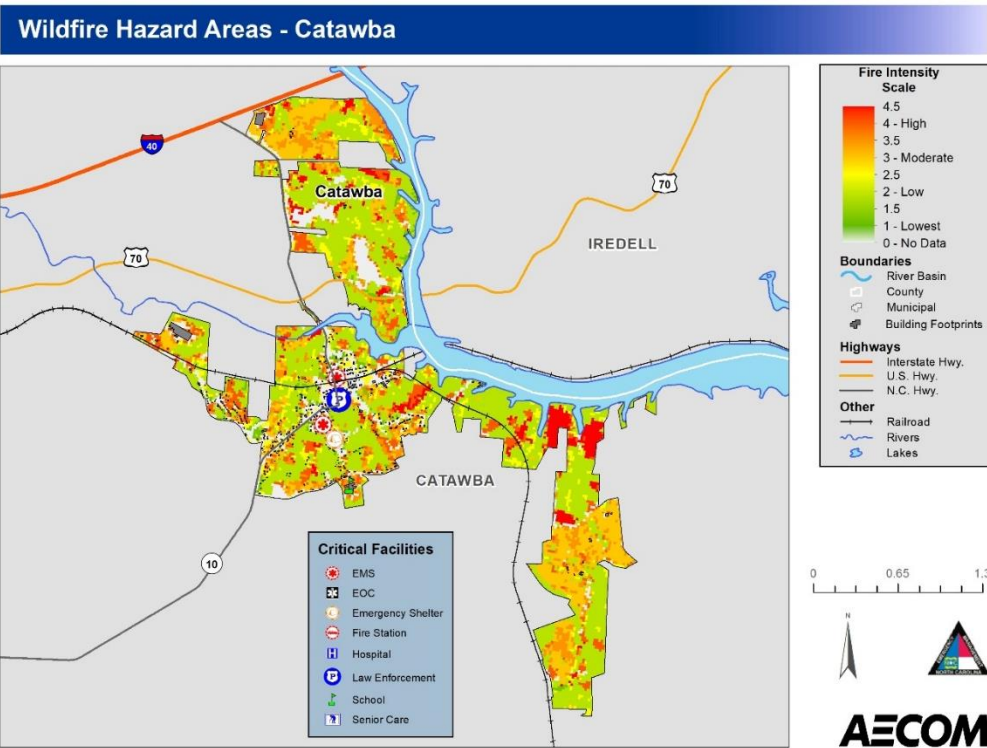


Figure 4-65: Wildfire Hazard Areas in Catawba

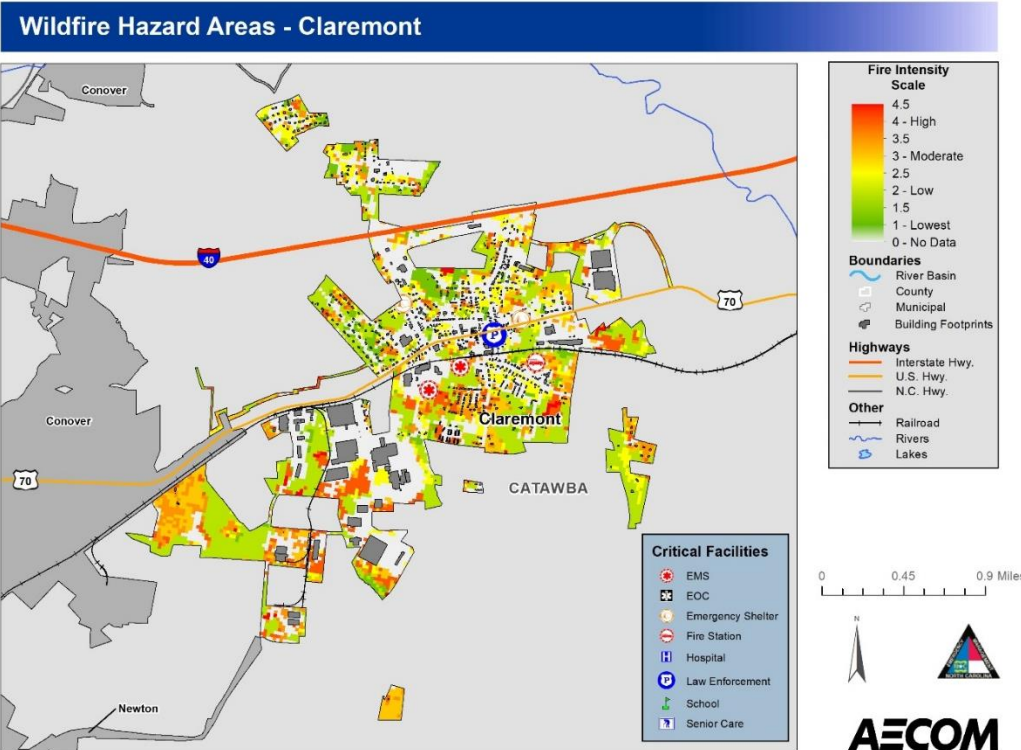


Figure 4-66: Wildfire Hazard Areas in Claremont

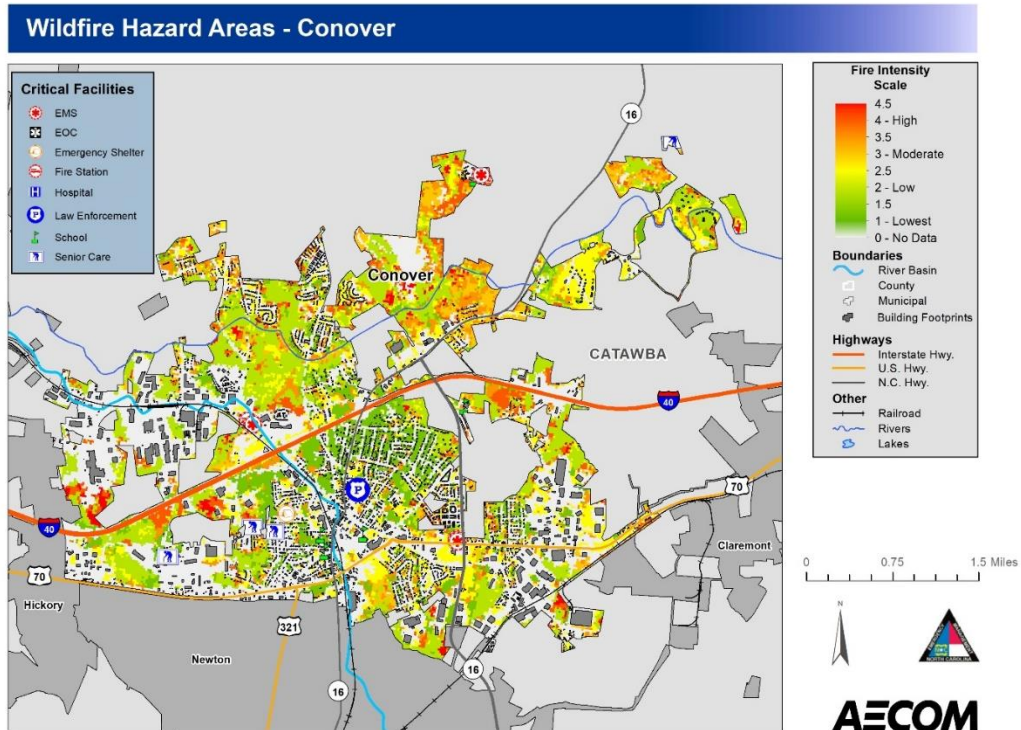


Figure 4-67: Wildfire Hazard Areas in Conover

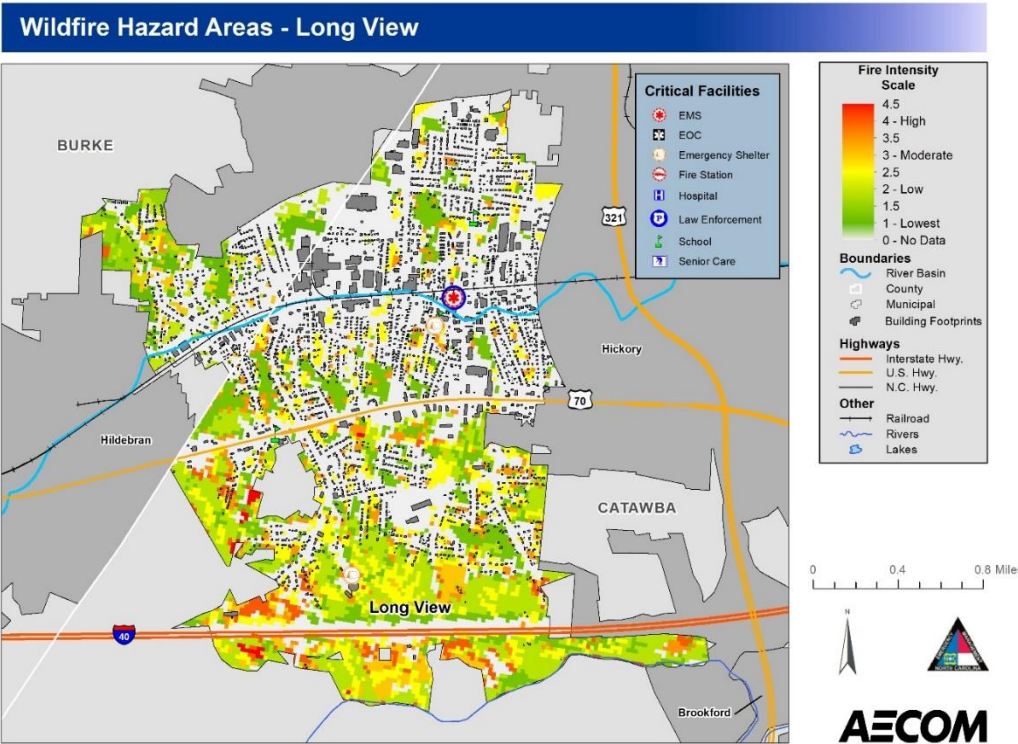


Figure 4-68: Wildfire Hazard Areas in Long View

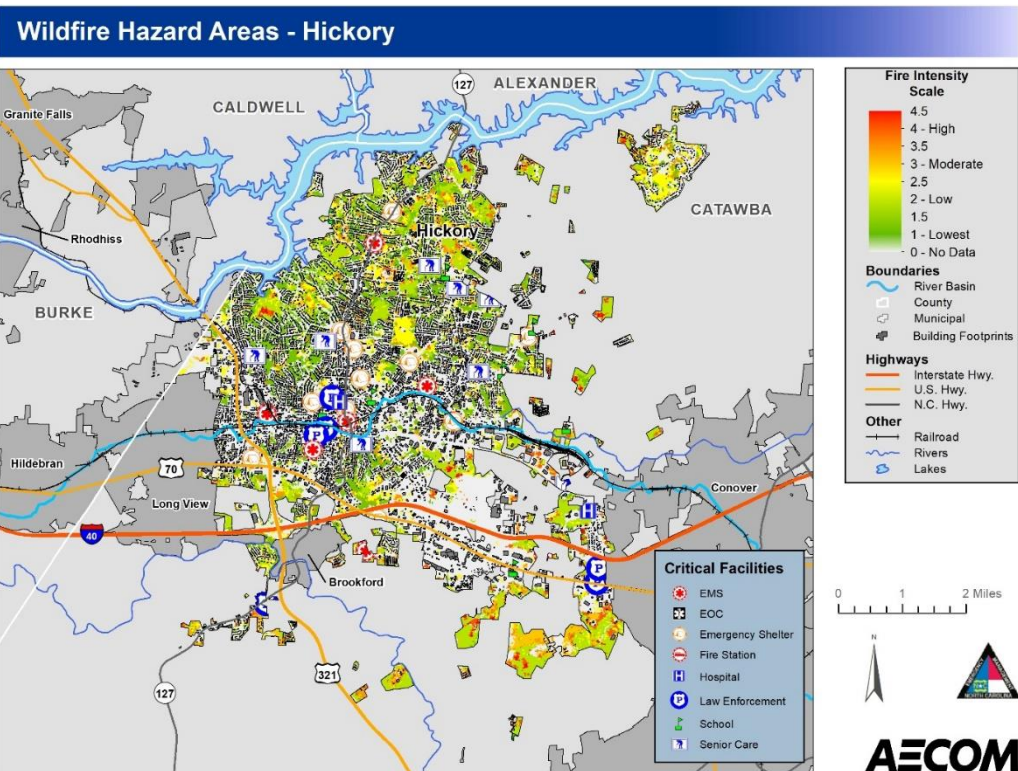


Figure 4-69: Wildfire Hazard Areas in Hickory

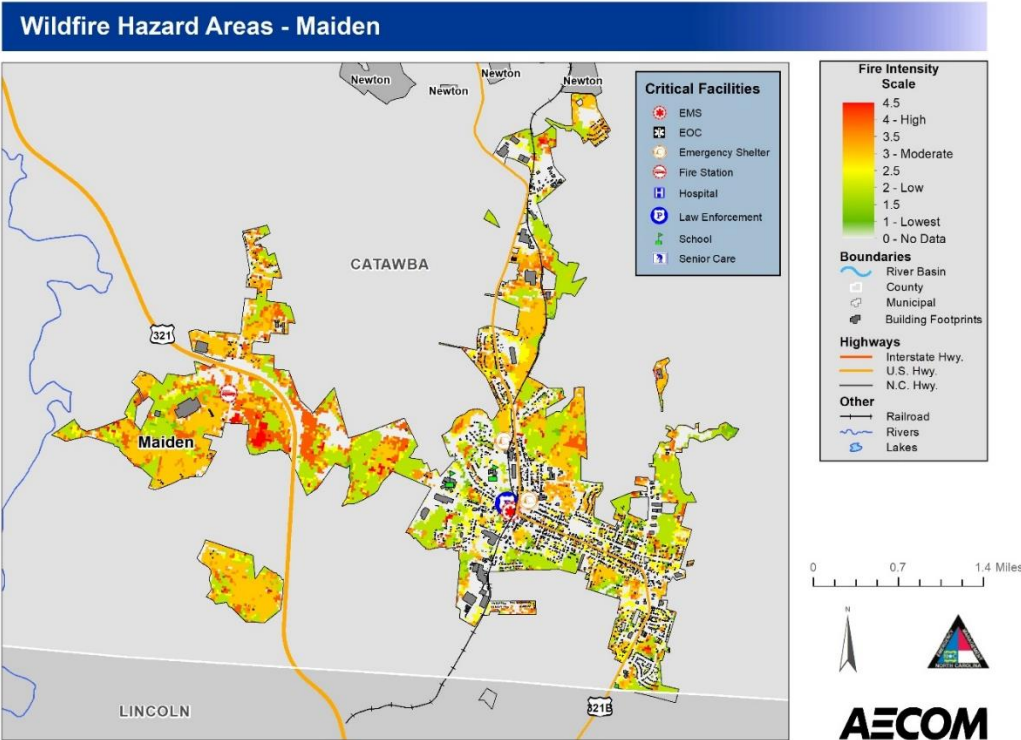


Figure 4-70: Wildfire Hazard Areas in Maiden

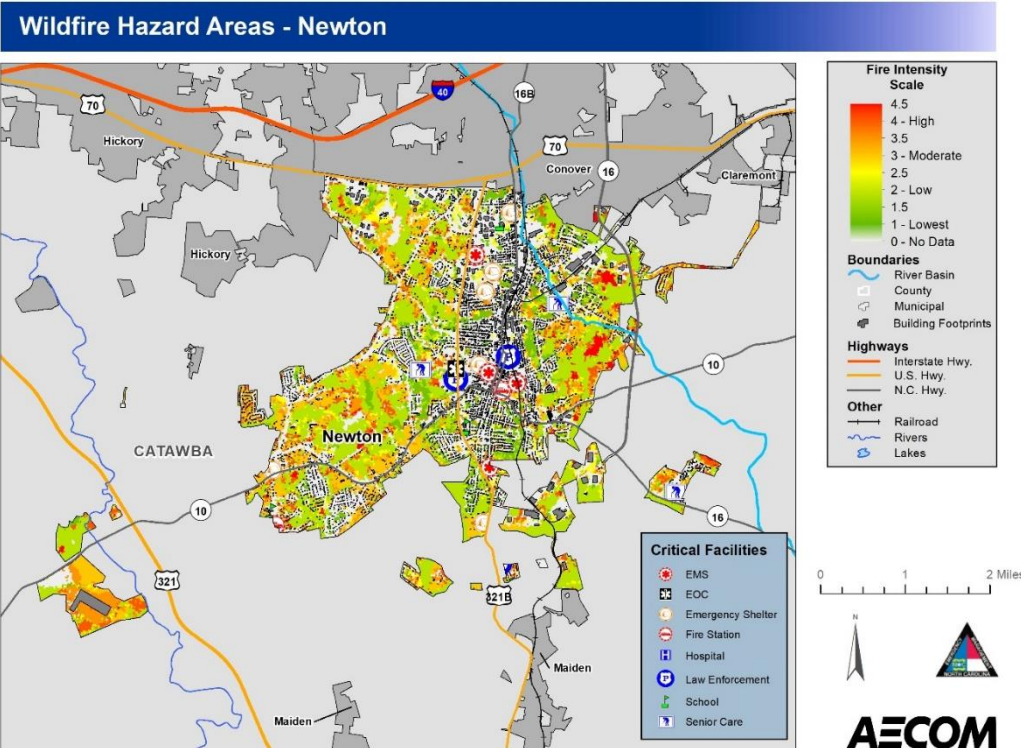


Figure 4-71: Wildfire Hazard Areas in Newton

Table 4-23: Incident summary from incidents between 2023 and 2018 from the National Interagency Fire Center²³

County	2018-2023	2018-2023		
	5-Year Average Number of Fires	5-Year Average Number of Acres Burned	Total Number of Wildfires	Total Acres Burned
Alexander	0	0	0	0
Burke	3	18.79	15	21.95
Caldwell	0.6	19.14	3	74
Catawba	0	0	0	0
TOTAL	3.2	19.19	16	95.95

4.5.4.3. Historical Occurrences

There have been 35 incidents of wildfire reported to the National Interagency Fire Center²⁴ between 2014 and 2023. The reported causes of the fires varied, with 9 starting from undetermined causes, 21 starting because of humans, and 5 starting from natural causes. The total estimated costs were approximately \$6,063,696 and the reported fires burned over 13,285.95 acres, with the average number of acres burned per year for the last ten years at 1,328 acres.

Table 4-24: Significant reported wildfires between 2014 and 2023 in the Unifour Counties according to the National Interagency Fire Center²⁵

Incident Name	Discovery Date	Fire Out Date	County	City	Fire Cause	Acres	Estimated Cost
Chestnut Knob	11/6/2016		Burke	Morganton	Undetermined	6,435	\$4,600,000
White Creek	3/16/2017	4/13/2017	Burke		Natural	5,500	\$937,840
Blue Gravel	4/11/2015	4/24/2015	Burke		Undetermined	521	\$264,194

²³ Wildland Fire Interagency Geospatial Services. (2024). Wildland fire incident locations [Dataset]. In National Interagency Fire Center, NIFC Open Data Site. National Interagency Fire Center. https://data-nifc.opendata.arcgis.com/datasets/b4402f7887ca4ea9a6189443f220ef28_0/explore?location=0.000000%2C0.000000%2C1.93&showTable=true

²⁴ Wildland Fire Interagency Geospatial Services. (2024). Wildland fire incident locations [Dataset]. In National Interagency Fire Center, NIFC Open Data Site. National Interagency Fire Center. https://data-nifc.opendata.arcgis.com/datasets/b4402f7887ca4ea9a6189443f220ef28_0/explore?location=0.000000%2C0.000000%2C1.93&showTable=true

²⁵ Wildland Fire Interagency Geospatial Services. (2024). Wildland fire incident locations [Dataset]. In National Interagency Fire Center, NIFC Open Data Site. National Interagency Fire Center. https://data-nifc.opendata.arcgis.com/datasets/b4402f7887ca4ea9a6189443f220ef28_0/explore?location=0.000000%2C0.000000%2C1.93&showTable=true

Incident Name	Discovery Date	Fire Out Date	County	City	Fire Cause	Acres	Estimated Cost
Silver Creek	12/13/2014		Burke		Undetermined	300	\$3,362
Henry Fork	4/15/2024		Burke	Salem	Undetermined	211	\$3,000
Upper Creek	6/7/2016	7/2/2016	Burke		Natural	169	\$250,000
Corn Field	3/17/2018	3/22/2018	Caldwell		Human	42	
Rackett Branch	3/5/2022	3/17/2022	Caldwell		Human	30	
McNab	4/18/2017	4/28/2017	Burke		Human	25	
Babel Tower	4/25/2023	8/8/2023	Burke		Natural	12	

4.5.4.4. *Probability of Future Occurrences*

Table 4-25: NRI Frequency, Risk Rating, and Historic Loss Ratio for Wildfires

County	EAL	Risk Index Rating	Frequency (% Chance per Year)	Historic Loss Ratio
Alexander	\$27,000	Very Low	0.016%	Relatively Low
Burke	\$64,000	Relatively Low	0.034%	Relatively Low
Caldwell	\$76,000	Very Low	0.029%	Relatively Low
Catawba	\$62,000	Very Low	0.007%	Relatively Low

EAL – Expected Annual Loss

Based on the analyses performed in iRISK, the probability of future Wildfire is shown in the table below, by jurisdiction.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

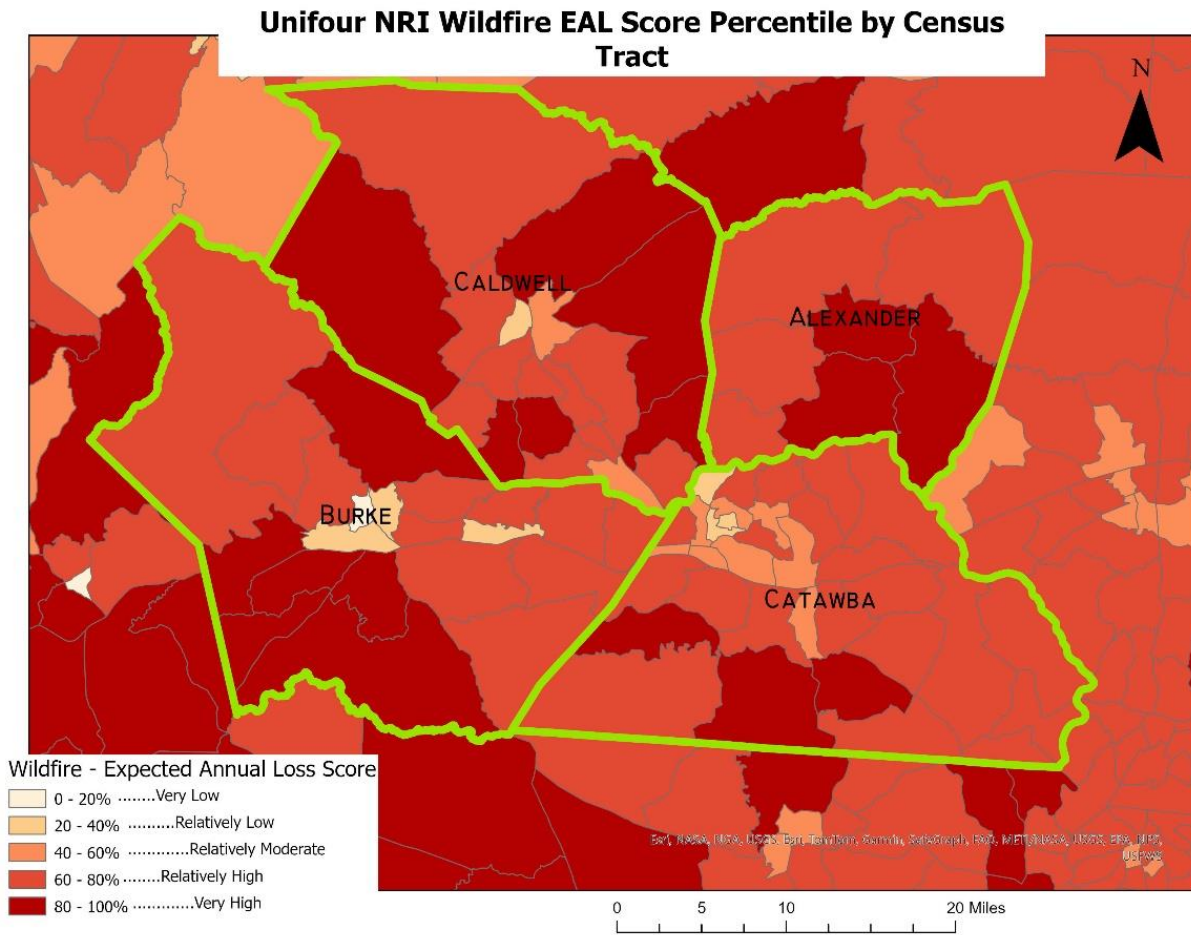


Figure 4-72: Unifour NRI Wildfire EAL Score by Census Tract

Table 4-26: iRisk Probability of Future Wildfire Occurrences

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Medium
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	Medium
Catawba County (Unincorporated Area)	Medium
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Medium
City of Morganton	Low
City of Newton	Low

Jurisdiction	iRISK Probability of Future Occurrence
Town of Brookford	Low
Town of Cahj's Mountain	Medium
Town of Catawba	Medium
Town of Connelly Springs	Medium
Town of Drexel	Medium
Town of Gamewell	Medium
Town of Glen Alpine	Low
Town of Granite Falls	Medium
Town of Hildebran	Medium
Town of Hudson	Medium
Town of Long View	Low
Town of Maiden	Medium
Town of Rhodhiss	Medium
Town of Rutherford College	Medium
Town of Sawmills	Medium
Town of Taylorsville	Medium
Town of Valdese	Low
Village of Cedar Rock	Medium

iRISK = An interactive, Web-based risk-assessment tool

4.5.4.5. *Wildfire Hazard Vulnerability*

Wildfires can cause significant damage to property and threatens the lives of people who are unable to evacuate wildfire-prone areas. Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. Further, 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. 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.

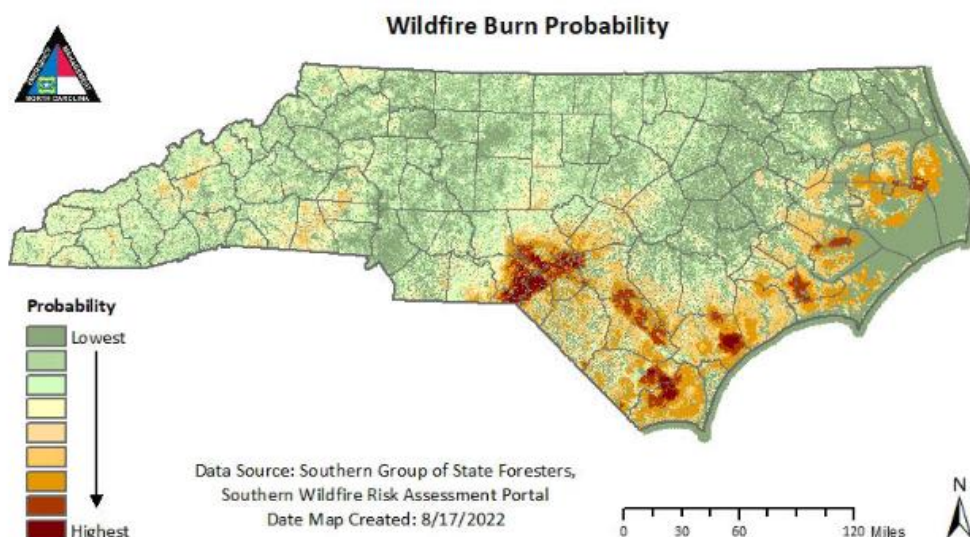


Figure 4-73: Wildfire Burn Probability for NC from the 2023 NC HMP

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, such as reduced air quality by means of wildfire smoke and ash. The areas of the state with the largest wildfire hazard occurrence that are also within the most exposed regions. Many areas in the eastern and western part of the state have high risk for wildfire since there are large, forested areas in these regions. However, some counties in the central part of the state also have higher risk. Still, a county’s exposure score plays a major role and counties with high exposure and high wildfire risk score highest. Figure 4-73 shows wildfire hazard vulnerability scores by county for the state of North Carolina. To view a more detailed analysis of vulnerability of buildings, population, and high-risk buildings, see wildfire vulnerability tables in Appendix H.

Figure 4-73 shows the areas in NC with a high probability of experiencing wildfires according to the Southern Wildfire Risk Assessments Burn Probability Index updated in 2022.²⁶

The Characteristic Fire Intensity Scale (FIS)²⁷ identifies areas where fuel hazards and where there is potential for dangerous fires based on wind, weather, and fuel conditions. The FIS utilizes a scale that measures potential wildfire intensity in 5 classes of magnitude. These classes are defined as:

²⁶ North Carolina Emergency Management & North Carolina Department of Public Safety. (2022). State of North Carolina 2023 Hazard Mitigation Plan. In ncdps.gov. NC Department of Public Safety. <https://www.ncdps.gov/20230125-2023-nc-shmp-final-publicpdf/open>

²⁷ Pyrologix. (2023). Characteristic Fire Intensity Scale [Dataset]. In Southern Wildfire Risk Assessment Portal. Southern Wildfire Risk Assessment.

Table 4-27: FIS Scale descriptions

Scale Class	Description
1	Very Low: Very small, discontinuous flames less than 1 ft in length, low rate of spread. Easy to suppress with basic firefighting training
2	Low: Small flames less than 2 ft long, short range spotting possible.
3	Moderate: Flames up to 9 ft long, short range spotting possible, and trained firefighters would have difficulty suppressing these wildfires without aircraft support. This increases potential for harm, damage to property, and potentially life-threatening injuries.
4	High: Large flames up to 40 ft in length, medium range spotting is possible, and trained firefighters, engines, and dozers can be ineffective. Direct attack may be effective, and there is a significant potential for harm, serious injury, and damage to property.
5	Very High: Flames exceeding 200 ft in length with extreme fire behavior.

FIS = Fire Intensity Scale

ft = foot

The FIS ratings for each count are presented in the table below and are represented with ½ class increments to help visualize the distribution of total area within each class of the FIS.

Table 4-28: FIS percentage of total county area in each category of fire intensity potential.

Characteristic Fire Intensity Scale Category	Alexander	Burke	Caldwell	Catawba
0	17.4 %	13.2 %	12.1 %	31.4 %
1	3.6 %	6.3 %	4.8 %	6.5 %
1.5	24.5 %	23.3 %	17.1 %	26.1 %
2	14.9 %	23.7 %	22.3 %	10.0 %
2.5	9.4 %	10.8 %	17.3 %	0.7 %
3	24.5 %	10.7 %	11.5 %	22.5 %
3.5	2.7 %	4.9 %	3.3 %	1.7 %
4	2.7 %	5.1 %	6.5 %	1.1 %
4.5	0.2 %	1.8 %	4.7 %	0.0 %
5	0.0 %	0.1 %	0.4 %	0.0 %
> 5	0.0 %	0.0 %	0.0 %	0.0 %

4.5.4.6. *Future Vulnerability: Problem Statement*

People

There is potential for health risks associated with wildfire events which diminish air quality and can cause serious health problems with individuals with health problems such as asthma, heart conditions, or lung diseases. This may also impact citizens who don't have a disability and create health issues such as respiratory issues, sore throat, or eye itchiness. The proportion of individuals with a disability is 17.1% in Alexander County, 20.4% in Burke County, 18.8% in Caldwell County, and 14.0% in Catawba County, and these individuals may be at an increased risk of being disproportionately impacted by wildfire events in terms of health impacts and preexisting vulnerabilities. To address the potential risk to residents associated with wildfires, the jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability and improve resilience:

- Educate the public about health impacts of wildfires and guidance for those with specific preexisting health conditions.
- Develop emergency health protocol to treat and support those who are at an increased risk of being impacted by wildfire related air quality issues in the event of a wildfire.

Changes in Development or Housing Characteristics

Alexander County has reported a 4.33% increase and Catawba County has reported a 3.62% increase in total housing units between 2018 and 2023, (See Table 3-6). In addition, Catawba county has a projected increase in population of 15.8% between 2022 to 2042 and aims to increase housing units significantly to support an increase of residents. Burke County aims to develop policies that encourage higher density developments to support the development of new housing and encourage relocation or new arrivals. Caldwell County is updating their zoning and subdivision regulations to ensure they are compatible for land use and plans to expand their inventory of available properties through the county to encourage commercial development projects and new amenities that attract new residents.

The changes stated in the Comprehensive Plans of the planning area and projected increase in potential for rapid growth demonstrate that there may be challenges associated with development in high wildfire hazard areas, (indicated in Figure 4-43, Figure 4-44, Figure 4-46, Figure 4-54, Figure 4-63, Figure 4-72, Figure 4-73). Therefore, there should be special precautions taken to prevent development in high hazard areas and if it cannot be prevented, there should be special precautions taken to increase preparedness of individuals in the high hazard areas. To address the potential risk to residents associated with wildfires, the jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability and improve resilience:

- Improve zoning regulations to include restrictions or limitations of development in areas that are at an increased risk of experiencing wildfires.
- Educating the public about wildfire risk and preparedness strategies for homeowners in the planning area.

- Invest in improved infrastructure that allows an increased access to water supply systems which supports expanded firefighting capabilities.
- Require new developments to create a wildfire risk assessment in high wildfire hazard areas.
- Mandate defensible space surrounding new developments in high wildfire risk areas.

Economy

Each County in the planning area aims to attract new residents and increase economic development. Catawba County is aiming to focus on organized development and future land use planning to accommodate future growth, including economic growth. Caldwell County aims to attract new residents through various goals that will support development and alter current and future land use goals. According to the Burke County Blueprint Burke Strategic Use Plan, growth and development in Burke County are projected to be predominantly located around the incorporated areas along the I-40 corridor and US-70 urban corridor, where there is water and sewer infrastructure in place to support further development. Alexander County aims to support increased population, and new residents can provide benefits such as a larger tax base, increased workforce, and attract new businesses and industries. As a result of this projected or encouraged economic growth and development, there is potential for economic disruption due to wildfire hazards that may impact new development, tourism, or critical infrastructure that are needed to facilitate activities associated with economic growth. To address the potential risk to residents associated with wildfires, the jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability and improve resilience:

- Provide education for businesses in the area to consider potential impacts or disruptions due to wildfire hazard areas.

Natural Environment

Wildfire causes damage to the natural environment by killing vegetation and destroying habitat area. The risk of flood or debris is also increased after a wildfire due to the decrease in vegetation, and secondary impacts of wildfires include erosion, landslides, reduction of water quality, habitat fragmentation, and habitat degradation.

- Provide wildfire prevention training and education for residents in the planning area to avoid negative impacts due to wildfire occurrence.

First Responders

First Responders are at significant risk of serious injury and even potentially life-threatening injuries when rescuing people stuck in dangerous or life-threatening situations associated with wildfires. Wildfires may also reduce capabilities for emergency response in surrounding areas.

- Consider providing annually occurring wildfire training for first responders.
- Establish clear evacuation routes and procedures, including designated shelters and transportation options for vulnerable populations.

Continuity of Operation

Wildfires can result in impacted continuity of operations because of potential power outage, damaged or dangerous roads, reduced access to critical facilities impacted by wildfire, and reduced access to emergency equipment.

- Periodically review inventory of critical resources, including personnel, equipment, and supplies, necessary for continued operations during wildfire events.
- Schedule regular reviews and updates of COOP plans based on new risks, lessons learned from past wildfire events, and changes in operations.
- Develop robust communication plans to keep staff informed during wildfire events, including alerts, updates, and instructions.

Table 4-29 represents the NRI exposure values for each county, where exposure is defined as “the representative value of buildings (in dollars), population (in both people and population equivalence dollars), or agriculture (in dollars) potentially exposed to a natural hazard occurrence”. Table 4-30 below represents the value of agriculture, value of buildings, and amount of people, with a population equivalence value, which are potentially vulnerable to wildfires.

4.5.4.7. NRI Risk Values

Table 4-29: NRI Expected Annual Loss, Frequency, Risk Index Value, and Risk Index Score for Wildfires.

County	Expected Annual Loss	Frequency % Chance per Year	Risk Index Value	Risk Index Score
Alexander	\$27,000	0.016%	Very Low	47.6
Burke	\$64,000	0.034%	Very Low	60
Caldwell	\$76,000	0.029%	Very Low	62.2
Catawba	\$62,000	0.007%	Very Low	59.2

Table 4-30: Exposure values for Wildfires from the NRI

County	Agriculture Value	Population Amount	Population Equivalence Value	Building Value	Total Value (With Population Equivalence Value)
Alexander	\$12,650,115	2,180.76	\$25,296,867,060	\$379,833,873	\$25,689,351,048
Burke	\$4,597,847	2,861.79	\$33,196,799,615	\$328,994,710	\$33,530,392,172
Caldwell	\$3,601,662	3,339.27	\$38,735,532,747	\$526,553,187	\$39,265,687,596
Catawba	\$7,914,444	14,105.36	\$163,622,226,553	\$2,913,887,050	\$166,544,028,047
Total Value	\$28,764,068	22,487	\$260,851,425,975	\$4,149,268,820	\$265,029,458,863

4.5.4.8. *Climate Change*

According to the North Carolina Climate Science Report, higher annual and seasonal average temperatures and associated increases in drying rates will lead to an increased likelihood of conditions conducive to wildfires.

While there has been a long-term upward trend in the number of wildfires in North Carolina, the total acreage burned has shown a downward trend. Increases in the number of wildfires will nevertheless pose a major risk for human health and emergency services, putting more lives at risk of fire related injuries, fatalities, and property losses. It is likely that future droughts in their multiple forms in North Carolina will be more frequent and intense due to higher temperatures leading to increased evaporation, therefore, it is likely the frequency of climate conditions conducive to wildfires in North Carolina will increase.

Wildfire risk is greatest among potentially underserved communities in the southern and western regions of the state due to large wildland areas and limited warning and response capabilities. The North Carolina State Hazard Mitigation Plan lists Burke and Catawba Counties in the Unifour Region among those counties likely to be most affected by an increased risk from wildfires.

4.5.5. **Tornado**

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 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 to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and can cause extreme destruction and turning normally harmless objects into deadly missiles.

Tornados are more likely to occur during the spring and early summer months of March through June and can occur at any time of day but are 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.






Waterspouts are weak tornadoes that form over warm water and are most common along the Gulf Coast and southeastern states. Waterspouts occasionally move inland, becoming tornadoes that cause damage and injury. However, most waterspouts dissipate over the open water causing threats only to marine and boating interests. Typically, a waterspout is weak and short-lived, and because they are so common, most go unreported unless they cause damage.

Tornados are more likely to occur during the spring and early summer months of March through June and can occur at any time of day but are 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 damages to structures of light construction such as residential homes (particularly mobile homes) and tend to remain localized in impact. Table 4-31 shows the Enhanced Fujita Scale for Tornadoes which was developed to measure tornado strength and associated damages. 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. Figure 4-74 shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

Table 4-31: Enhanced Fujita Scale for Tornadoes²⁸

Storm Category	Damage Level	3 Second Gust (mph)	Description of Damages	Photo Example
EF0	Gale	65–85	Some damage to chimneys; breaks branch off trees; pushes over shallow-rooted trees; damages to sign boards	
EF1	Weak	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 might be destroyed.	
EF2	Strong	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.	

²⁸ US Department of Commerce, N. (2024, January 31). The Enhanced Fujita Scale (EF scale). National Weather Service. <https://www.weather.gov/oun/efscale>

Storm Category	Damage Level	3 Second Gust (mph)	Description of Damages	Photo Example
EF5	Incredible	200+	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.	

mph = miles per hour

The tornadoes associated with tropical cyclones are most frequent in September and October when the incidence of tropical storm systems is greatest. This type of tornado usually occurs around the perimeter of the storm, and most often to the right and ahead of the storm path or the storm center as it comes ashore. These tornadoes commonly occur as part of large outbreaks and generally move in an easterly direction.

4.5.5.1. Location within the Planning Area

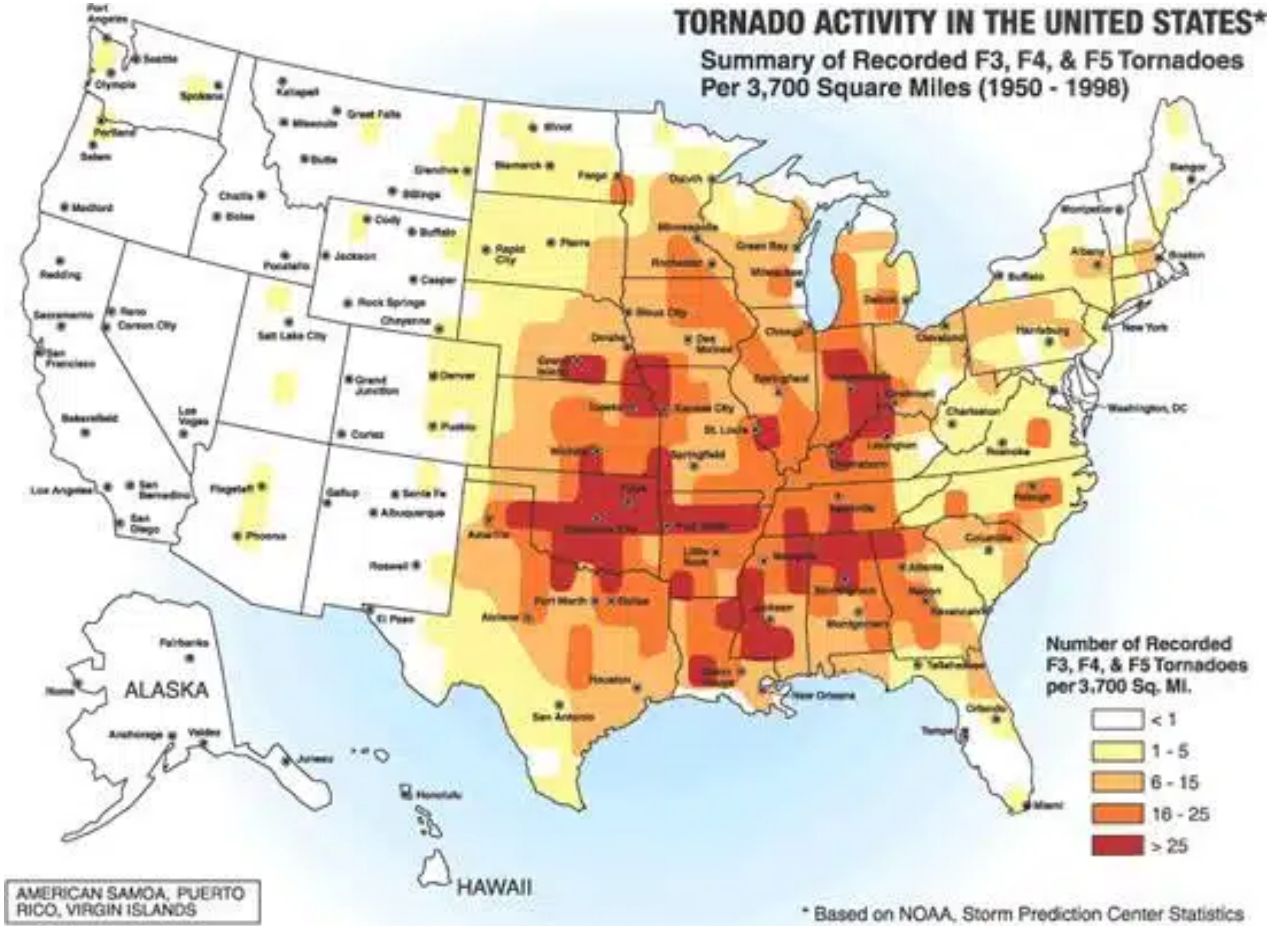


Figure 4-74: Tornado Activity in the United States. Source: American Society of Civil Engineers

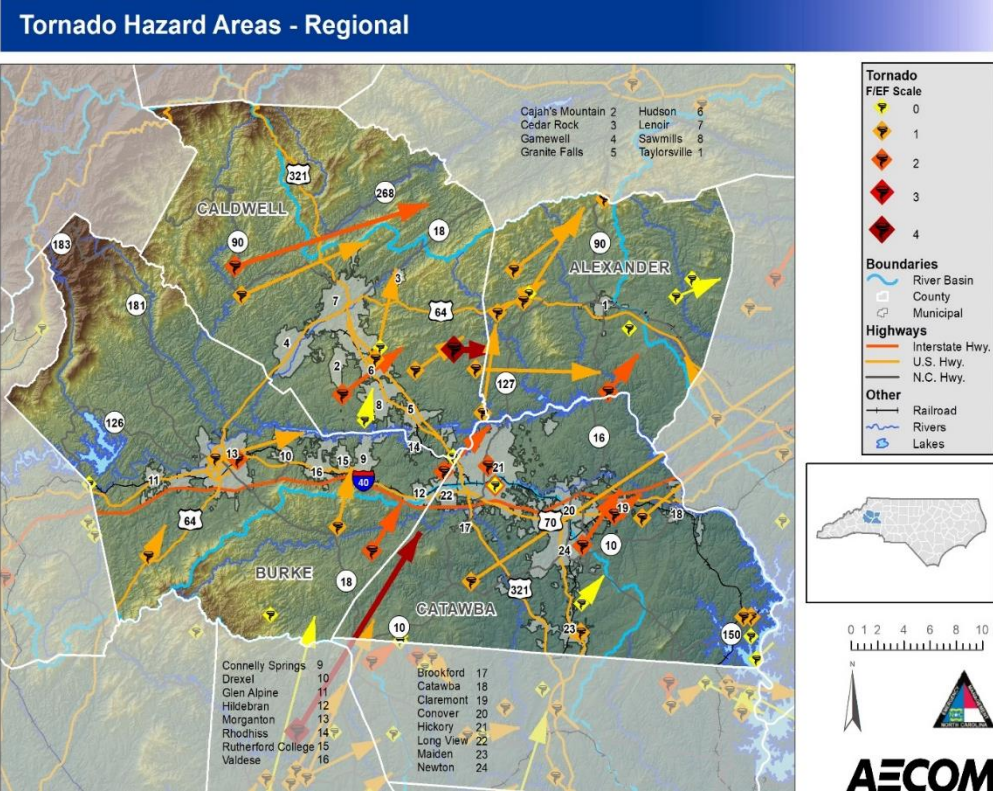


Figure 4-75: Historic Tornado Point Locations and Damage Paths in the Unifour Region (1951-2024)

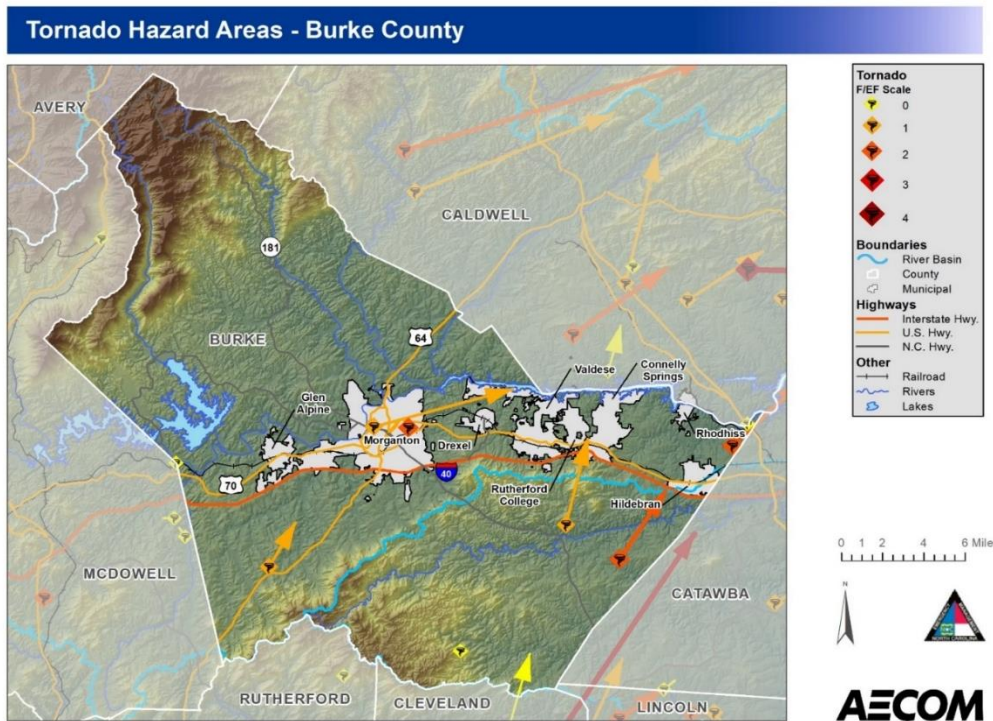


Figure 4-76: Tornado Hazard Areas for Burke County

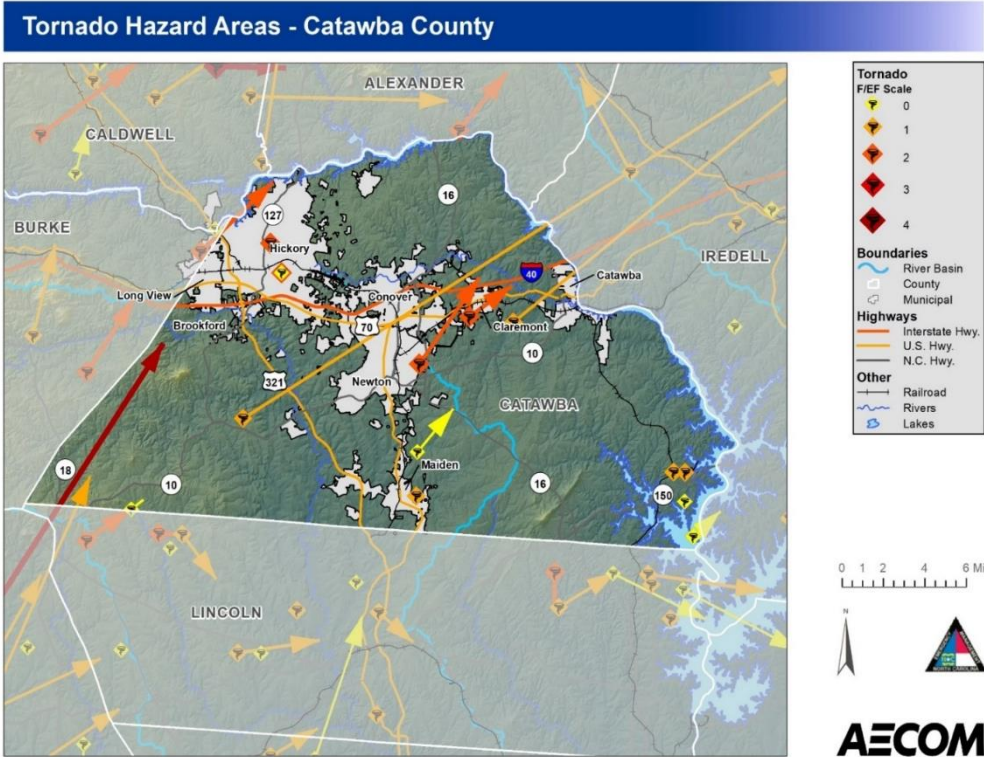


Figure 4-77: Tornado Hazard Areas for Catawba County

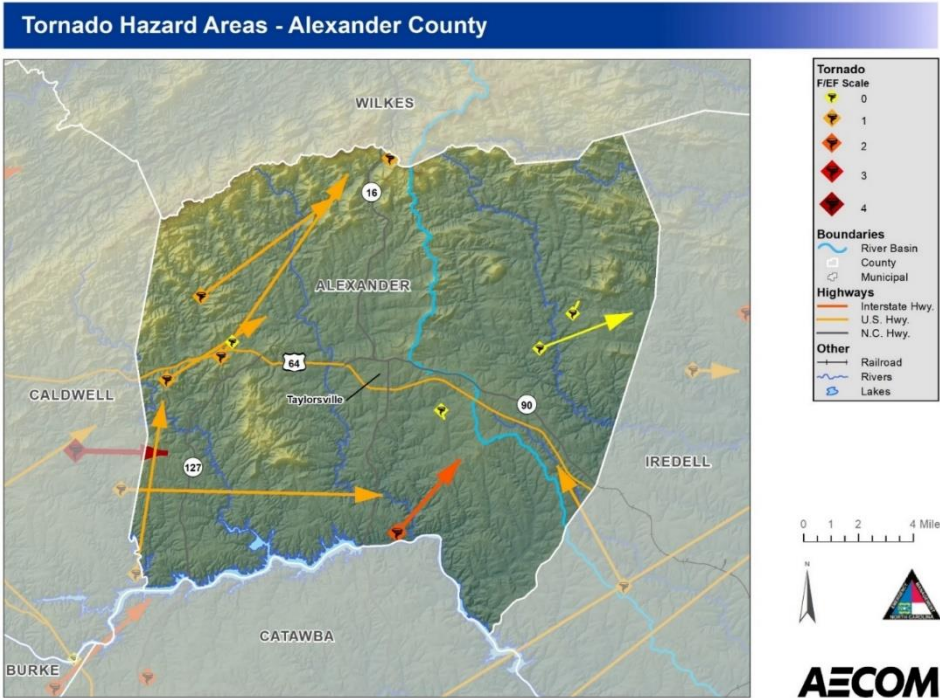


Figure 4-78: Tornado Hazard Areas for Alexander County

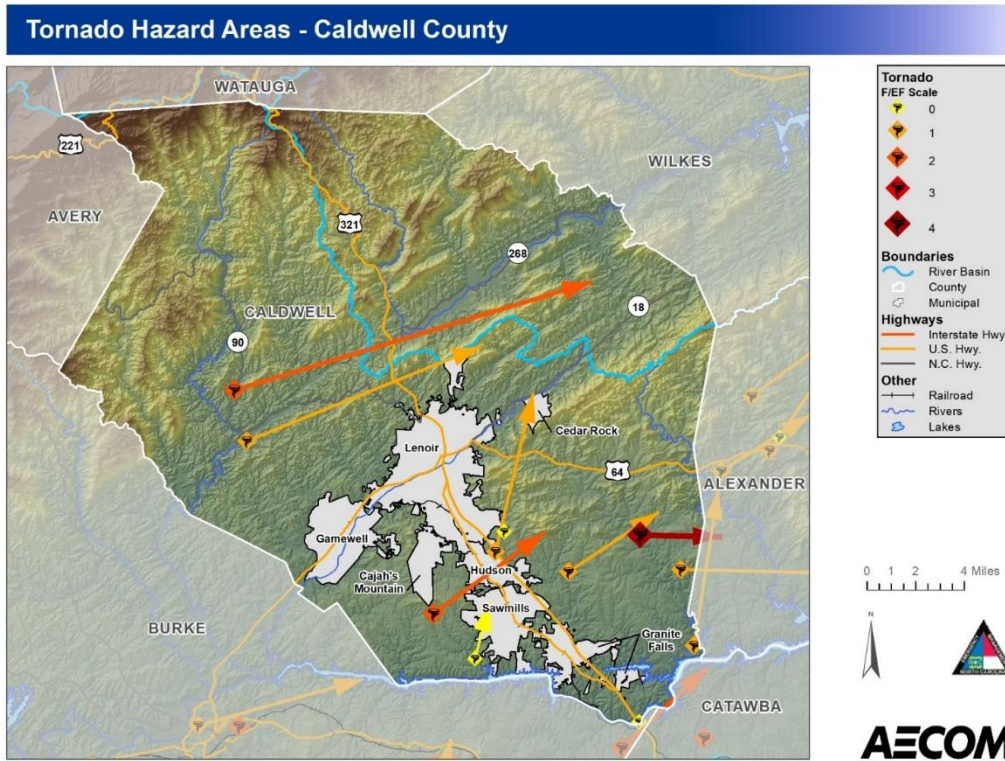


Figure 4-79: Tornado Hazard Areas for Caldwell County

Tornadoes are unpredictable manifestations and are not isolated to a specific geographic location. Therefore, it is assumed that the entire planning area is exposed to this hazard.

4.5.5.2. Extent (Magnitude and Severity)

Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale.

Extent Event:

Tornadoes of any magnitude and severity are possible within the planning area. Since 1951, the highest magnitude tornado to impact the Unifour Region has been an F4 on the Fujita Scale for Tornado Damage which has occurred on 05/05/1989 in Catawba County (Unincorporated Area) and on 05/07/1998 in Caldwell County (Unincorporated Area). The following table provides the **highest recorded** events in the jurisdictions below. The other jurisdictions not listed below had no occurrences within the jurisdictional boundaries according to the NCDC.

Table 4-32: Highest magnitude tornados in the Planning area occurred between 1951-2017

Location	Date	Magnitude
Alexander County (Unincorporated Area)	3/5/83	F1
Burke County (Unincorporated Area)	9/27/10	EF1
Burke County (Unincorporated Area)	10/8/17	EF1
City of Morganton	5/24/79	F2

Location	Date	Magnitude
Caldwell County (Unincorporated Area)	5/7/98	F4
Town of Hudson	7/9/77	F0
Town of Sawmills	10/8/17	EF0
Catawba County (Unincorporated Area)	5/5/89	F4
City of Claremont	10/26/10	EF2
City of Hickory	8/9/51	F2
City of Newton	8/18/54	F2
Town of Maiden	5/23/73	F1

4.5.5.3. Historical Occurrences

Between 2013 and 2023, there have been 14 reports of tornados in the Unifour Counties which have a total associated property damage value of \$2,506,000 and no injuries or deaths reported to be associated with the tornados, according to the NCDC Storm Events Database.

The historical occurrences ranging from 2013 to 2023 have been identified based on the NCDC Storm Events database (Table 4-33) and can be viewed in the NCDC Storm Events Database. It should be noted that only those historical occurrences listed in the NCDC database are shown here and that other, unrecorded, or unreported events may have occurred within the planning area during this timeframe.

Table 4-33: Tornados Reported by the NCDC Storm Events Database between 2013-2023 in the Unifour Counties²⁹

County	Location	Date	Magnitude	Reported Property Damage
Catawba	Duan	5/1/2017	EF0	\$10,000
Burke Co.	Camp Creek	10/8/2017	EF0	\$1,000
	Connelly Springs		EF1	\$150,000
Caldwell	Baton	10/8/2017	EF0	\$10,000
	Hudson		EF1	\$300,000
Catawba	Plateau	10/23/2017	EF0	\$0
Burke	Hickory Municipal Airport		EF2	\$1,500,000
Catawba	Longview	10/23/2017	EF1	\$500,000
Caldwell	Grace Chapel			\$0
Alexander	Bethlehem	4/19/2019	EF1	\$0
	All Healing Springs			\$0
	Smith's Store	8/17/2021	EF0	\$5,000
	Stony Pt	3/23/2022	EF1	\$5,000
	All Healing Springs		EF1	\$25,000

²⁹National Oceanic and Atmospheric Administration [NOAA]. (n.d.). Storm Events Database (By National Center for Environmental Information [NCEI]). National Center for Environmental Information. <https://www.ncdc.noaa.gov/stormevents/>

According to the NCDC Storm Event Database, between 1950 and 2023 there have been 50 recorded instances of tornados in the Unifour Counties. These 50 reported events have caused an estimated \$52,618,500 in property damage, \$0 in crop damages, 0 deaths, and 17 injuries. The highest magnitude tornado on record is an EF4 and the lowest magnitude tornado on record is an EF0.

4.5.5.4. Probability of Future Occurrences

Table 4-34: Tornado NRI EAL Values, Ratings, Risk Index Score and Rating, Frequency, and Historic Loss Ratio for Unifour Counties

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$872,000	\$5.2 Million	\$2.2 Million	\$1.6 Million
	Rating	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively Low
Risk Index	Score	48.2	89.2	74.8	66.7
	Rating	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively Low
Frequency (Events per Year)		0.1	0.2	0.2	0.2
Historic Loss Ratio		Relatively Moderate	Relatively Moderate	Relatively Moderate	Relatively Low

Definitions for Descriptors Used for Probability of Future Hazard Occurrences:

Based on the analyses performed in iRISK, the probability of future Tornado is shown in the table below, by jurisdiction:

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-35: iRISK Probability of Future Occurrences

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Low
Caldwell County (Unincorporated Area)	Low
Catawba County (Unincorporated Area)	Low
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Low
City of Morganton	Low

Jurisdiction	iRISK Probability of Future Occurrence
City of Newton	Low
Town of Brookford	Low
Town of Cahah's Mountain	Low
Town of Catawba	Low
Town of Connelly Springs	Low
Town of Drexel	Low
Town of Gamewell	Low
Town of Glen Alpine	Low
Town of Granite Falls	Low
Town of Hildebran	Low
Town of Hudson	Low
Town of Long View	Low
Town of Maiden	Low
Town of Rhodhiss	Low
Town of Rutherford College	Low
Town of Sawmills	Low
Town of Taylorsville	Low
Town of Valdese	Low
Village of Cedar Rock	Low

4.5.5.5. *Tornado Hazard Vulnerability*

All the inventoried assets in the Unifour Region are exposed to potential tornado activity. Any specific vulnerability of individual assets would depend greatly on individual design, building characteristics, and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future updates. To view buildings, population, and high loss buildings vulnerable to tornados, see Appendix H for an analysis of tornado vulnerability for EF4 tornados.

4.5.5.6. *Future Vulnerability: Problem Statement*

People

Tornados often have rapid onset which reduce the ability for the impacted areas to seek shelter. Tornados can cause severe injury because of direct tornado impact or due to debris associated with the tornado event. Tornados often damage power lines, create gas leaks, or create electrical system malfunction or failure, leading to risk of fire, electrocution, or explosions.

Because tornados have such a rapid onset they can create disproportionately hazardous situation to those without adequate telephone service in their housing units (Alexander County at 1.3%, Burke County at 1.1%, Caldwell County at 1.6%, and Catawba County at 1.3% of the

total population) who have limited ability to receive alerts about tornado hazards or those who reside in RVs, mobile homes, or Vans as their primary residence which are at an increased risk of damage due to the construction of these housing units, and these housing units account for 25.9 % in Alexander County, 20.4% in Burke County, 17.1% in Caldwell County, and 13.1% in Catawba County of the total housing units, from Table 3-5.

Having limited access to telephone services creates a significant disproportionate impact during tornado hazards and households that reside in pre-manufactured homes, such as mobile homes or RVs, are also especially vulnerable to being disproportionately impacted by tornado hazards. Potential mitigation actions that jurisdictions in the planning area should consider addressing potential vulnerability of residents include:

- Conduct periodic review of risk of vulnerable populations to address projected increases in population and development and appropriately prepare for tornado hazards in those areas.
- Conduct regular evaluations to ensure all community members, particularly underserved populations, have equitable access to resources and support.
- Consider constructing tornado shelters in areas with large percentages of vulnerable housing types.
- Work with telephone and internet service providers to expand telephone service and internet access to reduce disproportionate hazards associated with housing that does not have access to tornado alerts via text messages, telephone, or internet-based alerts.

Changes in Development or Housing Characteristics

As development increases, there is no increased or decreased risk of tornados associated in the planning area. In rural areas, a tornado may move along a path where no residents or property exists, but as jurisdictions increase in size or concentration of development, tornado activity has a greater change of impacting exposed buildings and populations to hazards. The changes stated in the Comprehensive Plans of the planning area and projected increase in population demonstrate the potential for rapid growth, but also demonstrate that there may be challenges meeting the demand for emergency response and availability of community resources after flooding events and the need for emergency response capabilities to be reassessed routinely. Potential mitigation actions that jurisdictions in the planning area should consider addressing potential vulnerability of new development include.

- Enforce minimum design standards required for buildings to be resilient to tornado hazards.
- In areas with high densities of vulnerable housing units consider requiring developments to construct tornado shelters in future development.

Economy

Tornados can cause widespread economic damages because of their damages to property, facilities, and infrastructure located in the tornadoes path. There is potential that tornadoes will cause major damage resulting in loss of homes, businesses, properties, critical facilities, and others due to high wind speeds and debris associated with tornado events.

Natural Environment

Natural environments in the path of direct impact can be significantly disrupted by tornado events.

First Responders

First Responders can be impacted by tornados through injury during tornado response efforts or because of impact from the tornado itself. The ability to respond could be significantly impacted in the event of damaged critical facilities and infrastructure or because of reduced access to impacted areas, reduced ability to communicate, and damage to emergency equipment. Potential mitigation actions that jurisdictions in the planning area should consider addressing potential vulnerability of the first responders include:

- Provide annual training to first responders to safely respond and assist in areas that have been impacted by tornados in the planning area.
- Review emergency response procedures regularly to update responsibilities, areas of risk, and protocol for flooding events.
- Maintain detailed inventory of residents who are vulnerable to disproportionate impacts of tornados in the planning area and update annually.

Continuity of Operation

Operations may be significantly impacted by tornados due to damage or destruction of critical facilities, emergency response facilities, and critical infrastructure which would limit the response capacity during or after a tornado occurs. Potential mitigation actions that jurisdictions in the planning area should consider addressing continuity of operations include:

- Periodically review inventory of critical resources, including personnel, equipment, and supplies, necessary for continued operations after tornado events occur.
- Develop robust communication plans to keep staff informed during and after tornado events, including alerts, updates, and instructions.
- Schedule regular reviews and updates of COOP plans based on new risks, lessons learned from past tornado events, and changes in operations.

Table 4-36: NRI Exposure Values and Vulnerability for Tornados

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Alexander	\$202,258,636	36,437	\$422,669,200,000	\$6,490,937,927	\$429,362,396,563
Burke	\$93,436,823	87,532	\$1,015,371,200,000	\$13,643,350,490	\$1,029,107,987,313
Caldwell	\$55,120,539	80,586	\$934,797,600,000	\$15,099,673,534	\$949,952,394,073
Catawba	\$88,641,140	160,509	\$1,861,904,400,000	\$37,175,998,799	\$1,899,169,039,939

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Total	\$439,457,138	365,064	\$4,234,742,400,000	\$72,409,960,750	\$4,307,591,817,888

4.5.5.7. Climate Change

As reported by the North Carolina State Hazard Mitigation Plan, the National Aeronautics and Space Administration (NASA), predicts that tornado events in the future are likely to become more frequent in the southeastern USA because of weather extremes. While the number of annual days of which weather conditions were favorable for tornadoes decreased from 1979 to 2020 across the southern parts of the traditional ‘Tornado Alley’ in the central part of the continental USA, an increase was observed from the Mississippi Valley across much of the Southeast over the same period.

Tornado potential is measured by an index that NASA created called the Convective Available Potential Energy (CAPE) index. This measures how warm and moist the air is, which is a major contributing factor in tornado formation. NASA projects that by the period of 2072-2099 the CAPE in the Unifour Region will increase by 300-400J/kg, which places it in the area likely to experience the second greatest increase in CAPE in the United States. This indicates that there will potentially be even more frequent tornadoes in the Unifour Region going forward.

The North Carolina Climate Science Report also suggests that the overall occurrence of tornadoes will increase due to climate change throughout the State. Since the 1970s, the United States has experienced a decrease in the number of days per year on which tornadoes occur but an increase in the number of tornadoes that form on such days. In other words, the frequency of days with large numbers of tornadoes (tornado outbreaks) appears to be increasing, with the result that the total number of tornadoes per year may be increasing.

Hurricanes are in some instances associated with the production of tornadoes. Stronger hurricanes resulting from the effects of climate change would in theory be more prone to produce tornadoes due to a stronger wind field, but there is very low confidence in this projection due to the limited research results to date.

4.5.6. Earthquake

An earthquake is the motion 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 death(s) 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 quicksand. 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 because 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. These plate borders generally follow the outlines of the continents, with the North American plate following the continental border with the Pacific Ocean in the west but following the mid-Atlantic trench in the east. As earthquakes occurring in the mid-Atlantic trench usually pose little danger to humans, the greatest earthquake threat in North America is along the Pacific Coast.

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.

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 (see Table 4-37). 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 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, with a I corresponding to imperceptible (instrumental) events, IV corresponding to moderate (felt by people awake), to XII for catastrophic (destruction). A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in Table 4-37.

Table 4-37: Richter Scale³⁰

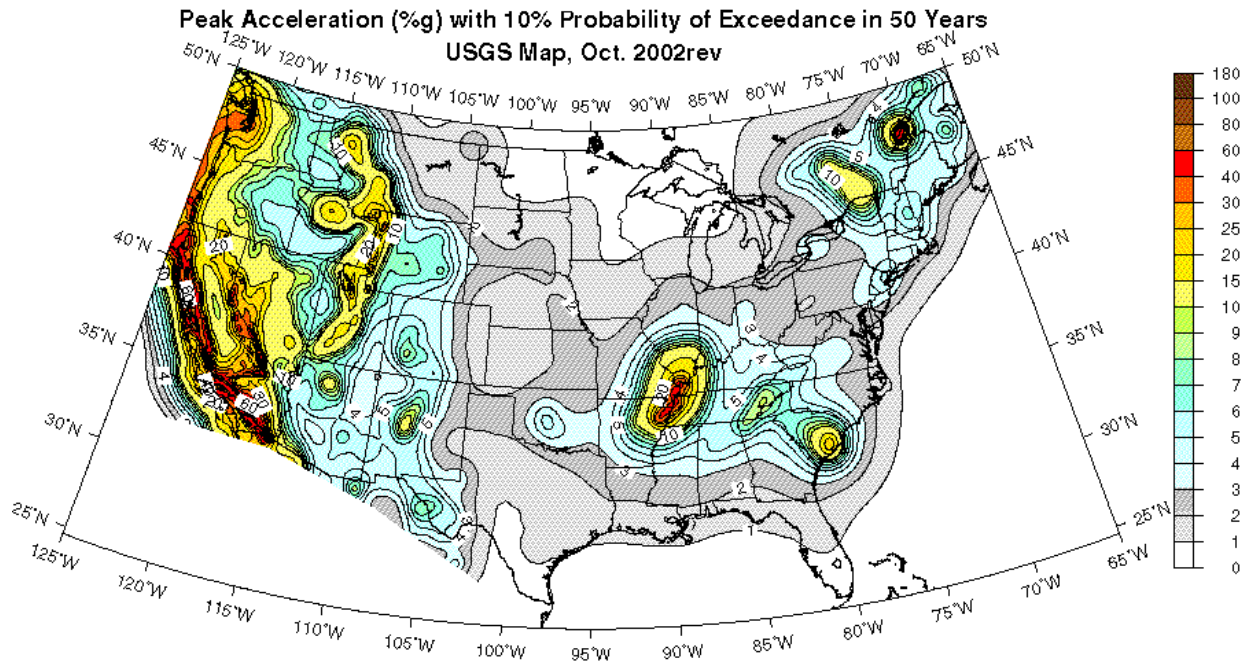
³⁰ Earthquake Hazards Program. (n.d.-a). Richter Scale. U.S. Geological Survey. <https://www.usgs.gov/media/images/richterscalegif#:~:text=The%20Richter%20magnitude%20scale%20was,of%20waves%20recorded%20by%20seismographs>.

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally, not felt but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 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 greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Table 4-38: Modified Mercalli Intensity Scale for Earthquakes³¹

Scale	Intensity	Description Of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	
II	Feeble	Some people feel it	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<5.4
VII	Very Strong	Mild Alarm: walls crack; plaster falls	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<8.1
XII	Catastrophic	Total destruction: trees fall; ground rises and falls in waves	>8.1

³¹ Earthquake Hazards Program. (n.d.). The modified Mercalli intensity scale. The Modified Mercalli Intensity Scale | U.S. Geological Survey. <https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale>



Source: United States Geological Survey³²

Figure 4-80: Peak Acceleration with 10 Percent Probability of Exceedance in 50 Years

Figure 4-80 shows 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.

4.5.6.1. Earthquake Hazard Analysis

The below figures show peak ground acceleration and historic earthquake epicenters for the state of North Carolina and relevant surrounding areas.

³² Frankel, A. D., Carver, D. L., & Williams, R. A. (2002). Nonlinear and linear site response and basin effects in Seattle for the M 6.8 Nisqually, Washington earthquake. *Bulletin of the Seismological Society of America*, 92(6), 2090-2109.

Earthquake Hazard Areas - Regional

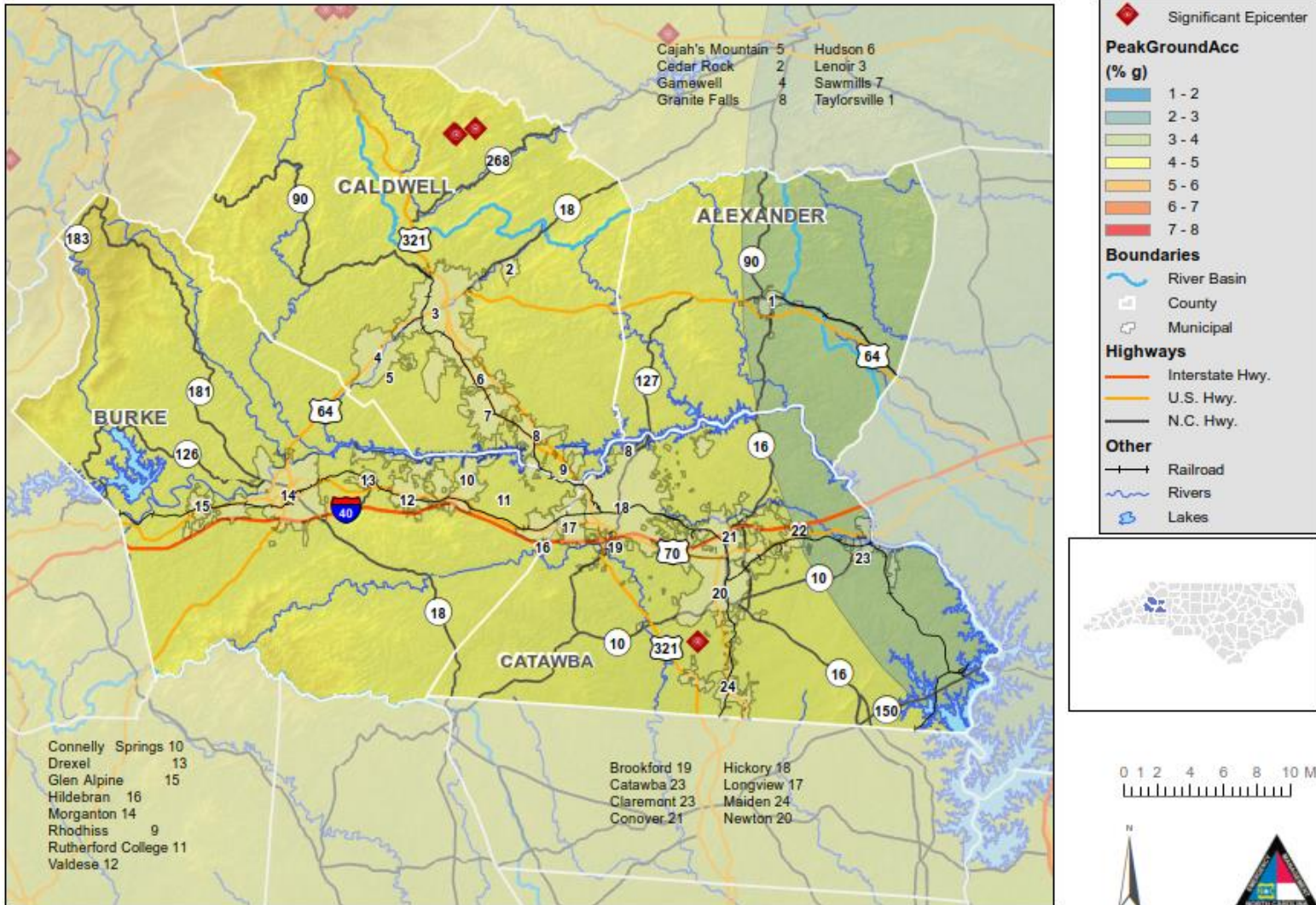


Figure 4-81: Earthquake Hazard Areas

Earthquake Hazard Areas

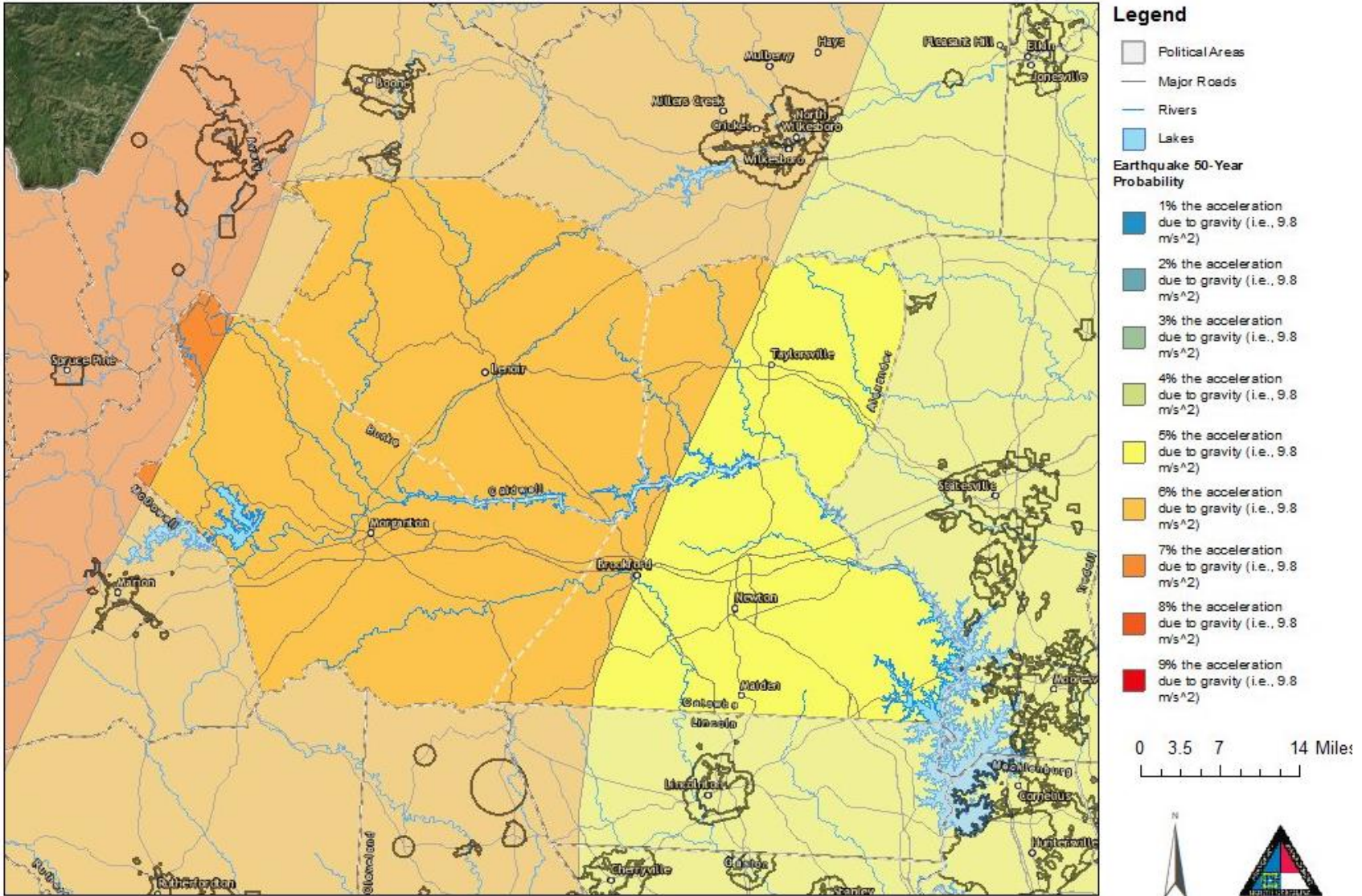


Figure 4-82: Earthquake Hazard Areas

Earthquake Hazard Areas - Burke County

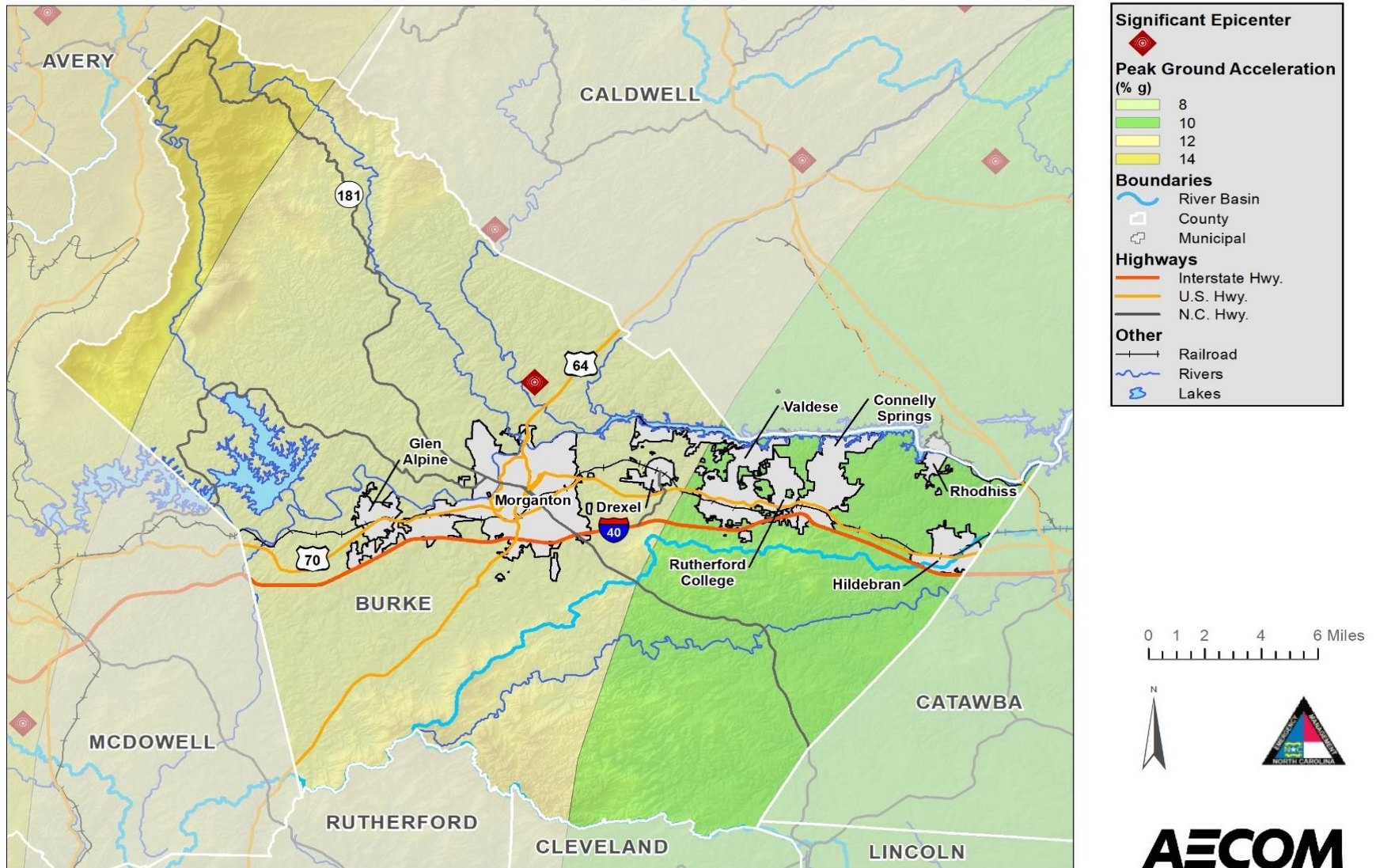


Figure 4-83: Earthquake Hazard Areas

Earthquake Hazard Areas - Caldwell County

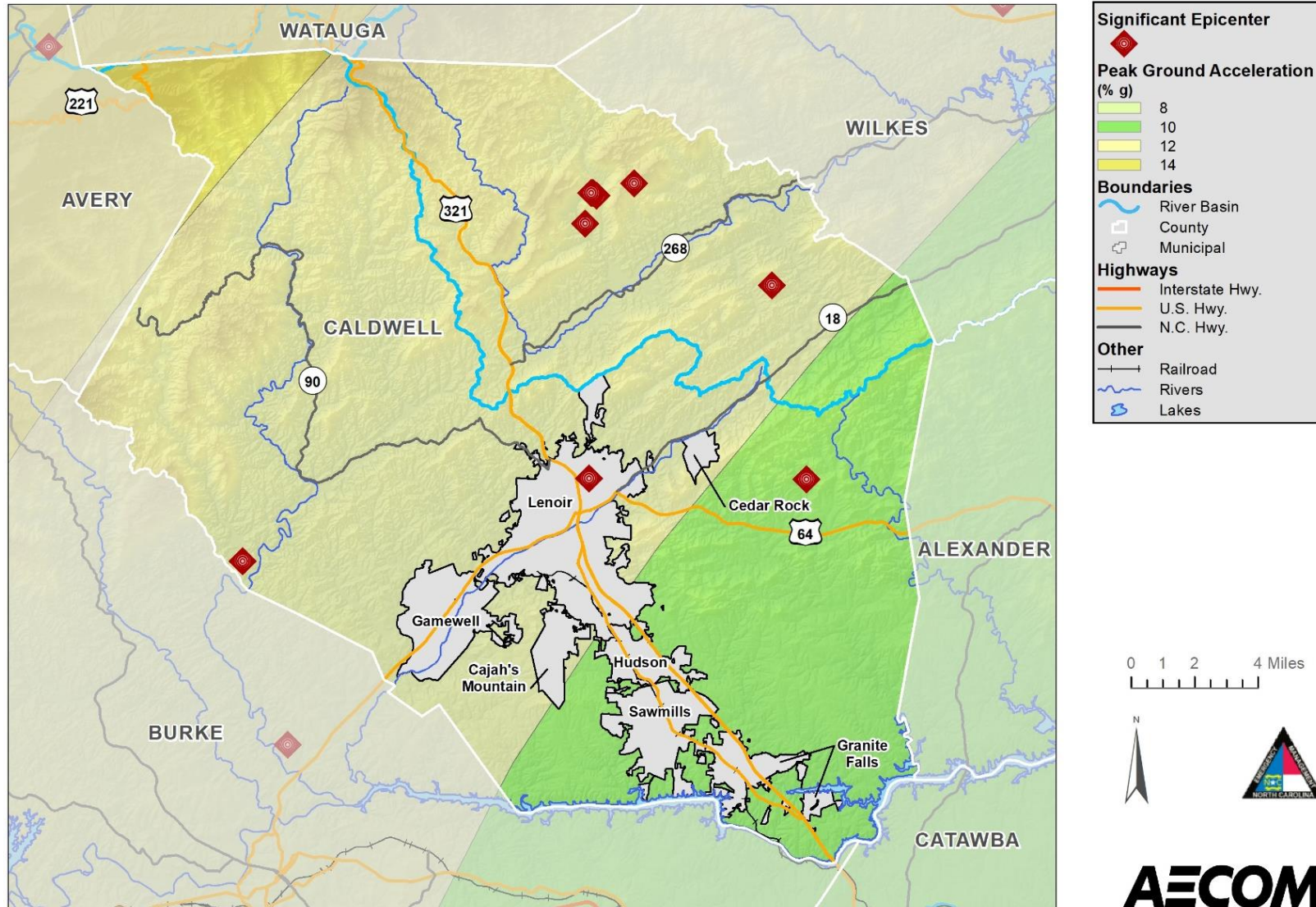


Figure 4-84: Earthquake Hazard Areas



Earthquake Hazard Areas - Alexander County

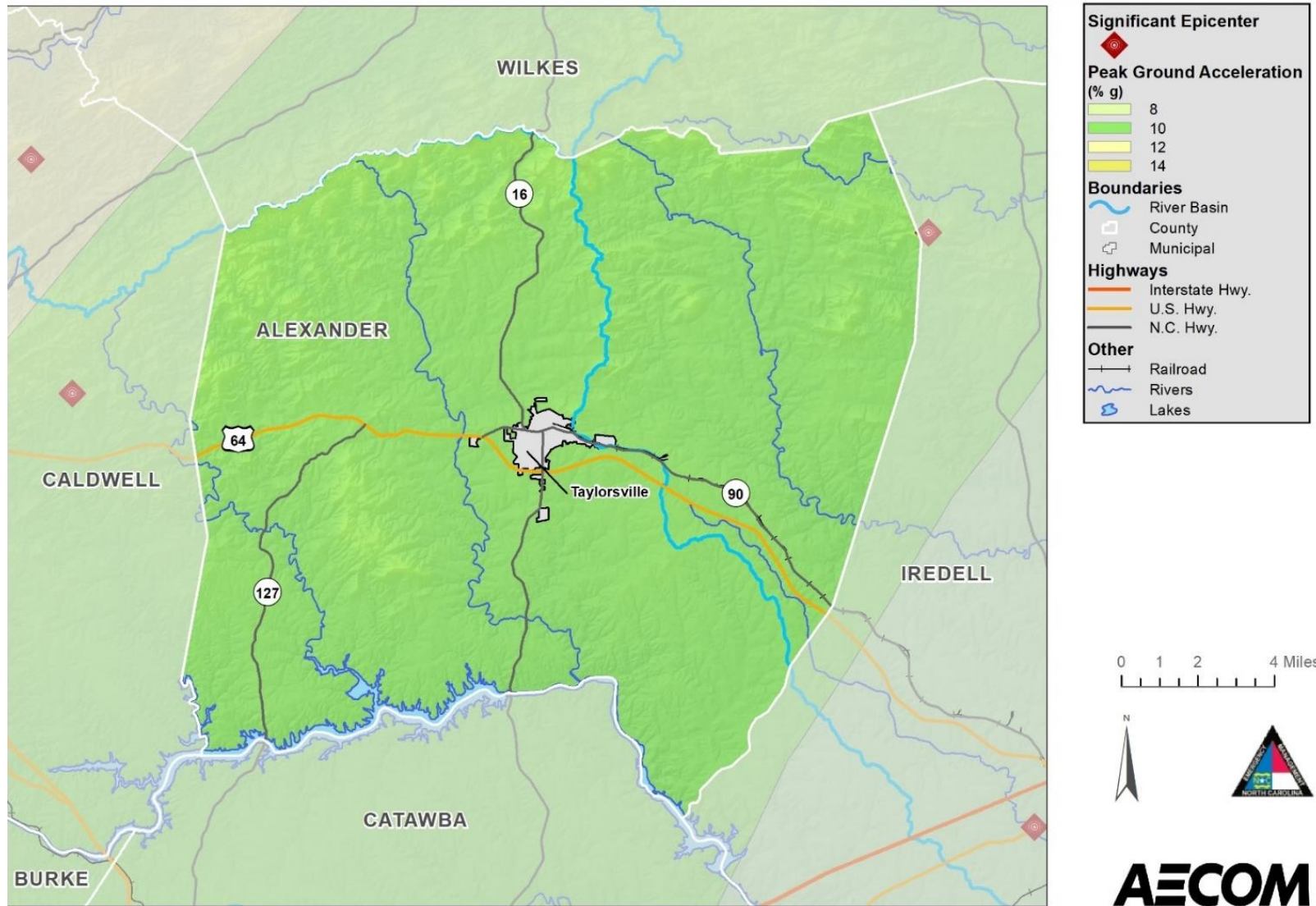


Figure 4-85: Earthquake Hazard Areas

Earthquake Hazard Areas - Catawba County

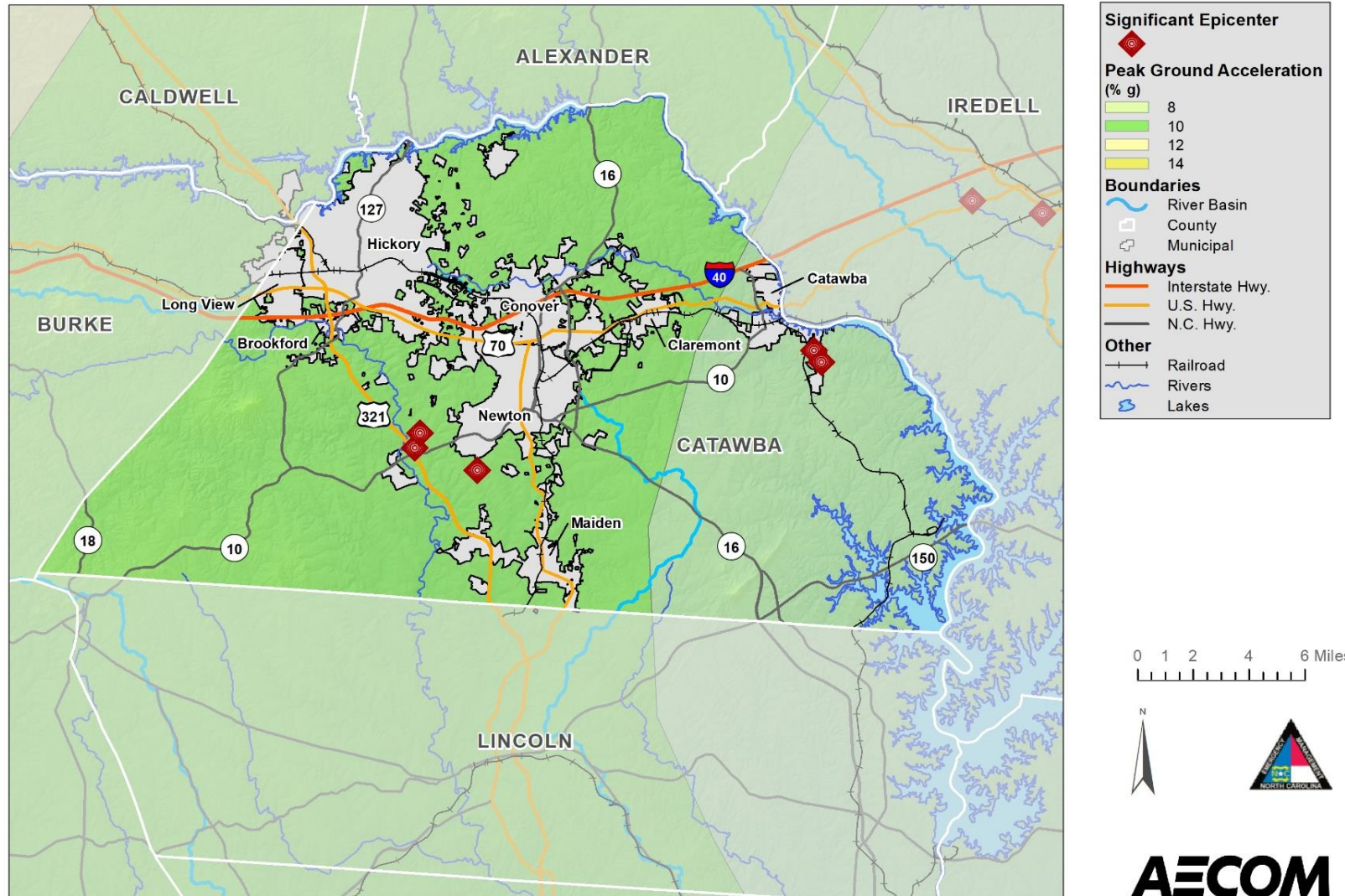


Figure 4-86: Earthquake Hazard Areas

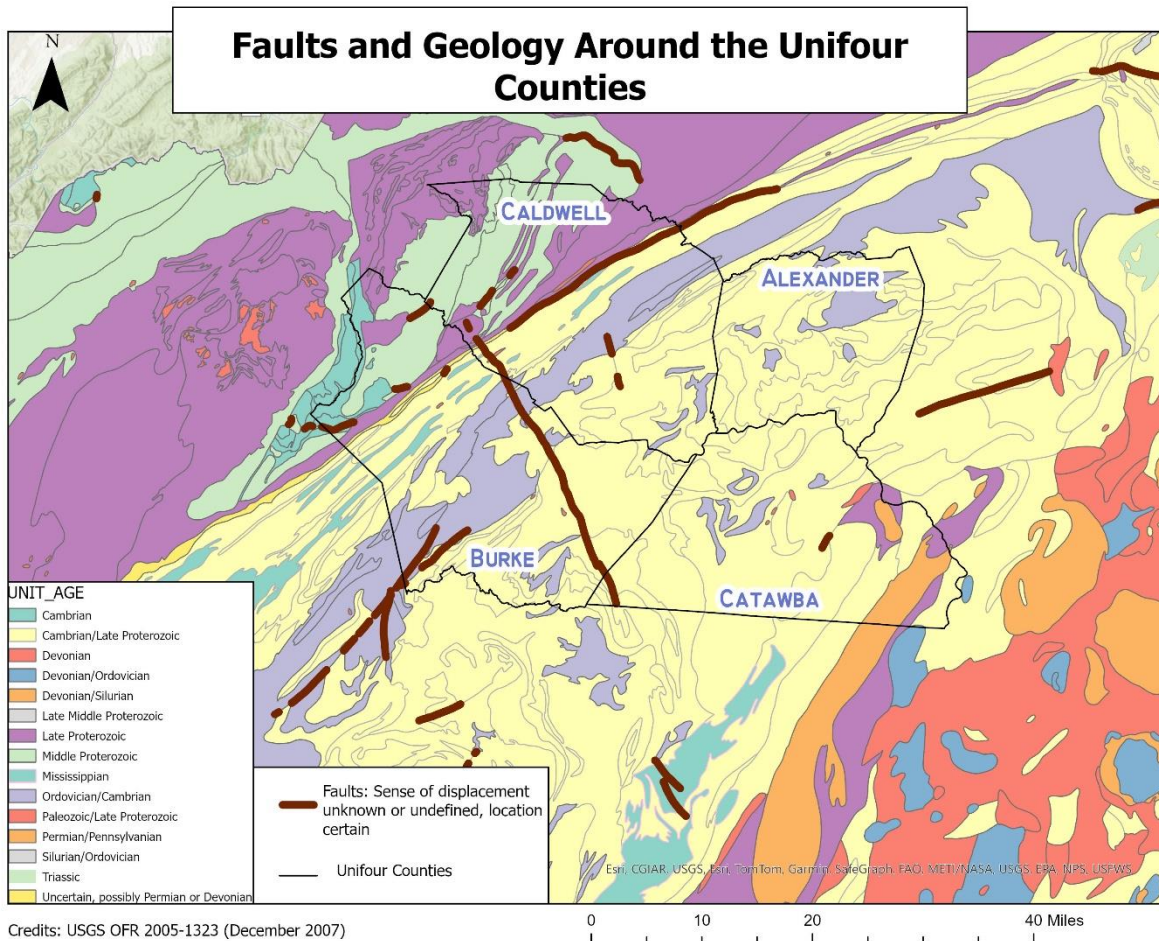


Figure 4-87: Faults and Geological age of areas in and around the Unifour Counties

4.5.6.2. Extent (Magnitude and Severity)

Extent Event:

Earthquake extent can be measured by the Richter Scale and the Modified Mercalli Intensity (MMI) scale. The most severe earthquake felt in the Unifour Region since the mid-1800s was a six (VI) on the Modified Mercalli Intensity Scale. This event occurred in 1886, the effects of which were reported specifically in the City of Hickory which was 337 miles from the epicenter of the earthquake. The effects of this magnitude earthquake typically include trees swaying, suspended objects swinging, and objects falling off shelves. Earthquakes of greater magnitude may be possible within the region; however, this is known to be the greatest severity currently on record.

4.5.6.3. Historical Occurrences

Table 4-39: Modified Mercalli Intensity Scale for Earthquakes and historical occurrences of earthquakes from National Geophysical Data Center/World Data Service (NGDC/WDS) Significant Earthquake Database.

Date	Location	Intensity (MMI)	Details
09/01/1886	Hickory	VI	337 miles from epicenter
02/21/1916	Hickory	V	107 miles from epicenter
08/26/1916	Newton	IV	42 miles from epicenter
11/03/1928	Newton	III	130 miles from epicenter
05/13/1957	Claremont	IV	76 miles from epicenter
05/13/1957	Conover	IV	70 miles from epicenter
05/13/1957	Hickory	V	59 miles from epicenter
05/13/1957	Maiden	IV	73 miles from epicenter
05/13/1957	Newton	IV	71 miles from epicenter
09/13/1976	Long View	II	109 miles from epicenter

Table 4-40: Earthquakes reported by the USGS between 2023 and 2018 within 100 miles of the Unifour Counties³³

Date	Magnitude*	Closest County	Closest City	Approximate Distance from City (miles)
2023-06-04	3.24 md	Burke	Glen Alpine	62.4
2023-05-23	2.76 md	Burke	Glen Alpine	61.7
2022-12-08	2.69 md	Burke	Glen Alpine	49.5
2022-10-25	2.59 md	Alexander	Taylorsville	46.8
2021-11-21	2.56 md	Caldwell	Lenoir	56.2
2021-08-17	2.65 md	Burke	Morganton	4.5
2021-02-12	2.79 md	Burke	Glen Alpine	45
2021-02-04	2.56 md	Alexander	Taylorsville	39.5
2020-10-25	2.81 md	Alexander	Taylorsville	41.5
2020-10-01	2.63 md	Caldwell	Cedar Rock	38.5

³³ U.S. Geological Survey. (n.d.). Earthquake Catalog [Dataset]. In USGS Earthquake Hazards Program. USGS. <https://earthquake.usgs.gov/earthquakes/search/>

Date	Magnitude ⁺	Closest County	Closest City	Approximate Distance from City (miles)
2020-08-11	2.87 md	Alexander	Taylorsville	38.5
2020-08-09	5.1 mw	Alexander	Taylorsville	38.4
2020-08-09	2.62 md	Alexander	Taylorsville	39
2019-09-12	2.54 md	Burke	Glen Alpine	90
2019-08-18	2.51 md	Burke	Glen Alpine	48
2019-03-26	2.61 md	Burke	Glen Alpine	92
2018-06-10	2.68 md	Alexander	Taylorsville	24

***Magnitude Types³⁴:**

- **Mw**= Computed for all M5.0 or larger earthquakes worldwide, but generally robust for all M5.5 worldwide. Provides consistent results to M~4.5 within a regional network of high-quality broadband stations. Authoritative USGS magnitude if computed.
 - 4 or larger
- **Md** = Based on the duration of shaking as measured by the time decay of the amplitude of the seismogram. Sometimes the only magnitude available for very small events, but often used (especially in the past) to compute magnitude from seismograms with "clipped" waveforms due to limited dynamic recording range of analog instrumentation, which makes it impossible to measure peak amplitudes. Computed by NEIC but only published when there is no other magnitude available.
 - 4 or smaller

4.5.6.4. Probability of Future Occurrences

Table 4-41: NRI Earthquake EAL, Risk Index, Frequency, and Historic Loss Ratio

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$145,000	\$1.1 Million	\$338,000	\$407,000
	Rating	Very Low	Relatively Low	Relatively Low	Relatively Low
Risk Index	Score	54.7	83.6	69.1	68.5
	Rating	Very Low	Relatively Low	Relatively Low	Very Low
Frequency (% Chance per Year)		0.046%	0.049%	0.058%	0.054%

³⁴ U.S. Geological Survey. (n.d.-b). Magnitude Types. USGS Earthquake Hazards Program. Retrieved June 27, 2024, from <https://www.usgs.gov/programs/earthquake-hazards/magnitude-types>

County	Alexander	Catawba	Burke	Caldwell
Historic Loss Ratio	Relatively Low	Relatively Moderate	Relatively Low	Relatively Low

4.5.6.5. Probability of Future Occurrences

Based on the analyses performed in iRISK, the probability of future Earthquake is shown in the table below, by jurisdiction.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences:

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-42: iRisk Probability of Future Earthquakes

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Low
Caldwell County (Unincorporated Area)	Low
Catawba County (Unincorporated Area)	Low
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Low
City of Morganton	Low
City of Newton	Low
Town of Brookford	Low
Town of Cahah's Mountain	Low
Town of Catawba	Low
Town of Connelly Springs	Low
Town of Drexel	Low
Town of Gamewell	Low
Town of Glen Alpine	Low
Town of Granite Falls	Low
Town of Hildebran	Low
Town of Hudson	Low
Town of Long View	Low
Town of Maiden	Low

Jurisdiction	iRISK Probability of Future Occurrence
Town of Rhodhiss	Low
Town of Rutherford College	Low
Town of Sawmills	Low
Town of Taylorsville	Low
Town of Valdese	Low
Village of Cedar Rock	Low

4.5.6.6. Earthquake Hazard Vulnerability

Vulnerability for earthquake for the area is considered, in relative terms, to be limited should a significant earthquake event occur. FEMA considers loss ratios greater than 10% to be significant and an indicator a community may have more difficulties recovering from an event. These loss estimates do not include income losses, such as lost wages, rental expenses, relocation costs, etc. that can occur following an earthquake. All future structures and infrastructure built in the Unifour region will be vulnerable to seismic events and may also experience damage not accounted for in these estimated losses. These loss estimates do not include income losses, such as lost wages, rental expenses, relocation costs, etc. that can occur following an earthquake. All future structures and infrastructure built in the Unifour will be vulnerable to seismic events and may also experience damage not accounted for in these estimated losses.

4.5.6.7. Future Vulnerability: Problem Statement

People

Because the planning area relatively low for Burke and Caldwell County and Very Low for Catawba and Alexander County, with a less than 0.058% chance of earthquake events per year in the planning area according to the NRI, it is unlikely that an earthquake in the planning area will result in severe injury or death. Those who are unable to take shelter may be at an increased risk of injury during an earthquake event. Earthquakes may also disrupt power lines, sewer lines, water lines, and gas pipelines. This would lead to a risk of fires, explosions, or gas leaks along with disruption of utilities.

Although there are updated warning systems in each county that act as a reverse 911 which may alert residents to secondary hazards related to earthquake damage, 1.3% in Alexander County, 1.1% in Burke County, 1.6% in Caldwell County, and 1.3% in Catawba County reported that they do not have telephone service in their housing unit, which would prevent critical alerts from reaching those potentially rural and isolated areas where individuals may become trapped or unable to receive assistance in the event of a hazard.

A notable percentage of residents lack access to internet and computers in the area which can be used to relay critical information following earthquakes or emergencies. Specifically, 16.4% of residents in Alexander County, 20.3% in Burke County, 16.8% in Caldwell County, and 13.6% in Catawba County do not have internet access. Similarly, the number of individuals without

computer access is also significant, with 10.5% in Alexander County, 11.2% in Burke County, 12.9% in Caldwell County, and 7.5% in Catawba County. This highlights a digital divide that may affect residents' ability to participate in online activities, access information, and utilize digital resources. Potential mitigation actions that jurisdictions in the planning area should consider reducing vulnerability of residents to earthquake events include:

- Conduct periodic review of flooding risk of vulnerable populations to address projected increases in population and development and appropriately prepare for earthquake hazards in those areas.
- Conduct regular evaluations to ensure all community members, particularly underserved populations, have equitable access to resources and support.
- Collaborate with local nonprofits and community organizations to reach underserved populations with resources and information about earthquake preparedness.
- Consider working with local telephone and internet providers to expand internet and telephone access to those without access to critical emergency alerts in their housing units.
- Develop earthquake safety and hazard education programs to improve resident response to earthquake events.

Changes in Development or Housing Characteristics

Vulnerability to earthquakes should not vary significantly throughout the planning area, but housing that is not built to withstand earthquake events may experience damage if an earthquake occurs. As a result, jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability of future development:

- Update building codes to ensure that new developments are built to withstand earthquake events and reduce potential risk to human life in the event of an earthquake.

Economy

Depending on the severity of the earthquake, damage and destruction of homes, property, infrastructure, and critical facilities could strain the local economy by creating financial burdens for residents, businesses, and local governments associated with recovery efforts. This includes property damage, disruption of services impacting economic stability of residents, loss of income due to damage or loss of customers, additional expenses for immediate recovery, and potential displacement. As a result, jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability of the economy:

- Provide resources to local businesses and residents in the planning area about earthquake damage prevention and resilience to improve preparedness and recovery.

Natural Environment

Earthquakes can disturb the natural environment by causing landslides, ground failure, rupturing, ecosystem disruption, increased erosion, potential chemical spills or leaks, and alteration of habitat. As a result of potential disruptions to the natural environment, jurisdictions

in the planning area should consider the following mitigation actions to reduce vulnerability of the natural environment:

- Conduct a hazardous material inventory or confirm locations of hazardous materials in earthquake hazard areas.
- Develop post-earthquake protocol to assess and clean up hazardous materials or contamination after earthquakes which may cause a release of hazardous materials.

First Responders

Earthquake events have the potential to deteriorate the structural integrity of infrastructure and buildings, so first responders who enter unstable structures without proper protection could be at a heightened risk of severe injury or death without specialized training. Earthquakes can also damage roads, infrastructure, and emergency facilities required for responding to emergencies. Additional disruptions in communication can lead to delay of response and impact first responders' ability to prepare for response. As a result, jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability of the first responders:

- Review emergency response procedures regularly to update responsibilities, areas of risk, and protocol for earthquake events.
- Implement and maintain advanced earthquake warning systems that utilize real-time data to alert communities of impending earthquake risks.

Continuity of Operation

Earthquakes may cause damage to critical facilities and infrastructure required to continue normal day to day activities. Earthquakes may also disrupt power lines, sewer lines, water lines, and gas pipelines. This would lead to a risk of fires, explosions, or gas leaks along with disruption of utilities. These disruptions would impact those who rely on the availability of infrastructure and critical facilities in the areas with damage from an earthquake event. The jurisdictions in the planning area should consider the following mitigation actions to address disruption to continuity of operations in the event of an earthquake:

- Periodically review inventory of critical resources, including personnel, equipment, and supplies, necessary for continued operations during earthquakes.
- Develop robust communication plans to keep staff informed during and after earthquake events, including alerts, updates, and instructions.
- Schedule regular reviews and updates of COOP plans based on new risks, lessons learned from past earthquake events, and changes in operations.

Climate Change

Recent studies have suggested that climate change may cause more earthquakes by increasing the weight of water on the earth's crust and destabilizing cracks and faults, leading to more seismic activity. However, this is only assumed to be a potential issue in areas that are more

seismically volatile than the southeastern USA, and it is unlikely to impact the Unifour Region. Neither the current North Carolina State Hazard Mitigation Plan nor the North Carolina Climate Science report consider that climate change may increase the probability of earthquakes in the State.

Table 4-43: Exposure values and vulnerability from the NRI for earthquakes

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Alexander	N/A	36,444.00	\$422,750,400,000	\$6,490,861,000	\$429,241,261,000
Burke		87,570.00	\$1,015,812,000,000	\$13,643,108,000	\$1,029,455,108,000
Caldwell		80,652.00	\$935,563,200,000	\$15,099,454,000	\$950,662,654,000
Catawba		160,610.00	\$1,863,076,000,000	\$37,175,602,000	\$1,900,251,602,000
Total	N/A	365,276.00	4,237,201,600,000.00	72,409,025,000.00	4,309,610,625,000.00

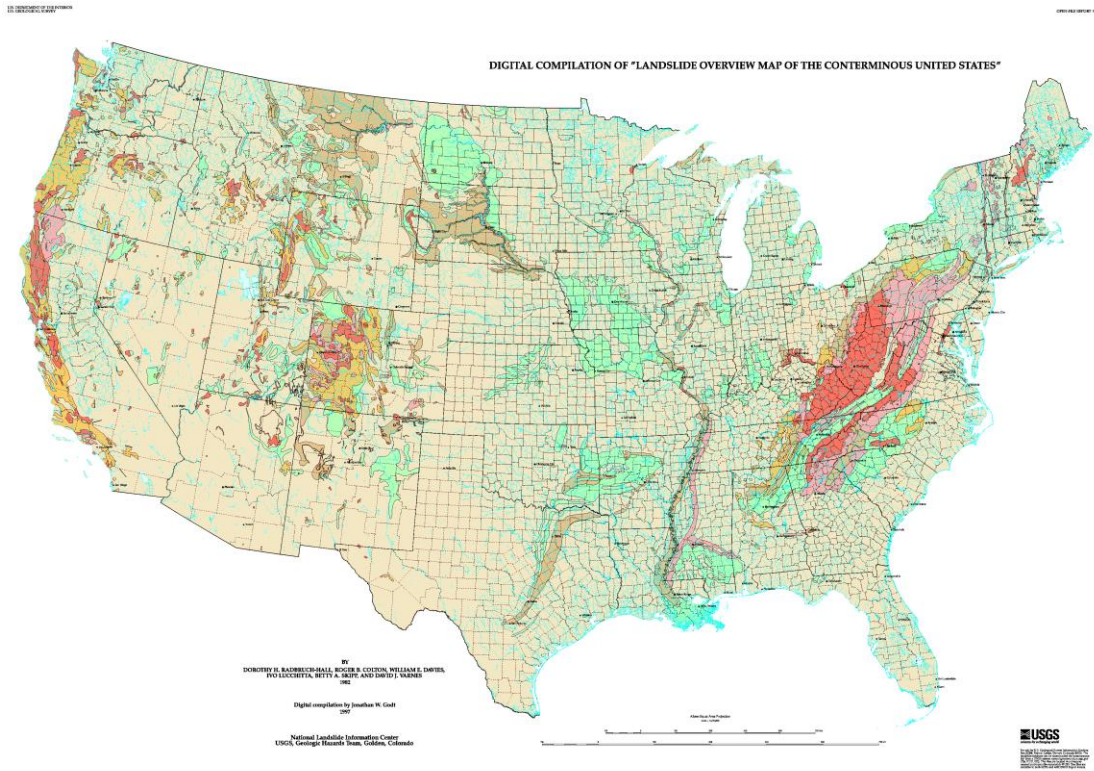
Table 4-43 represents the agricultural, population number and equivalence, building, and total exposure value in terms of USD and population number. A RMT analysis of earthquake vulnerability by building type, high risk buildings, and people, see Appendix H.

4.5.7. 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, 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 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. Landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly.



EXPLANATION

LANDSLIDE INCIDENCE

- Low (less than 1.5% of area involved)
- Moderate (1.5%-15% of area involved)
- High (greater than 15% of area involved)

LANDSLIDE SUSCEPTIBILITY/INCIDENCE

- Moderate susceptibility/low incidence
- High susceptibility/low incidence
- High susceptibility/moderate incidence

Susceptibility not indicated where same or lower than incidence. Susceptibility to landsliding 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 landsliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated.

Figure 4-88: Landslide Overview Map of the Conterminous United States *Source: United States Geological Survey*

Areas that are 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; flat-lying areas away from sudden changes in slope; and areas at the top or along ridges, set back from the tops of slopes.

Figure 4-89 delineates areas where large numbers of landslides have occurred and areas which are susceptible to landslides in the conterminous United States. This map layer is provided in the U.S. Geological Survey Professional Paper 1183, *Landslide Overview Map of the Conterminous United States*³⁵.

4.5.7.1. Landslide Hazard Analysis

Figure 3-42 North Carolina Landslide Risk Areas

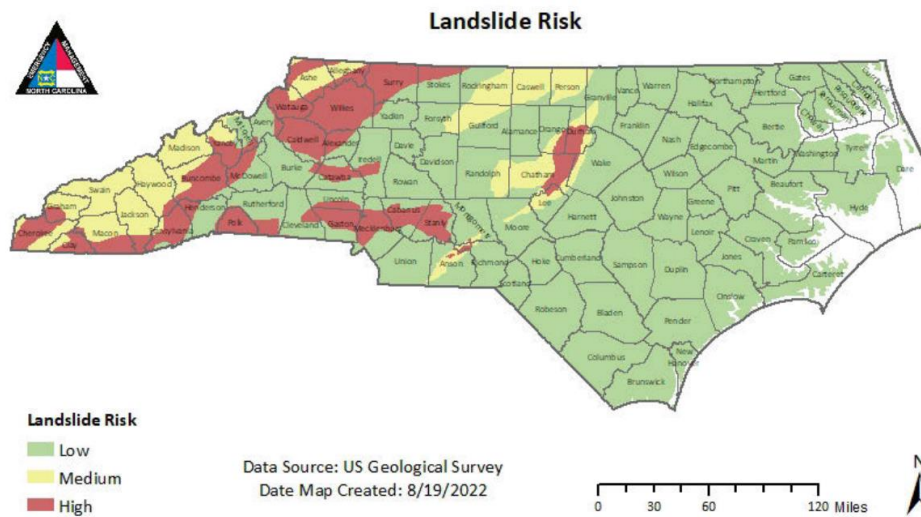


Figure 4-89: Landslide Risk in NC from the NC State Hazard Mitigation Plan (2023)

4.5.7.2. Location within the Planning Area

The below figures show information developed by the United States Geological Survey (USGS) which depicts areas of landslide incidence and susceptibility. This information suggests that there is potential risk that is not supported by any historical data or detailed landslide hazard mapping presently available for the planning area. In addition, the figures show slope and average annual precipitation data for the plan area. According to the NC State Hazard Mitigation Plan, the majority of Caldwell County is at a high risk for landslide, while the other portion of the County is at a low landslide. The majority of Burke County is at a minimal risk, but a small eastern portion of the county is at a high risk.

There have been no reported incidents of landslides in Catawba County, therefore there is no more detailed information about the occurrences in the County.

³⁵ *Landslide Overview Map of the Conterminous United States* (No. .S. Geological Survey Professional Paper 1183). (n.d.). [Dataset]. http://landslides.usgs.gov/html_files/landslides/nationalmap/national.html.

Landslide Hazard Areas - Regional

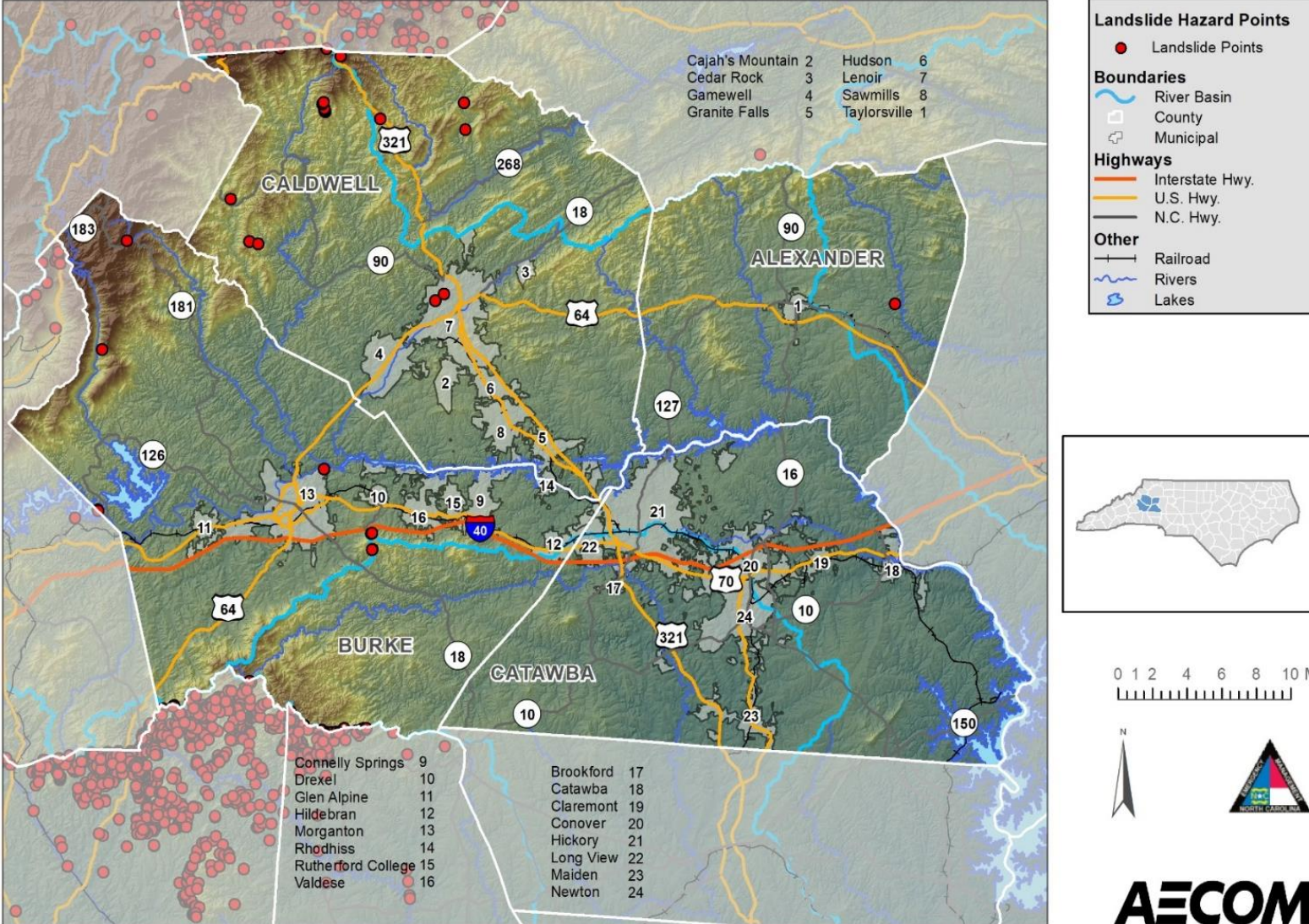


Figure 4-90: Landslide Hazard Areas



Landslide Hazard Areas - Alexander County

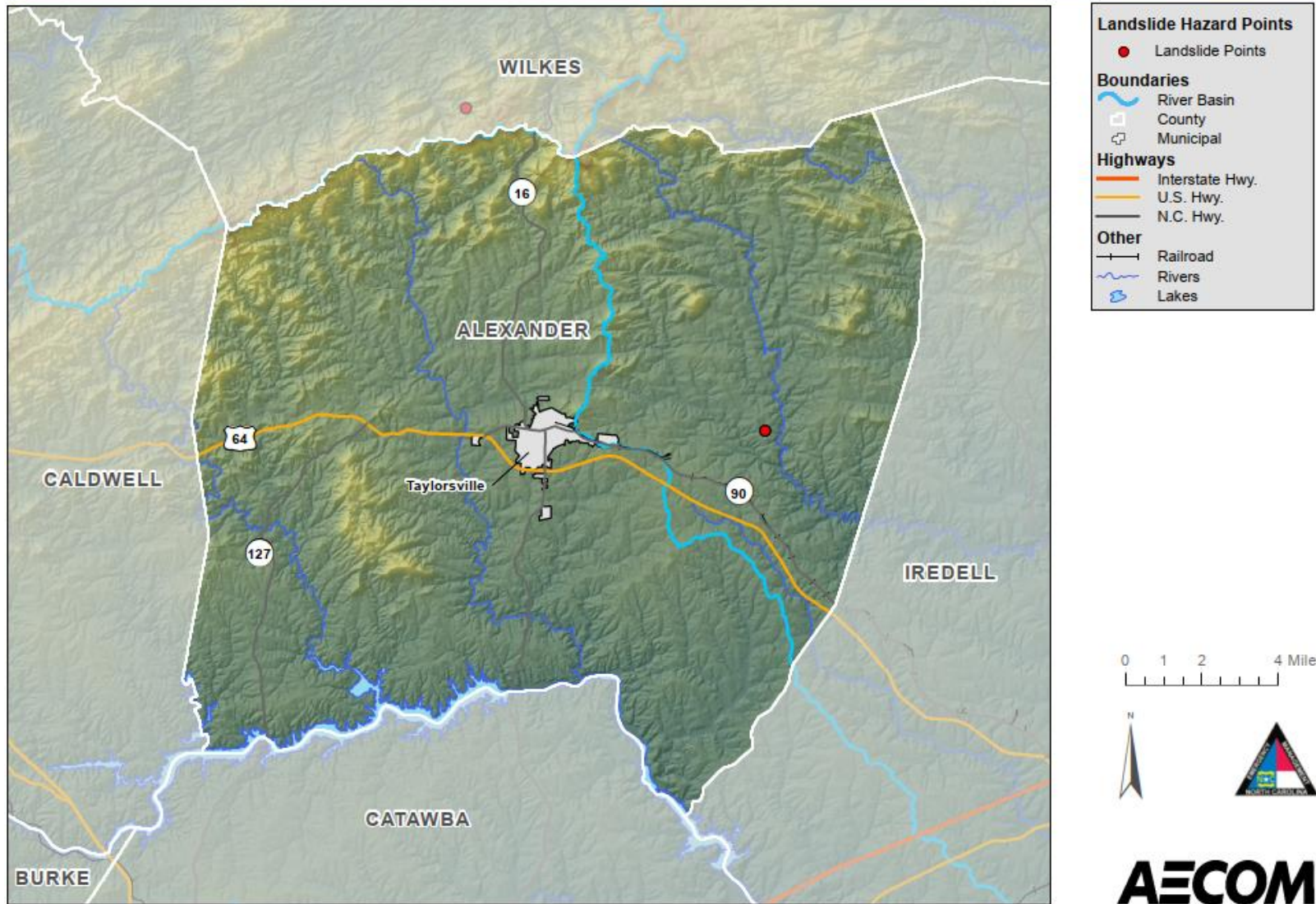


Figure 4-91: Landslide Hazard Areas for Alexander County

Landslide Hazard Areas - Burke County

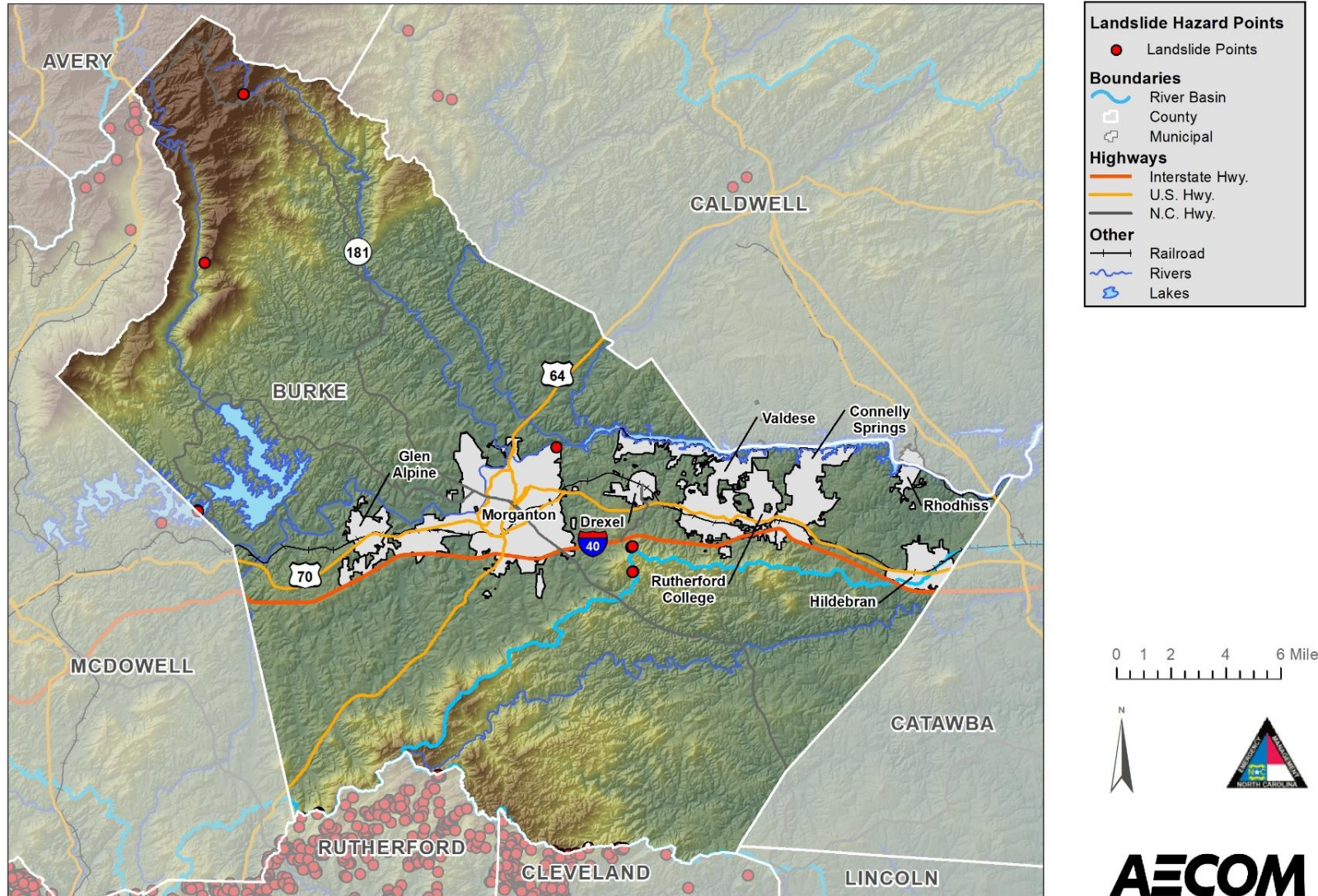
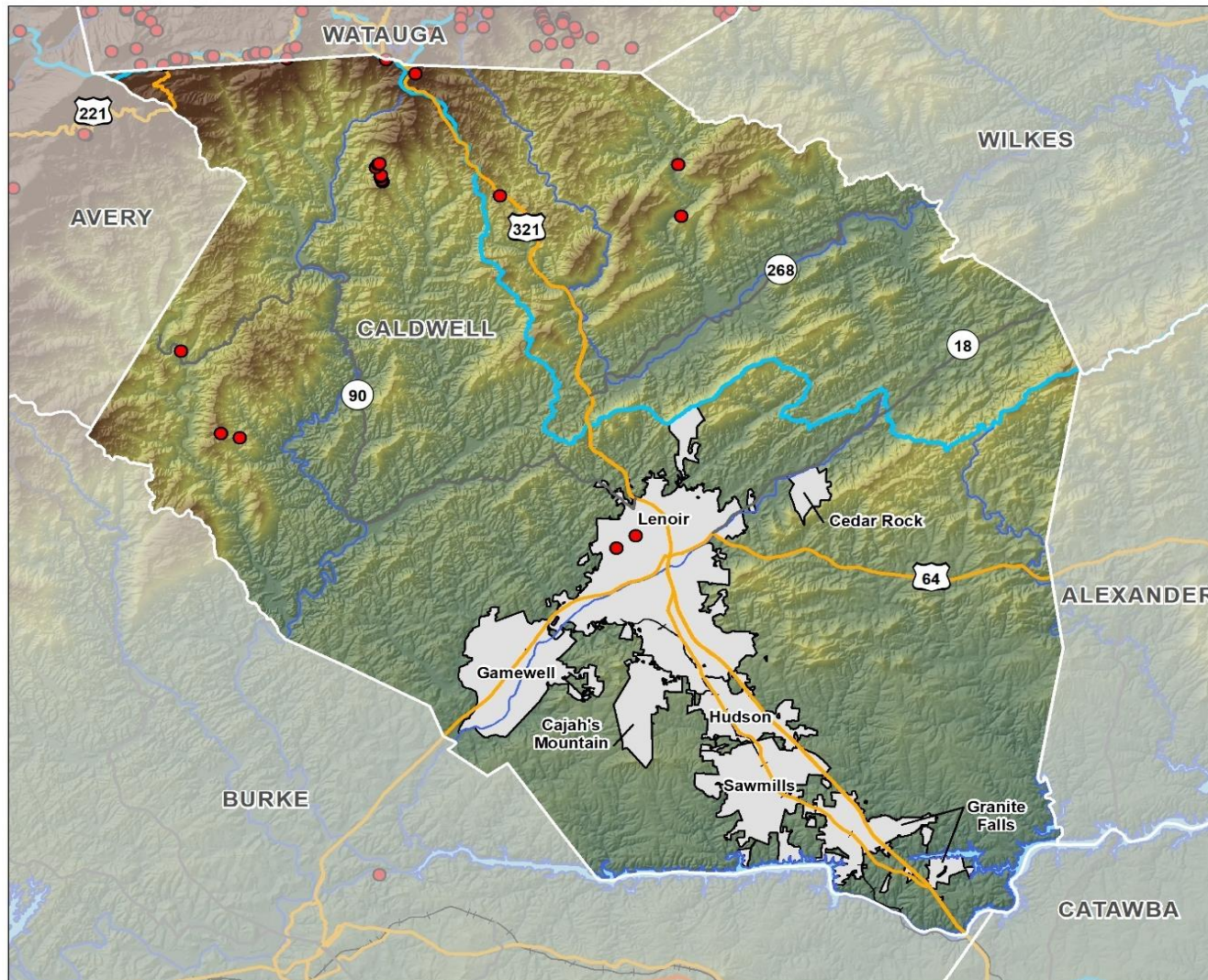


Figure 4-92: Landslide Hazard Areas for Burke County

Landslide Hazard Areas - Caldwell County



Landslide Hazard Points

- Landslide Points

Boundaries

- ~ River Basin
- County
- ⊕ Municipal

Highways

- Interstate Hwy.
- U.S. Hwy.
- N.C. Hwy.

Other

- Railroad
- ~ Rivers
- ~ Lakes



Figure 4-93: Landslide Hazard Areas for Caldwell County

4.5.7.3. Extent (Magnitude and Severity)

Event Extent:

The magnitude and severity of landslides can vary greatly depending on terrain and other highly localized factors. There were four anecdotal reported landslides in the Unifour Region, however there is no data available on the severity of these landslides as they were provided by local knowledge through the Hazard Mitigation Planning Committee. Mitigation strategy regarding landslide identification and mapping will be considered in future mitigation actions for the Unifour Region. Landslide data is provided by USGS and NCDEQ.

4.5.7.4. Historical Occurrences

Table 4-44 provides a summary of this historical information by participating jurisdiction. It is important to note that many of the events attributed to the county are countywide or cover large portions of the county. The individual counts by jurisdiction are for those events that are only attributed to that one jurisdiction.

Table 4-44: Landslide Points and available related data recorded by the NC Department of Environmental Quality for Caldwell, Burke, and Alexander County (No reported events for Catawba County Available)³⁶

County	Location	Movement Date	Rate	Type	Slope Configuration	Fatalities
Alexander	Hiddenite	9/17/2014	Rapid (>5m/sec)	Fall	Cut Slope – Not road Related	1
Burke	Morganton	12/9/2016		Slide	Embankment – Not road related	0
	Marrion	10/2/2019				
	Valdese	12/8/2020		Flow	Road Embankment	
	Valdese	1/20/2020	Slow (>1.6 m / Year)	Slide	Road Cut	
	Ashford	1/30/2020		Flow	Unmodified	
	Linville Falls	1/22/2024				
	Linville Falls	1/31/2024		Flow		
Caldwell	Globe	1/21/2015	Extremely Rapid (>5m/sec)	Flow	Road Embankment	0

4.5.7.5. Probability of Future Occurrences

The probability of future Landslide is shown in the table below, by jurisdiction:

³⁶ Bozdog, N. (2023). North Carolina landslide points [Dataset]. In NC Department of Environmental Quality, NC One Map. https://www.nconemap.gov/datasets/01965a193482438cb70332e5e524e38b_0/about

Table 4-45: NRI Landslide EAL, Risk Index Values, Frequency, and Historic Loss Ratio

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$22,000	\$150,000	\$182,000	\$560,000
	Rating	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively High
Risk Index	Score	49	92.3	94	98
	Rating	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively High
Frequency (Events per Year)		0	0	0	0.2
Historic Loss Ratio		Very Low	Very Low	Very Low	Very Low

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-46: Probability of Future Landslide Occurrence from iRisk

Jurisdiction	Probability of Future Occurrence
Alexander County (Unincorporated Area)	Medium
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	Medium
Catawba County (Unincorporated Area)	High
City of Claremont	High
City of Conover	High
City of Hickory	High
City of Lenoir	Medium
City of Morganton	Medium
City of Newton	High
Town of Brookford	Medium
Town of Cahaj's Mountain	Medium
Town of Catawba	High
Town of Connelly Springs	Medium
Town of Drexel	Medium
Town of Gamewell	Medium
Town of Glen Alpine	Medium

Jurisdiction	Probability of Future Occurrence
Town of Granite Falls	Medium
Town of Hildebran	High
Town of Hudson	Medium
Town of Long View	High
Town of Maiden	Medium
Town of Rhodhiss	Medium
Town of Rutherford College	Medium
Town of Sawmills	Medium
Town of Taylorsville	Medium
Town of Valdese	Medium
Village of Cedar Rock	Medium

4.5.7.6. Landslide Hazard Vulnerability

Sufficient hazard information is not currently available with which to conduct a detailed vulnerability assessment. In addition, any specific vulnerability of individual assets would depend on individual design, building characteristics, and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future plan updates. Mitigation strategy regarding landslide identification and mapping will be considered in future mitigation actions for the Region.

Table 4-47: Landslide NRI Exposure data and vulnerability summary

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Alexander	N/A	36,444.00	\$422,750,400,000	\$6,490,861,000	\$429,241,261,000
Burke		45,828.35	\$531,608,893,634	\$6,939,551,997	\$538,548,445,631
Caldwell		43,002.41	\$498,827,936,038	\$8,693,517,302	\$507,521,453,340
Catawba		58,367.72	\$677,065,519,369	\$13,751,638,365	\$690,817,157,735
Total			183,642.48	\$2,130,252,749,041.00	\$35,875,568,664.00

4.5.7.7. Future Vulnerability: Problem Statement

People

Catawba and Burke County are at a relatively moderate risk, Caldwell County is at a relatively high risk, and Alexander County is at a relatively low risk of experiencing landslides each year according to the NRI. Landslides may also disrupt power lines, sewer lines, water lines, and gas

pipelines. This would lead to a risk of fires, explosions, or gas leaks along with disruption of utilities.

Although there are updated warning systems in each county that act as a reverse 911 which may alert residents to secondary hazards related to landslide damage, 1.3% in Alexander County, 1.1% in Burke County, 1.6% in Caldwell County, and 1.3% in Catawba County reported that they do not have telephone service in their housing unit, which would prevent critical alerts from reaching those potentially rural and isolated areas where individuals may become trapped or unable to receive assistance in the event of a hazard.

A notable percentage of residents lack access to internet and computers in the area which can be used to relay critical information following landslides or emergencies. Specifically, 16.4% of residents in Alexander County, 20.3% in Burke County, 16.8% in Caldwell County, and 13.6% in Catawba County do not have internet access. The number of individuals without computer access is also significant, with 10.5% in Alexander County, 11.2% in Burke County, 12.9% in Caldwell County, and 7.5% in Catawba County. This highlights a digital divide that may affect residents' ability to participate in online activities, access information, and utilize digital resources. Potential mitigation actions that jurisdictions in the planning area should consider reducing vulnerability of residents to landslide events include:

- Conduct periodic review of flooding risk of vulnerable populations to address projected increases in population and development and appropriately prepare for landslide hazards in those areas.
- Conduct regular evaluations to ensure all community members, particularly underserved populations, have equitable access to resources and support.
- Collaborate with local nonprofits and community organizations to reach underserved populations with resources and information about landslide preparedness.
- Consider working with local telephone and internet providers to expand internet and telephone access to those without access to critical emergency alerts in their housing units.
- Develop landslide safety and hazard education programs to improve resident response to earthquake events.

Changes in Development or Housing Characteristics

Vulnerability to landslides varies significantly throughout the planning area, but housing that is not built to withstand landslide events may experience damage if a landslide occurs. As a result, jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability of future development:

- Consider limiting development in areas with high potential to experience landslides.

Economy

Depending on the severity of the landslide, damage and destruction of homes, property, infrastructure, and critical facilities could strain the local economy by creating financial burdens for residents, businesses, and local governments associated with recovery efforts. This includes

property damage, disruption of services impacting economic stability of residents, loss of income due to damage or loss of customers, additional expenses for immediate recovery, and

Natural Environment

As a result of potential disruptions to the natural environment, jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability of the natural environment:

- Conduct a hazardous material inventory or confirm locations of hazardous materials in landslide hazard areas.
- Develop post-landslide protocol to assess and clean up hazardous materials or contamination after landslides which may cause a release of hazardous materials.

First Responders

- Landslide events have the potential to deteriorate the structural integrity of infrastructure and buildings, so first responders who enter unstable structures without proper protection could be at a heightened risk of severe injury or death without specialized training. Landslides can also damage roads, infrastructure, and emergency facilities required for responding to emergencies. Additional disruptions in communication can lead to delay of response and impact first responders' ability to prepare for response. As a result, jurisdictions in the planning area should consider the following mitigation actions to reduce vulnerability of the first responders:
- Review emergency response procedures regularly to update responsibilities, areas of risk, and protocol for landslide events.
- Implement landslide alert and warning systems that utilize real-time data to alert communities of impending landslide risks.
- Establish clear evacuation procedures in the event of conditions that are favorable to landslide occurrence.

Continuity of Operation

Landslides may cause damage to critical facilities and infrastructure required to continue normal day to day activities. Landslides may also disrupt power lines, sewer lines, water lines, and gas pipelines. This would lead to a risk of fires, explosions, or gas leaks along with disruption of utilities. These disruptions would impact those who rely on the availability of infrastructure and critical facilities in the areas with damage from a landslide event. The jurisdictions in the planning area should consider the following mitigation actions to address disruption to continuity of operations in the event of a landslide:

- Periodically review inventory of critical resources, including personnel, equipment, and supplies, necessary for continued operations after landslides.
- Develop robust communication plans to keep staff informed during and after landslide events, including alerts, updates, and instructions.

- Schedule regular reviews and updates of COOP plans based on new risks, lessons learned from past earthquake events, and changes in operations.

4.5.7.8. Climate Change

The increasing intensity of rainfall events anticipated because of climate change will lead to an increase in the number and extent of global landslide occurrences. However, there is very little readily available evidence or studies that indicate a significant increase in landslide activity is likely in the Unifour Region. The current North Carolina State Hazard Mitigation Plan does not suggest that climate change may increase the increase the probability of earthquakes in North Carolina outside the mountainous regions in the western part of the state.

4.5.8. Snow

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Some winter storms may be large enough to affect several states, while others may affect only a single community. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely impair visibility.

4.5.8.1. Snow Hazard Analysis

In general, winter weather events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation, all of which may create locally hazardous conditions regardless of the magnitude of the overall event. Blizzards, the most dangerous of all winter storms, combine heavy snowfall, low temperatures, and winds of at least 35 mph, reducing visibility to only a few yards. Blizzards have been reported in several counties in western North Carolina.

4.5.8.2. Location within the Planning Area

Winter weather, including blizzards, frosts/freezes, heavy snow and sleet, are widespread atmospheric conditions that are not isolated to a specific geographic location. Therefore, it is assumed that the entire planning area is exposed to this hazard. However, it is possible to map average annual snowfall and greatest one-day snowfall as an indicator of where severe conditions have been observed historically in the plan area. The maps depicted below show average snow accumulation in the planning area between 2008 and 2024 in inches.

Snow Hazard Areas - Regional

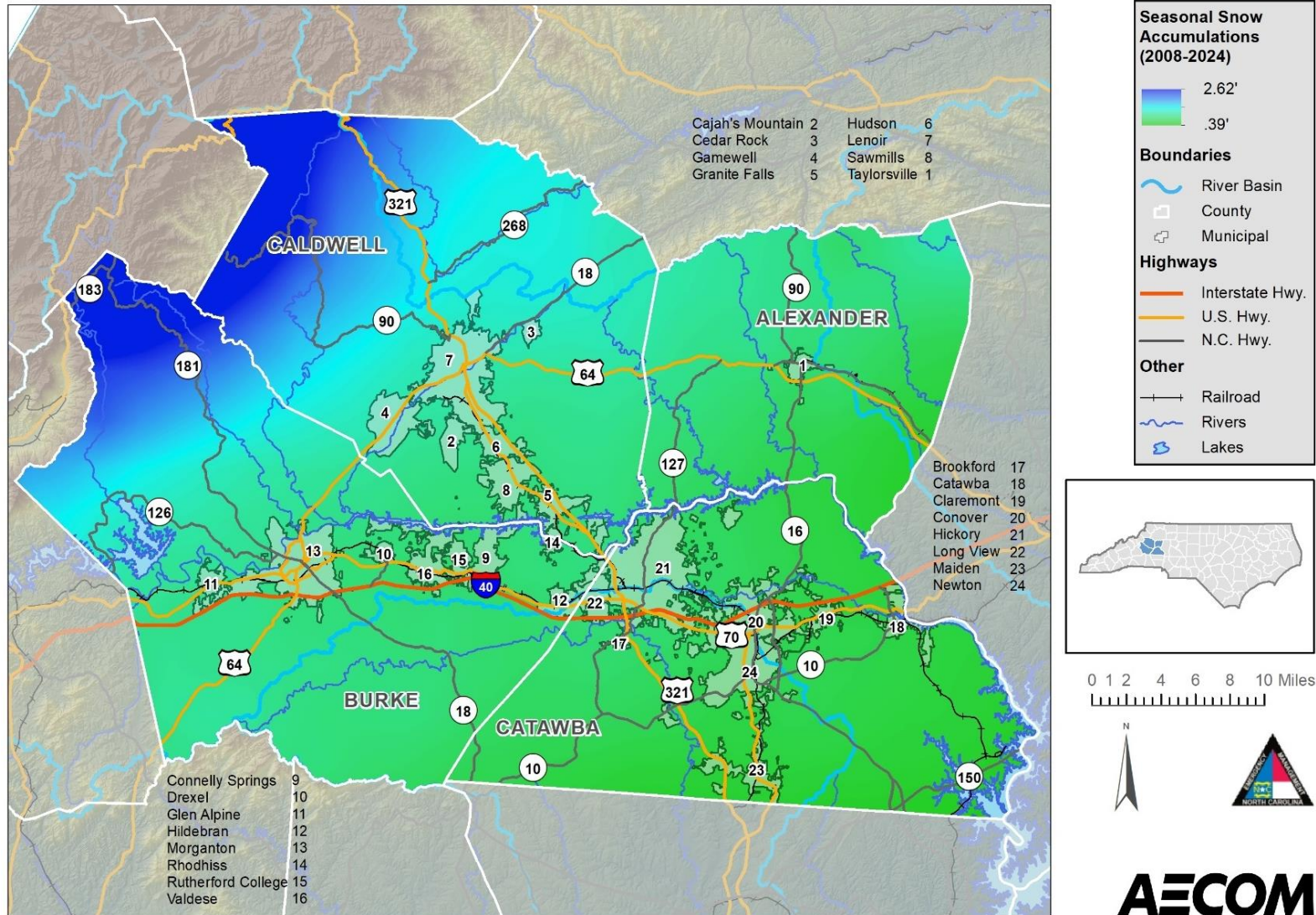
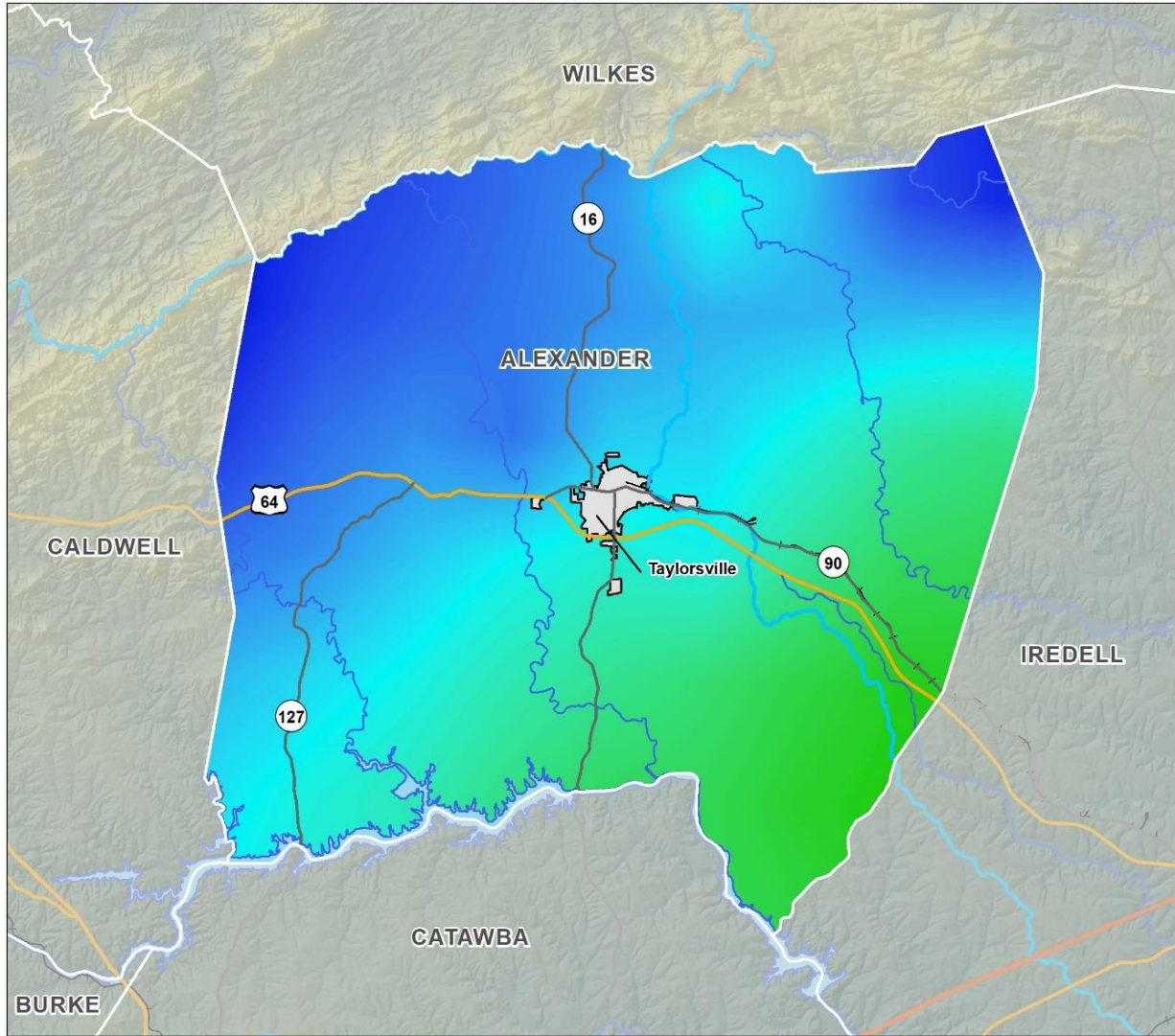


Figure 4-94: Snow Hazard Areas

Snow Hazard Areas - Alexander County



Seasonal Snow Accumulations (2008-2024)

- .83'
- .46'

Boundaries

- River Basin
- County
- Municipal

Highways

- Interstate Hwy.
- U.S. Hwy.
- N.C. Hwy.

Other

- Railroad
- Rivers
- Lakes



Figure 4-95:

Snow Hazard Areas for Alexander County

Snow Hazard Areas - Taylorsville

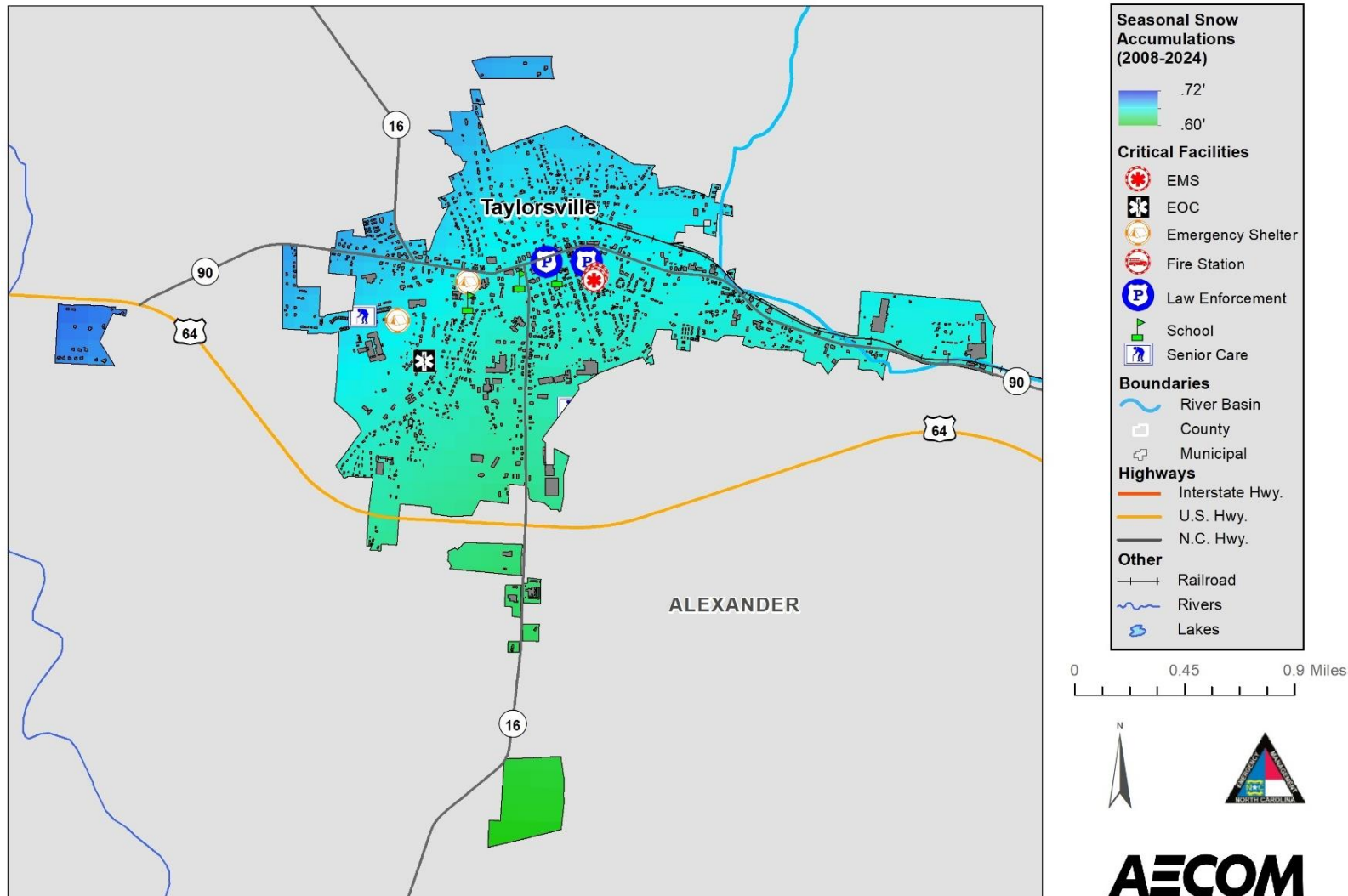
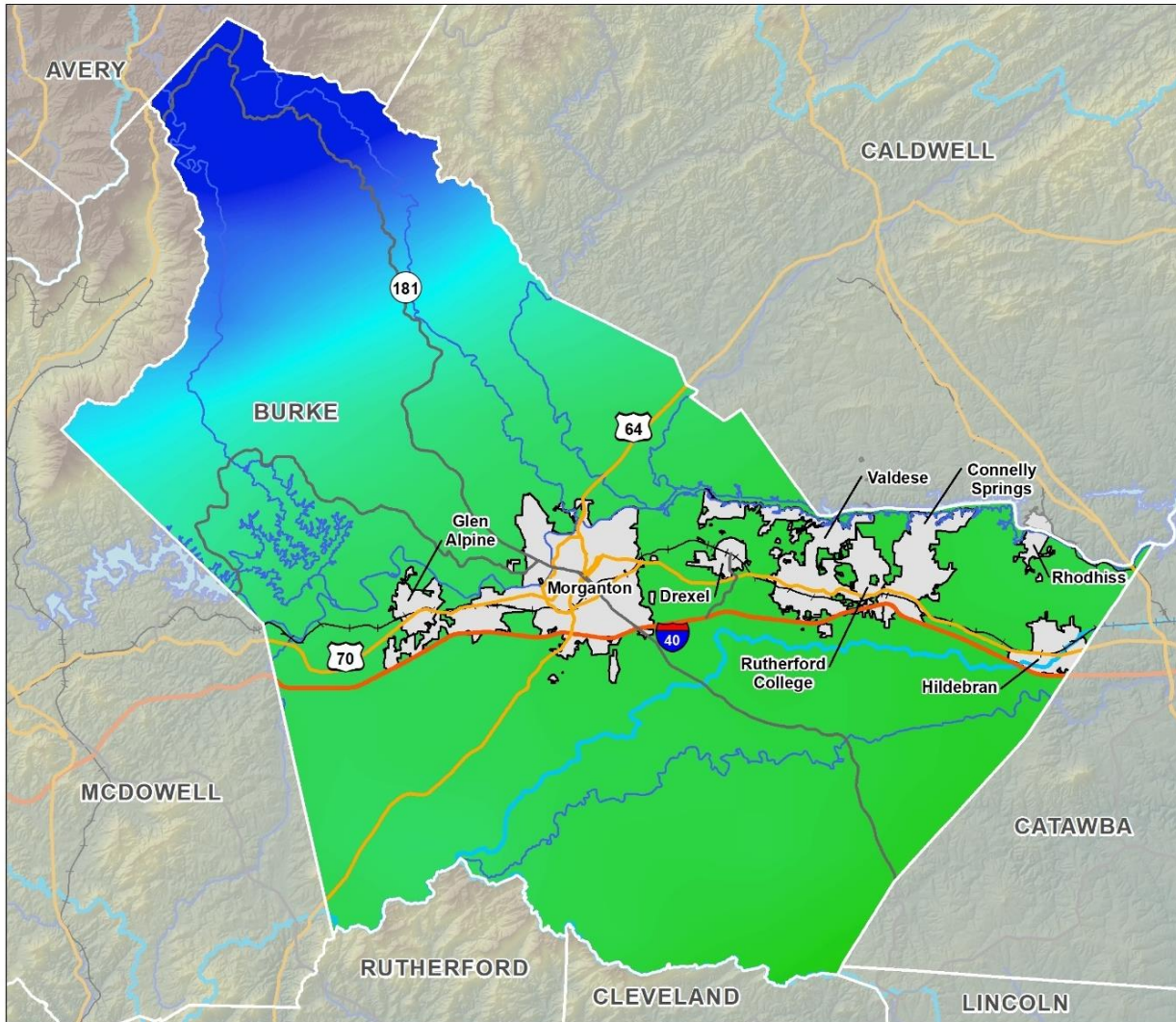


Figure 4-96: Snow Hazard Areas for Taylorsville

Snow Hazard Areas - Burke County



Seasonal Snow Accumulations (2008-2024)

- 2.37'
- .57'

Boundaries

- River Basin
- County
- Municipal

Highways

- Interstate Hwy.
- U.S. Hwy.
- N.C. Hwy.

Other

- Railroad
- Rivers
- Lakes



Figure 4-97:

Snow Hazard Area –Burke County

Snow Hazard Areas - Connelly Springs

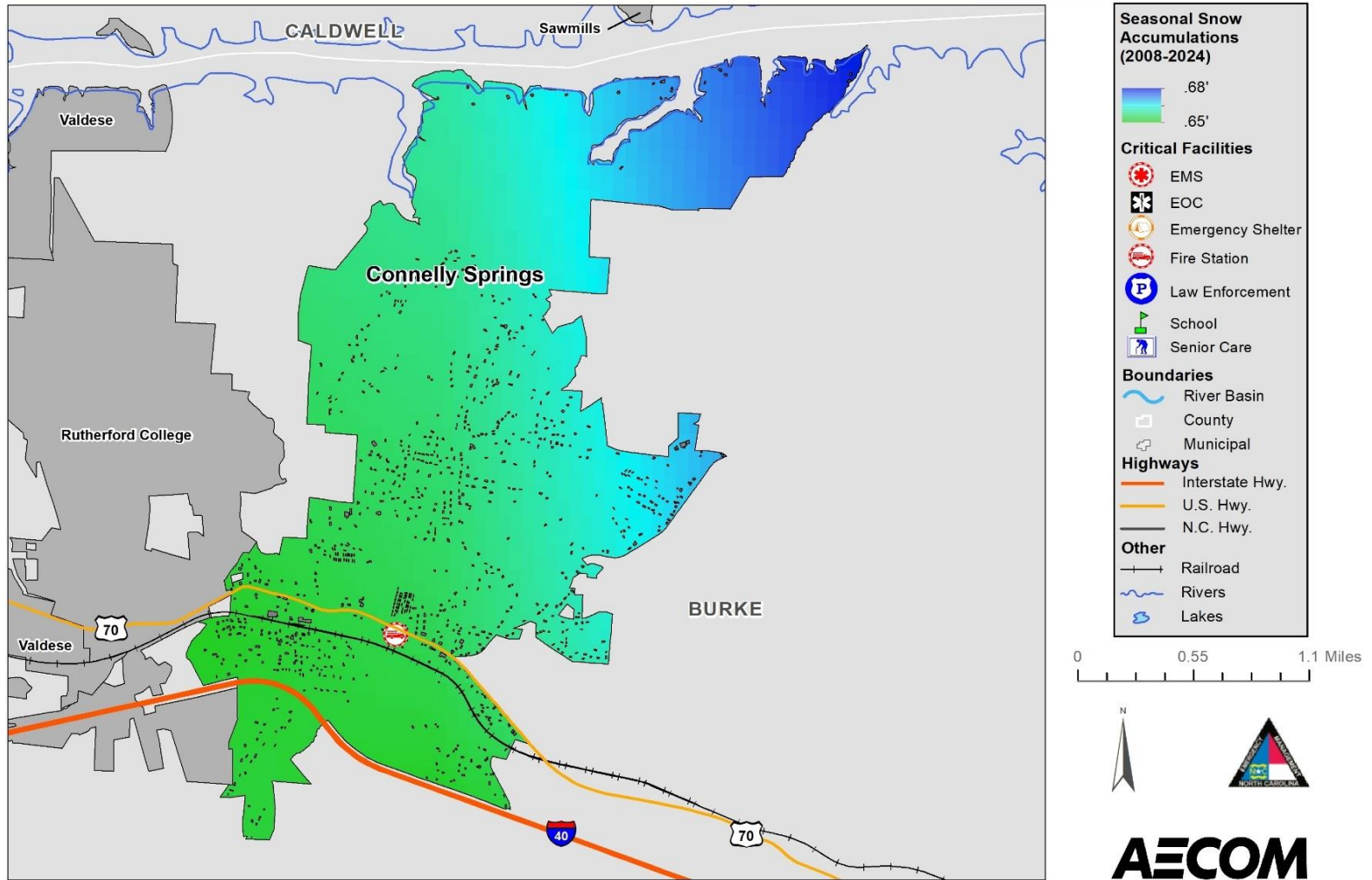


Figure 4-98: Snow Hazard Areas Connelly Springs

Snow Hazard Areas - Drexel

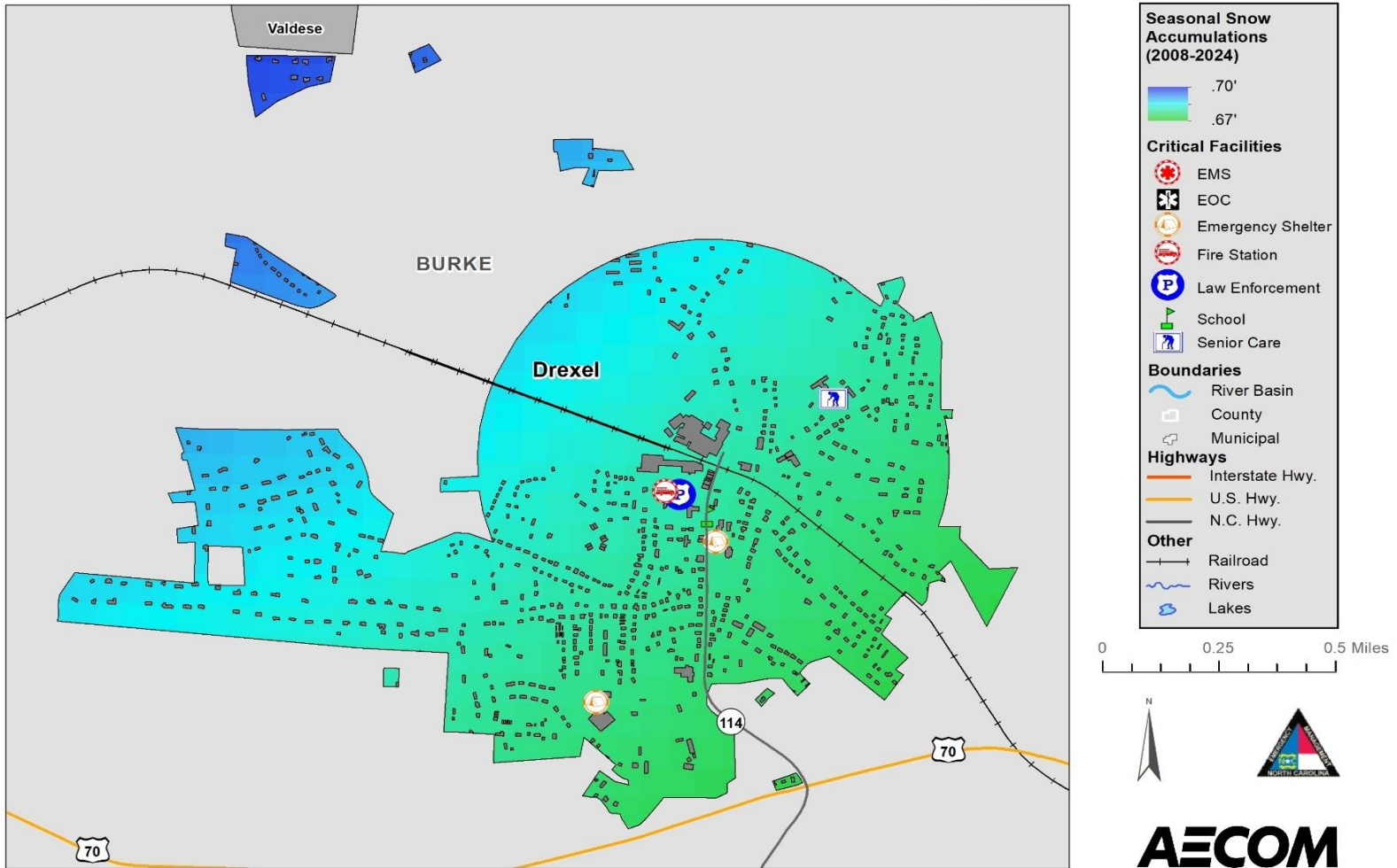


Figure 4-99: Snow Hazard Areas for Drexel

Snow Hazard Areas - Glen Alpine

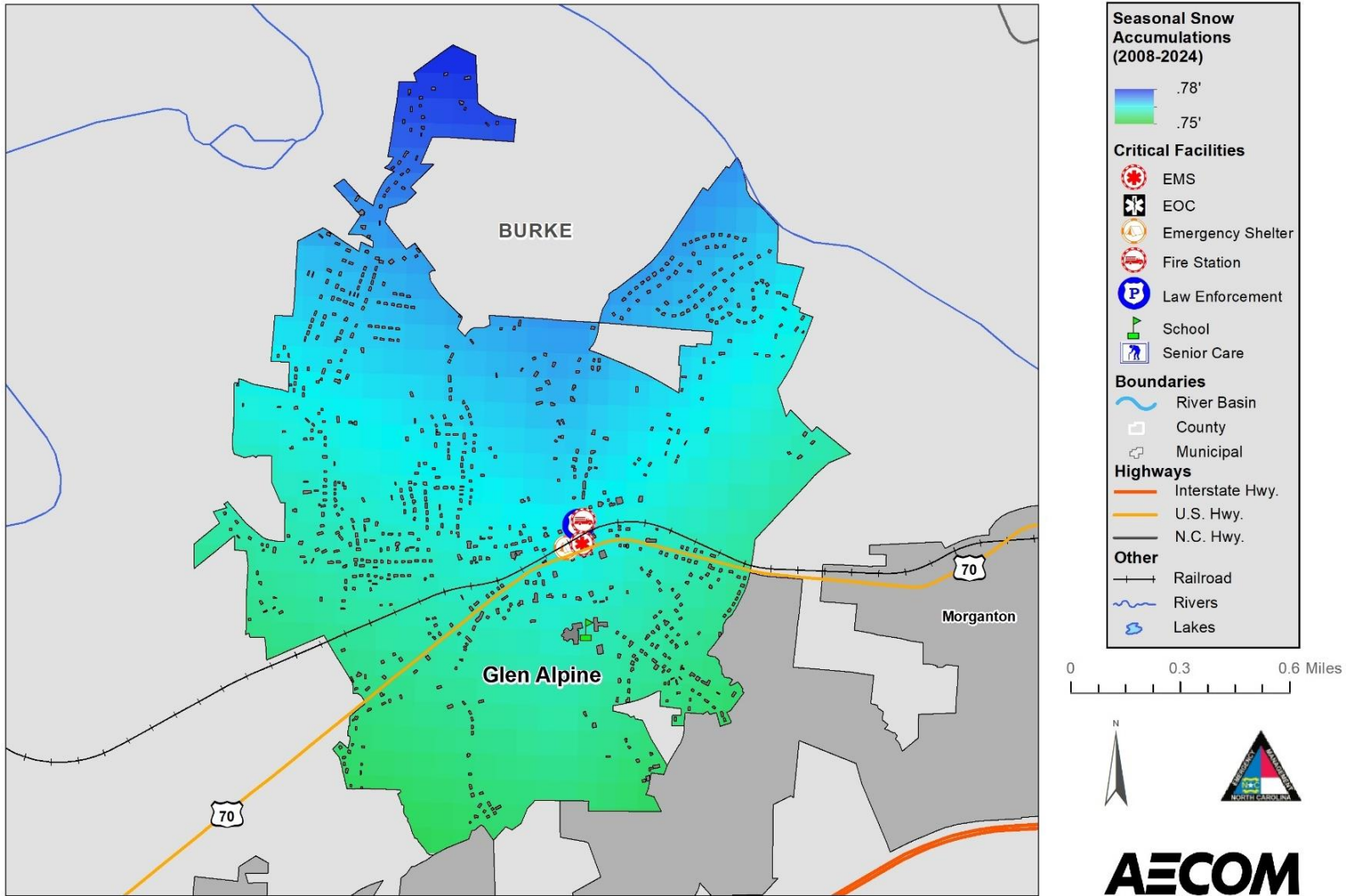


Figure 4-100: Snow Hazard Areas for Glen Alpine



Snow Hazard Areas - Hildebran

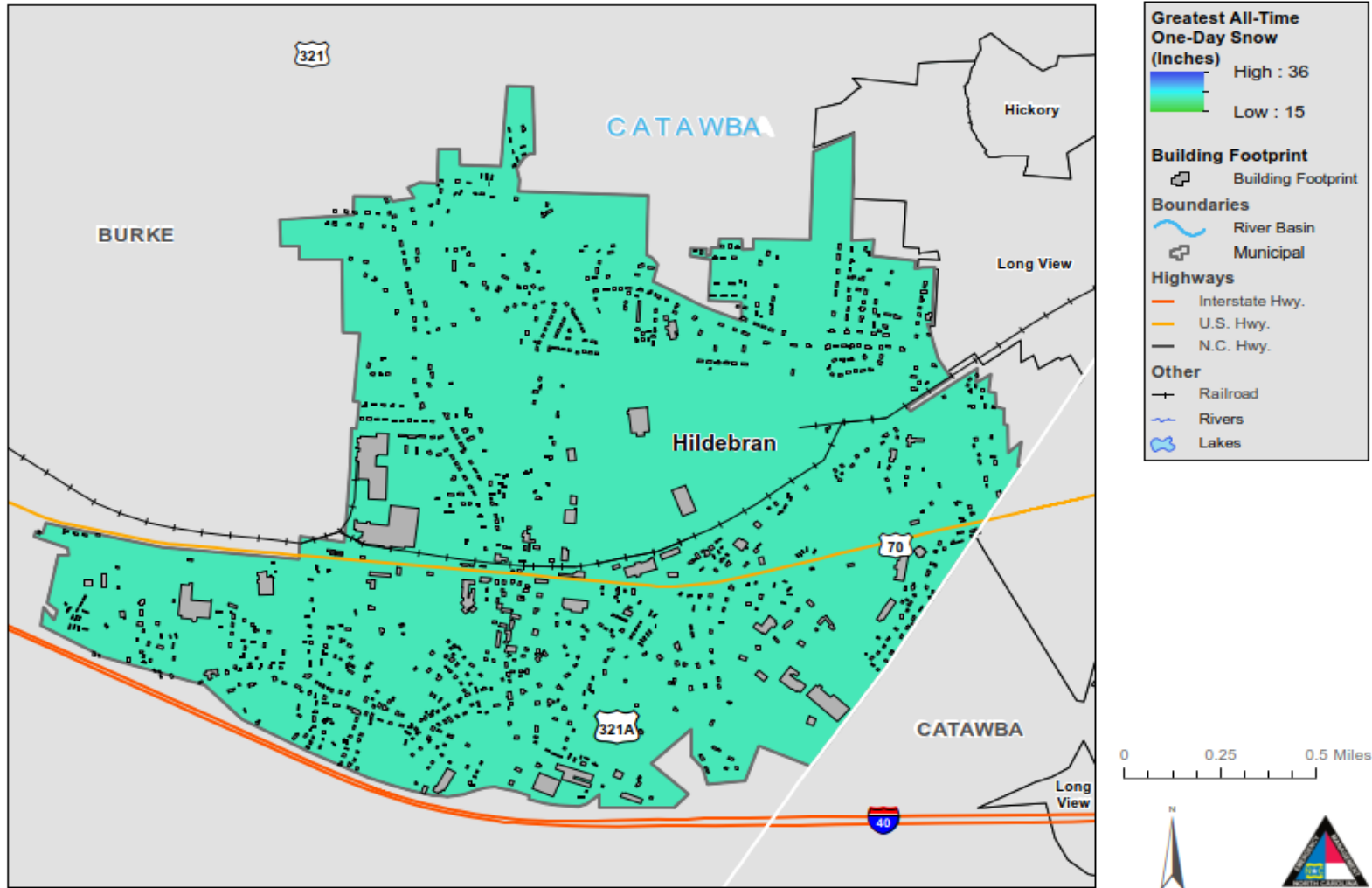


Figure 4-101: Snow Hazard Areas for Hildebran

Snow Hazard Areas - Morgantown

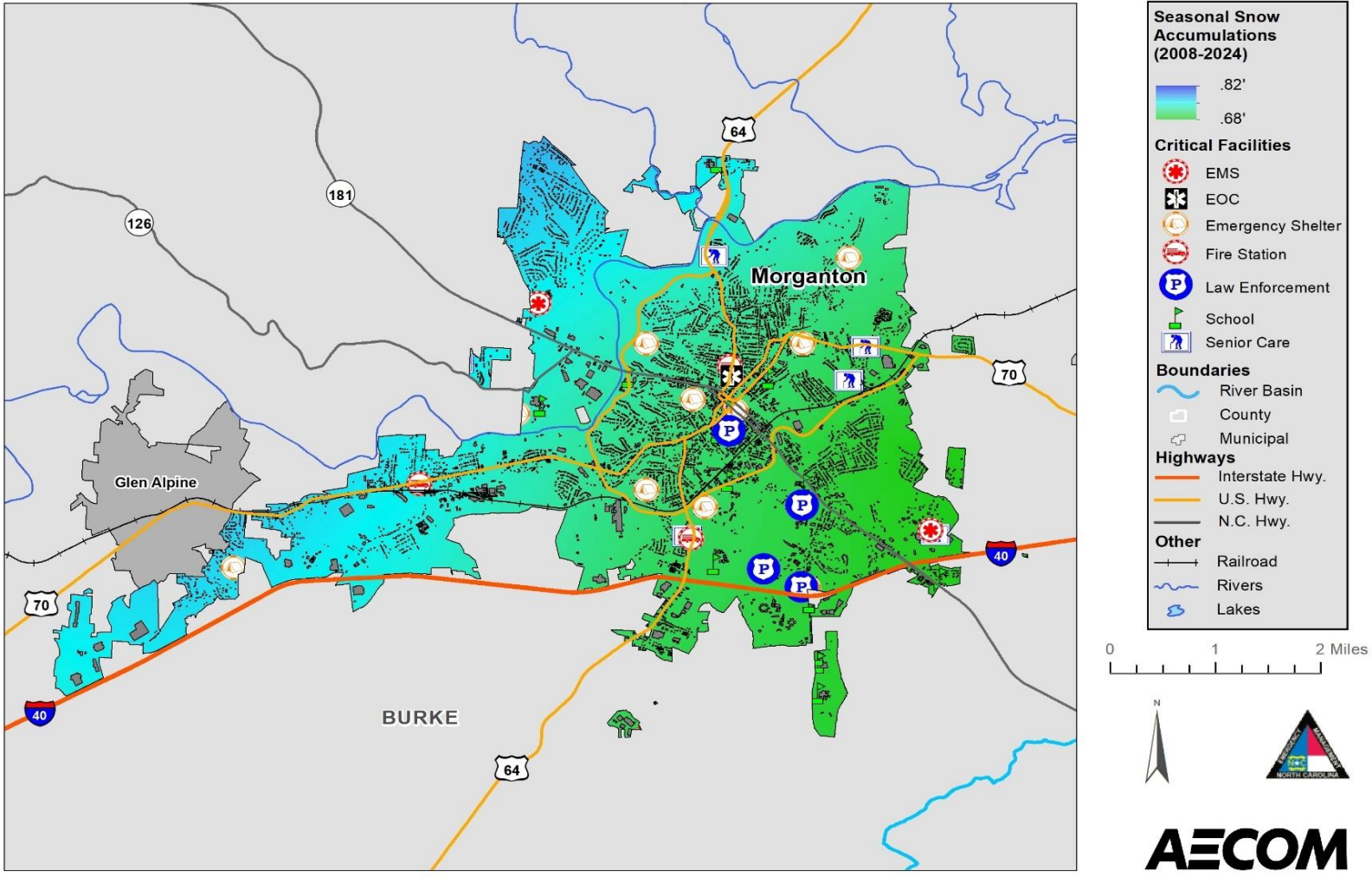


Figure 4-102: Snow Hazard Areas for Morgantown

Snow Hazard Areas - Rutherford College

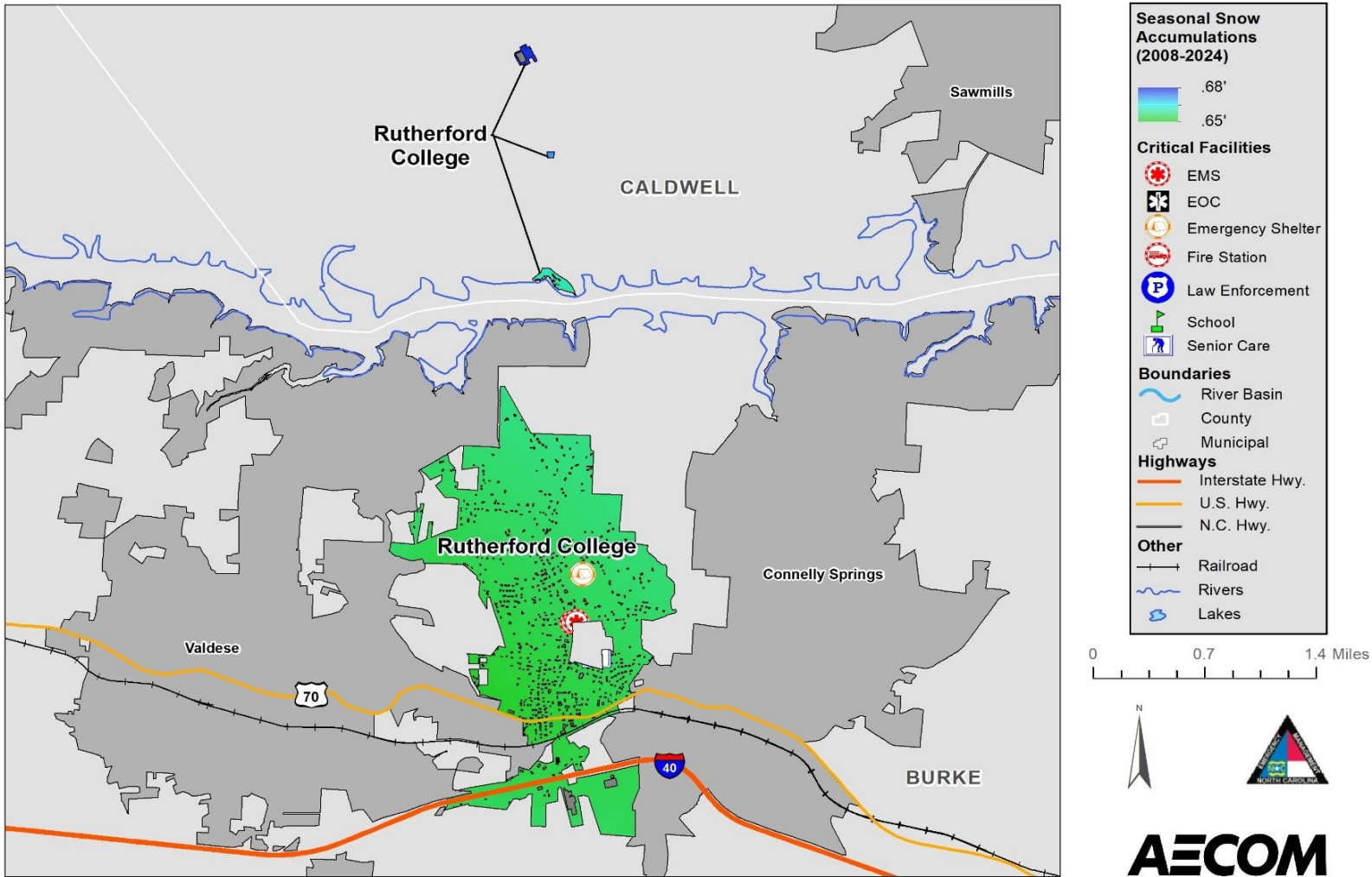


Figure 4-103: Snow Hazard Areas for Rutherford College

Snow Hazard Areas - Valdese

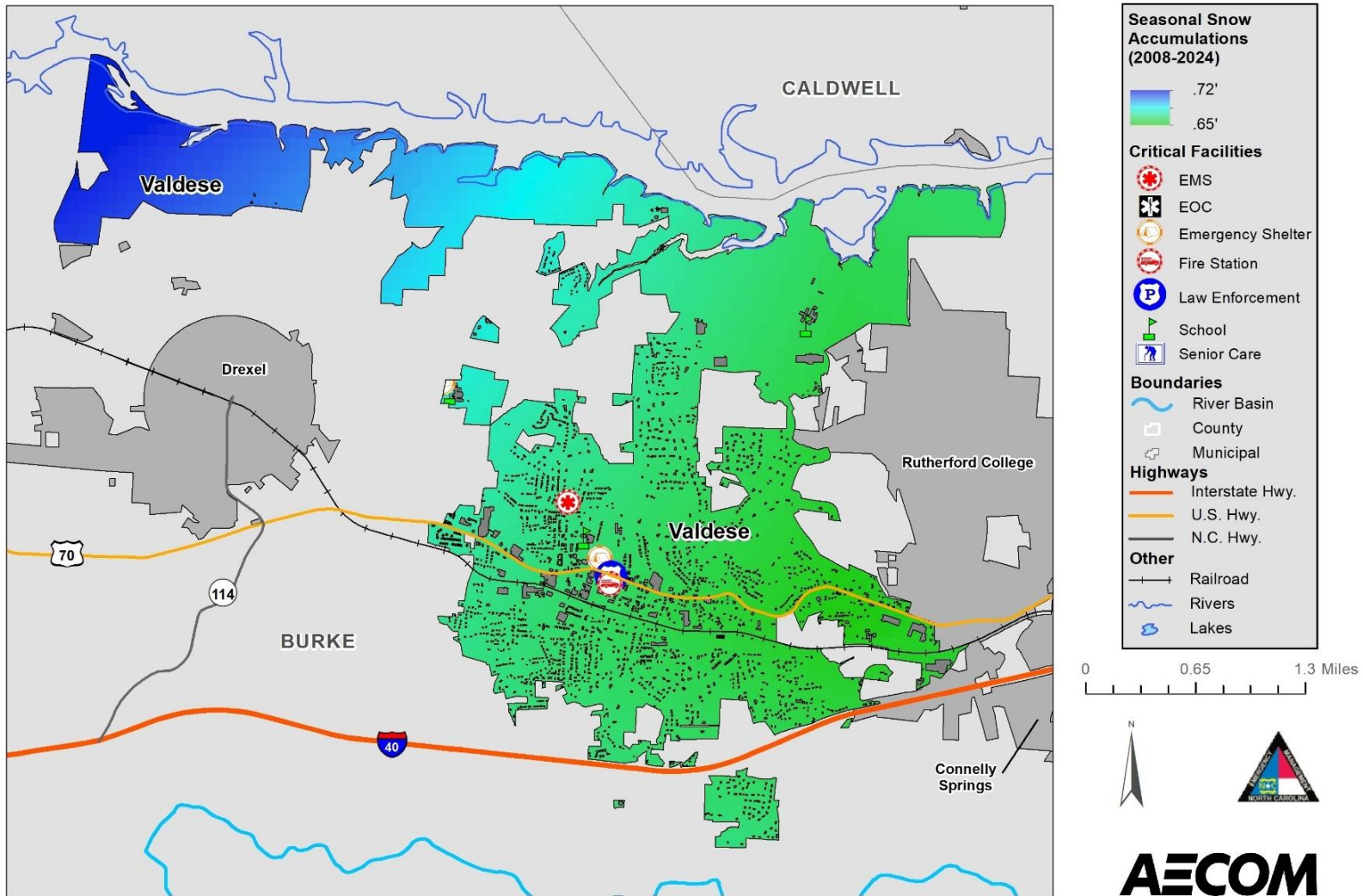


Figure 4-104: Snow Hazard Areas for Valdese

Snow Hazard Areas - Caldwell County

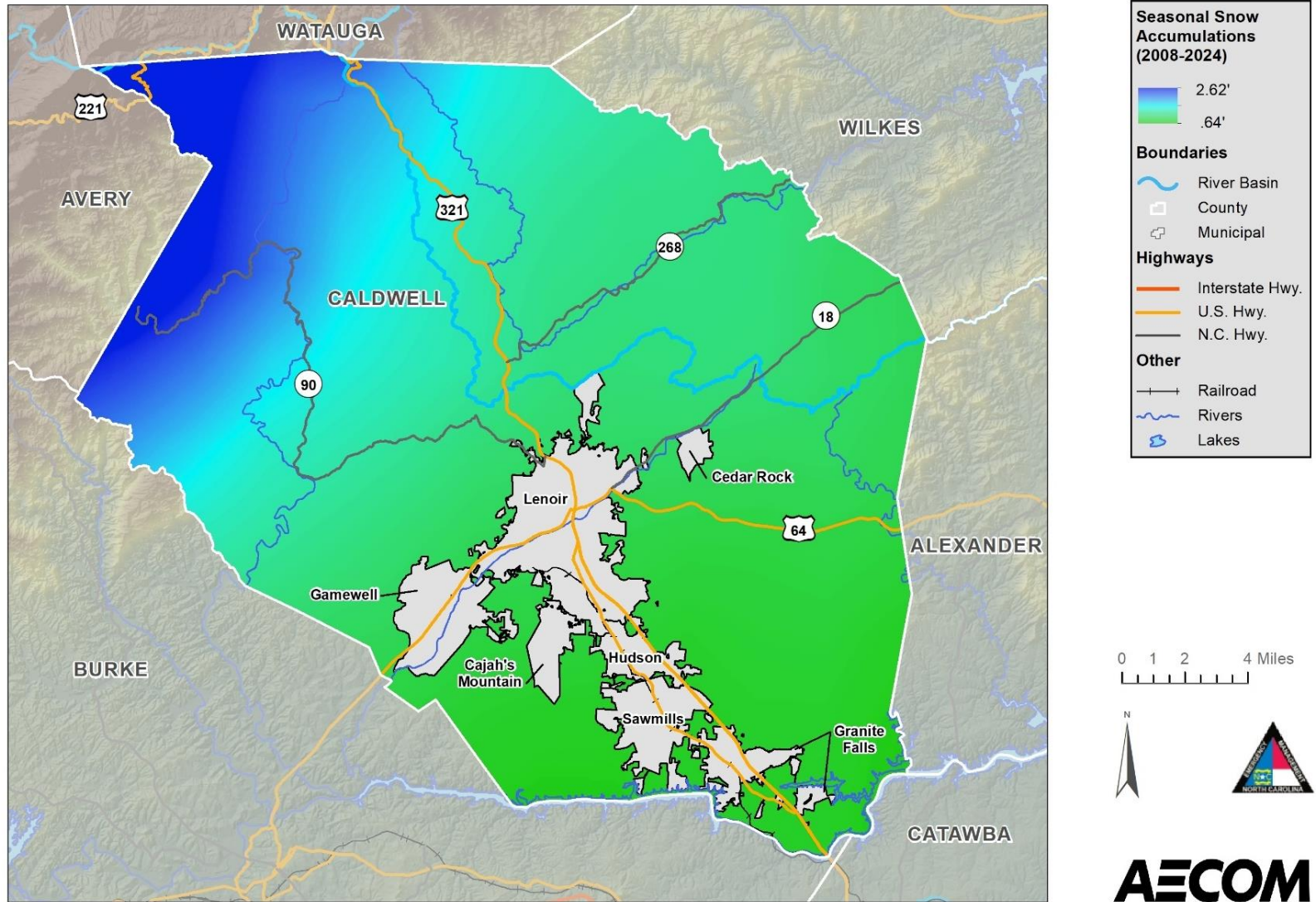


Figure 4-105: Snow Hazard Area – Caldwell County

Snow Hazard Areas - Cajah's Mountain

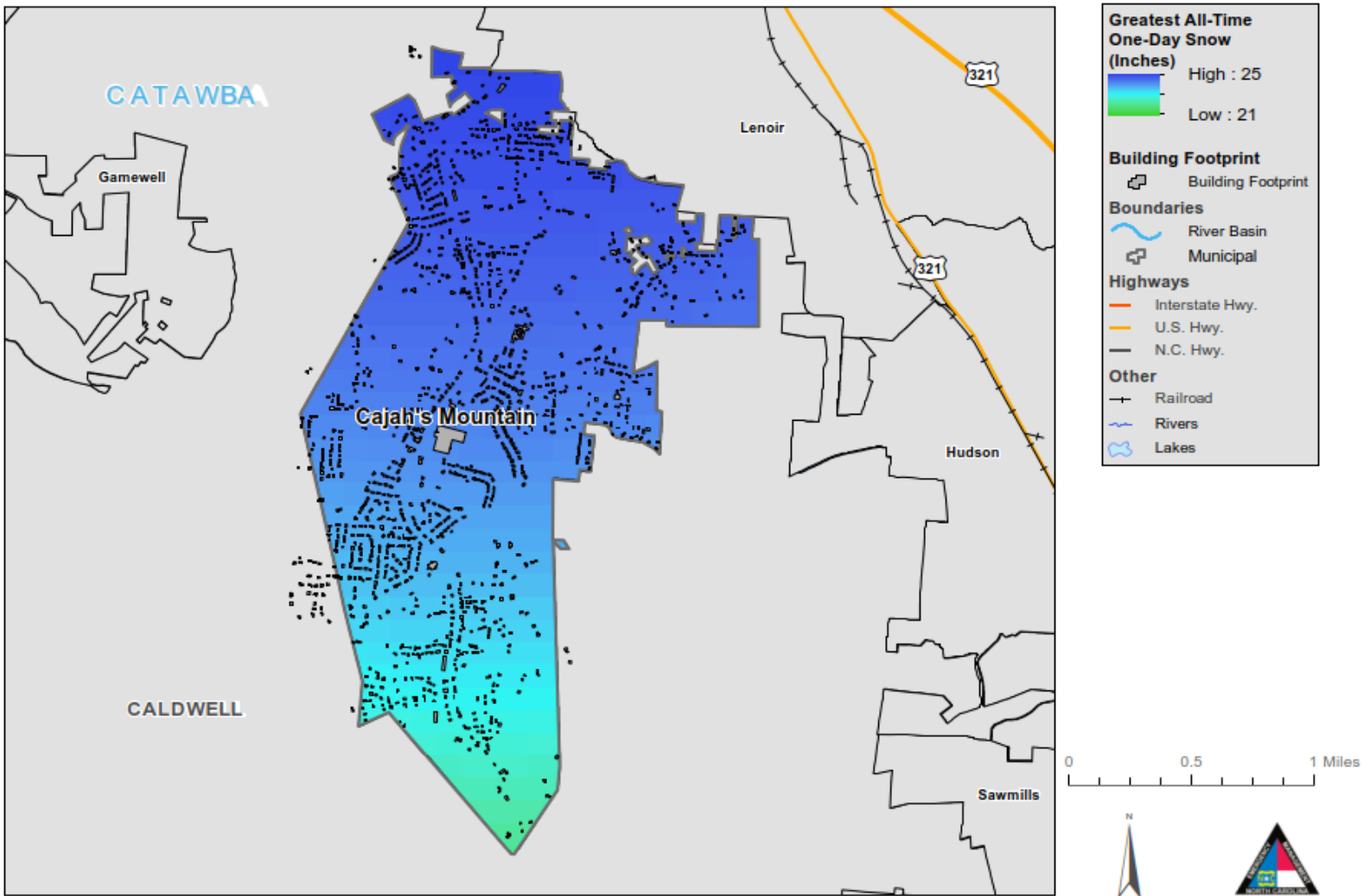


Figure 4-106: Snow Hazard Areas for Cajah's Mountain

Snow Hazard Areas - Cedar Rock

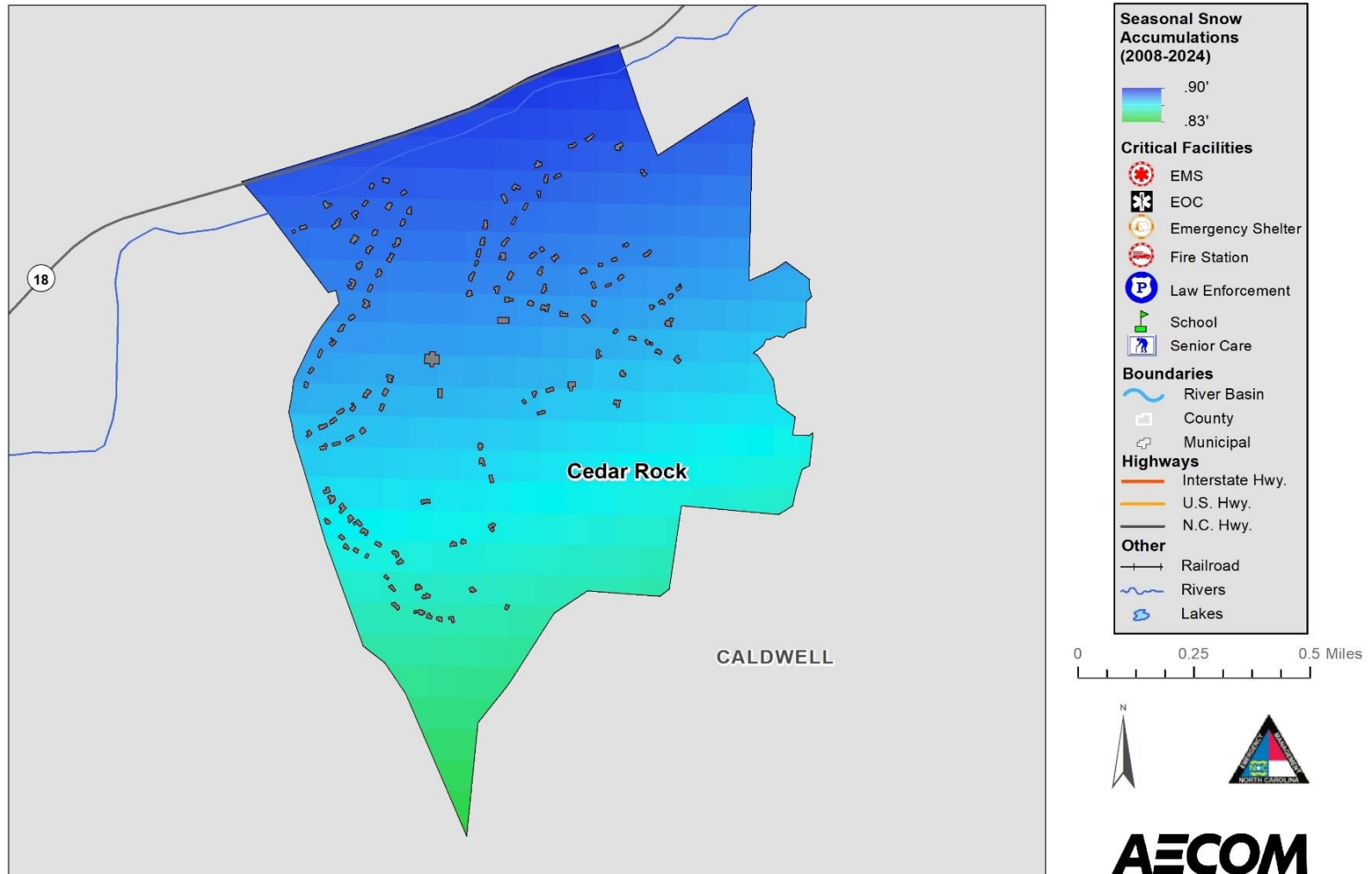


Figure 4-107: Snow Hazard Areas for Cedar Rock

Snow Hazard Areas - Gamewell

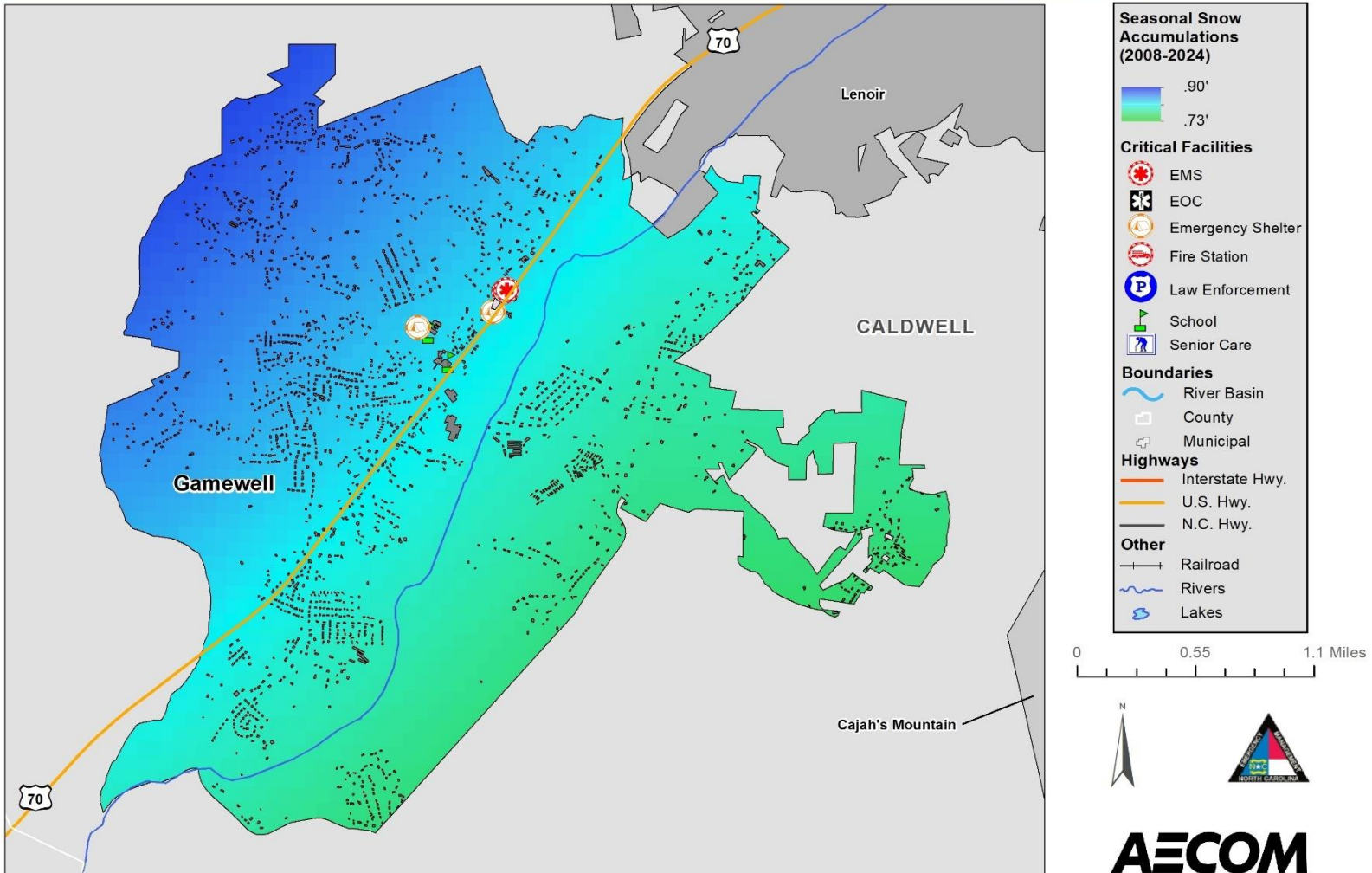


Figure 4-108: Snow Hazard Areas for Gamewell



Snow Hazard Areas - Granite Falls

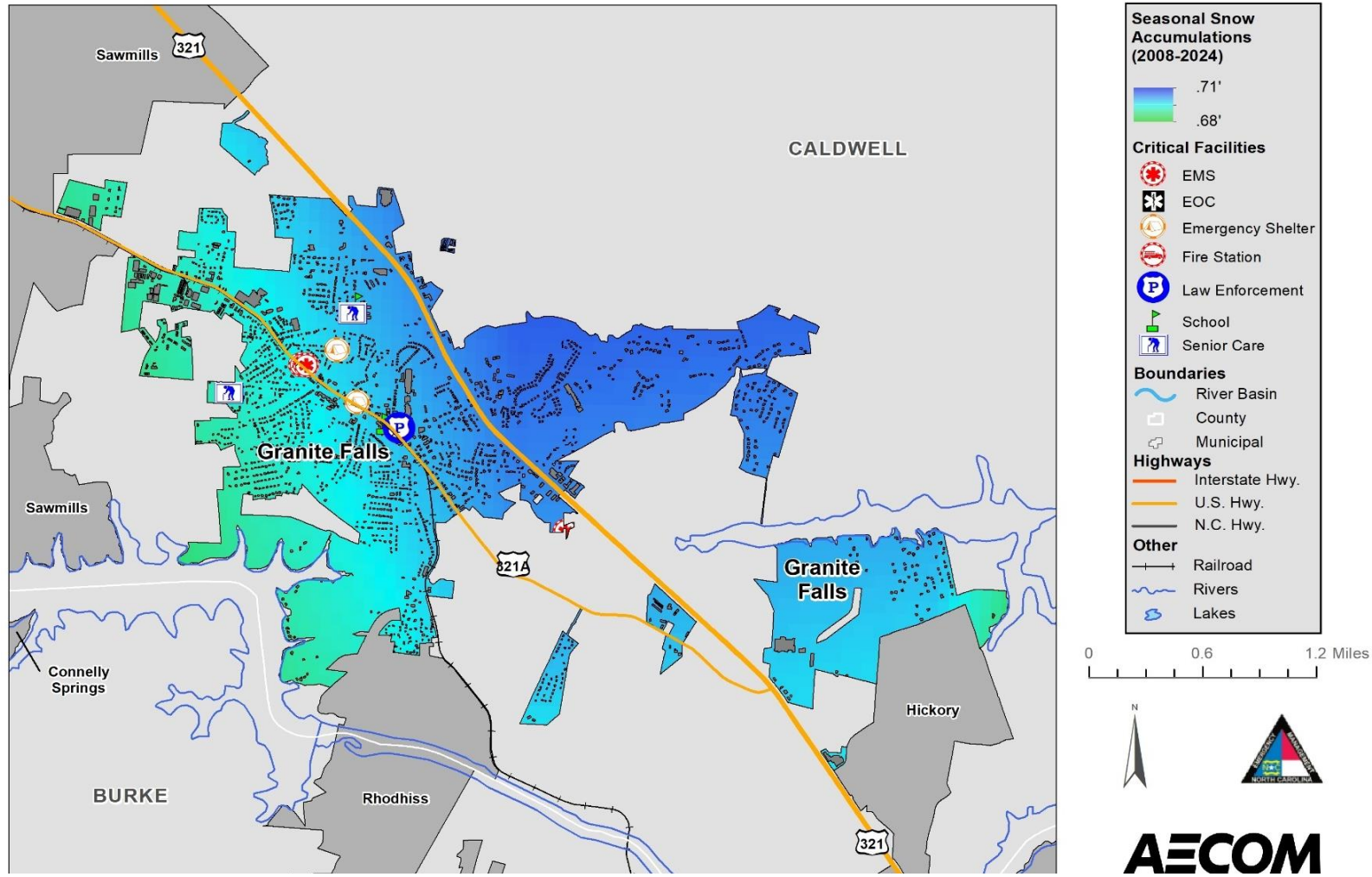


Figure 4-109: Snow Hazard Areas for Granite Falls

Snow Hazard Areas - Hudson

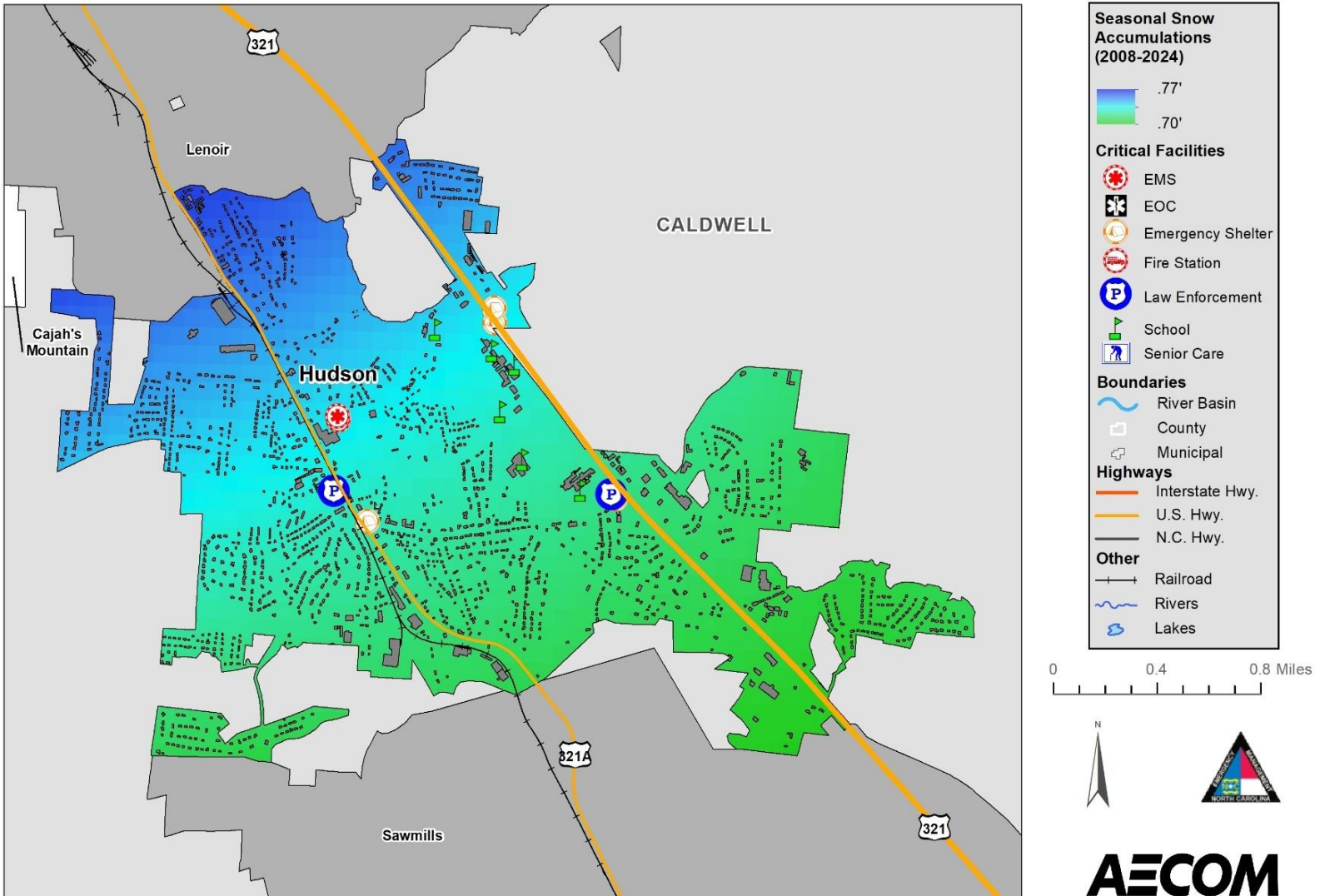


Figure 4-110: Snow Hazard Areas for Hudson

Snow Hazard Areas - Lenoir

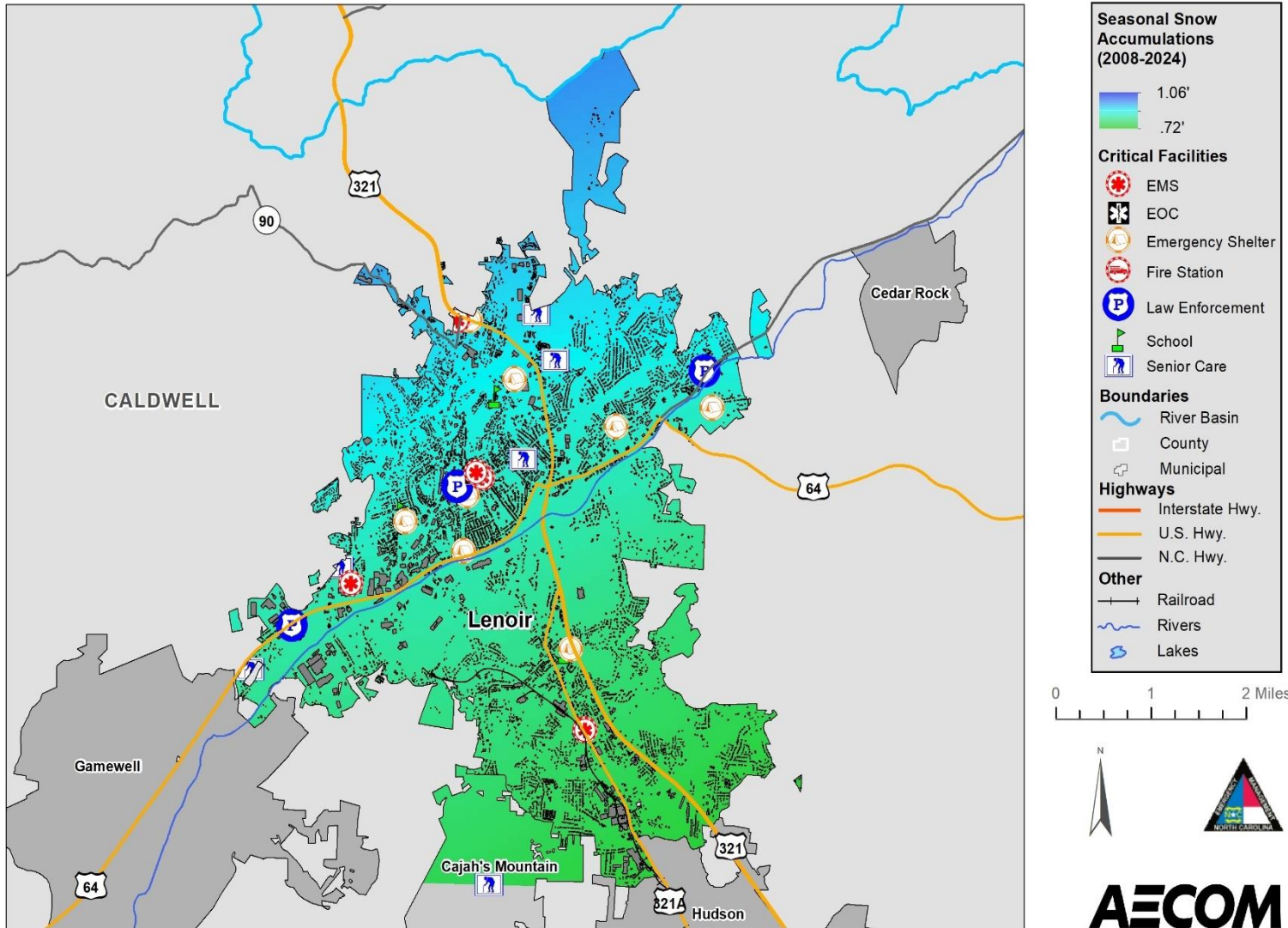


Figure 4-111: Snow Hazard Areas for Lenoir

Snow Hazard Areas - Rhodhiss

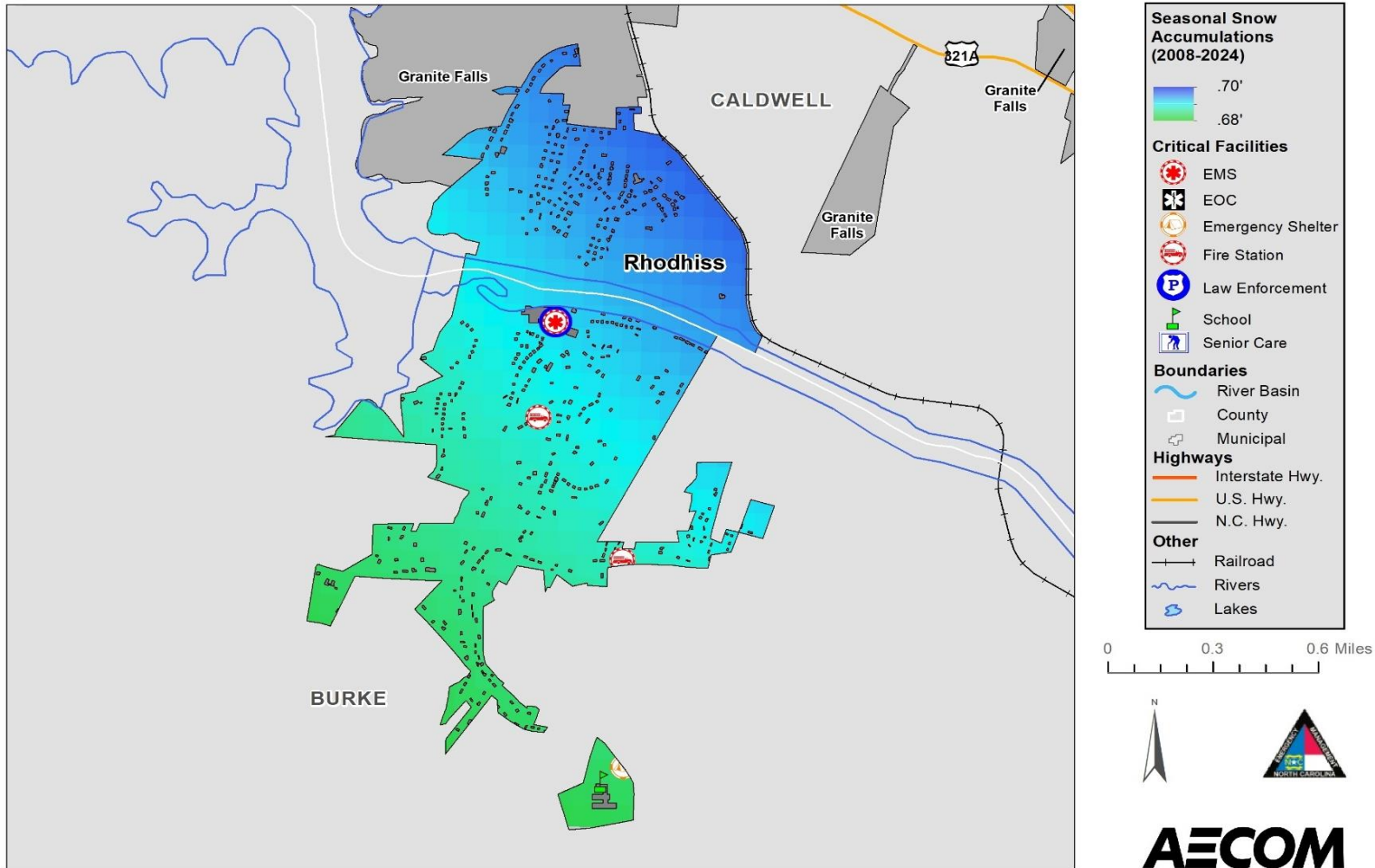


Figure 4-112: Snow Hazard Areas for Rhodhiss

Snow Hazard Areas - Sawmills

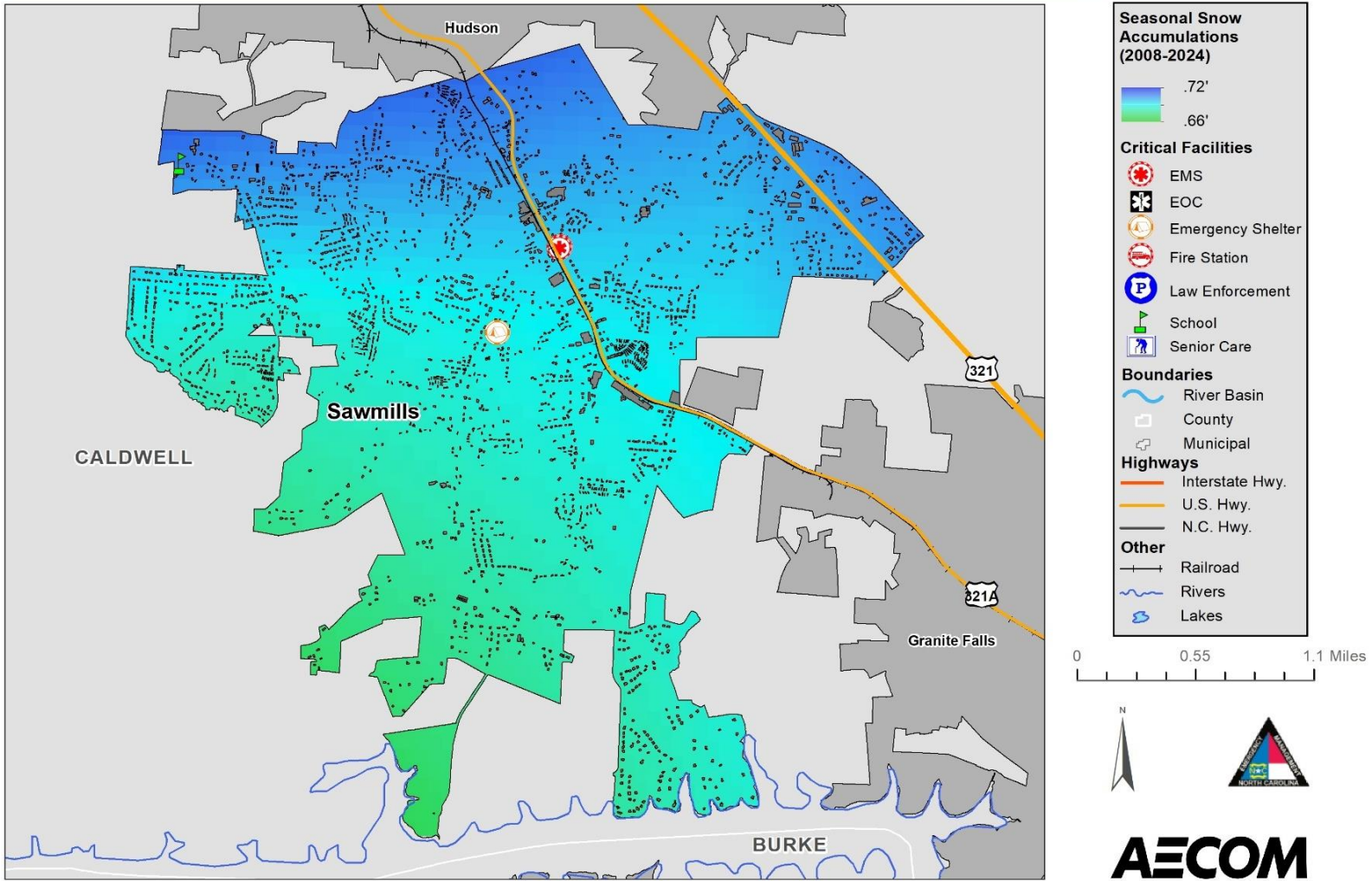


Figure 4-113: Snow Hazard Areas for Sawmills

Snow Hazard Areas - Catawba County

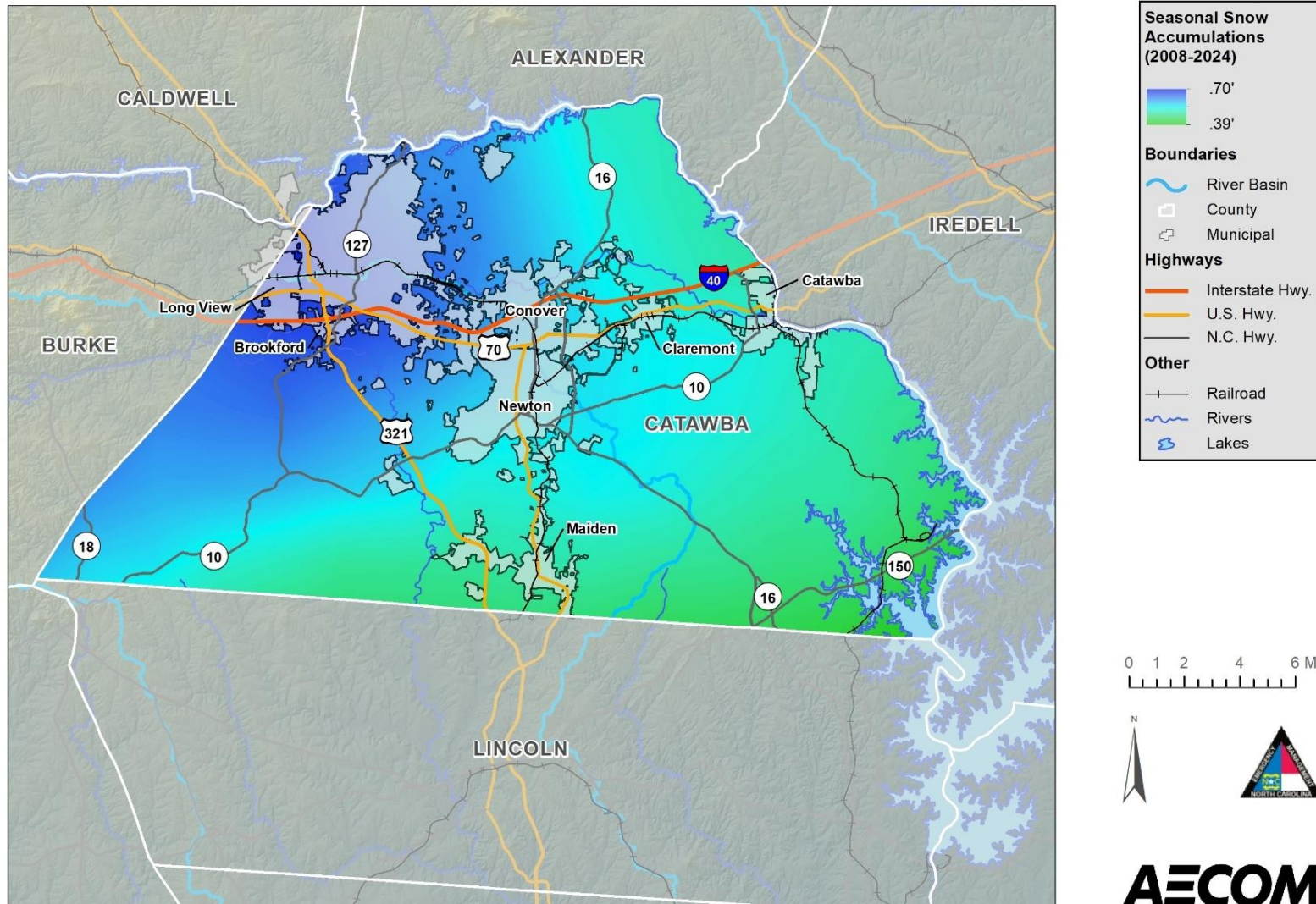


Figure 4-114: Snow Hazard Area – Catawba County

Snow Hazard Areas - Brookford

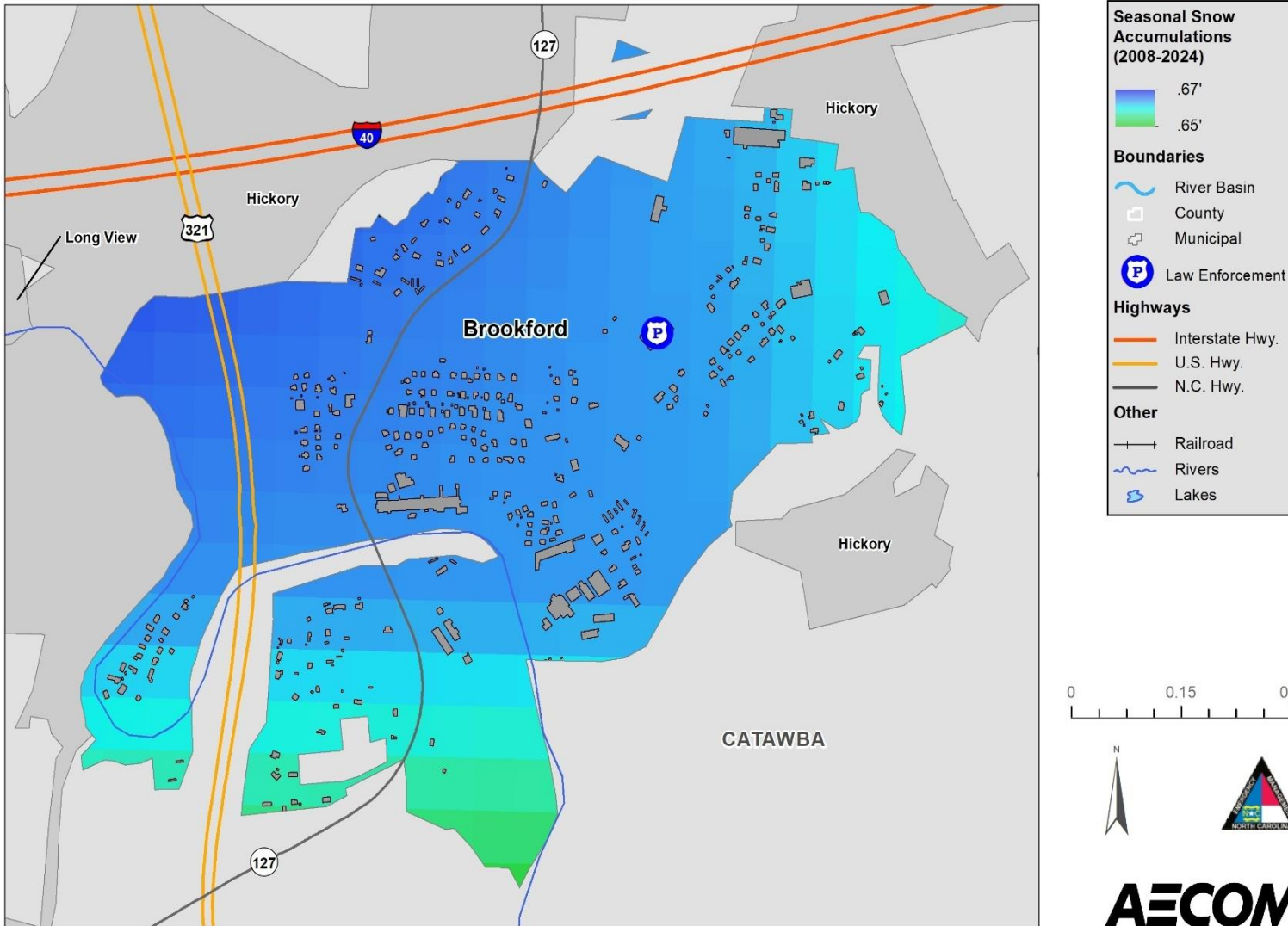


Figure 4-115: Snow Hazard Areas for Brookford

Snow Hazard Areas - Catawba

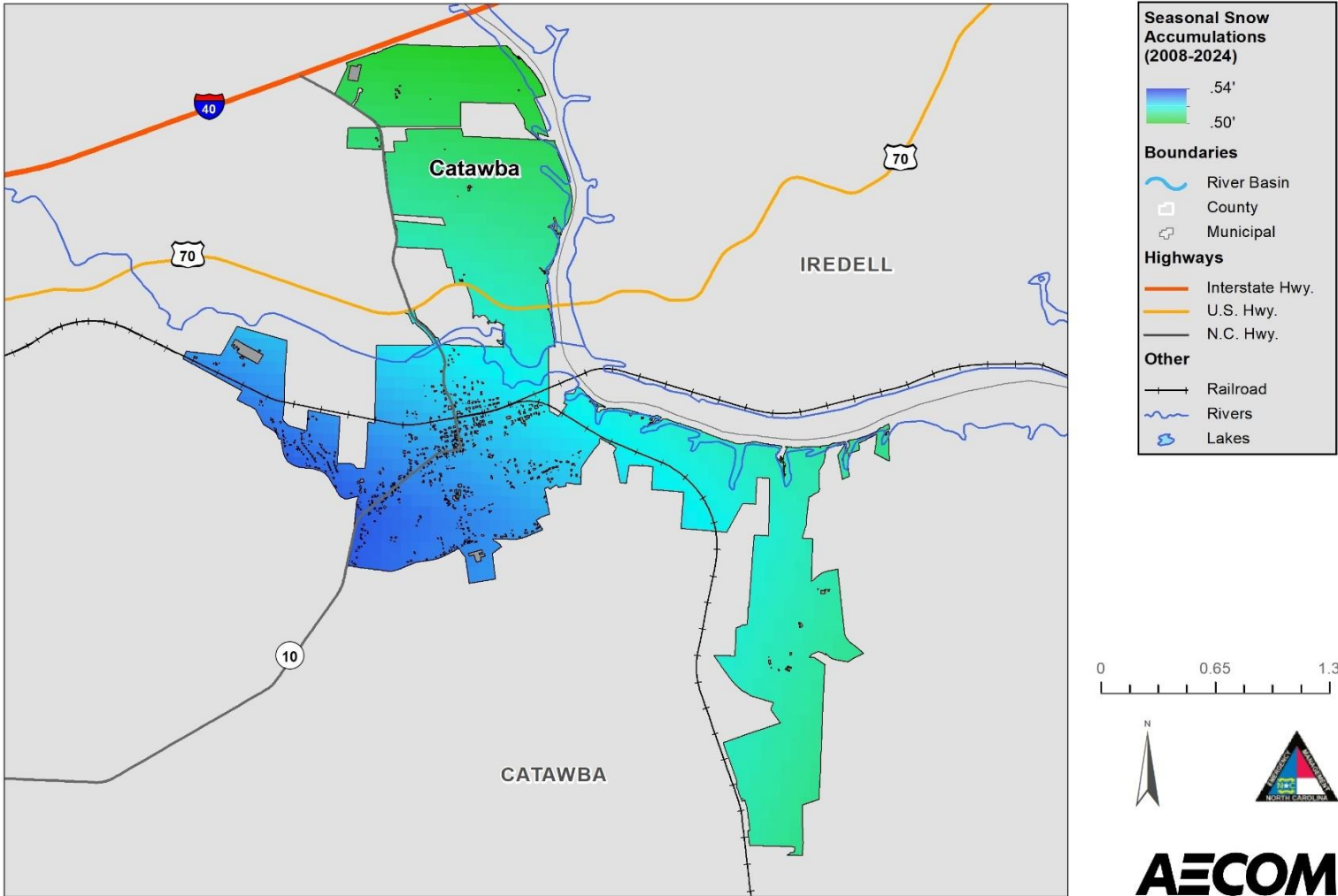


Figure 4-116: Snow Hazard Areas for Catawba

Snow Hazard Areas - Claremont

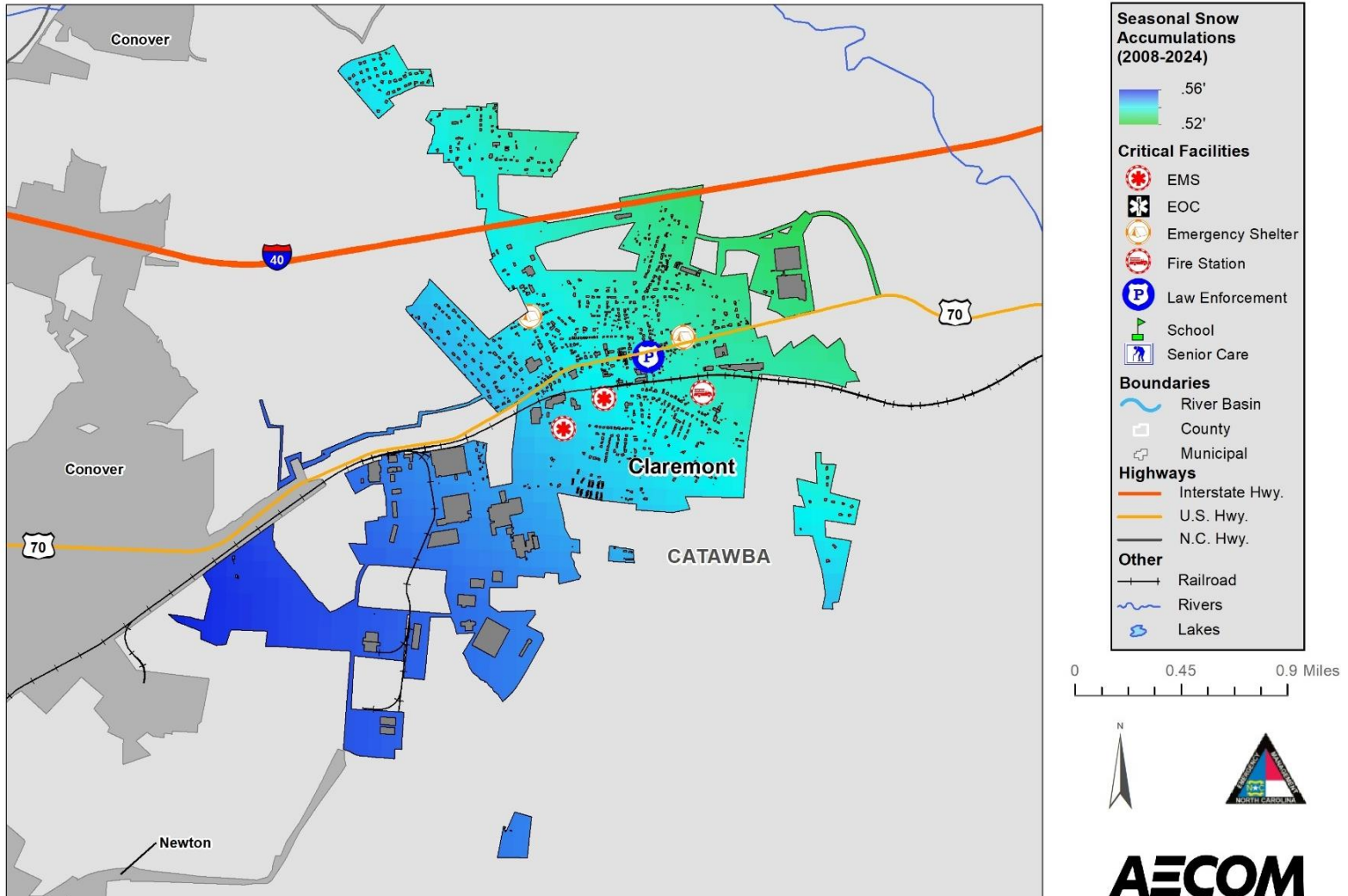


Figure 4-117: Snow Hazard Areas for Claremont

Snow Hazard Areas - Conover

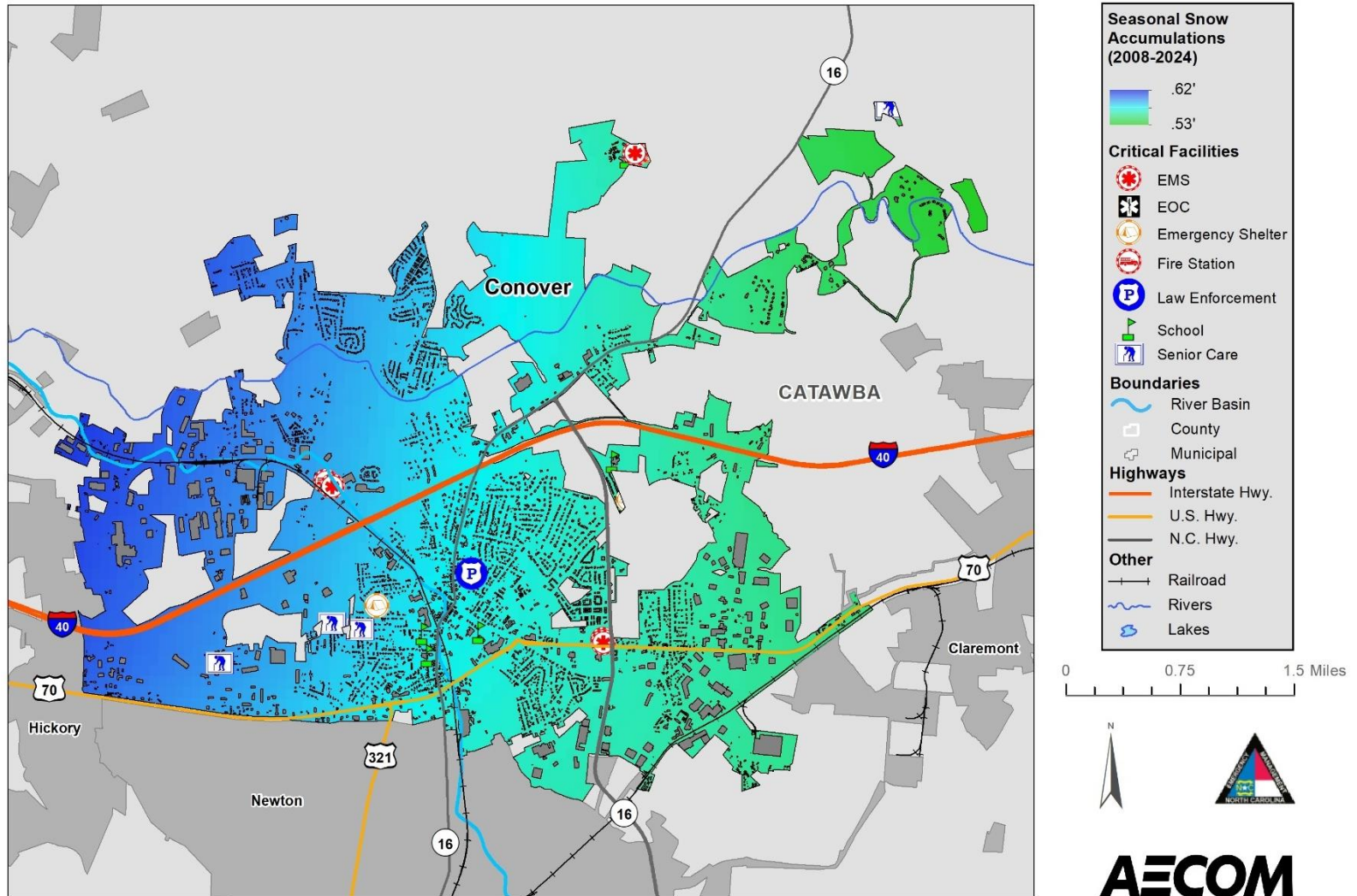


Figure 4-118: Snow Hazard Areas for Conover

Snow Hazard Areas - Long View

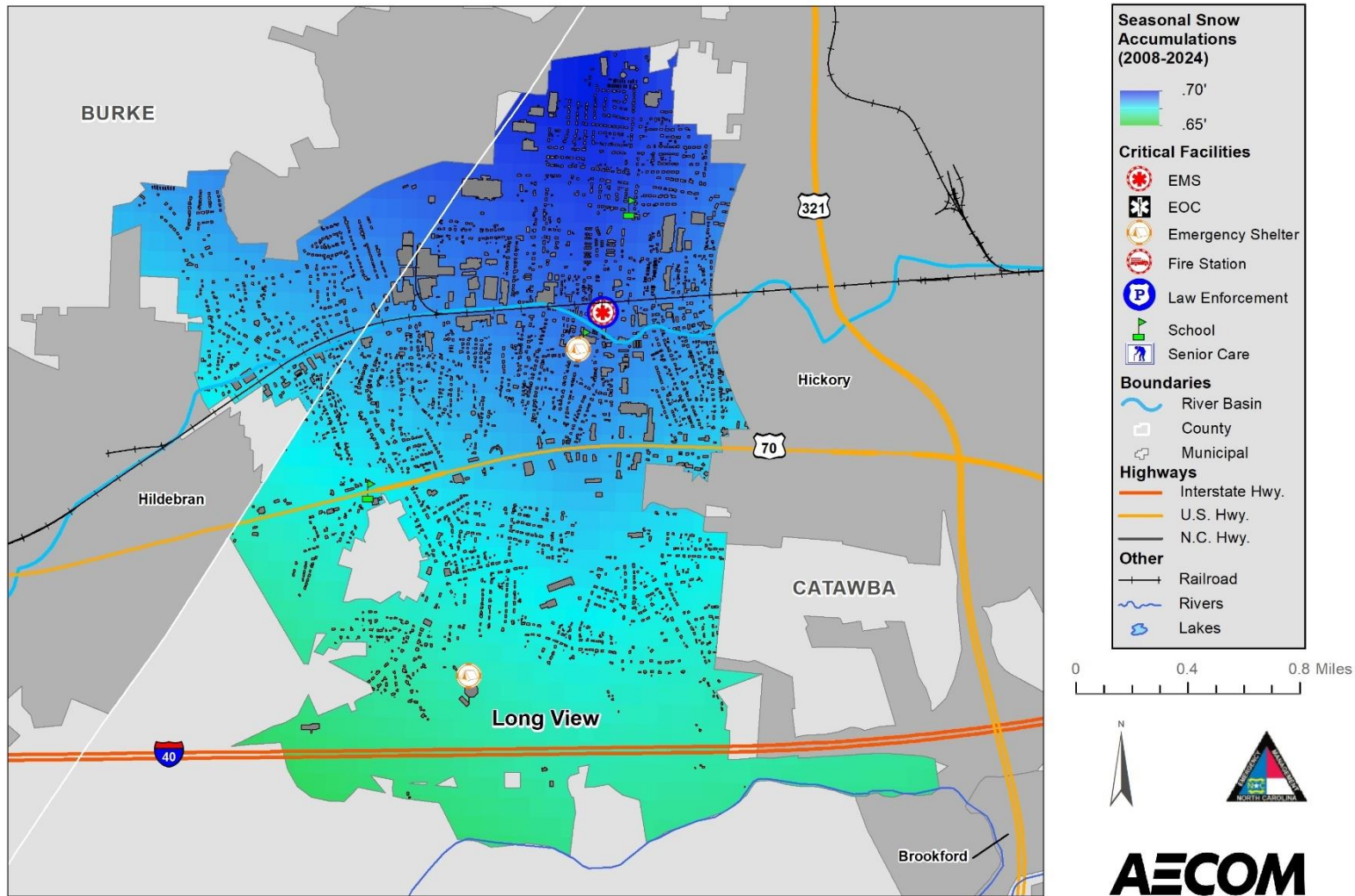


Figure 4-119: Snow Hazard Areas for Long View

Snow Hazard Areas - Hickory

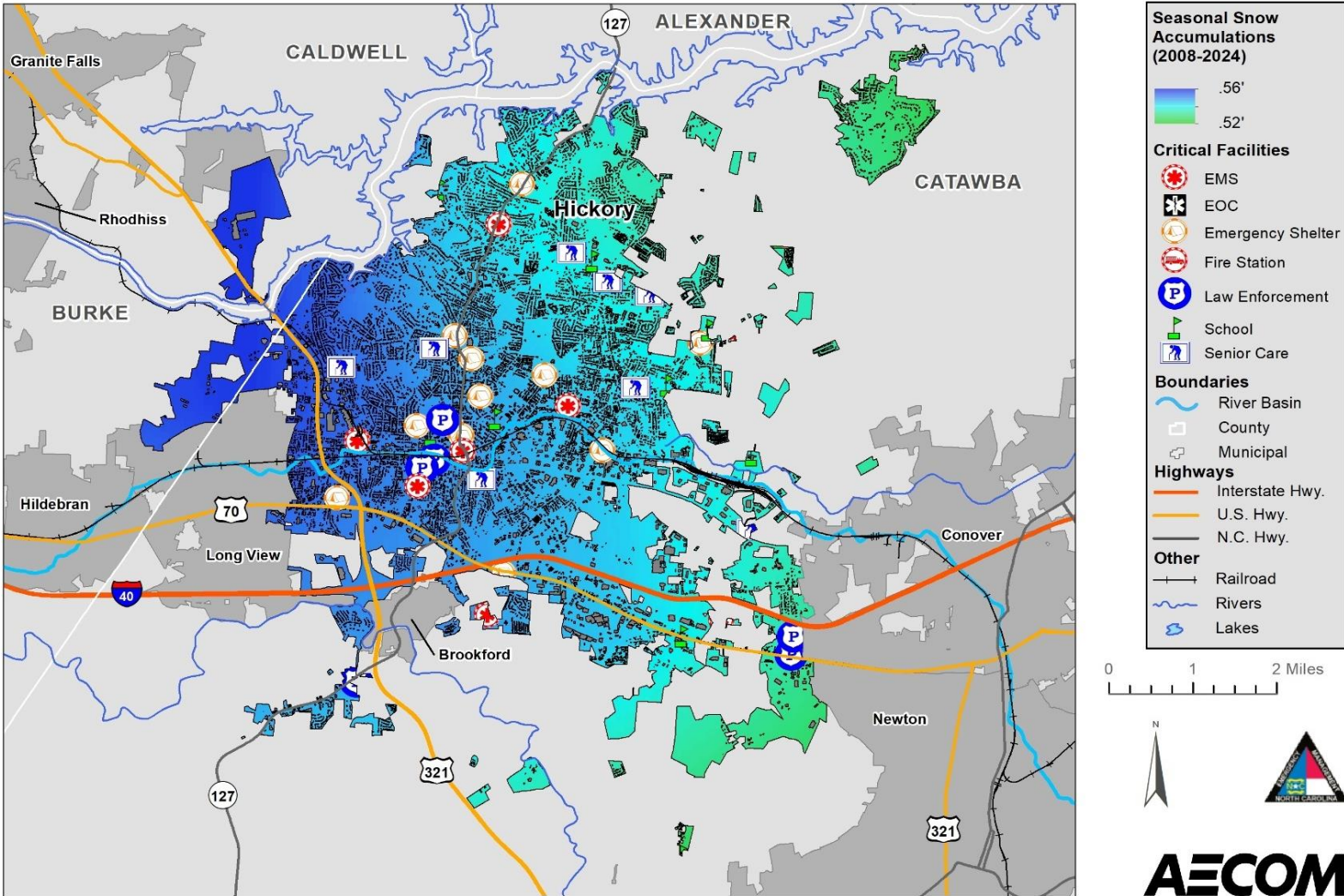


Figure 4-120: Snow Hazard Areas for Hickory

Snow Hazard Areas - Maiden

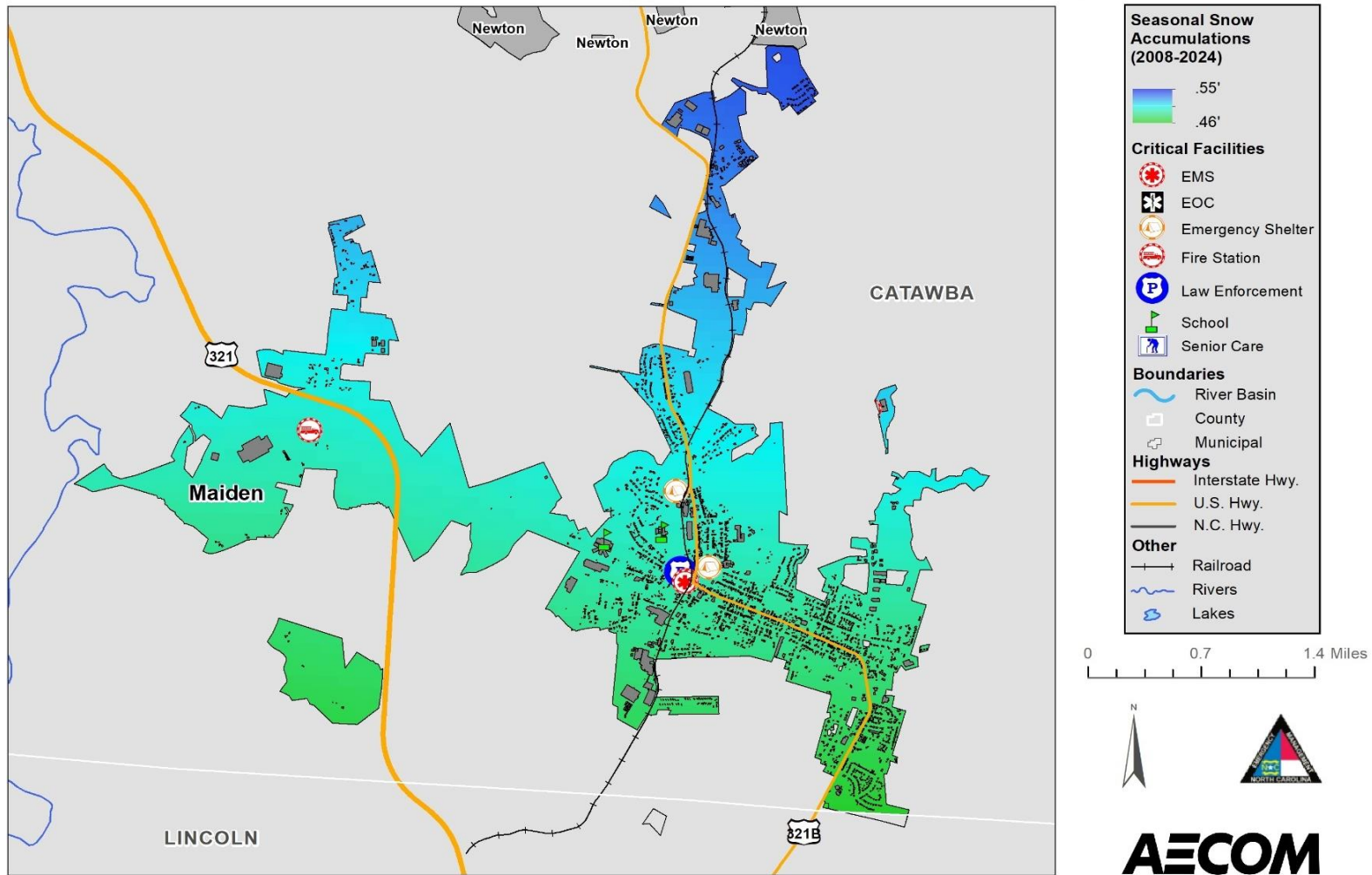


Figure 4-121: Snow Hazard Areas for Maiden

Snow Hazard Areas - Newton

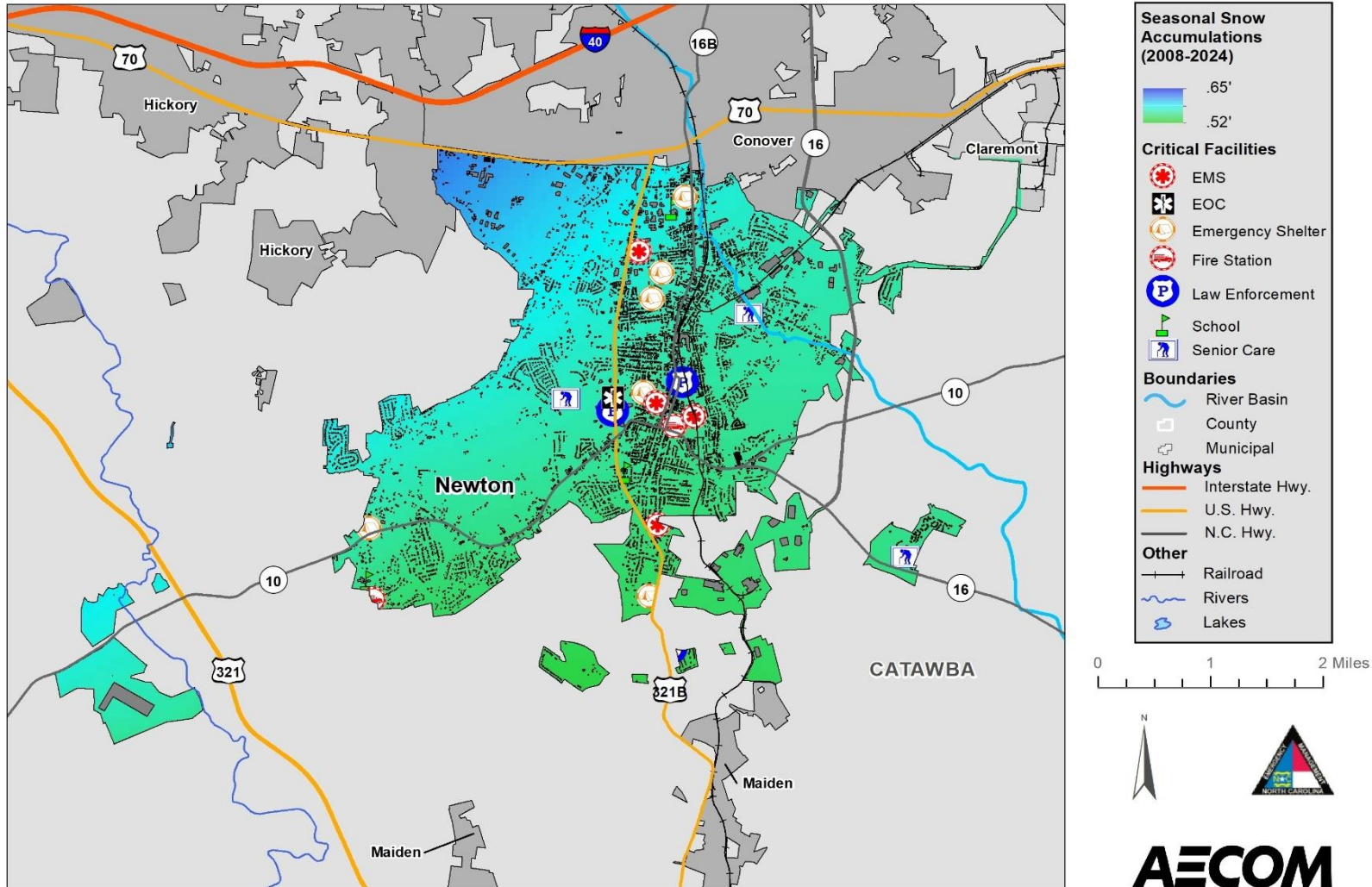


Figure 4-122: Snow Hazard Areas for Newton



4.5.8.3. *Extent (Magnitude and Severity)*

The extent of winter storms can be measured by the amount of snowfall received (in inches).

Extent Event:

The highest recorded event for the planning area occurred in Catawba County in 2004. The area received a total of 12-22 inches of snow across the county with the rate of snowfall at 3-4 inches per hour. This event created an estimated \$2,000 in property damage. Alexander (Zone), Burke (Zone), Caldwell (Zone) and Catawba (Zone) include all jurisdictions.

4.5.8.4. *Historical Occurrences*

The Appendix A contains a table with all recorded events of heavy snow, winter weather, and winter storms from 2018-2023, but the notable accounts of heavy snow in the Unifour counties are summarized below from the NCDC Storm Events database event narratives, unless sources are otherwise specified.

Alexander, Caldwell, Burke, and Catawba (12/8/2018):

NCDC Episode Narrative: *Snow developed across northwest North Carolina around midnight the morning of the 9th and began accumulating quickly. Moderate to heavy snow continued through the morning of the 9th before tapering off during the early afternoon. Storm total accumulations were generally in the 10-to-15-inch range, with slightly lower amounts south of I-40, and locally higher amounts across the mountains, particularly the high peaks along the Blue Ridge, where more than two feet fell. Travel was paralyzed across this area for a couple of days.*

A high-pressure system brought cold air over the state and brought temperatures at or below freezing for 2/3 of the state and in the mountains accumulations of over ten inches of snow were reported, while northern parts of the state received more than a foot of snow and well above the average annual snowfall due to the event³⁷.

Burke and Caldwell (1/8/2021):

Snow developed across western North Carolina around midnight and continued through the morning of the 8th as an area of low pressure moved across the coastal plain of Georgia and the Carolinas. Heavy snow accumulations were reached across much of the northern mountains during the late morning before the snow tapered off to scattered snow showers and flurries throughout the afternoon and evening. Total accumulations ranged from 3 to 6 inches across this area, with locally higher totals of as much as 8 inches reported above 4500 feet.

Alexander, Caldwell, Burke, Catawba (1/16/2022)

Moisture overspread the North Carolina foothills and far western Piedmont early on the 16th as strengthening low pressure moved across the Deep South. Strong northeast winds supplied ample cold air for the precipitation to begin as light snow across much of the foothills. Snow

³⁷Davis, C. (2021, August 10). Rapid reaction: A season's worth of snow in one day - North Carolina State Climate Office. North Carolina State Climate Office - A Public Service Center. <https://climate.ncsu.edu/blog/2018/12/rapid-reaction-a-seasons-worth-of-snow-in-one-day/>

continued into the overnight, becoming moderate to occasionally heavy, with snowfall rates of up to an inch per hour reported. Heavy snowfall criteria of 2 to 4 inches were reached in many areas by sunrise, with accumulating snow continuing through the morning hours before tapering off to occasional snow showers during the afternoon and evening. Total snow accumulations ranged from 5 to 10 inches across much of the area, with locally higher amounts along the eastern Blue Ridge escarpment. Travel was difficult to nearly impossible throughout the 16th and much of the 17th.

4.5.8.5. Probability of Future Occurrences

To utilize NRI Risk Values, EAL, Historic Losses, and other related data, the NRI Data for the counties below reflect the Winter Weather Risk Data because it represents snow, ice, and winter storms. Therefore, the risks below in Table 4-48 represent the NRI EAL, Risk Index Values, Expected Frequency, and Historic Loss Ratio for Winter Weather Events, as defined by the NRI.

Table 4-48: NRI EAL, Risk Index Values, expected frequency, and Historic Loss Ratio for Winter Weather

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$24,000	\$95,000	\$57,000	\$55,000
	Rating	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively Moderate
Risk Index	Score	33.8	68.7	56.5	54.8
	Rating	Relatively Low	Relatively Moderate	Relatively Low	Relatively Low
Frequency (Events per Year)		2.4	2.2	2.7	2.8
Historic Loss Ratio		Relatively Low	Relatively Low	Very Low	Very Low

The probability of future Snow is shown in the table below, by jurisdiction, from RMT iRisk.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-49: probability of Snow Hazards from iRisk

Jurisdiction	Probability of Future Occurrence
Alexander County (Unincorporated Area)	Medium
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	Medium

Jurisdiction	Probability of Future Occurrence
Catawba County (Unincorporated Area)	Medium
City of Claremont	Medium
City of Conover	Medium
City of Hickory	Medium
City of Lenoir	Medium
City of Morganton	Medium
City of Newton	Medium
Town of Brookford	Medium
Town of Cahaj's Mountain	Medium
Town of Catawba	Medium
Town of Connelly Springs	Medium
Town of Drexel	Medium
Town of Gamewell	Medium
Town of Glen Alpine	Medium
Town of Granite Falls	Medium
Town of Hildebran	Medium
Town of Hudson	Medium
Town of Long View	Medium
Town of Maiden	Medium
Town of Rhodhiss	Medium
Town of Rutherford College	Medium
Town of Sawmills	Medium
Town of Taylorsville	Medium
Town of Valdese	Medium
Village of Cedar Rock	Medium

4.5.8.6. Snow Hazard Vulnerability

All the inventoried assets in the Unifour Region are exposed to potential winter weather. Any specific vulnerabilities of individual assets would depend greatly on individual design, building characteristics (such as a flat roof), and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future updates. A qualitative factor in terms of vulnerability is a general lack of awareness on the part of county residents in preparing for and responding to winter storm conditions, such as snow in a manner that will minimize the danger to themselves and others. This lack of awareness is especially apparent when driving/roadway conditions catch motorists off-guard. Potential losses associated with winter storms, such as snow include the cost of the removal of snow from roadways, debris clean-up, and some indirect losses from

power outages, etc. All future structures and infrastructure in the region will be vulnerable to winter storms.

4.5.8.7. Future Vulnerability: Problem Statement

People

Snow hazards can cause power outages which can create potentially deadly impacts for individuals who have no alternative way to heat their homes for extended periods of time. The largest percentage of hypothermia victims are elderly individuals, which account for 20.4% of Alexander County, 21.0% of Burke County, 20.7% of Caldwell County, and 18.3% of Catawba County's total population (see Table 4-7). Additional danger arises when improper ventilation from kerosene heaters, blocked chimneys, and furnaces can release carbon monoxide which, if not properly ventilated, can cause carbon monoxide poisoning and death.

This can also disproportionately impact those without adequate telephone service in their housing units (Alexander County at 1.3%, Burke County at 1.1%, Caldwell County at 1.6%, and Catawba County at 1.3% of the total population) who have limited ability to contact emergency services for assistance in the event of prolonged power outages or other hazards which may arise due to snow hazards. To address vulnerable residents in the planning area in the event of winter weather or snow events, jurisdictions should consider the following mitigation actions:

- Conduct regular evaluations to ensure all community members, particularly underserved populations, have equitable access to resources and support.
- Consider developing an educational program to inform residents on how to prevent hypothermia or carbon monoxide poisoning in the event of power outages caused by winter weather events.
- Consider upgrading utilities to be more resilient during winter weather events.

Changes in Development or Housing Characteristics

Although each county in the planning area aims to increase housing units and development, the risk of snow hazards should not increase because of this change. But an increase in impervious surfaces can lead to increased runoff during snow melt which contributes to erosion and altered drainage patterns. Additionally, higher traffic volumes associated with increased development could create new vulnerabilities in withstanding snow loads, which includes poorly constructed roads which may be damaged by heavy snow or urban areas where snow removal is more difficult and increase likelihood of car accidents. To address increased development in the planning area in the event of winter weather or snow events, jurisdictions should consider the following mitigation actions:

- Include requirements of pervious surfaces and runoff control measures in new developments to direct snow melt into appropriate areas.
- Improve infrastructure to withstand heavy snow loads and reduce risk of damage to roads due to heavy snow.

Economy

The planning area may be adversely affected by snow hazards due to damages, disruptions of power, and limited transportation capabilities. But some businesses may be impacted disproportionately depending on the length of disruption of power, limited transportation capabilities, and other factors which may prevent continuing day to day functions.

Natural Environment

Accumulations of snow can damage tree limbs or whole trees, and the use of salt to clear ice and snow can lead to contaminated drinking water and contaminated freshwater ecosystems. To prevent damage to the natural environment in the planning area in the event of winter weather or snow events, jurisdictions should consider the following mitigation actions:

- Consider using environmentally friendly materials to remove ice from pavements and roads to prevent contamination of surrounding ecosystems and freshwater ecosystems that may be impacted by salt used to remove ice from roads.
- Increase the area of pervious surfaces in the planning area in future development to improve infiltration of runoff and prevent erosion due to snow melt.

First Responders

Snow hazards may limit the ability of first responders to travel and to respond to emergencies. Snow hazards may also create adverse impacts for personnel who aren't properly trained to operate in winter storm conditions or who do not have the appropriate protection from cold conditions. Local services may be strained during snow events when infrastructure improvements aren't keeping pace with growth.

Continuity of Operation

Clearing snow covered roads can create a challenge where main roads can be addressed first, while secondary roads can remain uncleared even after the snowstorm or winter weather event concludes.

4.5.8.8. *Climate Change*

The uncertainty associated with potentially changing climate conditions creates unpredictability for future severe winter storms and their accompanying snowfall. While rising global temperatures are likely to cause shorter and warmer winters in many areas, there is also the possibility that the likelihood of dangerously low temperatures may increase due to continuing trends of temperature extremes. Warmer winters, however, mean that precipitation that would normally fall as snow may begin to fall as rain or freezing rain instead.

According to the North Carolina Climate Science Report, it is very likely that total snowfall in the state will decrease, and it is also likely that the number of heavy snowstorms will decrease. Analysis of snowfall at North Carolina weather observing stations with long records found decreasing trends over the period of 1930–2007 at most stations, especially those outside of the mountainous region in the west of the state.

However, some global climate models predict an increase in the number of winter storms under higher emissions scenarios, but even if there were increases in the frequency or intensity of winter storms, the effects of warmer winters would nevertheless lead to decreases in average annual snowfall.

The NRI categorizes winter weather as a distinct category of risk, and Table 4-50 below summarizes the exposure value of buildings, population, and agriculture, along with the population equivalent value, potentially vulnerable to winter weather hazards.

Table 4-50: Winter Weather NRI exposure values and vulnerability

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total Exposure Value (including population equivalent value)
Alexander	\$202,258,636	36,437	\$422,669,200,000	\$6,490,937,927	\$429,362,396,563
Burke	\$93,434,888	87,524	\$1,015,278,400,000	\$13,642,218,341	\$1,029,014,053,229
Caldwell	\$55,098,567	80,475	\$933,512,735,709	\$15,073,052,806	\$948,640,887,082
Catawba	\$88,641,140	160,509	\$1,861,904,400,000	\$37,175,998,799	\$1,899,169,039,939
Total	\$439,433,231	364,945	\$4,233,364,735,709	\$72,382,207,873	\$4,306,186,376,813

4.5.9. Dam Failure

Dam failure is the uncontrolled release of water due to failure or a number of different structural issues. These include general structural weakness or integrity, overflow of water that exceeds the dam’s capacity, natural events that compromise the dam’s integrity, erosion, or movement that compromises the stability of the dam.

Worldwide interest in dam and levee safety has risen significantly in recent years. Communities across the county, including those in the Unifour region, have an elevated interest in dam safety, operation, and maintenance due to aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees.

There are approximately 92,000 dams in the United States as of 2024, according to FEMA’s National Inventory of Dams, most of which are privately owned. Other owners include state and local authorities, public utilities, and federal agencies. Dams provide numerous benefits, such as storage for drinking water, safe navigation channels, and agricultural irrigation. Dams also provide hydroelectric power, create lakes for fishing and recreation, and save lives by preventing or reducing the impacts of flood hazard events.

Though dams have many benefits, they can also pose a risk to communities if not correctly designed, operated, and maintained. When development exists downstream of a dam, the energy of the water stored behind even a small dam can cause loss of life and significant property damage in the event of a dam failure. If a levee breaks, scores of properties are quickly submerged, and residents may become trapped by rapidly rising floodwater. The failure of dams

and levees can potentially place large numbers of people and property in harm's way. The Unifour HMPC downloaded information from the State Dam Safety Program Office of NCDEQ website through NCDEQ, but dams that meet the following requirements are considered "exempt dams" according to the Senate Bill 107 / S.L. 2017-145 (06/29/2017):

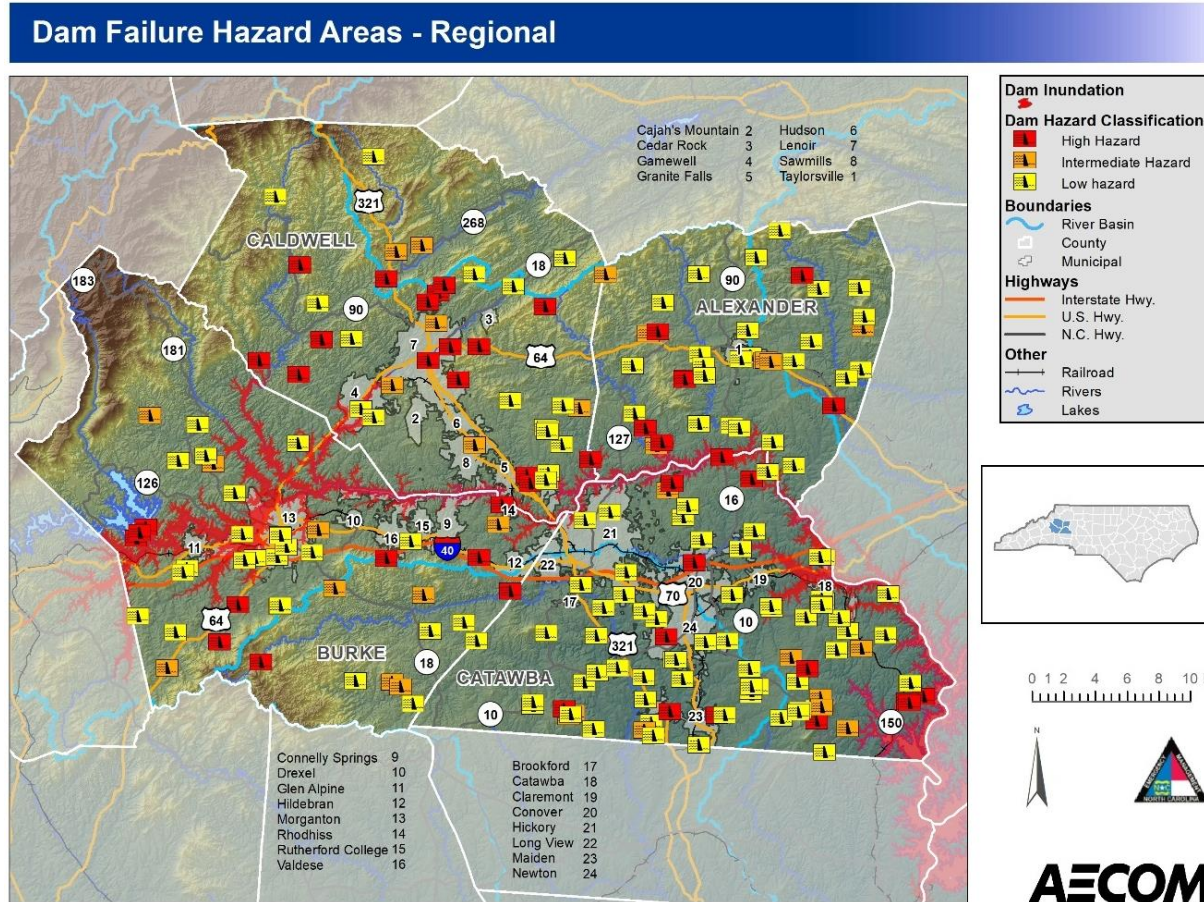


Figure 4-123: Dam Failure Hazard Areas

- Dams constructed by the US Army Corps of Engineers or other US Government Agency; Constructed with financial assistance from the United States Natural Resources
- Conservation Service, when that agency designed or approved plans for the dam supervised its construction.
- Licensed by the Federal Energy Regulatory Commission, or for which a license application is pending with the Federal Energy Regulatory Commission; For use in connection with electric generating facilities regulated by the Nuclear Regulatory Commission.
- Under a single private ownership that provides protection only to land or other property under the same ownership and that does not pose a threat to human life or property below the dam.
- That is less than 25 feet in height or that has an impoundment capacity of less than 50 acre-feet, unless the Department determines that failure of the dam could result in loss of human life or significant damage to property below the dam.

- Constructed for and maintains the purpose of providing water for agricultural use, when a person who is licensed as a professional engineer or is employed by the Natural Resources Conservation Service, county, or local Soil and Water Conservation District, and has federal engineering job approval authority under Chapter 89C of the General Statutes designed or approved plans for the dam.

Each local government collected and shared relevant data such as dam inspection findings, according to the NC State Dam Safety Program and shared Emergency Action Plans (EAPs), inundation maps, and potential impacts on critical infrastructure with local dam owners through public meeting and draft plan reviews. The jurisdictions in the planning area are expected to continue assisting with and continue to maintain compliance with regulatory requirements in cooperation with private, utility, and local government dam owners.

4.5.9.1. Location within the Planning Area

The figures below show counts and locations of high hazard, low hazard, and intermediate hazard dams in each participating jurisdiction.

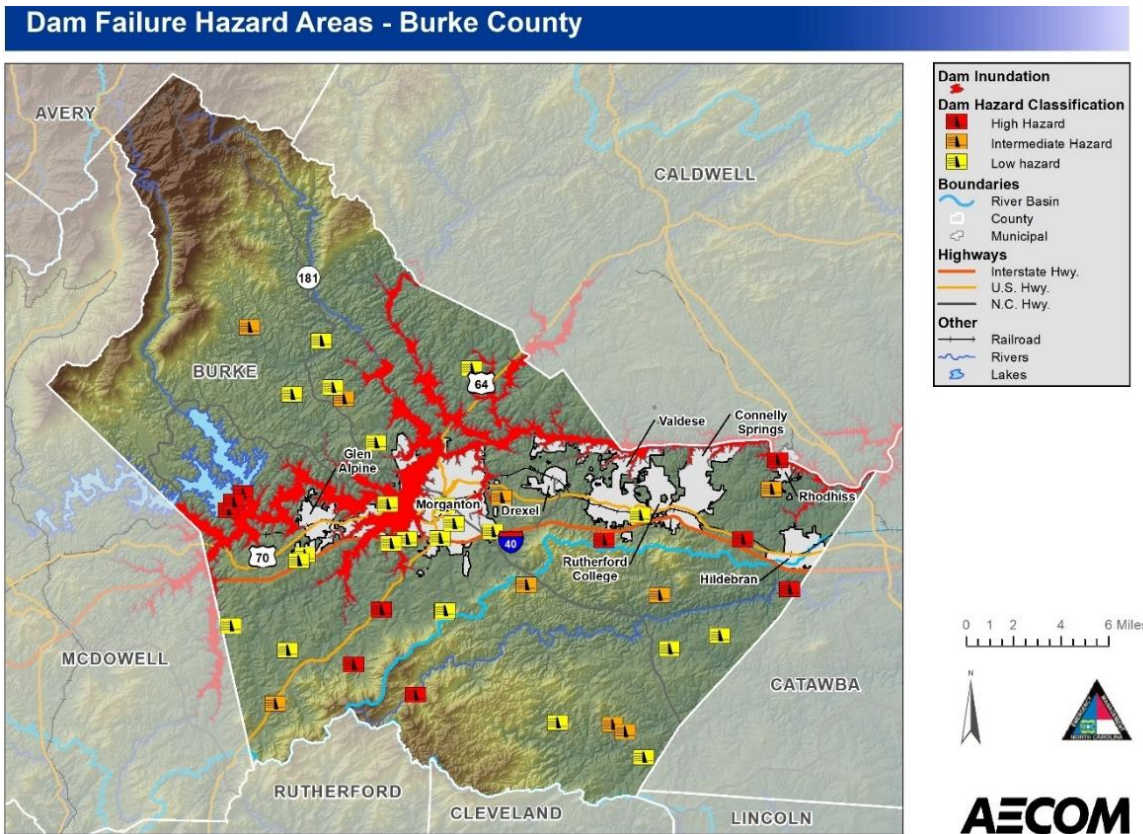


Figure 4-124: Dam Failure Hazard Areas for Burke County

Dam Failure Hazard Areas - Alexander County

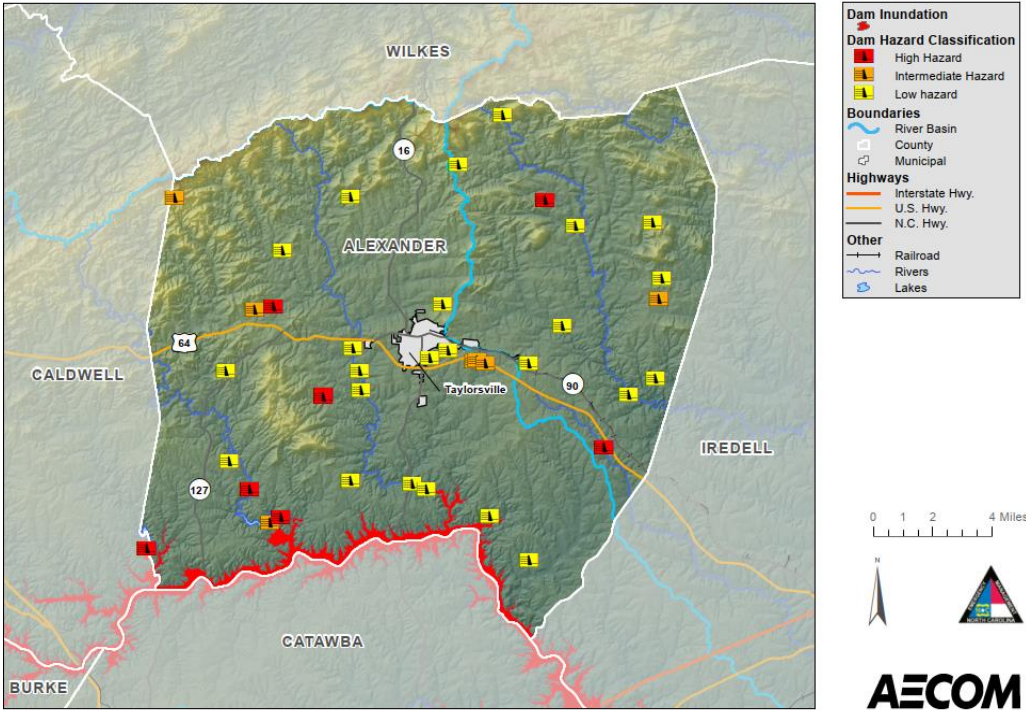


Figure 4-125: Dam Failure Hazard Areas for Alexander County

Dam Failure Hazard Areas - Catawba County

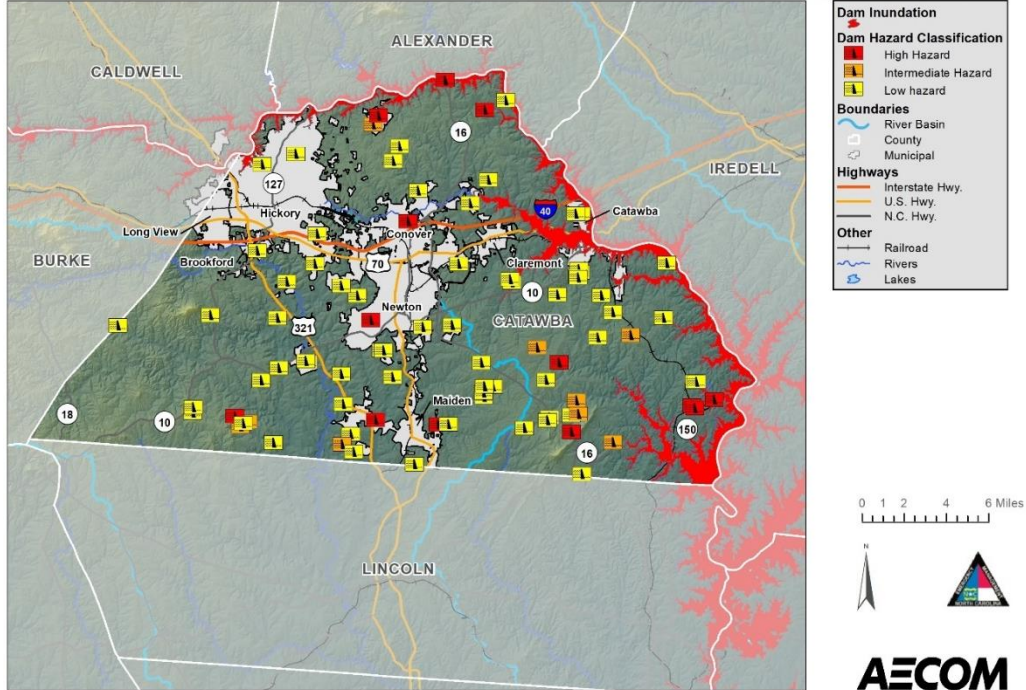


Figure 4-126: Dam Failure Hazard Areas for Catawba County

Table 4-51: Counts of High Hazard and Intermediate Hazard Dams by Jurisdiction. Source: State Dam Safety Program Office of NCDEQ³⁸.

Jurisdiction	High	Intermediate
Alexander		
Alexander County (Unincorporated Area)	8	0
Subtotal Alexander	8	0
Burke		
Burke County (Unincorporated Area)	4	5
City of Morganton	0	1
Subtotal Burke	4	6
Caldwell		
Caldwell County (Unincorporated Area)	4	2
City of Lenoir	2	0
Town of Granite Falls	1	2
Town of Sawmills	0	1
Subtotal Caldwell	7	5
Catawba		
Catawba County (Unincorporated Area)	5	5
City of Conover	1	0
City of Hickory	1	0
City of Newton	1	0
Subtotal Catawba	8	5
TOTAL PLAN	27	16

4.5.9.2. Extent (Magnitude and Severity)

Two factors influence the potential severity of a dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream. The potential extent of dam failure may be classified according to its “hazard potential,” meaning the probable damage that would occur if the structure failed in terms of loss of human life and economic loss or environmental damage. The State of North Carolina classifies dam structures under its regulations according to hazard potential as described in Table 4-51. Figure 4-127 provides locations of State-regulated dams. It is important to note that these classifications are not based on the adequacy or structural integrity of the existing dam structures.

³⁸ NCDEQ. (2024). NC Dam Inventory (No. 4ef4238790214334bd9261bcfa0e724a) [CSV]. NCDENR. <https://ncdenr.maps.arcgis.com/home/item.html?id=4ef4238790214334bd9261bcfa0e724a>

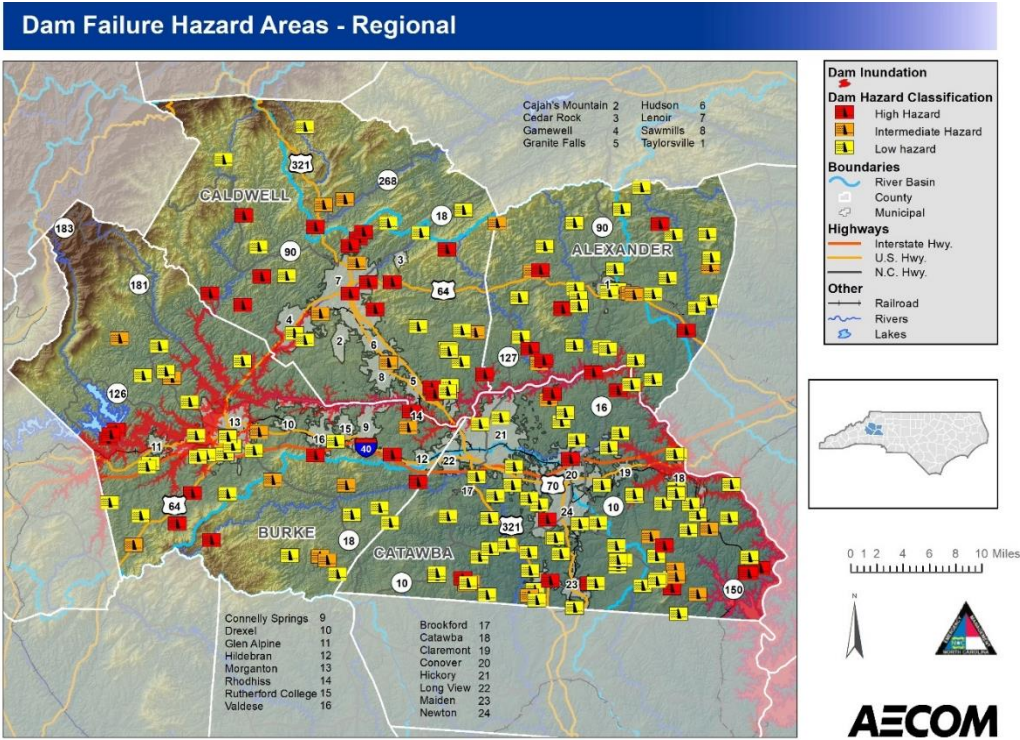


Figure 4-127: Locations of State-Regulated Dams

Table 4-52: Classification of Hazard Potential for North Carolina Dams Source: State Dam Safety Program Office of NCDEQ³⁹.

Hazard Classification	Description	Quantitative Guidelines
Low	Dams located where failure may damage uninhabited, low-value, non-residential buildings, agricultural land, or low-volume roads.	1) Less than 25 vehicles per day 2) Less than \$30,000
Intermediate	Dams located where failure may damage highways or secondary railroads, cause interruption of use or service of public utilities, cause minor damage to isolated homes, or cause minor damage to commercial and industrial buildings.	1) 25 to less than 250 vehicles per day 2) \$30,000 to less than \$200,000
High	Dams located where failure will likely cause loss of life or serious damage to homes, industrial and commercial buildings, important public utilities, primary highways or major railroads.	1) Probable loss of 1 or more human lives 2) More than \$200,000

³⁹ NCDEQ. (2024). NC Dam Inventory (No. 4ef4238790214334bd9261bcfa0e724a) [CSV]. NCDENR. <https://ncdenr.maps.arcgis.com/home/item.html?id=4ef4238790214334bd9261bcfa0e724a>

4.5.9.3. Historical Occurrences

According to the NC Dam Inventory maintained by the State Dam Safety Program Office⁴⁰ there have been eight incidents of dam breaches in Alexander, Burke, Caldwell, and Catawba Counties.

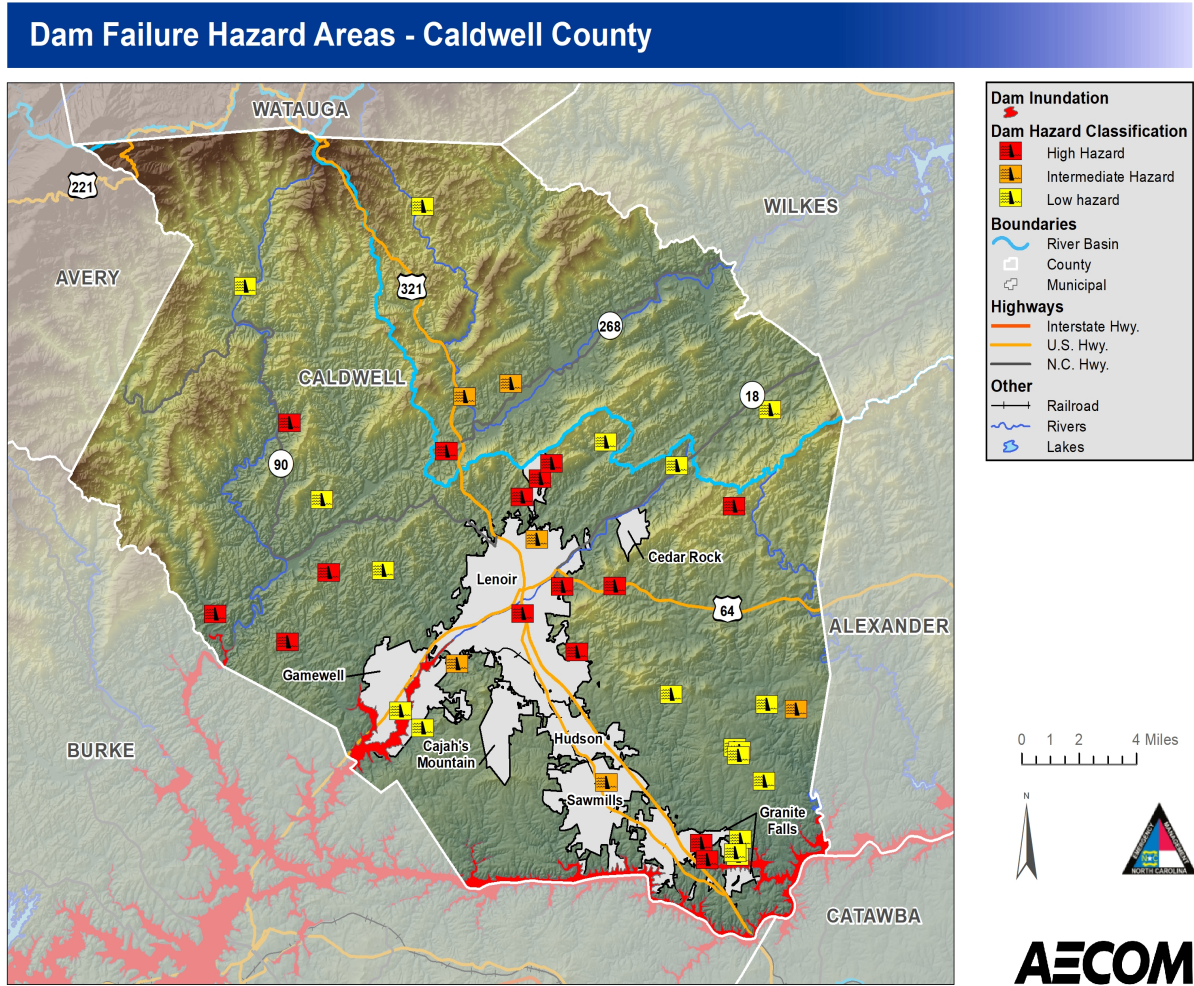


Figure 4-127A: Dam Hazard Failure Areas in Caldwell County

⁴⁰ NCDEQ. (2024). NC Dam Inventory (No. 4ef4238790214334bd9261bcfa0e724a) [CSV]. NCDENR. <https://ncdenr.maps.arcgis.com/home/item.html?id=4ef4238790214334bd9261bcfa0e724a>

Table 4-53: High or Intermediate Hazard Dams in the planning area, and dams that have reported breaches in the planning area according to the NC Office of NCDEQ ⁴¹.

County	Hazard Potential	NID_ID	Dam Name(S)	Condition	Dam Status	Owner Type	Last Inspection Date
Catawba	Low	NC01793	Davis Pond Dam	Not Rated	Breached	Unknown	2020/12/15
Caldwell	Low	NC01795	Broyhill Pond Dam	Not Rated	Breached	Unknown	2023/12/21
Alexander	Low	NC01700	Watts Lake Dam	Fair	Breached	Unknown	2020/12/15
Alexander	Low	NC01331	Harris Pond Dam	Unknown	Breached	Unknown	2000/12/14
Alexander	Low	NC00213	Valdese Lake Dam	Not Rated	Breached	Unknown	2005/03/18
Burke	Low	NC01232	Lenoir Water Supply Dam	Unknown	Breached	Unknown	2007/01/17
Caldwell	Low	NC02017	Dallas Clark Dam	Unknown	Breached	Unknown	1996/12/31
Burke	Low	NC02031	Huss Pond Dam	Fair	Breached	Unknown	2021/11/30
Burke	High	NC01288	Morganton Watershed Dam	Fair	Impounding	State	2023/12/19
Alexander	High	NC01341	Moretz Lake Dam	Fair	Impounding	Private	2023/03/02
Alexander	High	NC01809	Bowman Dam	Fair	Impounding	Private	2023/03/02
Alexander	High	NC05245	Icard Dam	Fair	Impounding	Private	2023/03/02
Alexander	Intermediate	NC01342	Rink Lake Dam	Fair	Impounding	Utility	2023/03/02
Catawba	Intermediate	NC02021	Catawba Springs Golf Dam Upper	Not Rated	Impounding	Private	2020/11/03
Caldwell	Intermediate	NC01997	Sims Pond Dam	Fair	Impounding	Private	2012/12/12
Caldwell	Intermediate	NC00330	Rauchfuss Lake Dam	Fair	Impounding	Private	2023/03/15
Caldwell	Intermediate	NC02001	Blue Ridge Tissue Dam; Omni Supply Dam	Satisfactory	Impounding	Private	2017/02/10

⁴¹ NCDEQ. (2024). NC Dam Inventory (No. 4ef4238790214334bd9261bcfa0e724a) [CSV]. NCDENR. <https://ncdenr.maps.arcgis.com/home/item.html?id=4ef4238790214334bd9261bcfa0e724a>

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County	Hazard Potential	NID_ID	Dam Name(S)	Condition	Dam Status	Owner Type	Last Inspection Date
Burke	Intermediate	NC00094	Willis Lake Dam	Unsatisfactory	Impounding	Private	2023/12/15
Burke	Intermediate	NC01958	Pritchard Pond Dam	Fair	Impounding	Private	2014/01/08
Catawba	High	NC05784	Mirror Lake Dam	Fair	Impounding	Private	2024/07/03
Catawba	Intermediate	NC00362	Comm Scope Dam	Fair	Impounding	Private	2021/11/23
Catawba	Intermediate	NC02034	Piney Grove Pond Dam	Fair	Impounding	Private	2020/11/03
Caldwell	High	NC01442	Fox Lake Dam	Poor	Impounding	Private	2024/02/01
Caldwell	High	NC06110	Holden Dam	Poor	Impounding	Private	2024/02/01
Caldwell	High	NC06579	Jack Munday Dam	Unknown	Impounding	State	Unknown
Caldwell	High	NC05750	Coffey Dam	Poor	Drained	Private	2019/11/19
Catawba	High	NC01321	Jones Lake Dam	Fair	Impounding	Private	2024/01/18
Catawba	Intermediate	NC02053	Cross Country Lake Dam	Fair	Impounding	Private	2023/12/13
Catawba	Intermediate	NC02062	Neill Dam	Fair	Impounding	Private	2023/12/13
Catawba	Intermediate	NC05473	Little Mountain Farms Upper Dam	Fair	Impounding	Private	2023/12/13
Burke	Intermediate	NC00093	Waters Lake Dam	Poor	Impounding	Private	2022/01/04
Alexander	High	NC01791	Cy Purser Pond Dam	Poor	Impounding	Private	2023/03/02
Alexander	Intermediate	NC01786	Little's Trout Pond Dam	Poor	Impounding	Private	2021/11/17
Alexander	Intermediate	NC01790	Alexander Wildlife Club Pond Dam	Fair	Impounding	Private	2023/12/21
Burke	High	NC00092	South Mountain State Park Dam; Broughton Hospital Dam	Fair	Impounding	State	2023/12/15

County	Hazard Potential	NID_ID	Dam Name(S)	Condition	Dam Status	Owner Type	Last Inspection Date
Burke	High	NC00141	Linville Dam; Bridgewater Dam	Unknown	Impounding	Utility	Unknown
Burke	High	NC00375	Paddys Creek Dam	Unknown	Impounding	Utility	Unknown
Burke	High	NC06523	Paddy Creek Chute Spillway	Unknown	Impounding	Utility	Unknown
Caldwell	High	NC01295	Old Mill Lake Dam	Unsatisfactory	Impounding	Private	2022/12/08
Caldwell	High	NC02013	Little Dam	Unknown	Impounding	Utility	Unknown
Burke	High	NC00104	Rhodhiss Lake Dam	Unknown	Impounding	Utility	Unknown
Caldwell	Intermediate	NC02008	Poplar Lake Dam	Poor	Impounding	Private	2022/12/08
Burke	Intermediate	NC01953	Miller Pond Dam	Satisfactory	Impounding	Private	2023/12/19
Catawba	High	NC00367	Newton City Lake Dam	Fair	Impounding	Local Gov	2024/01/25
Alexander	High	NC01808	Mccurdy Dam	Fair	Impounding	Private	2023/03/02
Alexander	Intermediate	NC01798	Smith Pond Dam	Fair	Impounding	Private	2023/12/21
Caldwell	High	NC01239	Girl Scout Pond Dam; Ginger Cascades Lake Dam	Fair	Impounding	Private	2023/03/15
Caldwell	High	NC02000	Benfield Dam; Cobb Dam	Poor	Impounding	Private	2024/01/11
Caldwell	High	NC01293	Clement Dam	Poor	Drained	Private	2015/05/20
Catawba	High	NC01322	Marshall Active Ash Basin Dam	Satisfactory	Impounding	Utility	2023/08/22
Catawba	High	NC06201	Marshall Holding Basin Dam	Satisfactory	Impounding	Utility	2023/08/22
Catawba	High	NC06202	Marshall Retention Basin Dam	Satisfactory	Impounding	Utility	2023/08/22

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County	Hazard Potential	NID_ID	Dam Name(S)	Condition	Dam Status	Owner Type	Last Inspection Date
Caldwell	High	NC02004	Moose Pond Dam	Poor	Impounding	Private	2024/01/11
Caldwell	High	NC02009	Green Mountain Camp Lower Dam	Fair	Impounding	Private	2024/02/06
Caldwell	High	NC00432	High Lake Dam	Poor	Impounding	Private	2024/02/06
Caldwell	High	NC02016	Lewis Faw Dam	Poor	Impounding	Private	2024/01/24
Caldwell	High	NC05586	Broyhill Walking Park Dam	Fair	Impounding	Local Gov	2024/01/04
Caldwell	High	NC06610	Laurel Valley Old Mill Dam	Poor	Impounding	Private	2024/02/06
Caldwell	Intermediate	NC02006	Powell Pond Dam	Fair	Impounding	Private	2013/05/21
Caldwell	Intermediate	NC06097	Prestwood Lake Dam	Poor	Impounding	Private	2013/02/04
Burke	High	NC00373	Henry River Dam	Unsatisfactory	Impounding	Private	2023/12/15
Burke	High	NC01940	Maple Lane Fishpond Dam	Poor	Impounding	Private	2023/12/19
Catawba	High	NC05260	Martin Marietta Maiden Quarry Dam	Fair	Impounding	Private	2022/03/16
Catawba	High	NC00361	Maiden Water Plant Lake Dam	Fair	Drained	Local Gov	2023/03/02
Catawba	High	NC00329	Oxford Dam; Lake Hickory Dam	Unknown	Impounding	Utility	Unknown
Catawba	High	NC00364	Flowers Lake Dam	Fair	Impounding	Private	2024/01/19
Catawba	High	NC02022	Catawba Springs Golf Dam Lower	Fair	Impounding	Private	2024/01/18
Burke	High	NC01952	Coffey Pond Dam	Poor	Drained	Private	2016/12/14

County	Hazard Potential	NID_ID	Dam Name(S)	Condition	Dam Status	Owner Type	Last Inspection Date
Burke	Intermediate	NC01290	Leonhardt Lake Dam; Lake Charles Dam	Fair	Impounding	Private	2023/12/19
Catawba	High	NC01312	Lethcoe Dam; Fji Corporation Dam	Fair	Impounding	Private	2023/03/02
Burke	Intermediate	NC00295	Table Rock Fish Hatchery Dam	Fair	Impounding	State	2013/05/15
Burke	Intermediate	NC01944	Goodman Pond Dam	Poor	Impounding	Private	2015/01/05
Catawba	High	NC01319	Leatherman Lake Dam	Fair	Impounding	Private	2024/01/18
Catawba	Intermediate	NC00365	Hart Lake Dam Lower	Fair	Impounding	Private	2021/11/16
Catawba	Intermediate	NC00366	Hart Lake Dam Upper	Fair	Impounding	Private	2021/11/16
Catawba	Intermediate	NC02048	Reinhardt Pond Dam	Fair	Impounding	Private	2020/11/03
Alexander	High	NC00297	Third Creek Watershed Dam #7A	Fair	Impounding	Private	2023/03/02
Alexander	High	NC00229	Lower Little River Dam #1	Fair	Impounding	Private	2023/03/02
Alexander	High	NC00379	Lower Little River Dam #2; Oliver Teagues Dam	Fair	Impounding	Private	2023/03/02
Alexander	Intermediate	NC01635	Rogers Lake Dam Upper	Poor	Impounding	Private	2023/12/21
Alexander	Intermediate	NC01636	Rogers Lake Dam Lower	Poor	Impounding	Private	2023/12/21
Alexander	Intermediate	NC01794	Adams Pond Dam	Fair	Impounding	Private	2023/02/14
Burke	High	NC01941	Barus Dam	Poor	Drained	Private	2015/05/20
Burke	Intermediate	NC01291	Mccorkle Lake Dam	Poor	Impounding	Private	2023/12/15

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County	Hazard Potential	NID_ID	Dam Name(S)	Condition	Dam Status	Owner Type	Last Inspection Date
Burke	Intermediate	NC01959	Bormuth Dam; Wood Dam	Fair	Impounding	Private	2022/01/13

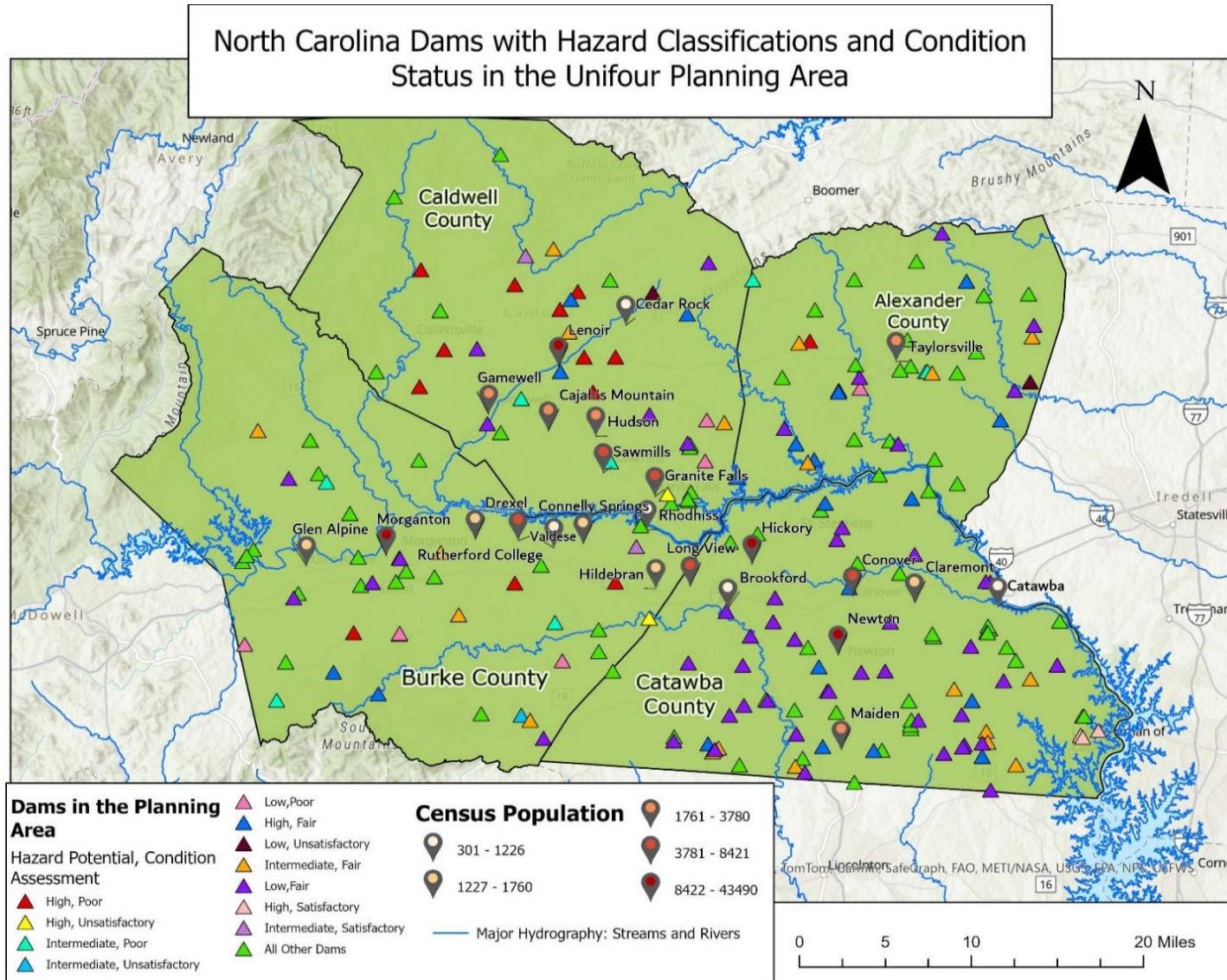


Figure 4-128: Breached Dams and Dams in Poor or Unsatisfactory Condition in the planning area from State Dam Safety Program Office of NCDEQ

4.5.9.4. *Probability of Future Occurrences*

The table below shows the probability of future dam failure by jurisdiction based on the analyses performed in iRISK.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-54: Probability of future occurrences from iRisk

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Low
Caldwell County (Unincorporated Area)	Low
Catawba County (Unincorporated Area)	Low
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Low
City of Morganton	Low
City of Newton	Low
Town of Brookford	Low
Town of Cahaj's Mountain	Low
Town of Catawba	Low
Town of Connelly Springs	Low
Town of Drexel	Low
Town of Gamewell	Low
Town of Glen Alpine	Low
Town of Granite Falls	Low
Town of Hildebran	Low
Town of Hudson	Low
Town of Long View	Low
Town of Maiden	Low
Town of Rhodhiss	Low
Town of Rutherford College	Low
Town of Sawmills	Low

Jurisdiction	iRISK Probability of Future Occurrence
Town of Taylorsville	Low
Town of Valdese	Low
Village of Cedar Rock	Low

4.5.9.5. Dam Failure Hazard Vulnerability

There is a fundamental limitation in the data available for dam/levee failure hazard events regarding the planning area’s vulnerability assessment. Excellent data is available for GIS analysis, including point locations and mapped inundation areas. However, this robust data is primarily available for the dams owned by Duke Energy Corporation. These include the Bridgewater Dam, Lookout Shoals Dam, Oxford Dam, and Rhodhiss Dam PMF Inundation Areas. These large facilities would undoubtedly profoundly impact the planning area should a failure occur; however, such failures are extremely unlikely, and the HMPC feels strongly that these are not the structures that concern the Unifour Region. The dam structures that are of concern are smaller, privately owned, and unregulated dams for which no GIS data or inventories are currently available. These facilities could cause the most damage and disruption should a more common failure occur.

Given the importance of smaller, privately owned, and/or unregulated dams and their gap in available data for the Unifour Region, it has been determined that presenting detailed risk assessment results for the Duke Energy facilities, even though data is available, would be misleading and unproductive for mitigation planning. It has also been determined that any rudimentary calculations based on the point locations for the dams mapped by NCDEQ would also be potentially misleading if any buffer or proximity analysis was performed to estimate surrounding impacts should a failure occur. Given these caveats, subsequent sections speak to the potential significant impacts of a dam failure event.

Therefore, any mitigation actions developed for this hazard should address data limitations, education and awareness programs, and/or any jurisdiction-specific concerns that may be addressable through an appropriate mitigation project.

4.5.9.6. Future Vulnerability: Problem Statement

People

Those located in dam hazard areas or areas with dams that are at a higher risk of failure indicated in Figure 4-123 and Figure 4-127 are at a higher risk of catastrophic damage to property, infrastructure, and critical facilities, which requires rapid response time for residents in areas of potential or imminent levee failure. Those who do not have telephone service (Alexander County at 1.3%, Burke County at 1.1%, Caldwell County at 1.6%, and Catawba County at 1.3% of the total population) are at an increased risk of reduced ability to respond quickly to reverse 911 systems or other warning systems. The majority of residents reported that they have internet and computer access, with 83.6% in Alexander County, 79.7% in Burke County, 83.2% in Caldwell County, and 86.4% in Catawba County reporting that they have

access to the internet. But, for those who do not have access to the internet or a computer, accessing critical information about hazards, warnings, and information about how to prepare for disasters could be limited.

Moreover, in Alexander, Burke, Caldwell, and Catawba County the percentage of residents without a vehicle available comprise 2.8%, 4.6%, 4.8%, and 4.9% of the residents, respectively. This creates a significant problem for residents who are in areas of potential dam failure with the reduced ability to evacuate in a timely manner in case of an emergency. Other impacts of flooding resulting from dam failure is infiltration of sewer lines, which can cause contamination of drinking water supply and damage utility lines. This creates a serious potential hazard for especially vulnerable groups such as elderly individuals, which account for 20.4% of Alexander County, 21.0% of Burke County, 20.7% of Caldwell County, and 18.3% of Catawba County's total population, according to American Community Survey 2018-2022 estimates in Table 4-7.

To address potential impact to individuals vulnerable to dam failure impacts in the planning area, jurisdictions should consider the following mitigation actions:

- Conduct periodic review of flooding risk of vulnerable populations to address projected increases in population and development and appropriately prepare for flooding hazards in those areas.
- Evaluate and expand emergency response resources and capabilities to accommodate population growth, including additional shelters, supplies, and trained personnel.
- Expand emergency response resources to address population that have limited transportation ability and develop an organized evacuation plan that includes transportation services for residents without vehicles, vulnerable residents, or residents with limited ability to evacuate in the event of a time sensitive emergency.
- Conduct regular evaluations to ensure all community members, particularly underserved populations, have equitable access to resources and support.
- Upgrade sewer and drainage systems to prevent infiltration and contamination of drinking water supplies after floods caused by dam failure.
- Collaborate with local nonprofits and community organizations to reach underserved populations with resources and information about flood and dam failure preparedness.
- Consider collaborating with telephone and internet utility providers to expand service to areas with limited telephone signal to ensure that individuals in hazard areas receive alerts of impending dam failure in a timely manner.

Changes in Development or Housing Characteristics

Alexander County has reported a 4.33% increase and Catawba County has reported a 3.62% increase in total housing units between 2018 and 2023, (See Table 3-6). In addition, Catawba county has a projected increase in population of 15.8% between 2022 to 2042 and aims to increase housing units significantly to support an increase of residents.

Burke County aims to develop policies that encourage higher density developments to support the development of new housing and encourage relocation or new arrivals. Caldwell County is updating their zoning and subdivision regulations to ensure they are compatible for land use and plans to expand their inventory of vacant properties through the county to encourage commercial development projects and new amenities that attract new residents. The changes stated in the Comprehensive Plans of the planning area and projected increase in population demonstrate the potential for rapid growth, but also demonstrate that there may be challenges associated with preparing for area wide evacuations in the event of potential Dam Failure, which requires a rapid response from residents and emergency personnel.

If future developments occur in areas where dam failure are a high, intermediate, or low hazard classification, there is risk of catastrophic damage to properties, infrastructure, and critical facilities. If development increases in areas of high hazard classification, there is risk of disproportionately exposure to potential dam failure hazards for those located in those areas. To address potential impact to future development to dam failure impacts in the planning area, jurisdictions should consider the following mitigation actions:

- Incorporate a growth management strategy which integrates development of housing into emergency response management and planning to minimize potential risk associated with increased development in the event of riverine flooding events.
- Assess emergency response capabilities annually and enhance emergency response capabilities to align with projected population growth and housing increases.
- Reduce vulnerability of new housing units by incentivizing development of affordable housing in areas with low probability of experiencing dam failure and in areas with high concentrations of vulnerable housing units such as RVs or mobile homes.
- Invest in flood mitigation infrastructure (e.g., retention ponds, improved drainage systems) in areas with high housing density, or projected high housing density, and flood risk for flooding related to dam failure.
- Implement a process for the periodic review and update of comprehensive plans to reflect changing demographics and housing trends while considering the dam risk areas.

Economy

Dam Failure creates potential for catastrophic damage to property, infrastructure, and critical facilities. Each County in the planning area has a significant portion of land dedicated to agriculture and as a result, riverine flooding threatens to impact local crops and agricultural operations. In addition, as the planning area aims to see a general increase in development in the future, potential dam failure could lead to property damage, infrastructure damage, and disruption of continuity of operations, significantly impacting the local economy, businesses, residents, and government. To address potential impact to the economy from dam failure impacts in the planning area, jurisdictions should consider the following mitigation actions:

- Explore funding to flood resilient infrastructure in key areas to improve post-dam failure flooding resilience.

- Explore funding to enhance dam maintenance and safety programs to fund actions such as repairing damage and addressing dam status to prevent dam failures.

Natural Environment

Dam Failure events create the potential for hazardous materials and chemicals to contaminate local water sources as well as generally disrupting ecosystems. Dam failure causes increased soil erosion, rapid sedimentation which clogs the waterways, decreases water quality by carrying pollutants downstream and contributing to contamination of rivers and lakes, and can destroy ecosystems downstream by destroying habitat for wildlife and plants. To address potential impact to the environment from dam failure in the planning area, jurisdictions should consider the following mitigation actions:

- Conduct a hazardous material inventory or confirm locations of hazardous materials in flood-prone areas or areas that may be impacted by dam failure.
- Reduce storage of hazardous materials in dam hazard areas
- Develop post-dam failure protocol to assess and clean up hazardous materials or contamination after dam failure related flooding causes a release of hazardous materials.

First Responders

First Responders are at significant risk of serious injury and even potentially life-threatening injuries when rescuing people stuck in dangerous or life-threatening situations. Dam Failure may significantly reduce the capacity of emergency services in their response and assistance during levee failure events. To address potential vulnerabilities of first responders in the event of dam failure in the planning area, jurisdictions should consider the following mitigation actions:

- Periodically review emergency response and evacuation procedures in the event of imminent dam failure.
- Implement and maintain advanced warning systems to utilize real-time data to alert communities of impending dam failure and areas under evacuation orders.
- Establish clear evacuation routes, procedures, and operations that consider those who have limited transportation options, underserved communities, and residents with limited mobility.

Continuity of Operations

Dam Failure has the potential to disrupt the normal operations in the affected area and create catastrophic barriers to recovery associated with damaged infrastructure, facilities, property, and critical facilities. Loss of power, disruption of communication, and reduced ability to respond to emergencies will significantly reduce capacity to continue normal operations in the event of Dam failure. To address potential vulnerabilities of continuity of operations in the event of dam failure in the planning area, jurisdictions should consider the following mitigation actions:

- Schedule regular reviews and updates of COOP plans based on new risks, lessons learned from past dam failure events, and changes in operations.

- Develop an inventory of critical resources, personnel, equipment, and supplies available during dam failure recovery and assess which resources are located primarily in high hazard dam areas to account for resources which may be damaged or destroyed post-dam failure events.

4.5.9.7. Climate Change

Climate and weather pattern changes are expected to lead to more severe storm events, likely increasing the risk of dam overtopping, structural damage, or other failures. In addition, hydraulic structures designed to current standards may not be sufficient to handle future climate change-driven conditions of more intense rainfall and runoff. Since the likelihood of dam failure depends on many factors in addition to climate considerations, detailed projections of future changes in the frequency of dam failures cannot be made with any degree of confidence.

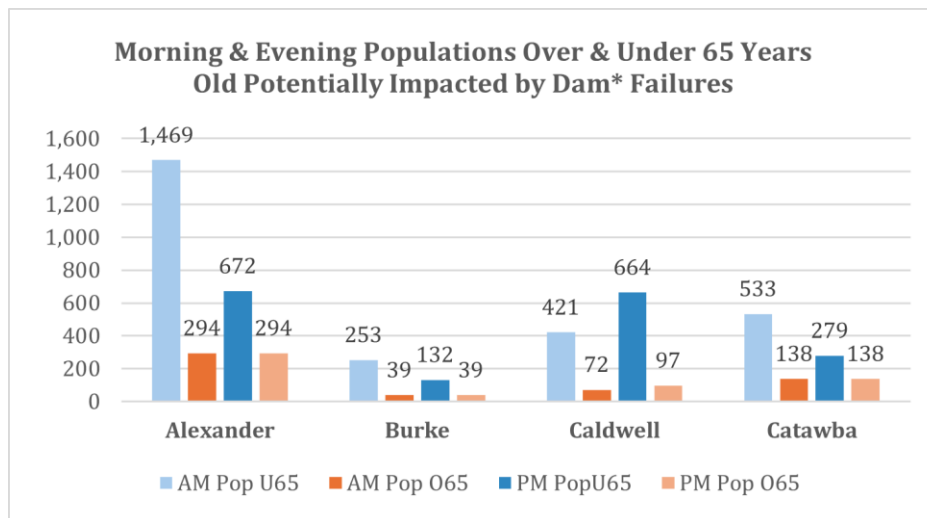
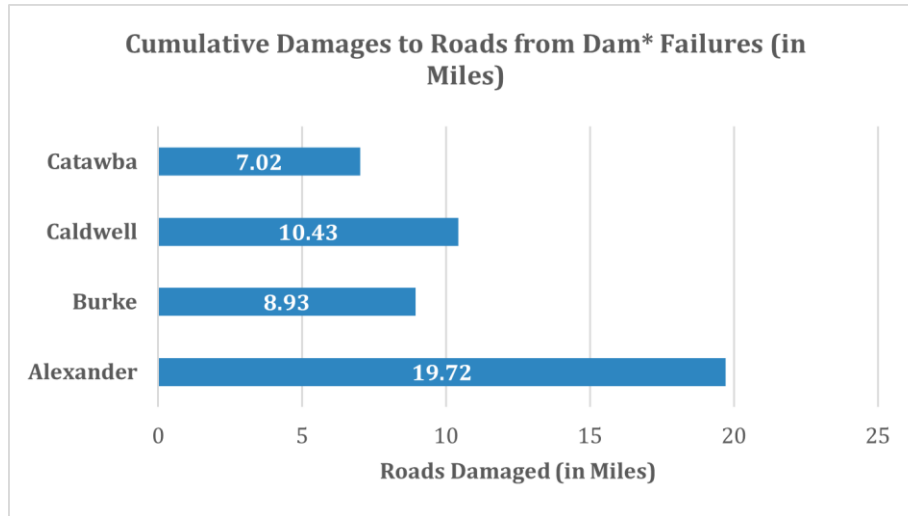
4.5.9.8. Potential Significant Impacts of Dam Incidents

This section highlights the critical vulnerabilities of Alexander, Burke, Caldwell, and Catawba counties to dam failures, focusing on infrastructure damage, population exposure, and economic impacts. Key analyses reveal the extent of cumulative road damages, populations at risk during morning and evening hours, and the financial losses associated with residential, commercial, industrial, and public buildings. This data underscores the importance of targeted mitigation strategies to protect vulnerable populations, enhance infrastructure resilience, and reduce economic disruption. This section presents data from the North Carolina Department of Public Safety's State Emergency Response Application (SERA), providing valuable insights for effective hazard mitigation planning.

Table 4-55: Dams with available and without available data in the planning area (Dams refers to High and Intermediate Hazard Dams)

Counties	Dams* With Available Impact Data	Dams* Without Available Impact Data
Alexander	6	2
Burke	4	6
Caldwell	6	9
Catawba	10	3

Dam failures can have significant impacts on infrastructure. Roads vulnerable to the impacts of dam failures can cause widespread infrastructure disruption that challenges emergency response efforts and impedes evacuation routes, directly affecting community safety and recovery efforts. Alexander County has the largest length of roadways vulnerable to the impacts of dam failure at 19.72 miles, followed by Caldwell (10.43 miles), Burke (8.93 miles), and Catawba (7.02 miles). Including these analyses supports planning efforts to prioritize infrastructure resilience, improve access during emergencies, and minimize disruptions to daily life.



*In this context, "Dams" refer to all High and Intermediate Hazard Dams reported in the previous sections.

Table 4-56: Buildings at risk and potential damage from dam failures

Building Risk vs. Building Damage from Dam Failures	Alexander	Burke	Caldwell	Catawba
Residential Buildings at Risk	1,003	134	245	424
Residential Building Damage	\$58,154,043.84	\$2,136,651.28	\$7,162,217.12	\$8,262,928.55
Commercial Buildings at Risk	15	5	65	6
Commercial Building Damage	\$4,757,358.38	\$133,703.90	\$12,360,319.10	\$443,742.45
Industrial Buildings at Risk	4	9	5	4
Industrial Building Damage	\$70,392.61	\$102,680.50	\$1,766,374.76	\$254,206.01
Public Buildings at Risk	0	5	4	5
Public Building Damage	\$0.00	\$1,311,580.22	\$539,695.71	\$48,893.58
Total Buildings at Risk	1,022	153	319	439
Total Building Damage	\$62,981,794.82	\$3,684,615.90	\$21,828,606.69	\$9,009,770.60

Highlighting populations exposed to the impacts of dam failures, categorized by age groups over and under 65 during morning (AM) and evening (PM) periods, is significant because it identifies the specific demographic vulnerabilities that must be addressed in the hazard mitigation planning process. This information allows for targeted strategies to protect those most at risk, such as older adults who may have mobility limitations or special medical needs, ensuring that emergency response plans are inclusive and effective. By understanding at-risk populations' daily patterns and demographics, communities can enhance evacuation routes, communication plans, and resource allocation to reduce overall impacts, protect people and infrastructure, and increase resilience to future dam-related hazards.

Alexander County has the highest morning exposure for those under 65 (1,469) and over 65 (294), highlighting a significant daytime risk, particularly for working-age adults and older residents. In contrast, Caldwell County sees a notable shift in evening exposure with increased vulnerability, especially for the under-65 population, rising from 421 in the morning to 664 in the evening, indicating a potential need for evening-focused evacuation and response measures. The consistent presence of older adults in both AM and PM periods across counties, such as 294 in Alexander and 138 in Catawba, underscores the need for tailored strategies that address the unique challenges elderly residents face during any time of day, enhancing overall community resilience to dam failures.

The analysis of building risk versus damage from dam failures in Alexander, Burke, Caldwell, and Catawba counties reveals significant variations in potential impacts, highlighting the need for tailored mitigation strategies. Alexander County faces the highest residential risk, with 1,003 homes at risk and damages exceeding \$58 million, emphasizing the critical importance of protecting residential areas to prevent substantial financial losses and displacement of residents. Caldwell County, although with fewer residential buildings at risk, experiences considerable commercial building damage totaling over \$12.3 million, which could disrupt local economies and businesses, demonstrating the necessity for focused economic resilience measures.

With lower overall risk, Burke County still shows vulnerability, especially in public infrastructure, with public building damages estimated at over \$1.3 million, indicating a need to enhance protective measures for essential services. Catawba County presents a diverse risk profile, with nearly \$9 million in total building damages, highlighting the importance of comprehensive risk assessments across all building types to inform strategic investments in dam safety improvements, emergency response planning, and infrastructure protection. These findings underscore the broader goal of reducing hazard impacts and building resilience in communities vulnerable to dam failures.

4.5.9.9. Cascading Impacts

In the context of high- and intermediate-hazard dams, cascading impacts refer to a chain reaction of different disasters. For example, a drought causes loss of vegetation that may cause additional stormwater runoff and erosion, leading to dam overtopping and/or silting. Due to a lack of available data and software modeling capabilities, the probability of the other 14 hazards identified in this plan having a cascading impact that results in a dam failure was not analyzed

quantitatively. Cascading impacts are briefly discussed in the list below for each hazard this plan covers. The list clearly identifies whether the planning team and relevant literature judge a hazard unlikely to have a significant cascading impact on dams.

Riverine Flooding: river flooding can lead to increased water pressure on a dam, potentially causing overtopping or structural failure, creating a cascading impact.

Levee Failure: levee failure could increase downstream water flow, adding pressure on nearby dams and heightening the risk of a high-hazard dam failure.

Wildfire: wildfires can remove vegetation, increasing runoff and erosion, which may contribute to dam overtopping or silting, leading to potential failure.

Tornado: tornadoes could damage a dam's infrastructure or surrounding vegetation but are less likely to cause a cascading impact leading to dam failure directly.

Earthquake: earthquakes can weaken a dam's structural integrity or trigger landslides into the reservoir, increasing the risk of dam failure.

Landslide: a landslide into a reservoir can displace water, causing rapid increases in water levels and potentially overtopping the dam.

Snow: rapid snowmelt can lead to increased runoff, contributing to overtopping and potential dam failure.

Hail: hail alone is unlikely to cause cascading impacts that result in dam failure, as it does not significantly affect water levels or structural integrity.

Drought: prolonged drought can weaken a dam's foundation or cause cracks, potentially leading to structural failure when water levels rise again.

Hurricane Winds: hurricane winds can cause significant structural damage or increase water inflow from heavy rainfall, raising the risk of dam failure.

Ice: ice buildup can block spillways or cause structural damage, increasing the likelihood of overtopping or dam failure.

Thunderstorm Winds: thunderstorm winds alone are unlikely to cause cascading impacts that lead to dam failure, though associated heavy rain could increase the risk.

Erosion: ongoing erosion can weaken a dam's structural integrity over time, eventually leading to a potential failure if not addressed.

Sinkholes: a sinkhole near a dam can undermine its foundation, leading to sudden structural failure and a cascading disaster.

4.5.10. Hail

Hailstorms are another potential damaging outgrowth of severe thunderstorms. 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, having developed sufficient weight, they fall as precipitation—as balls or irregularly shaped masses of ice. 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.

4.5.10.1. Hail Hazard Analysis

Hail is a product of thunderstorms or intense showers. Hail is generally white and translucent, consisting of liquid or snow particles encased with layers of ice. Hail is formed within the high portion of a well-organized thunderstorm. When hailstones become too heavy to be caught in an updraft and carried back into the clouds of a thunderstorm (hailstones can be caught in numerous updrafts, adding a coating of ice to the original frozen droplets each time), they then fall as hail, and a hailstorm occurs.

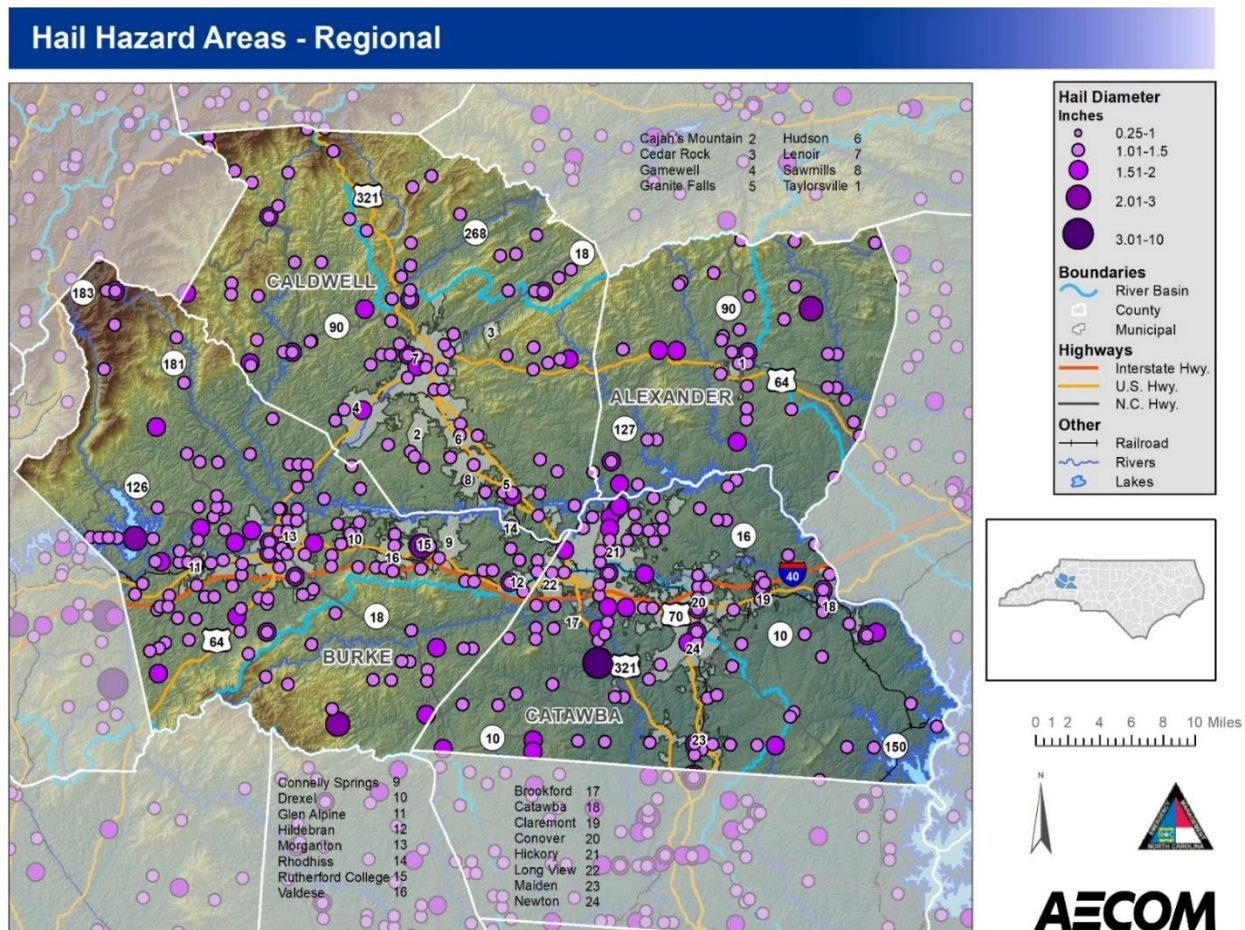


Figure 4-129: Hail Hazard Areas

4.5.10.2. Location within the Planning Area

Thunderstorms are widespread atmospheric disturbances that are not isolated to a specific geographic location. Therefore, it is assumed that the entire planning area is exposed to these hazards. However, it is possible to map historic hail reporting by diameter as an indication of where in the plan area these hazards have previously been observed and to what degree. The following maps represent the extent and location of hail within the planning area in hail diameter inches.

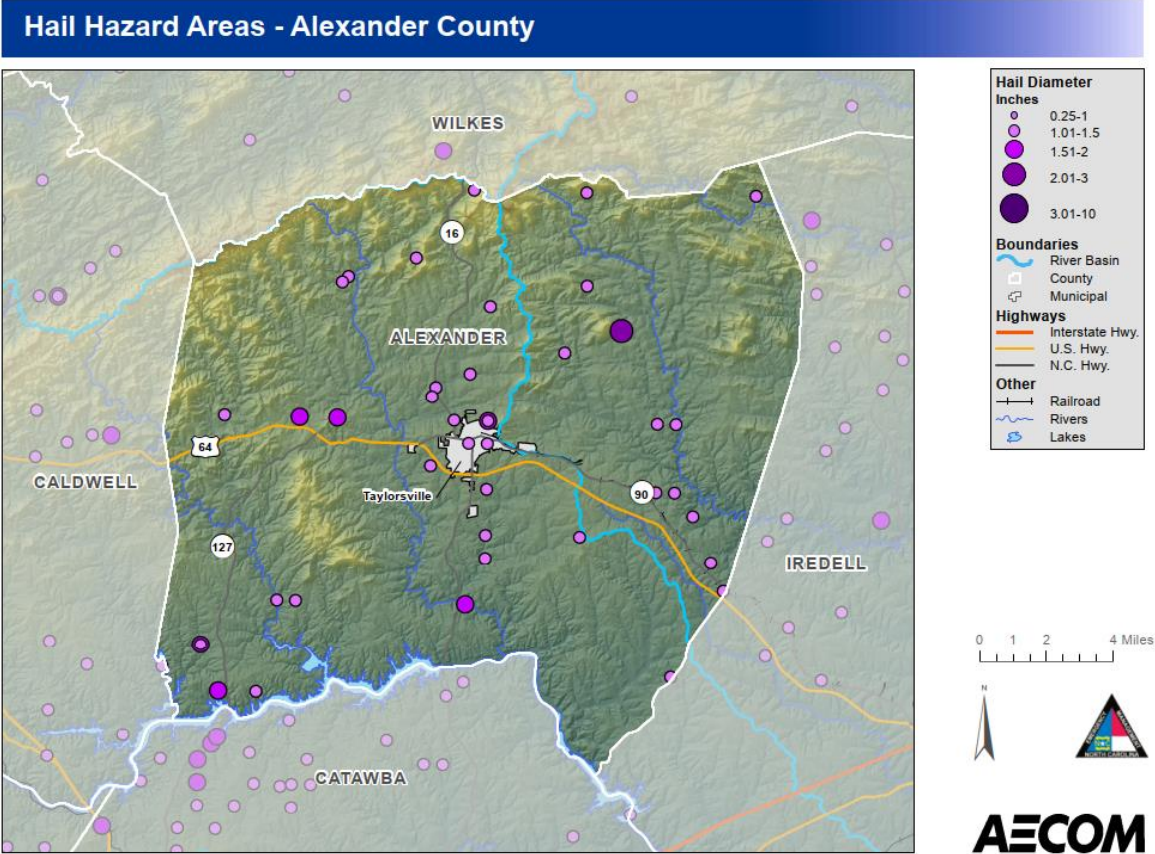


Figure 4-130: Hail Hazard Areas for Alexander County

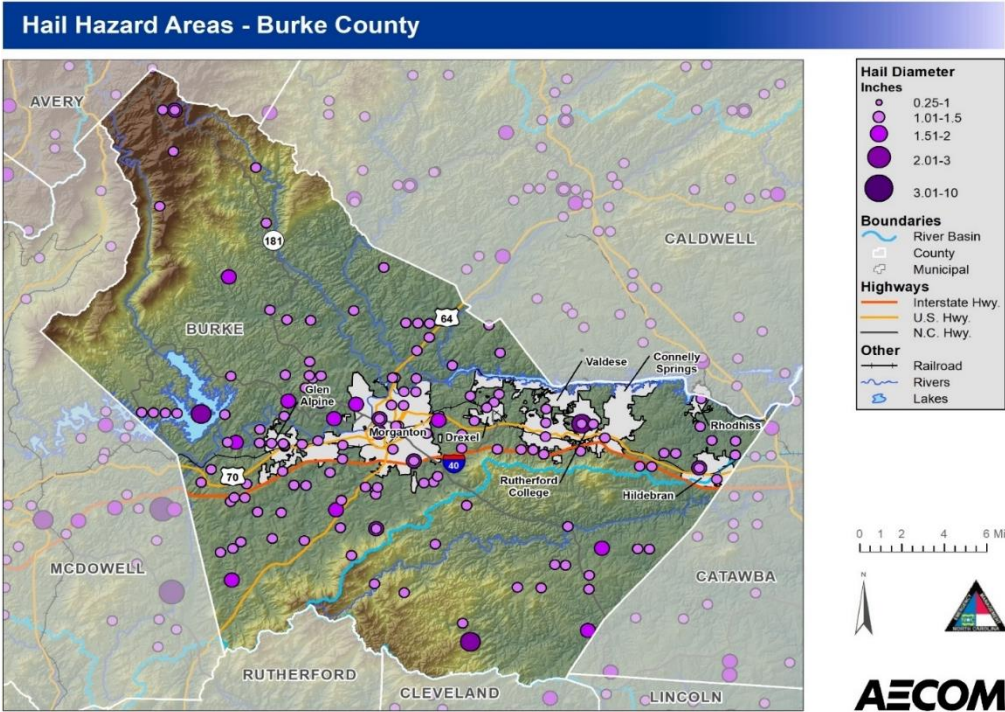


Figure 4-131: Hail Hazard Areas for Burke County

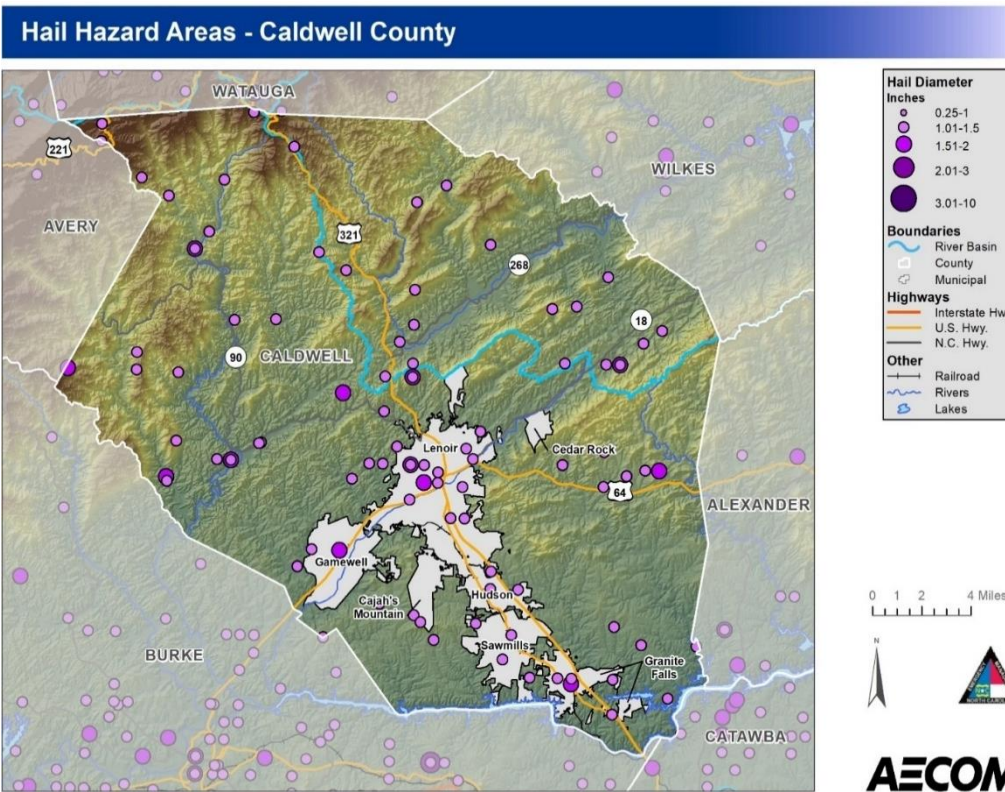


Figure 4-132: Hail Hazard Areas for Caldwell County

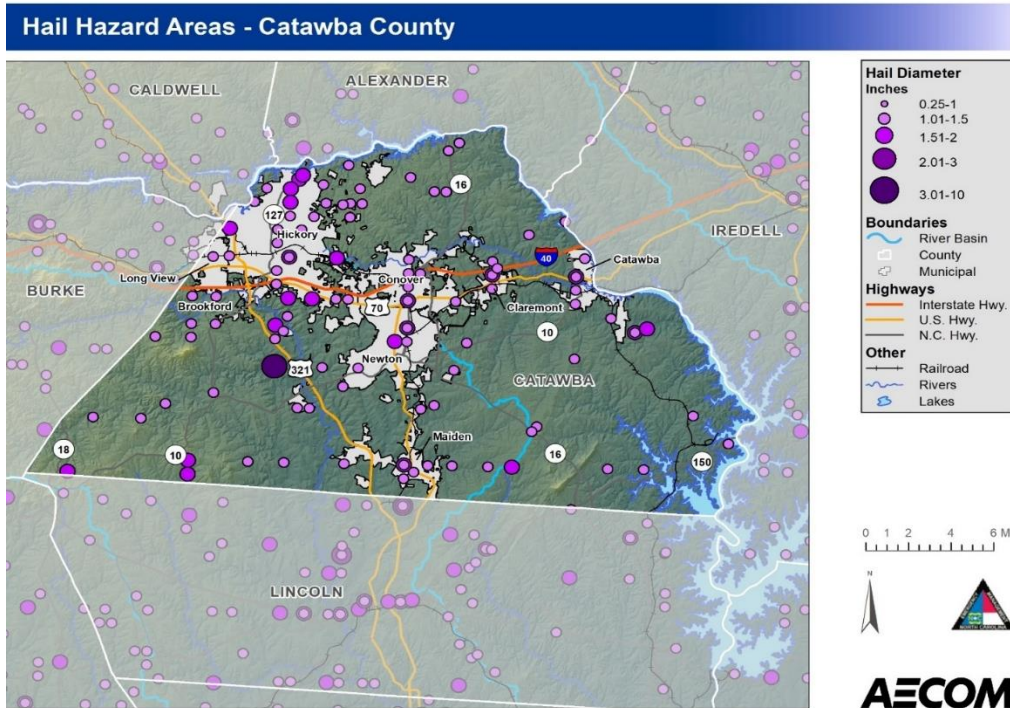


Figure 4-133: Hail Hazard Areas for Catawba County

4.5.10.3. Extent (Magnitude and Severity)

Hail is known to be damaging hazard occurrences in the Unifour Region that can result in multiple injuries and high losses in property damages. The largest recorded size of a hailstone in the planning area (according to NCDC) is 4.5 inches reported in Morganton in Burke County (in 2000) and in Newton in Catawba County (in 1998). Since 2000, there have been 432 reports of hail in the Unifour Region, and the report of the largest hail was in Morganton in 2008 at 2.75 in. There have been 109 reports in Catawba, 100 in Caldwell, 45 in Alexander, and 178 in Burke County total since 2000 (NCDC). Since 2018, there have been 40 days with hail reported, with no property damage reported, and the largest instance of hail was 2 in reported on July 21, 2018 (NCDC).

The Tornado and Storm research Organization (TORRO) Hailstorm Intensity Scale (H0 to H10) in relation to typical damage and hail size codes. Size codes are presented in Table 4-57.

Table 4-57: TORRO Hailstorm Intensity Scale

TORRO Hailstorm Intensity Scale				
	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m2	Typical Damage Impacts
H0	Hard Hail	5	0-20	No damage
H1	Potentially Damaging	5-15	>20	Slight general damage to plants, crops
H2	Significant	10-20	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60		Bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-75		Severe roof damage, risk of serious injuries
H8	Destructive	60-90		(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100		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

* Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed and surface wind speeds) affect severity.

Table 4-58: Hail Size and Diameter

Hail size and diameter in relation to TORRO Hailstorm Intensity Scale.		
Size code	Maximum Diameter mm	Description
0	5-9	Pea
1	10-15	Mothball
2	16-20	Marble, grape
3	21-30	Walnut
4	31-40	Pigeon's egg > squash ball
5	41-50	Golf ball > Pullet's egg
6	51-60	Hen's egg
7	61-75	Tennis ball > cricket ball

Hail size and diameter in relation to TORRO Hailstorm Intensity Scale.		
Size code	Maximum Diameter mm	Description
8	76-90	Large orange > Soft ball
9	91-100	Grapefruit
10	>100	Melon

The Size Code is the maximum reported size code accepted as consistent with other reports and evidence.

4.5.10.4. Historical Occurrences

According to NCDC, 494 recorded instances of hail conditions have affected the planning area causing an estimated \$10,053,000 in property damages, \$0 in crop damages, 0 death(s), and 0 reported injuries between 1950 and 2023.

The following historical occurrences have been identified based on the NCDC Storm Events database in from 2018-2023. It should be noted that only those historical occurrences listed in the NCDC database are shown here and that other, unrecorded, or unreported events may have occurred within the planning area during this timeframe. Although the NCDC Storm Events Database reports no property damage due to hail, there may be unreported property damage or other damages associated with reported hail events. Below, 10 hail events with the largest reported hail magnitude and extent are summarized below from the NCDC Storm Events Database:

Catawba, Alexander, Burke, Caldwell (7/21/2018)

Scattered thunderstorms developed during the afternoon across the North Carolina mountains and foothills and moved east. A few of the storms produced brief severe weather in the form of large hail and damaging winds.

County	Location	Magnitude (in)	Event Narrative
Catawba	Hickory	2	Public reported (via Social Media) two-inch diameter hail on the north side of Hickory.
Alexander	Bethlehem	1.75	Media and spotter reported half dollar to golf ball size hail in the Bethlehem area.
Burke	Morganton	1	Spotter and the media reported quarter size hail in the Morganton area.
Caldwell	Mt. Herman	1	Ham radio operator reported quarter size hail near Lenoir.

Caldwell County (5/26/2022)

A broad band of moderate to heavy rain showers with embedded strong to severe thunderstorms moved over western North Carolina throughout the afternoon into the evening. Several strong to severe thunderstorms produced locally damaging wind gusts, brief large hail, and even a couple of tornadoes, including a strong tornado in Iredell County. Media reported quarter to golf ball size hail in the Granite Falls and Northlakes areas.

Location	Granite Falls
Magnitude (in)	1.75

Alexander County (7/4/2019)

Scattered thunderstorms and storm clusters developed across the North Carolina Piedmont during the afternoon. A couple of the storms produced damaging wind gusts. Ham radio operator reported ping pong ball size hail on Walker Foundry Loop at Highway 16.

Location	Taylorsville Airport
Magnitude (in)	1.5

Burke County (4/13/2019)

Scattered clusters of heavy rain showers and thunderstorms developed in the vicinity of a stationary front across western North Carolina throughout the 13th. Repeated movement of showers and storms resulted in flash flooding developing across Cabarrus County beginning in the morning. Meanwhile, an isolated supercell thunderstorm produced large hail and isolated damaging wind gusts across Burke County during the afternoon. Media and the public reported quarter to half dollar size hail from the Oak Hill community to just north of Morganton.

Location	Oak Hill
Magnitude (in)	1.25

Burke, Catawba, and Alexander County (5/10/2018)

Isolated to scattered thunderstorms developed across the Blue Ridge during the afternoon and moved into the Piedmont during the evening. Some of the storms produced severe weather in the form of large hail and locally damaging winds. Strong to severe supercell thunderstorms developed repeatedly and trained across portions of the foothills, particularly in Polk County, such that some locations received multiple periods of up to golf ball size hail.

County	Location	Magnitude (in)	Event Narrative
Burke	Enola	1	Media reported nickel to quarter size hail off Salem Rd.
	Burke Chapel		Public reported hail of at least quarter size.
Catawba	Propst Xrds		Spotter reported up to quarter size hail north of Cooksville.
Alexander	Taylorsville		Media reported mostly nickel size hail with a few quarter size stones.

Burke County (6/3/2018)

Scattered thunderstorms developed across the southern Appalachians throughout the afternoon and moved southeast. Several storms produced brief severe weather in the form of large hail and damaging winds across the North Carolina mountains and foothills.

Location	Magnitude (in)	Event Narrative
Brindletown	1	Media reported quarter size hail on Bennett Rd and Scott Rd and on Jenkins Rd.
Burke Chapel	0.75	Spotter reported 3/4-inch hail.

Burke and Catawba County (8/8/2018)

Scattered thunderstorms developed across the North Carolina Blue Ridge during the afternoon, with storms developing gradually along outflows into the Piedmont throughout the afternoon and into the evening. A few of the storms produced brief damaging winds.

County	Location	Magnitude (in)	Event Narrative
Burke	Hildebran	1	Public reported quarter size hail On 3rd St Southeast.
Catawba	Duan	0.75	Spotter reported penny size hail on Saint James Church Rd.
	Propst Xrds	0.75	Spotter reported penny size hail on Mountain Grove Rd.

Caldwell County (7/20/2019)

Scattered to numerous thunderstorms developed across northern North Carolina during the afternoon. A few of the storms produced brief damaging wind gusts and some hail.

Location	Magnitude (in)	Event Narrative
Hudson	1	Amateur radio operator reported quarter size hail in the Hudson area.
Sawmills	0.88	Ham radio operator reported nickel size hail in Sawmills.

Caldwell County (9/30/2019)

Isolated thunderstorms developed near the North Carolina Blue Ridge during the afternoon and evening. A couple of the storms produced brief large hail.

Location	Magnitude (in)	Event Narrative
Hartland	1	Public reported dime to quarter size hail on Macedonia Rd.
Rhodhiss	1	Amateur radio reported quarter size hail on River Bend Dr near Highway 321.

Burke and Caldwell County (4/25/2020)

Isolated thunderstorms developed in the vicinity of a warm front across the mountains of southwest North Carolina and the northern foothills during the evening. In addition, a couple of supercell thunderstorms moved into the southern Piedmont from upstate South Carolina. Several of these storms produced large hail and brief damaging winds.

County	Location	Magnitude (in)	Event Narrative
Burke	Oak Hill	1	Broadcast media reported nickel to quarter size hail in the Oak Hill community.
Caldwell	Baton	1	Spotter reported quarter size hail on Mountain View Cir and Union Grove Rd and nearby at Oakmont Dr and Connelly Springs Rd.

A table in Appendix A provides a summary of this historical information by participating jurisdiction from 2018-2023 from the NCDC Storm Events Database. It is important to note that many of the events attributed to the county are countywide or cover large portions of the county. The individual counts by jurisdiction are for those events that are only attributed to that one jurisdiction.

4.5.10.5. Probability of Future Occurrences

Table 4-59: NRI Hail Risk Index, EAL, Frequency, and Historic Losses

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$205,000	\$992,000	\$224,000	\$198,000
	Rating	Relatively Low	Relatively Moderate	Relatively Low	Relatively Low
Risk Index	Score	68.2	91.1	70.9	67.7
	Rating	Relatively Low	Relatively Moderate	Relatively Low	Relatively Low
Frequency (Events per Year)		5.3	5.7	5.5	5.1
Historic Loss Ratio		Relatively Low	Relatively Low	Very Low	Very Low

The probability of future Hail is shown in the table below, by jurisdiction, from the RMT iRisk.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-60: Probability of hail from RMT iRisk

Jurisdiction	Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Low
Caldwell County (Unincorporated Area)	Low
Catawba County (Unincorporated Area)	Low
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Low
City of Morganton	Low
City of Newton	Low
Town of Brookford	Low
Town of Cahah’s Mountain	Low
Town of Catawba	Low
Town of Connelly Springs	Low
Town of Drexel	Low
Town of Gamewell	Low

Jurisdiction	Probability of Future Occurrence
Town of Glen Alpine	Low
Town of Granite Falls	Low
Town of Hildebran	Low
Town of Hudson	Low
Town of Long View	Low
Town of Maiden	Low
Town of Rhodhiss	Low
Town of Rutherford College	Low
Town of Sawmills	Low
Town of Taylorsville	Low
Town of Valdese	Low
Village of Cedar Rock	Low

4.5.10.6. Hail Hazard Vulnerability

All the inventoried assets in the Unifour Region are exposed to hail. Any specific vulnerability of individual assets depends greatly on individual design, building characteristics, and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future updates. According to the NC State Hazard Mitigation Plan⁴², several factors impact vulnerability to hail which include geographic location, urban development, climate change, lack of preparedness for severe weather, insufficient warning systems, increased urbanization, insufficient emergency response plans, agricultural practices or crops that may suffer greater damage due to insufficient protection, and areas more prone to severe thunderstorms.

4.5.10.7. Future Vulnerability: Problem Statements

People

The NRI estimates that there will be approximately 5.3 events in Alexander County, 5.7 events in Catawba County, 5.5 events in Burke County, and 5.1 events in Caldwell County per year, and without adequate preparedness can cause severe property damage or injury. To prevent injury and damage of property in the planning area due to hail, the jurisdiction within the planning area should consider the following mitigation actions:

- Consider development of a hail awareness program which aims to reduce property damage or risk of injury to residents in the planning area.

⁴² North Carolina Department of Public Safety. (2023). 2023 North Carolina State Hazard Mitigation Plan. <https://www.ncdps.gov/20230125-2023-nc-shmp-final-publicpdf/open>

Changes in Development or Housing Characteristics

Increased development is not projected to increase the risk of hail events; however, any new buildings or developments will have the same risk of hail damage as it is already in the area. If future development fails to incorporate measures for rainwater absorption, runoff reduction, and the use of materials that promote infiltration, it could negatively impact the surrounding planning area by leading to soil erosion caused by hail melting. To prevent future development vulnerabilities to hail, the following mitigation actions should be considered by the jurisdictions in the planning area:

- Consider requiring nature-based solutions to reduce potential of erosion from hail melt runoff (e.g., retention ponds, improved drainage systems) in areas with high housing density or projected high housing density.
- Implement a process for the periodic review and update of comprehensive plans to reflect changing demographics and housing trends while considering the hail risk areas.

Economy

Hail can have widespread negative impacts on crops and agriculture, resulting in significant losses associated with hail damages. The Expected Annual Loss for the planning area is \$205,000 in Alexander County, \$992,000 in Catawba County, \$224,000 in Burke County, and \$198,000 in Caldwell County per year according to the NRI (see Table 4-61) which could cause economic strain on the planning area. Hail can create significant financial strain on those who have experienced property damage or injury due to hail events which require replacement or repair of property.

Natural Environment

Hail can have negative impacts on agriculture, and other secondary impacts of hail melting can cause risk for river and flash flooding. Hail can lead to soil compaction and erosion, degrading the soil quality and reducing agricultural productivity. Hail can also harm flowering plants and crops which pollinators rely on for food, causing impacts to plant ecosystems. Damage to trees can create damage which makes trees more susceptible to disease, pests, or other long term health issues which can impact long term health of those ecosystems.

First Responders

Response during hail events could lead first responders being injured due to hail and the secondary impacts of hail events. Additional vulnerability can be attributed to damaged equipment delaying response time, increased call volumes to respond to injuries or property damage, or hazardous conditions caused by the hail which can slow down response times.

Continuity of Operation

Hail events have the potential to disrupt power and communications infrastructure which would limit the continuity of operations after a hazard event. This includes delays in emergency response and restoration of power due to hail damages or hazards.

4.5.10.8. Climate Change

Climate change can potentially produce more large hail by fueling stronger thunderstorm updrafts. Stronger updrafts suspend hail high within storms for longer, enabling them to grow and produce larger hailstones. Records show an increase in the number of large hailstones across the whole United States in recent years, and while there is also evidence of an increase in the number of hail days per year, the inherent uncertainty in reported hail size reduces the confidence in any projections. In fact, while the trend across much of the United States suggests more hail events with larger hail stones, in at least one study⁴³ a decrease in hail frequency and damage potential is predicted over eastern and southeastern regions in spring and summer, due to a significant increase in melting that mitigates gains in hail size from increased buoyancy.

Table 4-61: NRI Exposure Values for Hail and representative value of vulnerable agriculture, population, and building values.

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Alexander	\$202,258,636	36,437	\$422,669,200,000	\$6,490,937,927	\$429,362,396,563
Burke	\$93,436,823	87,532	\$1,015,371,200,000	\$13,643,350,490	\$1,029,107,987,313
Caldwell	\$55,120,539	80,586	\$934,797,600,000	\$15,099,673,534	\$949,952,394,073
Catawba	\$88,641,140	160,509	\$1,861,904,400,000	\$37,175,998,799	\$1,899,169,039,939
Total	\$439,457,138	365,064.00	\$4,234,742,400,000	\$72,409,960,750	\$4,307,591,817,888

4.5.11. Drought

Drought is a natural climatic condition caused by an extended period of limited rainfall beyond that which occurs naturally in a broad geographic area. High temperatures, high winds and low humidity can worsen drought conditions, and can make areas more susceptible to wildfire. Human demands and actions can also hasten drought-related impacts.

Droughts are frequently classified as one of four types: meteorological, agricultural, hydrological, or socio-economic. Meteorological droughts are typically defined by the level of “dryness” when compared to an average or normal amount of precipitation over a given period. Agricultural droughts relate common characteristics of drought to their specific agricultural-related impacts. Emphasis tends to be placed on factors such as soil water deficits, water needs based on differing stages of crop development, and water reservoir levels. Hydrological drought is directly related to the effect of precipitation shortfalls on surface and groundwater supplies. Human factors, particularly changes in land use, can alter the hydrologic characteristics of a

⁴³ The Changing Hail Threat Over North America in Response to Anthropogenic Climate Change: J. C. Brimelow, W. R. Burrows and J. M. Hanesiak, Published online at www.nature.com, 26 June 2017

basin. Socio-economic drought is the result of water shortages that limit the ability to supply water-dependent products in the marketplace.

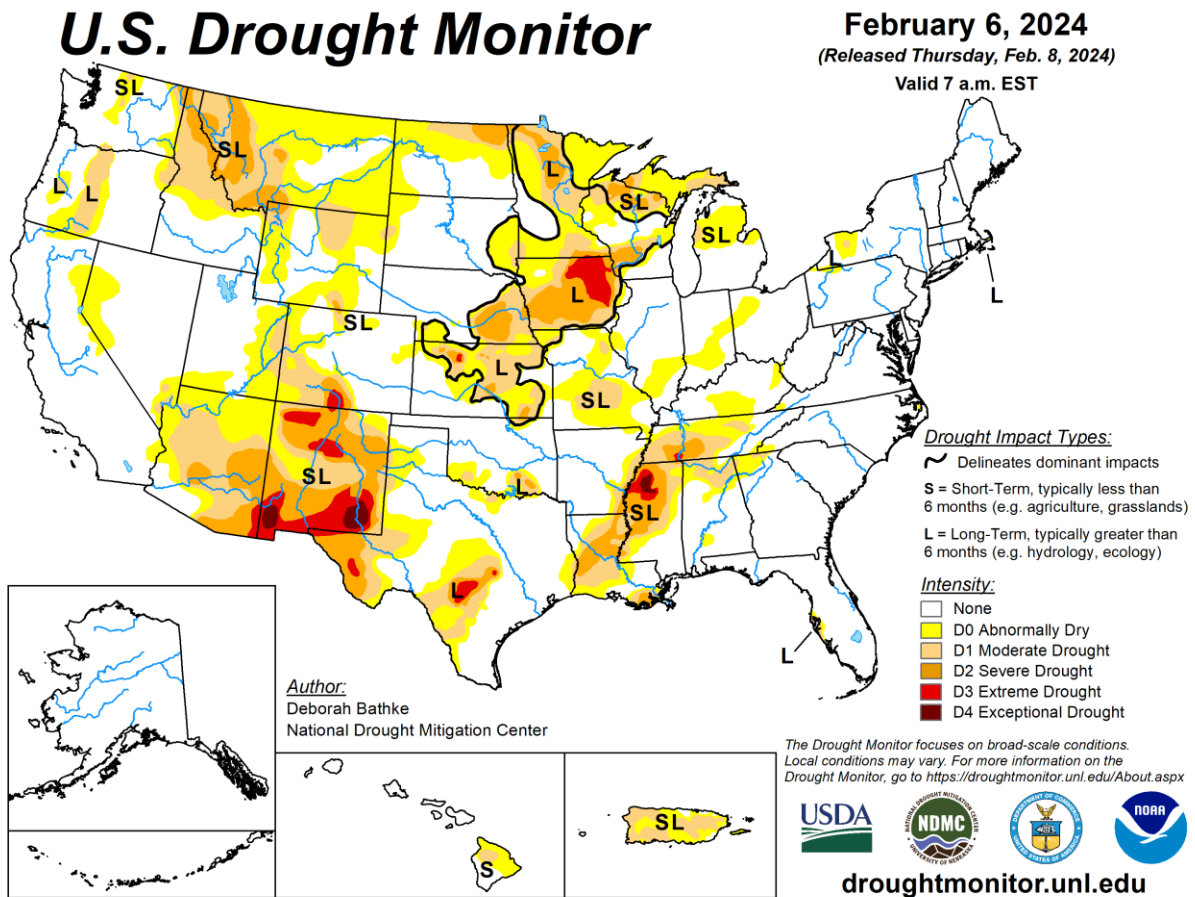


Figure 4-134: U.S. Drought Monitor from February 6, 2024 **Location within the Planning Area**

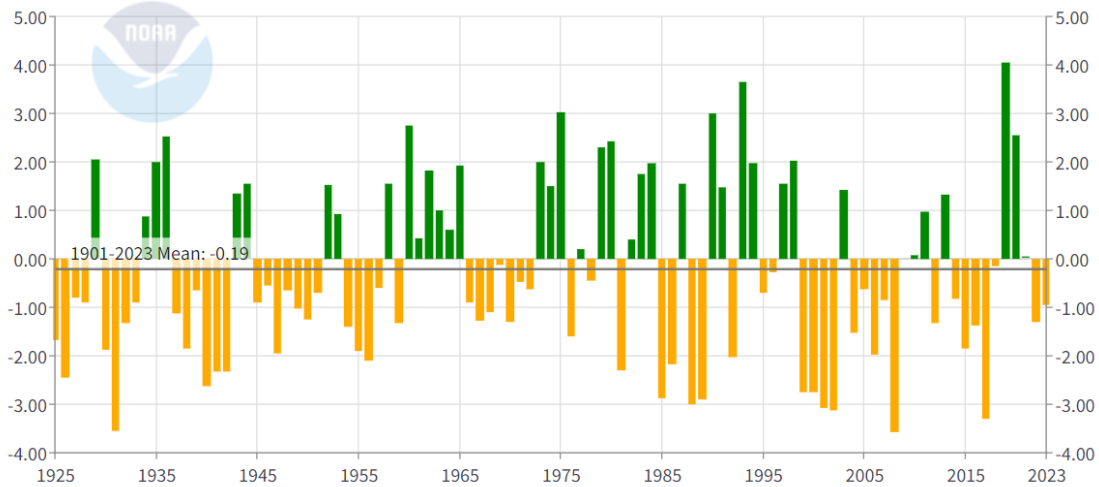
The National Weather Service looks at drought and extreme heat as episodes that impact a widespread forecast “zone,” and therefore it is not common to pinpoint a specific location within a planning area that is more susceptible to these hazards than others. From this viewpoint, each county is considered uniformly at risk to drought and extreme heat. However, the most significant financial losses are likely to occur in areas that are primarily agricultural.

Figure 4-134 shows the US Drought Monitor summary map for the United States Through February 2024.

Figure 4-135 shows the most recent Palmer Drought Severity Index summary map for the Unifour Region from 1895-2013. PDSI drought classifications are based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). As can be seen, the Eastern United States has historically not seen as many significant long-term droughts as the Central and Western regions of the country.

North Carolina, Climate Division 2 Palmer Drought Severity Index (PDSI)

March



Source: NOAA NCEI Climate at a Glance Divisional Time Series⁴⁴

Figure 4-135: Palmer Drought Severity Index for the Northern Mountains Climate Division

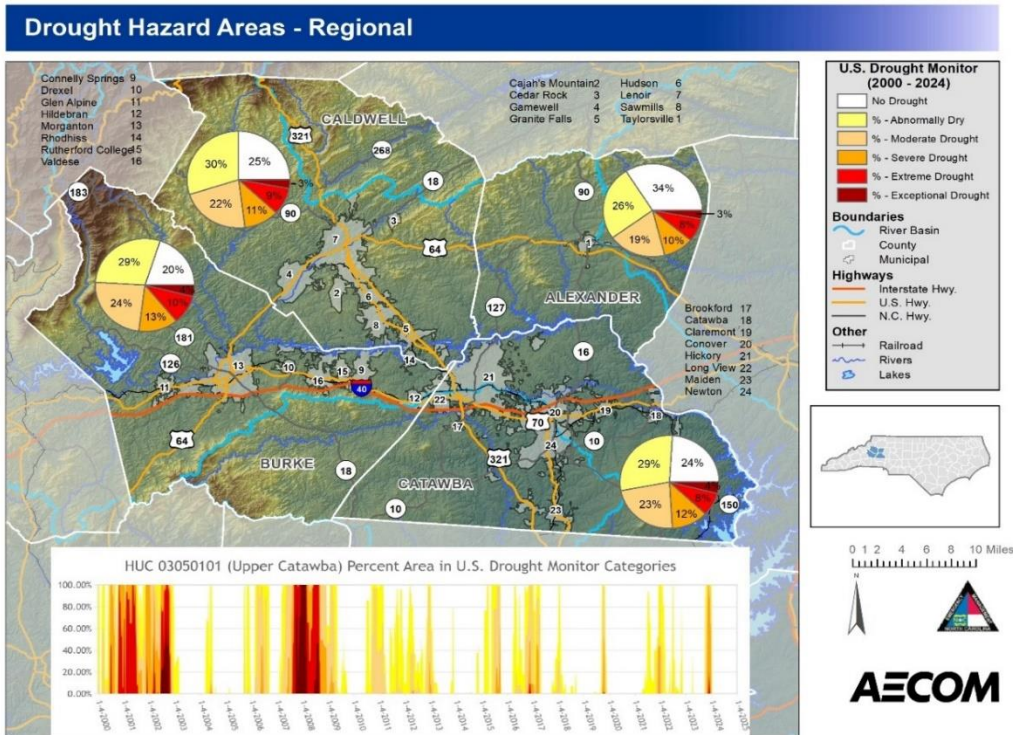


Figure 4-136: Drought Hazard Areas

⁴⁴ NOAA & NCEI. (2024, October 2). *NCEI Climate at a Glance Divisional Time Series*. National Centers for Environmental Information (NCEI). https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/divisional/time-series/3102/pdsi/1/3/1925-2023?base_prd=true&begbaseyear=1901&endbaseyear=2023

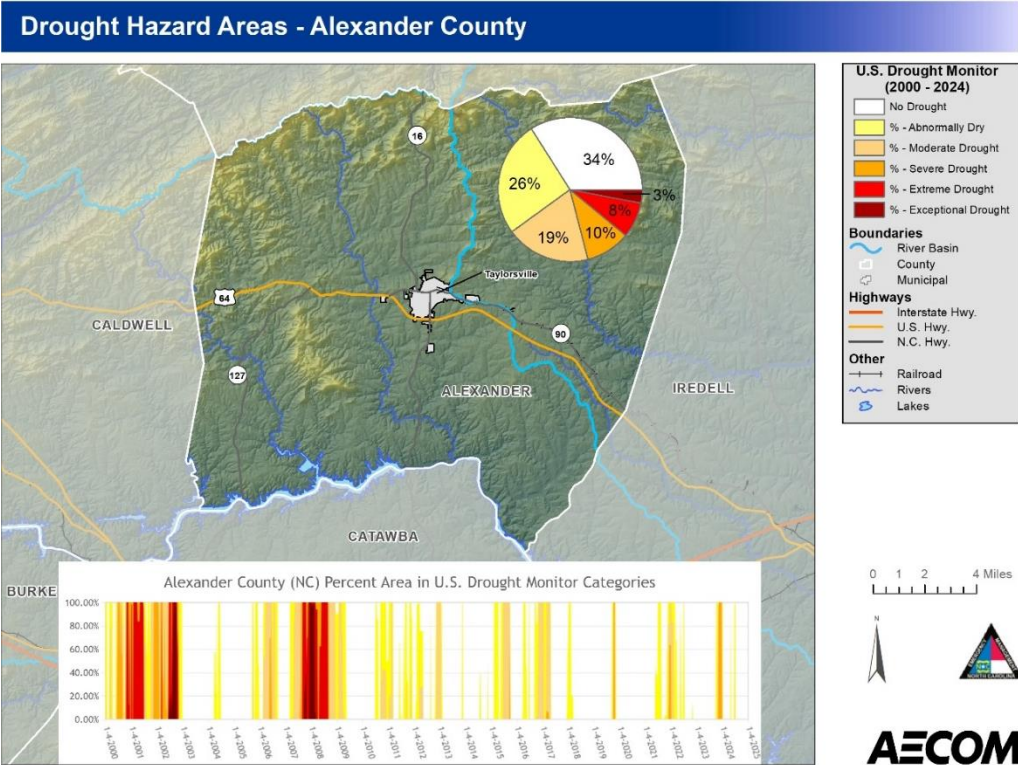


Figure 4-137: Drought Hazard Areas for Alexander County

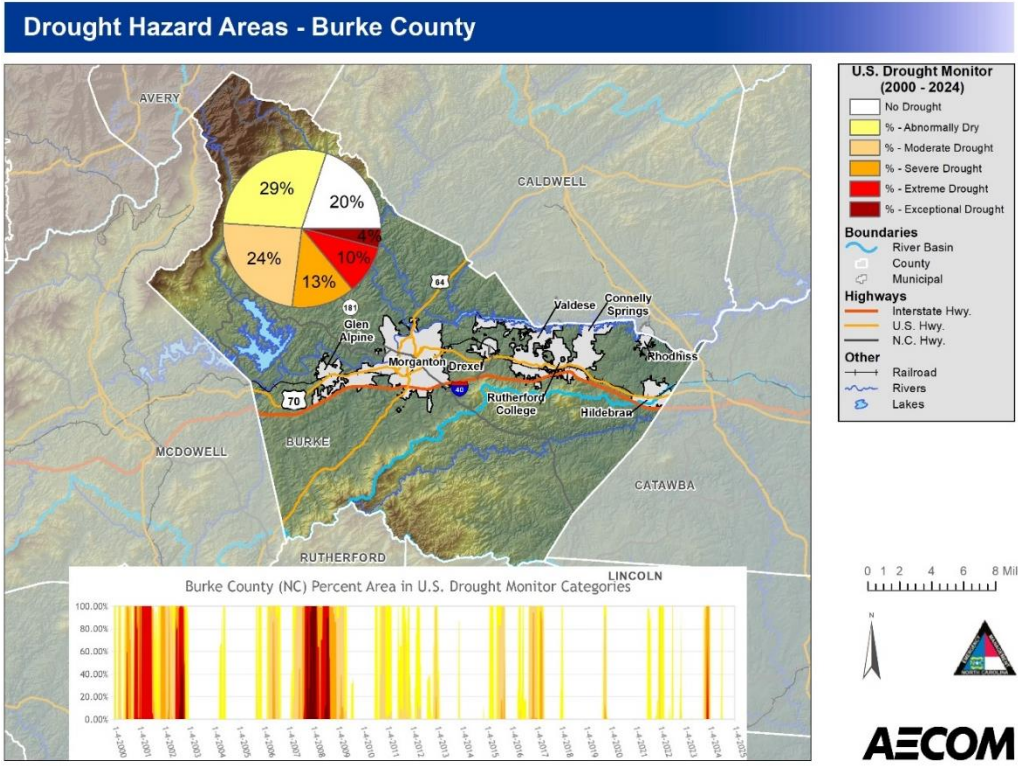


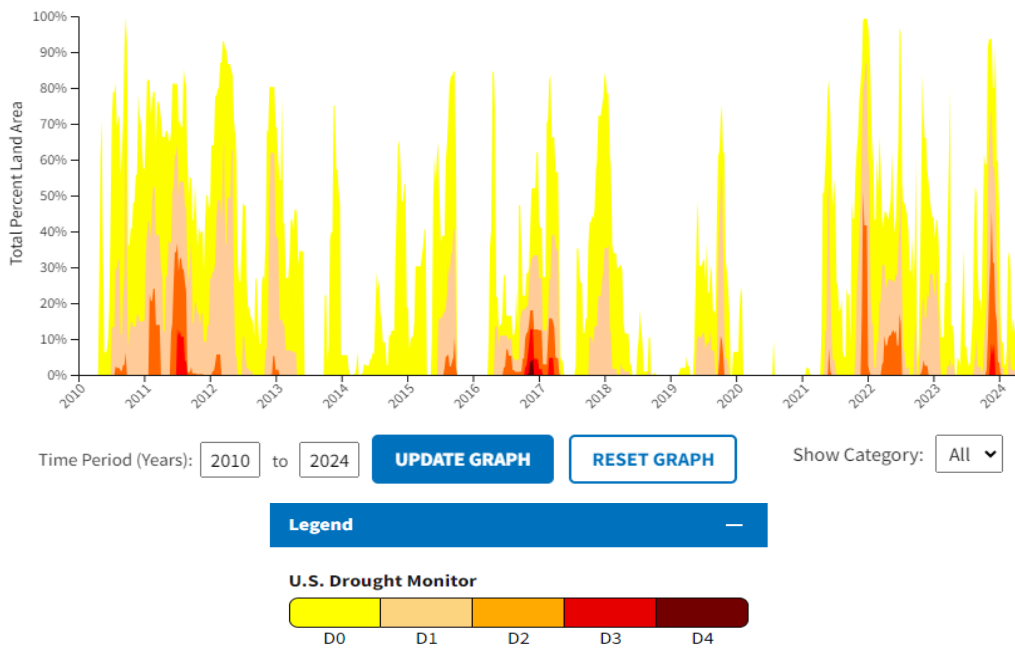
Figure 4-138: Drought Hazard Areas for Burke County

4.5.11.2. Extent (Magnitude and Severity)

Drought extent is defined by the NC Drought Management Advisory Council which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the North Carolina Drought Monitor Classifications, the most severe drought condition is Exceptional.

Extent Event:

As of 2024, the highest recorded event for the planning area was all counties (Alexander, Burke, Caldwell, Catawba) from December 2007-March 2008. According to the North Carolina Drought Monitor, all four counties and twenty-four jurisdictions (Taylorsville, Connelly Springs, Drexel, Glen Alpine, Hildebran, Rhodhiss, Morganton, Rutherford College, Valdese, Cahah's Mountain, Cedar Rock, Gamewell, Granite Falls, Hudson, Lenoir, Sawmills, Brookford, Catawba, Claremont, Conover, Hickory, Longview, Maiden, Newton) were in a D4 (Exceptional Drought) for this time period. Another example of severe drought occurred in January 2012 following months of lowered precipitation and continued until the end of February 2012⁴⁵. Drought conditions have also been observed from mid-2016 to mid-2017, where D1-D4 droughts were experienced in NC⁴⁶. More information about historic drought conditions in North Carolina and the percentage of land impacted can be found in Figure 4-141.



Source: National Integrated Drought System: National Drought Information System North Carolina⁴⁷

Figure 4-141: Drought monitor from 2010 to 2024 in North Carolina.

⁴⁵ North Carolina Department of Public Safety. (2023). 2023 North Carolina State Hazard Mitigation Plan. <https://www.ncdps.gov/20230125-2023-nc-shmp-final-publicpdf/open>

⁴⁶ North Carolina | Drought.gov. (n.d.-b). Drought.gov. <https://www.drought.gov/states/north-carolina#historical-conditions>

⁴⁷ North Carolina | Drought.gov. (n.d.). Drought.gov. <https://www.drought.gov/states/north-carolina#historical-conditions>

4.5.11.3. Historical Occurrences

The following historical occurrences of drought ranging from 1998 to 2023 have been identified based on the NCDC Storm Events database Table 4-62. It should be noted that only those historical occurrences listed in the NCDC database are shown here and that other, unrecorded, or unreported events may have occurred within the planning area during this timeframe.

Table 4-62: Occurrences of Drought (1998 to 2023). Source: National Climatic Data Center (NCDC) Storm Events Database and or potential user entered data.

Location	Events	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Alexander								
Alexander County (Unincorporated Area)	35	Standard	0	0	\$0	\$0	\$0	\$0
Burke								
Burke County (Unincorporated Area)	16	Standard	0	0	\$0	\$0	\$0	\$0
Caldwell								
Caldwell County (Unincorporated Area)	15	Standard	0	0	\$0	\$0	\$0	\$0
Catawba								
Catawba County (Unincorporated Area)	35	Standard	0	0	\$0	\$0	\$0	\$0
TOTAL PLAN	101 Events		0	0	\$0	\$0	\$0	\$0

According to NCDC 101 recorded instances of Drought conditions have affected the planning area since 1998 causing an estimated \$0 in losses to property, \$0 in losses to agricultural crops, 0 death(s), and 0 injury(ies).

Table 4-62 provides a summary of this historical information by participating jurisdiction. It is important to note that many of the events attributed to the county are countywide or cover large portions of the county. The individual counts by jurisdiction are for those events that are only attributed to that one jurisdiction.

4.5.11.4. *Probability of Future Occurrences*

Table 4-63: NRI Drought EAL, Risk Index, Frequency, and Historic Loss Ratio values. Risk index for drought is only based on agricultural/crop impacts.

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$140,000	\$379,000	\$342,000	\$183,000
	Rating	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively Low
Risk Index	Score	73.8	86.1	86	76.6
	Rating	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively Low
Frequency (Events per Year)		31	32.1	33.2	30.7
Historic Loss Ratio		Relatively Moderate	Relatively Moderate	Relatively Moderate	Relatively Moderate

The probability of future Drought is highly unpredictable and depend on the conditions of the specific areas that may be affected. The current risk, according to the 2023 NC Hazard Mitigation Plan, is between 1% and 0.33% annual probability. Although, the NCMHP (2023) also states that the changes in weather patterns and climate suggest that the drought conditions may be experienced more frequently in specific areas that are more prone to drought conditions.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-64: Probability of future hazard occurrence from the RMT iRisk Tool

Jurisdiction	Probability of Future Occurrence
Alexander County (Unincorporated Area)	Medium
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	Medium
Catawba County (Unincorporated Area)	Medium
City of Claremont	Medium
City of Conover	Medium
City of Hickory	Medium
City of Lenoir	Medium
City of Morganton	Medium

Jurisdiction	Probability of Future Occurrence
City of Newton	Medium
Town of Brookford	Medium
Town of Cahah's Mountain	Medium
Town of Catawba	Medium
Town of Connelly Springs	Medium
Town of Drexel	Medium
Town of Gamewell	Medium
Town of Glen Alpine	Medium
Town of Granite Falls	Medium
Town of Hildebran	Medium
Town of Hudson	Medium
Town of Long View	Medium
Town of Maiden	Medium
Town of Rhodhiss	Medium
Town of Rutherford College	Medium
Town of Sawmills	Medium
Town of Taylorsville	Medium
Town of Valdese	Medium
Village of Cedar Rock	Medium

4.5.11.5. Drought Hazard Vulnerability

It is estimated that annualized losses to the drought hazard will decrease over time due to the continued trend of decreasing agricultural production within the Region, much of which has to do with decreases in the number of farms and land available for farming. While future agricultural losses may decrease other sectors of the Region that are dependent on water supply will likely continue to experience future economic impacts during periods of severe to extreme drought conditions.

Drought conditions typically do not cause property damages or threaten lives, but rather drought effects are most directly felt by agricultural sectors. At times, drought may also cause community-wide impacts because of acute water shortages (regulatory use restrictions, drinking water supply, and saltwater intrusion). The magnitude of impacts correlates directly with local groundwater supplies, reservoir storage, and development densities. Drought conditions can also contribute to or exacerbate extreme heat concerns, particularly about elderly populations.

4.5.11.6. Future Vulnerability: Problem Statement

People

Drought can cause many impacts on those economically reliant on water supply, including decreased income or economic loss. Water shortages can also lead to use of lower quality water which can cause health issues. Drought can also create increased cost of food, water, and utilities for residents who are in an area where a drought is occurring.

Changes in Development or Housing Characteristics

Increased development and population could create a strain on water supply for residences, commercial activities, government activities, and industrial activities. Alexander County has reported a 4.33% increase and Catawba County has reported a 3.62% increase in total housing units between 2018 and 2023, (See Table 3-6). Burke County aims to develop policies that encourage higher density developments to support the development of new housing and encourage relocation or new arrivals. Caldwell County is updating their zoning and subdivision regulations to ensure they are compatible for land use and plans to expand their inventory of available properties through the county to encourage commercial development projects and new amenities that attract new residents.

Increased development could lead to more strain on water supplies, which would require planning for water use regulations and drought response protocol that will accommodate an increased population. To reduce vulnerability to drought impacts in the planning area, jurisdictions should consider the following mitigation actions:

- Update building codes to require high density developments to utilize water conservation practices in new housing units such as drought resistant landscaping and water conserving, environmentally friendly plumbing.

Economy

The NRI estimates that Catawba and Burke County are at a Relatively Moderate risk of experiencing drought conditions, while Alexander and Caldwell County are at a relatively low risk of impact from drought conditions annually. The Expected Annual Losses (EAL) score from the NRI represents the expected annual agricultural loss and are estimated to be \$140,000 in Alexander County, \$379,000 in Catawba County, \$342,000 in Burke County, and \$183,000 in Caldwell County. Those who rely on agriculture may be significantly impacted by drought conditions, which could significantly strain the economy of the planning area.

Natural Environment

Drought can damage habitats, limit water availability, and limit food supply for plants and animals. Drought can also lead to plants and trees dying from lack of precipitation and becoming fuel for a wildfire event. Drought also increases potential risk of wildfire which creates other economic impacts, environmental impacts, and or impacts on property and infrastructure. Droughts that last an extended period can result in wildfires that are more intense than usual. The NRI estimates that the number of drought events per year in the planning area are 31

events in Alexander County, 32.1 events in Catawba County, 33.2 events in Burke County, and 30.7 events in Caldwell County.

First Responders

Drought could have an impact on the amount of water available to respond to wildfires, but the overall impact of drought on first responders is not expected to be significant.

Continuity of Operation

There are no expected impacts to continuity of operations associated with drought.

4.5.11.7. Climate Change

Future changes in weather patterns and climate may have effects on the vulnerability to the drought hazard for all counties in North Carolina. These changes could impact the probability of drought occurrences, as well as the extent or location of droughts. Lasting drought conditions may be experienced in some areas more frequently.

The North Carolina Climate Science Report predicts future droughts to be warmer than historical events with a high level of confidence. The warmer conditions will lead to more rapid drying through increases in potential evapotranspiration. Therefore, it is likely that future droughts in the Unifour Region in their multiple forms will be more frequent and severe in terms of soil moisture deficits and the impacts on rainfed agriculture and natural vegetation.

Table 4-65: NRI Agricultural Exposure to Drought

County	Agriculture Exposure	Population Exposure	Population Equivalence	Building Exposure	Total exposure Value (including population equivalent value)
Alexander	\$9,296,672		N/A		\$9,296,672
Burke	\$21,668,012				\$21,668,012
Caldwell	\$12,091,164				\$12,091,164
Catawba	\$24,258,990				\$24,258,990
Total	\$67,314,838				\$67,314,838

4.5.12. Hurricane Winds

Hurricanes and tropical storms, along with nor'easters and typhoons, are classified as cyclones and are any closed circulation developing around a low-pressure center in which the winds rotate counterclockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes.

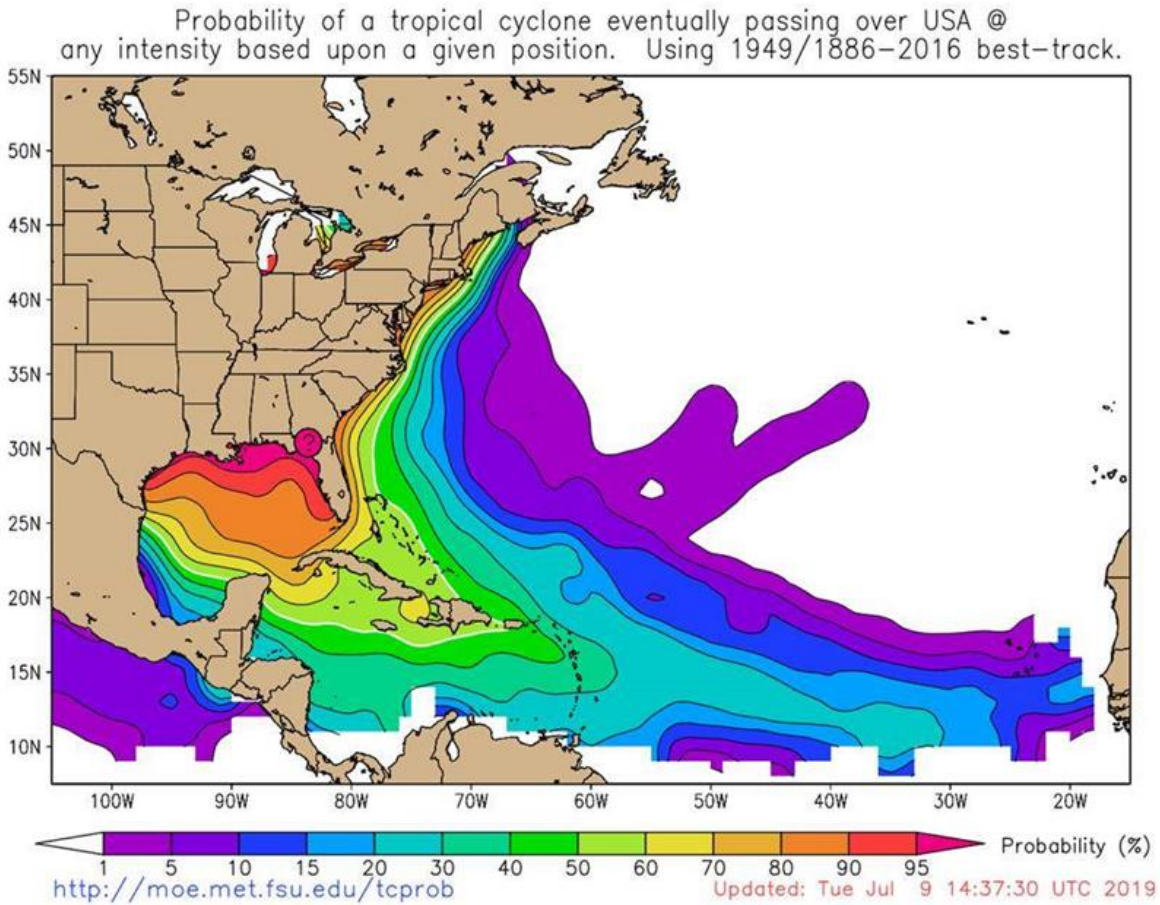


Figure 4-142: Empirical Probability of a Named Hurricane or Tropical Storm

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. Most 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. Based on a long-term average, approximately six storms reach hurricane intensity per year.

Figure 4-143 shows, for any location, the chance of a hurricane or tropical storm affecting the area sometime during the Atlantic hurricane season. The figure was created by the National Oceanic and Atmospheric Administration's (NOAA) Hurricane Research Division, using data from 1949/1886-2016. The figure shows the number of times a storm or hurricane was located within approximately 100 miles (165 kilometers) of a given spot in the Atlantic basin.

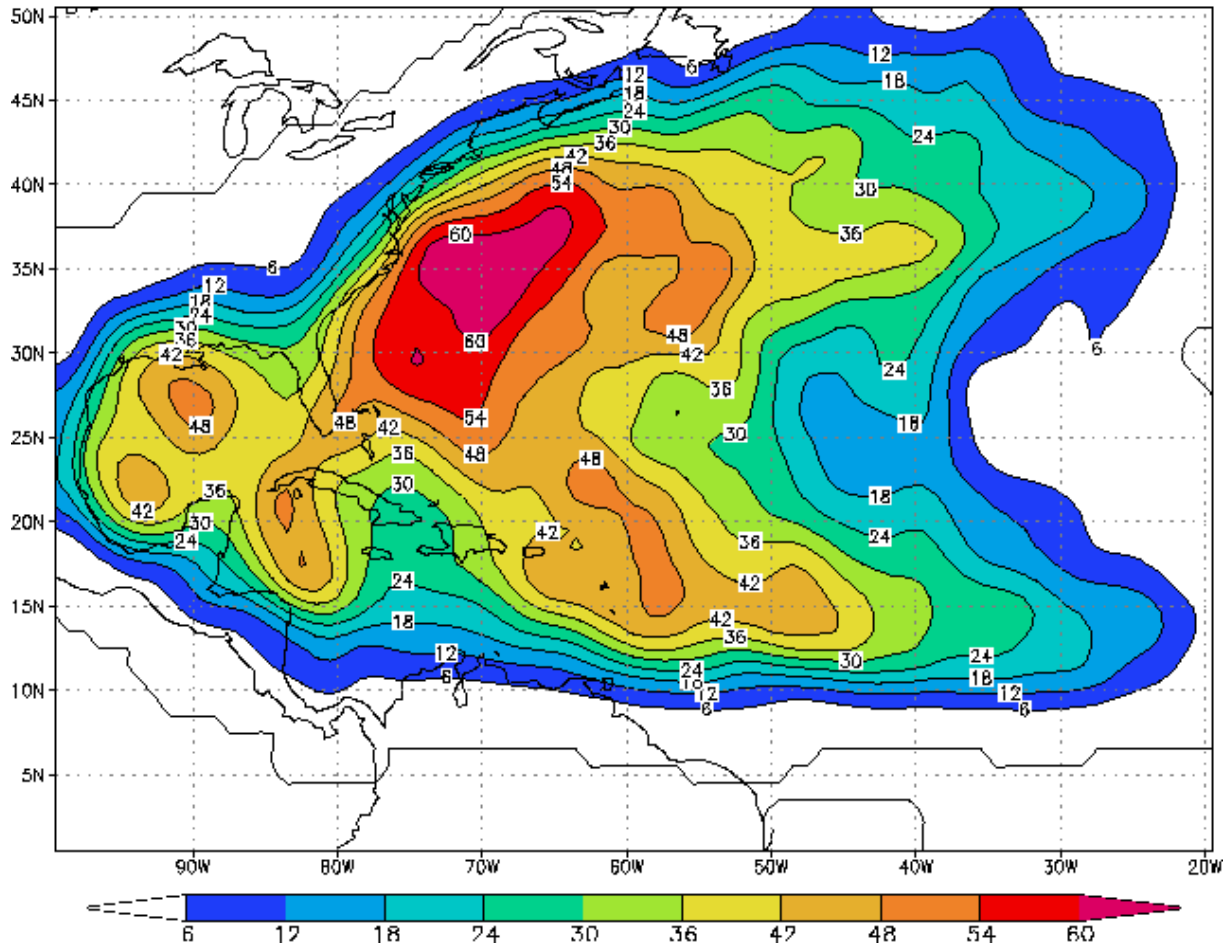


Figure 4-143: Empirical Probability of a Named Hurricane or Tropical Storm

Source: National Oceanic and Atmospheric Administration, Hurricane Research Division

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 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 which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense. The Saffir-Simpson Scale is shown in Table 4-66.

Table 4-66: Saffir-Simpson Scale





Category	Maximum Sustained Wind Speed (mph)	Minimum Surface Pressure (Millibars)	Storm Surge (Feet)
1	74–95	Greater than 980	3–5
2	96–110	979–965	6–8


Category	Maximum Sustained Wind Speed (mph)	Minimum Surface Pressure (Millibars)	Storm Surge (Feet)
3	111–130	964–945	9–12
4	131–155	944–920	13–18
5	155 +	Less than 920	19+

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure, and storm surge potential, 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 cyclones making landfall, they account for over 70 percent of the damage in the United States.

Table 4-67 describes the damage that could be expected for each hurricane category.

Table 4-67: Hurricane Damage Classifications

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

Storm Category	Damage Level	Description of Damages	Photo Example
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Sources: National Hurricane Center and the Federal Emergency Management Agency

Damage during hurricanes may also result from spawned tornadoes and inland flooding associated with heavy rainfall that usually accompanies these storms. Hurricane Floyd, for example, was at one time a Category 4 hurricane racing towards the North Carolina coast. As far inland as Raleigh, the state capital located more than 100 miles from the coast, communities were preparing for winds exceeding 100 miles per hour. While Floyd made landfall as a Category 2 hurricane it caused the worst inland flooding disaster in North Carolina’s history. Rainfall amounts exceeded 20 inches in certain locales and 67 counties sustained damages.

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

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

4.5.12.1. Location within the Planning Area

The figures below show the probability of future named storms and paths of historic storms in the planning area. northeast.

Hurricane Hazard Areas - Regional

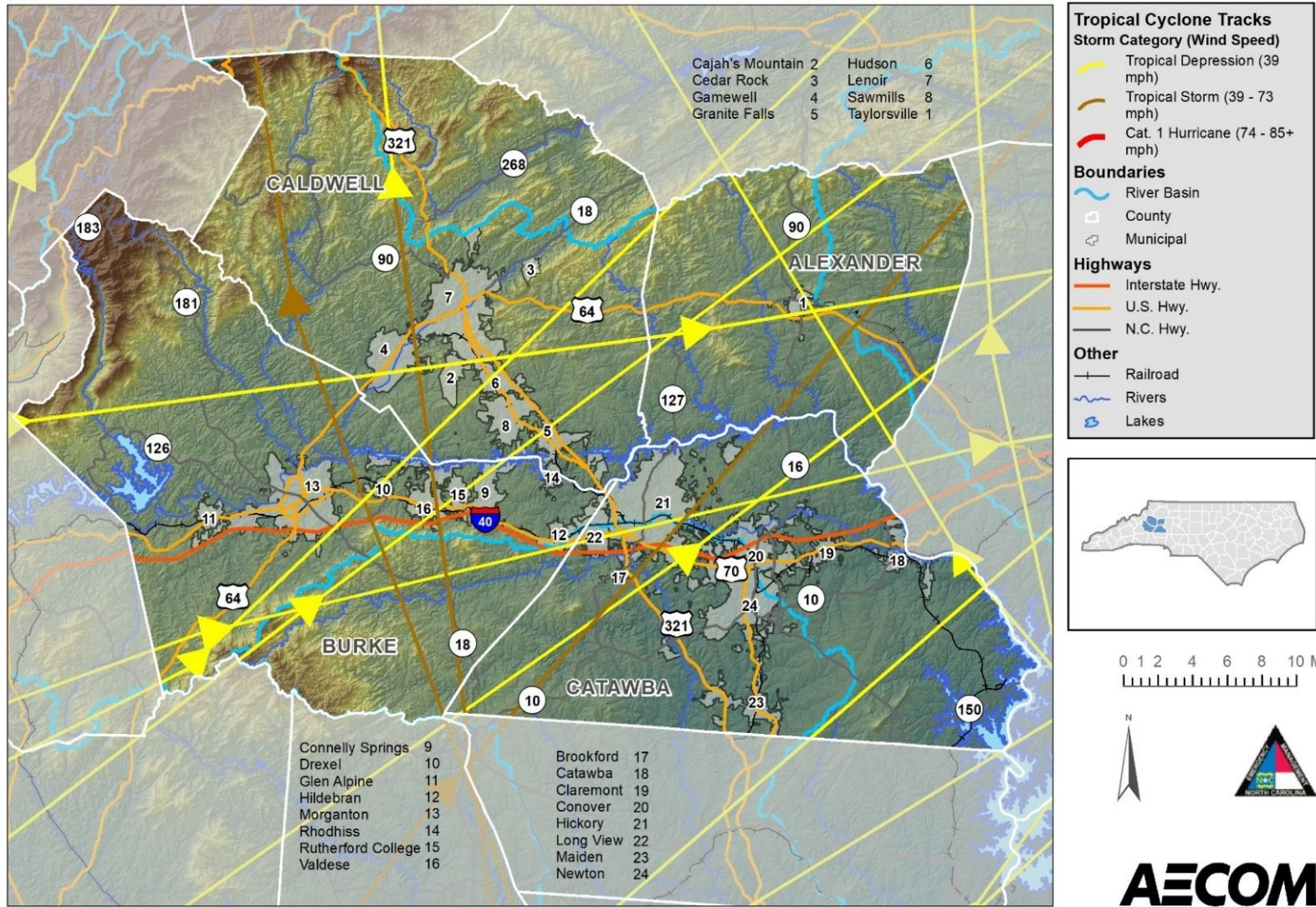


Figure 4-144: Hurricane Winds Hazard Areas

Hurricane Hazard Areas - Alexander County

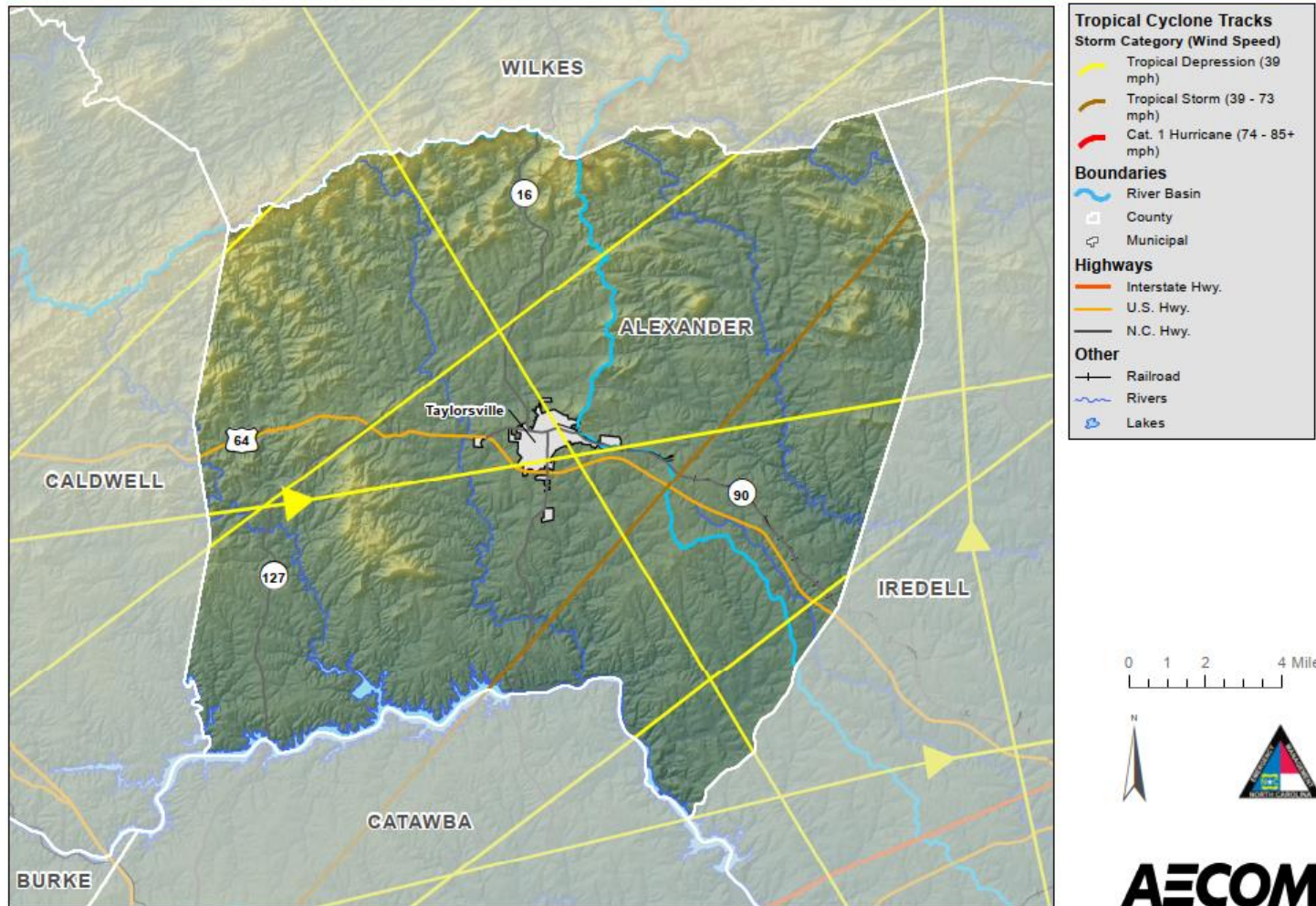


Figure 4-145: Hurricane Winds Hazard Areas for Alexander County

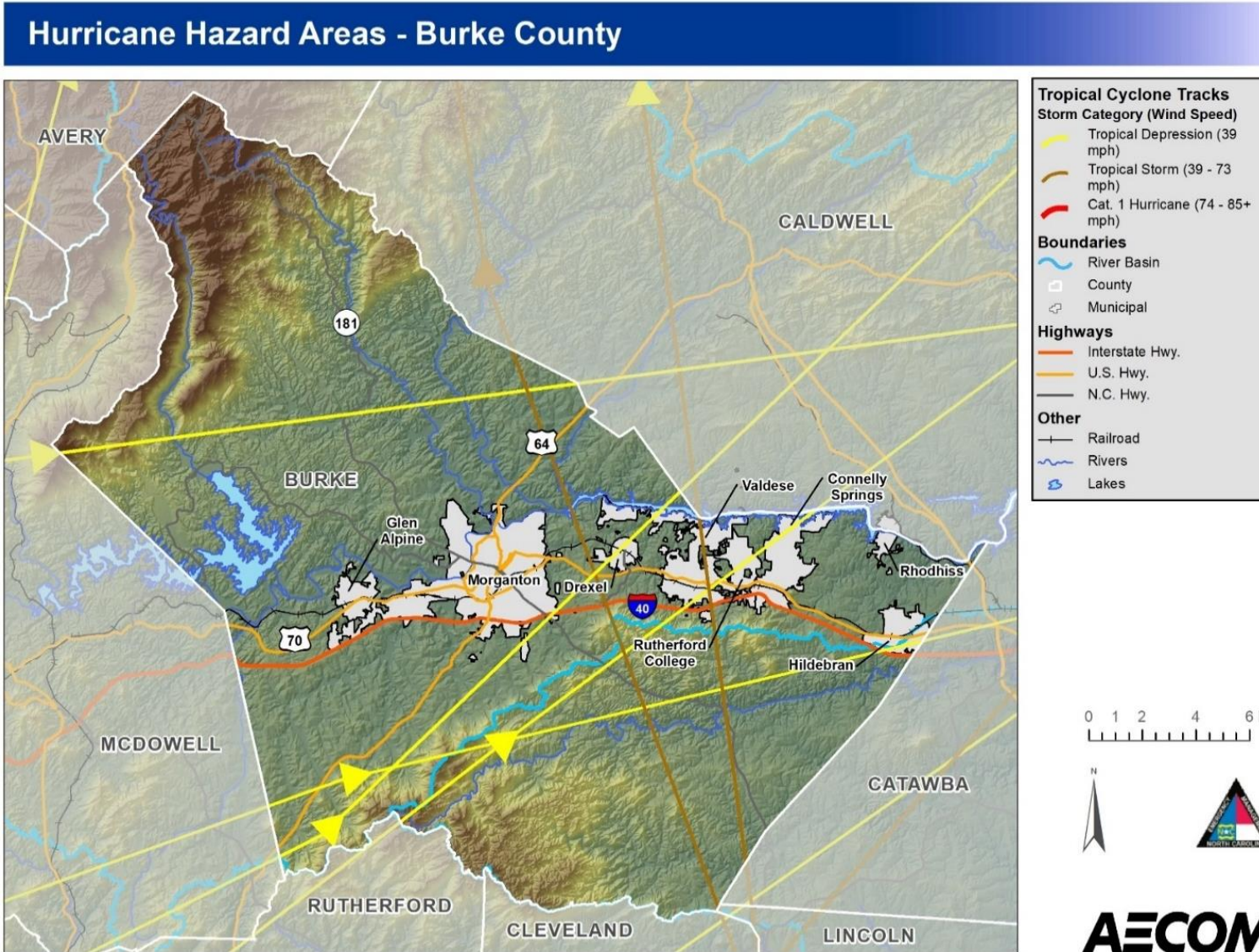


Figure 4-146: Hurricane Winds Hazard Areas for Burke County

Hurricane Hazard Areas - Caldwell County

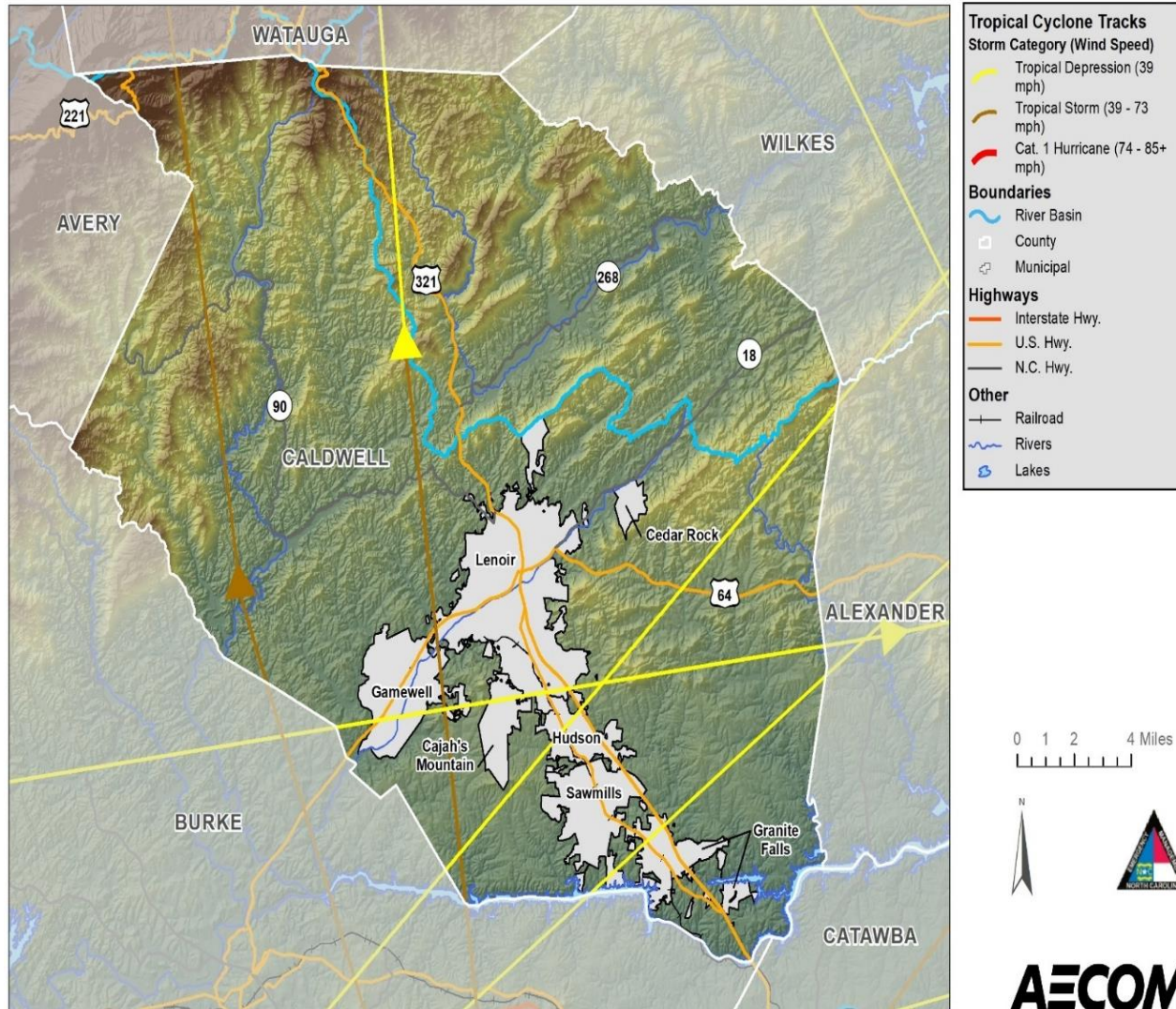


Figure 4-147: Hurricane Winds Hazard Areas for Caldwell County

Hurricane Hazard Areas - Catawba County

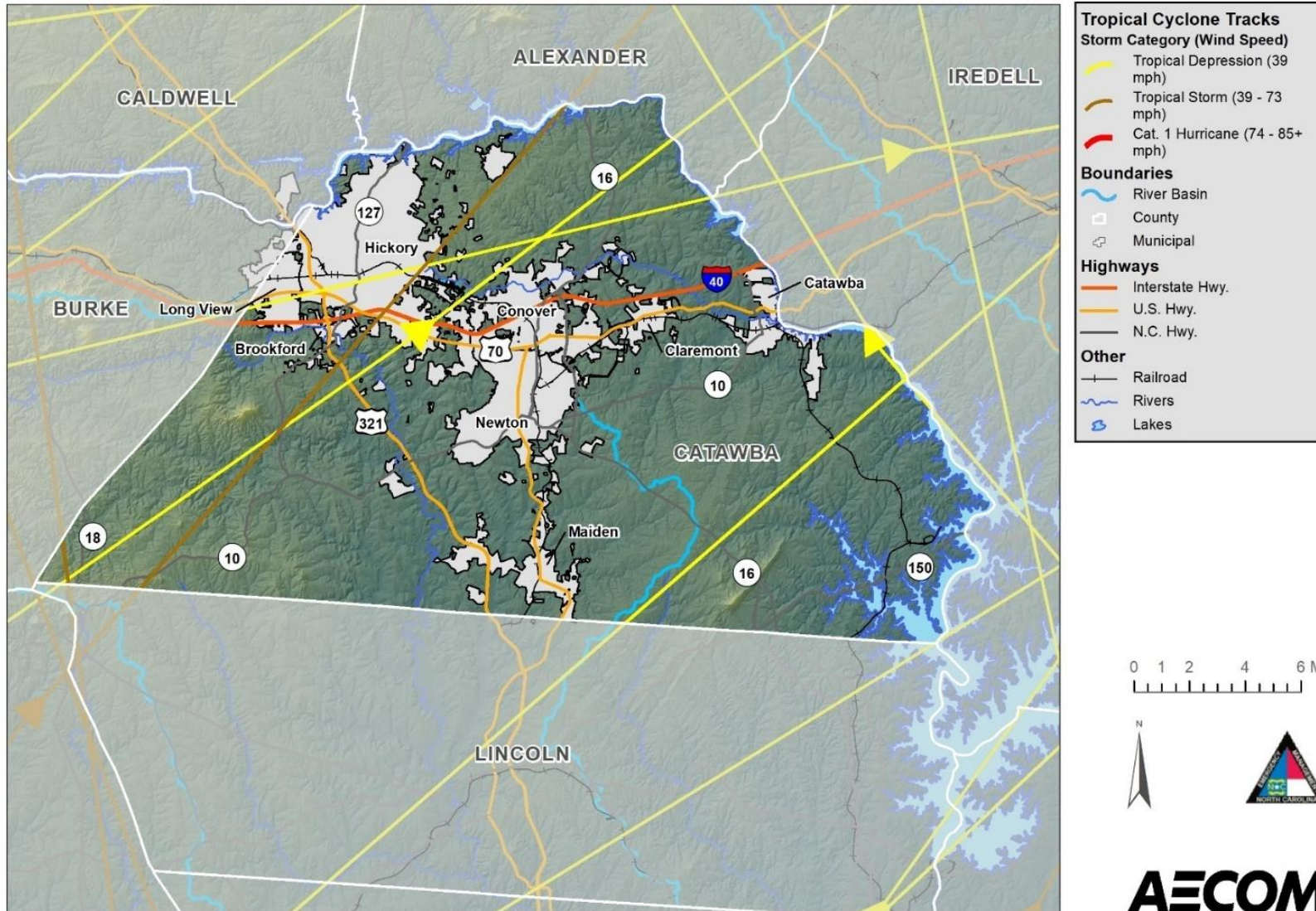


Figure 4-148: Hurricane Winds Hazard Areas for Catawba County

4.5.12.2. Extent (Magnitude and Severity)

Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5.

Extent Event:

Hurricanes and tropical storms of any magnitude and severity are theoretically possible within the planning area, however major hurricanes (Category 3 and greater) are less likely to retain that classification as far inland as the Unifour Region. Since the 1850s, the greatest magnitude hurricane to impact the planning area has been a Category 1 hurricane in 1989 (Hurricane Hugo) (see Historical Occurrences section below). A Category 1 hurricane typically results in minimal damages, including damage primarily to unanchored mobile homes, shrubbery, and trees.

4.5.12.3. Historical Occurrences

lists the 50 hurricanes, tropical depression, and tropical storm paths that have crossed within a 100-mile radius of the mean center of the planning area between 1859 to 2023⁴⁸. Between 1950 and 2023 there was a reported total property damage of \$6,000 in Burke, Caldwell, Catawba, and Alexander counties. The most powerful hurricane recorded remains as an unnamed hurricane that occurred in 1893 which reached a maximum recorded wind speed of 85 mph.

Table 4-68: Historical Occurrences of Hurricane Storm Paths Crossing within 75 Miles of the Planning Area

Name	Date	Magnitude	Maximum Recorded Wind Speed (mph)
Unnamed	9/17/1859	Tropical Storm	45
Unnamed	9/11/1882	Tropical Storm	45
Unnamed	6/22/1886	Tropical Storm	45
Unnamed	9/24/1889	Tropical Storm	50
Unnamed	8/28/1893	Category 1 Hurricane	85
Unnamed	7/19/1901	Tropical Depression	35
Unnamed	10/11/1902	Extra-tropical Storm	35
Unnamed	10/11/1905	Extra-tropical Storm	25
Unnamed	9/23/1907	Extra-tropical Storm	35
Unnamed	8/30/1911	Extra-tropical Storm	30
Unnamed	9/4/1913	Tropical Storm	45
Unnamed	8/3/1915	Tropical Depression	35

⁴⁸ NOAA's National Weather Service. (n.d.-b). *Climatology of tropical cyclones in eastern North Carolina*. <https://www.weather.gov/mhx/TropicalClimatology>

Name	Date	Magnitude	Maximum Recorded Wind Speed (mph)
Unnamed	9/23/1920	Tropical Storm	65
Unnamed	10/3/1927	Tropical Storm	45
Unnamed	8/11/1928	Extra-tropical Storm	30
Unnamed	8/18/1939	Tropical Depression	30
Unnamed	8/14/1940	Extra-tropical Storm	35
Unnamed	8/28/1949	Tropical Storm	45
Able	8/31/1952	Tropical Storm	50
Gracie	9/30/1959	Tropical Storm	70
Cleo	8/30/1964	Tropical Depression	30
Abby	6/8/1968	Tropical Depression	30
Babe	9/8/1977	Tropical Depression	30
David	9/5/1979	Tropical Storm	65
Bob	7/25/1985	Tropical Storm	65
Danny	8/18/1985	Tropical Depression	30
Chris	8/29/1988	Tropical Depression	30
Hugo	9/22/1989	Category 1 Hurricane	85
Beryl	8/17/1994	Tropical Depression	15
Bill	7/2/2003	Tropical Depression	25
Ivan	9/9/2004	Tropical Depression	25
Jeanne	9/13/2004	Tropical Depression	25
Cindy	7/3/2005	Extra-tropical Storm	20
Florence	9/10/2018	Tropical Depression	25
Michael	10/11/2018	Tropical Storm	52
Florence	9/13/2018	Tropical Depression	29
Bertha	5/27/2020	Tropical Depression	29
Claudette	6/21/2021	Tropical Depression	35
Ian	10/1/2022	Extratropical Storm	23

Source: NOAA National Hurricane Center and North Carolina State University Climate Office Hurricane Database

4.5.12.4. Probability of Future Occurrences

Table 4-69: NRI Risk Index, EAL, Frequency, and Historic Loss Ratio for Hurricanes

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$430,000	\$1,900,000	\$537,000	\$555,000
	Rating	Very Low	Relatively Low	Very Low	Relatively High
Risk Index	Score	61	75.1	63.8	63.9
	Rating	Very Low	Relatively Low	Relatively Low	Relatively Low
Frequency (Events per Year)		0	0.1	0	1.1
Historic Loss Ratio		Relatively Low	Relatively Low	Relatively Low	Relatively Moderate

Based on the analyses performed in iRISK, the probability of future Hurricane Winds is shown in the table below, by jurisdiction.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-70: iRISK Probability of future hurricane wind occurrences.

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Medium
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	Medium
Catawba County (Unincorporated Area)	Medium
City of Claremont	Medium
City of Conover	Medium
City of Hickory	Medium
City of Lenoir	Medium
City of Morganton	Medium
City of Newton	Medium
Town of Brookford	Medium
Town of Cahah's Mountain	Medium
Town of Catawba	Medium

Jurisdiction	iRISK Probability of Future Occurrence
Town of Connelly Springs	Medium
Town of Drexel	Medium
Town of Gamewell	Medium
Town of Glen Alpine	Medium
Town of Granite Falls	Medium
Town of Hildebran	Medium
Town of Hudson	Medium
Town of Long View	Medium
Town of Maiden	Medium
Town of Rhodhiss	Medium
Town of Rutherford College	Medium
Town of Sawmills	Medium
Town of Taylorsville	Medium
Town of Valdese	Medium
Village of Cedar Rock	Medium

4.5.12.5. Hurricane Winds Hazard Vulnerability

Continued enforcement of building codes, flood damage prevention ordinances and other local regulatory tools and policies designed to mitigate the effects of high hazard winds is expected to minimize future losses as construction and planning continue to seek higher standards. Based on historical events the most significant local impacts for the Unifour Region regarding future events will likely be damage to trees (and the requisite management of vegetative debris) and widespread power outages to the area.

To view vulnerable buildings, population, and high loss properties, see Appendix H.

4.5.12.6. Future Vulnerability: Problem Statements

People

Hurricane winds can create the need for evacuation, which could be difficult for vulnerable populations including underserved communities and socially vulnerable populations. In Alexander, Burke, Caldwell, and Catawba County the percentage of residents without a vehicle available comprise 2.8%, 4.6%, 4.8%, and 4.9% of the residents, respectively, which leads to an increased risk for individuals who are unable to evacuate to prevent serious or life-threatening injuries associated with remaining in hurricane wind hazard areas. The percentage of households that do not have telephone service in their housing unit are 1.3% in Alexander County, 1.1% in Burke County, 1.6% in Caldwell County, and 1.3% in Catawba County, and for individuals without telephone service, reverse 911 systems or mobile phone alerts may not be effective for these areas, (see Table 3-5).

Preparing for hurricane events is crucial for residents to avoid loss of property, potentially life-threatening injuries, or loss of life. As access to internet become more common, it is likely that resources to prepare for hazards such as hurricane winds will begin to be located primarily through the internet. The number of households with access to the internet were 83.6% in Alexander County, 79.7% in Burke County, 83.2% in Caldwell County, and 86.4% in Catawba County (See Table 3-5) as of 2022. Because there are households without internet access, there could be vulnerabilities due to lack of access to information about evacuations, preparedness, and mitigation actions before hurricane events.

In Alexander, Burke, Caldwell, and Catawba County the percentage of housing units that are mobile homes, boats, RVs, or vans comprise 25.9%, 20.4%, 17.1%, and 13.1% of the overall housing units in each county respectively, see Table 3-5. Hurricane winds have the potential to disproportionately impact a large portion of the planning area who reside in these housing units that may be more susceptible to hurricane wind or secondary impacts of hurricane winds. The compounding impacts of hurricane or tropical storm events include damages from flooding and heavy rain. Hurricane winds can damage critical infrastructure, property, and communications which can lead to decreased response time to emergencies during and after hurricane or tropical storm events.

In order to prevent vulnerabilities to hurricane winds in the planning area, jurisdictions in the planning area should consider the following mitigation actions:

- Consider collaborating with telephone and internet utility providers to expand service to areas with limited telephone signal to ensure that individuals in hazard areas receive alerts of impending hurricane wind events in a timely manner.

Changes in Development or Housing Characteristics

Increased development is not expected to increase the vulnerability of the planning area for experiencing hurricane events if new development in the planning area adhere to applicable building codes.

Economy

Hurricane events can cause damage to property damage which have the potential to interrupt day to day business operations, impose additionally recovery or evacuation related economic burdens. This includes economic strain on individuals, businesses, government, and overall operations associated with damage of critical infrastructure, replacement or repair of property, damages to buildings, and damages to critical facilities.

Natural Environment

Wind can cause damage to the natural environment by carrying debris and knocking down trees. Animals within the impacted areas can be impacted by the changes in the natural habitat and vegetation that is impacted by hurricane winds can be impacted by high winds, leading to trees being uprooted and forests losing significant amounts of foliage due to the strong winds. Additional impacts from hurricane or tropical storm events also create potential for hazardous materials to contaminate surrounding environments due to flooding or damage to hazardous

material containers. To prevent further damage to the environment in the event of hurricane winds, the jurisdictions in the planning area should consider the following mitigation actions:

- Conduct a hazardous material inventory or confirm locations of hazardous materials to identify areas where damage to infrastructure or property may lead to hazardous material release.
- Develop post-hurricane wind protocol to assess and clean up hazardous materials or contamination after flooding causes a release of hazardous materials.

First Responders

Hurricane events can significantly interrupt the ability of first responders to respond to emergencies by potentially limiting communication capabilities, damaging critical infrastructure required to travel, interrupting power supply, and potentially damaging critical emergency facilities. To prevent vulnerabilities for first responders in the event of hurricane winds, the jurisdictions in the planning area should consider the following mitigation actions:

- Review emergency response procedures regularly to update responsibilities, areas of risk, and protocol for hurricane and hurricane wind events.
- Implement and maintain advanced hurricane hazard systems that utilize real-time data to alert communities of impending hurricane wind risks.
- Establish clear evacuation routes and procedures, including designated shelters and transportation options for vulnerable populations.
- Periodically review emergency response and evacuation procedures in the event of hurricane events
- Establish clear evacuation routes, procedures, and operations that consider those who have limited transportation options, underserved communities, and residents with limited mobility.

Continuity of Operation

Damage associated with hurricane events is expected to cause disruption of emergency operations, power outages, damages or disruptions to roads, and reduction of capacity to communicate. Depending on the severity of the hurricane event, interruptions of continuity of operations can create prolonged periods of recovery. To improve continuity of operations after hurricane events, the jurisdictions in the planning area should consider the following mitigation actions:

- Periodically review inventory of critical resources, including personnel, equipment, and supplies, necessary for continued operations during and after hurricane events.
- Develop robust communication plans to keep staff informed during hurricane events, including alerts, updates, and instructions.
- Schedule regular reviews and updates of COOP plans based on new risks, lessons learned from past hurricane events, and changes in operations.

4.5.12.7. Climate Change

Changing climate and weather conditions are likely to impact the number and intensity of future hurricane events in North Carolina. The amount of influence that human-induced climate warming has had on hurricanes to date is believed to be relatively small, and this, in conjunction with observational limitations and large natural variations, makes it difficult to establish whether there are yet any clear trends in hurricanes that can be attributed to human-induced warming.

Studies conducted by the National Oceanic and Atmospheric Administration (NOAA) have predicted that while there may be less frequent, low-category storm events (Tropical Storms, Category 1 Hurricanes), there will be more high-category storm events (Category 4 and 5 Hurricanes) in the future. In other words, there may be fewer hurricanes overall in any given year, but when hurricanes do form, it is more likely that they will become larger storms that can cause massive damage.

That said, while a consistent finding of numerous previous studies of hurricanes and climate change was that the strongest storms will become stronger as the climate continues to warm, there is now less consistency regarding how hurricane frequency will change. Some earlier projections of decreases in hurricane activity now appear less confident in light of more recent high-resolution modeling studies.

On a global scale, it is predicted with high confidence that the intensity of the strongest hurricanes is likely to increase with a warming climate. For specific regions such as North Carolina, the confidence in this outcome is lower, but there is no known reason to suggest that North Carolina will not experience stronger hurricanes in future.

4.5.13. Ice

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Sleet—raindrops that freeze into ice pellets before reaching the ground—usually bounce when hitting a surface and do not stick to objects; however, sleet can accumulate like snow and cause a hazard to motorists. Freezing rain is rain that falls onto a surface with a temperature below freezing, forming a glaze of ice. Even small accumulations of ice can cause a significant hazard, especially on power lines and trees. An ice storm occurs when freezing rain falls and freezes immediately upon impact. Communications and power can be disrupted for days, and even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

A freeze is weather marked by low temperatures, especially when below the freezing point (zero degrees Celsius or thirty-two degrees Fahrenheit). Agricultural production is seriously affected when temperatures remain below the freezing point.

4.5.13.1. Ice Hazard Analysis

Winter weather events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation, all of which may create locally hazardous conditions regardless of the magnitude of the overall event. Ice storms occur when moisture falls and freezes immediately upon impact

on trees, power lines, communication towers, structures, roads, and other hard surfaces. Ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.

4.5.13.2. Location within the Planning Area

Winter weather, including blizzards, frosts/freezes, heavy snow, ice storms and sleet, are widespread atmospheric conditions that are not isolated to a specific geographic location. Therefore, it is assumed that the entire planning area is exposed to this hazard. The maps below represent ice storm event days per year for the planning area.

Ice Storm Hazard Areas - Regional

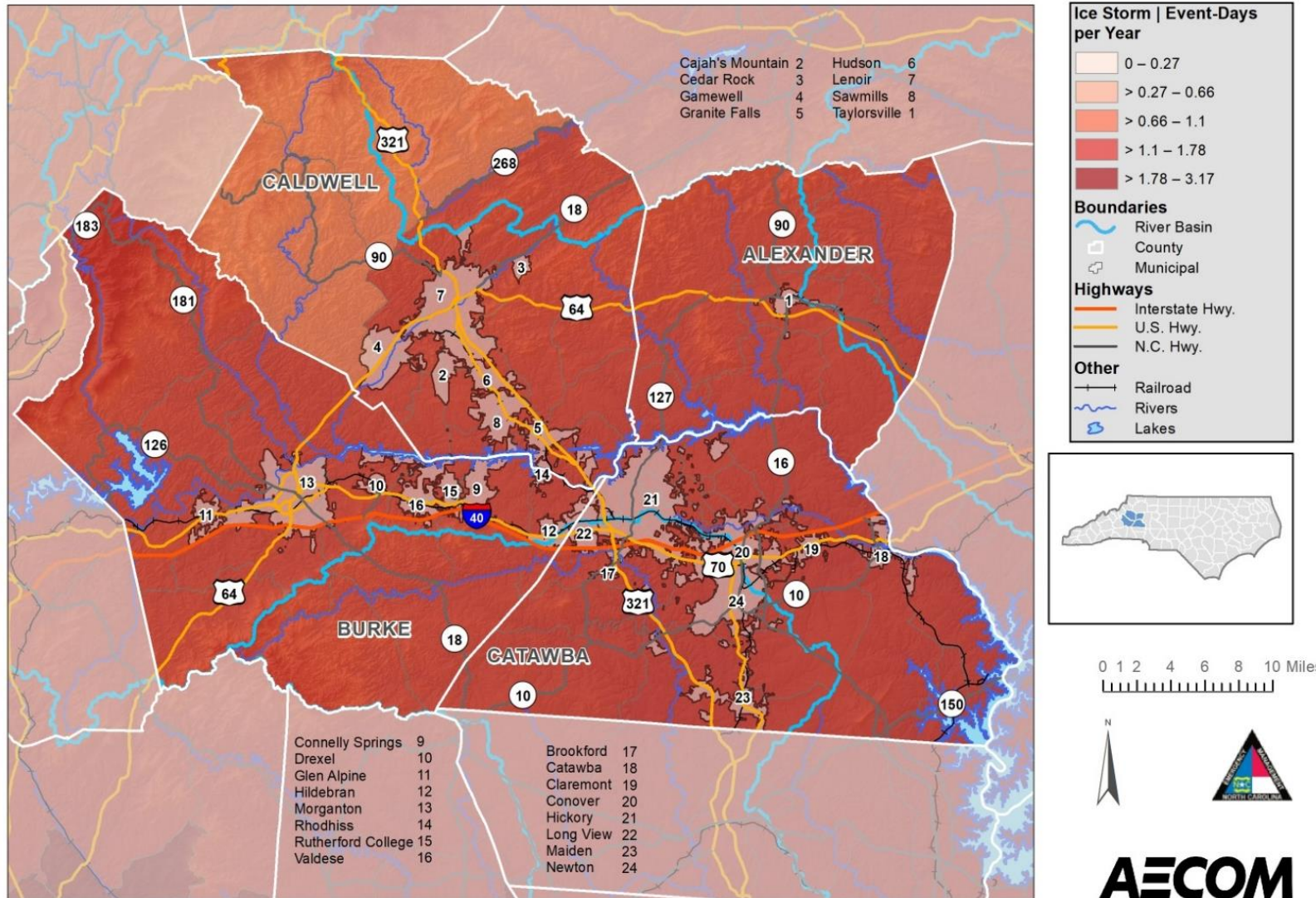


Figure 4-149: Ice Hazard Areas with Average Annual Accumulation in inches

Ice Storm Hazard Areas - Alexander County

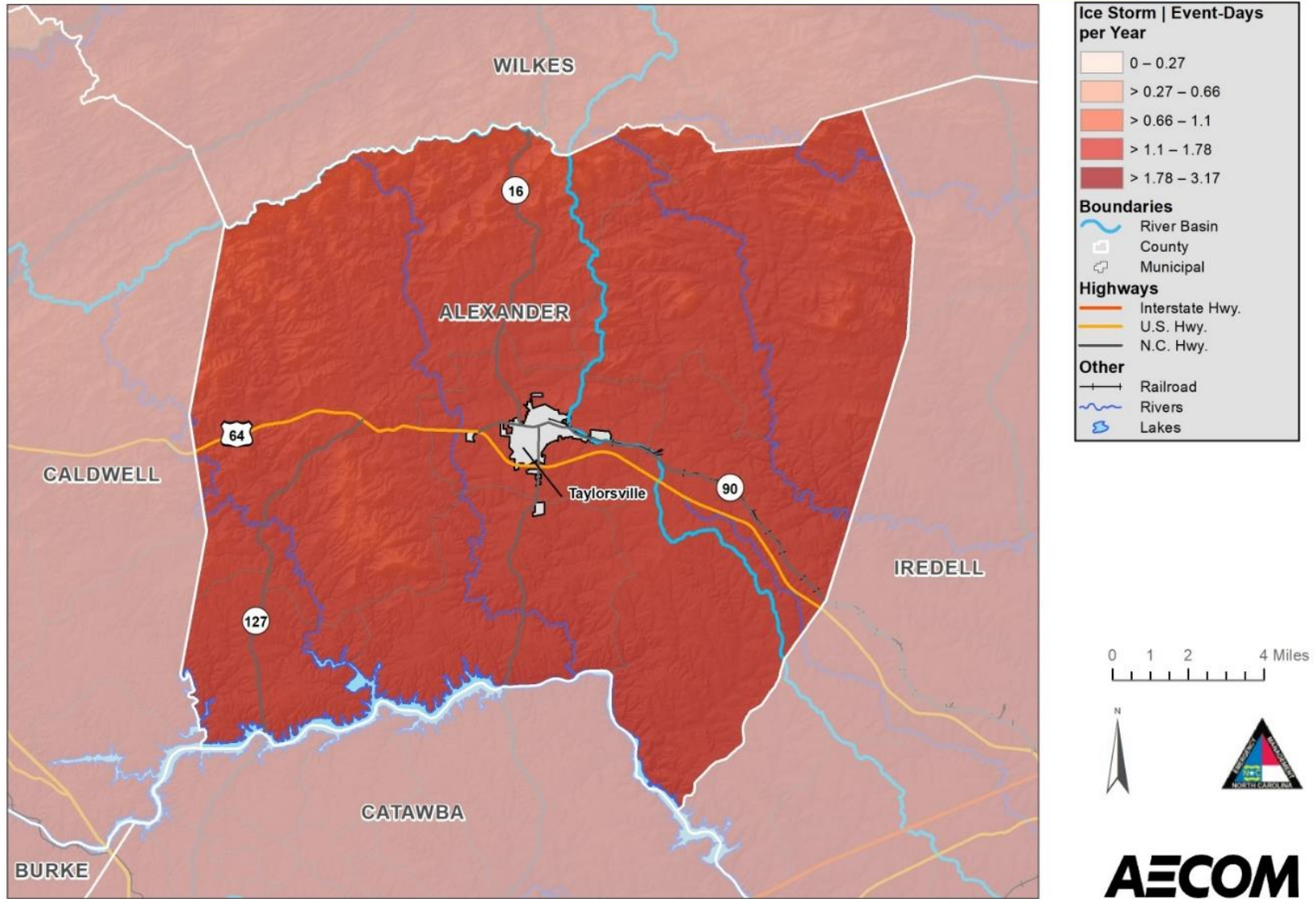


Figure 4-150: Ice Hazard Areas with Average Annual Accumulation in inches for Alexander County

Ice Storm Hazard Areas - Burke County

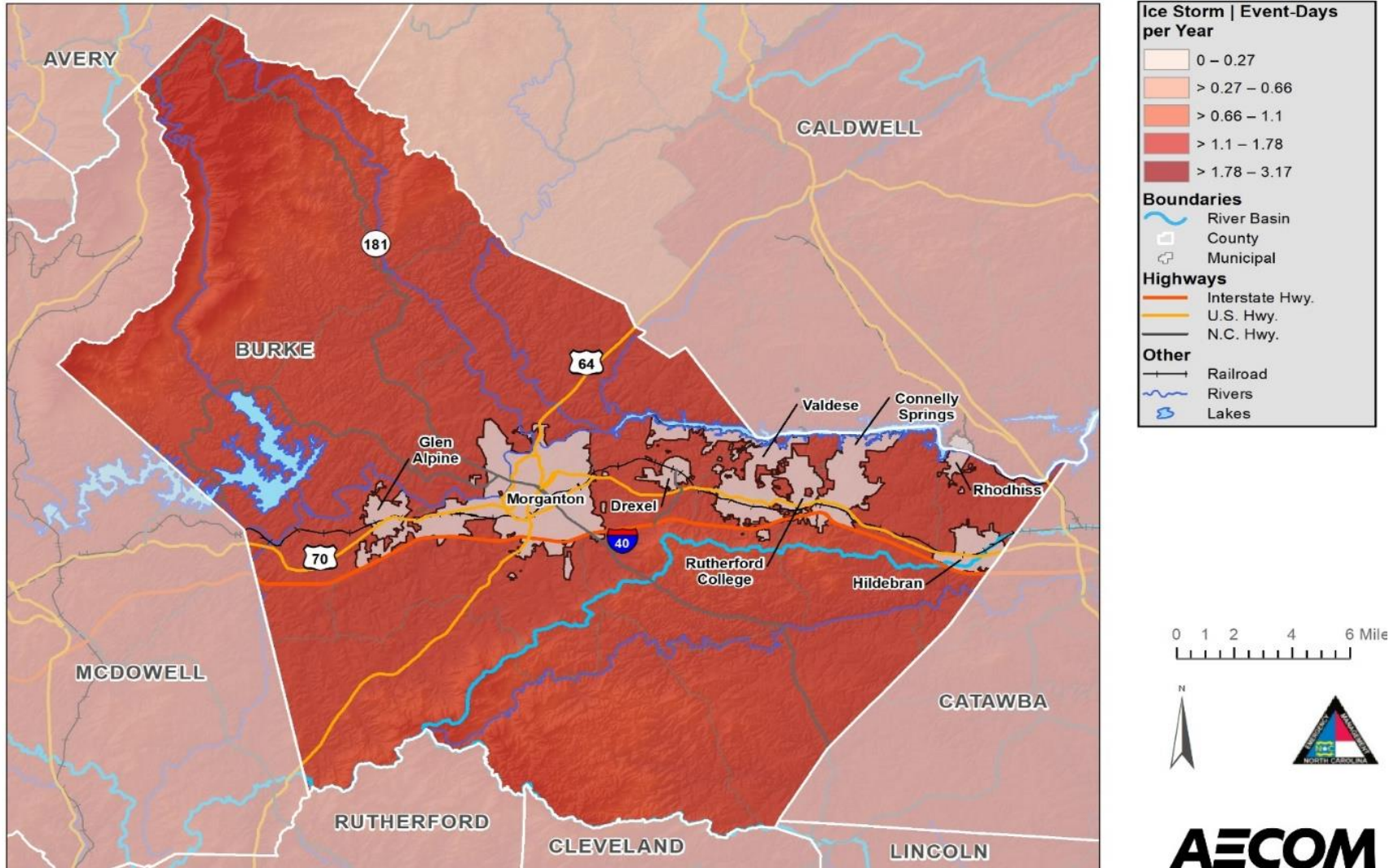


Figure 4-151: Ice Hazard Areas with Average Annual Accumulation in inches for Burke County

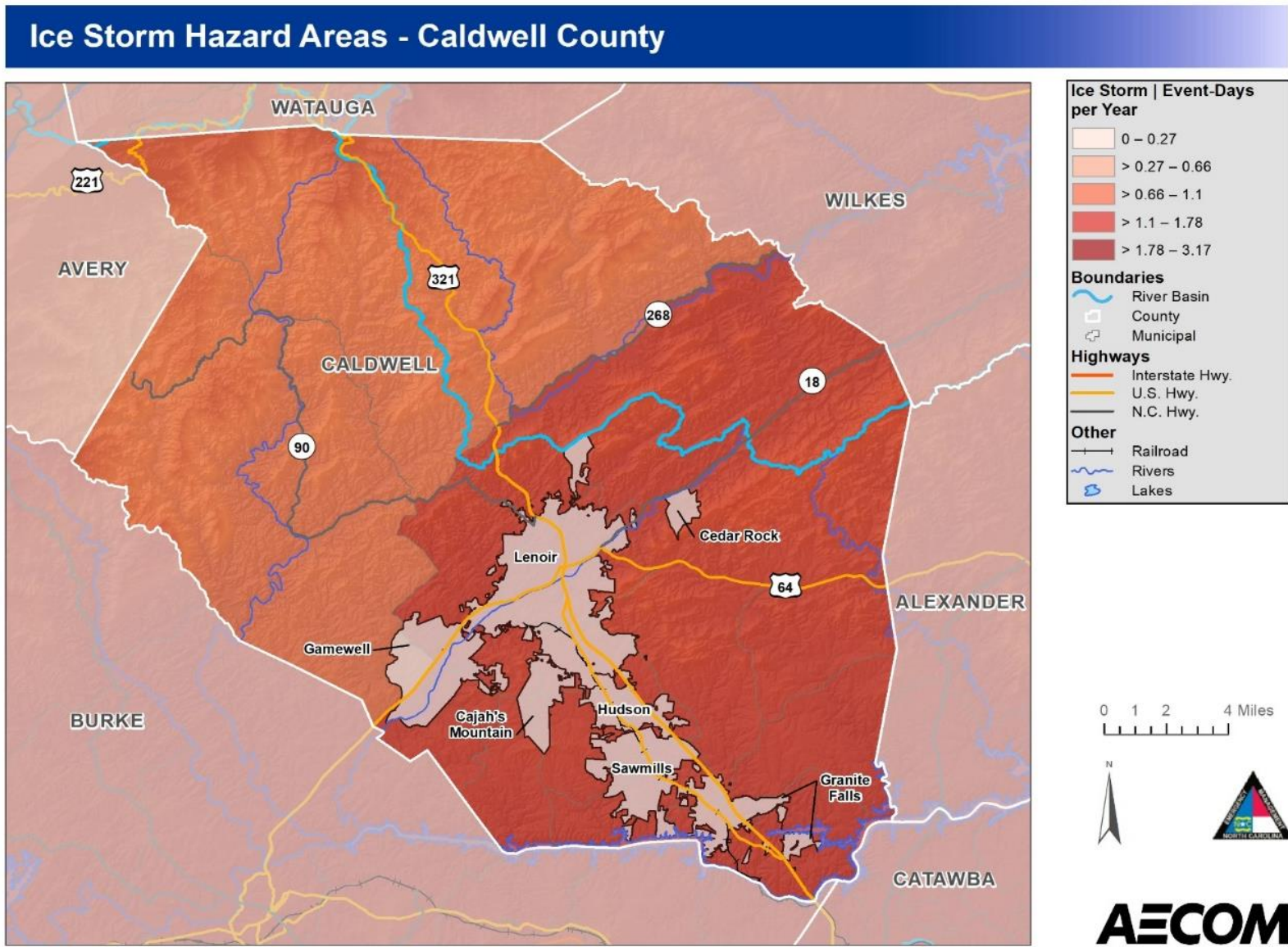


Figure 4-152: Ice Hazard Areas with Average Annual Accumulation in inches for Caldwell County

Ice Storm Hazard Areas - Catawba County

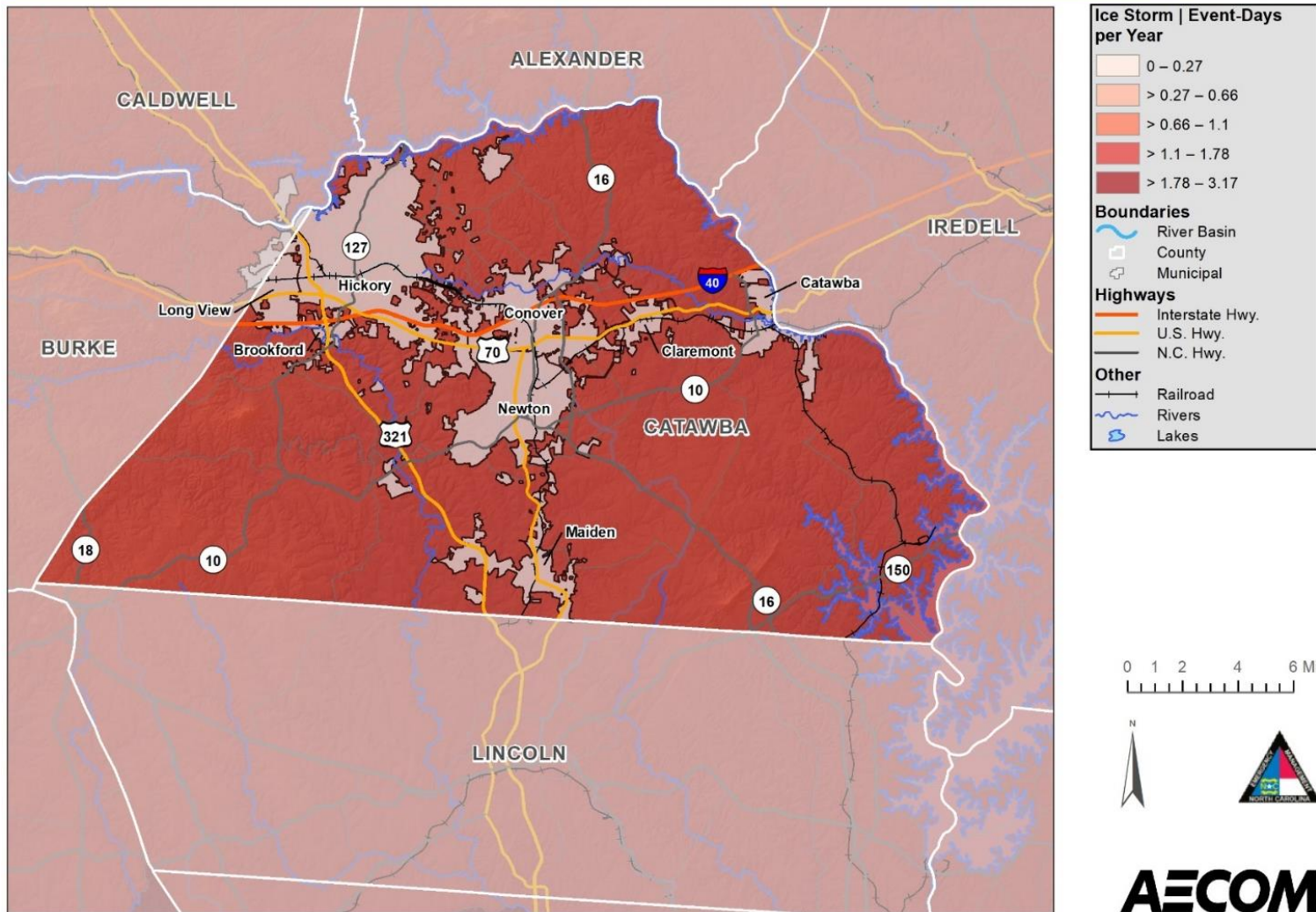


Figure 4-153: Ice Hazard Areas with Average Annual Accumulation in inches for Catawba County

4.5.13.3. *Extent (Magnitude and Severity)*

Severity of ice storms can be measured by the accumulation amount of ice received in inches.

Extent Event:

The highest recorded event for the planning area was in all four counties (Alexander, Burke, Caldwell, Catawba) and the 24 cities (Taylorsville, Connelly Springs, Drexel, Glen Alpine, Hildebran, Rhodhiss, Morganton, Rutherford College, Valdese, Cahah's Mountain, Cedar Rock, Gamewell, Granite Falls, Hudson, Lenoir, Sawmills, Brookford, Catawba, Claremont, Conover, Hickory, Longview, Maiden, Newton) in December 2002. The planning area received 3-4 inches of snow then transitioned into sleet and freezing rain accumulating 1/4-1/2 inches of ice.

4.5.13.4. *Historical Occurrences*

The following historical occurrences ranging from 1996 to the present have been identified based on the NCDL Storm Events database. NCDL presents winter weather hazards under multiple subcategories. The table below shows occurrences of winter weather events, frost/freezes, ice storms and sleet. Because winter weather affects a large geographic area, this information is processed by NCDL in forecast "zones," and therefore a municipal-level breakdown is not provided. Similarly, it is important to note that many of the events shown for one county are the same events that are counted for one of the other four counties in the planning area. For these reasons, totals are not provided in the table for the Unifour area as some double counting would be inherent in the numbers. Also, only those historical occurrences listed in the NCDL database are shown here and other smaller, unrecorded, or unreported events may have occurred within the planning area during this timeframe.

The following are summaries from the NCDL Storm Events Database episode narratives and are the only reported events of Ice Storms between 2018 and 2023:

Burke and Caldwell County (11/14/2018)

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. While most areas saw around a tenth of an inch or less of ice accretion, damaging ice accumulations were reported across the high elevations of Caldwell and Burke Counties, as well as eastern portions of Avery County.

Burke and Caldwell County (11/24/2018)

For the second time in 10 days, a freezing rain event developed across portions of the mountains and foothills of North Carolina. Precipitation developed during the overnight, as a wave of low pressure moved along the Gulf Coast. Precipitation began as rain and snow but transitioned to freezing rain across all but the highest elevations (where more of a wintry mix was reported), as a wedge of cold air locked in near the Blue Ridge. As freezing rain continued through daybreak, damaging accumulations of ice, generally between one quarter and one-half

inch were reported across the area. Quite a few trees and power lines, along with numerous power outages were reported across the area.

Alexander, Burke, Caldwell, and Catawba County (1/12/2019)

Moist air flowing over a wedge of cold air banked against the eastern slopes of the Appalachians resulted in precipitation development across the Blue Ridge and surrounding areas beginning during the evening of the 12th. The atmosphere quickly cooled to or below freezing near the escarpment and out across the lower elevations of the foothills and far northwest Piedmont. This resulted in much of the precipitation falling as freezing rain in these areas. The freezing rain continued through the overnight across the Blue Ridge and surrounding areas before tapering off around daybreak on the 13th. Total ice accretion of one quarter to one half inch was reported, with the heaviest amounts being across the foothills and immediately along the Blue Ridge escarpment. Scattered downed trees and power outages were reported throughout the area.

Burke and Caldwell County (2/17/2021)

Moisture and precipitation overspread the western North Carolina 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 trapped along the eastern Blue Ridge escarpment to allow much of this precipitation to fall as freezing rain. By the time the precipitation tapered off during the morning of the 18th, total ice accretion was around one quarter inch, although spotty amounts closer to one half inch were reported. Due to warm road temperatures, accretion was primarily limited to elevated surfaces and limited travel difficulties.

4.5.13.5. Probability of Future Occurrences

To utilize NRI Risk Values, EAL, Historic Losses, and other related data, the NRI Data for the counties below reflect the Winter Weather Risk Data because it represents snow, ice, and winter storms. Therefore, the risks below in Table 4-71 represent the NRI EAL, Risk Index Values, Expected Frequency, and Historic Loss Ratio for Winter Weather Events, as defined by the NRI.

Table 4-71: NRI Ice Storm Risk Index, EAL, Frequency, and Historic Loss Ratio

County		Alexander	Catawba	Burke	Caldwell
EAL	Value	\$612,000	\$2,000,000	\$1,400,00	\$1,300,000
	Rating	Relatively High	Very High	Very High	Relatively High
Risk Index	Score	92	98.2	97.2	96.4
	Rating	Relatively High	Very High	Very High	Very High
Frequency (Events per Year)		1.4	1.7	1.5	1.1
Historic Loss Ratio		Relatively Moderate	Relatively Low	Relatively Moderate	Relatively Moderate

The probability of future Ice is shown in the table below, by jurisdiction, according to the RMT iRisk.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-72: Probability of Future Ice Hazards according to RMT iRisk

Jurisdiction	Probability of Future Occurrence
Alexander County (Unincorporated Area)	Medium
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	Medium
Catawba County (Unincorporated Area)	Medium
City of Claremont	Medium
City of Conover	Medium
City of Hickory	Medium
City of Lenoir	Medium
City of Morganton	Medium
City of Newton	Medium
Town of Brookford	Medium
Town of Cahah's Mountain	Medium
Town of Catawba	Medium
Town of Connelly Springs	Medium
Town of Drexel	Medium
Town of Gamewell	Medium
Town of Glen Alpine	Medium
Town of Granite Falls	Medium
Town of Hildebran	Medium
Town of Hudson	Medium
Town of Long View	Medium
Town of Maiden	Medium
Town of Rhodhiss	Medium
Town of Rutherford College	Medium
Town of Sawmills	Medium
Town of Taylorsville	Medium
Town of Valdese	Medium

Jurisdiction	Probability of Future Occurrence
Village of Cedar Rock	Medium

4.5.13.6. Ice Hazard Vulnerability

A qualitative factor in terms of vulnerability is a general lack of awareness on the part of county residents in preparing for and responding to winter storm conditions, such as ice in a manner that will minimize the danger to themselves and others. This lack of awareness is especially apparent when driving/roadway conditions catch motorists off-guard. Potential losses associated with winter storms, such as ice include the cost of the removal of ice from roadways, debris clean-up, and some indirect losses from power outages, etc. All future structures and infrastructure in the region will be vulnerable to winter storms.

4.5.13.7. Future Vulnerability: Problem Statement

People

Ice hazards can impact residents, as they often cause increased road hazards and transportation accidents associated with icy roads or reduced visibility. Ice hazards can also cause power outages which can create potentially deadly impacts for individuals who have no alternative way to heat their homes for extended periods of time, and the danger arises when improper ventilation from kerosene heaters, blocked chimneys, and furnaces can release carbon monoxide which, if not properly ventilated, can cause carbon monoxide poisoning and death. The largest percentage of hypothermia victims are elderly individuals, which account for 20.4% of Alexander County, 21.0% of Burke County, 20.7% of Caldwell County, and 18.3% of Catawba County's total population (see Table 4-7).

This can also disproportionately impact those without adequate telephone service in their housing units (Alexander County at 1.3%, Burke County at 1.1%, Caldwell County at 1.6%, and Catawba County at 1.3% of the total population) who have limited ability to contact emergency services for assistance in the event of prolonged power outages or other hazards which may arise due to ice hazards. In order to prevent vulnerabilities to ice hazards, jurisdictions in the planning area should consider the following mitigation actions:

- Conduct periodic review of flooding risk of vulnerable populations to address projected increases in population and development and appropriately prepare for ice hazards in those areas.
- Implement public health initiatives that educate residents about the risks of improperly ventilated heaters and hypothermia in the event of power outages resulting from ice hazards.

Changes in Development or Housing Characteristics

Although each county in the planning area aims to increase housing units and development, the risk of ice hazards should not increase because of this change.

Economy

The planning area may be adversely affected by ice hazards due to damages, disruptions of power, and limited transportation capabilities. But some businesses may be impacted disproportionately depending on the length of disruption of power, limited transportation capabilities, and other factors which may prevent continuing day to day functions.

The NRI reports that the Expected Annual Loss due to ice storms are \$612,000 in Alexander County, \$2,000,000 in Catawba County, \$1,400,00 in Burke County, and \$1,300,000 in Caldwell County. According to the NRI, the planning area is at a relatively high risk of experiencing ice storms in Alexander County compared to similar counties, with an estimated number of ice storms per year at 1.4. The reports that the other counties in the planning area are very high risk of experiencing ice storms, with 1.7 events in Catawba County, 1.5 Events in Burke, and 1.1 events Caldwell County expected to occur per year. The economic impacts of ice storms could impact the local economy which may result in financial losses and disruption of day-to-day operations.

Natural Environment

The use of salt to clear ice and snow can lead to contaminated drinking water and contaminated freshwater ecosystems.

First Responders

Ice hazards may limit the ability of first responders to travel and to respond to emergencies. Ice hazards may also create adverse impacts for personnel who aren't properly trained to operate in winter storm conditions or who do not have the appropriate protection from cold conditions. To improve resilience of first responders in ice hazard events, the jurisdictions in the planning area should consider the following mitigation actions:

- Review emergency response procedures regularly to update responsibilities, areas of risk, and protocol for ice or winter weather events.
- Periodically review emergency response procedures in the event of impacted operations due to ice or winter weather hazards.

Continuity of Operation

Clearing ice- and snow-covered roads can create a challenge where main roads can be addressed first, while secondary roads can remain uncleared even after the snowstorm or winter weather event concludes.

4.5.13.8. Climate Change

The uncertainty associated with potentially changing climate conditions creates unpredictability for future severe winter storms including those that result in significant ice formation and accumulation. While it is generally assumed that rising global temperatures will result in shorter and warmer winters in many areas, warmer winters may mean that precipitation that would normally fall as snow may begin to fall as freezing rain instead.

The North Carolina Climate Science Report similarly states that there is considerable uncertainty about future changes in the number and severity of extratropical cyclones which cause winter storms, and consequently there is low confidence concerning future changes in the number of ice storms and incidents of freezing rain likely to occur.

4.5.14. Thunderstorm Wind

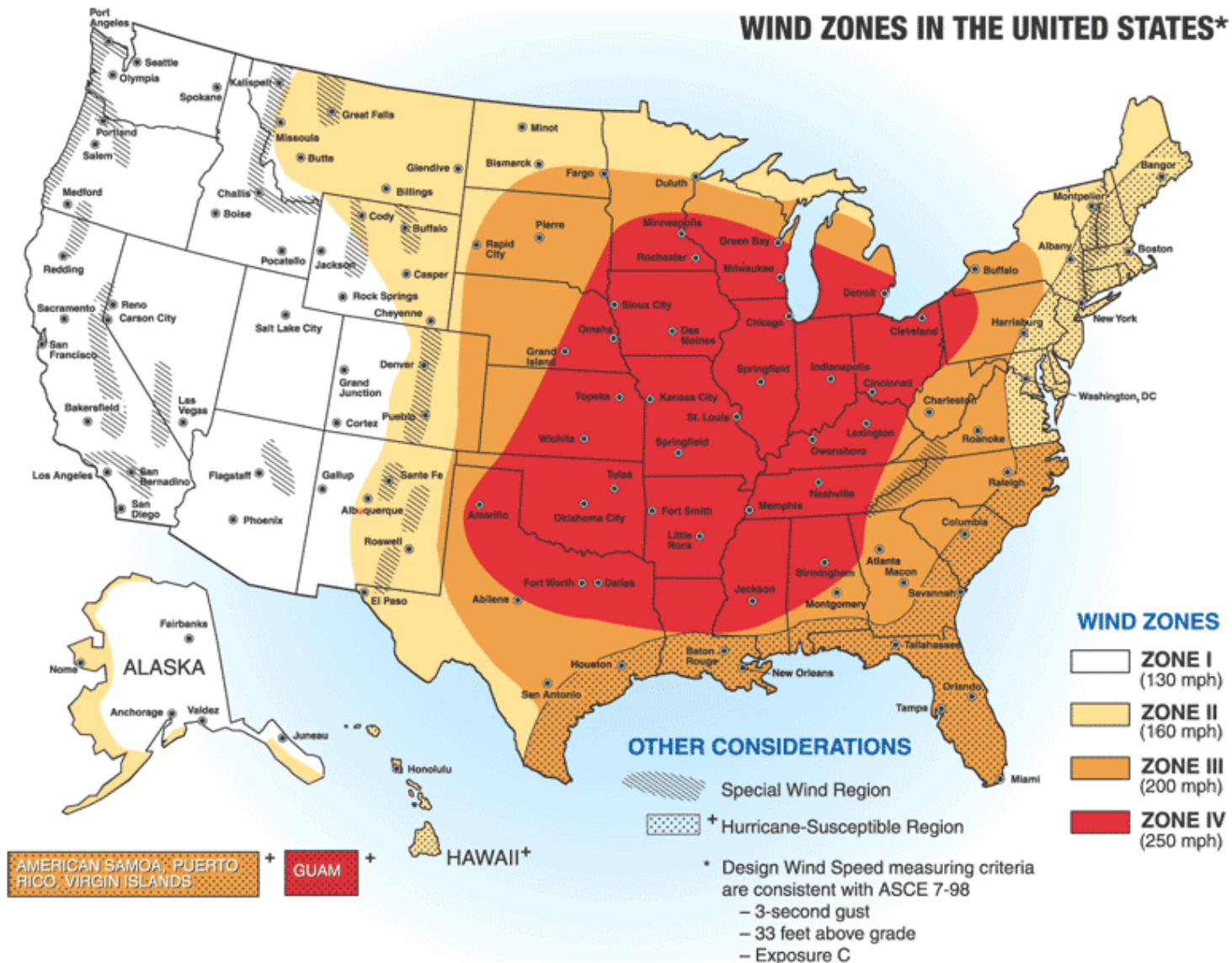
4.5.14.1. Thunderstorm Winds Hazard Analysis

Thunderstorms are caused when air masses of varying temperatures meet. Rapidly rising warm moist air serves as the “engine” for thunderstorms. These storms can occur singularly, in lines, or in clusters. 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% of these storms are classified as “severe.” Although thunderstorms generally affect a small area when they occur, they are very dangerous because of their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and damaging lightning. While thunderstorms can occur in all regions of the United States, they are most common in the central and southern states because atmospheric conditions in those regions are most ideal for generating these powerful storms.

4.5.14.2. Location within the Planning Area

Straight-line winds, which in extreme cases have the potential to cause wind gusts that exceed 100 miles per hour, are responsible for most thunderstorm wind damage. One type of straight-line wind, the downburst, can cause damage equivalent to a strong tornado and can be extremely dangerous to aviation. Figure 4-155 shows how the frequency and strength of extreme windstorms vary across the United States. The map was produced by the Federal Emergency Management Agency (FEMA) and is based on 40 years of tornado history and over 100 years of hurricane history. Zone IV, the darkest area on the map, has experienced both the greatest number of tornadoes and the strongest tornadoes. As shown by the map key, wind speeds in Zone IV can be as high as 250 MPH.

The National Weather Service collected data for thunder days, number and duration of thunder events, and lightning strike density for the 30-year period from 1948 to 1977. A series of maps was generated showing the annual average thunder event duration, the annual average number of thunder events, and the mean annual density of lightning strikes. The following maps represent the location of flash floods, lightning, and thunderstorm wind reports in the planning area. Figure 4-156 also illustrates the annual average number of severe thunderstorm warnings from 2004-2023.



Source: Federal Emergency Management Agency

Figure 4-154: Wind Zones in the United States

Thunderstorm Hazard Areas - Alexander County

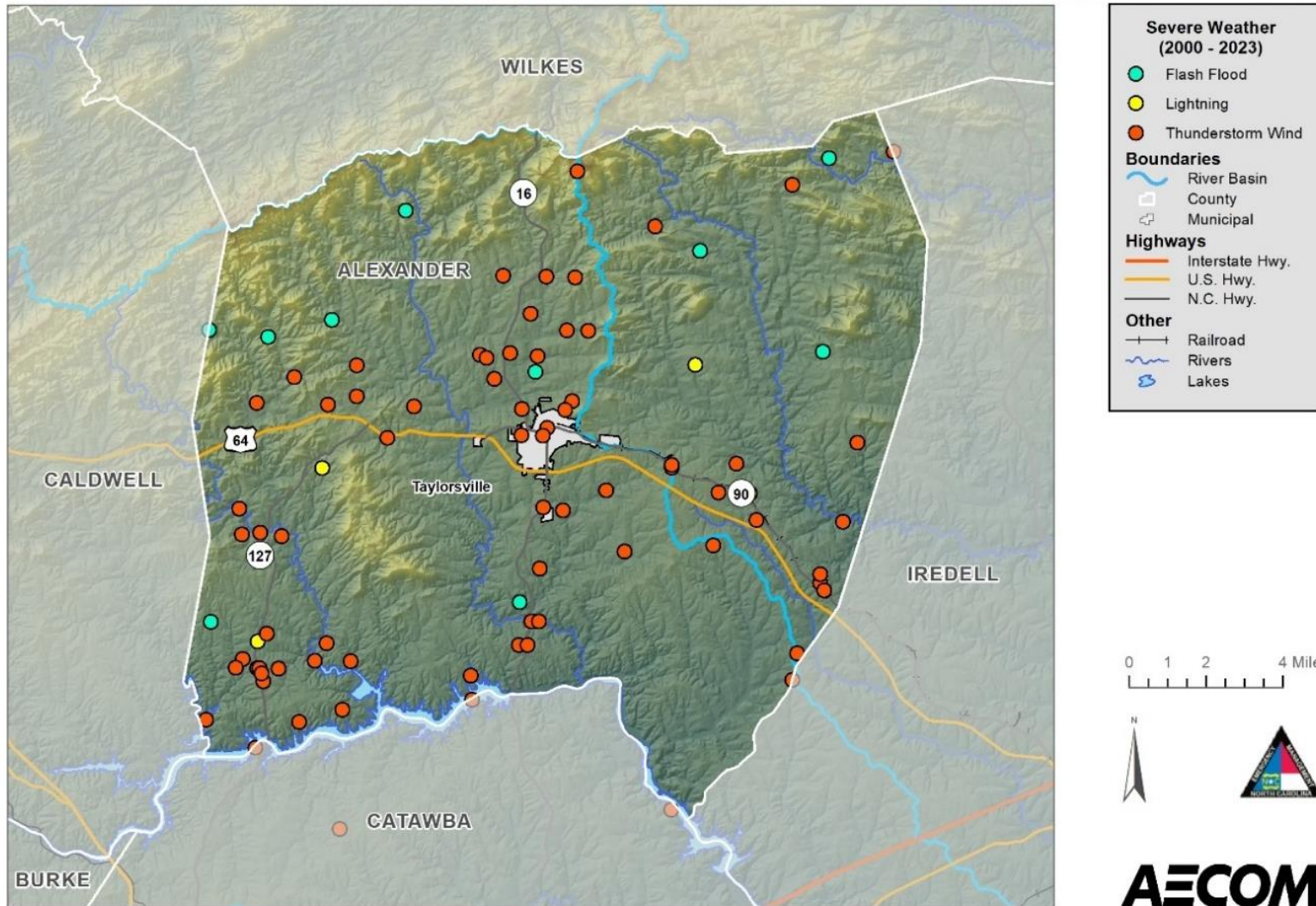
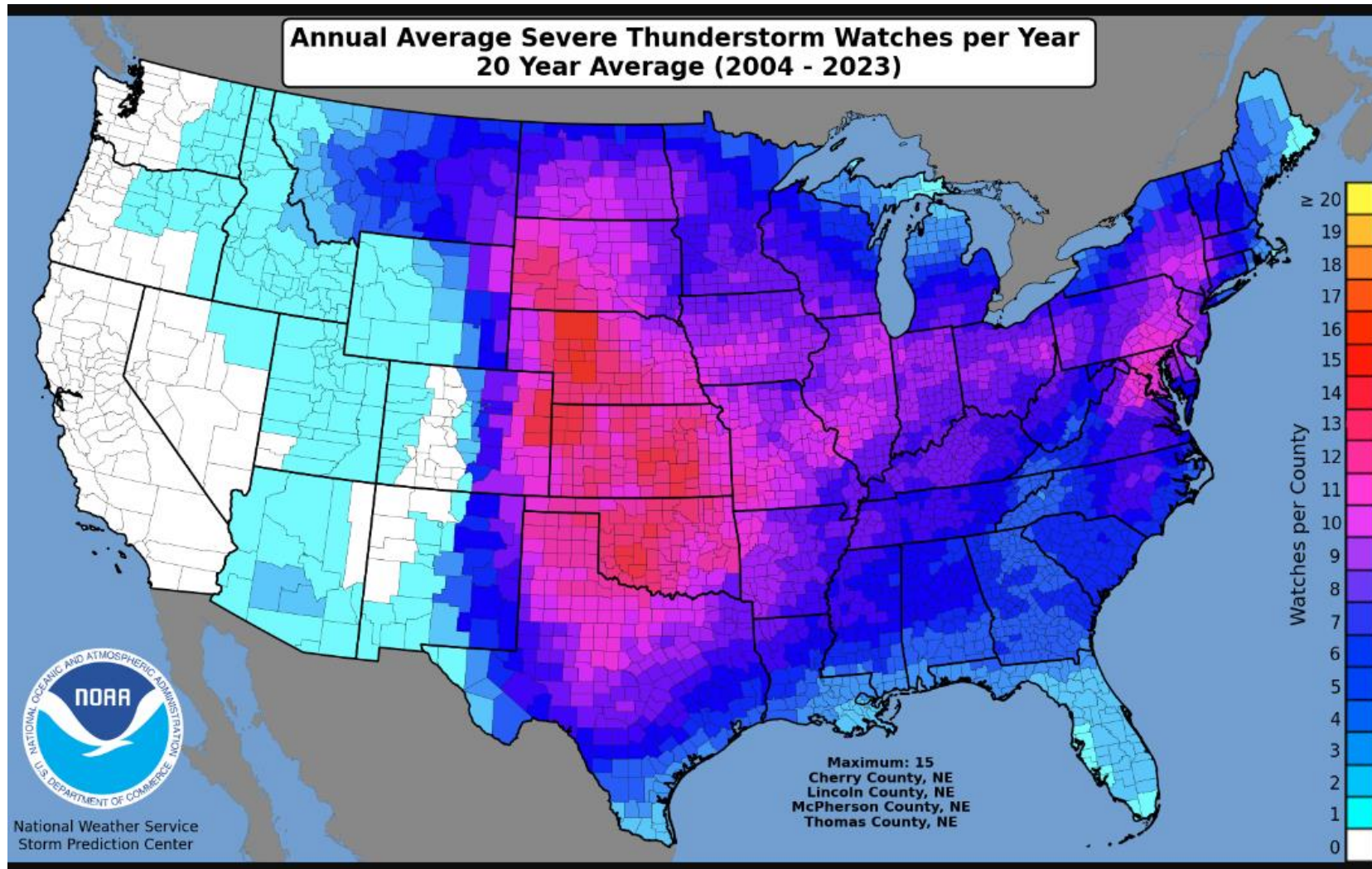


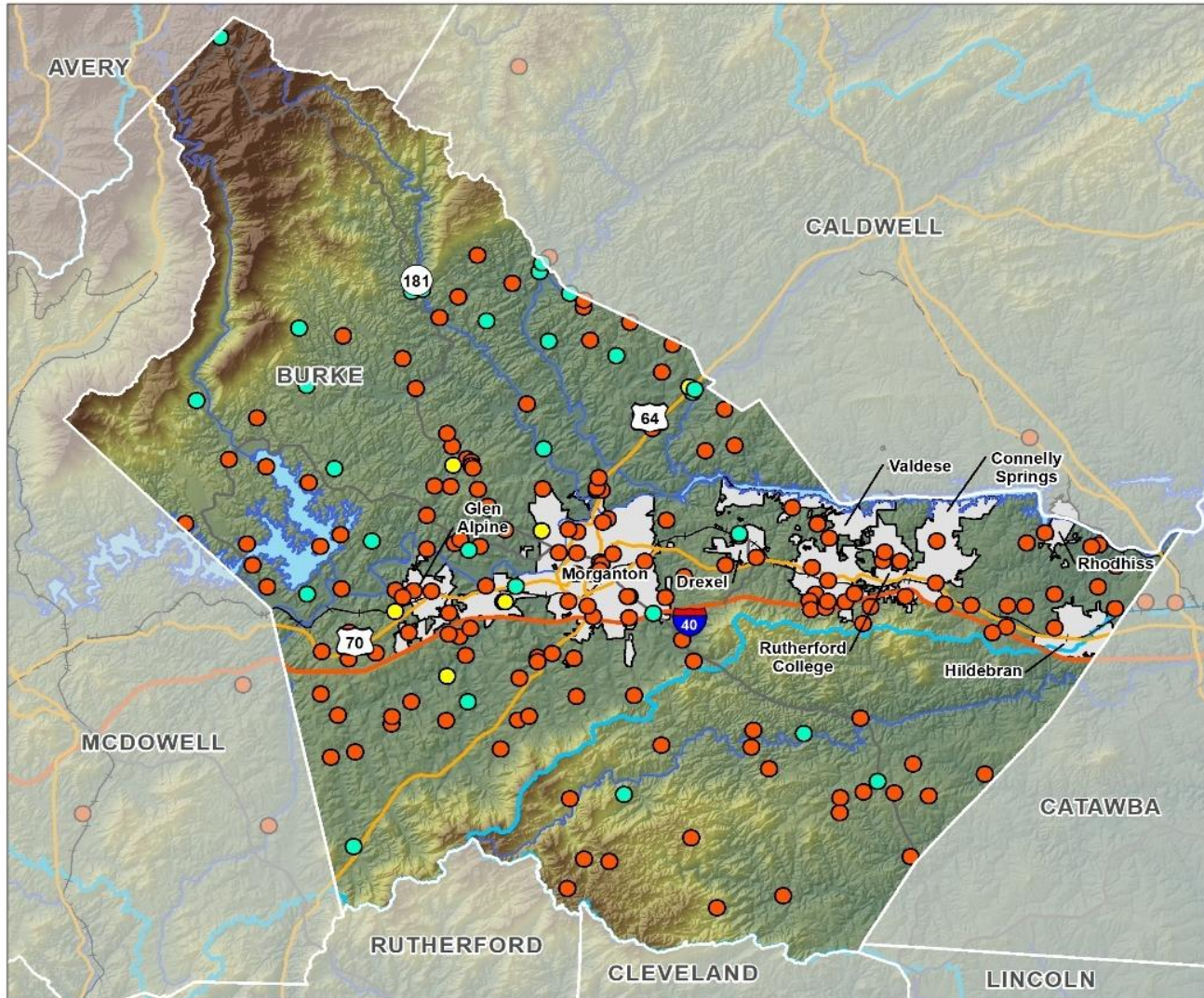
Figure 4-155: Thunderstorm Hazard Areas for Alexander County



Source: NOAA Severe Weather Maps, Graphics, and Data (<https://www.spc.noaa.gov/wcm/>)

Figure 4-156: Annual Average Number of Severe Thunderstorm Warnings (2004-2023)

Thunderstorm Hazard Areas - Burke County



Severe Weather (2000 - 2023)

- Flash Flood
- Lightning
- Thunderstorm Wind

Boundaries

- ~ River Basin
- County
- Municipal

Highways

- Interstate Hwy.
- U.S. Hwy.
- N.C. Hwy.

Other

- +— Railroad
- ~ Rivers
- ~ Lakes



Figure 4-157: Thunderstorm Hazard Areas for Burke County

Thunderstorm Hazard Areas - Caldwell County

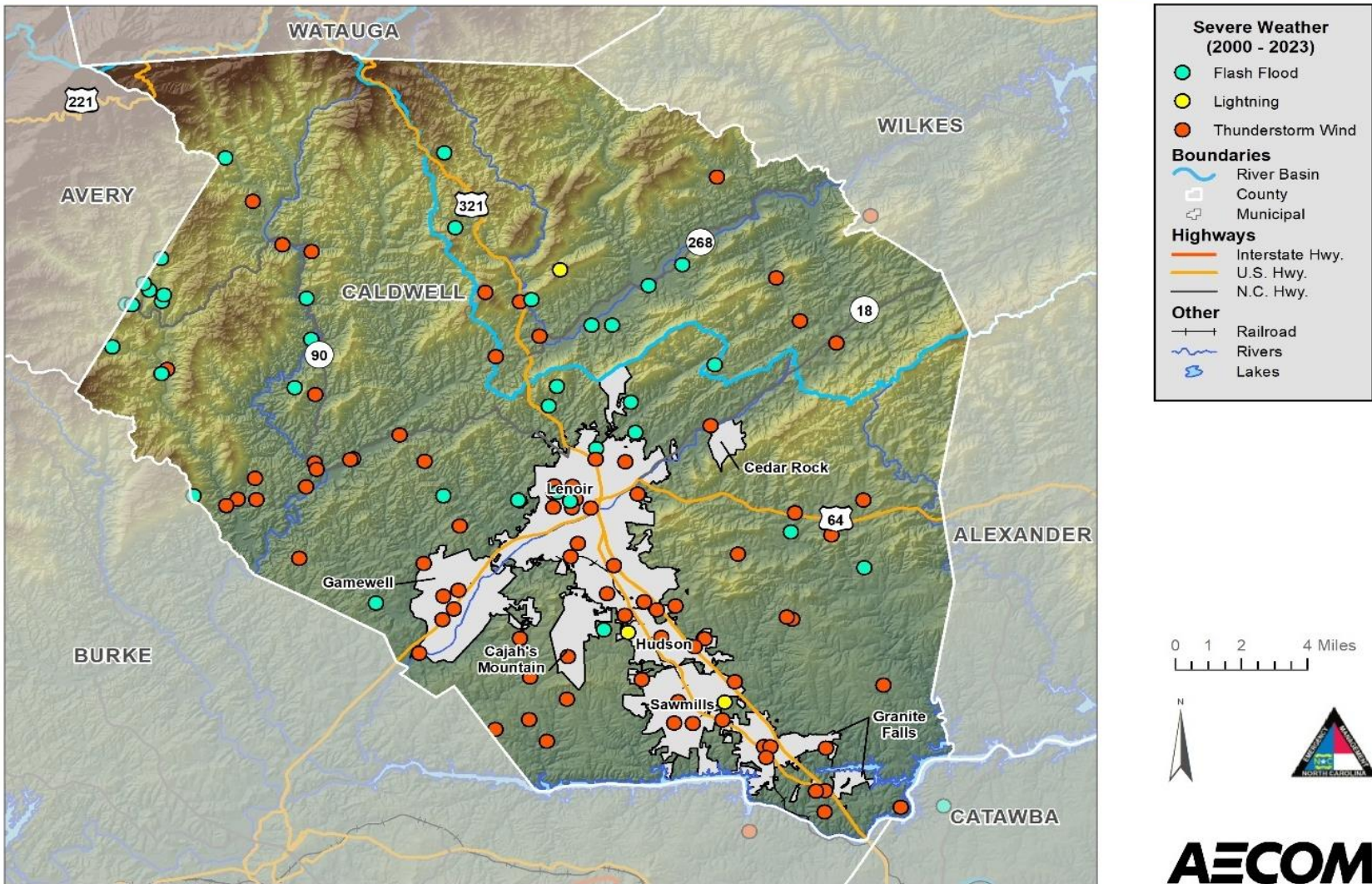


Figure 4-158: Thunderstorm Hazard Areas for Caldwell County

Thunderstorm Hazard Areas - Catawba County

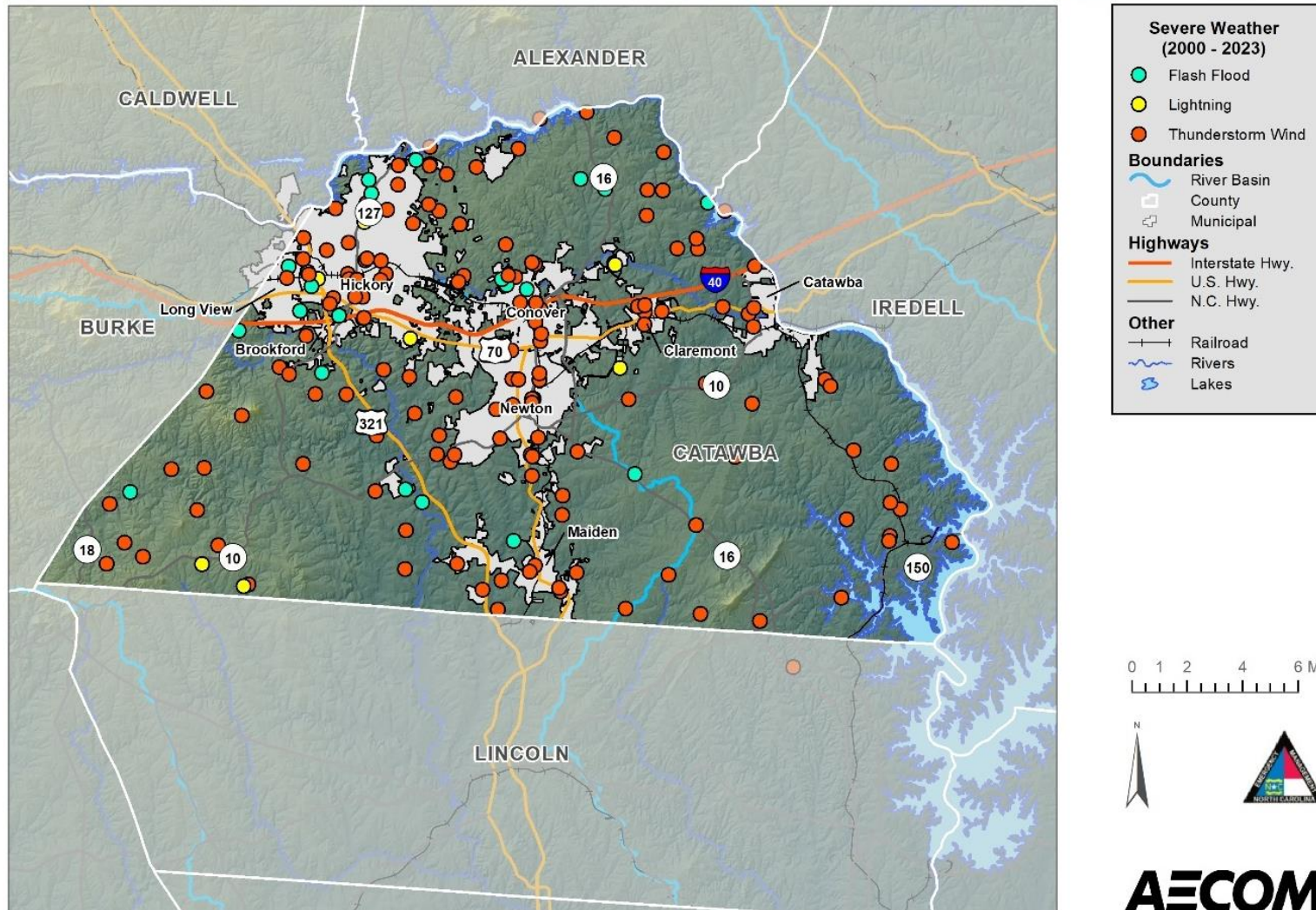


Figure 4-159: Thunderstorm Hazard Areas for Catawba County

4.5.14.3. Extent (Magnitude and Severity)

Thunderstorm extent is defined by the number of thunder events and wind speeds reported.

Extent Event:

Thunderstorms are known to be damaging hazard occurrences in the Unifour Region that can result in multiple injuries. There is currently no specific overall scale to rank the potential severity of severe events of this type, but it is assumed that the magnitude and severity of future occurrences will be like that of historical occurrences. The highest recorded thunderstorm winds in the planning area, according to NCDC Storm Events Database, were 75 knots reported in Rutherford College in Burke County in 1997.

4.5.14.4. Historical Occurrences

The following historical occurrences have been identified based on the NCDC Storm Events database as the most damaging events between 2018 and 2023, and all the episode and event narratives identified by the NCDC Storm Events database can be seen in Appendix A. It should be noted that only those historical occurrences listed in the NCDC database are shown here and that other, unrecorded, or unreported events may have occurred within the planning area during this time frame. It is important to note that many of the events attributed to the county are countywide or cover large portions of the county. The individual counts by jurisdiction are for those events that are only attributed to that one jurisdiction.

According to NCDC 641 recorded instances of Thunderstorm Winds conditions have affected the planning area causing an estimated \$3,193,000 in losses to property between 1955 and 2023, and one death and one 2 injuries reported between 2018 and 2023. The total reported property damage due to thunderstorm winds between A summary of all the accounts of thunderstorm winds between 2018 and 2023 from the NCDC database can be found in Appendix A along with the event narratives.

The following are summaries from the NCDC Storm Events Database of 10 of the most damaging reported thunderstorm wind events between 2018 and 2023 in terms of property damage and spatial extent:

Caldwell County (7/6/2018)

Deaths	1
Injuries	2
Property Damage	\$5,000

Scattered thunderstorms developed across the North Carolina mountains and foothills during the afternoon and moved into the western Piedmont by early evening. A few of the storms produced strong to damaging winds that caused tree damage, with one tree falling on a vehicle

north of Lenoir, killing one of the occupants. EM reported a large tree was blown down on a vehicle in Green Mountain Park killing a 78-year-old occupant and causing minor injuries to two others. A few other trees were blown down in Lenoir and areas just east of the city.

Alexander, Burke, Catawba, and Caldwell County (8/7/2023)

Numerous thunderstorms and storm clusters moved across western North Carolina throughout the afternoon. Many of these storms produced severe weather, mainly in the form of damaging wind gusts, some of which were long-lived. A couple of weak tornadoes also developed in the Piedmont, including a long-track EF1.

County	Location	Property Damage	Episode Narrative
Alexander	Bethlehem	\$50,000	Fire dept reported multiple trees and some power lines blown down, some blocking roads across southern Alexander County. Structural damage occurred to a couple of buildings, including a structure at Alexander County fairgrounds.
Burke	Hildebran	\$10,000	Public reported (via social media) a tree blown down on a home.
	Glen Alpine	\$2,000	County comms and spotter reported numerous trees and some power lines blown down from Glen Alpine across Morganton and vicinity. One tree fell on an outbuilding near Glen Alpine.
Caldwell	Hudson	0	Emergency manager reported a billboard blown over along Highway 321 near Hudson. Ham radio operator reported a tree blown down on power lines in Sawmills.
Catawba	Brookford	\$200,000	NWS storm survey found a swath of intense straight line wind damage across central Catawba County, from Mountain View and Hickory to Conover and Newton. Large numbers of trees were snapped and/or uprooted with numerous large tree branches downed. Several power poles were snapped, and a few structures were damaged, including a building at the Hickory American Legion Fairgrounds and a greenhouse that was destroyed.
	Maiden	0	Public reported (via social media) numerous trees and power lines blown down across Maiden and vicinity.
	Claremont	0	Public reported (via social media) trees blown down on I-40 in the Claremont area, and additional trees down on nearby Rock Barn Rd.
Total		\$262,000	

Alexander, Burke, Catawba, and Caldwell County (6/25/2018)

For the third day in a row, multiple thunderstorm clusters, some producing damaging winds moved from East Tennessee into western North Carolina during the afternoon into the evening. While severe weather was confined to the mountains on the 23rd and 24th, storms on the 25th also produced severe weather in the foothills and northwest Piedmont.

County	Location	Property Damage	Event Narrative
Alexander	All Healing Springs	0	Media reported multiple trees blown down on Mountain Ridge Church Road.
Burke	Table Rock	0	Spotter reported numerous trees and power lines blown down in western Burke County. Media reported numerous trees down in the Morganton area, especially along the Catawba River. At least one road was closed in Morganton due to falling trees. Additional sporadic tree damage was also reported outside of this corridor, including at Highway 18 and Antioch Rd near the Caldwell County line.
Caldwell	Gamewell	\$200,000	Multiple sources reported numerous trees blown down in the Gamewell area. Trees fell on and destroyed one house and severely damaged two others. Roads blocked by downed trees included Miller Hill Rd, Dulatown Rd, and Connelly Springs Rd in Granite Falls.
Catawba	Longview	0	Media reported trees blown down along Highway 321.
	Claremont	0	Broadcast media reported several trees blown down along River Bend Rd. Public also reported (via social media) reported numerous small trees blown down in the Catfish community.

Alexander and Burke County (7/6/2022)

Scattered thunderstorms and storm clusters developed over western North Carolina during the afternoon and evening. Several of the storms produced strong-to-damaging wind gusts.

County	Location	Property Damage	Event Narrative
Alexander	Bethlehem	0	Media reported trees blown down in Bethlehem and along Lake Hickory near Highway 16.
Burke	Burke Chapel	\$50,000	Public reported multiple trees blown down with one on a trailer, part of the roof removed from a house, and a destroyed barn on Buzz Lowman St. Media reported numerous trees blown down nearby on Old Laurel Rd and significant damage to the roof of a manufacturing building on Claude Britton Rd. Ham radio operator reported multiple large trees down on Highway 18.

Burke, Caldwell, and Catawba County (4/13/2020)

A strong storm system impacted the Southeast, resulting in an area of widespread heavy rain and embedded strong to severe thunderstorms that moved across western North Carolina during the late night and early morning hours. Localized flash flooding, some of which was quite significant developed across the mountains. Isolated severe weather also occurred, mainly in the form of damaging wind gusts. Strong southerly gradient winds also caused some damage across mainly the high elevations of western North Carolina.

County	Location	Property Damage	Event Narrative
Burke	Drexel	0	Media reported several trees blown down along John Berry Rd.
Caldwell	Gamewell	\$50,000	County comms reported trees blown down on Highway 18 in Gamewell. Spotter reported a large tree down on Connelly Springs Rd.
Catawba	Hickory	0	Public reported a tree and power line fell on a vehicle and structure in the Hickory area. Spotter reported multiple trees down along I-40 east of Hickory.

County	Location	Date	Property Damage	Event Narrative
Alexander	Bethlehem	8/13/2019	\$5,000	Amateur radio operator reported two trees blown down and blocking traffic near the intersection of Highway 127 and Telephone Exchange Rd. Spotter reported minor damage to a structure on Highway 127. Power lines were also blown down in the area.
Burke	Morganton	8/13/2019	0	Spotter reported trees blown down on Valley View St.
Catawba	Oyama	8/13/2019	0	County comms reported a tree blown down and blocking Snow Creek Rd NE and multiple trees and power lines down along Laurel Springs Dr, Lee Cline Rd, and County Home Rd.
	Bandy	8/13/2019	0	Public reported a tree and multiple large limbs blown down.

Alexander, Burke, Catawba, and Caldwell County (8/21/2019)

Widely scattered thunderstorms developed along the Blue Ridge during the afternoon and moved southeast. Several storms produced brief severe weather across the Piedmont, mainly in the form of damaging wind gusts.

Burke County (4/14/2019)

Numerous showers along with strong to severe thunderstorms developed across western North Carolina throughout the 14th in advance of a strong frontal system. Some of these storms produced areas of wind damage throughout the afternoon and evening.

Location	Date	Property Damage	Event Narrative
Morganton	4/14/2019	\$50,000	NWS storm survey reported numerous trees blown down throughout Morganton and vicinity, with several trees down on homes, including along West Fleming Dr, King St, and Antioch Rd.
Pleasant Grove Brke	4/14/2019	0	County comms reported multiple trees and power lines blown down on River Meadows Ln at the intersection Of River Rd.
Enola	4/14/2019	0	County comms reported multiple trees blown down near the intersection of Watershed Rd and Enola Rd.

Morganton, Burke County (7/27/2021)

Scattered thunderstorms and storm clusters developed across western North Carolina during the afternoon and early evening. A couple of the storms produced brief damaging wind gusts over the foothills. Spotter reported a tree blown down across on 3 cars and another tree on a house in the city of Morganton.

Reported Property Damage

\$30,000

Alexander and Catawba County (8/2/2020)

Scattered to numerous thunderstorms developed along a cold front across western North Carolina during the afternoon. A couple of the storms produced brief damaging winds across the northern foothills.

County	Location	Property Damages	Event Narrative
Alexander	Taylorsville Airport	\$20,000	Fire dept reported part of a chicken house destroyed and numerous trees and a few power lines blown down at the intersection of Sulfur Springs Rd and Hiddenite Church Rd.
Catawba	Oyama	0	Fire dept reported trees blown down at County Home Rd and Lee Cline Rd on Herman Sipe Rd and on 1st Ave Place NE.

Duan, Catawba County (6/16/2022)

Scattered thunderstorms developed over western North Carolina during the afternoon and moved southeast. Some of the storms organized into small clusters. Several of the clusters and individual cells produced large hail and damaging wind gusts. Public reported a large tree was blown down on a house along Highway 16 south of Newton.

Property Damage
\$10,000

Table 4-73: Summary of thunderstorm wind damages, deaths, injuries, and total injuries between 2018 and 2023 from the NCDC Storm Events Database

County	Total Event Reports	Property Damage	Total Deaths	Total Injuries
Alexander	15	\$120,000	0	0
Burke	59	\$157,000	0	0
Caldwell	18	\$221,000	1	2
Catawba	36	\$292,000	0	0

4.5.14.5. Probability of Future Occurrences

Based on the analyses performed in iRISK, the probability of future Thunderstorm Winds is shown in the table below, by jurisdiction.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less than 1% annual probability
- **Medium:** Between 1% and 10% annual probability
- **High:** Greater than 10% annual probability

Table 4-74: iRisk Probability of Future Thunderstorm Winds

Jurisdiction	iRISK Probability of Future Occurrence
Alexander County (Unincorporated Area)	Medium
Burke County (Unincorporated Area)	Medium
Caldwell County (Unincorporated Area)	Medium
Catawba County (Unincorporated Area)	Medium
City of Claremont	Medium
City of Conover	Medium
City of Hickory	Medium

Jurisdiction	iRISK Probability of Future Occurrence
City of Lenoir	Medium
City of Morganton	Medium
City of Newton	Medium
Town of Brookford	Medium
Town of Cajah's Mountain	Medium
Town of Catawba	Medium
Town of Connelly Springs	Medium
Town of Drexel	Medium
Town of Gamewell	Medium
Town of Glen Alpine	Medium
Town of Granite Falls	Medium
Town of Hildebran	Medium
Town of Hudson	Medium
Town of Long View	Medium
Town of Maiden	Medium
Town of Rhodhiss	Medium
Town of Rutherford College	Medium
Town of Sawmills	Medium
Town of Taylorsville	Medium
Town of Valdese	Medium
Village of Cedar Rock	Medium

4.5.14.6. *Thunderstorm Winds Hazard Vulnerability*

However, continued enforcement of building codes, flood damage prevention ordinances and other local regulatory tools and policies designed to mitigate the effects of high hazard winds is expected to minimize future losses as construction and planning continue to seek higher standards. Based on historical events the most significant local impacts for the Unifour Region regarding future events will likely be damage to trees (and the requisite management of vegetative debris) and widespread power outages to the area.

For more information about high loss properties, buildings, and population vulnerable to thunderstorm winds, see Appendix H with tables relevant to Thunderstorm Winds hazard vulnerability in the Unifour Regional HMP Area

4.5.14.7. Future Vulnerability: Problem Statements

People

Severe thunderstorm winds can cause property damage, injuries, or death. Severe thunderstorm winds can create disruptions in utilities, reduced ability for communication, injuries, potential fatalities, and property damages.

Some housing units are at an increased risk of damage from thunderstorm winds and in Alexander, Burke, Caldwell, and Catawba County the percentage of housing units that are mobile homes, boats, RVs, or vans were 25.9%, 20.4%, 17.1%, and 13.1% of the overall housing units in each county, respectively (See Table 3-5). This can also disproportionately impact those without adequate telephone service in their housing units (Alexander County at 1.3%, Burke County at 1.1%, Caldwell County at 1.6%, and Catawba County at 1.3% of the total population) who have limited ability to contact emergency services (See Table 3-5).

- Conduct periodic review of thunderstorm or severe storm risk of vulnerable populations to address projected increases in population and development and appropriately prepare for hazards in those areas.
- Evaluate and expand emergency response resources and capabilities to accommodate population growth, including additional shelters, supplies, and trained personnel.
- Collaborate with local nonprofits and community organizations to reach underserved populations with resources and information about severe weather and thunderstorm preparedness.
- Consider collaborating with telephone and internet utility providers to expand service to areas with limited telephone signal to ensure that individuals in hazard areas receive alerts of severe weather or thunderstorm hazards in a timely manner.

Changes in Development or Housing Characteristics

Increased growth and development should not have an impact on the thunderstorm wind risk throughout the planning area.

Economy

Economic damage may involve property damage of homes, businesses, buildings, and critical infrastructure which could negatively impact the planning area. This also includes interruption of business operations and additional living expenses for residents.

Natural Environment

The natural environment can be significantly impacted by wind, which has the potential to damage crops or vegetation. Wind can also damage or knock down trees which have the potential to bring down power lines and cause fires. Additional consequences are associated with other natural hazards that occur with thunderstorm events, which includes lightning that may start wildfires.

First Responders

During thunderstorms, there may be reduced capabilities to communicate and travel during emergencies. This would result from damaged or temporarily out of service transportation infrastructure, power outages, communication infrastructure damage, and blocked roads. Blocked roads, limited communication, possible damage to emergency response equipment, and loss of power may result in reduced ability to respond to emergency situations, such as fires started by downed power lines for example, may result in greater damage. To consider impacts to first responders in the planning area, the jurisdictions in the planning area should consider the following mitigation actions:

- Review emergency response procedures regularly to update responsibilities, areas of risk, and protocol for thunderstorm or severe weather events.
- Implement and maintain advanced severe weather or thunderstorm warning systems that utilize real-time data to alert communities of impending severe weather.

Continuity of Operation

Thunderstorm winds may cause downed trees, power outages, and related thunderstorm impacts may prevent continuity of operations. There may be impacts to day-to-day operations due to blocked roads, loss of power, and travel which may be limited due to road damage or debris. To prevent impacts to continuity of operations, the jurisdictions in the planning area should consider the following mitigation action:

- Schedule regular reviews and updates of COOP plans based on new risks, lessons learned from past thunderstorm or severe weather events, and changes in operations.

4.5.14.8. *Climate Change*

As reported by the North Carolina State Hazard Mitigation Plan, the National Aeronautics and Space Administration (NASA), predicts that thunderstorm events in the future are likely to become more frequent in the southeastern USA because of weather extremes. Thunderstorm potential is measured by an index that NASA created called the Convective Available Potential Energy (CAPE) index. This measures how warm and moist the air is, which is a major contributing factor in thunderstorm formation. NASA projects that by the period of 2072-2099 the CAPE in the Unifour Region will increase by 300-400J/kg, which places it in the area likely to experience the second greatest increase in CAPE in the United States. This indicates that there will potentially be even more frequent thunderstorms in the Unifour Region going forward.

The North Carolina Climate Science Report also suggests that the occurrence of severe thunderstorms will increase due to climate change throughout the State. Global climate models consistently project an increase in the frequency of severe thunderstorm events across the United States over the mid-to late 21st century. Based on the increased frequency of very high CAPE, increases in storm intensity are also projected for the Unifour Region over this same period.

4.5.15. 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 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.

An area's potential for erosion is determined by four factors: soil characteristics, vegetative cover, 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 help control erosion by shielding the soil surface from falling rain, absorbing water from the soil, and slowing the velocity of runoff. Runoff is also affected by the topography of the area including size, shape, and slope. The greater the slope length and gradient, the more potential an area has for erosion.

4.5.15.1. *Location within the Planning Area*

No data is currently available with which to map identified areas of erosion concern.

4.5.15.2. *Extent (Magnitude and Severity)*

The extent of erosion can be defined by the measurable rate of erosion that occurs over time for a specific land area.

4.5.15.3. *Extent Event:*

No data is currently available with which to determine magnitudes or severity of erosion hazard areas within the Unifour Region.

4.5.15.4. *Historical Occurrences*

No historical occurrences were identified in the planning area.

4.5.15.5. *Probability of Future Occurrences*

The probability of future Erosion is shown in the table below, by jurisdiction.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability

- **High:** More Than 10% Annual Probability

Jurisdiction	Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Low
Caldwell County (Unincorporated Area)	Low
Catawba County (Unincorporated Area)	Low
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Low
City of Morganton	Low
City of Newton	Low
Town of Brookford	Low
Town of Cahah's Mountain	Low
Town of Catawba	Low
Town of Connelly Springs	Low
Town of Drexel	Low
Town of Gamewell	Low
Town of Glen Alpine	Low
Town of Granite Falls	Low
Town of Hildebran	Low
Town of Hudson	Low
Town of Long View	Low
Town of Maiden	Low
Town of Rhodhiss	Low
Town of Rutherford College	Low
Town of Sawmills	Low
Town of Taylorsville	Low
Town of Valdese	Low
Village of Cedar Rock	Low

4.5.15.6. *Erosion Hazard Vulnerability*

Based upon a lack of historical events, relevant GIS data, and any immediate threat to life or property, a detailed vulnerability assessment has not been conducted for this hazard.

4.5.15.7. Future Vulnerability: Problem Statements

People

Erosion can lead to decreased agricultural productivity, ecosystem degradation, and leads to reduced ability to drain rainwater during flooding or rain events. Erosion can also lead to decreased water quality and availability of drinking water sources. Decreased agricultural productivity due to erosion related soil degradation could also increase the cost of food for residents who rely on agricultural operations within the planning area.

Changes in Development or Housing Characteristics

Increased development and expansion of infrastructure contribute to increased runoff, reduced rate of infiltration, and can accelerate soil erosion. Increased development also can lead to degraded ecosystems by increasing sedimentation, and removal of topsoil to make space for new construction. Jurisdictions in the planning area should consider the following mitigation actions:

- Consider restricting development in areas of increased threat of erosion.

Economy

Erosion can cause degraded soil quality which could lead to decreased agricultural productivity. This means that those who rely on agriculture may experience negative economic impacts due to reduced water availability, possible increased cost of water, and reduced soil productivity. It can also lead to decreased water quality and availability of water, which may lead to increased cost of utilities for residents in the planning area.

Erosion may also have negative economic impacts related to increased flooding caused by sediment buildup in storm drains. This could include the need for expanded stormwater control measures, adding strain on residents, businesses, and the governments by increasing the cost of infrastructure to address widescale or localized flooding.

Natural Environment

Erosion can lead to increased sedimentation (or turbidity), degraded soil quality, and desertification of land which impact ecosystems. Wind erosion can cause significant soil loss and increased sedimentation. Water erosion can occur over land or in streams and channels negatively impacts river and stream ecosystems by causing movement of the streambed and bank soils, and this also has the potential to negatively impact river and stream ecosystems by increasing pollution and sediment in waterways. Increased turbidity of waterways can also decrease oxygen levels in water and leads to degraded ecosystems. Additionally, increased sedimentation could decrease water supply and alter the hydrological properties of impacted ecosystems. To improve the resilience to erosion in the planning area, the jurisdictions should consider the following mitigation actions:

- Provide incentives for actions that improve soil quality and reduce the threats of erosion in the planning area such as stream restoration and habitat restoration.

First Responders

Erosion should not have a major impact on first responders or their operations, but decreased water supply may impact the water available to respond to wildfires or fires in the planning area.

Continuity of Operation

Erosion could lead to increased sedimentation, causing a buildup of sediment in storm drains and increased risk of flooding which would impact continuity of operations by reducing the ability to respond to emergencies, damaging infrastructure, damaging property, and damaging critical infrastructure.

4.5.15.8. *Climate Change*

Since erosion in this context is associated primarily with extreme runoff and flood events, and to a lesser extent extreme wind events, it is likely that the increasing frequency or intensity of these events as a result of climate change will cause greater erosion problems in the future. However, there is very little readily available information that could be used to evaluate in more detail any potential increase in the risk of erosion specifically in the Unifour Region.

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.

4.5.16. Sinkholes

There are three general types of sinkholes known to occur in North Carolina: geologic, debris-related, and infrastructure failure-related. Typical geologic sinkholes are related to the dissolving of limestone or other carbonate rocks by rainwater which has become slightly acidic from contact with either tannic acid from leaf litter or acids emitted from the burning of fossil fuels. This is the process of how caverns are formed. The surface water melts the carbonate as the water percolates downward. When a cavern is created, the thickness of the remaining carbonate continues to diminish until the weight of the cover rock exceeds the strength of the cover rock. The hole which is created can be circular or elongated.

The second type of sinkhole is one that is debris-related and is caused by the decomposition of building materials such as buried wood. Many times, a circular sinkhole develops along a newly paved or widened road, where a tree was cut down, but the root ball was never removed. When the root ball rots, the pavement collapses. The final type of sinkhole is one associated with the failure of buried infrastructure, such as pipes, culverts, or the settling of soil used to cover buried power lines, cables, water lines, or sewer lines.

In most cases, sinkholes associated with settling are from recently buried pipes or utility lines, where the cover material was not completely compacted and settled naturally over time. Significant infrastructure failure-related sinkholes are also caused by water (stormwater, potable water, or sewer) which carries soil and sediment from a crack, hole, or other point of failure in a pipe. The failure of a stormwater pipe can be dramatic because, during storm events when there are high water flows, there can be very rapid erosion of the soil and fill material used to cover buried pipes.

In addition to the sinkhole causes explained above, the only other category of ground collapse or land subsidence in North Carolina is from mine collapse but is not related to geological hazards.

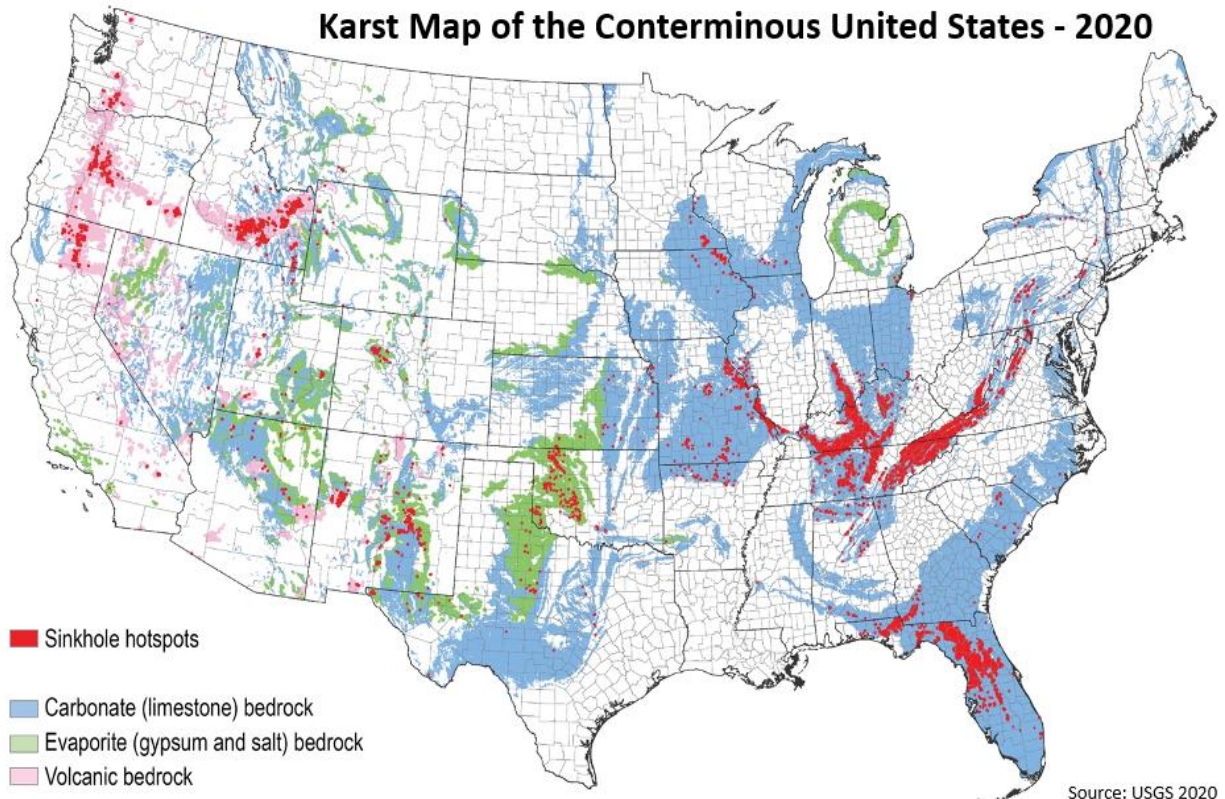


Figure 4-160: Karst Map of the United States

4.5.16.1. Location within the Planning Area

The geologic formations under Alexander, Burke, Caldwell, and Catawba counties are composed of igneous and metamorphic granitic rocks, which are not the types of rocks which can be dissolved by acidic water. Therefore, geologic sinkholes are not a significant concern for the planning area.

Sinkhole Hazard Areas - Catawba County

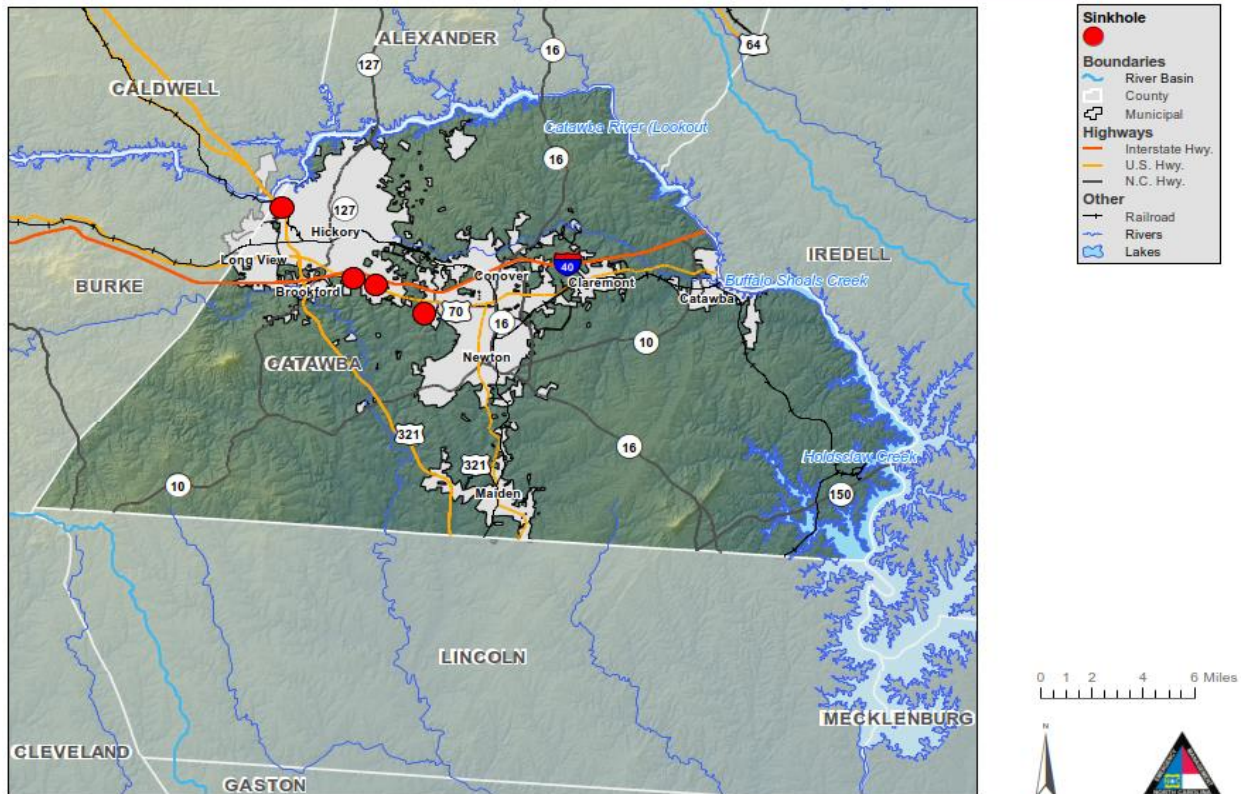


Figure 4-161: Sinkhole Hazard Areas in Catawba County

Debris and infrastructure-related sinkholes are dependent upon undocumented human activity, construction practices, and natural course of events and therefore no portions of the planning area can be specifically mapped as known sinkhole hazard areas. The maps below are known sinkhole locations in the planning area.

4.5.16.2. Extent (Magnitude and Severity)

The lengths of these natural conduits are often *measured* in feet for width and depth.

4.5.16.3. Extent Event:

Sinkholes are typically small, highly localized events that can have a varied magnitude and severity based on a wide range of site-specific variables. Since all historical data was provided by the HMPC no further information is available on the severity or depth of the previously occurred sinkholes.

Sinkhole Hazard Areas - Regional

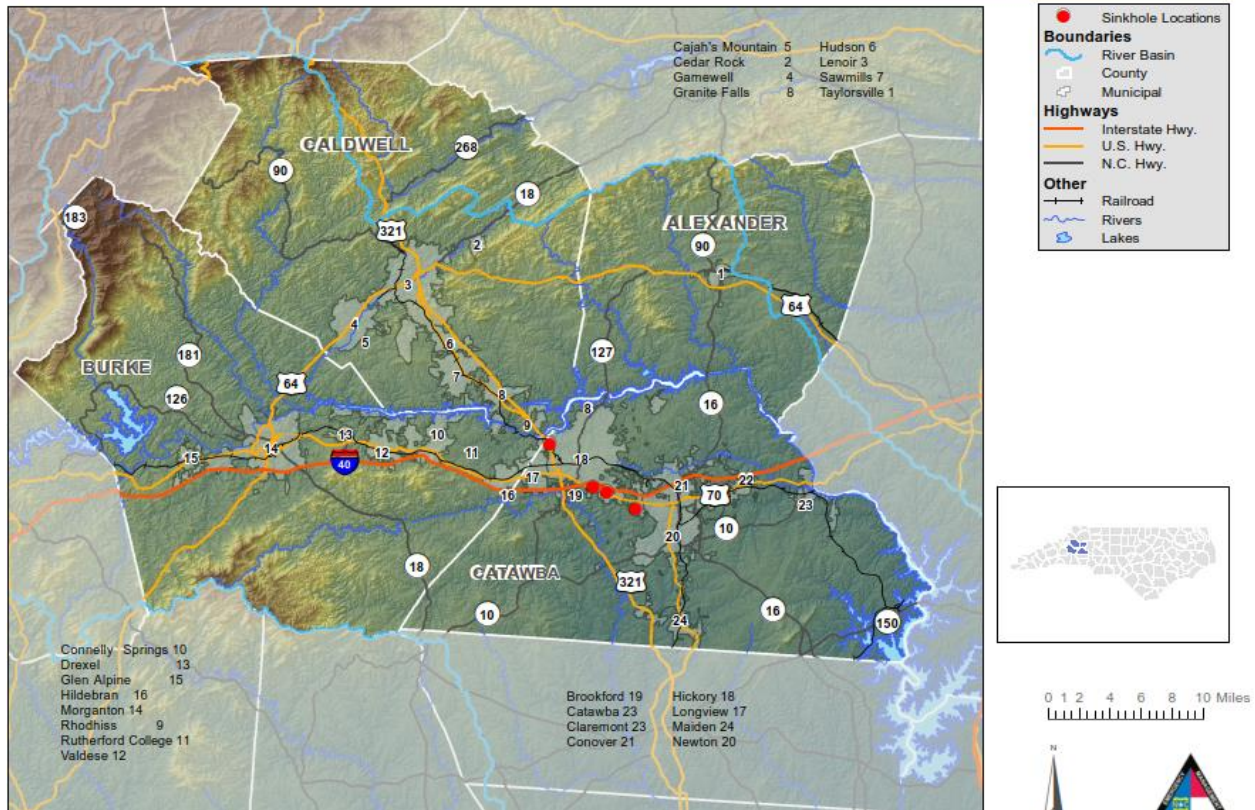


Figure 4-162: Sinkhole Hazard Areas

4.5.16.4. Historical Occurrences

There are only four occurrences in the planning area, all of which occur in Catawba County.

Table 4-75: Historical Occurrences of Sinkholes (2002 to 2024)

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Catawba								
City of Hickory	8/17/02		0	0	\$0	\$0	\$0	\$0
City of Hickory	7/1/05		0	0	\$0	\$0	\$0	\$0
City of Hickory	5/19/11		0	0	\$0	\$0	\$0	\$0
City of Hickory	7/30/13		0	0	\$0	\$0	\$0	\$0
Subtotal Catawba	4 Events		0	0	\$0	\$0	\$0	\$0
TOTAL PLAN	4 Events		0	0	\$0	\$0	\$0	\$0

Source: Catawba County Emergency Management.

Table 4-75 and Table 4-76 provide a summary of this historical information by participating jurisdiction. It is important to note that many of the events attributed to the county are countywide or cover large portions of the county. The individual counts by jurisdiction are for those events that are only attributed to that one jurisdiction.

Table 4-76: Summary of Historical Sinkholes Occurrences by Participating Jurisdiction. *Source: Catawba County Emergency Management*

Jurisdiction	Number of Occurrences	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Catawba							
City of Hickory	4	0	0	\$0	\$0	\$0	\$0
Subtotal Catawba	4	0	0	\$0	\$0	\$0	\$0
TOTAL PLAN	4	0	0	\$0	\$0	\$0	\$0

4.5.16.5. Probability of Future Occurrences

The probability of future Sinkholes is shown in the table below, by jurisdiction.

Definitions for Descriptors Used for Probability of Future Hazard Occurrences

- **Low:** Less Than 1% Annual Probability
- **Medium:** Between 1% And 10% Annual Probability
- **High:** More Than 10% Annual Probability

Table 4-77: iRisk Probability of future sinkholes.

Jurisdiction	Probability of Future Occurrence
Alexander County (Unincorporated Area)	Low
Burke County (Unincorporated Area)	Low
Caldwell County (Unincorporated Area)	Low
Catawba County (Unincorporated Area)	Low
City of Claremont	Low
City of Conover	Low
City of Hickory	Low
City of Lenoir	Low
City of Morganton	Low
City of Newton	Low
Town of Brookford	Low
Town of Cahah's Mountain	Low

Jurisdiction	Probability of Future Occurrence
Town of Catawba	Low
Town of Connelly Springs	Low
Town of Drexel	Low
Town of Gamewell	Low
Town of Glen Alpine	Low
Town of Granite Falls	Low
Town of Hildebran	Low
Town of Hudson	Low
Town of Long View	Low
Town of Maiden	Low
Town of Rhodhiss	Low
Town of Rutherford College	Low
Town of Sawmills	Low
Town of Taylorsville	Low
Town of Valdese	Low
Village of Cedar Rock	Low

4.5.16.6. Sinkhole Hazard Vulnerability

Due to what is assumed to be a relatively low probability of a sinkhole occurrence producing significant damages in the participating jurisdictions, as well as insufficient data and methodology to produce a region-wide assessment, a detailed vulnerability analysis was not conducted for this hazard.

4.5.16.7. Future Vulnerability: Problem Statement

People

There are no significant differences in sinkhole vulnerability throughout the planning area, but those in areas of development of infrastructure and construction may be vulnerable to sinkhole formation if there is failure of buried infrastructure such as pipes, culverts, or soil settling overpower, cable, water, or sewer lines.

Changes in Development or Housing Characteristics

Increased development may result in sinkhole formation if there is failure of buried infrastructure such as pipes, culverts, or soil settling overpower, cable, water, or sewer lines. As a result, areas that have an increase in underground infrastructure would have a higher potential for sinkholes to form. Additionally, in areas where decomposed building materials are not cleared before development, there could be a greater potential for sinkholes to occur.

Economy

Sinkholes could create negative economic impacts for those who have to repair damages associated with sinkhole formation. But there are no notable differences in economic impacts.

Natural Environment

There should be no notable vulnerability to sinkhole damages for the natural environment.

First Responders

There should be no notable differences in vulnerability to sink hole damages for first responders.

Continuity of Operation

If sinkholes appear near newly paved or widened road where the root ball of cleared trees weren't properly removed and are allowed to decompose a sinkhole may interfere with day-to-day operations by requiring road closures and repairs to roads, which may impact the ability for residents to travel throughout the surrounding areas.

4.5.16.8. Climate Change

Like landslides, sinkholes can be caused by heavy rains and flooding. An increase in the number and intensity of severe storms, and resulting heavy rains and flooding, may also result in sinkholes developing more frequently. Occurrence of sinkholes associated with the failure of drainage systems and other infrastructure will also be a likely consequence of the increased rainfall intensity associated with climate change. However, there is very little readily available information that could be used to evaluate in more detail any potential increase in the risk of sinkhole occurrence specifically in the Unifour Region.

4.6. Conclusions on Hazard Risk

Based on consensus of the Hazard Mitigation Planning Committee, in addition to the results presented in this Risk Assessment, the hazards addressed in this plan have been ranked according to the following prioritized list:

High Risk Hazards

- Flood
- Tornado
- Thunderstorm Wind
- Wildfire

Moderate Risk Hazards

- Snow
- Ice
- Sinkhole

- Dam Failure
- Hail
- Hurricane Winds

Low Risk Hazards

- Drought
- Erosion
- Landslide
- Levee Failure

4.6.1. NRI Summary

In addition to the results presented throughout this Risk Assessment, The Expected Annualized Losses (EAL) determined by FEMA's NRI is presented in Table 4-76 and summarized above further help substantiate the priority ranking stated here in these conclusions on hazard risk. The EAL Values are calculated by FEMA to represent the expected average economic loss in dollars from natural hazards each year with three consequence types: Buildings, People, and Agriculture. The EAL is calculated by the equation: Exposure X Annualized Frequency X Historic Loss Ratio, (Terms are defined in Table 4-4).

- **The Exposure Value** represents the natural consequence factor which represents the value of the three consequence types (People, buildings, and agriculture) that have the potential to be exposed to the natural hazard occurrence and was determined by exposure data which has the best accuracy and national data for each natural hazard.
- **The Annualized Frequency** is a natural hazard incidence factor which represents the probability of a natural hazard event occurring per year based on historical data. The Annualized Frequency is defined by the number of recorded events per year over the period of record or the modeled probability of a hazards occurrence each year.
- **The Historic Loss Ratio (HLR)** represents the estimated percentage of building value, population, or agriculture which are expected to be lost due to natural hazards. The Historic Loss Ratio is calculated by loss by consequence type documented for each hazard type from source data divided by the total value, by consequence type (People, Buildings, and Agriculture), estimated to be exposed to a natural hazard occurrence.

Please see the NRI Technical Documentation for more information about datasets, calculations, and methodology⁴⁹.

- In addition to the results presented throughout this Risk Assessment, the EAL in Table 4-78 with information about EAL calculations summarized above further help substantiate the priority ranking stated here in these conclusions on hazard risk. Certain

⁴⁹ Zuzak, C., Sheehan, A., Goodenough, E., McDougall, A., Stanton, C., McGuire, P., Mowrer, M., Roberts, B., & Rozelle, J. (2023). National Risk Index: Technical Documentation. In Federal Emergency Management Agency, FEMA.gov. Retrieved May 28, 2024, from https://www.fema.gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf

hazards (such as Hail, Ice, Snow, Thunderstorm Winds and Wildfire) occur very frequently, and are only summarized by total counts and total damages in each jurisdiction. Below are the summaries of Expected Annual Loss and Exposure Values in **Low**: Less Than 1% Annual Probability

- **Medium**: Between 1% And 10% Annual Probability
- **High**: More Than 10% Annual Probability

Table 4-77, EAL by consequence type in Table 4-76 and Expected Annual Frequency and Historic Loss Ratio in Table 4-78.

Table 4-78: NRI Expected Annual Loss and Exposure Values by Hazard Type for the Unifour Counties

Hazard	Expected Annual Loss							
	Alexander		Burke		Catawba		Caldwell	
	EAL	Exposure	EAL	Exposure	EAL	Exposure	EAL	Exposure
Cold Wave	\$0	\$0	\$11,000	\$14B	\$0	\$0	\$23,000	\$50B
Drought	\$140,000	\$9.3M	\$342,000	\$22M	\$379,000	\$24M	\$183,000	\$12M
Earthquake	\$145,000	\$429B	\$338,000	\$1T	\$1.1M	\$1.9T	\$407,000	\$951B
Hail	\$205,000	\$429B	\$224,000	\$1T	\$992,000	\$1.9T	\$198,000	\$950B
Heat Wave	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hurricane	\$430,000	\$429B	\$537,000	\$1T	\$1.9M	\$1.9T	\$555,000	\$950B
Ice Storm	\$612,000	\$429B	\$1.4M	\$1T	\$2M	\$1.9T	\$1.3M	\$950B
Landslide	\$22,000	\$146B	\$182,000	\$539B	\$150,000	\$691B	\$560,000	\$508B
Lightning	\$213,000	\$429B	\$726,000	\$1T	\$219,000	\$1.9T	\$461,000	\$950B
Riverine Flooding	\$37,000	\$2.3B	\$934,000	\$8.7B	\$541,000	\$13B	\$312,000	\$19B
Strong Wind	\$464,000	\$429B	\$411,000	\$1T	\$1.1M	\$1.9T	\$1M	\$950B
Tornado	\$872,000	\$429B	\$2.2M	\$1T	\$5.2M	\$1.9T	\$1.6M	\$950B
Wildfire	\$27,000	\$26B	\$64,000	\$34B	\$62,000	\$167B	\$76,000	\$39B
Winter Weather	\$24,000	\$429B	\$57,000	\$1T	\$95,000	\$1.9T	\$55,000	\$949B

Table 4-79: NRI EAL by Consequence or Components for the Unifour Counties

EAL Consequences or Components		Alexander	Burke	Catawba	Caldwell
Composite EAL		\$3,189,537.78	\$7,459,011.53	\$13,763,907.36	\$6,747,375.78
Total Building	EAL	\$1,727,076.44	\$4,308,976.54	\$9,086,511.01	\$4,106,089.49
	EAL Rate	\$1 per \$3.76K of building value	\$1 per \$3.17K of building value	\$1 per \$4.09K of building value	\$1 per \$3.68K of building value

EAL Consequences or Components		Alexander	Burke	Catawba	Caldwell
Population	EAL	0.09 Fatalities	0.21 Fatalities	0.36 Fatalities	0.19 Fatalities
	EAL Rate	1 per 421.81K people	1 per 420.38K people	1 per 450.72K people	1 per 416.27K people
	Equivalence EAL	\$1,002,030.40	\$2,415,382.34	\$4,130,966.33	\$2,245,633.35
Agriculture	EAL	\$460,430.95	\$734,652.65	\$546,430.03	\$395,652.94
	EAL Rate	\$1 per \$439.28 of Agriculture value	\$1 per \$127.19 of agriculture value	\$1 per \$162.22 of agriculture value	\$1 per \$139.32 of agriculture value

Table 4-80: NRI Expected Annual Frequency and Historic Loss Ratio Rating

Hazard	Expected Annual Loss							
	Alexander		Burke		Catawba		Caldwell	
	Frequency (Events Per Year)	Historic Loss Ratio	Frequency (Events Per Year)	Historic Loss Ratio	Frequency (Events Per Year)	Historic Loss Ratio	Frequency (Events Per Year)	Historic Loss Ratio
Cold Wave	0	No Rating	0	No Rating	0	No Rating	0.1	Relatively Low
Drought	31	Relatively Moderate	33.2	Relatively Moderate	32.1	Relatively Moderate	30.7	Relatively Moderate
Earthquake	0.046% Chance Per Year	Relatively Low	0.058% Chance per Year	Relatively Low	0.049% Chance per year	Relatively Moderate	0.054% Chance Per Year	Relatively Low
Hail	5.3	Relatively Low	5.5	Very Low	5.7	Relatively Low	5.1	Very Low
Heat Wave	0	No Rating	0	No Rating	0	No Rating	0	No Rating
Hurricane	0	Relatively Low	0	Relatively Low	0.1	Relatively Low	0	Relatively Low
Ice Storm	1.4	Relatively Moderate	1.5	Relatively Moderate	1.7	Relatively Low	1.1	Relatively Moderate
Landslide	0	Very Low	0	Very Low	0	Very Low	0.2	Very Low
Lightning	62.7	Relatively Moderate	54	Relatively Moderate	65.8	Very Low	57.1	Relatively Moderate
Riverine Flooding	0.4	Very Low	2	Relatively Low	1	Very Low	2.3	Very Low
Strong Wind	2.7	Relatively Low	2.6	Very Low	2.6	Relatively Low	2.8	Relatively Low
Tornado	0.14	Relatively Moderate	0.2	Relatively Moderate	0.2	Relatively Moderate	0.2	Relatively Low

Expected Annual Loss								
Hazard	Alexander		Burke		Catawba		Caldwell	
	Frequency (Events Per Year)	Historic Loss Ratio	Frequency (Events Per Year)	Historic Loss Ratio	Frequency (Events Per Year)	Historic Loss Ratio	Frequency (Events Per Year)	Historic Loss Ratio
Wildfire	0.016% Chance per Year	Relatively Low	0.034% Chance Per year	Relatively Low	0.007% Chance Per Year	Relatively Low	0.029% Chance per Year	Relatively Low
Winter Weather	2.4 Events Per Year	Relatively Low	2.7	Very Low	2.2	Relatively Low	2.8	Very Low

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Section 5. Capability Assessment

This section discusses the capability of the Plan Area to implement hazard mitigation activities. It consists of the following four subsections:

- 5.1 Overview
- 5.2 Conducting the Capability Assessment
- 5.3 Capability Assessment Findings
- 5.4 Conclusions on Local Capability

5.1. Overview

The purpose of conducting a *Capability Assessment* is to determine the ability of a local jurisdiction to implement a comprehensive *Mitigation Strategy*, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects. As in any planning process, it is important to try to establish which goals, objectives, and actions are feasible, based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A *Capability Assessment* helps to determine which mitigation actions are practical and likely to be implemented over time given a local government's planning and regulatory framework, level of administrative and technical support, 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, and programs already in place; and 2) an analysis of its capacity to carry them out. Careful examination of local capabilities will detect any existing gaps, shortfalls, or weaknesses with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. *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 Plan Area serves as a critical planning step and an integral part of the foundation for designing an effective *Mitigation Strategy*. Coupled with the *Risk Assessment*, the *Capability Assessment* helps identify and target meaningful mitigation actions for incorporation into the *Mitigation Strategy* portion of the Plan. It helps establish the goals and objectives for the Region to pursue under this Plan and ensures that those goals are realistically achievable under given local conditions.

5.2. Conducting the Capability Assessment

To facilitate the inventory and analysis of local government capabilities within the Plan counties, a detailed *Local Capability Assessment Survey* was distributed to members of the Hazard Mitigation Planning Committee (HMPC) at the second planning committee meeting. The survey questionnaire requested information on a variety of "capability indicators" such as existing local plans, policies, programs, or ordinances that contribute to and/or hinder the

Region's ability to implement hazard mitigation actions. Other indicators included information related to the Region's fiscal, administrative, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes, as well as any existing education and outreach programs that can be used to promote mitigation. Survey respondents were also asked to comment on the current political climate regarding hazard mitigation, an important consideration for local planning or decision-making.

At a minimum, the survey results provide an extensive and consolidated inventory of existing local plans, ordinances, programs, and resources in place or under development, in addition to their overall effect on hazard loss reduction. In completing the survey, local officials were also required to conduct a self-assessment of their jurisdiction's specific capabilities. The survey instrument thereby not only helps accurately assess the degree of local capability, but it also serves as a good source of introspection for counties and local jurisdictions that want to improve their capabilities as identified gaps, weaknesses, or conflicts can be recast as opportunities for specific actions to be proposed as part of the mitigation strategy.

Each jurisdiction was asked to rate their planning and regulatory, general planning, floodplain management, administrative and technical, fiscal, education and outreach, mitigation, political, and overall capabilities. The jurisdictions were also given the opportunity to provide details about their capabilities in terms of management plans which relate to their capabilities. These include hazard mitigation plans, comprehensive or general plans, disaster recovery plan, emergency operations plan, continuity of operations plans, capital improvement plans, historic preservation plan, zoning ordinances, subdivision ordinances, building codes, community rating system, floodplain management plans, open space management plans, and stormwater management plans. The capabilities assessments were used along with the completed mitigation actions to inventory the hazard mitigation capabilities of each jurisdiction to highlight their existing and ongoing capabilities along with areas of improvement.

The jurisdictions were also asked to rate their capabilities in terms of "High," "Moderate," or "Limited" for hazard mitigation in terms of overall hazard mitigation, planning and regulatory, general planning, floodplain management, administrative and technical, fiscal, education and outreach, mitigation, and political. Along with rating their capabilities for these categories, they were also given the opportunity to provide comments about their capability ratings. This allows the jurisdictions to think about the entire hazard mitigation planning process to get a sense of their overall hazard mitigation capabilities and are designed to provide nothing more than a general assessment of local government capability. In combination with the narrative responses provided by local officials, the results of this *Capability Assessment* provide critical information for developing an effective and meaningful mitigation strategy.

5.3. Capability Assessment Findings

The findings of the *Capability Assessment* are summarized in this Plan to provide insight into the relevant capacity of the Plan Area to implement hazard mitigation activities. All information is based on local government officials' input through the Local Capability Assessment Survey.

5.3.1. Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development, and redevelopment in a responsible manner, while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning, and transportation planning, in addition to 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 or programs in place or under development for the Plan Area, along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses, or conflicts with other initiatives and integrate the implementation of this Plan with existing planning mechanisms where appropriate.

Table 5-1 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for the Plan Area. 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 Hazard Mitigation Plan.

Element A4-a. Does the plan document what existing plans, studies, reports, and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?

Listed below are existing plans, studies, reports, and technical information reviewed for plan development and update. Relevant information such as hazard analysis, NFIP data, building codes, ordinances and communication procedures were incorporated into the mitigation plan via coordination with planning committee members.

Integration of Hazard Mitigation Plan into Community Planning Mechanisms

The successful implementation of the Hazard Mitigation Plan (HMP) relies on its seamless integration into existing community planning mechanisms, such as comprehensive plans, capital improvement plans, and other relevant frameworks. This integration ensures that hazard mitigation principles are embedded in the community's long-term development and decision-making processes.

D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?

Table 5-1: Review and Incorporation of Existing Plans, Studies, Reports, Ordinances, Technical Information and Programs

Jurisdiction	Hazard Mitigation Plan	Comprehensive Use Plan	Floodplain Management Plan	Open Space Management Plan	Stormwater Management Plan	Emergency Operations Plan	SARA Title III Plan	Radiological Emergency Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvement Plan	Economic Development Plan	Historic Preservation Plan	Transportation Plan	Flood Damage Prevention Ordinance	Flood Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Site Plan Review Requirements	Unified Development Ordinance	Post Disaster Redevelopment Ordinance	Building Code	Fire Code	Community Wildfire Protection Plan	National Flood Insurance Program
Alexander County	✓	✓	-	-	-	✓	✓	-	✓	-	✓	-	-	✓	✓	✓	-	✓	✓	✓	✓	-	✓	✓	-	✓
Town of Taylorsville	✓	✓	-	-	-	✓	✓	-	-	-	✓	✓	-	✓	✓	✓	-	✓	✓	✓	✓	-	✓	✓	-	✓
Burke County	✓	✓	✓	-	-	✓	-	-	-	-	-	✓	-	-	-	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
City of Morganton	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	✓	-	-	-	✓	✓	✓	✓	✓	-	-	✓	✓	-	✓
Town of Connelly Springs	✓	✓	✓	-	✓	-	-	-	-	-	-	-	-	-	-	✓	-	✓	✓	-	-	-	-	-	-	✓
Town of Drexel	✓	✓	✓	✓	-	✓	-	-	-	-	-	✓	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
Town of Glen Alpine	✓	✓	✓	-	✓	✓	-	✓	✓	-	-	-	-	-	-	✓	-	✓	✓	✓	-	-	✓	✓	✓	✓
Town of Hildebran	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓		✓
Town of Rutherford College	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓		✓
Town of Taylorsville	✓	✓	-	-	-	✓	✓	-	-	-	✓	✓	-	✓	✓	✓	-	✓	✓	✓	✓	-	✓	✓		✓

Section 5: Capability Assessment

Jurisdiction	Hazard Mitigation Plan	Comprehensive Use Plan	Floodplain Management Plan	Open Space Management Plan	Stormwater Management Plan	Emergency Operations Plan	SARA Title III Plan	Radiological Emergency Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvement Plan	Economic Development Plan	Historic Preservation Plan	Transportation Plan	Flood Damage Prevention Ordinance	Flood Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Site Plan Review Requirements	Unified Development Ordinance	Post Disaster Redevelopment Ordinance	Building Code	Fire Code	Community Wildfire Protection Plan	National Flood Insurance Program
Town of Valdese	✓	✓	✓	-	✓	✓	-	-	✓	-	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	✓
Catawba County	✓	✓	✓	-	-	✓	✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	✓
City of Claremont	✓	✓	-	-	-	✓	-	-	-	✓	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	✓
City of Conover	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-	✓	✓		✓	✓	✓	-	-	✓	✓	✓	✓
City of Hickory	✓	✓	✓		✓	✓	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓
City of Newton	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓	-	✓
Town of Brookford	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Town of Catawba	✓	✓	-	-	-	-	-	-	-	-	-	✓	✓	-	✓	✓		✓	✓	✓	-	-	-	-	-	✓
Town of Long View	✓	✓	✓	-	✓	✓	✓	-	✓	✓	-	✓	✓	-	-	✓	✓	✓	✓	✓	-	-	✓	✓	-	✓
Caldwell County	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	-	✓	✓	✓	-	-	✓	-	-	✓
City of Lenoir	✓	✓	-	-	✓	✓	✓	-	✓	-	-	✓	-	-	-	✓		✓	✓	✓	-	✓	✓	✓	-	✓

Jurisdiction	Hazard Mitigation Plan	Comprehensive Use Plan	Floodplain Management Plan	Open Space Management Plan	Stormwater Management Plan	Emergency Operations Plan	SARA Title III Plan	Radiological Emergency Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvement Plan	Economic Development Plan	Historic Preservation Plan	Transportation Plan	Flood Damage Prevention Ordinance	Flood Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Site Plan Review Requirements	Unified Development Ordinance	Post Disaster Redevelopment Ordinance	Building Code	Fire Code	Community Wildfire Protection Plan	National Flood Insurance Program
Town of Cahaj's Mountain	✓	✓	-	-	✓	✓	-	-	-	-	-	✓	-	-	✓	✓		✓	✓	-	-	-	✓	✓	-	✓
Town of Gamewell	✓	✓	✓	✓	✓	✓	-	-	-	-	-	✓	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
Town of Granite Falls	✓	✓	-	-	✓	✓	-	-	✓	-	-	✓	-	-	✓	✓		✓	✓	✓	-	-	✓	✓	-	✓
Town of Hudson	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓		✓	✓	✓	-	-	✓	✓	-	✓
Town of Rhodhiss	✓	✓	✓	✓	-	✓	-	-	-	-	-	✓	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
Town of Sawmills	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	✓	✓		✓	✓	✓	-	-	✓	✓	-	✓
Village of Cedar Rock	✓	✓	✓	-	-	-	-	-	-	-	-	✓	-	-	✓	✓	✓	✓		✓	-	-	✓	✓	-	✓

1. Comprehensive Plans: Each community will incorporate the goals, objectives, and actions of the HMP into their comprehensive plans. This will involve:

- **Review and Alignment:** Conducting a thorough review of the comprehensive plan to identify areas where hazard mitigation strategies can be integrated. This includes land use planning, zoning regulations, and environmental protection policies.
- **Stakeholder Engagement:** Engaging with stakeholders, including local government officials, community leaders, and residents, to ensure that the integration process reflects the community's needs and priorities.
- **Policy Updates:** Updating policies and ordinances to incorporate hazard mitigation measures, such as floodplain management, wildfire risk reduction, and earthquake-resistant building codes.

2. Capital Improvement Plans (CIPs): The integration of the HMP into CIPs will ensure that infrastructure investments consider hazard mitigation. This process includes:

- **Project Prioritization:** Prioritizing projects that address identified hazards, such as upgrading stormwater management systems, reinforcing critical infrastructure, and enhancing emergency response capabilities.
- **Funding Allocation:** Allocating funds for mitigation projects within the CIP, ensuring that resources are available for both immediate and long-term mitigation efforts.
- **Monitoring and Evaluation:** Establishing mechanisms to monitor and evaluate the effectiveness of mitigation projects, ensuring that they meet the intended goals and provide resilience against future hazards.

3. Other Planning Mechanisms: In addition to comprehensive plans and CIPs, the HMP will be integrated into other relevant planning mechanisms, such as:

- **Emergency Operations Plans (EOPs):** Ensuring that hazard mitigation strategies are included in emergency response and recovery plans, enhancing the community's preparedness and resilience.
- **Economic Development Plans:** Incorporating mitigation measures into economic development strategies to protect businesses and promote sustainable growth.
- **Environmental and Natural Resource Plans:** Aligning hazard mitigation with environmental conservation efforts, such as protecting wetlands and preserving open spaces that can serve as natural buffers against hazards.

4. Implementation and Coordination: To facilitate the integration process, a dedicated Hazard Mitigation Planning Committee (HMPC) will be established. The HMPC will:

- **Coordinate Efforts:** Work with various departments and agencies to ensure that mitigation strategies are consistently applied across all planning mechanisms.

- **Provide Training:** Offer training and resources to local officials and planners on incorporating hazard mitigation into their respective areas of responsibility.
- **Track Progress:** Develop a tracking system to monitor the integration process and report on progress to community leaders and stakeholders.

By integrating the requirements of the Hazard Mitigation Plan into comprehensive plans, capital improvement plans, and other planning mechanisms, communities will enhance their resilience to hazards and ensure a safer, more sustainable future.

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.

Each jurisdiction has access to the NRI and NOAA databases for planning purposes.

5.3.2. Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases are preparedness, response, and recovery. Each phase is interconnected with hazard mitigation, as Figure 5-1 suggests. Opportunities to reduce potential losses through mitigation practices are most often implemented before a disaster event, such as elevation of flood-prone structures or through the continuous enforcement of policies that prevent and regulate development that is vulnerable to hazards because of its location, design, or other characteristics. Mitigation opportunities can also be identified during immediate preparedness or response activities (such as installing storm shutters in advance of a hurricane), and in many instances during the long-term recovery and redevelopment process following a disaster event.



Figure 5-1: The Four Phases of Emergency Management

Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the **Local Capability Assessment Survey** asked several questions across a range of emergency management plans to assess the Area’s willingness to plan and their level of technical planning proficiency.

5.3.2.1. Updated Capabilities

Alexander County

- **Public Information and Warning Local Information Team (LIT) Community Alert System:** HyperReach notification platform has been implemented and the County continues to work with the local Information Team to increase the capabilities of the unified messaging system. This is maintained quarterly.
- **E-911 Center:** The County has constructed a E-911 Center that addresses new businesses and residences to add to the 911 address database. This is updated monthly or as needed to add new addresses as new construction projects obtain permits. This system addresses all the communities in Alexander County.
- **HyperReach:** The County has established HyperReach as their early warning system that uses social media, apps, and websites to share information with communities about early warnings of dam failure and potential hazards. The HyperReach system is a reverse 911 system that notifies residents about potentially hazardous conditions and is maintained quarterly. Applies to all communities in Alexander County.
- **Protocol for Monitoring Tail Race Areas:** Data about tail race monitoring areas below the Catawba River has been established by Duke Energy for real time information and alerts.
- **Transfer Switch Connections for New and Existing Public Facilities:** The County has added generators to newly constructed public facilities including the County Offices, Health Department, and Board of Elections.
- **Portable Generator:** The County has obtained a deployable trailer mounted generator for emergency response.
- **Town of Taylorsville Increased Emergency Response Forces:** the Town has increased the emergency response force by assisting with pay increases to assist with staffing issues, train more law enforcement, and maintain credentials.

Catawba County

- **Quick Connect Installation at Critical Public Facilities:** The County has coordinated with the American Red Cross to install pre-wired connections to use in portable generators at critical public facilities including two elementary schools (Startown Elementary and Bandys High School) with Department of Homeland Security Grants.
- **Requirement for Pre-wired Connections in New School Facilities:** The County has met with the Catawba County School representatives and established a policy to have pre-wired connections installed during any new construction to be more cost effective.
- **Protocol for Monitoring Tail Race Areas:** Data about tail race monitoring areas below the Catawba River has been established by Duke Energy for real time information and alerts.
- **Identification of Emergency Access Areas on Public Properties:** The County has established evacuation procedures for parks which include alternative routes.

They have also established natural breaks to reduce the spread of wildfires to the adjoining properties.

- **Protocol for Notification of Log Jamming in Priority Watershed:** Established to notify the appropriate agencies and community partners to assist in clearing the log jam. The NCDOT is also notified of log jams, possible or existing, that can jeopardize bridge abutments.
- **City of Claremont is Installing Generator Hook-ups for Critical Facilities:** The City of Claremont Fire Department, Police Department, Public Works Department, McLin Sewer Treatment Plant, Rescue Squad, and four out of five lift stations now have emergency generators. Public works is scheduled to be building a new permanent generator in the near future.
- **City of Conover has installed Generators at all Critical Facilities:** All critical facilities now have permanent full backup capability with generators including the City Hall, Police Stations, Fire Stations, and Public Works buildings. **Brush and Wildland Fire Training** has incorporated the training into the annual training schedule in the City Fire Department.
- **City of Newton** added an **additional tree trimming crew** to keep trees and limbs clear of electric lines to prevent damage.
- **Town of Maiden** has constructed a **Remote Fire Station** at the intersection of Elbow Road and Startown Road, and another fire station is currently under construction.
- **City of Hickory** has added **Additional Commanders in the Fire Department:** the City of Hickory had realigned the structure of its fire department to allow for better management of multiple incidents and provide safety for public safety personnel. The City has purchased 11 four-wheel drive vehicles with **Off-Road Capability Vehicles** to utilize when residents become stranded or cut-off from services due to hazardous weather events. The City of Hickory Police department have acquired an elevated platform **Police Skytower** that can support police personnel and or surveillance equipment. It has provided firsthand management of severe weather events and can also be used to observe areas impacted by severe weather. A **Second Ladder Company within the Hickory Fire Department** has provided the City and has the ability to reduce the existing 43 square mile coverage to two 21.5 square miles of coverage. The Hickory Police Department has installed the **Radio Frequency Interoperability Hardware** to prevent communication breakdown due to compatibility issues between radio and telephone systems. The City continues to update the system as needed and provide training to other local governments and emergency service groups as needed.
- **Town of Brookford** has prepared a **Local Evacuation Route** to ensure the safety of its residents in anticipation of hazard events, particularly wildfires and floodings. The Town of Brookford has developed a **Mutual Aid Agreement** with the City of Hickory and works with Catawba County.

- **Town of Long View** has obtained gear through a grant to train 2-3 times a year for **Brush and Forest Firefighting Training**. The Town of Long View has developed a **Hazard Awareness Month** to promote hazard awareness throughout the town in the month of March.
- **Town of Catawba** routinely relies on **Scheduled Tree Clearing** through a private company and Duke Energy to prune and trim trees in order to prevent damage from hazard events.

Burke County

- **HyperReach:** The County has established HyperReach as their early warning system that uses social media, apps, and websites to share information with communities about early warnings of dam failure and potential hazards. The HyperReach system is a reverse 911 system that notifies residents about potentially hazardous conditions and is maintained quarterly. Applies to all communities in Alexander County.
- **Community Health and Disaster Mitigation Explorer (CHADME):** the WPCOG has created a community health and disaster mitigation tool that has an inventory of all Burke County infrastructure, critical facilities, and areas of concern.
- **E-911 Expansion:** Burke County has updated and expanded their E-911 program to include municipalities to cover the entire County with one system. The E-911 center updated the system with new addresses on a continuous basis when new residences and businesses are built or permitted. Building permits require a 911 address to be given for any new construction projects.
- **Town of Rutherford College** has obtained a **portable generator** that is used for the pump station when the power is out.
- **Town of Valdese** has installed a **Quick Connect Emergency Generator** in 2018 in the Valdese Water Department Pump Station. The Town of Valdese continually **monitors and inspects storm drainage systems** to clear debris and prevent debris from blocking the drain.
- **City of Morganton: Major Sewer and Wastewater Upgrades** have been completed, including wastewater plant renovations and line upgrades for the City's wastewater sewer systems. The City has also installed new water plant generators above the flood hazard areas to serve as a power source backup during catastrophic events to maintain the systems drinking water.

Caldwell County

- **City of Lenoir has** Installed Backup Generator at City Hall

5.3.2.2. *Hazard Mitigation Plan*

A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural, and in some cases human-caused, hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment, and mitigation strategy.

- **28 of the 28 participating jurisdictions** in this regional planning effort have previously been covered by their county's multi-jurisdictional hazard mitigation plan.

5.3.2.3. *Disaster Recovery Plan*

A disaster recovery plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster event. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans to capitalize 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.

- **7 of the 28 participating jurisdictions** have a disaster recovery plan either in place or under development. (5 jurisdictions have one in place; 4 have one under development; 0 covered under a county plan)

5.3.2.4. *Emergency Operations Plan*

An emergency operations plan outlines responsibility and how resources are deployed during and following an emergency or disaster.

- **20 of the 28 participating jurisdictions** have an emergency operation plan either in place or are covered under a county plan.
- **Alexander County** has undergone a complete re-write of their EOP and expect it to be completed by the end of 2024 with opportunities to review and revise annually in the future. This EOP establishes a program for evaluating and improving critical services and critical facilities to reduce risks of damage due to natural hazards.
- **Catawba County** has established procedures in their EOP to address dams, monitoring, and high-water events for public notification and awareness.

5.3.2.5. *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.

- **10 of the 28 participating jurisdictions** have a continuity of operations plan in place.

5.3.3. **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. **The Local Capability Assessment Survey** also asked questions regarding general planning capabilities and the degree to which hazard mitigation is integrated into other ongoing planning efforts in the Plan Area.

5.3.3.1. *Updated Capabilities by Jurisdiction*

Alexander County

- **Land Use Development plan:** The County updated their Land Use Development plan in May 2024.

- **Town of Taylorsville** developed a **Unified Development Ordinance** has been adopted that combines the County and Town of Taylorsville zoning districts. A **Land Use Development Code** covering the area was also adopted in May 2024

Catawba County

- **Carolina Thread Master Plan:** Catawba County created and adopted the plan in coordination with the Carolina Thread Trail Organization which lays out a system of 126 miles of interconnected trails within the county, and 56 miles of the trail systems are located along river corridors which help preserve sensitive floodplain areas through the acquisition of easements.
- **Corridor Plans:** The County updated its corridor and small area plans to incorporate hazard mitigation elements into new development in areas where utilities, emergency services, and public facilities exist.
- **City of Claremont** has developed an **Infrastructure Database** that the WPCOG maintains with infrastructure and utilities database in a GIS system that is updated when changes are made.

Caldwell County

- **City of Lenoir** has developed a **Minimum Housing Database** to catalog vacant, substandard, and abandoned houses to prioritize the enforcement actions based on a formula that is weighted for factors such as public safety. Within 5 years, over 150 houses have been removed from the list as they are being abated. The City continues to identify houses for abatement and foreclosure every year.

Burke County

- **Town of Glen Alpine** reviews zoning ordinances on an annual basis and the Planning Board meets monthly to review ordinances, subdivision plans, future projects, and public concerns.
- **Town of Rutherford College** has revised its zoning regulations to require a 50-foot buffer for new development along the Catawba River and has revised the subdivision regulations to require all perennial and intermittent streams to be shown on subdivision plats.

5.3.3.2. Comprehensive/General Plan

A comprehensive land use plan, or general plan, establishes the overall vision for what a community wants to be and serves as a guide for future governmental decision making. Typically, a comprehensive plan contains sections on demographic conditions, land use, transportation elements, and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives, and actions.

- **28 of the 28 participating jurisdictions** have a comprehensive land use plan either in place or under development.
- **Alexander County** updated their Comprehensive Plan in May 2024, and it will be reviewed annually.

- **City of Morganton** has developed the Imagine Morganton 2040 comprehensive plan which will be adopted by the City Council in 2024 and includes a Land Development Plan.
- **Burke County, along with The Town of Long View**, have updated their Comprehensive Land Use Plan which was adopted in 2022 and will be continually monitored until the next scheduled review in 2030. This includes preparing a development plan to relocate public infrastructure out of hazard areas and has been awarded a BRIC grant to update a pumping station within the County to reduce flooding.

5.3.3.3. *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.

- **19 of the 28 participating jurisdictions** have a capital improvements plan in place or under development.
- **City of Morganton** has updated their CIP with a development plan to relocate public infrastructure out of hazard areas.
- **Burke County** has developed a Capital Improvement Plan for public facilities that steer capital projects out of hazard areas.

5.3.3.4. *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 damage. 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.

- **5 of the 28 participating jurisdictions** have an historic preservation plan in place or under development.

5.3.3.5. *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 each 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.

- **28 of the 28 participating jurisdictions** have a zoning ordinance in place or under development.
- **The City of Lenoir** continues to enforce the City's Minimum Housing Ordinance and rehabilitate and move unsafe structures in addition to creating and maintaining a database of abandoned and at-risk structures to help with enforcement.

- **The Town of Taylorsville** has developed a unified development ordinance that combines the Alexander County and the Town of Taylorsville zoning districts.
- **Town of Glen Alpine** planning board and staff meet monthly to review ordinances, subdivision plans, and future projects.

5.3.3.6. *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.

- **27 of the 28 participating jurisdictions** have a subdivision ordinance in place or under development.
- **The Town of Rutherford College** requires subdivision regulations to require that all perennial and intermittent streams be shown on subdivision plats.

5.3.3.7. *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.

- **26 of the 28 participating jurisdictions** have building codes in place.
- **Burke County** has updated its building codes to prevent new structures from being built in the tailrace area below the Catawba River dams.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program, developed by the Insurance Services Office, Inc. (ISO). In North Carolina, the North Carolina Department of Insurance assesses the building codes in effect in a particular community and how the community enforces its building codes, with special emphasis on mitigation of losses from natural hazards. 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.

C1-a. Does this include a discussion of the existing building codes and land use and development ordinances or regulations?

In conducting the assessment, ISO collects information related to personnel qualification and continuing education, as well as number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to 10, with a BCEGS grade of 1 representing exemplary commitment to building code enforcement, and a grade of 10 indicating less than minimum recognized protection. Table provides NFIP policy and claim information for each participating jurisdiction in the Plan Area.

5.3.4. Floodplain Management

Flooding represents the greatest natural hazard facing our 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 *Capability Assessment* as a key indicator for measuring local capability.

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. Participation in the National Flood Insurance Program (NFIP) is voluntary. To join, the community must:

- Complete an application;
- Adopt a resolution of intent to participate and cooperate with FEMA;
- Adopt and submit a floodplain management **ordinance** that meets or exceeds the minimum NFIP criteria. The floodplain management ordinance must also adopt any FIRM or FHBM for the community.

Table 5-2 provides NFIP policy and claim information for each participating jurisdiction in the Plan Area.

5.3.4.1. NFIP Participation Worksheet

Jurisdictions completed NFIP Participation Worksheets (Appendix J) to clarify their status in terms of participation and regulations relating to NFIP compliance. Questions in the NFIP worksheet include the following:

- Please provide details about who is (or who may be if you are unsure) responsible for ensuring compliance with NFIP regulations
- Which jurisdiction facilitates or regulates your NFIP compliance?
- Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details
- How has your jurisdiction implemented the substantial improvement/substantial damage provisions of their floodplain management regulations after an event.

Table 5-2: NFIP Policy and Claim Information

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies In Force	Insurance In Force	Written Premium In Force	Total Payments
Alexander County						
Alexander County (Unincorporated Area)	2/01/91	7/07/09	22	\$5,737,000	\$36,031	\$44,910
Town of Taylorsville	11/30/09	7/07/09	3	\$1,750,000	\$8,345	\$10,572
Subtotal Alexander	-	-	25	\$7,487,000	\$44,376	\$55,480
Burke County						
Burke County (Unincorporated Area)	6/17/91	7/07/09	55	\$14,438,000	\$64,021	\$80,728
City of Morganton	2/19/87	7/07/09	41	\$12,219,000	\$72,545	\$92,579
Town of Connelly Springs	2/20/08	7/07/09	2	\$700,000	\$1,090	\$1,319
Town of Drexel	8/19/86	7/07/09	4	\$1,208,000	\$4,428	\$5,517
Town of Glen Alpine	5/20/10	7/07/09	2	\$546,000	\$1,447	\$1,966
Town of Hildebran	9/05/07	7/07/09	13	\$2,870,000	\$10,500	\$46,000
Town of Rutherford College	4/22/11	7/07/09	1	\$350,000	\$571	\$690
Town of Valdese	7/03/86	7/07/09	5	\$1,856,000	\$9,108	\$11,955
Subtotal Burke	-	-	107	\$1,317,000	\$153,210	\$194,754
Caldwell County						
Caldwell County (Unincorporated Area)	8/16/88	7/07/09	60	\$14,895	\$77,704	\$96,287
City of Lenoir	8/16/88	7/07/09	82	\$22,818,000	\$157,465	\$195,715
Town of Cahaj's Mountain	3/06/90	7/07/09	1	350,000	434	\$529
Town of Gamewell	2/15/00	7/07/09	1	\$149,000	\$720	\$1,091
Town of Granite Falls	8/16/88	7/07/09	4	\$766,000	\$2,700	\$3,251

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies In Force	Insurance In Force	Written Premium In Force	Total Payments
Town of Hudson	3/06/90	7/07/09	5	\$2,936,000	\$5,173	\$6,636
Town of Rhodhiss	7/03/86	7/07/09	5	\$1,290,100	\$3,223	\$12,587
Town of Sawmills	3/21/13	7/07/09	1	\$350,000	\$856	\$1,027
Village of Cedar Rock	5/10/10	7/07/09	0	0	0	0
Subtotal Caldwell	-	-	159	\$28,673,995	\$232,613	\$317,123
Catawba County						
Catawba County (Unincorporated Area)	9/03/80	7/07/09	84	\$22,714,000	\$74,614	\$92,811
City of Claremont	9/05/07	7/07/09	11	\$3,056,000	\$6,929	\$9,257
City of Conover	9/03/80	7/07/09	19	\$5,539,000	\$25,181	\$30,702
City of Hickory	8/03/81	7/07/09	94	\$26,046,000	\$78,611	\$98,041
City of Newton	9/03/80	7/07/09	13	\$4,407,000	\$18,437	\$23,096
Town of Brookford	12/18/79	7/07/09	0	0	0	0
Town of Catawba	9/03/80	7/07/09	3	\$949,000	\$2,455	\$2,947
Town of Long View	9/03/80	7/07/09	5	\$1,387,000	\$4,946	\$6,369
Town of Maiden	9/03/80	7/07/09	9	\$4,478,000	\$15,436	\$19,263
Subtotal Catawba	-	-	238	\$68,576,000	\$226,609	\$282,486
TOTAL PLAN	-	-	529	\$106,053,995	\$656,808	\$849,843

- How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.
- Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details

Please describe of how your jurisdiction has implemented the substantial improvement/substantial damage provisions in the floodplain **management** regulations that apply to your jurisdiction after an event.

All jurisdictions listed above participate in the National Flood Insurance Program and will continue to comply with all required provisions and work to adequately comply in the future, utilizing several strategies. Floodplain management is managed through zoning ordinances, building code restrictions, and the county building inspection program. The jurisdictions will coordinate with NCEM and FEMA to develop maps and regulations related to Special Flood Hazard Areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property. Each county and its municipalities while participating in the National Flood Insurance Program comply with regulations as demonstrated in regular Community Assessment Visits.

5.3.4.2. Updated Capabilities

Alexander County

- **Flood Prevention Ordinance:** Alexander County is expected to have a Land Development Code which has a section on flood prevention ordinances by September 2024 and to be updated annually. This also includes zoning and subdivision regulations in floodplain, steep slope, and wildfire hazard areas.
- **Updated Regulatory Floodplain Maps:** The County adopts and utilizes the current NC Floodplain Mapping Program Data, and it is reviewed annually.
- **Coordinated Floodplain Permitting System:** The County is setting up a centralized online permitting system which will be used by all inspection agencies with floodplain permitting and is estimated to start in 2025.
- **Town of Taylorsville:** has installed a **New Culvert For Muddy Creek** to improve drainage. The Town has worked to widen streets and improve the stormwater drainage for **Right-of-way and Ditch Maintenance** with funding to prevent damage to streets and property from stormwater.

Catawba County

- **Stormwater Requirements in the County Master Plan:** The County includes stormwater management requirements in the County Master Plan and maintenance plans are required and reviewed by staff.
- **Stormwater Committee:** A multi-jurisdictional Stormwater Committee to prioritize stormwater issues and projects within the area has been established with fire department, law enforcement, emergency managers, and the NCDOT staff, meeting quarterly to discuss issues of concern. Public service announcements are also periodically run to encourage the clearing of private road drains and driveway culvert drains.

- **City of Claremont** has adopted a **Floodplain Regulation** in their Comprehensive Use Plan which has floodplain regulation and current floodplain data. The new floodplain maps will be updated when FEMA adopts the updated FIRMs. The City of Claremont verified the height of manhole flood zones by GPS to ensure proper equipment is present and manholes along creeks have risers to improve **Water, Sewer, and Storm Facilities Data Collection**.
- **Town of Maiden** received a NC Department of Environmental Quality grant to improve the Maiden Reservoir Dam for **Dam Failure Study** and has multi-phase plan to address the issues with the dam. The Town has installed **Risers for Sewer Manholes** to improve infiltration and inflow during heavy rains. The Town continues to conduct **Public Awareness for Storm Drain Clearing** training to encourage residents to keep storm drains clear of debris during storms.
- **Town of Brookford** adopted a **Flood Prevention Ordinance** based on models provided by the State of North Carolina. The Town has worked closely with Catawba County to dispose of debris and development of a **Debris Management Plan**. The Town continues to work with the Public Works Department to do weekly **Routine Storm Drain Inspection** as a preventative action.
- **City of Newton** has maintained continued **NFIP Compliance** with digital floodplain elevation certificates for all construction in the floodplain, including ongoing development.
- **Town of Catawba** routinely **Cleans and Repairs Stormwater Drains** as an ongoing preventative action.

Caldwell County

- **Flood Insurance Rate Maps:** The County has maintained comprehensive Geographic Information Systems (GIS) with current Flood Insurance Rate Map panels to ensure that information is readily available to the County citizens along with historical FIRM panels.
- **Town of Gamewell keeps Flood Insurance Rate Maps** on file at the Town Hall and on the County website.
- **City of Lenoir** continued to enforce the **Flood Damage Prevention Ordinance** and regulate construction within special flood hazard areas by requiring that all floodplain developments obtain floodplain development permits from the Lenoir Planning Department. In 2018 the City hired Freese and Nichols Inc. to begin an inventory of all **Underground stormwater infrastructure and Piped Stream Mapping** and to develop a Capital Improvements Plan based on the stormwater infrastructure needs of the City. This included a database to record any reported issues, develop an inventory of stormwater hotspots, and known structural issues or failures within pipes prioritized by a weighting system to allow the Council to prioritize funding needs. In 2023, the City hired WPCOG who have mapped half of the City's stormwater system as of June 2024. City of Lenoir staff continue to monitor storm drains before, during, and after storms to ensure **Obstruction Removal of Storm Drains** are completed in a timely manner. The staff also continue to collect reports from the public and utilize this information to identify problem areas where obstructions occur more frequently to prevent future occurrences.

- **Town of Hudson:**
 - **Flood Damage Prevention Ordinance:** the Town of Hudson has developed a Flood Damage Prevention Ordinance which was adopted in 2022 and they continue to enforce floodplain requirements.
 - **Flood Insurance Rate Maps:** The Town of Hudson continues to maintain FIRMs in the Hudson Town Hall and on the Caldwell County Tax Mapping website.
 - **Stormwater Regulation Enforcement:** The City of Lenoir continues to administer stormwater regulations for the Town of Hudson.

Burke County

- **Updated Flood Damage Prevention Ordinance:** The County along with the Town of Long View and the City of Morganton have continued to review and update their Flood Damage Prevention Ordinances based on changing hazard information, and they will be reviewed again based on map updated in 2025 if necessary.
- **Update of Regulatory Floodplain Maps:** the County adopts and utilizes the current NC Floodplain Mapping Program data which coincides with state update maps. The County continues to monitor the maps for updates.
- **Centralized Permitting:** The County, along with the Town of Long View, have set up a centralized permitting process including a filing and permitting process that ensures that compliance is maintained with floodplain regulations.
- **City of Morganton** continues to work with FEMA to adopt and **Update Regulatory Flood Maps** as they are released. There have been public meetings with the State and County representatives for concerned citizens. The City is currently waiting on the State to change the future Preliminary Maps to the Effective Maps. The City Public Works Department **Established a Drainage System Inspection Program** performs an annual critical systems maintenance, inspection, repair, and replacement of failed systems. The City continues to maintain the drainage system with an ADWI Grant to help document their assets and plan for future stormwater projects. **Acquisition and Inventory of High-Risk Properties in Flood Prone Areas is ongoing**, as The City continues to identify high risk properties and maintain a list of the properties, and as funding becomes available the City acquires the high-risk properties to eliminate the catastrophic loss of life and damage to property. Most of the properties are incorporated into greenways and parks within flood-prone areas.
- **Town of Hildebran** works with property owners and developers to ensure **Management of Future Development in Flood-Prone Areas** outside of the designated floodplain.
- **Town of Rutherford College** has developed a **Stormwater Management Plan** which meets all of the Federal Phase II stormwater regulations. The Town has also completed their stormwater map and conducted stormwater outreach.
- **Town of Valdese** has addressed drainage system management with the Town **Stormwater and Watershed Ordinance** which is under continuous observation and evaluation.

5.3.4.3. 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, adding extra local measures to provide protection from flooding. All 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. Class ratings, which range from 10 to 1, are tied to flood insurance premium reductions as shown in Table 5-3. As class ratings improve (the lower the number, the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

Table 5-3: 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%

Community participation in the CRS is voluntary. Any community in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years, based on community comments intended to make the CRS more user friendly, and extensive technical assistance available for communities who request it. There are currently no CRS participants in the planning area.

5.3.4.4. 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.

- **15 of the 28 participating** jurisdictions have a floodplain management plan in place.

5.3.4.5. 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.

- **8 of the 28 participating jurisdictions** have an open space management plan in place or under development.

5.3.4.6. 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.

- **16 of the 28 participating jurisdictions** have a stormwater management plan in place.
- **Burke County**, along with **The Town of Valdese**, have developed a countywide stormwater management plan covering the Catawba river basin which was completed in 2015. The Town of Valdese has also assigned a director of the Storm Water Management Program to assist with the plan.

5.3.5. Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Technical capability can generally be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using geographic information systems (GIS) to analyze and assess community hazard vulnerability. The Local Capability Assessment Survey was used to capture information on administrative and technical capability through the identification of available staff and personnel resources. *The Local Capability Assessment Survey* was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Table 5-8 provides a summary of the *Local Capability Assessment Survey* results for the Plan Area regarding relevant staff and personnel resources. A checkmark indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skills.

Table 5-4: Relevant Staff/Personnel Resources

Jurisdiction	Planners with knowledge of land development and land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Building Official	Emergency manager	Floodplain manager	Land surveyors	Scientist familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS	Resource development staff or grant writers	Maintenance programs to reduce risk	Warning systems/services
Burke County	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	-	✓
City of Morganton	✓	✓	✓	✓	-	✓	✓	-	✓	✓	✓	✓	✓
Caldwell County	✓	-	✓	✓	✓	✓	-	-	✓	✓	✓	-	-
City of Lenoir	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓
Town of Rhodhiss	-	-	✓	✓	✓	✓	-	-	✓	✓	✓	-	-
Catawba County	✓	✓	✓	✓	✓	✓	-	-	✓	✓	-	-	-
Town of Brookford	-	-	-	-	✓	✓	-	-	-	-	-	✓	-
Town of Catawba	✓	-	-	✓	-	✓	-	-	-	✓	✓	✓	-
City of Conover	✓	✓	✓	-	✓	✓	-	-	✓	✓	✓	✓	✓
City of Hickory	✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓	✓	✓
Town of Long View	✓	✓	✓	-	-	✓	-	-	-	✓	✓	✓	✓

Jurisdiction	Planners with knowledge of land development and land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Building Official	Emergency manager	Floodplain manager	Land surveyors	Scientist familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS	Resource development staff or grant writers	Maintenance programs to reduce risk	Warning systems/services
Town of Maiden	✓	-	✓	-	-	✓	-	-	-	-	-	✓	✓
City of Newton	✓	✓	✓	✓	✓	✓	-	-	✓	✓	-	✓	✓
Town of Drexel			✓	✓	✓	✓	-	-	✓	✓	✓	-	-
Town of Valdese	✓	-	-	-	✓	✓	-	-	-	-	-	✓	✓
Alexander County	✓	-	✓	✓	✓	✓	-	-	✓	-	-	-	✓
Town of Granite Falls	✓	-	✓	-	-	✓	-	-	✓	-	-	✓	✓
Town of Hudson	✓	✓	✓	✓	✓	✓	-	-	-	✓	✓	-	✓
Town of Gamewell	-	-	✓	✓	✓	✓	-	-	✓	✓	✓	-	-
Town of Taylorsville	✓		✓	✓	✓	✓	-	-	✓	-	-	-	✓
Town of Hildebran	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	-	✓
City of Claremont	✓	✓	✓	-	-	✓	-	-	-	✓	-	✓	✓
Town of Glen Alpine	-	-	-	✓	✓	✓	-	-	✓	✓	-	-	-

Jurisdiction	Planners with knowledge of land development and land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Building Official	Emergency manager	Floodplain manager	Land surveyors	Scientist familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS	Resource development staff or grant writers	Maintenance programs to reduce risk	Warning systems/services
Town of Connelly Springs	✓	-	-	✓		✓	-	-	-	-	-	-	-
Town of Rutherford College	-	-	-	✓	✓	✓	-	-	✓	✓	-	-	-
Town of Sawmills	✓	✓	✓	✓	✓	✓	-	-	-	✓	✓	-	✓
Town of Cahah's Mountain	✓	✓	✓	✓	✓	✓	-	-	-	-	✓	-	-
Village of Cedar Rock	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	-	✓

5.3.6. Fiscal Capability

The ability of a local government to act 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 houses, which can require a substantial commitment from local, state, and federal funding sources.

The Local Capability Assessment Survey was used to capture information on the Region's fiscal capability through the identification of locally available financial resources.

Table 5-5 provides a summary of the results for the Plan Area regarding relevant fiscal resources. A checkmark indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

Table 5-5: Relevant Fiscal Resources

Jurisdiction	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation Bonds	Revenue Bonds	Special Tax Bonds	Other
Burke County	✓	✓	-	-	✓	-	-	-	-	-	-
City of Morganton	✓	✓	-	✓	✓	-	-	-	-	-	-
Caldwell County	-	✓	✓	✓	✓	-	-	-	-	-	-
City of Lenoir	✓	✓	✓	-	✓	-	-	-	-	-	-
Town of Rhodhiss	✓	-	-	-	✓	-	-	-	-	-	-
Catawba County	✓	✓	✓	-	✓	-	-	✓	-	-	-
Town of Brookford	-	✓	-	-	-	-	-	-	-	-	-
Town of Catawba	✓	✓	-	-	✓	-	-	✓	✓	-	-
City of Conover	✓	✓	-	-	✓	-	✓	-	-	-	-
City of Hickory	✓	✓	-	-	✓	-	-	✓	-	-	-

Jurisdiction	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation Bonds	Revenue Bonds	Special Tax Bonds	Other
Town of Long View	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-
Town of Maiden	✓	✓	-	✓	✓	-	-	✓	-	-	-
City of Newton	✓	✓	-	✓	✓	-	-	-	-	-	-
Town of Drexel	✓	✓	-	✓	✓	-	-	-	-	-	-
Town of Valdese	✓	✓	-	-	✓	-	-	-	-	-	-
Alexander County	-	✓	-	-	✓	-	-	✓	✓	✓	-
Town of Granite Falls	✓	✓	-	✓	✓	✓	✓	-	-	-	-
Town of Hudson	✓	✓	-	-	-	-	-	-	-	-	-
Town of Gamewell	✓	-	-	-	✓	-	-	-	-	-	-
Town of Taylorsville	✓	✓	-	-	✓	-	-	✓	✓	✓	-
Town of Hildebran	-	-	-	-	-	-	-	-	-	-	-
City of Claremont	✓	✓	-	-	✓	-	✓	-	-	-	-
Town of Glen Alpine	-	✓	-	-	-	-	-	-	-	-	-
Town of Connelly Springs	-	✓	-	-	✓	-	-	-	-	-	-
Town of Rutherford College	✓	-	-	-	✓	-	-	✓	-	-	-
Town of Sawmills	✓	✓	-	-	-	-	-	-	-	-	-
Town of Cajah's Mountain	-	-	-	-	✓	-	-	-	-	-	-
Village of Cedar Rock	✓	-	✓	-	-	-	✓	-	-	-	-

5.3.7. Education and Outreach Capability

This type of local capability refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-

related information. Examples include natural disaster or safety related school programs; participation in community programs such as Firewise or StormReady; and activities conducted as part of hazard awareness campaigns such as a Tornado Awareness Month.

provides a summary of the results for the Plan Area with regard to relevant education and outreach resources. A checkmark indicates that the given resource is locally available for hazard mitigation purposes.

5.3.7.1. *Added Capabilities*

Alexander County

- **Public Floodplain Management Information:** The County reviews a library of retrofitting techniques and continues to build a library of techniques which is reviewed monthly.
- **Community Alert System Education:** The City works with the Alexander County Emergency Management to conduct public outreach about the Community Alert System and the HyperReach Alert and Warning System along with the Town of Taylorsville.

Burke County

- **Retrofitting Technique Library:** Burke County maintains documentation related to retrofitting techniques and continues to add new documents as needed.
- **Community Alert System Outreach:** The County completed an outreach campaign to educate the public about the Community Alert System, how to obtain pre and post disaster resources, mitigation strategies, and mitigation actions for homeowners.
- **City of Morganton offers access to online Flood Elevation Certificates, FIRMs, and other flood mapping protection services for their Hazard Awareness Program** through NCEM. City staff consults with property owners and developers as to how to access this information and obtain guidance on a routine basis.
- **Town of Glen Alpine** offers **Education and Safety Training in Schools** through continuous programs, and will offer education in fire prevention, safety training, and mitigating natural hazards training to the schools and citizens. These will be focusing on talks to civic groups, children, Town citizens, and elderly adults. The Fire Department visits schools and civic clubs annually to present programs on fire prevention and safety, natural hazard awareness.
- **Town of Hildebran** has participated and will continue to participate in **Hazard Mitigation Outreach** both locally and regionally.
- **Town of Rutherford College** plans to conduct **Pre-Disaster Preparation Outreach** to educate the public at disaster fairs for the region.
- **Town of Valdese** continues to educate the public on safety and disaster preparedness in **Pre-Disaster Preparation Outreach**. The Valdese Fire Marshal was assigned to address continued education for the public on disaster preparedness and safety.

Catawba County

- **Community Alert System Outreach:** The County completed an outreach campaign to educate the public about the Community Alert System, how to obtain pre and post disaster resources, mitigation strategies, and mitigation actions for homeowners. This also includes the City of Conover, the Town of Brookford, and the Town of Maiden.
- **Local Emergency Planning Committee Network:** The LEPC meets semi-annually to discuss emergency preparedness, and an environmental specialist has been added to the group to provide additional expertise for the group. The committee has been established to do the work and is up and running.
- **Firewise Community Programs:** County Forest Service Agency provided information about the Firewise program during various events throughout the past several years. They have also shared information with various fire departments when speaking about fire prevention. The County's Community Wildfire Protection Plan addresses areas of concern which are monitored by the Forest Service.
- **Manufactured Home Evacuation Outreach:** Outreach has been conducted to manufactured homeowners about emergency preparedness, such as participating in the County's Community Alert System. Information has been directly delivered to these owners and programs have also been conducted to inform owners of manufactured homes.
- **Flood-Prone Area Education and Outreach:** Staff has conducted door-to-door meetings with property owners in the Carpenters Cove area of Lake Lookout and shared information with the owners included: emergency preparedness, the County's Community Alert System, and flood insurance information. Countywide community and school programs have been conducted about the County's Community Alert System and flood prevention/insurance issues. An owner in Carpenters Cove applied for a flood mitigation grant and has completed mitigation actions for his structures.
- **Storm and Drought Resistant Landscape Manual:** Information about species of plants that grow well in the county has been obtained from various nurseries in the county. A list of the plants has been compiled and illustrations have been developed and incorporated into a user-friendly manual.
- **Standard Hook Up Emergency Generator Education and Outreach:** Staff have worked with the nursing homes in the County and conducted testing of generators at schools and hospitals.
- **Tree-Trimming Outreach:** The County continues to educate residents about tree-trimming techniques to reduce power outages due to downed tree limbs.
- **City of Claremont** has a full-time **Public Information Officer** who provides information about hazard events and storm drainage clearing on social media and other forms of communication. The Public Information Officer who assists with social media outreach will continue educating residents about Drainage Clearing and Voluntary Water Use Restrictions during water conservation times. This will also include the development of hazard impacts in the City of Claremont and resources available for mitigation.

- **City of Conover** continues to highlight mitigation practices for homeowners through **Public Service Announcements through social media and the City Website** such as tree trimming, during wildfire and winter storm seasons and promotes education via social media, website, and brochures before, during, and after storm events. The City works with the Catawba County Emergency Services Department to conduct public outreach about the **Community Alert System** and all new utility customers are enrolled automatically in public outreach newsletters.
- **Town of Maiden** works with Catawba County Emergency Services Department to conduct public outreach about the **Community Alert System** and information about the system is also linked on the website.
- **Town of Long View** has established a **Hazard Awareness Month** in the month of March to spread awareness about natural hazards in the town.
- **Town of Brookford** has worked in coordination with Catawba County, the American Red Cross, and other organizations to continually update residents **Community Disaster Preparedness**. The Town of Brookford continually updates its residents about evacuation plans and the use of the community buildings as safe houses in extreme situations. Additionally, the Town continues to update and educate community members through Facebook and quarterly announcements.

Caldwell County

- **Hazard and Development Regulations:** The County had maintained information about hazards and development regulations in the local library, providing FEMA resources and links in the county’s websites, and ensuring that all municipalities provide a link regarding flooding information.

Table 5-6: Education and Outreach Resources

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access, and functional needs populations, etc.	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety related school programs	StormReady certification	Firewise Communities certification	Public-private partnership initiatives addressing disaster-related issues	Other
Burke County	-	✓	✓	✓	✓		✓
City of Morganton	-	✓	-	-	-	-	-
Caldwell County	✓	✓	-	-	-	-	-

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access, and functional needs populations, etc.	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety related school programs	StormReady certification	Firewise Communities certification	Public-private partnership initiatives addressing disaster-related issues	Other
City of Lenoir	✓	✓	✓	✓	-	-	-
Town of Rhodhiss	✓	✓	✓	✓	-	-	-
Catawba County	✓	✓	✓	✓	-	-	-
Town of Brookford	-	✓	-	-	-	✓	-
Town of Catawba	-	-	-	-	-	-	-
City of Conover	-	-	-	-	-	-	-
City of Hickory	✓	✓	✓	✓	-	-	-
Town of Long View	✓	✓		✓	-	-	-
Town of Maiden	✓	✓	✓	-	-	-	-
City of Newton	-	✓	-	-	-	-	-
Town of Drexel	✓	✓	✓	-	-	✓	-
Town of Valdese	-	✓	-	✓	-	-	-
Alexander County	✓	✓	✓	✓	-	✓	-
Town of Granite Falls	✓	✓	✓	✓	-	-	-
Town of Hudson	-	-	-	-	-	-	-
Town of Gamewell	✓	✓	✓	✓	-	-	-
Town of Taylorsville	-	-	-	-	-	-	-
Town of Hildebran	✓	✓	✓	✓	-	✓	-

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access, and functional needs populations, etc.	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety related school programs	StormReady certification	Firewise Communities certification	Public-private partnership initiatives addressing disaster-related issues	Other
City of Claremont	-	✓	-	-	-	-	✓
Town of Glen Alpine	-	✓	-	✓	-	-	-
Town of Connelly Springs	-	-	-	-	-	-	-
Town of Rutherford College	✓	-	-	-	-	-	-
Town of Sawmills	-	-	-	-	-	-	-
Town of Cahaj's Mountain	-	✓	-	-	-	-	-
Village of Cedar Rock	-	✓	-	-	✓	-	-

5.3.8. Mitigation Capability

This type of local capability refers to the mitigation strategies and actions developed by the communities in this plan. Table 5-7 provides a summary of the results for the planning area regarding relevant mitigation resources. A checkmark indicates that the given resource is locally available for hazard mitigation purposes.

5.3.8.1. Added Capabilities:

Catawba County

- County Unified Development Ordinance (UDO)** was amended to encourage the planting of drought tolerant plant materials as part of the landscaping requirements for new development. A Landscaping Manual is in the final stages of development which will include specific drought tolerant species for planting in the county. Also, the UDO encourages the use of sustainable maintenance systems for landscaping, such as rain barrels or cisterns. Catawba County adopted a policy whereby it will rebate 50% of fees related to plan review or express plan review for commercial buildings seeking LEED, Energy Star, and/or NC Healthy Built Homes certification. Catawba County is a signatory to the Duke Energy Relicensing Agreements which

established a Low Inflow Protocol (LIP) in managing the river system during times of drought.

- **Carbon Footprint Analysis For The County's Facilities;** An Evaluation was conducted of current policies to identify ways to reduce greenhouse gases. Implement priority strategies identified in the study, which may include the production of biodiesel fuel at the County's EcoComplex, renewable energy sources such as windmills, reduction of particulate matter and ozone through recommendations of the Early Action Compact, and the development of an energy plan which may include purchasing policies that address energy reduction strategies and contractor policies for equipment emissions.
- **Green Purchasing Policy:** The Green Purchasing Policy was established to promote green friendly operations throughout the County government. All County owned buildings have been retrofitted for lighting. 100% of county lighting has been converted to T-8 lighting or better. Projects in progress to convert landfill gas to renewable natural gas. Plans continue to install solar panels on existing landfill property.
- **Farm and Food Sustainability Plan:** the plan was developed by a committee of over 20 partners which identified 66 action items to be implemented over the next 5+ years to help promote and sustain agriculture in the county. Action items included identifying conservation lands to be protected by local land trusts and advocating for bottomlands to be incorporated into the State's Ecosystem Enhancement Program.
- **Preservation of Large, Intact Forest Through the Unified Development Ordinance:** Catawba County acquired 580 acres of land on Lake Norman (referred to as the Mountain Creek tract) in late 2010 and this tract of land consists of an old growth forest with planted pines which will be preserved in perpetuity. The County Staff continue efforts to reduce invasive species including efforts related to pine tree removal and replacement at Riverbend and Mountain Creek Parks. Hudson Chapel property has been acquired by the County to preserve natural habitat.
- **Catawba County Parks Master Plan:** The Parks Master Plan was updated in 2017 to identify locations and funding sources for greenways to preserve sensitive land along river systems. Funding sources include Clean Water Management Trust Fund, Carolina Thread Trail, and others.
- **Local Land Trust Cooperation to Preserve Sensitive Land Along River Systems:** The county continues to work with two area land trusts to secure conservation easements on farmland to preserve sensitive land along river systems.
- **City of Conover** works with property owners and the NC Department of Transportation for **Tree Trimming of City Property** to address situations where dead or damaged trees are observed near the street rights of way. The City Utility Department continues to remove problematic trees and incorporate tree trimming into street maintenance activities. Utilities Department also clears problematic trees near critical infrastructure as part of routine maintenance.
- **City of Morganton** evaluates its **Tracking System for Mitigation Activities** and improves upon the information it provides to the public regarding mitigation activities. Weekly department head assessment meetings and interdepartmental review of the

information provided generates routine updates through the City's website, CoMPAS Cable Programming, public awareness notices, press releases, and other educational brochures.

Table 5-7: Mitigation Resources

Jurisdiction	Do you apply for mitigation grant funding?	Do you perform reconstruction projects?	Do you perform building elevations?	Do you perform acquisitions?
Burke County	No	No	Yes	No
City of Morganton	No	No	Yes	No
Caldwell County	No	No	No	No
City of Lenoir	Yes	No	Yes	No
Town of Rhodhiss	No	No	No	No
Catawba County	Yes	Yes	Yes	Yes
Town of Brookford	No	No	No	No
Town of Catawba	No	No	No	No
City of Conover	No	No	No	No
City of Hickory	Yes	Yes	Yes	Yes
Town of Long View	Yes	Yes	No	Yes
Town of Maiden	No	No	No	No
City of Newton	No	Yes	No	No
Town of Drexel	Yes	Yes	No	No
Town of Valdese	No	No	No	No
Alexander County	No	No	Yes	No
Town of Granite Falls	No	No	No	No
Town of Hudson	No	No	No	No
Town of Gamewell	No	No	No	No
Town of Taylorsville	Yes	No	Yes	No
Town of Hildebran	No	No	No	No
City of Claremont	No	No	No	No

Jurisdiction	Do you apply for mitigation grant funding?	Do you perform reconstruction projects?	Do you perform building elevations?	Do you perform acquisitions?
Town of Glen Alpine	No	No	No	No
Town of Connelly Springs	No	No	No	No
Town of Rutherford College	No	No	No	No
Town of Sawmills	No	No	No	No
Town of Cajah's Mountain	No	No	No	No
Village of Cedar Rock	No	Yes	No	No

5.3.9. Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Hazard mitigation may not be a local priority or may conflict with or be seen as an impediment to other goals of the community, such as growth and economic development. Therefore, the local political climate must be considered in designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing their adoption and implementation.

The *Local Capability Assessment Survey* was used to capture information on the political capability of the Plan Area. Survey respondents were asked to identify some general examples of local political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (e.g., building codes, floodplain management, etc.). The comments provided by the participating jurisdictions are listed below:

The agency responsible for monitoring this Plan is the Catawba County Emergency Management Department. Periodic revisions and updates of the Unifour Regional Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, considering 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 each jurisdiction's individual Mitigation Action Plan.

The HMPC will continue to meet regularly, as determined by the Catawba County Emergency Management Department. These regular meetings will take place in the fall of each year so that sufficient time is available to prepare public outreach messages and assess the status of any mitigation actions relevant to the upcoming severe seasonal spring weather and the start of hurricane season. Meetings will also be convened

as necessary following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed by the participating jurisdictions.

County and local staff of each participating jurisdiction will also continue to attend training workshops sponsored by the North Carolina Division of Emergency Management or others as appropriate to keep up to date with any changing guidance or planning requirements and to communicate that information to other representatives of participating jurisdictions.

As part of this monitoring, evaluation, and enhancement process, each participating jurisdiction will be expected to provide an annual status update to Catawba County for their respective Mitigation Action Plans to evaluate the Plan’s implementation effectiveness. This will ensure that the Plan is continuously maintained and updated to reflect changing conditions and needs within the Region. If determined appropriate or as requested, an annual report on the Plan will be developed and presented to local governing bodies of participating jurisdictions to report progress on the actions identified in the Plan and to provide information on the latest legislative requirements and/or changes to those requirements.

5.3.10. Local Self-Assessment

In addition to the inventory and analysis of specific local capabilities, the *Local Capability Assessment Survey* asked counties and local jurisdictions within the Plan Area to conduct a self-assessment of their perceived capability to implement hazard mitigation activities. As part of this process, local officials were encouraged to consider the barriers to implementing proposed mitigation strategies in addition to the mechanisms that could enhance or further such strategies. In response to the survey questionnaire, county officials classified each of the capabilities as either “limited,” “moderate,” or “high.”

Table 5-8: Self-Assessment of Capability

Jurisdiction	Plans, Ordinances, Codes and Programs	Administrative and Technical Capability	Fiscal Capability	Education and Outreach Capability	Mitigation Capability	Political Capability	Overall Capability
Burke County	Limited	Moderate	Limited	Limited	Limited	Limited	Limited
City of Morganton	Moderate	Moderate	Moderate	Limited	Limited	Moderate	Moderate
Caldwell County	Limited	High	Limited	Moderate	Limited	Limited	Moderate
City of Lenoir	High	Limited	High	Limited	Limited	Moderate	Limited
Town of Rhodhiss	Limited	Limited	Moderate	Limited	Limited	Limited	Limited
Catawba County	Moderate	High	High	High	Moderate	High	Moderate
Town of Brookford	Moderate	Limited	Limited	Limited	Moderate	Limited	Moderate
Town of Catawba	High	Moderate	Limited	Limited	Moderate	High	Moderate

Jurisdiction	Plans, Ordinances, Codes and Programs	Administrative and Technical Capability	Fiscal Capability	Education and Outreach Capability	Mitigation Capability	Political Capability	Overall Capability
City of Conover	High	Limited	Limited	Limited	Limited	Limited	Limited
City of Hickory	High	High	High	High	Moderate	High	High
Town of Long View	High	High	High	High	High	High	High
Town of Maiden	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
City of Newton	Unrated	Unrated	Unrated	Unrated	Unrated	Unrated	Unrated
Town of Drexel	Limited	Limited	Moderate	Limited	Limited	Limited	Limited
Town of Valdese	Moderate	Limited	Limited	Limited	Unrated	Unrated	Limited
Alexander County	Moderate	Limited	Limited	Moderate	Limited	Limited	Moderate
Town of Granite Falls	Moderate	Moderate	Moderate	Limited	Moderate	Limited	Moderate
Town of Hudson	Moderate	Moderate	Limited	Moderate	Moderate	Moderate	Moderate
Town of Gamewell	Limited	Limited	Moderate	Limited	Limited	Limited	Limited
Town of Taylorsville	Moderate	Limited	Limited	Moderate	Limited	Limited	Limited/Moderate
Town of Hildebran	Moderate	Moderate	Limited	Limited	Limited	Moderate	Moderate
City of Claremont	Moderate	Limited	Moderate	Moderate	Limited	Unrated	Moderate
Town of Glen Alpine	Limited	Moderate	Limited	Limited	Limited	Limited	Limited
Town of Connelly Springs	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Town of Rutherford College	Moderate	Moderate	Moderate	Limited	Limited	Limited	Moderate
Town of Sawmills	Moderate	Moderate	Limited	Moderate	Moderate	Moderate	Moderate
Town of Cahah's Mountain	Moderate	Moderate	Limited	Limited	Limited	Moderate	Moderate
Village of Cedar Rock	Limited	Limited	Limited	High	Moderate	Moderate	Moderate

5.3.11. Equity in the Capability Assessment

In order to understand the capabilities of the communities involved in the planning process, an equity questionnaire was distributed to better represent underserved communities such as low-income communities, communities that have been systematically denied participation in parts of economic, social, and civic life. The Equity Questionnaire was distributed to community planners to note what could be done to reduce barriers, recognize non-traditional capabilities, and highlight any barriers for underserved communities and vulnerable populations to be included in the mitigation planning process. For example, an underserved community in the planning area may have a strong network of community advocates who can support mitigation which makes it important to identify existing community resources. Results can be found in Appendix K.

The questions addressed identifying communities and populations lacking resources, identifying gaps in community planning or assistance to prepare for disasters, disproportionately served areas, barriers to disaster preparedness and safety, nontraditional resources available, and enhanced engagement strategies to improve community hazard mitigation planning involvement. Questions and examples of answers in the survey include:

- **Which neighborhoods or groups of people do not have enough resources to prepare for disasters and become stronger against them?**
 - “none”
 - “Limited and sporadic throughout county with locations of lower socioeconomic residents
 - “Neighborhoods with high poverty rates and elderly populations often lack adequate resources for disaster preparedness.”
 - “Elderly or disabled”
 - “North, Northeast, and East rural area are lacking in internet capabilities. Funding is difficult for many as the county is a retirement community with a large percent living on fixed income.”
 - “Those who lack internet or other forms of mass communication.”
- **What resources are missing that prevent these communities from getting the help that they need to plan for and reduce risk from natural, weather-related disasters?**
 - “Missing resources include access to transportation for evacuation, financial assistance for emergency kits, and community outreach programs.”
 - “No funding for mitigation strategies, language barriers (Spanish and Hmong)”
 - “Outreach to identify individuals and provide them with the necessary information”
 - “Knowledge of flood-prone areas. Infrastructure.”
 - “Infrastructure for communications, staffing for educational events, and general funding to provide resources and education.”
 - “There are less resources close by. Thankfully, agencies such as United Way have helped these areas. Earlier this year, the United Way and I imagine other agencies as well helped when Claremont had a tornado, but the damage was still lasting.”

- “Communication. Some individuals do not use internet, etc., so there needs to be other efficient ways to get the messages and information out.”
- **Do wealthier communities or neighborhoods get more support than under-resourced communities when it comes to preparing for disasters?**
- **What barriers make it harder for under-resourced communities to stay safe during disasters?**
 - “Barriers include lack of financial resources, limited access to transportation, language barriers, and insufficient public awareness campaigns tailored to vulnerable populations.”
 - “Having the resources to be mobile, and funds to repair damages afterwards.”
 - “lack of internet access, language issues”
 - “Awareness of potential hazards/hazardous areas. Lack of funding for necessary mitigation efforts.”
 - “NWS radar seems to overshoot our area leading to delayed weather alerts. Funding for staffing and dedicated staffing for education and community outreach. Families live on a fixed income and less likely to invest in preparedness. Reactive mentality versus a proactive one.”
 - “It is mostly because these communities are simply not geographically close to most businesses and agencies. Most resources for Catawba County are in Hickory and some in Newton. The smaller towns are more rural with most of the land being farmland or forests.”
- **What other things besides money and the usual support resources can we use to make communities more prepared against natural disasters?**
 - “More participation with faith-based outreach and responder participation in few communities”
 - “Leveraging local community organizations, faith-based groups, and volunteer networks can enhance preparedness. Establishing partnerships with businesses for resource donations and creating community resilience workshops are also beneficial.”
 - “Ensuring infrastructure repair and replacement is prioritized equally.”
 - “Work with churches and Catawba County United Way partnerships”
 - “Flood water preparedness and a solid law enforcement team.”
- **What issues do we need to consider when planning for disasters, preparing for support, and distributing resources in our area?**

● Yes ~58%
● No ~42%



- How can we get everyone in the community involved in disaster planning?

- “Strategies include organizing community meetings, utilizing social media and local media outlets for outreach, involving local leaders and influencers, and creating educational programs in schools to raise awareness from a young age.”
- “Effective public outreach, specifically targeting community groups.”

5.4. Conclusions on Local Capability

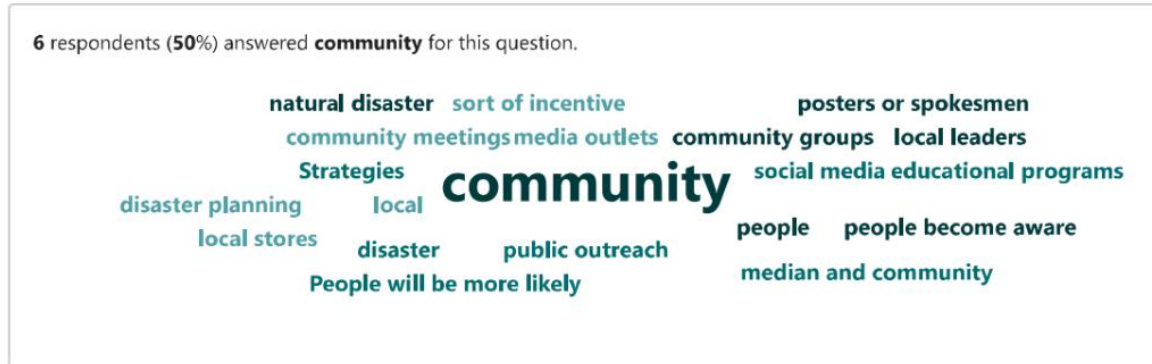


Figure 5-2: Example of a word cloud from the social equity questionnaire results. (*More results from the questionnaire can be found in Appendix K.*)

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 7; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their mitigation actions.

Where possible, the local government should implement the identified mitigation actions through existing plans and policies that already have support from the community and policy makers. For instance, a Community Wildfire Protection Plan identifies a community’s priorities for wildfire fuel reduction projects. A capital improvements program outlines a jurisdiction’s spending plan for capital projects that support existing and future developments, such as roads, water and sewer systems. Include mitigation projects in the capital improvements plan, such as strengthening at-risk critical facilities or acquiring open space in known hazard areas. Other tools for carrying out mitigation actions could include staff work plans, permitting procedures, job descriptions and training.

Section 6. Mitigation Strategy

The Mitigation Strategy section provides the blueprint for the participating jurisdictions in the Plan Area to follow to become less vulnerable to the negative effects of the natural hazards identified and addressed in this Plan. It is based on the consensus of the Hazard Mitigation Planning Committee (HMPC) and the Risk Assessment and Capability Assessment findings and conclusions. It consists of the following five subsections:

- 6.1 Overview
- 6.2 Mitigation Goals
- 6.3 Identification and Analysis of Mitigation Techniques
- 6.4 Selection of Mitigation Techniques for the Plan Area
- 6.5 Plan Update Requirement

6.1. Overview

The intent of the Mitigation Strategy is to provide the Plan Area with overall goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques deemed available to meet those goals and reduce the impact of identified hazards. The HMPC identified and analyzed 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. It is designed to be comprehensive, strategic, and functional in nature:

- In being comprehensive, the development of the Mitigation Strategy included a thorough review of all-natural hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high-risk hazards, but also to help the Plan Area achieve compatible economic, environmental, and social goals.
- In being strategic, the development of the Mitigation 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 included the identification of mitigation goals. Mitigation goals represent broad statements achieved through implementing 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), as well as 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 the 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 Plan Area (found in Section 7: Mitigation Action Plans). Each County and participating jurisdiction has its own Mitigation Action Plans (MAP) that reflect the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional action plan and is considered the most essential outcome of the mitigation planning process. A significant amount of time and effort was applied to this step in the process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for the plan counties and incorporated municipalities 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 the 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 area Hazard Mitigation Plan.

In preparing each Mitigation Action Plans for the Plan Area, 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 planning area. Prioritization of the proposed mitigation actions was based on the factors outlined in subsection 6.1.1.

6.2. Mitigation Action Prioritization

The priority for each mitigation action was determined by the participating jurisdiction by identifying each action as high, moderate, or low priority. To make this decision, local government officials reviewed and considered the findings of the Risk Assessment and Capability Assessment. Other considerations included each individual mitigation action's effect 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). Benefits include losses avoided and population protected from injury and loss of life.

- The point of contact for each county helped coordinate the prioritization process by reviewing each action and working with the lead agency/department responsible to determine a priority for each action. Actions were classified as high, moderate, or low priority by the participating jurisdiction officials. Only a general cost/benefit review was considered through the process of selecting and prioritizing mitigation actions. Mitigation actions with "high" priority were determined to be the most cost

effective and most compatible with the participating jurisdictions’ unique needs. Actions with a “moderate” priority were determined to be cost-effective and compatible with jurisdictional needs but may be more challenging to complete administratively or fiscally than “high” priority actions. Actions with a “low” priority were determined to be important community needs, but the community likely identified several potential challenges in terms of implementation (e.g. lack of funding, technical obstacles). A more detailed cost/benefit analysis will be applied to projects prior to the application for or obligation of funding, as appropriate.

The HMPC deemed that there were no changes in priorities since the last approval of the mitigation plan as of September 15, 2024. However, this is subject to change in the future in response to the impacts of Hurricane Helene on the planning area which occurred after input from the HMPC was included in the plan update.

6.3. Mitigation Goals

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 Plan area counties and participating municipalities have developed four goal statements for local hazard mitigation planning in the Plan Area. These goals are presented in Table 6-1.

Each goal, purposefully broad in nature, establishes the parameters used to review and update existing mitigation actions and aids in formulating new ones. The consistent implementation of mitigation actions over time will ensure that these mitigation goals are achieved.

Table 6-1: Regional Mitigation Goals

GOAL #1	Encourage conservation of natural environments including forests, surface waters, wetlands, floodplains, and stream corridors
GOAL #2	Evaluate and revise existing and/or create new plans, policies, procedures, regulations and ordinances that will help reduce the damaging effects of natural hazards through effective mitigation
GOAL #3	Increase capabilities to support and implement effective mitigation measures
GOAL #4	Increase public awareness of hazard mitigation and hazard risk

6.4. Identification and Analysis of Mitigation Techniques

In formulating the Mitigation Strategy for the Plan Area, a wide and comprehensive range of activities were considered to help achieve the established mitigation goals, in addition to addressing any specific hazard concerns. These activities were discussed during the HMPC meetings. In general, all activities considered by the planning committee can be classified under one of the following four broad categories of mitigation techniques: local plans and regulations, structure and infrastructure projects, natural systems protection, and education and awareness programs. These are described in detail below.

Appendix M contains the range of mitigation actions that jurisdictions were to consider.

6.5. Local Plans and Regulations

Mitigation actions that fall under this category include government authorities, policies, or codes that influence the way land, and buildings are developed and built. Examples of these types of actions include:

- Comprehensive plans
- Land use ordinances
- Subdivision regulations
- Development review
- NFIP Community Rating System
- Capital improvement programs
- Open space preservation
- Stormwater management regulations and master plans

6.6. Structure and Infrastructure Projects

Mitigation actions that fall under this category involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards. Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance (HMA) program. Examples of these types of actions include:

- Acquisitions and elevations of structures in flood-prone areas
- Utility undergrounding
- Structural retrofits
- Floodwalls and retaining walls
- Detention and retention structures
- Culverts
- Safe rooms

6.7. Natural Systems Protection

Mitigation actions that fall under this category minimize damage and losses and preserve or restore the functions of natural systems. Examples of these types of actions include:

- Sediment and erosion control
- Stream corridor restoration
- Forest management
- Conservation easements
- Wetland restoration and preservation

6.8. Education and Awareness Programs

Mitigation actions that fall under this category inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as Storm Ready or Fire wise communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions. Examples of these types of actions include:

- Radio or television spots
- Websites with maps and information
- Real estate disclosure
- Presentations to school groups or neighborhood organizations
- Mailings to residents in hazard-prone areas
- StormReady
- Firewise

6.9. Other Types of Actions

Participating jurisdictions may wish to include other types of actions in their Mitigation Action Plans that do not fit into one of the categories listed above. In some cases, these may not be viewed as pure examples of mitigation, but they may be related in ways that make sense to the local government adopting the actions. Examples of these types of actions include:

- Warning systems
- Communications enhancements
- Emergency response training and exercises
- Evacuation management
- Sandbagging for flood protection
- Installing temporary shutters for immediate wind protection
- Other forms of emergency services

6.10. Selection of Mitigation Techniques for the Plan Area

To determine the most appropriate mitigation techniques for the jurisdictions in the Plan Area, the HMPC thoroughly reviewed and considered the findings of the Risk Assessment and Capability 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).

6.11. Plan Update Requirement

In keeping with FEMA requirements for plan updates, the mitigation actions identified in the previous plan were evaluated to determine their current implementation status. Updates on the implementation status of each existing mitigation action are provided as part of the Mitigation Action Plans found in Section 7. Information from the previous plan has not yet been included in other planning mechanisms for the jurisdictions.

Section 8. Plan Maintenance Procedures

The *Plan Maintenance Procedures* section discusses how the *Mitigation Strategy* and *Mitigation Action Plans* will be implemented by participating jurisdictions and how the overall Regional Hazard Mitigation Plan will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in the hazard mitigation planning process. It consists of the following three subsections:

- 8.1 Implementation
- 8.2 Monitoring, Evaluation, and Enhancement
- 8.3 Continued Public Involvement¹

Plan Maintenance Step	When	How	Who
Monitoring	Twice per year.	Get status updates on mitigation actions, compile progress reports and identify mid-course corrections.	Emergency Management Director
Evaluating	Once a year or after a disaster event.	Use a standard form to review how the plan has been carried out so far and record lessons learned.	Emergency Management Director, Lead Jurisdiction Planning Department Manager
Updating	Every 5 years, or after a disaster event.	Review the plan and update it as necessary. This may mean hiring a contractor to perform a more in-depth update process.	Emergency Management Director, Lead Jurisdiction Planning Department Manager

Figure 8-1: Plan maintenance procedures recommended by the FEMA local mitigation handbook

8.1. Implementation

Each jurisdiction participating in this Plan is responsible for implementing specific mitigation actions as prescribed in their locally adopted *Mitigation Action Plan* (Section 7). In each Mitigation Action Plan, every proposed action is assigned to a specific local department or agency to assign responsibility and accountability and increase the likelihood of subsequent implementation. This approach enables individual jurisdictions to update their own unique

¹ Federal Emergency Management Agency [FEMA]. (2023). Local Mitigation Planning Handbook. In FEMA.gov (pp. i–ii). https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-handbook_052023.pdf

mitigation action list as needed without altering the broader focus of the regional Plan. The separate adoption of locally specific actions also ensures that each jurisdiction is not held responsible for the monitoring and implementation of actions belonging to other jurisdictions involved in the planning process.

In addition to the assignment of a local lead department or agency, an implementation period or a specific implementation date or window has been assigned to each mitigation action to help assess whether actions are being implemented in a timely fashion. The jurisdictions present within the Plan Area 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*.

It will be the responsibility of each participating jurisdiction to determine additional implementation procedures beyond those listed within their *Mitigation Action Plan*. This includes integrating the requirements of the Regional Hazard Mitigation Plan into other local planning documents, processes, or mechanisms such as comprehensive or capital improvement plans, when appropriate. The members of the Hazard Mitigation Planning Committee (HMPC) will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Regional Hazard Mitigation Plan and will not contribute to increased hazard vulnerability in the Plan Area. Opportunities to integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the HMPC and through the five-year review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Regional Hazard Mitigation Plan is deemed by the HMPC to be the most effective and appropriate method to implement local hazard mitigation actions currently.

The Plan Area Hazard Mitigation Plan will be highlighted whenever possible in Annual Reports prepared by each county and included in departmental, or agency reports as deemed appropriate. In addition, each municipal jurisdiction will seek to implement this plan's goals and strategies by incorporating the recommendations into annual action plans adopted by their respective City or Town Councils. This plan will be incorporated by reference into other planning mechanisms whenever appropriate.

8.2. Monitoring, Evaluation, and Enhancement

The agencies responsible for monitoring this Plan are the Alexander, Burke, Caldwell and Catawba County Emergency Management Departments. Priorities have not changed since the plan was previously approved. Periodic revisions and updates of the Unifour Regional Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, considering 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 each jurisdiction's individual Mitigation Action Plan.

The HMPC will continue to meet regularly, as determined by the Alexander, Burke, Caldwell and Catawba County Emergency Management Departments. These regular meetings will take place in the fall of each year so that sufficient time is available to prepare public outreach messages and assess the status of any mitigation actions relevant to the upcoming severe seasonal spring weather and the start of hurricane season. Meetings will also be convened as necessary following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed by the participating jurisdictions.

County and local staff of each participating jurisdiction will also continue to attend training workshops sponsored by the North Carolina Division of Emergency Management or others as appropriate to keep up to date with any changing guidance or planning requirements and to communicate that information to other representatives of participating jurisdictions.

As part of this monitoring, evaluation, and enhancement process, each participating jurisdiction will be expected to provide an annual status update to Caldwell County for their respective Mitigation Action Plans to evaluate the Plan's implementation effectiveness. This will ensure that the Plan is continuously maintained and updated to reflect changing conditions and needs within the Region. If determined appropriate or as requested, an annual report on the Plan will be developed and presented to local governing bodies of participating jurisdictions to report progress on the actions identified in the Plan and to provide information on the latest legislative requirements and/or changes to those requirements.

8.2.1. Five (5) Year Plan Review

The Plan will be reviewed by the HMPC every five years to determine whether there have been any significant changes in the Plan Area that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, the 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 will be reviewed by the HMPC every five years to determine whether there have been any significant changes in the Plan Area that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, the 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 community officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. The lead agency will be responsible for reconvening the HMPC and conducting the five-year review.

During the five-year plan review process, the following questions will be considered as *criteria* for **evaluating** and **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 the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures outlined herein. Upon completion of the review and update/amendment process, the Plan Area Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at the North Carolina Division of Emergency Management for final review and approval in coordination with the Federal Emergency Management Agency.

8.2.2. Disaster Declaration

Following a disaster declaration, the Plan will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. The Lead Agencies will be responsible for reconvening the HMPC and ensuring appropriate stakeholders are invited to participate in the plan revision and update process after declared disaster events.

8.2.3. Reporting Procedures

The results of the five-year review will be summarized by the HMPC in the relevant sections of the updated plan. This includes: a comprehensive description of the plan update process including an evaluation of planning process (Section 2); any updates to the planning area profile (Section 3); any notable revisions or updates to the risk assessment (Section 4) or capability assessment (Section 5); updated mitigation goals and consideration of mitigation action alternatives where necessary (Section 6); status updates on previously adopted mitigation action plans, including the identification of reasons for delays or obstacles to their implementation, as well as the identification of newly proposed mitigation actions (Section 7); and revisions or updates to plan maintenance procedures (Section 8).

Any necessary revisions or changes to the countywide Plan elements must follow the monitoring, evaluation, and enhancement procedures outlined herein. For changes and updates to the individual *Mitigation Action Plan* appropriate local designees will assign responsibility for the completion of the task.

To assist with the continued engagement of the jurisdiction with HMP implementation and mitigation action progress, the Plan Incorporation Worksheet provides an incorporation and

monitoring tool to keep track of plan progress, implementation, review periods, progress updates, and public review periods to document changes to the capabilities of each jurisdiction in regard to planning. This Plan Incorporation and Monitoring Tool is in Appendix E.

8.3. Continued Public Involvement

Public participation is an integral component of the mitigation planning process and will continue to be essential as this Plan evolves and is updated over time.

The most appropriate and meaningful opportunities for the public to be involved in the maintenance and implementation of the Unifour Regional Hazard Mitigation Plan is during the five-year plan review process as described earlier in this section. As demonstrated in Section 2: *Planning Process*, the Unifour Region and its participating jurisdictions have been extremely ambitious in gaining widespread public involvement during the five-year plan review process through multiple methods. While the five-year plan review process represents the greatest opportunity for such involvement, other efforts to involve the public in the maintenance, evaluation, and revision process will continue to be made as necessary. These efforts may include:

- Advertising meetings of the Hazard Mitigation Planning Committee in the local newspaper, public bulletin boards and/or City and County office buildings;
- Designating willing citizens and private sector representatives as official members of the Hazard Mitigation Planning Committee;
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place;
- Utilizing City and County Web sites to advertise any maintenance and/or periodic review activities taking place; and
- Maintaining copies of the Plan in public libraries or other appropriate venues;
- Posting the Annual Progress Reports on the Plan to City, County and Town Web sites;
- Heavy publicity of the plan and potential ways for the public to be involved after each major event, tailored to the event that has just happened;
- Planned activities during Severe Weather Preparedness Week (or similar events), such as sending brief press releases that tie recent hazard occurrences with information from the hazard mitigation plan;
- Keeping websites, social media outlets, etc. updated and interactive;
- Drafting articles for the local community newspapers/newsletters;
- Holding annual public meetings;

Section 7. Mitigation Actions

7.1. Overview

The *Mitigation Action Plans* section includes *Mitigation Action Plans* (MAP) for each participating jurisdiction. As stated in Section 6, each County and participating jurisdiction has its own MAP that reflects the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional action plan and is considered the most essential outcome of the mitigation planning process.

The participating jurisdictions are listed below in the order that the MAPs are included in this section.

Alexander County

- Town of Taylorsville

Burke County

- City of Morganton
- Town of Connelly Springs
- Town of Drexel
- Town of Glen Alpine
- Town of Hildebran
- Town of Rutherford College
- Town of Valdese

Caldwell County

- City of Lenoir
- Town of Cahah's Mountain
- Town of Gamewell
- Town of Granite Falls
- Town of Hudson
- Town of Rhodhiss
- Town of Sawmills
- Village of Cedar Rock

Catawba County

- City of Claremont

- City of Conover
- City of Hickory
- City of Newton
- Town of Brookford
- Town of Catawba
- Town of Long View
- Town of Maiden

The actions were and will be identified, prioritized, implemented, and administered by each local jurisdiction. Prioritization includes emphasis on how much benefits are maximized according to the cost-benefit review of the proposed projects and their associated costs. The actions in the following table have been ranked based on a cost-benefit review conducted by the planning team through the planning process. Each action has been provided a priority of low, medium, or high based on this review.

The Mitigation Action Plan is organized by mitigation strategy category (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, or Public Information 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.
- **Potential Funding Sources**—Local, State, or Federal sources of funds are noted here, where applicable.
- **Cost Estimate**—High (greater than \$50,000) Medium (between \$20,000 & \$50,000) Low (less than \$20,000), Minimal (Generally only staff time is required), To be determined (cost varies or is unknown)
- **Implementation Schedule**—Date or time frame for when the action should be complete, and More information is provided when possible. This includes monthly, annually, continually (when reviewed as needed), or periodic review intervals as specified.
 - **All Hazards Include:** River Flooding, Levee Failure, Wildfire, Tornado, Earthquake, Landslide, Snow, Dam Failure, Hail, Drought, Hurricane Winds, Ice, Thunderstorm Winds, Erosion, and Sinkholes.
- **Implementation Status (2024)**—Indication of completion, progress, deferment, or no change since the previous plan. If the action **is new, that will be noted here:**

**For all acronyms and abbreviations please see abbreviation definitions located at the plan introduction*

Table 7-1: Mitigation Action Status Definitions

Mitigation Action Status	Definition
To Be Continued:	Continuing action or program; requires annual or periodic maintenance to continue the action
Complete:	No further action required for mitigation action to be implemented or used
In Progress:	Action is currently being implemented
Deferred:	Action will be reevaluated later
Deleted:	The Jurisdiction will no longer utilize the action as a viable mitigation action that can be implemented.
New	The mitigation action has just been added to the 2024 HMP Update
Priority	Definition
High	Highly cost-effective, administratively feasible and politically feasible strategies that could be implemented in 2 fiscal years and be continued.
Medium	Strategies that have at least two of the following characteristics (but not all three) and could be implemented in 3 fiscal years: Highly cost-effective; or administratively feasible, given current levels of staffing and resources; or are politically popular and supportable given the current environment.
Low	Strategies that have one of the following characteristics and could be implemented in the next five years): Highly cost-effective; or administratively feasible, given current levels of staffing and resources; or are politically popular and supportable given the current environment.

7.2. Alexander County

Alexander County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Conduct outreach to the public regarding Alexander County's Community Alert System to educate them on how to obtain information both pre- and post-disaster events.	Public Information and Awareness	All Hazards	Alexander County 911 Director and EM Coordinator	Minimal	Alexander County General Fund	2 Years	High	To Be Continued	Completed and continual work with County PIO with messaging on county webpage and social media. Creation of Local Information Team with county and school system PIO to increase unified messaging. This is maintained quarterly.
2	Improve information sharing with Duke Energy regarding its operational procedures for the movement of water through its hydro-electric systems on the Catawba River.	Public Information and Awareness	Riverine Flooding	Alexander County Emergency Management	Minimal	Alexander County General Fund	5 Years	High	To Be Continued	Maintained monthly and continue to meet once a year for training and tabletop exercises. The County has a great working relationship with staff and communicates monthly. Increased communication with Duke Liaison during storm events.
3	Establish a protocol for monitoring the tail race areas below the Catawba River dams during high water events to ensure security of the area and limiting public access.	Prevention	Riverine Flooding	Alexander County Emergency Management	Minimal	Alexander County General Fund	5 Years	High	Complete	Data sharing webpage established by Duke Energy for real time information and alerts to impacted areas.
4	Install generator transfer switch connections during the construction of new public facilities (schools, fire stations, County buildings, etc.).	Structural Projects	All Hazards	Alexander County Public Works Director and Emergency	To Be Determined	Alexander County General Fund; DHS, EMPG,	5 Years	High	To Be Continued	Recently installed Generator on County EOC. Transfer switches installed on the Board of Elections. Generator for Cold storage installed on Health Department. County has a

Section 7: Mitigation Actions

Alexander County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
				Management Coordinator		HMGP, BRIC				deployable trailer mounted generator and has added distribution box for generator to capital improvement planning. Reviewed annually during CIP.
5	Upgrade centralized coordinated permitting process, including effective filing/permitting system to ensure compliance with floodplain regulations.	Prevention	Riverine Flooding	Alexander County Planning Director and Alexander County Chief Code Enforcement Officer	Minimal	Local staff time	1 Year	Moderate	To Be Continued	Upgrading to an online permitting software utilized by all inspection agencies which will include flood plain permitting. Pending updates in CY 2025.
6	Upgrade and maintain Early Warning System.	Emergency Warning Systems	All Hazards	Alexander County 911 Director and EM Coordinator	Minimal	Local; state; federal; private (Duke Energy) grants	1 Year	High	To Be Continued	Hyper Reach is used as an early warning system for Alexander County. Alexander County can send IPAWS messaging through Hyper Reach. Use of social media, Website, and Apps to share information with citizens along with the radio station. Formation of Local Information Team to assist with unified messaging throughout the county. Maintained quarterly.
7	Establish a program for evaluating and improving critical services (roads, bridges, water, sewer, electricity, etc.) and critical facilities (fire, rescue, medical, etc.) to	Utility Improvements	All Hazards	Alexander County Planning Director and Alexander County Emergency	Minimal	Local; state; federal grants	1 Year	Moderate	To Be Continued	Critical Infrastructure is listed in Comprehensive Plan 2045. They are also listed in the Emergency Operations Plan and maintained in the 911 Center. Planning to add EMS, warehouse space, and new

Alexander County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	reduce risk to natural hazards.			Management Coordinator						courthouse pending funding availability. Reviewed annually.
8	Prepare countywide stormwater management plan covering the Catawba River basin.	Prevention	Riverine Flooding	Alexander County Planning Director	Minimal	Local; state grants	1 Year	Moderate	To Be Continued	Pending the hiring of an engineer to fully adopt and implement changes in the Land Development Code. Reviewed annually
9	Prepare development plan for relocating public infrastructure out of hazardous areas.	Prevention	All Hazards	Alexander County Emergency Management, Alexander County Public Works Director	Minimal	Local staff time	1 Year	Low	In Progress	Comprehensive Plan was updated in April 2024 and Land Use Development was updated in May 2024 addressing mitigation actions moving forward. Currently there are no plans to relocate infrastructure out of this area. Reviewed annually.
10	Improve Emergency Operations Plan, which outlines warning and evacuation procedures for critical facilities, instructions for getting persons out of flood-prone or isolated areas, and protocols for controlling vehicles on evacuation routes.	Emergency Services	All Hazards	Alexander County Emergency Management	Minimal	Local, State, Federal	1 Year	High	To Be Continued	Emergency Operations Plan is going through complete rewrite. Expected completion will be at the end of CY 2024. Evacuations will be covered in the new rewrite. Pending CY 2024.
11	Review/update Flood Damage Prevention Ordinance.	Prevention	Riverine Flooding	Alexander County Planning Director	Minimal	Local staff time	1 Year	Moderate	To Be Continued	Expected to have Land Development Code which addresses this area which should be updated by September 2024. Maintained annually.

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Alexander County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
12	Adopt zoning and subdivision regulations in floodplain, steep slope, and wildfire areas.	Prevention	Riverine Flooding; Wildfire; Landslide	Alexander County Planning Director	Minimal	Local staff time	1 Year	High	Complete	The Land Use Development Code covering this area was adopted in May 2024.
13	Revise/update regulatory floodplain maps.	Public Information and Awareness	Riverine Flooding	Alexander County Planning Director	Minimal	Local, State, Federal	1 Year	Moderate	To Be Continued	The County adopts and utilizes current NC Floodplain Mapping Program data. Updates coincide with state map updates. Reviewed annually.
14	Acquire federal funds to purchase destroyed or substantially damaged properties and relocate households.	Property Protection	All Hazards	Alexander County Planning Director, Alexander County EM Coordinator, and Alexander County Administration.	Minimal	State; Federal Grants	5 Years	High	To Be Continued	No properties were purchased, and no households were relocated. Staffing levels and funding do not allow a designated individual for these projects.
15	Complete CRS application. Ensure participation in the NFIP.	Public Information and Awareness	Riverine Flooding	Alexander County Planning Director and Alexander County Emergency Management Coordinator	Minimal	Local staff time	1 Year	Moderate	To Be Continued	Requires continuous monitoring. All development applications reviewed for floodplain compliance prior to issuance. Floodplain areas identified on applicable zoning permits. Alexander County does not intend to apply for CRS.
16	Update 1993 Comprehensive Land Use Plan.	Prevention	All Hazards	Alexander County Planning Director	Minimal	Local staff time	1 Year	High	To Be Continued	2045 Comprehensive Plan was updated and approved in April 2024. Will review annually for mitigation awareness.

Alexander County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
17	Step up centralized, coordinated permitting process including effective filing/permitting system to ensure compliance with floodplain regulations.	Prevention	Riverine Flooding	Alexander County Planning Director and Alexander County Chief Code Enforcement Officer	Minimal	Local staff time	5 Years	High	To Be Continued	Upgrading to an online permitting software utilized by all inspection agencies which will include flood plain permitting. Pending CY 2025.
18	Develop a comprehensive Capital Improvement Plan (CIP) for public facilities that steers capital projects out of hazardous areas.	Prevention	Riverine Flooding	Alexander County Administration	Minimal	Local staff time	1 Year	High	To Be Continued	CIP was discussed with the previous County Manager and started with some departments. This has been put on hold until a new County Manager is hired. Continued Annually.
19	Maintain library on retrofitting techniques. Publicize through bulletins/newsletters.	Public Information and Awareness	All Hazards	Alexander County Planning Director and Alexander County Emergency Management Coordinator	Minimal	Local staff time	Monthly	Moderate	To Be Continued	Constantly learning new techniques and best industrial standards. Building library throughout time. Reviewed monthly.
20	Continuation and expansion of E-911 Addressing Program to include all municipalities with the goal to cover entire county with one system.	Emergency Warning Systems	All Hazards	Alexander County IT Director, GIS, and 911 Director	Minimal	Local staff time	Monthly	High	To Be Continued	Requires continuous monitoring. Our addressing office and the E-911 Center update the addresses continuously when new residences and businesses are built. Before building permits are issued, a 911 address must be given for the new

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Alexander County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
										construction project. Maintained Monthly
21	Drainage system management—prepare countywide storm water management plan covering the Catawba River basin.	Prevention	Riverine Flooding	Alexander County Planning Director	High	Local; state	5 Years	High	To Be Continued	Pending the hiring of an engineer to fully adopt and implement changes in the Land Development Code.
22	Acquisition of properties susceptible to flood damage and wildland fires.	Property Protection	Riverine Flooding; Wildfire	Alexander County Planning Director and Alexander County Emergency Management Coordinator	Minimal	Local; state; federal grants	5 Years	Moderate	To Be Continued	No property acquisitions were conducted within the past 5 Years. No federal grant funds were applied for or received. Reviewed annually.
23	Consider adopting and enforcing land use ordinances in inundation zones	Prevention	Dam Failure; Riverine Flooding	Alexander County Planning Director	Minimal	Local; state; federal grants	5 Years	Moderate	New Action	New Action

7.3. Town of Taylorsville

Town of Taylorsville Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Maintain street rights of way and ditches to prevent damage to streets and property in a natural hazard.	Prevention	Riverine Flooding; Thunderstorm Winds; Hail; Hurricane Winds; Tornado	Town of Taylorsville Public Works	High	Power bill revenue	1 Year	High	In Progress	Work has been done to widen streets and improve stormwater draining when funding permits. This is reviewed annually and when funding permits.
2	Improve drainage on Muddy Creek.	Structure and Infrastructure Projects	Riverine Floodings; Thunderstorm Winds; Hurricane Winds	Town of Taylorsville; NCDOT; Alexander County	Medium	State / Federal Grants	5 Years	Moderate	Complete	A new culvert has been installed to improve drainage on Muddy Creek
3	Assist Alexander County with all mitigation actions that have a countywide impact and that benefit the Town of Taylorsville.	Prevention	All Hazards	Town of Taylorsville Administration	Minimal	Local, State, Federal Grants	5 Years	Low	Complete	The Land Use Development Code covering this area was adopted in May 2024.
4	In coordination with Alexander County, conduct outreach to the public regarding Alexander County's Community Alert System to educate them on how to obtain information both pre- and post- disaster events.	Public Information and Awareness	All Hazards	Town of Taylorsville Administration	Minimal	Alexander County General Fund	1 Year	High	To Be Continued	Maintained Quarterly: The Town of Taylorsville is Working with Alexander County Emergency Management to share the Hyper Reach Alert and Warning System.
5	To establish, where feasible, additional emergency response forces, by at least 10%,	Emergency Services	Riverine Flooding; Hurricane Winds;	Town of Taylorsville Administration	Minimal	Alexander County General Fund and Increased	1 Year	Low	To Be Continued	Maintained Annually: Pay increases for TPD and Taylorsville FD were issued to assist with

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Town of Taylorsville Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	that are trained, equipped, and prepared to respond to a variety of emergency and disaster situations. This concept is concurred by Alexander County and the Town of Taylorsville.		Thunderstorm Winds; Hail; Tornado; Wildfire; Drought; Snow; Ice			Property Taxes with Development				staffing issues. Funding continues for Alexander Rescue Squad. TPD continues to train and maintain credentials for law enforcement.
6	Encouraging new construction to be 1 or more feet above the base flood elevation and follow NFIP criteria.	Prevention	Riverine Flooding	Town of Taylorsville Administration	Minimal	Town of Taylorsville	5 Years	Low	New Action	New Action

7.4. Burke County

Burke County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Review/update Flood Damage Prevention Ordinance.	Prevention	Riverine Flooding	Burke County Planning & Development Department; Burke County Building Inspections Department; Burke County Emergency Services Department	Minimal	Local Staff Time	1 Year	Moderate	To Be Continued	Reviewed Annually: Completed with continued monitoring on an annual basis based on hazard information changes.
2	Revise/Update regulatory floodplain maps of any known flood areas.	Prevention	Riverine Flooding	Burke County Planning & Development Department; Burke County Land Records/GIS Department	Minimal	Local, State, Federal Grants	1 Year	Moderate	To Be Continued	Continued Monitoring: Completed with continued monitoring and the County is waiting on new maps that may be released in 2025 for further review.
3	Adopt zoning and subdivision regulations in floodplain, steep slope, and wildfire hazard areas.	Prevention	All Hazards	Burke County Planning & Development Department; Burke County Emergency Services Department; Burke County Building Inspections Department	Minimal	Local Staff Time	1 Year	High	To Be Continued	Reviewed Annually: Completed and reviewed annually after the floodplain ordinance was adopted. All development projects are reviewed for floodplain compliance prior to development.
4	Update Comprehensive Use Plan	Prevention	All Hazards	Burke County Planning & Development Department	Minimal	Local Staff Time	1 Year	High	To Be Continued	Reviewed Annually: The Comprehensive Land Use Plan was reviewed, revised, and adopted in 2022. The Plan will be

Section 7: Mitigation Actions

Burke County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
										reviewed each year and will be updated every 5 years.
5	Step up centralized coordinated permitting process, including effective filing/permitting system to ensure compliance with floodplain regulations.	Prevention	Riverine Flooding	Burke County Emergency Services Department; Burke County Planning & Development Department; Burke County Building Inspections Department; Burke County Environmental Health Department	Minimal	Local Staff Time	1 Year	Moderate	To Be Continued	Reviewed Annually: Permitting system is now computerized with process flow and undergoes annual reviews. The permitting process has been reviewed annually for the last 5 years.
6	Upgrade and maintain Early Warning System.	Prevention	All Hazards	Burke County Emergency Services Department	Minimal	Local, State, Federal, and Private (Duke Energy) Grants	5 Years	High	To Be Continued	Continued Monitoring: Burke County utilizes Hyper-Reach, Reverse E-911, IPaws, and Smart 911 notifications to notify residents of potentially hazardous conditions and uses the local radio station for National Weather Service severe weather.
7	Establish a program for evaluating and improving critical services (roads, bridges, water, sewer, electricity, etc.) and critical facilities (fire, rescue,	Prevention	All Hazards	Burke County Emergency Services Department; Burke County Planning & Development	Minimal	Local, State, and Federal Grants	1 Year	Moderate	To Be Continued	Reviewed Annually: Burke County continues to coordinate with agencies to review and improve critical services and critical facilities to reduce

Burke County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	medical, etc.) to reduce risk to natural hazards.			Department; NCDOT						the risk to natural hazards.
8	Prepare countywide stormwater management plan covering the Catawba River basin.	Prevention	Riverine Flooding	Burke County Planning & Development Department	Minimal	Local, State Grants	5 Years	Moderate	In Progress	Burke County does not have a storm water manager and work with DEQ as needed to manage stormwater in Burke County.
9	Prepare development plan for relocating public infrastructure out of hazardous areas.	Prevention	All Hazards	Burke County Planning & Development Department; Burke County Building Inspections Department	Minimal	Local Staff Time	5 Years	Low	To Be Continued	A BRIC grant awarded in 2024 to update a pumping station within Burke County to reduce flooding.
10	Improve Hazardous Warning and Response Plan, which outlines warning and evacuation procedures for critical facilities, instructions for getting persons out of flood-prone or isolated areas, and protocols for controlling vehicles on evacuation routes.	Prevention	All Hazards	Burke County Planning & Development Department; Burke County Emergency Services Department	Minimal	Local, State, and Federal Grants	1 Year	High	To Be Continued	Reviewed annually: Burke County continues to review and enhancing outreach to citizens and essential personnel about the Hazardous Warning and Response Plan that was updated in 2025.
11	Review/update Flood Damage Prevention Ordinance limiting development in the floodway according to NFIP criteria.	Prevention	Riverine Flooding	Burke County Planning & Development Department; Burke County Building Inspections Department	Minimal	Local Staff Time	1 Year	Moderate	To Be Continued	Reviewed annually: New maps will be reviewed in 2025, and the Flood Damage Prevention Ordinance will be reviewed as needed.

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Burke County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
12	Adopt zoning and subdivision regulations in floodplain, steep slope, and wildfire areas.	Prevention	All Hazards	Burke County Planning & Development Department	Minimal	Local Staff Time	1 Year	High	To Be Continued	Reviewed annually: Burke County reviews zoning and subdivision regulations annually.
13	Revise/update regulatory floodplain maps according to NFIP regulations.	Prevention	Riverine Flooding	Burke County Planning & Development Department; Burke County Land Records/GIS Department	Minimal	Local, State, and Federal Grants	1 Year	Moderate	To Be Continued	Reviewed as needed: Burke County continues to review new maps and will update regulatory maps in 2025 if needed.
14	Acquire federal funds to purchase destroyed or substantially damaged properties and relocate households.	Structure and Infrastructure Projects	All Hazards	Burke County Emergency Services Department; Burke County Planning & Development Department	Minimal	State and Federal Grants	5 Years	High	Deferred	No damage has occurred since 2019 that would qualify for federal funding.
15	CRS application. Ensure participation in the NFIP	Prevention	Riverine Flooding	Burke County Emergency Services Department	Minimal	Local Staff Time	1 Year	Moderate	To Be Continued	Continuous monitoring and reviewing all applications.
16	Update 1993 Comprehensive Land Use Plan.	Prevention	All Hazards	Burke County Planning & Development Department	Minimal	Local Staff Time	1 Year	High	To Be Continued	Reviewed as needed: The Comprehensive Land Use Plan has been reviewed, revised, and adopted in 2022 with next scheduled review in 2030.
17	Develop a comprehensive Capital Improvement Plan for public facilities that steers capital projects out of hazardous areas.	Prevention	Riverine Flooding	Burke County Planning & Development Department	Minimal	Local Staff Time	5 Years	High	To Be Continued	Nothing has been built in a hazardous area since last plan update.

Burke County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
18	Maintain library on retrofitting techniques. Publicize through bulletins/newsletters.	Public Information and Awareness	All Hazards	Burke County Building Inspections Department; Burke County Emergency Services Department; Burke County Planning & Development Department	Minimal	Local, State Grants	1 Year	Moderate	To Be Continued	Continuously monitored: all documents are now digitized and will be reviewed annually
19	Continuation and expansion of E-911 Addressing Program to include all municipalities with goal to cover entire county with one system.	Prevention	All Hazards	Burke County Emergency Services Department; 911 Addressing; Burke County Land Records/GIS Department	Minimal	Local Staff Time	1 Year	High	To Be Continued	Continuously monitored: Burke County continues to continuously monitor, maintain, and update E911 addresses. E911 addresses are obtained during site review/building permit issuance.
20	Drainage system management to prepare countywide storm water management plan covering the Catawba River basin.	Prevention	Riverine Flooding	Burke County Planning & Development Department; West Piedmont Council of Governments (WPCOG)	To Be Determined	Local, State Grants	5 Years	High	Complete	Completed in 2015.
21	Acquisition of properties susceptible to flood damage and wildland fires.	Structure and Infrastructure Projects	Riverine Flooding; Wildfire	Burke County Planning & Development Department; Burke County Building Inspections Department; Burke County Emergency	Minimal	Local, State, and Federal Grants	5 Years	Moderate	To Be Continued	No damage has occurred since 2019 that would qualify for federal funding.

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Burke County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
				Services Department						
23	Consider adopting and enforcing land use ordinances in inundation zones	Prevention	Dam Failure; Riverine Flooding	Burke County Planning & Development Department	Minimal	Local; state; federal grants	5 Years	Moderate	New Action	New Action

7.5. Town of Connelly Springs

Town of Connelly Springs Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Require structures to be built in the floodplain to be constructed two feet above base flood elevation or be floodproofed to meet NFIP criteria.	Prevention	Riverine Flooding	Town of Connelly Springs Planning Board; Burke County Building Inspections Department	Minimal	Local staff time	5 Years	Low	To Be Continued	The Town contracts with Burke County for services provided by the CFM to review all development within the floodplain. No known development has occurred in the floodplain over the past five years.
2	Track rebuilding activities after severe storms and consider policies to minimize repetitive losses.	Prevention	All Hazards	Town of Connelly Springs Board of Alderman (Planning Board)	Minimal	Local staff time	5 Years	Moderate	In Progress	No severe storms have impacted the town in the past five years that would trigger this activity. Measurable progress is slow due to staff availability and funding.
3	Require floodproofing for structures not elevated two feet above base flood elevation to meet NFIP criteria.	Prevention	Riverine Flooding	Town of Connelly Springs Planning Board; Burke County Building Inspections Department	To Be Determined	Local, Federal, and State grant funded	5 Years	Low	In Progress	All development within the floodplain is reviewed by the Burke County Floodplain Manager in accordance with a Resolution of Intent adopted September 8, 2003.
4	Require/maintain FEMA elevation certificates for all new permits for buildings or improvements in the floodplain to meet NFIP criteria.	Prevention	Riverine Flooding	Town of Connelly Springs Board of Alderman (Planning Board); Burke County Building Inspections Department	Minimal	Local, Federal, and State grant funded	5 Years	Low	In Progress	No known new development has occurred in the floodplain. Will be reviewed as needed.

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Town of Connelly Springs Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
5	Receive and begin using regulatory floodplain maps.	Prevention	Riverine Flooding	Town of Connelly Springs Board of Alderman (Planning Board)	Minimal	Local, Federal, and State grant funded	5 Years	High	To Be Continued	The Town adopts and utilizes current North Carolina Floodplain Mapping Program data. Updates coincide with state map updates.
6	Review zoning and subdivision regulations to better control future development in these susceptible areas.	Prevention	Riverine Flooding	Town of Connelly Springs Board of Alderman (Planning Board)	Minimal	Local staff time	5 Years	Moderate	To Be Continued	The Town has contracted with Burke County to provide zoning and code enforcement services which has identified gaps in zoning enforcement which are currently being addressed.
7	Work in cooperation with Burke County, surrounding local governments, and state and federal agencies to maintain appropriate mitigation strategies.	Prevention	All Hazards	Town of Connelly Springs Board of Alderman (Planning Board)	To Be Determined	Local, Federal, and State grant funded	5 Years	High	To Be Continued	Town of Connelly Springs participates in interagency meetings organized by Burke County and encourages participation in projects developed at the county level to the residents such as the E-911 Addressing System and sign-up for the emergency notification system (Hyper Reach). Projects are shared with residents through town council meetings, traditional media, and community flyers. Measurable progress is slow due to staff availability and funding.

7.6. Town of Drexel (WPCOG)

Town of Drexel Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Revise and review zoning and subdivision regulations in floodplain areas to better control and limit development in floodways per NFIP criteria for future development in these hazard susceptible areas.	Prevention	Riverine Flooding	Town of Drexel Zoning Board; Town Council	Minimal	Town of Drexel General Fund	5 Years	Moderate	To Be Continued	New Subdivision Ordinance was adopted in 2014. Reviewed annually.
2	Revise and review subdivision regulations to require all perennial and intermittent streams be shown on plats.	Prevention	Riverine Flooding	Town of Drexel Zoning Board; Town Council	Minimal	Town of Drexel General Fund	5 Years	Moderate	To Be Continued	Currently required for major subdivisions. Reviewed annually.
3	In cooperation with Burke County, assist in delivering a program for evaluating and improving critical services (roads, bridges, water, sewer, electricity, etc.) and critical facilities (fire, rescue, medical, etc.) to reduce risk to natural hazards.	Prevention	All Hazards	Town of Drexel Town Council	Minimal	Local; state; federal grants	1 Year	Moderate	To Be Continued	All Critical Facilities are located at Town hall but could use improvements. More than Burke County. Reviewed annually. The whole region is taking initiative with WPCOG.
4	In cooperation with Burke County, assist (as needed) in preparing a countywide stormwater management plan.	Prevention	Riverine Flooding	Town of Drexel Town Council	Minimal	Local; state; federal grants	5 Years	Moderate	In Progress	In Progress: Works with Burke County as needed and will be reviewed annually.

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Town of Drexel Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
5	Install generator transfer switch connections during the construction of new public facilities (schools, fire stations, public buildings, etc.).	Structural Projects	All Hazards	Town of Drexel Planning and Zoning Department	To Be Determined	Local; State, Federal HMGP	5 Years	High	Deferred	Deferred. Town has not built any new public facilities.
6	Establish and maintain an early warning system to warn residents of potential natural hazards.	Emergency Services	All Hazards	Town of Drexel Planning and Zoning Department	Minimal	Town of Drexel General Fund	5 Years	Low	New Action	New Action
7	Conduct community outreach and education to inform residents about all possible natural disasters in the planning area and how to prepare for natural hazards.	Public Information and Awareness	All Hazards	Town of Drexel Planning and Zoning Department	Minimal	Town of Drexel General Fund	5 Years	Low	New Action	New Action

7.7. Town of Glen Alpine

Town of Glen Alpine Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Maintain continued compliance with NFIP and NPDES Phase 2 stormwater control compliance.	Prevention	Riverine Flooding	Town of Glen Alpine Zoning Department/Code Enforcement Officer	Low	General budget	5 Years	High	To Be Continued	Measurable progress is slow due to staff availability and funding. Will be reviewed annually.
2	Offer education in fire prevention, safety training and mitigating natural hazards to the schools and citizens focusing on talks to civic groups, children, Town citizens, and elderly adults.	Public Information and Awareness	All Hazards	Town of Glen Alpine Fire Department	Low	General budget	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. Will be reviewed annually.
3	The Planning Board reviews on an annual basis local zoning ordinances and land use plans for subdivisions, construction of new homes, and commercial development to avoid development in hazard prone areas.	Prevention	All Hazards	Town of Glen Alpine Planning Board; Zoning Officer	Low	General fund	5 Years	Moderate	To Be Continued	Measurable progress is slow due to staff availability and funding. Will be reviewed annually.
4	Continue to evaluate and conduct a detailed needs assessment of emergency services, response, and critical needs to better evaluate and identify vulnerable populations.	Emergency Services	All Hazards	Glen Alpine Fire Department; Burke County Emergency Management	Low	General budget; grants	5 Years	High	To Be Continued	Measurable progress is slow due to staff availability and funding. Will be reviewed annually.

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Town of Glen Alpine Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
5	Establish and maintain an early warning system to warn residents of potential natural hazards.	Emergency Services	All Hazard	Town of Glen Alpine; Burke County	High	General budget; grants; County Funding	5 Years	Moderate	New Action	New Action
6	Limit development in flood hazard areas per NFIP requirements.	Prevention	Riverine Flooding	Town of Glen Alpine; Burke County	Low	General budget; grants; County Funding	5 Years	Low	New Action	New Action

7.8. Town of Hildebran (WPCOG)

Town of Hildebran Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Install quick-connect emergency generator hook-ups for remaining critical facilities.	Structural Projects	All Hazards	Town of Hildebran Town Council	High	Local funds; grants	5 Years	Moderate	In Progress	Look at Municipal Complex and Town Hall. No measurable activity occurred due to funding, limited staff time.
2	Participate in public outreach on hazard mitigation both locally and regionally.	Public Information and Awareness	All Hazards	Town of Hildebran Planning Department	Low	Local funds; grants	5 Years	Moderate	To Be Continued	The Town has participated in local outreach and will continue in the future.
3	Inventory all critical facilities' capabilities and needs.	Emergency Services	All Hazards	Town of Hildebran Planning Department	Low	Local funds	2 Years	Moderate	In Progress	The WPCOG has created the CHADME tool which has inventory of Burke County infrastructure, critical facilities, and areas of concern.
4	Maintain updated database of all infrastructure.	Public Information and Awareness	All Hazards	Town of Hildebran Planning Department; Town of Hildebran Engineering Department	Low	Local funds; grants	2 Years	Moderate	Complete	The WPCOG has created a tool that highlights all these assets in one place. It is called the CHADME.
5	Manage future development in flood-prone areas per NFIP requirements.	Prevention	Riverine Flooding	Town of Hildebran Planning Department	Minimal	Local staff time	5 Years	Low	In Progress	The Town will continue to work with property owners and developers to look at the BMP for development in flood-prone areas outside of the designated floodplain. Currently no development has occurred in flood-prone or floodplain areas.

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Town of Hildebran Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
6	Establish and maintain an early warning system to warn residents of potential natural hazards.	Emergency Services	All Hazard	Town of Hildebran Planning Department	High	Local funds; grants; county funds	5 Years	Moderate	New Action	New Action
6	In cooperation with Burke County, assist in establishing a program for evaluating and improving critical services (roads, bridges, water, sewer, electricity, etc.) and critical facilities (fire, rescue, medical, etc.) to reduce risk to natural hazards.	Prevention	All Hazards	Town of Hildebran Planning Department; Town of Hildebran Engineering Department	Minimal	Local; state; federal grants	5 Years	Moderate	In Progress	The WPCOG has created the CHADME tool which has inventory of Burke County infrastructure, critical facilities, and areas of concern.
7	In cooperation with Burke County, assist (as needed) in preparing a countywide stormwater management plan.	Prevention	Riverine Flooding	Town of Hildebran Planning Department; Town of Hildebran Engineering Department	To Be Determined	Local; State grants and staff time	5 Years	Moderate	Deleted	No longer in progress.
8	Phase II Stormwater Implementation.	Prevention	Riverine Flooding	Town of Hildebran Planning Department; Town of Hildebran Engineering Department	To Be Determined	Local funds; grants	5 Years	Low	Deleted	The Town received an exemption based on population.

7.9. City of Morganton

City of Morganton Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Review/update Flood Damage Prevention Ordinance to ensure maximum protection from flood hazard events (CRS 430) and limit development in floodways per NFIP criteria.	Prevention	Riverine Flooding; Wildfire	City of Morganton Planning Commission; City Council	Minimal	Local staff time	5 Years	High	In Progress	The city is reviewing its current ordinance and the proposed State Model Ordinance and producing a final document for adoption by City Council.
2	Revise/update regulatory floodplain maps (CRS 410).	Public Information and Awareness	Riverine Flooding	City of Morganton Planning Commission	Minimal	Local and State grants; FEMA	5 Years	High	To Be Continued	One public meeting with the State and County representatives was held in Morganton for the concerned citizens. State representatives indicated it may be 2 years before state adopts current preliminary maps. Will be maintained annually.
3	Update Land Development Plan.	Prevention	Riverine Flooding	City of Morganton Planning Commission; City Council	High	Local staff time	1 Year	High	To Be Continued	Imagine Morganton 2040 Comprehensive Plan proposed to be adopted by City Council in 2024. Will be maintained annually.
4	Maintain E-911 dispatch programs to include all municipalities within the county to cover the entire county with one system.	Emergency Warning Systems	All Hazards	City of Morganton Public Safety Department; Burke County Emergency Services	High	Local; State grants	5 years	High	To Be Continued	City and local jurisdictions combined 911 dispatch through the construction of a new call center and consolidation of services. Completion and implementation were in the Fall 2024. Will be maintained annually.

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City of Morganton Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
5	Establish/Maintain coordinated Drainage System Inspection Program.	Prevention	Riverine Flooding	City of Morganton Public Works Department	Minimal	Local staff time	5 Years	High	To Be Continued	The City Public Work Department continues to maintain the drainage system. A DWI Grant was awarded to help document our assets and plan for future stormwater projects. Will be inspected annually.
6	Utilize an early warning system to ensure adequate evacuation time or awareness in case of a major hazard event.	Emergency Warning Systems	All Hazards	City of Morganton Public Safety Department; Burke County Emergency Services	Minimal	Local; State grants and staff time	5 Years	High	To Be Continued	Duke Energy maintains the early warning system for dam failures and potential hazards dealing with Lake James. Hyper-Reach is used for a reverse 911 system to notify residences of potentially hazardous conditions. A local radio station is used for National Weather Service severe weather. Will be maintained annually.
7	Establish a list of priority properties for acquisition in the event of another natural disaster.	Property Protection	Riverine Flooding	City of Morganton Development & Design Department, Public Information Office	Minimal	Local Federal and State Grants	5 Years	High	To Be Continued	The City continues to identify and acquire high-risk properties as funding is made available to eliminate catastrophic loss of life and damage to property. Most of these properties are incorporated into parks and greenways within flood-prone areas Measurable progress is slow due to staff availability and funding. Will be maintained annually.

City of Morganton Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
8	Evaluate flood or access problems for critical facilities; develop recommendations for protecting critical parts (e.g., police and fire command centers); and identify alternate command posts, if necessary.	Prevention	Riverine Flooding	City of Morganton Public Safety Department	Minimal	Local staff time	5 Years	High	Complete	The City's budget for 2024 includes funding for asset management plans for water and wastewater that will identify areas of concern for these critical facilities. The city continually designs and constructs upgrades to the City Water and wastewater systems. Generator Project completed and other projects to improve/upgrade the Water and Sewer Systems continue.
9	Develop and implement a hazard awareness program to include elevation Certificates, FIRM Data, Bulletin on property protection measures and flood insurance, and other activities under CRS 310/320/330/340/440.	Public Information and Awareness	Riverine Flooding	City of Morganton Development & Design Department	Minimal	Local staff time	5 Years	High	To Be Continued	The city offers access to online Flood Elevation Certificates, FIRMs, and other flood mapping protection services through NCEM. City staff consults with property owners and developers as to how to access this information and obtain guidance on a routine basis. City staff will prepare the noted bulletin for information. Will be maintained annually.
10	Develop a tracking system to evaluate progress and revise mitigation activities, as necessary.	Public Information and Awareness	All Hazards	City of Morganton Public Information Office	Minimal	Local staff time	5 Years	High	To Be Continued	Each year the City evaluates and improves upon the information it provides to the public regarding mitigation

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City of Morganton Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
										activities. Weekly department head assessment meetings and interdepartmental review of the information provided generates routine updates through the City's website, CoMPAS Cable Programing, public awareness notices, press releases, and other educational brochures. Will be maintained annually.
11	Capital Improvements Program—development plan for relocating public infrastructure out of hazards areas.	Prevention	All Hazards	Burke County Planning & Development Department; Burke County Building Inspections Department	Minimal	Local staff time	5 Years	Low	To Be Continued	Requires continuous monitoring. The only infrastructure Burke County has in hazardous areas is a Sewer Pump Station that is in a floodplain area. It is not possible to relocate the pump station due to the terrain and the cost to relocate. Any new projects are reviewed for hazardous areas before construction begins. Will be maintained annually.

7.10. Town of Rutherford College (WPCOG)

Town of Rutherford College Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Require and maintain FEMA elevation certificates for new buildings or improvements to buildings on lots including portions of the 100-year floodplain (CRS 31).	Prevention	Riverine Flooding	Town of Rutherford College Planning Department	To Be Determined	Local	1 Year	Low	To Be Continued	Will be reviewed and maintained as required.
2	Revise/update regulatory floodplain maps (CRS 410).	Public Information and Awareness	Riverine Flooding	Town of Rutherford College Planning Department	To Be Determined	State Funding	1 Year	Low	To Be Continued	Will be reviewed annually and as required.
3	Prepare and implement a town-wide stormwater management plan to meet federal Phase II stormwater regulations. Complete stormwater map and conduct stormwater outreach.	Prevention	Riverine Flooding; Erosion; Sinkhole	Town of Rutherford College Town Council	Low	Local	1 Year	High	To Be Continued	Completed in 2021 and will be Reviewed annually.
4	Require 50-foot buffers for new development activities along the Catawba River.	Prevention	Riverine Flooding	Town of Rutherford College Planning Department	To Be Determined	State Funding	1 Year	Low	To Be Continued	Compliance reviewed as needed and as new development occurs.
5	Maintain portable backup generator for emergency power needs.	Structural Projects	All Hazards	Town of Rutherford College Town Council	Minimal	Local Staff Time	1 Year	High	To Be Continued	Currently, Rutherford College has a large portable generator, but it is primarily used for the pump stations when the power goes out. This action will be maintained annually.
6	Obtain short-wave radio to provide direct communication with Burke County use existing walkie-	Emergency Services	All Hazards	Town of Rutherford College Public Works Department	Low	Local Grant	5 Years	Moderate	To Be Continued	Measurable progress is slow due to staff availability

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Town of Rutherford College Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	talkies with number assigned to Burke County EMS.									and funding. Will be reviewed annually.
7	Revise subdivision regulations to require all perennial and intermittent streams be shown on subdivision plats.	Prevention	Riverine Flooding	Town of Rutherford College Administration Department	To Be Determined	Local	1 Year	Moderate	To Be Continued	Reviewed as needed and subdivision requirements will be reviewed annually.
8	Trim trees along town power lines as needed.	Prevention	Hurricane Winds, Thunderstorm Winds; Tornadoes; Snow; Ice	Town of Rutherford College Planning Department; Duke Energy	Minimal	Local Funding	1 Year	High	To Be Continued	This is completed yearly and is maintained by the town.
9	Conduct outreach to educate the public on pre-disaster preparation targeting schools, churches, civic groups, etc.	Public Information and Awareness	All Hazards	Town of Rutherford College Fire Department	To Be Determined	HMA grants; Homeland Security grants; emergency management grants; local funding	3 Years	High	To Be Continued	Hoping to conduct a Disaster Fair for the region (WPCOG).
10	Work with Burke County to implement and maintain an emergency alert system.	Emergency Services	All Hazards	Town of Rutherford College Planning Department	High	Local funding	5 Years	Moderate	New	New Action

7.11. Town of Valdese

Town of Valdese Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Promote the advancement of early warning to the public by providing All Hazard Weather Alert radios at little or no cost to the public and ensuring the placement of the radios in all schools, daycares, churches, etc.	Public Information and Awareness	All Hazards	Town of Valdese Fire Department; Burke County Emergency Management	To Be Determined	HMA grants; Homeland Security grants; emergency management grants; local funding	5 Years	High	In Progress	No measurable progress has been made due to lack of staff and funding.
2	Conduct outreach to educate the public on pre-disaster preparation targeting schools, churches, civic groups, etc.	Public Information and Awareness	All Hazards	Town of Valdese Fire Department, Burke Count Safe Kids	To Be Determined	HMA grants; Homeland Security grants; emergency management grants; local funding	3 Years	High	To Be Continued	Continuously educating the public on safety and disaster preparedness. Performed annually.
3	Install quick-connect emergency generator transfer switch at Town of Valdese Water Department Pump Station.	Structural Projects	All Hazards	Town of Valdese Water Department	High	HMA grants; Homeland Security grants; emergency management grants; local funding	5 Years	High	Complete	Complete
4	Maintain routine inspection and clearing of storm drainage system.	Structural Projects	Riverine Flooding	Town of Valdese Public Works Department	Minimal	Town of Valdese General Fund	5 Years	High	To Be Continued	Maintained as needed or scheduled.

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Town of Valdese Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
5	Maintain compliance with the NFIP by: Providing related training periodically for Town Planning Director and Town Emergency Management Coordinator and encouraging certain staff positions to obtain Certified Floodplain Manager (CFM) certification.	Prevention	Riverine Flooding	Town of Valdese Planning Department	To Be Determined	Town of Valdese General Fund	3 Years	Moderate	To Be Continued	The Planner has received training, but the Town of Valdese still needs to train other staff. This is maintained annually.
6	In cooperation with Burke County, assist in establishing a program for evaluating and improving critical services (roads, bridges, water, sewer, electricity, etc.) and critical facilities (fire, rescue, medical, etc.) to reduce risk to natural hazards.	Prevention	All Hazards	Town of Valdese Public Works Department	To Be Determined	Local; state; federal grants	5 Years	Moderate	Deferred	Deferred due to lack of funding and will be reviewed as needed.
7	In cooperation with Burke County, assist (as needed) in preparing a countywide stormwater management plan.	Prevention	Riverine Flooding	Town of Valdese Public Works Department / Wastewater Department	To Be Determined	Local; state grants	5 Years	Moderate	Complete	Complete: Town of Valdese has Storm Water Management Program in place, with an assigned Director.
8	Develop an open space plan, target properties for acquisition, and fund an acquisition program per NFIP criteria	Prevention	Riverine Flooding	Town of Valdese Planning Department	Minimal	To Be Determined	5 Years	Moderate	In Progress	Open space plan is addressed in the Land Use Plan, but no funding for acquisition of properties is available.

Town of Valdese Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
9	Implement drainage system management project.	Structural Projects	Riverine Flooding	Town of Valdese Public Works Department	Minimal	Town of Valdese General Fund	5 Years	High	To Be Continued	Addressed in storm water ordinances and under continuous observation and evaluation.
10	Implement an early warning system.	Public Information and Awareness	All Hazards	Burke County Emergency Management; Town of Valdese Fire Department	To Be Determined	HMA grants; Homeland Security grants; emergency management grants; local funding	5 Years	High	To Be Continued	Town now has a public emergency alert system and use County's reverse 911 when needed.
11	Establishment of reserve fund for relocating damaged infrastructure.	Structural Projects	Riverine Flooding	Town of Valdese Administration	To Be Determined	To Be Determined	5 Years	Moderate	Deferred	Deferred due to lack of funding.
12	Improve Hazard Warning and Response Plan.	Prevention	All Hazards	Burke County Emergency Management; Town of Valdese Fire Department	To Be Determined	Local; state; federal grants	5 Years	High	To Be Continued	Town now has a public emergency alert system and use County's reverse 911 and Rave when needed.

7.12. Catawba County

Catawba County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Install generator transfer switch connections during the construction of new public facilities (schools, fire stations, County buildings, etc.).	Structural Projects	All Hazards	Catawba County Finance; Purchasing; and Emergency Services Departments	To Be Determined	General Fund; DHS, EMPG, HMGP, PDM; BRIC.	5 Years	High	To Be Continued	County continues to seek funding to address need for transfer switches.
2	Continue to evaluate County policies to reduce greenhouse gases. These policies may include additional lighting retrofitting, "green" purchasing goals, upgrading of equipment in buildings, acquisition/dedication of parkland, and timber management at existing parks.	Natural Resource Protection	Riverine Flooding; Hurricanes Winds; Thunderstorm Winds; Tornadoes; Wildfire; Drought; Snow; Ice and Dam or Levee Failure.	County Manager's Office	Minimal	General Fund	5 Years	High	To Be Continued	Will be reviewed annually, and the County will consider greenhouse gas reduction policy.
3	Prepare a one-page information sheet that incorporates the floodplain development permitting process for all departments. In addition, when permits are being reviewed where access to the site requires new driveway/road construction across a floodplain, require stream crossing plans with drainage calculations, culvert size, and installation details.	Public Information and Awareness	Riverine Flooding	Catawba County Building Inspections; Planning, Parks & Development; and Environmental Health Departments	Minimal	General Fund	2 Years	High	In Progress	Currently addressed through County's Stormwater Plan. A County engineer will review plans for new subdivisions and work with local landowners in flood plain areas.

Catawba County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
4	Update the County's Parks Master Plan to identify locations and funding sources for greenways to preserve sensitive land along river systems.	Natural Resource Protection	Riverine Flooding	Catawba County Planning, Parks & Development Department	Minimal	General Fund	3 Years	High	Complete	Complete
5	Conduct outreach to the public regarding the County's Community Alert System to educate them about how to obtain information both pre- and post-event and about mitigation strategies.	Public Information and Awareness	All Hazards	Catawba County Emergency Services Department	Minimal	General Fund	3 Years	High	To Be Continued	Will be reviewed and updated by the County annually.
6	Incorporate hazard mitigation elements into the development of new small area and corridor plans.	Prevention	All Hazards	Catawba County Planning, Parks & Development Department	Minimal	General Fund	2 Years	High	To Be Continued	Corridor plans continue to encourage growth in areas where utilities, public facilities, and emergency services resources exist (i.e. smart growth principles).
7	Improve information sharing with Duke Energy regarding its operational procedures for the movement of water through its hydro-electric systems on the Catawba River. This can be achieved by meeting formally at least once a year, when significant weather events are anticipated, and when upgrades or improvements to the system are scheduled.	Public Information and Awareness	Riverine Flooding	Catawba County Emergency Services Department	Minimal	General Fund	5 Years	High	To Be Continued	Meets annually to review significant weather events and consider improvements.

Section 7: Mitigation Actions

Catawba County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
8	Maintain a protocol for monitoring the tail race areas below the Catawba River dams during high water events to ensure security of the area and limiting public access.	Prevention	Riverine Flooding	Catawba County Emergency Services and Sheriff's Departments	Minimal	General Fund	3 Years	High	To Be Continued	Maintained annually.
9	Work with local land trusts to secure conservation easements on farmland to preserve sensitive land along river systems.	Natural Resource Protection	Riverine Flooding	Catawba County Planning, Parks & Development, Cooperative Extension, and Soil & Water Conservation Departments	To Be Determined	Farmland Preservation Trust Fund; other private funding sources	5 Years	Moderate	To Be Continued	This is a continuous effort with two area land trusts and reviewed as needed
10	Identify locations of log jamming in priority watersheds which could jeopardize bridge abutments and water supply using new GIS aerial photography available in late 2014. Relay this information to appropriate agencies and develop action plans for abatement.	Natural Resource Protection	Riverine Flooding	Catawba County Emergency Services and Planning, Parks & Development Departments	Minimal	General Fund and Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program grants	3 Years	Moderate	Complete	Complete
11	Evaluate the need for stronger building code requirements for structures constructed in the tail race areas below the Catawba River dams to prevent property damage downstream.	Prevention	Riverine Flooding	Catawba County Building Codes & Services Department	Minimal	General Fund	5 Years	Moderate	To Be Continued	Evaluated annually by the county.

Catawba County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
12	Propose the requirement for a stormwater master plan for new major subdivisions that addresses the treatment of stormwater for new roads and lots within the development.	Prevention	Riverine Flooding	Catawba County Utilities & Engineering Department	Minimal	General Fund	5 Years	Moderate	To Be Continued	County Master Plan addresses stormwater requirements. Plans are reviewed by County Staff to ensure that they meet requirements. Maintenance Plans are required and reviewed by staff annually.
13	Preserve large, intact forest land through the acquisition and/or dedication of park land through the County's Unified Development Ordinance requirements. As part of the Parks Department forestry management program, non-native pine plantation stands in the park property will be selectively harvested to allow for the successional return of native forest vegetation. This action is aimed at reducing greenhouse gases through carbon sequestration and thereby also helping to reduce the potential of increased frequency and severity of natural hazards (particularly drought and wildfire, but many others identified in this Plan as well).	Natural Resource Protection	All Hazards	Catawba County Planning, Parks & Development Department	Minimal	General Fund	5 Years	High	To Be Continued	County Staff continue efforts to reduce invasive species including efforts related to pine tree removal and replacement at Riverbend and Mountain Creek Parks. Hudson Chapel property has been acquired by the County to preserve natural habitat.
14	Conduct a carbon footprint analysis for the County's facilities and evaluate current	Natural Resource Protection	All Hazards	Multi-departmental through Green	Minimal	General Fund and Energy	5 Years	High	To Be Continued	100% of county lighting has been converted to T-8 lighting or better.

Section 7: Mitigation Actions

Catawba County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	policies to identify ways to reduce greenhouse gases. Implement priority strategies identified in the study, which may include the production of biodiesel fuel at the County's EcoComplex, renewable energy sources such as windmills, reduction of particulate matter and ozone through recommendations of the Early Action Compact, and the development of an energy plan which may include purchasing policies that address energy reduction strategies and contractor policies for equipment emissions.			Initiatives Team, especially the Catawba County Public Health and Utilities & Engineering Departments		Department grants				Projects in progress to convert landfill gas to renewable natural gas. There are plans to continue to install solar panels on existing landfill property.
15	Develop a farmland preservation plan which will identify tools and techniques to preserve sensitive farmland, and particularly those areas prone to flooding.	Prevention	Riverine Flooding	Catawba County Planning, Parks & Development Department; Cooperative Extension through the Agricultural Advisory Board	To Be Determined	ADFP trust fund grant; Catawba County General Fund	3 Years	High	Complete	Complete
16	Maintain continued compliance with the NFIP through implementation of the specific actions. This includes evaluating the CRS and identifying strategies that can be implemented to reduce	Public Information and Awareness	Riverine Flooding	Catawba County Planning, Parks & Development and Emergency Services Departments	To Be Determined	General Fund and Grants	5 Years	High	To Be Continued	NFIP compliance is maintained by the County Floodplain Administrator and the County continues to maintain compliance

Catawba County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	flood potential and in turn allow for a reduction in flood insurance rates for citizens of the County. These strategies may include maintaining digital FEMA elevation certificates, training for plan reviewers and building inspectors, sponsoring a training workshop for surveyors, and pursuing CFM certification for a staff person. Supplies of FEMA and NFIP materials will also be made available to the public in various locations throughout the county such as libraries and on the Catawba County website.									with all NFIP requirements.
17	Develop a countywide greenway master plan to provide an interconnected trail network which preserves sensitive land along river systems. These trails can become part of the Carolina Thread Trail, Duke Energy Relicensing facilities, and the Lake Norman Bicycle Route.	Prevention	Riverine Flooding	Catawba County Planning, Parks & Development Department	To Be Determined	Carolina Thread Trail; Parks and Recreation Trust Fund (PARTF); Clean Water Management Trust Fund (CWMTF); other grant sources	3 Years	High	Complete	Complete
18	Provide education to citizens about tree-trimming techniques to reduce the	Public Information and Awareness	Hurricane Winds; Thunderstorm Winds; Tornado; Snow; Ice	Cooperative Extension through local	Minimal	General Fund	3 Years	High	To Be Continued	Cooperative Extension continues education efforts regarding tree-trimming techniques to

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Catawba County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	potential for power outages due to downed tree limbs.			power companies						County residents. Duke Energy has conducted a Bradford Pear tree replacement program in Catawba County.
19	Coordinate with the American Red Cross to install pre-wired connections (“Quick Connects”) to use portable generators at targeted critical public facilities and those designed to serve as shelters for disaster survivors. Evaluate other locations with existing wiring which can accommodate generators, for example, schools, churches, recreation centers.	Emergency Services	All Hazards	Catawba County Emergency Services Department; American Red Cross	To Be Determined	DHS, EMPG, HMGP, PDM, BRIC	3 Years	High	Complete	Complete
20	Provide outreach education to property owners along flood-prone areas, such as Carpenters Cove, about floodplain regulations and evacuation plans. This includes direct mailings to owners of repetitive loss properties (as identified by FEMA) about available mitigation grant programs. Also provide education opportunities for school-age children, such as the American Red Cross “Masters of Disaster” education program.	Public Information and Awareness	Riverine Flooding	Catawba County Emergency Services Department; American Red Cross; Catawba County Planning, Parks & Development Department	Minimal	General fund	3 Years	High	Complete	Complete

Catawba County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
21	Promote a standard hook up for emergency generators such that any portable generator can be simply connected to it for supply of power to vital circuits in homes and/or public buildings. Priority locations are hospitals, nursing homes, schools, and government buildings.	Emergency Services	Riverine Flooding; Hurricane Winds; Thunderstorm Winds; Tornado; Wildfire; Drought; Snow; Ice; Erosion; Dam or Levee Failure; Earthquake; Sinkhole; Landslide	Catawba County Emergency Services Department; American Red Cross	To Be Determined	DHS, EMPG, HMGP, PDM, BRIC	3 Years	High-Moderate	Complete	Complete
22	Identify areas for emergency access to and from public properties, such as Bakers Mountain Park, Riverbend Park, and the Wildlife Club (off Lynn Mountain Road). These areas will be maintained for access by emergency personnel in the event of wildfires or other events. This includes working with key property owners adjoining the subject properties, developing cooperative agreements, and clearing/maintaining new or existing fire roads. Emphasis will be placed on securing access ways at each of these properties. Gating, ditching, signage, and fencing is necessary in high-risk areas that are prone to vandalism that may result in forest fires.	Emergency Services	Wildfire	Catawba County Emergency Services Department; Forest Service; Park Personnel	To Be Determined	Grants or community-service projects with organized groups	3 Years	Moderate	Complete	Complete

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Catawba County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	The first phase will be mapping of appropriate locations and training with EMS in the County's parks.									
23	Evaluate the Firewise communities' program and its application to develop communities and homes which are designed, built, and maintained to withstand wildfires.	Public Information and Awareness	Wildfire	Catawba County Emergency Services; Fire Department; and Planning, Parks & Development Departments	To Be Determined	To Be Determined	3 Years	Moderate	Complete	Complete
24	Ensure that manufactured home parks have perimeter vegetative buffers to protect manufactured homes from high wind events.	Prevention	Hurricane and Tropical Storm; Thunderstorm; Tornado	Catawba County Planning, Parks & Development Department	Minimal	Private	3 Years	Moderate	Deleted	Deleted
25	Continue the work of the established multi-jurisdictional Stormwater Committee to prioritize stormwater issues/projects within the area. This committee will meet regularly to develop action plans and establish priorities for addressing stormwater issues which would minimize the impacts of flooding throughout the County. Examples of efforts would include coordination of stormwater review of subdivisions, public education on clearing stormwater drains and culverts, a stormwater	Prevention	Riverine Flooding	Multi-jurisdictional with staff of Catawba County Engineering and Planning Departments	Minimal	General fund	5 Years	Moderate	Complete	Complete

Catawba County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	plan to address flooding episodes at Carpenters Cove, and sharing of information with the NCDOT regarding debris accumulation at bridge abutments, culverts, etc.									
26	Coordinate with Social Services to provide back-up power at family care, nursing, and adult care homes within the county.	Structural Projects	All Hazards	Catawba County Emergency Services; Social Services	To Be Determined	DHS, EMPG, HMGP, PDM, BRIC	5 Years	Moderate	Complete	Complete
27	Evaluate ordinances and policies to develop ways to address mitigation for drought events. This may include implementation of a Low Inflow Protocol along the Catawba River and encouraging drought resistant vegetation and LEED standards for new development.	Natural Resource Protection	Drought	Catawba County Planning, Parks & Development Department	Minimal	General fund	5 Years	Moderate	Complete	Complete
28	Continue and expand the network of public-private partners, such as the LEPC, to include other organizations like the CPAC to engage the business community in hazard mitigation activities.	Public Information and Awareness	Riverine Flooding; Hurricane Winds; Thunderstorm Winds; Tornado; Wildfire; Drought; Snow; Ice; Erosion; Dam or Levee Failure; Earthquake; Sinkhole; Landslide	Catawba County Emergency Services Department	Minimal	General fund	5 Years	Moderate	Complete	Complete

Section 7: Mitigation Actions

Catawba County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
29	Develop a landscape manual which encourages the use of native trees and vegetation which are storm and drought resistant. This manual will be available to the development community as a tool to meet the landscaping requirements of the Unified Development Ordinance. The public will also be encouraged to use this manual when landscaping individual home sites.	Public Information and Awareness	Hurricane Winds; Thunderstorm Winds; Tornado; Wildfire; Drought; Snow; Ice;	Catawba County Planning, Parks & Development Department; Cooperative Extension	Minimal	General fund	5 Years	Low	Complete	Complete
30	Provide outreach education to manufactured home park owners and residents on the need for developing an evacuation plan during imminent hazard threats.	Public Information and Awareness	Riverine Flooding; Hurricane Winds; Thunderstorm Winds; Tornado; Wildfire; Snow; Ice; Erosion; Dam or Levee Failure; Earthquake; Sinkhole; Landslide; Hail	Catawba County Emergency Services Department	Minimal	General fund	5 Years	Low	Complete	Complete
31	In coordination with the Carolina Thread Trail organization, begin acquiring land and construct an interconnected trail network along Lyle Creek.	Natural Resource Protection	Riverine Flooding	Catawba County Planning, Parks & Development Department	To Be Determined	Carolina Thread Trail; PARTF; North Carolina State Trails Program; volunteers	2 Years	High	In Progress	Work continues to reach goals of connected trail networks.
23	Consider adopting and enforcing land use ordinances in inundation zones	Prevention	Dam Failure; Riverine Flooding	Catawba County Planning, Parks & Development Department	Minimal	Local; state; federal grants	5 Years	Moderate	New Action	New Action

7.13. Town of Brookford

Town of Brookford Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Develop a debris management plan.	Prevention	Riverine Flooding; Hurricane Winds; Thunderstorm Winds; Hail; Wildfire; Snow; Ice	Town of Brookford Administration Department	Minimal	Local staff time	4 Years	Moderate	Complete	Natural debris will be disposed of locally in Town, and manufactured debris will be disposed of working closely with Catawba County.
2	Develop a post-disaster plan to facilitate decision-making following a hazard event.	Emergency Services	All Hazards	Town of Brookford Administration Department; Town of Brookford Police Department; Town of Brookford Public Works Department	Minimal	Local staff time	4 Years	Moderate	Deferred	Deferred to the next plan update. Measurable progress is slow due to staff availability and funding.
3	Implement moderate to major repairs to stormwater drains.	Prevention	Riverine Flooding	Town of Brookford Public Works Department	Minimal	Local staff time	2 Years	High	In Progress	The Town has completed 2 large stormwater maintenance jobs along 22nd Ave SE.
4	Identify and strengthen facilities to function as public shelters.	Emergency Services	All Hazards	Town of Brookford Administration Department	To Be Determined	Grants; local staff time	4 Years	Low	In Progress	The Town hall is currently under renovation.
5	In coordination with the Catawba County Emergency Services Department, conduct outreach to the public regarding the County's Community Alert System to educate them about how to obtain	Public Information and Awareness	All Hazards	Town of Brookford; Catawba County Emergency Services Department	Minimal	General Fund	2 Years	High	To Be Continued	The Town does Public Outreach through Facebook and Quarterly announcements with billing materials.

Section 7: Mitigation Actions

Town of Brookford Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	information both pre- and post-event and about mitigation strategies.									
6	Maintain continued compliance with the NFIP by limiting development in the floodways.	Public Information and Awareness	Riverine Flooding	Town of Brookford Administration Department	Minimal	Local staff time	4 Years	High	To Be Continued	The Town adopted a Flood Damage Prevention Ordinance based on the model provided by the State of North Carolina. There are no inspectors within the Town, other than those that inspect through the County.
7	Develop mutual aid agreement with other jurisdictions to augment local inspection personnel after major disasters.	Emergency Services	All Hazards	Town of Brookford Administration Department	Minimal	Local staff time	4 Years	Moderate	To Be Continued	Mutual Aid Agreement is completed. Will be reviewed and updated annually.
8	Prepare a Local Evacuation Plan to ensure the safety of Town residents in advance of anticipated hazard events, particularly wildfires and flooding.	Emergency Services	Wildfire; Riverine Flooding	Town of Brookford Police Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	Will be reviewed and updated annually.
9	Enhance local citizens' disaster preparedness through continuous outreach and education efforts in coordination with Catawba County, the American Red Cross, and other support organizations.	Public Information and Awareness	All Hazards	Town of Brookford Administration Department; Town of Brookford Police Department	Minimal	Local staff time	5 Years	High	To Be Continued	The Town of Brookford continues to update and educate the community through Facebook and quarterly announcements.

Town of Brookford Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
10	Continue routine inspections of the Town's storm drain system.	Prevention	Riverine Flooding	Town of Brookford Public Works Department	Minimal	Local staff time	Weekly	Moderate	To Be Continued	The Public Works Dept continues to do weekly Storm Drain Inspections.
11	Continue routinely pruning and clearing limbs on the Town's rights of way.	Prevention	Hurricane Winds; Thunderstorm Winds; Hail; Tornado; Snow; Ice	Town of Brookford Public Works Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	The Public Works Dept has fallen behind on the right of way maintenance due to being understaffed.

7.14. Town of Catawba (WPCOG)

Town of Catawba Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Evaluate Town policies to reduce greenhouse gases. These policies may include additional lighting retrofitting, "green" purchasing goals, and upgrading of equipment in buildings.	Natural Resource Protection	All Hazards	Town of Catawba Planning, Administration, and Public Works Departments	Minimal	Local staff time	5 Years	High	Deferred	From a planning capacity there is nothing in place. Work with parties responsible (Administration, Police, and Fire) to achieve action.
2	Keep infrastructure database updated when repairs are made, and new facilities are installed.	Prevention	Riverine Flooding; Hurricane Winds; Thunderstorms Winds	Town of Catawba Public Works Department	Minimal	Local staff time	5 Years	Low	Deferred	Public Works has no records, yet. Measurable progress is slow due to staff availability and funding.
3	Participate in local and regional public outreach programs regarding hazard potential in our area.	Public Information and Awareness	All Hazards	Town of Catawba Planning, Administration, Police, Fire, and Public Works Departments	Minimal	Local staff time	5 Years	Moderate	To Be Continued	The Town has participated in local outreach and will continue in the future.
4	Review Town of Catawba plans and ordinances for alignment and inclusivity regarding potential hazard mitigation measures.	Prevention	Riverine Flooding; Hurricane Winds; Thunderstorms Winds	Town of Catawba Planning and Administration Departments	Minimal	Local staff time	5 Years	High	In Progress	Some ordinances have been adopted/changed but changes are still needed. Measurable progress is slow due to lack of funding and staff availability.
5	Review flood data and designate flood-prone area for greenways in plans, if possible.	Prevention	Riverine Flooding	Town of Catawba Planning Department	Minimal	Local staff time	5 Years	Moderate	In Progress	Town has been working to build a green way along Lyle Creek and the Catawba River.
6	Maintain continued compliance with the NFIP through implementation of	Public Information	Riverine Flooding	Town of Catawba Planning Department	Minimal	Local staff time	5 Years	High	To Be Continued	The Town adopted a Flood Damage Prevention Ordinance based off the

Town of Catawba Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	the following specific actions: Evaluate and consider the adoption of “higher standards” that are proven to reduce flood damage. Develop a checklist for review of building/development permit plans and for inspection of development in floodplains; Establish a goal to have each plan reviewer attend a related training periodically; Encourage or require certain local staff positions to obtain and maintain CFM certification; and Maintain supplies of FEMA/NFIP materials to help property owners evaluate measures to reduce potential hazard damage; Make available in public buildings, local library, website, etc. and inform people who they can call to learn more information.	and Awareness								model provided by the State that provides “higher standards” particularly regarding freeboard. The Town Planner will continue to attend a training regarding floodplain management if possible. There are no inspectors within the Town, other than those that inspect through the County. The Town has FEMA/NFIP information in Town Hall for pick up. The Town’s website will add a link that directs people to FEMA and State program sites.
7	Develop a debris management plan.	Prevention	Riverine Flooding; Hurricane Winds; Thunderstorm Winds; Tornado; Wildfire; Snow; Ice	Town of Catawba Administration Department	To Be Determined	DHS, EMPG, HMGP, PDM, BRIC, Economic Development Administration – Disaster Mitigation Planning and	5 Years	High	In Progress	Public works still has an informal plan currently in place and debris is used as mulch and provided to the public for free. No formal plan has been drafted.

Section 7: Mitigation Actions

Town of Catawba Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
						Technical Assistance.				
8	Provide hazard susceptibility checklist for homeowners to conduct their own inspections.	Public Information and Awareness	All Hazards	Town of Catawba Administration Department	To Be Determined	DHS, EMPG, HMGP, PDM, BRIC, Citizen Corps. Many FEMA and American Red Cross publications are available at no cost.	5 Years	Low	To Be Continued	The Town has and will continue to provide materials to citizens via the sources listed above.
9	Establish pre-disaster debris management contracts.	Emergency Services	Riverine Flooding; Hurricane Winds; Thunderstorm Winds; Tornado; Wildfire; Snow; Ice	Town of Catawba Administration, Police, Fire, and Public Works Department	Minimal	Local staff time	5 Years	High	In Progress	The Town's Public Works Department removes debris, and, in the case of a disaster, can take it to a landfill. The Town currently provides free mulch, made from the debris.
10	Develop a post-disaster plan to facilitate decision making following a hazard event.	Emergency Services	All Hazards	Town of Catawba Administration, Police, and Fire Departments	To Be Determined	DHS, EMPG, HMGP, PDM, BRIC; Economic Development Administration – Disaster Mitigation Planning and Technical Assistance.	5 Years	High	Deferred	None in existence to the best of planning staff knowledge. Parties responsible (Administration, Police, and Fire) do not seem to have time to complete this given their current workload.
11	Draft a new stormwater drain map.	Prevention	Riverine Flooding	Town of Catawba Administration and Public Works Departments	To Be Determined	To Be Determined	5 Years	High	In Progress	Measurable progress is slow due to lack of funding and staff availability. Will be reviewed annually.

Town of Catawba Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
12	Routinely clean and repair stormwater drains.	Prevention	Riverine Flooding	Town of Catawba Public Works Department	Minimal	To Be Determined	5 Years	High	To Be Continued	This activity has been completed as a mitigation action and now the Town Public Works Department does this as a preventative continuing action.
13	Routinely prune trees and clear tree limbs hanging in right of way.	Prevention	Hurricane Winds; Thunderstorm Winds; Tornado; Snow; Ice	Duke Energy (Asplundh)	Minimal	To Be Determined	3 Years	High	To Be Continued	The Town relies upon a private company (Asplundh) through Duke Energy for pruning. Routine pruning occurs according to the private company's schedule.
14	Identify and strengthen facilities to function as public shelters.	Emergency Services	All Hazards	Town of Catawba Administration Department	To Be Determined	DHS, EMPG, HMGP, PDM, BRIC	3 Years	Low	Complete	The Town of Catawba Fire Department is a public shelter, and the Town of Catawba Rescue Building serves as a backup. (It has a generator on site.)

7.15. City of Claremont

City of Claremont Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Update Claremont Land Development Plan and Recreation Master Plan with current flood data and keep flood-prone areas designated for greenways.	Prevention	Riverine Flooding	City of Claremont Planning and Zoning Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	The new Comprehensive Land Use Plan was adopted in 2023, with a section on Floodplain regulation. Maps will need to be updated when FEMA adopts updated FIRMs. Reviewed annually.
2	Keep infrastructure database updated when repairs are made, and new facilities are installed.	Prevention	All Hazards	City of Claremont Planning and Zoning Department	Minimal	Local staff time	5 Years	High	In Progress	WPCOG maintains a GIS system with utilities mapped. Updates are sent to WPCOG when changes are made.
3	Take part in regional public outreach programs about hazard potential in our areas.	Public Information and Awareness	All Hazards	City of Claremont Planning and Zoning Department; City of Claremont Administration Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	City has a full-time employee that functions as a Public Information Officer. Social Media posts are made when there are hazard events, as well as when the county makes hazard posts. Staff will search for ways to further improve on this action.
4	Install quick-connect emergency generator hook-ups for remaining critical facilities: four (4) pump stations and City Hall.	Structural Projects	All Hazards	City of Claremont Public Works Department; City of Claremont Administration Department; City of Claremont Police Department; City of	Minimal	Local; DHS, EMPG, HMGP, PDM, BRIC	5 Years	High	In Progress	Installing permanent generator at (3) pump stations; last pump station will be decommissioned within the next 5 years with Lyle Creek Extension.

City of Claremont Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
				Claremont Fire Department						
5	Create a public outreach program for City citizens about specific hazards that impact Claremont and the resources available for mitigation using social media, the City website, City newsletter, etc.	Public Information and Awareness	All Hazards	City of Claremont Planning and Zoning Department; City of Claremont Administration Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	City has a full-time employee that functions as a Public Information Officer, who operates the city website, social media and writes a newsletter. Planning Staff will work to develop social media outreach, when the need arises.
6	Using social media, the city website, and other public outreach, encourage residents to keep storm drains and ditches clear of debris during storms (to assist, not rely solely on Public Works).	Public Information and Awareness	Riverine Flooding	City of Claremont Public Works Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	City has a full-time employee that functions as a Public Information Officer. Planning Staff will work to develop social media outreach.
7	Maintain continued compliance with the NFIP through implementation of the following specific actions: Maintain digital FEMA elevation certificates for all construction in the floodplain, establish a goal to have each plan reviewer attend a related training periodically, Encourage or require certain local staff positions to obtain and maintain CFM certification, and Send information about the flood hazard and promote the availability of flood insurance	Public Information and Awareness	Riverine Flooding	City of Claremont Planning and Zoning Department	Minimal	Local staff time	5 Years	High	To Be Continued	Maintained compliance with NFIP. There have been no new developments in need of Elevation Certificates. An audit by NCDPS was successfully completed in June 2024. Staff plans to attend floodplain management training.

Section 7: Mitigation Actions

City of Claremont Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	through regularly scheduled mailings.									
8	Install quick-connect emergency generator hook-ups for remaining critical facilities.	Structural Projects	All Hazards	City of Claremont Public Works Department; City of Claremont Administration Department; City of Claremont Police Department; City of Claremont Fire Department	Minimal	Local; DHS, EMPG, HMGP, PDM, BRIC	5 Years	High	In Progress	Public Works is scheduled to have a new building with permanent generator within the next 5 years. The only remaining facility will be City Hall, which does not require a generator.
9	Encourage residents to continue with voluntary water restrictions and water conservation actions.	Natural Resource Protection	Drought	City of Claremont Planning and Zoning Department; City of Claremont Public Works Department	Minimal	Local staff time	5 Years	Moderate	In Progress	City has a full-time employee that functions as a Public Information Officer. Planning Staff will work to develop social media outreach, when the need arises.
10	Verify height of manholes in flood zones with GPS and ensure proper equipment is present.	Prevention	Riverine Flooding	City of Claremont Public Works Department	Minimal	Local staff time	3 Years	Moderate	Complete	Manholes along creeks have risers
11	Explore the feasibility of a Capital Improvement Plan to extend water lines to areas near the city with well problems.	Prevention	Drought	City of Claremont Planning and Zoning Department	Minimal	Local staff time	5 Years	Moderate	Deferred	It is not a current goal of the city to extend water lines beyond properties within our authority.
12	Explore the feasibility of municipal purchase or private donations of floodplain areas for use as greenways.	Property Protection	Riverine Flooding	City of Claremont Planning and Zoning Department	Minimal	Local/private donation	5 Years	Moderate	Deferred	It is not currently feasible for the city to maintain a greenway.
13	Routinely inspect and maintain fire hydrants.	Prevention	Wildfire	City of Claremont Fire Department;	Minimal	Local staff time	5 Years	Moderate	To Be Continued	Flushing is done bi-annually. Fire Department

City of Claremont Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
				City of Claremont Public Works Department						does annual inspection and flow testing. Work orders are submitted for any needed repairs. This is maintained bi-annually.
14	Encourage residents to keep storm drains clear of debris during storms (to assist, not rely solely on Public Works).	Public Information and Awareness	Riverine Flooding	City of Claremont Public Works Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	City has a full-time employee that functions as a Public Information Officer. Planning Staff will work to develop social media outreach on a quarterly basis.

7.16. City of Conover

City of Conover Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Maintain continued community compliance with the NFIP and provide education to property owners, elected officials, and appointed officials about flood prevention and limit development in the floodway.	Public Information and Awareness	Riverine Flooding	City of Conover Planning and Economic Development Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	The City of Conover Staff continues to enforce local floodplain regulations on a case-by-case basis. City was audited for compliance by NCEM in 2024.
2	Provide education via website, social media, brochures, etc. regarding what to do before, during, and after storm events.	Public Information and Awareness	Hurricane Winds; Thunderstorm Winds; Hail; Tornado; Snow; Ice	City of Conover Fire Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	The City of Conover promotes public awareness during the proper months (Sept Preparedness) and uses awareness material from NCEM, Ready NC, etc.
3	Educate public about maintenance of property and trimming of trees located near streets and power lines.	Public Information and Awareness	Hurricane Winds; Thunderstorm Winds; Hail; Tornado; Snow; Ice	City of Conover Public Works Department; Duke Energy Corporation	Minimal	Local staff time	5 Years	Moderate	To Be Continued	The city plans to schedule public outreach annually and review public education information.
4	Ensure firefighters are properly trained in brush fire fighting techniques.	Emergency Services	Wildfire	City of Conover Fire Department	Low	Local staff time	5 Years	Moderate	To Be Continued	Brush Firefighting training is currently scheduled for company training the fall of 2024 and the Company Training schedule has incorporated brush firefighting training on an annual basis. This is completed annually.
5	In coordination with the Catawba County Emergency Services	Public Information	All Hazards	City of Conover; Catawba County	Minimal	General Fund	2 Years	High	To Be Continued	Promoted by newsletter and all new utility

City of Conover Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	Department, conduct outreach to the public regarding the County's Community Alert System to educate them about how to obtain information both pre- and post-event and about mitigation strategies.	and Awareness		Emergency Services Department						customers are enrolled automatically and is updated quarterly.
6	Install generator transfer switch connections during the construction of new public facilities (schools, fire stations, City buildings, etc.).	Structural Projects	All Hazards	City of Conover Planning and Economic Development Department	To Be Determined	Local, State; HMGP	5 Years	High	Complete	All critical city facilities have full backup capability including police, fire, city hall, public works. Generator status of possible shelter locations such as schools or churches unknown.
7	Maintain continued compliance with the NFIP through implementation of the following specific actions: Hold informative work sessions for newly elected officials and new appointees to planning commissions and appeals/variance boards, to provide an overview of floodplain management, the importance of participating in the NFIP, and the implications of failing to enforce the requirements of the program or failing to properly handle variance requests, and Maintain supplies of FEMA/NFIP materials to help property owners evaluate measures to reduce potential hazard damage.	Public Information and Awareness	Riverine Flooding	City of Conover Planning and Economic Development Department	Minimal	Local staff time	2 Years	Moderate	To Be Continued	Measurable progress is slow due to staff availability and funding. Will be reviewed annually.

Section 7: Mitigation Actions

City of Conover Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
8	Work with the local media to highlight mitigation practices for homeowners during wildfire and winter storm seasons through the development of PSAs.	Public Information and Awareness	Wildfire; Snow; Ice	City of Conover Fire Department	To Be Determined	To Be Determined	2 Years	Moderate	To Be Continued	The city uses its website and social media to communicate with citizens about storm events.
9	Aggressively encourage tree trimming of large older trees near structures, power lines, and rights of way.	Prevention	Hurricane Winds; Thunderstorm Winds; Hail; Tornado; Snow; Ice	City of Conover Public Works Department; Duke Energy Corporation	To Be Determined	To Be Determined	2 Years	Moderate	To Be Continued	Continues to work with NCDOT to remove problematic trees and incorporate tree trimming into street maintenance activities. The Utilities Department also clears problematic trees near critical infrastructure as part of routine maintenance.
10	Ensure firefighters are properly trained in brush/wildland fire fighting techniques.	Emergency Services	Wildfire	City of Conover Fire Department	Low	Local staff time	5 Years	Moderate	To Be Continued	Brush Firefighting training is currently scheduled for company training the fall of 2024 and the Company Training schedule has incorporated brush firefighting training on an annual basis.
11	Routinely inspect and maintain fire hydrants.	Prevention	Wildfire	City of Conover Fire Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	At this point in the current calendar year all hydrants have been flow tested and maintenance has been performed on the bonnet and outlet covers. During the second half of the calendar year hydrants will be painted. This occurs annually.

City of Conover Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
12	Consider establishing a local reserve fund for public mitigation measures.	Mitigation Funding	All Hazards	City of Conover Finance Department; City of Conover Public Works Department; City of Conover Planning and Economic Development Department	To Be Determined	To Be Determined	2 Years	Moderate	In Progress	The City funds staff positions which implement guidelines of the adopted hazard mitigation plan. Measurable progress is slow due to lack of funding and staff availability.

7.17. City of Hickory

City of Hickory Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Continue the enforcement of the City of Hickory 2007 Flood Damage Prevention Ordinance. This ordinance regulates construction and development activities within SFHAs and limiting development in the floodways according to NFIP standards.	Prevention	Riverine Flooding	City of Hickory Planning and Development Services Department	Minimal	City of Hickory General Fund	5 Years	High	To Be Continued	This is a continuous process that is monitored regularly to maintained NFIP compliance.
2	Monitor and enforce the provisions of the City of Hickory's NPDES Phase 2 Stormwater Control Ordinance and continue to provide community outreach on the importance of stormwater management.	Prevention	Riverine Flooding	City of Hickory Public Services Department, Engineering Division	Minimal	City of Hickory General Fund	5 Years	High	To Be Continued	This is a continuous process that is monitored regularly and reviewed annually.
3	Coordinate with willing, voluntary owners of repetitive loss properties to apply for hazard mitigation funding to implement projects that reduce or eliminate the long-term risk of future flood damages. This may be accomplished through property buyouts, elevation, or retrofit projects that remove or alter insured, at-risk repetitive loss structures.	Property Protection	Riverine Flooding	City of Hickory Planning and Development Services Department	To be determined	Federal and State Hazard Mitigation Assistance Grants	5 Years	Moderate	In Progress	No measurable progress due to lack of staff and resources. Will be reviewed annually.
4	Remove obstructions from public drainage ways or where threats to public infrastructure	Prevention	Riverine Flooding	City of Hickory Public Services Department	Minimal	City of Hickory General Fund	5 Years	High	To Be Continued	This is a continuous process that is monitored as necessary.

City of Hickory Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	have been identified. The removal of obstructions will lessen the risk of flooding and damage to roadway and bridges.									
5	Purchase 11 four-wheel drive vehicles with off-road capabilities. These vehicles will be utilized to reach citizens who become stranded or cut-off from services due to flooding, winter weather, or similar events.	Emergency Services	Riverine Flooding; Snow; Ice	City of Hickory Police and Fire Departments	Minimal	City of Hickory General Fund	5 Years	High	Complete	Purchases have been completed and vehicles are in use.
6	Realignment of Fire Department command structure to add an additional Incident Commander per shift. This position will allow for better management of simultaneous multiple incidents and provide scene safety after a hazard event.	Emergency Services	All Hazards	City of Hickory Fire Department	Minimal	City of Hickory General Fund	5 Years	High	Complete	The position was created. Position structure will be reviewed annually.
7	Continue to provide educational outreach to civic groups, neighborhood groups, school children, and similar persons on the importance of fire safety and prevention.	Public Information and Awareness	Wildfire	City of Hickory Fire Department, Fire Prevention Division	Minimal	City of Hickory General Fund	5 Years	Moderate	To Be Continued	Fire education is provided throughout the calendar year to school children, civic groups and neighborhood groups. This is completed annually.
8	In coordination with the Catawba County Emergency Services Department, conduct outreach to the public regarding the County's Community Alert System to educate them about how to obtain information both	Public Information and Awareness	All Hazards	City of Hickory; Catawba County Emergency Services Department	Minimal	General Fund	5 Years	High	To Be Continued	Coordination will occur annually and the outreach will continue as needed.

Section 7: Mitigation Actions

City of Hickory Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	pre- and post-event and about mitigation strategies.									
9	Maintain continued compliance with the NFIP through implementation of the following specific actions: Evaluate permit application forms to determine possible modifications focused on flood hazard prevention; Develop a checklist for review of building/development permit plans and for inspection of development in floodplains; Sponsor a periodic NFIP workshop for local surveyors and builders; Encourage or require certain local staff positions to obtain and maintain CFM certification; and develop handouts for permit applications on specific issues such as installation of manufactured homes in flood hazard areas according to HUD installation standards, or guidance on improving/repairing existing buildings to better withstand potential hazards.	Public Information and Awareness	Riverine Flooding	City of Hickory Planning and Development Services Department	Minimal	City of Hickory General Fund	5 Years	High	To Be Continued	City staff has received additional training in flood prevention.
10	Contact owners of repetitive loss properties to inform them of the technical assistance and hazard mitigation grant funding assistance made available to owners of repetitively flooded	Public Information and Awareness	Riverine Flooding	City of Hickory Planning and Development Services Department	Minimal	City of Hickory General Fund	5 Years	High	In Progress	No measurable progress has been made due to lack of resources and staff.

City of Hickory Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	properties through the NCEM and FEMA This includes information on the pre-disaster grant funding program provided by FEMA through its HMA programs, and particularly the RFC program that can provide up to 100% in federal funds for eligible hazard mitigation activities.									
11	Continue to enforce the requirements of the City of Hickory's 2007 Flood Damage Prevention Ordinance. This ordinance regulates construction standards for development activities within SFHAs.	Prevention	Riverine Flooding	City of Hickory Planning and Engineering Departments	Minimal	City of Hickory General Fund	5 Years	High	To Be Continued	This is a continual activity that is updated annually and or as needed.
12	Monitor and enforce the provisions of the City of Hickory's NPDES Phase 2 Stormwater Control Ordinance and continue to provide community outreach to the public as to the ordinance's requirements and the importance of adequate stormwater control.	Prevention	Riverine Flooding	City of Hickory Engineering Departments	Minimal	City of Hickory General Fund	5 Years	High	To Be Continued	These educational opportunities are provided annually at several public events.
13	Remove obstructions from drainage ways were located on public property or where a threat to a public improvement such as a road or drainage structure is identified.	Prevention	Riverine Flooding	City of Hickory Public Services Department	Minimal	City of Hickory General Fund	5 Years	High	To Be Continued	Hickory Public Utilities was recently awarded a BRIC grant to perform shoreline stabilization activities at Northeast WWTP. Stabilization will

Section 7: Mitigation Actions

City of Hickory Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
										protect public infrastructure from damage.
14	Designate emergency thoroughfares and update to necessary standards. Work with NCDOT representatives to identify emergency thoroughfares and identify necessary improvements to enhance safety and improve functionality during emergency events.	Emergency Services	All Hazards	City of Hickory Fire Department and NCDOT	To Be Determined	City of Hickory General Fund	5 Years	High	To Be Continued	Review occurs to ensure new populations are accounted for in operations. Reviewed as needed and on a regular basis.
15	Continue to routinely prune trees and clear tree limbs hanging over rights of way to enhance safety and improve function during an emergency. In addition, continue policy requiring underground utility lines in new development and redevelopment projects.	Prevention	Hurricanes Winds; Thunderstorms Winds; Tornadoes; Snow; Ice	Hickory Planning and Public Services Departments	Minimal	City of Hickory General Fund and Private Developers	5 Years	High	To Be Continued	All development projects are required to install underground utilities, where practical and legal to do so.
16	Implement City of Hickory Police Department Radio Frequency Interoperability hardware, to prevent communication breakdowns due to compatibility issues between radio frequencies and telephone systems.	Emergency Warning Systems	All Hazards	City of Hickory Police Department	Medium	City of Hickory General Fund	5 Years	High	Complete	Complete
17	Implementation of Sky Tower by Hickory Police Department. Sky Tower is an elevated platform capable of supporting police	Emergency Services	All Hazards	City of Hickory Police Department	High	JAG Grant	5 Years	Moderate	Complete	Complete

City of Hickory Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	personnel and/or surveillance equipment.									
18	Implement second ladder company within the City of Hickory Fire Department. A second ladder company will provide the city with the ability to reduce the existing 43 square mile coverage area for the single ladder company into two 21.5 square mile coverage areas for the two companies.	Emergency Services	All Hazards	City of Hickory Fire Department	High	Five- year federal grant followed by funding by City of Hickory General Fund	5 Years	High	Complete	Complete
19	Takeover of duties of existing Hickory Rescue Light Rescue. The City of Hickory Fire Department will assume the responsibilities and response areas of the existing Hickory Rescue Light Rescue operated by Catawba County.	Emergency Services	All Hazards	City of Hickory Fire Department	To Be Determined	City of Hickory General Fund	5 Years	Moderate	Complete	Complete
20	Involve emergency preparedness staff in the development of all planning activities with hazard mitigation impacts.	Prevention	All Hazards	Catawba County Emergency Services Department; Planning Department; Economic Development; City of Hickory	Minimal	Catawba County General Fund	5 Years	High	To Be Continued	Other organizations are involved when necessary or advisable. Reviewed annually.

7.18. Town of Long View

Town of Long View Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Update Comprehensive Land Use Plan.	Prevention	All Hazards	Long View Planning Department	Minimal	Minimal	5 Years	High	To Be Continued	Review, revised and adopted in 2022 with next schedule review in 2030.
2	Increase dimensions of drainage culverts in troublesome areas.	Prevention	Riverine Flooding	Town of Long View Public Works Department	Minimal	To Be Determined	2 Years	High	In Progress	No measurable progress due to lack of staff and resources. Will be reviewed annually.
3	Step up centralized, coordinated permitting process including effective filing/permitting system to ensure compliance with floodplain regulations.	Prevention	Riverine Flooding	Long View Planning Department	Minimal	Minimal	5 Years	High	To Be Continued	Computerized permitting and inspection program has been completed and is continually monitored.
4	Draft a new stormwater drain map.	Prevention	Riverine Flooding	Town of Long View Planning Department; Town of Long View Public Works Department	Minimal	Minimal	3 Years	Moderate	Deferred	No measurable progress due to lack of staff and resources. Will be reevaluated annually.
5	Review/update Flood Damage Prevention Ordinance and limit development in the floodways according to NFIP criteria.	Prevention	Riverine Flooding	Long View Planning Department	Minimal	Minimal	5 Years	Moderate	To Be Continued	Monitoring occurs based on hazard information changes and will be reviewed annually.
6	Encourage residents to keep storm drains clear of debris before and after storms (to assist, not rely solely on Public Works).	Public Information and Awareness	Riverine Flooding	Town of Long View Planning Department; Town of Long View Public Works Department	Minimal	Minimal	5 Years	Moderate	Deferred	No measurable progress due to lack of staff and resources. Will be reviewed as needed.

Town of Long View Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
7	Ensure participation in the NFIP.	Prevention	Riverine Flooding	Long View Planning Department	Minimal	Minimal	5 Years	Moderate	To Be Continued	Continuously maintaining all applications reviewed.
8	Coordinate with local power companies to develop publicly acceptable tree trimming policies. Include public education for property owners on the benefits of proper tree trimming around power lines and clearing of debris around homes.	Public Information and Awareness	Snow; Ice; Thunderstorm Winds	Town of Long View Planning Department	Minimal	Minimal	3 Years	Moderate	Deferred	No measurable progress due to lack of staff and resources.
9	Develop Vulnerability Assessment Plan.	Prevention	All Hazards	Town of Long View Planning Department; Town of Long View Public Works Department; Town of Long View Fire Department	To be determined	Minimal	4 Years	Moderate	Deferred	No measurable progress due to lack of staff and resources.
10	Require tree preservation and/or plantings for residential and non-residential development to reduce the impacts of stormwater runoff.	Prevention	Riverine Flooding; Landslide	Town of Long View Planning Department	Minimal	Minimal	2 Years	High	Deferred	No measurable progress due to lack of staff and resources.
11	Promote a “Hazard Awareness Month” to spread hazard awareness throughout the Town.	Public Information and Awareness	All Hazards	Town of Long View Administration Department	Low	To Be Determined	1 Year	Moderate	To Be Continued	Completed annually.
12	In coordination with the Catawba County Emergency Services Department, conduct outreach to the public regarding the County’s Community Alert System to	Public Information and Awareness	All Hazards	Town of Long View; Catawba County Emergency	Minimal	General Fund	2 Years	High	Deferred	No measurable progress due to lack of staff and resources.

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Town of Long View Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	educate them about how to obtain information both pre- and post-event and about mitigation strategies.			Services Department						
13	Maintain continued compliance with the NFIP through implementation of the following specific actions: Evaluate permit application forms to determine possible modifications focused on flood hazard prevention, Encourage or require certain local staff positions to obtain and maintain CFM certification; Hold informative work sessions for newly elected officials and new appointees to planning commissions and appeals/variance boards to provide an overview of floodplain management, the importance of participating in the NFIP and the implications of failing to properly handle variance requests; Conduct a review of other regulatory programs and planning tools and report on opportunities to improve consistency with the objectives of floodplain management; and Maintain supplies of FEMA/NFIP materials to help property owners evaluate measures to reduce potential hazard damage.	Public Information and Awareness	Riverine Flooding	Town of Long View Planning Department	Minimal	Local staff time	5 Years	High	Deferred	No measurable progress due to lack of staff and resources.

Town of Long View Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
14	Routinely inspect and clear debris from drainage system.	Prevention	Flood	Town of Long View Public Works Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	Performed as needed and the program is reviewed annually.
15	Routinely prune trees and clear tree limbs hanging in the right of way.	Prevention	Thunderstorm Winds; Snow; Ice	Town of Long View Public Works Department	Minimal	Local staff time	5 Years	High	To Be Continued	Performed as needed and the program is reviewed annually.
16	Require the burial of electrical, telephone, and cable lines for new development.	Prevention	Thunderstorm Winds; Snow; Ice	Town of Long View Planning Department	Low	Private sector	5 Years	High	In Progress	No measurable progress has been made due to staff and lack of funding.
17	Routinely inspect and maintain fire hydrants.	Prevention	Wildfire	Town of Long View Fire Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	Performed as needed and the program is reviewed annually.
18	Provide hazard susceptibility checklist for homeowners to conduct their own inspections.	Public Information and Awareness	All Hazards	Town of Long View Administration Department; Town of Long View Planning Department	To Be Determined	FEMA; American Red Cross	5 Years	Moderate	In Progress	No measurable progress has been made due to staff and lack of funding.
19	Acquire federal funds to purchase destroyed or substantially damaged properties and relocate households.	Structure and Infrastructure Projects	All Hazards	Planning and Finance Departments	Minimal	State and Federal Grants	5 Years	High	In Progress	No measurable progress has been made due to staff and lack of funding.
20	Explore the feasibility of municipal purchase or private donations of floodplain areas for use as greenways.	Property Protection	Riverine Flooding	Town of Long View Planning Department	Minimal	Local staff time	3 Years	Moderate	In Progress	No measurable progress has been made due to staff and lack of funding.
21	Ensure firefighters are properly trained and equipped for brush/forest firefighting techniques.	Emergency Services	Wildfire	Town of Long View Fire Department	Minimal	Yearly Budgeted Activity	5 Years	Moderate	To Be Continued	Performed as needed and the program is reviewed annually.

7.19. Town of Maiden

Town of Maiden Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Maintain continued compliance with the NFIP through implementation of the following specific actions: Evaluate permit application forms to determine possible modifications focused on flood hazard prevention, Develop a checklist for review of building/development permit plans and for inspection of development in floodplains, Establish a goal to have each plan reviewer attend a related training periodically, Maintain a map of areas that flood frequently (e.g., areas where repetitive loss properties are located) and prioritize those areas for inspection immediately after the next flood. If outside FEMA SFHAs, consider requiring existing NFIP regulatory standards through overlay zoning, etc., and conduct a review of other regulatory programs and planning tools, such as the comprehensive plan and	Public Information and Awareness	Riverine Flooding	Town of Maiden Planning Department	Minimal	Local staff time	5 Years	High	To Be Continued	NFIP compliance is maintained according to requirements and is evaluated as needed to maintain NFIP compliance. This is reviewed as needed or as required.

Town of Maiden Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	zoning ordinance, and report on opportunities to improve consistency with the objectives of floodplain management.									
2	Continue to address the long-term maintenance and removal of the Maiden Water Supply dam structure with relevant state agencies.	Prevention	Riverine Flooding; Dam or Levee Failure	Town of Maiden Public Works Department	To Be Determined	Local; state; federal grants	5 Years	High	To Be Continued	This is reviewed annually.
3	Continue with the installation of more effective risers to sewer manholes to reduce infiltration and inflow during heavy rains.	Prevention	Riverine Flooding	Town of Maiden Public Works Department	Minimal	Local staff time	5 Years	High	To Be Continued	This is reviewed annually.
4	Routinely prune trees and clear tree limbs hanging near electrical lines.	Prevention	Hurricane Winds; Thunderstorm Winds; Hail; Tornado; Snow; Ice	Town of Maiden Public Works Department, Electrical Division	High	Local grants	5 Years	High	In Progress	Limbs are trimmed through town in phases and as funds are available: \$25,000 annually is the estimated cost associated with this action.
5	Routinely inspect and clean debris from drainage system.	Prevention	Riverine Flooding	Town of Maiden Public Works Department	Minimal	Local staff time	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
6	Explore the feasibility of municipal purchase and/or private donation of floodplain areas for use as greenways.	Property Protection	Riverine Flooding	Town of Maiden Planning Department	Minimal	Local staff time	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
7	Investigate backup power opportunities for critical facilities	Structural Projects	All Hazards	Town of Maiden	To Be Determined	Local, State and Federal Grants	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.

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Town of Maiden Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
8	Continue to ensure firefighters are properly trained and equipped for brush/wildland firefighting techniques.	Emergency Services	Wildfire	Town of Maiden Fire Department	Minimal	Local staff time	2 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
9	Continue to encourage residents to keep storm drains clear of debris during storms (to assist, not rely solely on Public Works) with PSAs.	Public Information and Awareness	Riverine Flooding	Town of Maiden Public Works Department	Minimal	Local staff time	5 Years	Moderate	To Be Continued	This is reviewed annually.
10	In coordination with the Catawba County Emergency Services Department, conduct outreach to the public regarding the County's Community Alert System to educate them about how to obtain information both pre- and post-event and about mitigation strategies.	Public Information and Awareness	All Hazards	Town of Maiden; Catawba County Emergency Services Department	Minimal	General Fund	5 Years	High	To Be Continued	To be continued seasonally at community events and is reviewed annually.
11	Develop a dam failure study for the Maiden Reservoir Dam and continue to address the long-term maintenance or removal of the dam structure with relevant state agencies.	Prevention	Riverine Flooding; Dam or Levee Failure	Town of Maiden Public Works Department	To Be Determined	Local; state; federal grants	5 Years	High	In Progress	Study is 75% complete.
12	Construct a remote fire station to house at least two trucks and additional firefighting and life/safety equipment necessary for first	Emergency Services	All Hazards	Town of Maiden Fire Department; Town of Maiden Administration Department	Minimal	Grants; taxes	5 Years	Moderate	In Progress	Additional fire station under construction.

Town of Maiden Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	responders during periods of emergency or disasters.									
13	Conduct public outreach and education regarding natural hazards that impact the planning area.	Public Information and Awareness	All Hazards	Town of Maiden	Minimal	Local funding	5 Years	Moderate	New Action	New

7.20. City of Newton

City of Newton Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Maintain continued compliance with the NFIP through implementation of the following specific actions: Maintain FEMA digital elevation certificates for all construction in the floodplain and establish a goal to have each plan reviewer and building inspector attend a related training periodically (for example, the NC Association of Floodplain Managers Annual Conference or Fall Floodplain Institute).	Public Information and Awareness	Riverine Flooding	City of Newton Planning and Zoning Department	Minimal	General Fund	5 Years	High	To Be Continued	Maintained annually to ensure NFIP requirements are met and compliance is maintained.
2	Increase dimensions of drainage culverts in troublesome areas.	Prevention	Riverine Flooding	City of Newton Public Works Department	To Be Determined	To Be Determined	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
3	Maintain a seasonal hazard awareness campaign.	Public Information and Awareness	All Hazards	City of Newton Public Information Officer	To Be Determined	To Be Determined	5 Years	Low	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
4	In coordination with the Catawba County Emergency Services Department, conduct outreach to the public regarding the County's Community Alert System to	Public Information and Awareness	All Hazards	Town of Newton; Catawba County Emergency Services Department	Minimal	General Fund	2 Years	High	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.

City of Newton Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	educate them about how to obtain information both pre- and post-event and about mitigation strategies.									
5	Maintain continued compliance with the NFIP through implementation of the following specific actions: Evaluate permit application forms to determine possible modifications focused on flood hazard prevention and develop a checklist for review of building/development permit plans and for inspection of development in floodplains.	Public Information and Awareness	Riverine Flooding	City of Newton Planning and Zoning Department	Minimal	To Be Determined	5 Years	High	To Be Continued	The Planning Department has continued to maintain digital elevation certificates for all construction in the floodplain, including current developments. A flood hazard focus during the City's annual zoning permit revisions included flood management in the development checklist and budgeted for floodplain training for proceeding five years. This resulted in the City's Floodplain Program receiving a clean audit by the State in 2013.
6	Routinely inspect and clear debris from drainage system.	Prevention	Riverine Flooding	City of Newton Planning and Zoning Department	To Be Determined	To Be Determined	5 Years	High	To Be Continued	Public works staff cleans and inspects the drainage system as needed, including problem areas before and after heavy rain events.
7	Routinely prune trees and clear tree limbs hanging in right of way.	Prevention	Hurricane Winds; Thunderstorm Winds; Hail; Tornado; Snow; Ice	City of Newton Public Works Department	To Be Determined	To Be Determined	5 Years	High	To Be Continued	The city has hired an additional tree trimming crew (2 total) to keep trees and limbs clear of electric lines seasonally.
8	Maintain a comprehensive infrastructure mapping system to document	Public Information	All Hazards	City of Newton Public Works Department	To Be Determined	To Be Determined	5 Years	High	To Be Continued	The city has collected all known infrastructure (water, sewer, electric) and has a

Section 7: Mitigation Actions

City of Newton Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	locations and attributes of infrastructure systems.	and Awareness								process in place to continuously update the data set.
9	Evaluate existing utility network and create a list of infrastructure protection projects based on highest potential hazard impacts.	Prevention	All Hazards	City of Newton Public Works Department	To Be Determined	To Be Determined	5 Years	High	In Progress	The city has a Capital Improvement Plan that plans capital cost for a five-year period. Hazard mitigation is a category for ranking projects.
10	Increase dimensions of drainage culverts in troublesome areas.	Prevention	Riverine Flooding	City of Newton Public Works Department	To Be Determined	To Be Determined	5 Years	Moderate	In Progress	The city has undertaken several culvert projects over the last several years, which involved replacing undersized culverts with larger sized pipes.
11	Train fire personnel in wildfire, brush, and forest fire firefighting techniques and practices.	Emergency Services	Wildfire	City of Newton Fire Department	To Be Determined	To Be Determined	5 Years	Moderate	To Be Continued	The Fire Department trains each of its personnel in wildfire, brush, and forest fire techniques on an annual basis.
12	Work with local media to establish a public wildfire awareness program.	Public Information and Awareness	Wildfire	City of Newton Fire Department	To Be Determined	To Be Determined	5 Years	Moderate	In Progress	Over the past 5 Years, the Fire Department has worked with the City's PIO and local media to educate the public about wildfire hazards. The City's efforts to educate the public on wildfires includes adopting a proclamation for a Fire Safety Week each year. The city has also included relevant articles in its quarterly newsletter which goes out to all utility customers, as well as including information on the

City of Newton Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
										City's website, Facebook page, and Twitter. In addition, the Fire Department has a Fire Educator that speaks to groups of all ages about fire safety topics, which includes wildfire awareness. Specific groups visited by the Fire Educator include schools, childcare centers, and civic groups.
13	Maintain a seasonal hazard awareness campaign.	Public Information and Awareness	All Hazards	City of Newton Public Information Officer	To Be Determined	To Be Determined	5 Years	Low	In Progress	The City's PIO through the local media, newsletters, and social media worked to educate the public on seasonal hazards. The city has included articles about hazard awareness in its quarterly newsletter, which is sent out to all utility customers, as well as including information on the City's website, Facebook page, and Twitter. Also, the PIO has prepared and obtained brochures to distribute as needed to educate the public on hazard awareness of all hazards in the planning area.

7.21. Caldwell County

Caldwell County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Require a finished floor elevation certificate for all development within the SFHA within both incorporated and unincorporated portions of the county. All elevation certificates should be submitted on an official FEMA elevation certificate. No certificate of occupancy shall be issued for any development within a defined SFHA without the submittal of the required elevation certificate to limit development in the floodway according to NFIP criteria.	Prevention	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department; Planning Staff of all municipalities in Caldwell County	Medium	Existing staff and administrative resources	5 Years	High	To Be Continued	Reviewed on a case-by-case basis and is required in SFHAs as needed.
2	Maintain a map information service involving the following: Provide information relating to FIRMs to all inquirers, including provision of information on whether a given property is located within a flood hazard area, provide information regarding the flood insurance purchase requirement, maintain historical and current FIRMs, advertise once annually in the local newspaper, and Provide information to inquirers about local floodplain management requirements.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department; administrative staff of all participating jurisdictions within Caldwell County	High	Tax-based funding	5 Years	Moderate	To Be Continued	This is performed annually and will be updated as needed.

Caldwell County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
3	Caldwell County will annually mail a notice to all property owners whose land is located within a SFHA. The notice should clearly state that the recipient's property is susceptible to flooding and provide information pertinent to emergency evacuation and post-disaster recovery.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	Low	Maintain present activities under the funding available	5 Years	Moderate	To Be Continued	This is performed annually and will be updated as needed.
4	The Caldwell County Planning Department will work with local real estate agencies to ensure that agents are informing clients when property for sale is located within a SFHA. Caldwell County will provide these agencies with brochures documenting the concerns relating to development located within flood-prone areas and ways that homeowners may make their homes more disaster resistant to strong winds, lightning, and heavy rains.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department; Caldwell County Emergency Management Department	Minimal	Existing Department Budget and Staff Resources	5 Years	High	To Be Continued	This is performed annually and will be updated as needed.
5	The Caldwell County Planning Department and Caldwell County Building Inspections will make information regarding hazards and development regulations within floodplains available through the following: Ensuring that the local library	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Building Inspections and Planning Department; administrative staff of all participating	Low	Maintain present activities under the funding available	5 Years	High	Complete	Completed

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Caldwell County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	maintains information relating to flooding and flood protection, Providing a link on their website to FEMA resources addressing flooding and flood protection, and Each of the county's municipalities, if a website is in place, will provide a link on their website to FEMA resources addressing flooding and flood protection, sheltering, evacuation procedures, disaster preparedness, and post-disaster recovery.			jurisdictions within the county						
6	The Caldwell County Building Inspections will provide comprehensive services regarding planning and development activities within the defined SFHA and issues relating to the construction of disaster resistant structures. These services will include providing site specific flood and flood-related information on an as-needed basis, maintaining a list of contractors with experience in floodproofing and retrofit techniques, providing information on wind proofing construction methods for new and renovated structures, maintaining materials	Public Information and Awareness	Riverine Flooding	Caldwell County Building Inspections; Caldwell County Planning Department	Minimal	Existing Department Budget and Staff Resources	5 Years	High	To Be Continued	This is updated annually and as needed.

Caldwell County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	providing an overview of how to select a qualified contractor, making site visits upon request to review occurrences of flooding, drainage problems, and sewer problems. If applicable, the inspector should provide one-on-one advice to the property owner, providing advice and assistance regarding CRS activity 530, Advertising the availability of this service once annually within the local newspaper, and maintaining a log of all individuals assisted through this County service including all site visits.									
7	Caldwell County and its municipalities will continue to maintain all property acquired within the SFHA as undisturbed open space in perpetuity. All parties will continue to pro-actively establish open space within the floodplain and floodway as grant funds become available to carry out this initiative.	Prevention	Riverine Flooding; Dam or Levee Failure	Caldwell County Building Inspections; Caldwell County Planning Department	High	Grant fund resources; EMS Base Budget	5 Years	High	To Be Continued	This is updated annually and as needed.
8	The Caldwell County Planning Department will maintain a comprehensive GIS) with current FIRM panels to make this information readily available to County citizens. In	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department; Caldwell County Information	To Be Determined	Existing department and Staff Resources	4 Years	High	Complete	Complete

Section 7: Mitigation Actions

Caldwell County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	addition to this digital data, bound copies of all historical and current FIRM panels will be maintained within the Caldwell County Planning Department office.			Technology Department						
9	The Caldwell County Mitigation Advisory Committee, in conjunction with all municipal jurisdictions participating in the plan update, will work on the five-year implementation of this Hazard Mitigation Plan Update. At the end of the five-year period, the County will again update the plan.	Public Information and Awareness	All Hazards	Caldwell County Emergency Management Department	To Be Determined	General Fund	5 Years	High	To Be Continued	This is updated every 5 Years.
10	Caldwell County, as well as all participating jurisdictions, will continue to support the North Carolina Office of Dam Safety's efforts to monitor and inspect all dams throughout the county, as well as the State of North Carolina. The County relies on this agency to ensure that all dam facilities, both public and private, are properly maintained and stable.	Prevention	Riverine Flooding; Dam or Levee Failure	Caldwell County Emergency Management Department; administrative staff of all participating jurisdictions	Low	Caldwell County Emergency Management Budget for registry	5 Years	High	In Progress	No measurable progress due to staffing and funding. \$1,500 annually required to maintain this action.
11	Caldwell County will maintain participation in the CRS program. Additionally, Caldwell County will work with all	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department; elected boards of	Local staff time	Existing Department Budget and Staff Resources	5 Years	Moderate	In Progress	No measurable progress due to staffing and funding. This is reviewed

Caldwell County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	participating jurisdictions, upon request, to secure inclusion in the CRS program. Currently, only unincorporated Caldwell County is a participant in the program.			all participating jurisdictions						annually and as needed.
12	The Caldwell County Emergency Management Department will continue to work closely with the American Red Cross on the management and, when necessary, operation of emergency shelter facilities within the county. The County will operate only in a support role in dealing with individual shelter issues.	Emergency Services	All Hazards	American Red Cross; Caldwell County Emergency Management Department	High	Grant funding and possible donations	5 Years	High	In Progress	No measurable progress due to staffing and funding. This is reviewed annually and as needed.
13	Caldwell County will work with the American Red Cross and will attempt to obtain funding for locating switches and generators at all emergency shelter locations.	Emergency Services	All Hazards	Caldwell County Emergency Management Department; American Red Cross	Minimal	Existing Department Budget and Staff Resources or grant funding	5 Years	High	In Progress	No measurable progress due to staffing and funding. This is reviewed annually and as needed.
14	The Caldwell County Emergency Management Department will continue to coordinate with the Caldwell County Public Works Department, as well as all participating jurisdictions, regarding the monitoring of water resources statewide. When necessary, the County	Natural Resource Protection	Drought	Caldwell County Water Department; administrative staff of all participating jurisdictions	Minimal	Existing Department Budget and Staff Resources	5 Years	Low	In Progress	No measurable progress due to staffing and funding. This is reviewed annually and as needed.

Section 7: Mitigation Actions

Caldwell County Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	will institute measures to conserve water resources according to the County's Drought Management Plan.									
15	Caldwell County will assist all communities within the county, including property owners in unincorporated areas, in applying for FEMA-sponsored mitigation grant assistance for the acquisition and/or elevation of substantially damaged structures following a natural disaster.	Property Protection	Riverine Flooding	Caldwell County Emergency Management Department; elected boards of all participating jurisdictions	To Be Determined	Existing Department Budget and Staff Resources	5 Years	Low	In Progress	No need for implementation in last 5 Years. This is reviewed annually and as needed.
16	The Caldwell County Emergency Management Department will continue to work on the establishment of a comprehensive special need's registry in conjunction with an early warning system to notify residents of hazard events. This effort will involve the cooperation of all participating jurisdictions.	Emergency Services	All Hazards	Caldwell County Emergency Management Department; administrative staff of all participating jurisdictions	Minimal	Existing Department Budget and Staff Resources	5 Years	Low	Deferred	No measurable progress due to staffing and funding. This is reviewed annually and as needed.
17	The City of Lenoir will continue to serve an administrative role in the implementation and enforcement of the County's comprehensive stormwater management program. The stormwater regulations outlined within this program shall apply to Gamewell,	Prevention	Riverine Flooding	City of Lenoir Planning and Building Inspections Department; administrative staff of Caldwell County; administrative	Minimal	Existing Department Budget and Staff Resources	5 Years	High	In Progress	No measurable progress due to staffing and funding. This is reviewed annually and as needed.

Caldwell County Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	Cajah's Mountain, Lenoir, Hudson, Sawmills, and Granite Falls.			staff of all municipalities within the county						
18	Caldwell County will consider the development and adoption of a slope control ordinance based on the findings outlined within this plan.	Prevention	Landslide	Caldwell County Planning Department; Caldwell County Board of Commissioners	Minimal	Existing Department Budget and Staff Resources	5 Years	Low	In Progress	No measurable progress due to staffing and funding. This is reviewed annually and as needed.
19	To incorporate discussions relating to the provision of electric service during or following natural hazard events, Caldwell County will consider inviting a staff member from each of the electric service providers operating in the county to attend and participate in all LEPC meetings.	Emergency Services	Riverine Flooding; Dam or Levee Failure; Snow; Ice; Thunderstorm; Windstorm	Caldwell County Emergency Management Department; Electric Service Providers	Minimal	Existing Department Budget and Staff Resources	5 Years	Moderate	In Progress	Utility providers remain involved in LEPC, and this action is reviewed annually.
23	Consider adopting and enforcing land use ordinances in inundation zones	Prevention	Dam Failure; Riverine Flooding	Caldwell County Planning Department	Minimal	Local; state; federal grants	5 Years	Moderate	New Action	New Action

7.22. Town of Cajah's Mountain

Town of Cajah's Mountain Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Maintain a map information service involving the following: Provide information relating to FIRMs to all inquirers, including provision of information on whether a given property is located within a flood hazard area, provide information on the flood insurance purchase requirement, maintain historical and current FIRMs, advertise once annually in the local newspaper, and Provide information to inquirers about local floodplain management requirements.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department; Town of Cajah's Mountain	To Be Determined	Town of Cajah's Mountain General Fund	5 Years	High	In Progress	Caldwell County Online GIS maps include updated flood hazard area overlays and Town staff are available to answer questions and make determinations. Current and previous FIRMs available for review at Town Hall.
2	Provide information regarding hazards and development regulations within floodplains available through the following: Ensuring that the local library maintains information relating to all natural hazards impacting the planning area. Provide a link on website to FEMA resources addressing natural hazards.	Public Information and Awareness	All Hazards	Caldwell County Planning and Development Department; Caldwell County Building Inspections Department; Town of Cajah's Mountain	To Be Determined	General Fund	5 Years	High	In Progress	The Town of Cajah's Mountain has utilized its website to publicize FEMA resources for disaster preparedness.
3	Caldwell County and all participating jurisdictions will continue to maintain all property acquired within the SFHA as undisturbed open space in perpetuity. All parties will continue	Prevention	Riverine Flooding; Dam or Levee Failure; Wildfire	Caldwell County Commissioners; Town of Cajah's Mountain	To Be Determined	General Fund	5 Years	High	In Progress	Will participate in the county program to establish perpetual open space in SFHAs as budget allows. This

Town of Cajah's Mountain Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	to pro-actively establish open space within the floodplain and floodway as grant funds become available to carry out this initiative according to NFIP criteria									is reviewed annually and as needed.
4	The Caldwell County Mitigation Advisory Committee, in conjunction with all municipal jurisdictions participating in the plan update, will work on the five-year implementation of this Hazard Mitigation Plan Update. At the end of the five-year period, the committee will again update the plan.	Public Information and Awareness	All Hazards	Caldwell County Emergency Management Department	To Be Determined	General Fund	5 Years	High	In Progress	Participated in the regionalization of the Caldwell County hazard mitigation plan and is now a participating jurisdiction in the Unifour Regional Hazard Mitigation Plan which has taken the place of the previously planned county-level 5-year plan update.
5	Caldwell County, as well as all participating jurisdictions, will continue to support the North Carolina Office of Dam Safety efforts to monitor and inspect all dams throughout the County, as well as the State of North Carolina. The County relies on this agency to ensure that all dam facilities, both public and private, are properly maintained and stable.	Prevention	Riverine Flooding; Dam or Levee Failure	Caldwell County Emergency Management Department	To Be Determined	General Fund	5 Years	High	In Progress	The Town will work in conjunction with County Emergency Management staff to remain informed about the safety status of local dams to be able to pass this information along to citizens.
6	Caldwell County Emergency Services will continue to coordinate with the Caldwell County Public Works Department, as well as all	Emergency Services	Drought	Caldwell County Water Department	To Be Determined	General Fund	5 Years	High	In Progress	The Town will notify citizens if the County's Drought Management Plan must be implemented through

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Town of Cahaj's Mountain Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	participating jurisdictions, regarding the monitoring of water resources statewide. When necessary, the County will institute measures to conserve water resources according to the County's Drought Management Plan.									its website, social media, and Town Hall informational sign.
7	Caldwell County will assist all communities within the County, including property owners in unincorporated areas, in applying for FEMA-sponsored mitigation grant assistance for the acquisition and/or elevation of substantially damaged structures following a natural disaster.	Property Protection	All Hazards	Caldwell County Emergency Management Department	To Be Determined	General Fund; possible grant funding	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually and as needed.
8	The City of Lenoir will continue to serve an administrative role in the implementation and enforcement of the County's comprehensive stormwater management program. The stormwater regulations outlined within this program shall apply to Gamewell, Cahaj's Mountain, Lenoir, Hudson, Sawmills, and Granite Falls.	Prevention	Riverine Flooding; Dam or Levee Failure	City of Lenoir Planning Department	To Be Determined	General Fund	5 Years	High	In Progress	The Town contracts with the City of Lenoir on a yearly basis for implementation and enforcement of the Stormwater regulations.

7.23.Village of Cedar Rock (WPCOG)

Village of Cedar Rock Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Caldwell County will assist all communities within the County, including property owners in unincorporated areas, in applying for FEMA-sponsored mitigation grant assistance for the acquisition and/or elevation of substantially damaged structures following a natural disaster.	Property Protection	Riverine Flooding	Caldwell County Building Inspections Department	Minimal	General Budget	5 Years	Moderate	In Progress	No new development since last plan update. This is reviewed annually and as needed.
2	Investigate maintaining a contract with a qualified post-disaster recovery service provider for essential services and equipment including generators and will include documentation required for reimbursement from FEMA/NCEM.	Emergency Services	All Hazards	Village of Cedar Rock Village Council	Minimal	Grants and tax-based funding	5 Years	Moderate	Deferred	Deferred due to contracting with WPCOG for a staff person to manage disaster recovery and response.
3	Monitor water resources and when necessary, institute measures to conserve water through Drought Management Plan.	Natural Resource Protection	Drought	Caldwell County Water Department	High	Grants and tax-based funding	5 Years	High	To Be Continued	Monitoring occurs annually. Lack of need for implementation due to lack of drought conditions.
4	Support the NC Office of Dam Safety; make sure dams are regularly inspected.	Prevention	Riverine Flooding; Dam or Levee Failure	NC DENR, Dam Program	Minimal	Grants and tax-based funding	5 Years	High	In Progress	Measurable progress is slow due to staff availability and relevance to the Village. 5% complete.

Section 7: Mitigation Actions

Village of Cedar Rock Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
5	Continue to maintain all property acquired within the SFHA as undisturbed open space in perpetuity. Continue to pro-actively establish open space within the floodplain in accordance with NFIP criteria.	Prevention	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	High	Grants and tax-based funding	5 Years	High	To Be Continued	This is maintained annually and as needed.
6	Provide information regarding hazards and development regulations within the floodplain available through library resources, links to FEMA addressing natural hazards on the Village website, disaster preparedness, and post-disaster recovery.	Public Information and Awareness	All Hazards	Caldwell County Building Inspections Department; Village of Cedar Rock	Minimal	General Budget	5 Years	High	To Be Continued	Village staff work with Caldwell County to ensure information disseminated annually.
7	Maintain a map information service about FIRMs, advertise annually in the paper, and provide information to inquirers about local floodplain management requirements.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	High	Tax-based funding	5 Years	High	To Be Continued	Advertised annually maintained continuously.
8	Require flood elevation certificates for development within the SFHA.	Prevention	Riverine Flooding	Caldwell County Building Inspections Department	Moderate	General Budget	5 Years	High	To Be Continued	This will be reviewed as needed and as required by NFIP regulations.
9	Create an outreach program to inform residents about hazard preparedness and awareness through multiple touch points and social media.	Public Information and Awareness	All Hazards	Village of Cedar Rock	Minimal	General Budget	5 Years	Moderate	New	New Action

7.24. Town of Gamewell (WPCOG)

Town of Gamewell Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Caldwell County and the Town of Gamewell will assist in applying for FEMA-sponsored mitigation grant assistance.	Structural Projects	All Hazards	Caldwell County Building Inspections Department; Town of Gamewell	Minimal	Local, state and federal grant sources	5 Years	Moderate	To Be Continued	Assistance with applications occurs on an as needed basis.
2	Maintain a contract with a qualified post-disaster recovery service provider for essential services and equipment including generators and will include documentation required for reimbursement from FEMA/NCEM.	Prevention	All Hazards	Town of Gamewell Town Council; Town of Gamewell Administration	Minimal	Local, state and federal grant sources	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding.
3	Monitor water resources and when necessary, institute measures to conserve water through Drought Management Plan.	Prevention	Drought	Caldwell County Water Department	High	Grants and tax-based funding	5 Years	High	Deleted	It is not feasible for the Town to institute drought management policies since it does not own or operate a water distribution facility. Estimated \$1,500,000 cost associated with this action.
4	Support the NC Office of Dam Safety; make sure dams are regularly inspected.	Structural Projects	Riverine Flooding; Dam or Levee Failure	North Carolina Department of Environment and Natural Resources (NCDENR), Dams Program	Minimal	Grants and tax-based funding	5 Years	High	In Progress	Caldwell County has started a registry to track the location and depth of all ponds and dams within the county.

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Town of Gamewell Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
5	Continue to maintain all property acquired within the SFHA as undisturbed open space in perpetuity. Continue to pro-actively establish open space within the floodplain according to NFIP criteria.	Natural Systems Protection	Riverine Flooding; Dam or Levee Failure;	Caldwell County Planning Department	High	Grants and tax-based funding	5 Years	High	To Be Continued	Estimated \$250,000+ cost is associated with this action. Progress will be updated when more funding becomes available to assist with the action.
6	Provide information regarding hazards and development regulations within the planning area available through the following: library, link on website to FEMA information addressing flood protection, disaster preparedness, and post-disaster recovery.	Public Information and Awareness	All Hazards	Caldwell County Building Inspections Department; Town of Gamewell	Low	General Budget	2 Years	High	In Progress	The Town of Gamewell is working in coordination with Caldwell County to fulfill this action. Measurable progress is slow due to lack of funding and staff availability.
7	Maintain a map information service about FIRMs, advertise annually in the newspaper, and provide information to inquirers about local floodplain management requirements.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	High	Tax-based funding	5 Years	High	To Be Continued	Maps are kept on file at Town Hall and are also available on the County website. \$85,000 cost associated with this activity
8	Require flood elevation certificates for development within the SFHA.	Prevention	Riverine Flooding	Caldwell County Building Inspections Department	High	General Budget	2 Years	High	In Progress	This will be a part of the new Flood Damage Prevention Ordinance to be adopted in late 2019 or early 2020. There is an estimated \$50,000 cost associated with this activity.

7.25. Town of Granite Falls

Town of Granite Falls Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Establish and maintain Temporary Disaster Debris Staging Area by selecting suitable site and submitting to the NCDENR for approval for use during a natural disaster.	Structural Projects	Tornado; Snow; Ice; Thunderstorm; Hurricane and Tropical Storm	Caldwell County Emergency Management Department; Town of Granite Falls Manager	Minimal	Existing Department Budget and Staff Resources	5 Years	Moderate	In Progress	The Town has not yet utilized the Granite Falls Recreation Center as a Temporary Disaster Debris Staging site and therefore has not asked the Solid Waste Section of NCDEQ to activate the site. Conditional approval granted October 9, 2013, remains in effect. This action item is carried forward to the 2019-2024 Plan.
2	Implement educational outreach to citizens on recognizing potential conflicts between trees and overhead power lines, tree trimming techniques to reduce potential for power outages due to downed trees or falling tree limbs, and the benefits of hiring an arborist and safety tips for cleanup after a storm.	Public Information and Awareness	Tornado; Snow; Ice; Thunderstorm; Hurricane and Tropical Storm	Town of Granite Falls Electric Department with assistance from Electricities	Minimal	Existing Department Budget, public power agency, and Staff Resources	2 Years	High	Deferred	The Town has included some information in newsletters that are sent out with utility bills. However, the Town still plans to incorporate more comprehensive efforts on our website.
3	Evaluate infrastructure upgrades to freshwater intake on Lake Rhodhiss to ensure water supply during severe drought conditions.	Structural Projects	Drought	Town of Granite Falls Water Department	To Be Determined	General fund, grant funding	4 Years	Moderate	In Progress	Fresh water intake has been inspected to ensure proper depth and functionality. The Town is evaluating options for

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Town of Granite Falls Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
										a backup intake pump that could be deployed in the event of a severe drought.
4	Incorporate hazard mitigation elements into the next update of the Town's Land Use Plan and any small area or corridor plans.	Prevention	All Hazards	Town of Granite Falls Planning Department	Minimal	General fund, grant funding	2 Years	Moderate	In Progress	The Town updated the Land Use Plan in 2021. Protection of natural resources and provision of services were a focus. This plan will be updated again in the near future.
5	Caldwell County and all participating jurisdictions will continue to maintain all property acquired within the SFHA as undisturbed open space in perpetuity according to NFIP criteria. All parties will continue to pro-actively establish open space within the floodplain and floodway as grant funds become available to carry out this initiative.	Prevention; Natural Systems Protection	Riverine Flooding; Dam or Levee Failure	Town of Granite Falls Town Council	Minimal	Grants and tax-based funding	5 Years	High	To Be Continued	The Town is currently working to acquire property in the Special Flood Hazard Area (SFHA) with the intention of keeping it undeveloped. The Town remains committed to maintaining any property that is acquired within a SFHA as open space in perpetuity.
6	Caldwell County, as well as all participating jurisdictions, will continue to support the NC Office of Dam Safety's efforts to monitor and inspect all dams throughout the county, as well as the State of NC. The County relies	Structural Projects	Flood; Dam or Levee Failure	Caldwell County Emergency Management Department; Town of Granite Falls Town Council	To Be Determined	Local Budget	5 Years	High	Deferred	No measurable progress due to lack of funding and staff resources. This is reviewed annually and as needed.

Town of Granite Falls Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	on this agency to ensure that all dam facilities, both public and private, are properly maintained and stable.									
7	Caldwell County Emergency Management will continue to coordinate with the County Public Works Department, as well as all participating jurisdictions, regarding the monitoring of water resources statewide. When necessary, the County will institute measures to conserve water resources according to the County's Drought Management Plan.	Natural Systems Protection	Drought	Caldwell County Water Department: Town of Granite Falls Town Council	To Be Determined	Existing Department Budget and Staff Resources	5 Years	High	To Be Continued	The Town has policies in place for implementation should the need arise. The Town continues to maintain participation with the Drought Management Advisory Group and cooperation with Caldwell County Emergency Management.
8	Caldwell County will assist all communities within the county, including property owners in unincorporated areas, in applying for FEMA-sponsored mitigation grant assistance for the acquisition and/or elevation of substantially damaged structures following a natural disaster.	Structural Projects	Riverine Flooding	Caldwell County Emergency Management	Minimal	Existing Department Budget and Staff Resources/Grants	5 Years	Moderate	To Be Continued	Pursuit of grant funding will continue to be a priority to minimize flood damage and/or prevent repetitive loss.
9	Caldwell County Emergency Services will continue to work on the	Prevention	All Hazards	Caldwell County Emergency Management	Minimal	Existing Department	5 Years	Moderate	In Progress	The Town would be able to work with Caldwell County Emergency

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Town of Granite Falls Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	establishment of a comprehensive special need's registry. This effort will involve the cooperation of all participating jurisdictions.			Department; Granite Falls		Budget and Staff Resources				Management to develop a comprehensive special needs registry. This is reviewed annually.
10	Town of Granite Falls will continue to serve an administrative role in the implementation and enforcement of the County's comprehensive stormwater management program. The stormwater regulations outlined within this program shall apply to Granite Falls, Gamewell, Cahah's Mountain, Lenoir, Hudson, and Sawmills.	Prevention	Riverine Flooding; Dam or Levee Failure	City of Lenoir Planning Department	Minimal	Existing Department Budget and Staff Resources	5 Years	High	Completed	Administration of the Town's Stormwater Program is now handled by the Western Piedmont Council of Governments. The Town is in good standing in this program. A new action item has been added to reflect this.
11	Caldwell County, as well as all participating jurisdictions, will maintain a contract with a qualified post-disaster recovery service provider. This contract will include the provision of essential services and equipment, including generators, and will include documentation required for reimbursement from FEMA/NCEM.	Structural Projects	All Hazards	Caldwell County Emergency Management Department; Granite Falls	Minimal	Grants and tax-based funding	5 Years	Moderate	In Progress	This remains a priority and has been carried forward as an action item for the 2024 Plan. No measurable progress due to lack of funding and staff resources. This is reviewed annually and as needed.

Town of Granite Falls Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
12	The Town of Granite Falls will aim to draft a comprehensive Parks and Recreation Plan over the next five years. This plan will incorporate recommendations regarding the purchase and development of flood-prone land for recreational purposes.	Prevention	Riverine Flooding; Dam or Levee Failure	Town of Granite Falls Town Council	Minimal	Existing Department Budget and Staff Resources; grant funding	5 Years	Moderate	In Progress	The Town recently updated the Parks & Recreation Master Plan. The focus is on provision of services, however land in the Special Flood Hazard Area (SFHA) can be acquired for recreational purposes.
13	Maintain a map information service involving the following: Provide information relating to FIRMs to all inquirers, including provision of information on whether a given property is located within a flood hazard area, provide information regarding the flood insurance purchase requirement, maintain historical and current FIRMs, advertise once annually in the local newspaper, and provide information to inquirers about local floodplain management requirements.	Natural Systems Protection, Education & Outreach	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	Minimal	Existing Department Budget and Staff Resources	5 Years	High	In Progress	The Town continues to make all the relevant information available and to provide information to those who inquire about floodplain management requirements. The Town can continue to find more effective ways to get floodplain information to the public, particularly those whose property lies in Special Flood Hazard Areas. The Town will evaluate the effectiveness of a direct mailing to affected property owners to advise regarding the limitations that may exist on their property.
14	Install backup generator or transfer switch (to facilitate	Structural Projects	Tornado; Snow; Ice;	Town of Granite Falls Electric	Minimal	Existing department,	5 Years	Moderate	In Progress	Backup generators have been installed at the

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Town of Granite Falls Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	safe connection of portable generator) when any new Town facilities are constructed, or existing buildings are substantially renovated.		Thunderstorm Winds; Hurricane Winds	Department with assistance from Electricities		public power agency, and grant funding				Police Department and Town Administrative Offices. This will be reviewed annually to include new buildings constructed in the town.
15	Amend Zoning Ordinance to require that any new manufactured home parks must include a buffer (vegetative, masonry, berm, etc.) that can serve as a wind break.	Prevention	Tornado; Severe Thunderstorm Winds; Hurricane Winds	Town of Granite Falls Planning Department	Minimal	Existing Department Budget	5 Years	Moderate	Deferred	The Town of Granite Falls continually updates and amends its Development Regulations. This action item can be incorporated in a future Zoning Text Amendment, either stand-alone or as a part of a larger update.
16	Develop a map of all stormwater outfalls within the Town's jurisdiction. Comprehensive map can serve as a tool for maintaining and periodically inspecting for any blockages or damage, particularly in advance of a heavy rain event.	Structural Projects	Tornado; Snow; Ice; Thunderstorm Winds; Hurricane Winds	Town of Granite Falls	To be Determined	General Fund, Grant Funding	5 Years	Moderate	In Progress	The Town of Granite Falls will work with staff from the Western Piedmont Council of Governments to complete a stormwater outfall inventory.
17	Develop an informational brochure that explains the importance of keeping storm drains and catch basins clear of debris and encourages residents to be proactive about keeping	Public Information and Awareness	Riverine Flooding; Thunderstorm Winds; Hurricane Winds;	Town of Granite Falls	Minimal	General Fund, Grant Funding	2 Years	Moderate	To Be Continued	The Town website was updated to include general information about our Stormwater Program. This will be reviewed and updated annually.

Town of Granite Falls Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	them clean and reporting issues. This information could be disseminated through the Town's website, social media and newsletter.									
18	Establish a new electric sub-station that would provide a secondary feed for the Town's electric distribution system.	Structural Projects	Tornado; Snow; Ice; Thunderstorm Winds; Hurricane Winds	Town of Granite Falls Electric Department	High	Grant Funding	10 Years	Moderate	To Be Continued	This is a project that is listed in our Capital Improvement Plan, however due to rapidly increasing prices, funding is a primary obstacle. The Town will continue to pursue suitable land.
19	Maintain a map information service involving the following: Provide information relating to FIRMs to all inquirers, including provision of information on whether a given property is located within a flood hazard area, Provide information regarding the flood insurance purchase requirement, Maintain historical and current FIRMs, Advertise once annually in the local newspaper, and provide information to inquirers about local floodplain management	Natural Systems Protection	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	Minimal	Existing Department Budget and Staff Resources	5 Years	High	In Progress	Caldwell County Online GIS maps include updated flood hazard area overlays and Town staff are available to answer questions and make determinations. Current and previous FIRMs are available for review at Town offices. The Town of Granite Falls Flood Damage Prevention Ordinance is available on the Town website.

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Town of Granite Falls Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	requirements; Limit development in floodways according to NFIP criteria.									
20	The Caldwell County Mitigation Advisory Committee (MAC), in conjunction with all municipal jurisdictions participating in this plan update, will work on the five-year implementation of this Hazard Mitigation Plan Update. At the end of the five-year period, the County will again update the plan.	Prevention	All Hazards	Caldwell County Emergency Management Department	To Be Determined	General Fund	5 Years	High	To Be Continued	The Town of Granite Falls has participated in the regionalization of the Caldwell County hazard mitigation plan and is now a participating jurisdiction in the Unifour Regional Hazard Mitigation Plan of the previously planned county-level 5-year plan update.
21	Caldwell County Emergency Services and the Town of Granite Falls will continue to work on the establishment of a comprehensive special need's registry. This effort will involve the cooperation of all participating jurisdictions.	Prevention	All Hazards	Caldwell County Emergency Services; Granite Falls	Minimal	Existing Department Budget and Staff Resources	5 Years	Moderate	Deferred	Measurable progress is slow due to staff availability and funding. This is reviewed annually.

7.26.Town of Hudson (WPCOG)

Town of Hudson Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Administer stormwater regulations.	Prevention	Riverine Flooding; Sinkhole; Erosion; Landslide	Town of Hudson Planning and Building Inspections Department; Caldwell County; all participating jurisdictions in Caldwell County	High	Existing Department Budget and Staff Resources	5 years	High	To Be Continued	The Town of Hudson continues to administer stormwater regulations for the Town of Hudson. Prepare for new audits from NCDEQ and EPA. Implement new stormwater illicit discharge identification methods. \$50,000 estimated cost associated with this action.
2	Town of Hudson and Caldwell County will assist communities within the jurisdiction, including property owners in unincorporated areas, in applying for FEMA-sponsored mitigation grant assistance for the acquisition and/or elevation of substantially damaged structures following a natural disaster.	Structural Projects	Riverine Flooding	Caldwell County Building Inspections Department; Town of Hudson	Minimal	Grants and tax-based funding	5 Years	Moderate	To Be Continued	Caldwell County and the Town have been and continue to help when communities are applying for funding to help landowners bring at-risk structures into compliance.
3	Investigate maintaining a contract with a qualified post-disaster recovery	Prevention	All Hazards	Town of Hudson Administration Department; Town	Minimal	Grants and tax-based funding	5 Years	Moderate	Deferred	Deferred to the next plan update: Measurable progress

Section 7: Mitigation Actions

Town of Hudson Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	service provider for essential services and equipment including generators and will include documentation required for reimbursement from FEMA/NCEM.			of Hudson Police Department						is slow due to staff availability and funding.
4	Monitor water resources and when necessary, institute measures to conserve water through Drought Management Plan.	Prevention	Drought	Caldwell County Water Department; Hudson	High	Grants and tax-based funding	5 Years	High	In Progress	Measurable progress is slow due to staff availability and funding. \$1,500,000 estimated cost associated with this action.
5	Support the NC Office of Dam Safety; make sure dams are regularly inspected.	Structural Projects	Riverine Flooding; Dam or Levee Failure	North Carolina Department of Environment and Natural Resources (NCDENR) Dams Program; Hudson	Minimal	Grants and tax-based funding	5 Years	High	To Be Continued	Caldwell County has started a registry to track the location and depth of all ponds and dams within the Town. To be continued annually.
6	Continue to maintain all property acquired with the SFHA as undisturbed open space in perpetuity. Continue to pro-actively establish and protect open space within the floodplain according to NFIP criteria.	Natural Systems Protection	Riverine Flooding; Dam or Levee Failure; Wildfire	Caldwell County Planning Department; Hudson	High	Grant funds; Lenoir EMS Base Budget	5 Years	High	To Be Continued	Action continues. Flood Damage Prevention Ordinance was adopted in 2015. Estimated \$250,000+ cost associated with this mitigation action.
7	Caldwell County Planning and Building Inspections Departments will make information regarding hazards and development	Public Information and Awareness	All Hazards	Planning Dept. Caldwell County Building Inspections	Minimal	General Budget	2 Years	High	To Be Continued	The Town of Hudson is working in coordination with the Caldwell County

Town of Hudson Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	regulations within the planning area available through library resources, providing a link on website to FEMA information addressing flood protection on the Town website, offering information on disaster preparedness, and offering information post-disaster recovery.			Department; Hudson						Town Planner to fulfill this action.
8	Maintain a map information service about FIRMs, advertise annually in the newspaper, and provide information to inquirers about local floodplain management requirements.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	High	Tax-based funding	5 Years	Low	To Be Continued	Maps are kept on file at Hudson Town Hall and are available on the Caldwell County Tax Mapping website. A \$85,000 estimated cost is associated with this mitigation action.
9	Require flood elevation certificates for development within the SFHA.	Prevention	Riverine Flooding	Planning Dept/Caldwell County Building Inspections Department	High	General Budget	2 Years	High	To Be Continued	Flood Damage Prevention Ordinance adopted in 2022. Estimated \$50,000 cost associated with this action.
10	Establish and conduct community outreach regarding all natural hazards that can occur in the planning area.	Public Information and Awareness	All Hazards	Town of Hudson	Minimal	General Budget	5 Years	Moderate	New	New Action

7.27. City of Lenoir

City of Lenoir Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Continue enforcement of Lenoir’s Flood Damage Prevention Ordinance. This ordinance regulates construction and development activities within SFHAs to limit development in the floodways according to NFIP criteria.	Property Protection	Riverine Flooding	City of Lenoir Planning Department	Minimal	General Fund; User Fees for Floodplain Development Permits	5 Years	High	To Be Continued	All floodplain development is required to obtain floodplain development permits from the Lenoir Planning Department.
2	The City of Lenoir will maintain compliance with all the Minimum Measures outlined in the City’s Stormwater Management Plan, consistent with the requirements of the NC DEQ and the US EPA. These minimum measures include public input, public outreach and education, post construction stormwater controls, illicit discharge monitoring and enforcement, construction site run-off controls, and good housekeeping at City facilities.	Property Protection; Public Information and Awareness Programs	Riverine Flooding	Western Piedmont Council of Governments	High	General Fund; exploring a Stormwater Utility Fee	5 Years	High	To Be Continued	No change since 2019, WPCOG manages the stormwater program. This mitigation has an estimated cost of \$51,000 per year to maintain.

City of Lenoir Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
3	Remove obstructions from public drainage ways or where threats to public infrastructure have been identified. The removal of obstructions will lessen the risk of flooding and damage to roadways and bridges.	Structural Projects	Riverine Flooding; Thunderstorm Winds; Hurricane Winds	City of Lenoir Public Works Department	Minimal	General Fund, exploring the adoption of a Stormwater Utility Fee	5 Years	High	To Be Continued	Visual inspection by Streets' staffs before, during and after storm events as well as reports from the public. Staff have identified "problem areas" which are inspected at a higher frequency.
4	Continue to provide educational outreach to civic groups, neighborhood groups, school children, and similar persons as to the importance of natural hazard safety, awareness, and prevention.	Public Information and Awareness	All Hazards	City of Lenoir Fire Department	Minimal	General Fund	5 Years	Moderate	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
5	Explore options for pruning trees, clearing tree limbs hanging over rights of way, and removal of dead trees on public and private property to enhance safety and improve function during an emergency. In addition, develop an informational handout with resources to encourage the private clearing of unhealthy or	Natural Systems Protection; Public Information and Awareness Programs	Thunderstorm Winds; Hurricane Winds; Wildfire	City of Lenoir Public Works Department; Nuisance Abatement (Police and Planning Departments)	Low	Existing Staff Resources; General Fund; grants	5 Years	Moderate	In Progress	Public Works prunes limbs on trees that hang over rights of way as needed and is quick to remove fallen trees over roadways. An informational handout has not been created but can be prioritized by staff. Estimated cost is around \$15,000.

Section 7: Mitigation Actions

City of Lenoir Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	dead trees/limbs on private property.									
6	Identify and map the location of piped/underground streams throughout the city and monitor these locations for signs of structural failure. Make property owners aware of piped streams on their properties.	Structural Projects; Public Information and Awareness Programs	Thunderstorm Winds; Hurricane Winds; Riverine Flooding; Sinkhole	City of Lenoir Planning and Public Works Department	Minimal	General Fund, stormwater utility fund, grants	5 Years	High	To Be Continued	In 2023, the city hired the WPCOG to map the entirety of the City's stormwater system. Over half of the system has been mapped as of June 2024. No progress has been made regarding making property owners aware of piped streams on their property.
7	Explore the feasibility of establishing a Stormwater Utility Fee as a dedicated funding source for stormwater infrastructure projects to replace aging infrastructure, address erosion, and mitigate flood-prone areas.	Prevention	Thunderstorm Winds; Hurricane Winds; Riverine Flooding; Sinkhole	City of Lenoir Planning Department; City of Lenoir Finance Department; City of Lenoir Public Works Department	Minimal	Existing Staff Resources	2 Years	High	To Be Continued	Freese and Nichols Inc has been contracted by the city to create a stormwater infrastructure criticality assessment tool. Along with the mapped stormwater system, this will help the city create a stormwater CIP.
8	Continue to enforce the City's Minimum Housing Ordinance to rehabilitate or remove unsafe	Prevention	Thunderstorm Winds; Hurricane Winds; Wildfire	City of Lenoir Planning Department	Minimal	General Fund	5 Years	High	To Be Continued	The city continues to identify houses for abatement

City of Lenoir Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	structures. In addition, create a database of abandoned and at-risk structures in the city to aide enforcement.									and/or foreclosure every year.
9	Continue to explore the feasibility of erecting a back-up power generator to serve City Hall in the event of power failure. This ensures communication lines remain open during natural and manmade disasters that result in power failure, as all City communications are routed through City Hall.	Structural Projects	All Hazards	City of Lenoir Public Works Department; City of Lenoir Finance Department; City of Lenoir IT Department	Medium	General Fund; Grants	2 Years	High	Complete	City Hall's backup generator was installed in 2019. The estimated cost of this action was \$40,000.
10	Conduct outreach to educate the public on pre-disaster preparation targeting schools, churches, civic groups, etc.	Public Information and Awareness	All Hazards	City of Lenoir Fire Department	To Be Determined	HMA grants; Homeland Security grants; emergency management grants; local funding	3 Years	High	New action	New Action

7.28.Town of Rhodhiss (WPCOG)

Town of Rhodhiss Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	Require a finished floor elevation certificate for all development within the SFHA within both incorporated and unincorporated portions of the County. All elevation certificates should be submitted on an official FEMA elevation certificate. No certificate of occupancy shall be issued for any development within a defined SFHA without the submittal of the required elevation certificate.	Prevention	Riverine Flooding; Dam or Levee Failure	Caldwell County Building Inspections Department	Minimal	Existing staff and administrative resources	5 Years	High	Deferred	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
2	Maintain a map information service involving the following: Provide information relating to FIRMs to all inquirers, including provision of information on whether a given property is located within a flood hazard area, Provide information regarding the flood insurance purchase requirement, Maintain historical and current FIRMs, Advertise once annually in the local newspaper, and Provide information to inquirers about local floodplain management requirements; and limit development in the floodway according to the NFIP criteria.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Burke County; Caldwell County; Town of Rhodhiss	Minimal	Existing Department Budget and Staff Resources	5 Years	High	To Be Continued	The Town is actively involved in assisting the NC Floodplain Mapping Program in achieving their goals. This is reviewed annually.

Town of Rhodhiss Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
3	Caldwell County and its municipal jurisdictions will continue to maintain all property acquired within the SFHA as undisturbed open space in perpetuity. All parties will continue to pro-actively establish open space within the floodplain and floodway as grant funds become available to carry out this initiative.	Prevention	Riverine Flooding; Dam or Levee Failure; Wildfire	Surrounding counties; Town of Rhodhiss	To Be Determined	State and federal grant resources	5 Years	High	In Progress	Continuing discussions with a property owner to create a greenway along the Catawba River. The Town has purchased property on the Caldwell County side of Town to develop a park on the Catawba River. The Town received a PARTF grant which will help in making this happen.
4	The Caldwell County Building Inspections Department will provide comprehensive services regarding planning and development activities within the defined SFHA and issues relating to the construction of disaster resistant structures. These services will include Providing site-specific flood and flood-related information on an as-needed basis, maintaining a list of contractors with experience in floodproofing and retrofit techniques, providing information on wind proofing construction methods for new and renovated structures, maintaining materials providing an overview of how to select a qualified contractor, making site visits upon request to review occurrences of flooding,	Public Information and Awareness	Riverine Flooding	Primary Responsible Party: Caldwell County Building Inspections Department. Secondary Responsible Party: Caldwell County Planning and Development Department	Minimal	Existing Department Budget and Staff Resources	5 Years	High	To Be Continued	The Town of Rhodhiss relies on Caldwell County to implement the actions described and this is reviewed annually.

Section 7: Mitigation Actions

Town of Rhodhiss Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	drainage problems, and sewer problems. If applicable, the inspector should provide one-on-one advice to the property owner, providing advice and assistance regarding CRS activity 530, Advertising the availability of this service once annually within the local newspaper, and maintaining a log of all individuals assisted through this County service including all site visits.									
5	The Caldwell County Mitigation Advisory Committee (MAC), in conjunction with all municipal jurisdictions participating in the plan update, will work on the five-year implementation of this Hazard Mitigation Plan Update. At the end of the five-year period, the County will again update the plan.	Public Information and Awareness	All Hazards	Primary Responsible Party: Caldwell County Emergency Services. Secondary Responsible Party: Caldwell County Mitigation Advisory Committee and Town of Rhodhiss	To Be Determined	Funding for annual maintenance and implementation of the hazard mitigation plan will be provided through the Caldwell County annual budget ordinance.	5 Years	High	To Be Continued	The Town of Rhodhiss has participated in the regionalization of the Caldwell County hazard mitigation plan and is a participating jurisdiction in the Unifour Regional Hazard Mitigation Plan.
6	Caldwell County, as well as all participating jurisdictions, including Duke Energy, will continue to support the North Carolina Office of Dam Safety efforts to monitor and inspect all dams throughout the County, as well as NC The County relies on this agency to ensure that all dam facilities, both public and	Prevention	Riverine Flooding; Dam or Levee Failure	Primary Responsible Party: Caldwell County Emergency Services. Secondary Responsible Party: Town of Rhodhiss.	Minimal	Existing Department Budget and Staff Resources	5 Years	High	In Progress	Measurable progress is slow due to staff availability and funding. This will be reviewed annually.

Town of Rhodhiss Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
	private, are properly maintained and stable.									
7	To provide comprehensive and effective emergency response services to all Town residents, the Town of Rhodhiss will take steps to update and/or acquire the following equipment over the course of the next five years: One new fire truck, emergency communication equipment, rescue tools (per the recommendation of Caldwell County Emergency Services), one set of jaws of life (Hurst Tools), and it should be noted that the Town of Rhodhiss needs to rehabilitate the Town's existing fire department or build a new facility. This effort will involve replacement of all equipment.	Emergency Services	All Hazards	Primary Responsible Party: Town of Rhodhiss Town Council. Secondary Responsible Party: Caldwell County Emergency Services.	High	State and Federal Grants	5 Years	High	Deferred	The Town of Rhodhiss fire department has acquired the emergency communication equipment (hand-held radios). The fire department cannot perform rescues because of a lack of availability of funding to purchase needed equipment and certification in rescue would be needed. We have made some improvements in the fire department such as: partial wiring of the upstairs and main breaker box; re-flooring the downstairs area and painting it; dividing the upstairs areas into individual rooms/wiring what can be done at present. We continue to apply for federal grants to help with the purchase of a new fire truck and the state grants have helped with purchasing turn-out gear. We are replacing turn-out gear as we can afford to do so. The following will be done as monies may be acquired: a sprinkler

Section 7: Mitigation Actions

Town of Rhodhiss Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
										system, insulation, finish wiring, and a phone or alarm for rescue assistance at fire department (push button alarm). The Town of Rhodhiss requires additional grant management assistance to fully complete this Mitigation Action. This action is expected to cost \$1,000,000+ to complete.
8	Involve emergency preparedness staff in the development of all planning activities with hazard mitigation impacts.	Prevention	All Hazards	Caldwell County Emergency Services Department; Planning Department; Economic Development	Minimal	Caldwell County General Fund	5 Years	High	To Be Continued	Town of Rhodhiss will continue to involve all staff in all planning activities in the community. This is reviewed as needed.

7.29.Town of Sawmills (WPCOG)

Town of Sawmills Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
1	WPCOG to administer stormwater regulations. Action applies for individual new NPDES permit, new ordinance adoption.	Prevention	Riverine Flooding; Sinkhole; Erosion; Landslide;	WPCOG	Medium	Existing Department Budget and Staff Resources	2 Years	High	In Progress	Will be amending due to EPA/DEQ audit of Sawmills adoption of new ordinance, resolutions permit requirements, public outreach requirements. This action is estimated to cost \$50,000.
2	Caldwell County will assist all communities within the county, including property owners in unincorporated areas, in applying for FEMA-sponsored mitigation grant assistance for the acquisition and/or elevation of substantially damaged structures following a natural disaster.	Structural Projects	Riverine Flooding	Caldwell County Building Inspections Department	Minimal	State and Federal Grant programs	5 Years	Moderate	Deferred	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
3	Maintain a contract with a qualified post-disaster recovery service provider for essential services and equipment including generators and will include documentation required for reimbursement from FEMA/NCEM.	Property Protection	All Hazards	Town of Sawmills Public Works and Sanitation Department	Minimal	General Fund	5 Years	Moderate	To Be Continued	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
4	Monitor water resources and when necessary, institute measures to conserve water through Drought Management Plan.	Prevention	Drought	Caldwell County Water Department	High	Grants and tax-based funding	5 Years	High	In Progress	Measurable progress is slow due to staff availability and funding. This action is estimated to cost \$1,500,000.
5	Support the NC Office of Dam Safety; make sure dams are regularly inspected.	Structural Projects	Riverine Flooding;	NC DENR Dams Program	Minimal	Grants and tax-based funding	5 Years	High	In Progress	Measurable progress is slow due to staff availability

Section 7: Mitigation Actions

Town of Sawmills Mitigation Actions										
Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
			Dam or Levee Failure							and funding. This is reviewed annually.
6	Continue to maintain all property acquired within the SFHA as undisturbed open space in perpetuity. Pro-actively establish open space within the floodplain in compliance with NFIP regulations.	Natural Systems Protection	Riverine Flooding; Dam or Levee Failure; Wildfire	Caldwell County Planning Department	High	Grant funds; Sawmills Budget	5 Years	High	Deferred	This will be reevaluated as necessary.
7	Caldwell County Planning and Building Inspections Departments will make information regarding hazards and development regulations within planning area available through the following: library, link on website to FEMA addressing flood protection, disaster preparedness, and post-disaster recovery.	Public Information and Awareness	All Hazards	Caldwell County Building Inspections Department	Low	General Budget	2 Years	High	To Be Continued	Information will be updated on the website annually.
8	Maintain a map information service about FIRMs, advertise in the paper, and provide information to inquirers about local floodplain management requirements.	Public Information and Awareness	Riverine Flooding; Dam or Levee Failure	Caldwell County Planning Department	High	Tax-based funding	2 Years	High	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
9	Require flood elevation certificates for development within the SFHA.	Prevention	Riverine Flooding	Town of Sawmills Planning Department	High	General Budget	5 Years	High	In Progress	Measurable progress is slow due to staff availability and funding. This is reviewed annually.
10	Maintain portable backup generator for emergency power needs.	Structural Projects	All Hazards	Town of Sawmills Town Council	Low	Caldwell County Emergency Management: State and	5 Years	High	Deferred	Measurable progress is slow due to staff availability and funding. This is reviewed annually.

Town of Sawmills Mitigation Actions

Mitigation Action #	Description	Type of Mitigation Action	Hazards Addressed	Lead Agency & Department Responsible	Estimated Cost	Possible Funding	Implementation Schedule	Priority	2024 Status	2024 Status Description
						Federal grants)				
11	Conduct an outreach and engagement program to discuss natural hazards and mitigation methods. Educate residents about preparation, safety, and planning for natural hazards.	Public Information and Awareness	All Hazards	Town of Sawmills	Minimal	General Budget	2 Years	High	New Action	New Action

Appendix A: Severe Weather Occurrences (2018-2024)

Tables:

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Table A- 7: Documented wildfires from the National Interagency Fire Center Database for the Unifour Counties. A-66

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
Alexander	Vashti	11/12/2020	Tropical Cyclone Eta moved from the eastern Gulf of Mexico, across the northern Florida peninsula, to off the South Carolina coast throughout the 11th and 12th. Tropical moisture streaming into the Carolinas throughout this time resulted in development of heavy rainfall, with widespread rainfall amounts of 4 to 6 inches, with locally higher amounts across the foothills and Piedmont of North Carolina. This resulted in areas of flash flooding and main stem river flooding, some of which was	Emergency manager reported major flash flooding developed throughout Alexander County after up to 9 inches of rain fell in 24 hours, with around half of that falling in a 3-hour period prior to daybreak on the 12th. The most significant flooding occurred along the South Yadkin River in the Hiddenite area. Multiple recreational vehicles and campers were swept down the river from a campground off Princess Ln. Five people, ages ranging from 1 to 76, drowned and 31 more people required rescue from rapidly rising flood water. Otherwise, most of the creeks and streams in the central and northeast part of the county overflowed onto at least one road, with more than 50 roads closed at some	Property Damage	\$450,000

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
			significant, resulting in multiple fatalities and significant damage.	point during the event. Although heavy rainfall tapered off across		
				Alexander County throughout the morning, runoff from the earlier excessive rain continued to cause elevated stream levels and localized high water conditions to persist into the afternoon. A portion of a bridge over the South Yadkin collapsed on Cheatham Ford Rd during this time. Part of another bridge was washed out on Hopewell Church Rd (over Mill Creek). A 64-year-old man was killed when he drove his vehicle over the collapsed bridge. At least two other bridges were also compromised.	Deaths	6
				Fire dept reported flash flooding developed along Duck Creek after 4 to 6 inches of rain fell in just a few hours along the Caldwell/Alexander County line. Two individuals were swept down the creek when they fled their vehicle after driving into flood water at Duck Creek Dr and Dover Church Rd. A 49-year old woman drowned while the other person was rescued. At least one road was washed out in the area.	Deaths	1
All Healing Springs	7/15/2023	Widespread showers and thunderstorms developed in the vicinity of a trough over the North Carolina foothills throughout the 15th. While rainfall was primarily in the 2 to 3 inch range, isolated areas of 4 to 6 inches fell in just a few hours across the northern foothills. This resulted in localized, but significant flash flooding across western Alexander County, where one fatality occurred.	Fire department reported most roads in the Bethlehem area were flooded and closed after another round in a series of heavy rainfall episodes caused flash flooding to develop across the area during the morning of the 9th. Multiple water rescues had to be performed. Twenty four hour rainfall totals	Injuries	1	
				Property Damage	\$10,000	
Bethlehem	6/9/2019	A moist upslope flow developing north of a stationary front resulted in widespread showers and thunderstorms developing across western North Carolina during the evening of the 8th into the overnight and early morning hours of the ninth. Four to seven inches of rain, with		Property Damage	\$11,000	

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
			locally higher amounts of 10 inches or more falling over the northern foothills resulted in flash flooding in multiple areas. The widespread nature of the excessive rainfall within the Catawba River watershed caused the river to rise to levels not seen in almost 80 years in the western Piedmont, with flooding persisting in some areas through the 10th. Meanwhile, a brief, weak tornado developed across Rutherford County.	were in the 4 to 7 inch range, with much of that falling in relatively short bursts.		
	Taylorsville	2/6/2020	Unusually high levels of moisture for early February combined with a slow-moving frontal system to produce an extended period of moderate to heavy rainfall across western North Carolina from the morning of the 5th until the early morning hours of the 7th. Intense rain rates associated with bands of heavy rain showers and embedded thunderstorms developing along the front during the morning and afternoon of the 7th resulted in rather widespread flash flooding. Isolated tornadoes also developed during this time across the Piedmont. Total rainfall of 3 to 6 inches resulted in flooding persisting along some main stem rivers and larger streams well into the 7th.	Newspaper reported flash flooding developed across central Alexander County after 4 to 5.5 inches of rain fell across the county in around 24 hours, with much of that falling during the morning and early afternoon of the 6th. Multiple tributaries of the Lower Little River overflowed their banks and flooded adjacent roads. These included Muddy Fork, which inundated Old Wilkesboro Rd just north of Taylorsville, Stirewalt Creek which flooded Heavenly Acres Rd, and Glade Creek which flooded Millersville Rd and Paul Pane Store Rd.	Property Damage	\$2,000
	Taylorsville Airport	1/9/2024	A major/complex frontal system brought widespread rain with embedded thunderstorms to western North Carolina, mainly during the afternoon of the 9th. Widespread rainfall amounts of 3 to 5 inches (with locally higher amounts) in around 12 hours resulted in numerous reports of flooding. Isolated severe thunderstorms	Fire dept reported flash flooding developed along Muddy Fork after 3 to 5 inches of rain fell across Alexander County in around 12 hours. Old Wilkesboro Rd was closed and rendered impassable due to inundation from the creek.	Property Damage	\$1,000

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
			also resulted in a number of damaging wind gusts reports over the Piedmont, along with an EF1 tornado that impacted portions of Catawba and Iredell Counties.			
Burke	Calvin	6/8/2019	A moist upslope flow developing north of a stationary front resulted in widespread showers and thunderstorms developing across western North Carolina during the evening of the 8th into the overnight and early morning hours of the ninth. Four to seven inches of rain, with locally higher amounts of 10 inches or more falling over the northern foothills resulted in flash flooding in multiple areas. The widespread nature of the excessive rainfall within the Catawba River watershed caused the river to rise to levels not seen in almost 80 years in the western Piedmont, with flooding persisting in some areas through the 10th. Meanwhile, a brief, weak tornado developed across Rutherford County.	Multiple sources reported flash flooding developed across portions of northern Burke County when as much as 6 inches of rain fell across the area in just a few hours. Flooding began on the Highway 64 corridor when a portion of the highway had to be closed in the Chesterfield community due to flood water. Antioch Rd was also flooded by Lower Creek in this same area. Water from Canoe Creek was also reportedly flowing over Highway 226. Smith Branch overflowed its banks in the Connelly Springs area, flooding some houses on Woodlawn Dr. A nursing home was evacuated in the Rutherford College area after a small unnamed tributary overflowed its banks. A tributary of Henry Fork flooded a portion of Woodland Hill Rd in Hildebrand, which undermined the structural integrity of the road and prompted voluntary evacuations.	Property Damage	\$50,000
	Brindletown	2/6/2020	Unusually high levels of moisture for early February combined with a slow-moving frontal system to produce an extended period of moderate to heavy rainfall across western North Carolina from the morning of the 5th until the early morning hours of the 7th. Intense rain rates associated with bands of heavy rain showers and embedded thunderstorms developing along the front during the morning and afternoon of the 7th resulted in rather widespread flash flooding. Isolated tornadoes also	County comms and media reported localized flash flooding developed across the southeastern half of Burke County after 4.5 to 5.5 inches of rain fell in about 24 hours with much of that falling during the morning of the 6th. Multiple roads were closed several roads and private bridges damaged/washed out due to a combination of small stream flooding as well as poor drainage in urban areas. These included Nuckolls Dr Morningstar Church Rd Byrd Rd East Meadow Trail Van Horn Rd Powell Rd Antioch Rd and Powell Dr Ext.		\$25,000

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
	Joy	2/6/2020	developed during this time across the Piedmont. Total rainfall of 3 to 6 inches resulted in flooding persisting along some main stem rivers and larger streams well into the 7th.	Although heavy rainfall tapered off across Burke County during the afternoon county comms reported high water conditions persisted through the evening and early part of the overnight with multiple roads remaining flooded and closed throughout the county. In addition a stream gauge on the Johns River north of Morganton exceeded its established flood stage after 3 to 6 inches of rain fell in and near the headwaters over about 24 hours. Multiple roads were flooded including Old Johns River Rd Spainhour Rd Johns River Rd and Corpening Bridge Rd.		\$25,000
	Chesterfield	11/12/2020	Tropical Cyclone Eta moved from the eastern Gulf of Mexico, across the northern Florida peninsula, to off the South Carolina coast throughout the 11th and 12th. Tropical moisture streaming into the Carolinas throughout this time resulted in development of heavy rainfall, with widespread rainfall amounts of 4 to 6 inches, with locally higher amounts across the foothills and Piedmont of North Carolina. This resulted in areas of flash flooding and main stem river flooding, some of which was significant, resulting in multiple fatalities and significant damage.	A stream gauge on Hunting Creek near Morganton indicated significant flash flooding developed along the stream after 4.5 to 6 inches of rain fell in the area, with a significant portion of that falling in the 2-3 hours prior to daybreak. Coal Chute Rd was inundated and several businesses between the river and East Fleming Dr were also flooded. Backwater effects along Fiddlers Run also resulted in flooding of Bethel Park. Additionally, spotter reported severe drainage flooding along Highway 64 at Chesterfield. Other non-specific road flooding reports were received from elsewhere in Morganton as well as in the Valdese area.		\$10,000

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
	Enola	10/7/2021	A slow moving area of upper level low pressure over the Mid-Mississippi Valley pumped semi-tropical weather into the western Carolinas for a couple of days, resulting in occasional rounds of moderate to heavy in the day leading up to the 7th. Scattered slow-moving thunderstorm clusters developed over the foothills during the morning of the 7th, producing torrential rainfall rates of 2 to 3 inches per hour and total rainfall amounts of 3 to 7 inches, much of which fell in just 2 to 3 hours. This excessive rainfall resulted in flash flooding of a number of creeks and other small streams.	A stream gauge on the Broad River at Bat Cave indicated flash flooding developed, with over a one-foot rise in less than an hour, after 3 to 6 inches of rain fell across the basin in just a few hours. Multiple campgrounds and a few homes were inundated from Bat Cave and vicinity downstream to the Rutherford County line.		\$10,000
Caldwell	Globe	4/13/2020	A strong storm system impacted the Southeast, resulting in an area of widespread heavy rain and embedded strong to severe thunderstorms that moved across western North Carolina during the late night and early morning hours. Localized flash flooding, some of which was quite significant developed across the mountains. Isolated severe weather also occurred, mainly in the form of damaging wind gusts. Strong southerly gradient winds also caused some damage across mainly the high elevations of western North Carolina.	Emergency manager reported flash flooding developed along multiple creek across northwest Caldwell County after 4 to 6 inches of rain fell, mostly in less than 8 hours. Anthony Creek overflowed its banks in the Globe community, washing out a low water crossing. Wilson Creek washed out several low water crossing on Brown Mountain Beach Rd. Johns River inundated Old Johns River Rd in several locations. Buffalo Creek and several of its tributaries also inundated low water crossing in the far northern part of the county. A stream gauge on the Yadkin River near Patterson exceeded its established flood stage, indicating flooding of low lying roads and minor flooding of some structures in the Happy Valley community.	Property Damage	\$100,000

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages
	Edgemont	5/18/2018	EM and county comms reported significant flash flooding developed along Johns River and especially Wilson Creek after as much as 7 inches of rain fell in just a few hours across extreme western Caldwell County. Water from Wilson Creek entered several homes on Laurel St in Edgemont, and two families at this location were rescued via helicopter after their homes were cut off by flood water. A stream gauge on Wilson Creek at Edgemont reached its highest level since the gauge became operational in 2008. Portions of Wilson Creek Beach Rd, Brown Mountain Beach Rd, and Old Johns River Rd were reportedly washed away, while numerous other roads were flooded and closed, including Adako Rd and Collettsville Rd along the Johns River. A parking lot at Collettsville School was flooded with about two feet of water from the Johns River. Multiple landslides were also reported to be blocking roads in the area, including an estimated 100 foot wide slide that blocked Edgemont Rd.		\$50,000
	Richland	11/12/2020	Tropical Cyclone Eta moved from the eastern Gulf of Mexico, across the northern Florida peninsula, to off the South Carolina coast throughout the 11th and 12th. Tropical moisture streaming into the Carolinas throughout this time resulted in development of heavy rainfall, with widespread rainfall amounts of 4 to 6 inches, with locally higher amounts across the foothills and Piedmont of North Carolina. This resulted in areas of flash flooding and main stem river flooding, some of which was significant, resulting in multiple fatalities and significant damage.	A stream gauge on the Yadkin River near Patterson exceeded its established flood stage after 4 to 7 inches fell across the basin, with much of that falling in only 3 hours or so between midnight and daybreak on the 12th. Multiple roads and some homes were inundated in the Happy Valley community, especially between Highway 268 and the river. Additionally, a few mudslides developed in the Yadkin basin, including a large one that covered/closed Kirby Mountain Rd north of Patterson.	\$50,000
	Edgemont	6/9/2019	A moist upslope flow developing north of a stationary front resulted in widespread showers and thunderstorms developing across western North Carolina during the evening of the 8th into the overnight and early morning hours of the ninth. Four to seven inches of rain, with locally higher amounts of 10 inches or more falling over the northern foothills resulted in flash flooding in multiple areas.	During an ongoing flood event, new flash flooding developed across Caldwell County, particularly in the Wilson Creek and Johns Creek basins, after heavy rain showers and thunderstorms moved back into the area and dropped 1 to 2 inches of rain on top of saturated soils and swollen streams in just a couple of hours. The main impacts were along Wilson Creek, where the stream reportedly rose 3 to 4 feet in the span of 20 minutes between Edgemont and the confluence with the Johns River. An occupant of a home along Edgemont Rd had to be rescued when water from Wilson Creek inundated the home, rising to window-level. A gauge on the Johns River	\$30,000

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
			The widespread nature of the excessive rainfall within the Catawba River watershed caused the river to rise to levels not seen in almost 80 years in the western Piedmont, with flooding persisting in some areas through the 10th.	just over the line in Burke County rose quickly from minor to moderate stage, indicating worsening flooding of several roads along the stream and its tributaries. Flooding also persisted along the Yadkin River in the northern part of the county.		
	Lenoir	6/8/2019	Meanwhile, a brief, weak tornado developed across Rutherford County.	Multiple sources reported flash flooding developed over southern and eastern portions of Caldwell County after 4 to 7 inches of rain fell in just a few hours. The bulk of the flooding issues were from the south side of Lenoir to Hudson and Cahaj's Mountain. Multiple roads were reported to be covered with water in south Lenoir, with motorists unable to leave their driveways. Severe urban flooding of the town hall parking lot in Cahaj's Mountain apparently resulted in a sink hole opening up, which a vehicle then fell into. A tributary of Little Gunpowder Creek overflowed its banks and flooded Legion Rd near the Friendly Park Rd intersection. Meanwhile, Duck Creek overflowed its banks in the northeast part of the county and washed out part of Duck Creek Rd. Finally, a stream gauge on Little Creek in Lenoir exceeded its established flood stage.		
Catawba	Catawba	11/12/2020	Tropical Cyclone Eta moved from the eastern Gulf of Mexico, across the northern Florida peninsula, to off the South Carolina coast throughout the 11th and 12th. Tropical moisture streaming into the Carolinas throughout this time resulted in development of heavy	A stream gauge on the Catawba River at Lookout Shoals Dam indicated major flash flooding developed just upstream of the dam after 5 to 8 inches of rain fell throughout the Catawba basin, with the bulk of that falling in only a 3-hour period between midnight and sunrise on the 12th. Numerous homes were inundated and damaged, with numerous residents	Property Damage	\$500,000

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
			rainfall, with widespread rainfall amounts of 4 to 6 inches, with locally higher amounts across the foothills and Piedmont of North Carolina. This resulted in areas of flash flooding and main stem river flooding, some of which was significant, resulting in multiple fatalities and significant damage.	evacuated along the western shores of Lookout Shoals Lake. This was the second major flood event along this portion of the Catawba in less than two years (June 2019), and the second highest crest on record at Lookout Shoals (August 1940).		
	Catawba	6/9/2019	A moist upslope flow developing north of a stationary front resulted in widespread showers and thunderstorms developing across western North Carolina during the evening of the 8th into the overnight and early morning hours of the ninth. Four to seven inches of rain, with locally higher amounts of 10 inches or more falling over the northern foothills resulted in flash flooding in multiple areas. The widespread nature of the excessive rainfall within the Catawba River watershed caused the river to rise to levels not seen in almost 80 years in the western Piedmont, with flooding persisting in some areas through the 10th. Meanwhile, a brief, weak tornado developed across Rutherford County.	A dam pool stage gauge reported and emergency manager confirmed flooding of the Catawba River upstream of the Lookout Shoals dam occurred after widespread rainfall amounts of 4 to 7 inches fell within the basin upstream of the dam, with much of that falling over the course of several hours. Several homes in the Carpenters Cove community and along Longfield St were inundated with flood water. The pool elevation behind the dam peaked at just over 108 ft on the morning of the 9th, which was its highest level since August 1940.		\$250,000
	Long View	6/8/2019		Multiple sources reported flash flooding developed in Hickory and vicinity after 4 to 6 inches of rain fell in just a few hours. This was in addition to the 3 inches of rain that fell across roughly the same area on the night of the 7th. Flooding was first reported in southeast Hickory where apartment buildings on 12th Ave SE were flooded by Miller Branch resulting in the rescue of several residents. Flooding was otherwise confined primarily to the Mountain View area where multiple streams overflowed their banks and flooded roads. These included a tributary of Henry Fork which flooded Mountain Grove Rd Henry Fork flooding Old Shelby Rd another tributary of		

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages	
				Henry Fork that flooded Wallace Dairy Rd at Mt Zion Church Rd and Pott Creek which sent water into Fred T Foard High School and the adjacent road.		
	Catawba	2/6/2020	Unusually high levels of moisture for early February combined with a slow-moving frontal system to produce an extended period of moderate to heavy rainfall across western North Carolina from the morning of the 5th until the early morning hours of the 7th. Intense rain rates associated with bands of heavy rain showers and embedded thunderstorms developing along the front during the morning and afternoon of the 7th resulted in rather widespread flash flooding. Isolated tornadoes also developed during this time across the Piedmont. Total rainfall of 3 to 6 inches resulted in flooding persisting along some main stem rivers and larger streams well into the 7th.	A stream gauge at Lookout Shoals Dam on the Catawba River exceeded its established flood stage, reaching moderate flood levels after widespread rainfall of 4.5 to 5.5 inches fell throughout the basin in about 24 hours. Crawl space flooding of a home occurred on Longfield St, while other homes in the Carpenters Cove community experienced some inundation of foundations.		\$50,000
	Hickory	8/15/2020	Numerous showers and thunderstorms and storm clusters developed over the northern foothills of North Carolina from the evening into the early morning hours. Repeating and slow moving showers and storms resulted in localized heavy to excessive rainfall and flash flooding.	Multiple sources reported flash flooding developed along multiple streams and creeks across northern Catawba County especially Falling Creek Snow Creek and Lyle Creek after 2.5 to 4.5 inches of rain fell across the area in just a few hours. Multiple swift water rescues were reported especially along Falling Creek and Snow Creek. Water from Lyle Creek inundated an apartment complex on County Home Rd in Conover. Roads impacted and closed due to flood waters included Bunkerhill School Rd near Deal Rd		\$50,000

County	Location	Event Date	Event Narrative	Episode Narrative	Notable Damages
				Highway 16 Snow Creek Rd Kool Park Rd NE 12th Ave and Springs Rd NE.	

Table A- 1: Summary of 5 most notable flooding and flash flooding events from the NCDC Storm Events Database between 2018 and 2023.

Location	Date	Event Type	Episode Narrative
Alexander (Zone)	3/12/2018	Winter Weather	Precipitation developed across the northern foothills and northwest Piedmont during the early morning in association with a frontal zone and associated low pressure. While most of the precip fell as rain, cooler air filtering in from the north, along with cooling brought about higher precipitation rates forced a brief change over to snow around sunrise. The snow accumulated quickly in spots, and some areas north of I-40 reported as much as 4 inches. The quick accumulation caused slick spots to develop on roads, with quite a few traffic accidents reported along the I-40 corridor. However, a warm ground and quickly warming temps ended resulted in fast melting after the snow.
Caldwell Mountains (Zone)			
Burke Mountains (Zone)			
Greater Caldwell (Zone)			
Catawba (Zone)	3/14/2018	Winter Weather	An area of moderate to heavy snow showers moved off the Blue Ridge and across the foothills and portions of the far western Piedmont around sunrise. Although the snow was brief, generally only lasting around an hour in most locations, up to an inch of snow quickly accumulated. Despite warm road temperatures, the rapid accumulation resulted in some travel difficulties across the foothills.
Burke Mountains (Zone)			
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Caldwell Mountains (Zone)	3/24/2018	Winter Weather	As a warm front lifted slowly north across the Tennessee Valley and the Carolinas, an area of light to moderate snow developed across the northern mountains around daybreak on the 24th. Warmer air gradually overspread the area from the southwest, allowing many areas to change to rain. The exception was along the Blue Ridge, mainly along and east of the continental divide, where a narrow corridor of near-freezing surface temperatures locked in for much of the day. By late afternoon, temperatures warming above the surface forced a transition to sleet and freezing rain in these areas. Ice accumulation of up to one half inch was reported on top of up to an
Burke Mountains (Zone)			
Caldwell Mountains (Zone)			

Location	Date	Event Type	Episode Narrative
			inch of sleet and snow. Pockets of significant tree damage were reported in locations that received the higher ice accumulations.
Alexander (Zone)			Precipitation developed across the northern foothills and northwest Piedmont during the morning of the 24th, as a warm front lifted slowly north across the Tennessee Valley and the Carolinas. After falling as rain for much of the day, precipitation turned to snow and sleet during the evening as cooler air funneled into the area from the northeast. Many areas along and north of I-40 received a quick half inch to 2 inches of snow and sleet before the precipitation tapered off during the early morning hours.
Greater Caldwell (Zone)			
Alexander (Zone)	11/24/2018	Winter Weather	Precipitation developed across the mountains, foothills, and far western Piedmont of North Carolina during the overnight, as a wave of low pressure moved along the Gulf Coast. Precipitation began as rain in most areas, but transitioned to freezing rain as a wedge of cold air locked in across the area. By the time the precipitation tapered off around sunrise, ice accretion of one tenth to one quarter inch was reported in many areas, with the highest amounts reported near the Blue Ridge. Scattered downed trees and power lines/power outages were reported.
Catawba (Zone)			
Alexander (Zone)	12/8/2018	Heavy Snow	Snow developed across northwest North Carolina around midnight the morning of the 9th, and began accumulating quickly. Moderate to heavy snow continued through the morning of the 9th before tapering off during the early afternoon. Storm total accumulations were generally in the 10 to 15 inch range, with slightly lower amounts south of I-40, and locally higher amounts across the mountains, particularly the high peaks along the Blue Ridge, where more than two feet fell. Travel was paralyzed across this area for a couple of days.
Greater Caldwell (Zone)			
Greater Burke (Zone)			
Burke Mountains (Zone)			
Caldwell Mountains (Zone)			
Catawba (Zone)			
Alexander (Zone)	1/23/2019	Winter Weather	Patchy light freezing rain developed across western North Carolina during the early morning hours of the 23rd and continued off and on through mid-morning. Ice accretion was generally confined to areas north of I-85, and was quite light in most areas, around a tenth of an inch or less. Some slick spots developed on roads, resulting in a few traffic accidents. Patchy light freezing rain developed across western North Carolina during the early morning hours of the 23rd and continued off and on through mid-morning. Ice accretion was generally confined to areas north of I-85, and was quite light in most
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Burke Mountains (Zone)			

Location	Date	Event Type	Episode Narrative
Caldwell Mountains (Zone)			areas, around a tenth of an inch or less. Some slick spots developed on roads, resulting in a few traffic accidents.
Catawba (Zone)			
Alexander (Zone)	2/19/2019	Winter Weather	A moist southerly flow develop above a cool wedge of high pressure resulted in development of precipitation across western North Carolina during the afternoon and evening of the 19th. Just enough cold air was in place to allow the precipitation to initially fall as a mixture of sleet and snow along the eastern Blue Ridge escarpment as well as the far northern foothills and Piedmont. As warm air developed aloft, precipitation gradually transitioned to sleet and freezing rain in most of these locations during the overnight and early morning hours of the 21st. Most areas transitioned to rain during the morning of the 21st, although some pockets of freezing rain persisted in sheltered areas along the Blue Ridge. Total sleet and snow accumulations generally ranged from one half inch to less than 2 inches, although some high elevation areas along the Blue Ridge saw 2 to 4 inches of snow. Some locations along the Blue Ridge saw between .1 and .2 inch ice accretion before the precip tapered off or changed to rain.
Burke Mountains (Zone)			
Caldwell Mountains (Zone)			
Greater Caldwell (Zone)			
Alexander (Zone)	12/13/2019	Winter Weather	Moisture associated with a developing low pressure system along the Southeast Coast overspreading a cool and dry air mass over western North Carolina resulted in development of freezing rain, mainly along the Blue Ridge escarpment, and along and near the I-40 corridor in the foothills and Piedmont. Light ice accretion of around .10 inch or less was primarily confined to elevated surfaces, although a few slick spots developed over the mountains. Precipitation changed to rain throughout the morning as temperatures warmed above freezing.
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Catawba (Zone)			
Caldwell Mountains (Zone)			
Burke Mountains (Zone)			
Burke Mountains (Zone)	1/31/2020	Winter Weather	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.
Caldwell Mountains (Zone)			

Location	Date	Event Type	Episode Narrative
Caldwell Mountains (Zone)	2/21/2020	Winter Weather	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.
Burke Mountains (Zone)			
Burke Mountains (Zone)	2/28/2020	Winter Weather	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.
Caldwell Mountains (Zone)			
Burke Mountains (Zone)	12/16/2020	Winter Weather	Light freezing rain developed over portions of western North Carolina, primarily areas along the eastern Blue Ridge escarpment, the northern foothills, and northwest Piedmont as areas of low pressure moved along the Gulf and southeast Atlantic coast. The precipitation changed to rain in most locations during the late morning as temperatures warmed above freezing. Total ice accretion was generally around a tenth of an inch or less, although isolated spots along the eastern Blue Ridge saw around a quarter of an inch. Light freezing rain developed over portions of western North Carolina, primarily areas along the eastern Blue Ridge escarpment, the northern foothills, and northwest Piedmont as areas of low pressure moved along the Gulf and southeast Atlantic coast. The precipitation changed to rain in most locations during the late morning as temperatures warmed above freezing. Total ice accretion was generally around a tenth of an inch or less, although isolated spots along the eastern Blue Ridge saw around a quarter of an inch.
Alexander (Zone)			
Caldwell Mountains (Zone)			
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Catawba (Zone)			
Burke Mountains (Zone)	12/24/2020	Winter Weather	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.
Caldwell Mountains (Zone)			

Location	Date	Event Type	Episode Narrative
Greater Caldwell (Zone)	1/7/2021	Winter Weather	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.
Greater Burke (Zone)			
Burke Mountains (Zone)	1/8/2021	Heavy Snow	Snow developed across western North Carolina around midnight and continued through the morning of the 8th as an area of low pressure moved across the coastal plain of Georgia and the Carolinas. Heavy snow accumulations were reached across much of the northern mountains during the late morning, before the snow tapered off to scattered snow showers and flurries throughout the afternoon and evening. Total accumulations ranged from 3 to 6 inches across this area, with locally higher totals of as much as 8 inches reported above 4500 feet.
Caldwell Mountains (Zone)			
Caldwell Mountains (Zone)	1/30/2021	Winter Storm/ Winter Weather	<p>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 to a couple of inches or so throughout the evening. As temperatures warmed aloft, precip transitioned to sleet, especially along and south of I-40, where heavy sleet accumulations of 1 to 2 inches were reported in some areas. A transition to freezing rain occurred before the precip ended, resulting in a light glaze of ice on top of the sleet and snow. Total snow and sleet accumulations ranged from 1 to 3 inches along and south of I-40, where sleet undercut the totals, to 4 to 6 inches across Avery and Mitchell Counties. Ice accretion was mostly less than a tenth of an inch.</p> <p>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.</p>
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Catawba (Zone)			
Alexander (Zone)			
Burke Mountains (Zone)	2/6/2021	Winter Weather	<p>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.</p> <p>Snow developed across the the Piedmont and foothills of western North Carolina during the evening of the 6th and continued into the overnight hours before tapering off or changing to rain during the early morning of the 7th. Total snow accumulations</p>
Burke Mountains (Zone)			
Caldwell Mountains (Zone)			
Alexander (Zone)			

Location	Date	Event Type	Episode Narrative
Greater Caldwell (Zone)			generally ranged from 1 to 3 inches across the area, with some locally higher amounts of around 4 inches reported. The snow briefly changed to sleet and freezing rain in some areas before the precipitation ended, but accumulations were minimal.
Greater Burke (Zone)			
Catawba (Zone)			
Alexander (Zone)	2/17/2021	Winter Weather	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.
Catawba (Zone)			
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Alexander (Zone)	1/16/2022	Heavy Snow	Moisture overspread the North Carolina foothills and far western Piedmont early on the 16th as strengthening low pressure moved across the Deep South. Strong northeast winds supplied ample cold air for the precipitation to begin as light snow across much of the foothills. Snow continued into the overnight, becoming moderate to occasionally heavy, with snowfall rates of up to an inch per hour reported. Heavy snowfall criteria of 2 to 4 inches was reached in many areas by sunrise, with accumulating snow continuing through the morning hours before tapering off to occasional snow showers during the afternoon and evening. Total snow accumulations ranged from 5 to 10 inches across much of the area, with locally higher amounts along the eastern Blue Ridge escarpment. Travel was difficult to nearly impossible throughout the 16th and much of the 17th.
Burke Mountains (Zone)			
Caldwell Mountains (Zone)			
Catawba (Zone)			
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Alexander (Zone)	2/7/2022	Winter Weather	Moisture associated with low pressure developing off the South Carolina coast overspread the North Carolina Piedmont during the morning, resulting in a brief period of light precipitation. Enough cold air was in place to allow much of this to fall as freezing rain north of I-85. Light ice accretion of around a tenth of an inch or less was reported, mainly on elevated surfaces. Roads were warm enough such that travel issues were primarily relegated to a few slick spots on bridges and overpasses. Spotty dustings of snow were also reported north of I-40.
Catawba (Zone)			
Greater Burke (Zone)			
Greater Caldwell (Zone)			
Burke Mountains (Zone)	1/6/2024	Winter Weather	The second arctic cold front in 4 days brought gusty northwest winds and another shot of very cold air to the southern Appalachians in the wake of an arctic cold front. Winds gusting from 30 to 45 mph combined with air temperatures in the single digits, with

Location	Date	Event Type	Episode Narrative
Caldwell Mountains (Zone)			some below zero readings observed above 4000 feet, to produce wind chill values between 10 and 25 below above 3500 feet. Meanwhile, wind chill values from 0 to 10 below were observed in the North Carolina mountains valleys and across the higher elevations of South Carolina and northeast Georgia.
Burke Mountains (Zone)	1/9/2024	Winter Weather	Precipitation overspread the southern Appalachians during the early morning of the 9th in advance of a strong storm system. Once the precipitation began, pockets of cold air developed and became trapped for a few hours in a small area along the eastern Blue Ridge escarpment of North Carolina. This resulted in freezing rain falling in these areas. Isolated ice accretion was reported, with a few locations receiving almost a quarter inch.
Burke Mountains (Zone)	1/18/2024	Winter Weather	Snow showers developed across the high elevations of North Carolina during the evening of the 18th. Snow showers continued off and on through the 19th before tapering off during the early morning hours of the 20th. While snow was initially limited to the higher elevations, snow levels fell in the wake of a cold front, with snow showers eventually impacting the valleys during the afternoon and evening of the 19th. By the time the snow tapered off, total accumulations of 2 to 6 inches were reported, mainly above 3500 feet. However, some lower valley locations received 1 to 4 inches, including in the Asheville area and in the lower French Broad Valley.
Caldwell Mountains (Zone)			
Burke Mountains (Zone)	3/1/2024	Winter Weather	Precipitation developed across portions of the North Carolina mountains during the pre-dawn hours. Pockets of cold air lingering across some high elevation locations, as well as valley locations near the Blue Ridge escarpment resulted in light freezing rain. Light icing occurred, with general ice accretion of around a tenth of an inch or less. However, some spotty locations saw amounts close to one quarter inch.

Table A- 2: Winter Weather, Heavy Snow, and Winter Storm Events from the NCDRC Storm Events Database between 2018 - 2024.

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Morganton</u>	05/21/2000	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/21/2000	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/24/2000	Hail	2.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	05/24/2000	Hail	0.75 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Morganton</u>	05/24/2000	Hail	4.50 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/24/2000	Hail	4.50 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/28/2000	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	06/28/2000	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Newton</u>	07/28/2000	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Rutherford College</u>	08/25/2000	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	08/25/2000	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/04/2001	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/04/2001	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Terrell</u>	06/25/2001	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Brindletown</u>	04/17/2002	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	05/10/2002	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Claremont</u>	05/10/2002	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/06/2002	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	06/13/2002	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Kings Creek</u>	07/04/2002	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	04/30/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/30/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	05/02/2003	Hail	1.75 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Millersville</u>	05/03/2003	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Hiddenite</u>	05/03/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Ellendale</u>	05/03/2003	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	05/03/2003	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Newton</u>	05/03/2003	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	05/03/2003	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/03/2003	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	05/15/2003	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Jonas Ridge</u>	05/15/2003	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	05/15/2003	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/15/2003	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/15/2003	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	05/15/2003	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	05/15/2003	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hildebran</u>	05/15/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	06/30/2003	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Longview</u>	07/09/2003	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/12/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/13/2003	Hail	1.75 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Morganton</u>	07/13/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/16/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	07/16/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Collettsville</u>	07/18/2003	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	07/21/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	07/21/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Maiden</u>	07/21/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Valdese</u>	07/29/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	08/22/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Icard</u>	08/22/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	08/22/2003	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Sherrills Ford</u>	08/22/2003	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Drexel</u>	05/09/2004	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Stony Pt</u>	05/09/2004	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Hildebran</u>	05/09/2004	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/09/2004	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	05/22/2004	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	05/22/2004	Hail	1.50 in.	0	0	50.00K	0.00K
<u>Lenoir</u>	05/22/2004	Hail	0.75 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Morganton</u>	05/30/2004	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/04/2004	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	07/04/2004	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	04/07/2005	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	05/10/2005	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/10/2005	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	05/10/2005	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	05/10/2005	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/14/2005	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Chesterfield</u>	06/06/2005	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	06/19/2005	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Longview</u>	06/19/2005	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	08/05/2005	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/03/2006	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	04/03/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/03/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hiddenite</u>	04/03/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/08/2006	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	04/08/2006	Hail	0.88 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Terrell</u>	04/17/2006	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/25/2006	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/25/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Longview</u>	04/25/2006	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Claremont</u>	04/25/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	04/25/2006	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Conover</u>	04/25/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	04/25/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/13/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/14/2006	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Gamewell</u>	05/14/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Maiden</u>	05/14/2006	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Maiden</u>	05/14/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Maiden</u>	05/14/2006	Hail	2.00 in.	0	0	1.00K	0.00K
<u>Maiden</u>	05/14/2006	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hildebran</u>	05/14/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/14/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Conover</u>	05/14/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	05/14/2006	Hail	0.75 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Catawba</u>	05/20/2006	Hail	2.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/02/2006	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/11/2006	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	06/22/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	06/22/2006	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Maiden</u>	06/23/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Maiden</u>	06/23/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	07/04/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Conover</u>	07/04/2006	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Conover</u>	07/15/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	07/20/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/28/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	09/10/2006	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Patterson</u>	10/05/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	11/11/2006	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Newton</u>	04/15/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	04/15/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Gamewell</u>	04/15/2007	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	04/15/2007	Hail	0.75 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Morganton</u>	06/08/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Catawba</u>	06/08/2007	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	06/11/2007	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	06/11/2007	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/11/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Icard</u>	06/12/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	06/12/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/14/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Jonas Ridge</u>	06/24/2007	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Patterson</u>	06/28/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	06/28/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Jonas Ridge</u>	07/23/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/25/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	07/25/2007	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Longview</u>	08/04/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	08/23/2007	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	08/23/2007	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	04/26/2008	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Maiden</u>	04/26/2008	Hail	0.88 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Collettsville</u>	05/08/2008	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	05/08/2008	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Patterson</u>	05/11/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/11/2008	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/11/2008	Hail	2.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/10/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	06/21/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/21/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Patterson</u>	06/22/2008	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/22/2008	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Conover</u>	06/22/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Catawba</u>	06/22/2008	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/27/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/28/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Valdese</u>	07/07/2008	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/07/2008	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/07/2008	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Grandin</u>	07/07/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	08/02/2008	Hail	0.75 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Lenoir</u>	08/14/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	08/14/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	08/14/2008	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	09/30/2008	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Longview</u>	04/21/2009	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/09/2009	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Kings Creek</u>	05/16/2009	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Vashti</u>	05/29/2009	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Collettsville</u>	06/02/2009	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Mortimer</u>	06/02/2009	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	06/03/2009	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Drums Xrds</u>	06/11/2009	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Enola</u>	07/12/2009	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	07/20/2009	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	07/20/2009	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	07/20/2009	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Calvin</u>	07/20/2009	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/20/2009	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Burke Chapel</u>	07/20/2009	Hail	0.75 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>All Healing Spgs</u>	08/05/2009	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Brookford</u>	08/05/2009	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Drexel</u>	09/09/2009	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Valmead</u>	05/14/2010	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	05/28/2010	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Enola</u>	05/28/2010	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/15/2010	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Claremont</u>	06/15/2010	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Drexel</u>	07/09/2010	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Rufus</u>	07/18/2010	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Patterson</u>	08/05/2010	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Grace Chapel</u>	11/16/2010	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	02/28/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Claremont</u>	02/28/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/09/2011	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/09/2011	Hail	2.00 in.	0	0	0.00K	0.00K
<u>Connellys Spgs</u>	04/09/2011	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Gamewell</u>	04/28/2011	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	04/28/2011	Hail	0.75 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Glen Alpine</u>	05/10/2011	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	05/10/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Chesterfield</u>	05/13/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Chesterfield</u>	05/13/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Patterson</u>	05/24/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Baily Camp</u>	05/26/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Mortimer</u>	05/26/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Whitnel</u>	05/26/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Valmead</u>	05/26/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/08/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Calvin</u>	06/08/2011	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Connellys Spgs</u>	06/10/2011	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Brookford</u>	06/11/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/11/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/11/2011	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Catawba</u>	06/12/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Kings Creek</u>	06/21/2011	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Startown</u>	06/21/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/28/2011	Hail	0.75 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Oyama</u>	06/28/2011	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hickory</u>	07/07/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Whitnel</u>	08/11/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Baton</u>	08/11/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Collettsville</u>	08/13/2011	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Propst Xrds</u>	08/14/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	08/18/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Catawba</u>	08/18/2011	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hickory</u>	08/19/2011	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Bridgewater</u>	08/21/2011	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Oyama</u>	02/24/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Claremont</u>	02/24/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Oyama</u>	02/24/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	03/20/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Patterson</u>	04/17/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Drexel</u>	04/17/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/26/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Valdese</u>	04/26/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Richland</u>	04/27/2012	Hail	1.50 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Glen Alpine</u>	05/01/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	05/01/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	05/01/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/01/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/01/2012	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/01/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Yadkin Vly</u>	05/02/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Globe</u>	05/02/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Drexel</u>	05/21/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Pleasant Grove Brke</u>	05/22/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Globe</u>	06/22/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	06/22/2012	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Globe</u>	07/01/2012	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Warrior</u>	07/01/2012	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/01/2012	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Icard</u>	07/01/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/01/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Brookford</u>	07/01/2012	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Brookford</u>	07/01/2012	Hail	2.00 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Morganton</u>	07/01/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Draco</u>	07/01/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/02/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Catawba</u>	07/16/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Longisland</u>	07/16/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/25/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Olivers Xrds</u>	07/25/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Paynes Store</u>	08/02/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Conover</u>	08/02/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Calvin</u>	08/08/2012	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Cedar Vly</u>	09/28/2012	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Pleasant Grove Brke</u>	05/07/2013	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	05/11/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Drexel</u>	05/11/2013	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	05/11/2013	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Brindletown</u>	05/11/2013	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Joy</u>	05/21/2013	Hail	1.50 in.	0	0	1.00K	0.00K
<u>Lenoir</u>	05/22/2013	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Valmead</u>	05/22/2013	Hail	0.75 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Vashti</u>	05/23/2013	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Taylorsville</u>	05/23/2013	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hiddenite</u>	05/23/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Drexel</u>	06/13/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Conover</u>	06/13/2013	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Bridgewater</u>	06/26/2013	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Enola</u>	06/26/2013	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	07/05/2013	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	07/12/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Collettsville</u>	07/12/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/12/2013	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	07/12/2013	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Enola</u>	07/12/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Jonas Ridge</u>	07/17/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Stony Pt</u>	07/17/2013	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Claremont</u>	07/17/2013	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Jonas Ridge</u>	07/25/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Oyama</u>	08/12/2013	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	04/03/2014	Hail	0.88 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Oak Hill</u>	06/04/2014	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/11/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Jonas Ridge</u>	06/16/2014	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Icard</u>	06/16/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Icard</u>	06/18/2014	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hildebran</u>	06/18/2014	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Longview</u>	06/18/2014	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Icard</u>	06/18/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Chesterfield</u>	06/19/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Saw Mills</u>	06/19/2014	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Valdese</u>	06/19/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Brookford</u>	06/19/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Claremont</u>	06/19/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Jonas Ridge</u>	06/19/2014	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/20/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Connellys Spgs</u>	07/23/2014	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Drexel</u>	07/24/2014	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	09/06/2014	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Chesterfield</u>	10/10/2014	Hail	1.00 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Morganton</u>	10/11/2014	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Joy</u>	04/09/2015	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Collettsville</u>	04/09/2015	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Globe</u>	06/01/2015	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	06/02/2015	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Catawba</u>	06/02/2015	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	06/18/2015	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Calvin</u>	06/18/2015	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Valdese</u>	06/19/2015	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hudson</u>	06/19/2015	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	06/19/2015	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Oyama</u>	06/30/2015	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	06/30/2015	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Catawba</u>	07/21/2015	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	08/14/2015	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	09/04/2015	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Grace Chapel</u>	09/04/2015	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hickory</u>	09/04/2015	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Gamewell</u>	09/04/2015	Hail	1.00 in.	0	0	1.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Glen Alpine</u>	05/02/2016	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Pleasant Grove Brke</u>	05/03/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Burke Chapel</u>	05/03/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Propst Xrds</u>	05/03/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Propst Xrds</u>	05/03/2016	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Cotton Factory</u>	05/03/2016	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Drums Xrds</u>	05/03/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>All Healing Spgs</u>	06/02/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Valdese</u>	06/27/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/29/2016	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/29/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	06/29/2016	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Enola</u>	06/29/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Conover</u>	06/29/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	06/30/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	06/30/2016	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Duan</u>	07/03/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	07/05/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Claremont</u>	07/11/2016	Hail	1.00 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Chesterfield</u>	07/16/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	07/16/2016	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Conover</u>	07/22/2016	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Morganton</u>	09/27/2016	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Grandin</u>	09/28/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Bridgewater</u>	09/29/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Collettsville</u>	09/29/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Stony Pt</u>	09/29/2016	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Stony Pt</u>	09/29/2016	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Patterson</u>	09/29/2016	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Enola</u>	03/01/2017	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Valdese</u>	03/01/2017	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Enola</u>	03/01/2017	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Pleasant Grove Brke</u>	03/01/2017	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Oyama</u>	03/01/2017	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Kings Creek</u>	03/27/2017	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Drexel</u>	04/05/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Rutherford College</u>	04/05/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	04/06/2017	Hail	1.25 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Baily Camp</u>	05/19/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	05/19/2017	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	06/13/2017	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hudson</u>	06/13/2017	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Oyama</u>	06/13/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>leard</u>	07/13/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/17/2017	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Taylorsville Arpt</u>	07/17/2017	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Liledoun</u>	07/17/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/17/2017	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hickory</u>	07/17/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>lcard</u>	07/17/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Lenoir</u>	07/18/2017	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Collettsville</u>	07/22/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Chesterfield</u>	07/23/2017	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Taylorsville Arpt</u>	09/05/2017	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hickory</u>	05/07/2018	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Enola</u>	05/10/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Burke Chapel</u>	05/10/2018	Hail	1.00 in.	0	0	0.00K	0.00K

Appendix A: Severe Weather Occurrences (2018-2024)

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Propst Xrds</u>	05/10/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Taylorville</u>	05/10/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Granite Falls</u>	05/20/2018	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Brindletown</u>	06/03/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Burke Chapel</u>	06/03/2018	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Mt Herman</u>	06/10/2018	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	06/11/2018	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	06/11/2018	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Chesterfield</u>	07/05/2018	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Morganton</u>	07/21/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hickory</u>	07/21/2018	Hail	2.00 in.	0	0	0.00K	0.00K
<u>Mt Herman</u>	07/21/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Bethlehem</u>	07/21/2018	Hail	1.75 in.	0	0	0.00K	0.00K
<u>Duan</u>	08/08/2018	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Propst Xrds</u>	08/08/2018	Hail	0.75 in.	0	0	0.00K	0.00K
<u>Hildebran</u>	08/08/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Glen Alpine</u>	09/01/2018	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Oak Hill</u>	04/13/2019	Hail	1.25 in.	0	0	0.00K	0.00K
<u>Hiddenite</u>	05/31/2019	Hail	0.88 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
<u>Taylorsville Arprt</u>	07/04/2019	Hail	1.50 in.	0	0	0.00K	0.00K
<u>Oyama</u>	07/11/2019	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Saw Mills</u>	07/20/2019	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Hudson</u>	07/20/2019	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Burke Chapel</u>	07/31/2019	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Morganton</u>	08/13/2019	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Abingdon</u>	08/21/2019	Hail	0.88 in.	0	0	0.00K	0.00K
<u>Startown</u>	08/23/2019	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Hartland</u>	09/30/2019	Hail	1.00 in.	0	0	0.00K	0.00K
<u>Rhodhiss</u>	09/30/2019	Hail	1.00 in.	0	0	0.00K	0.00K
Oak Hill – Burke County	4/25/2020	Hail	1.00 in.	0	0	0.00K	0.00K
Baton – Caldwell County	4/25/2020	Hail	1.00 in.	0	0	0.00K	0.00K
Propst XRDS – Catawba County	4/26/2020	Hail	0.88in	0	0	0.00K	0.00K
Morganton – Burke County	7/10/2020	Hail	1.00 in.	0	0	0.00K	0.00K
Chesterfield – Burke County	7/21/2020	Hail	1.00 in	0	0	0.00k	0.00k
Valdese – Burke County	7/21/2020	Hail	1.00 in.	0	0	0.00K	0.00K
Hickory – Burke County	7/21/2020	Hail	1.00 in.	0	0	0.00K	0.00K
Morganton – Burke County	3/27/2021	Hail	0.75 in.	0	0	0.00K	0.00K
Newton – Catawba County	6/14/2021	Hail	1.00 in.	0	0	0.00K	0.00K

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Deaths</u>	<u>Injuries</u>	<u>Property Damage</u>	<u>Crop Damage</u>
Claremont – Catawba County	7/17/2021	Hail	0.75 in.	0	0	0.00K	0.00K
Baton – Caldwell County	8/14/2021	Hail	0.88 in.	0	0	0.00K	0.00K
Glen Alpine – Burke County	5/01/2022	Hail	1.00 in.	0	0	0.00K	0.00K
Granite Falls – Caldwell County	5/26/2022	Hail	1.75 in.	0	0	0.00K	0.00K
Chesterfield – Burke County	6/02/2022	Hail	0.75 in.	0	0	0.00K	0.00K
Oak Hill – Burke County	6/02/2022	Hail	1.00 in.	0	0	0.00K	0.00K
Chesterfield – Burke County	7/02/2022	Hail	0.75 in.	0	0	0.00K	0.00K
Burke Chapel – Burke County	7/06/2022	Hail	1.75 in.	0	0	0.00K	0.00K
Newton – Catawba County	8/10/1011	Hail	0.88 in.	0	0	0.00K	0.00K
Warrior – Caldwell County	3/03/2023	Hail	0.88 in.	0	0	0.00K	0.00K
Taylorsville – Alexander County	4/06/2023	Hail	1.00 in.	0	0	0.00K	0.00K
Smiths Store – Alexander County	4/06/2023	Hail	1.00 in.	0	0	0.00K	0.00K
Enola – Burke County	4/22/2023	Hail	0.75 in.	0	0	0.00K	0.00K
Brindletown – Burke County	6/26/2023	Hail	1.00 in.	0	0	0.00K	0.00K
Hickory – Catawba County	7.01/2023	Hail	1.00 in.	0	0	0.00K	0.00K
Rutherford College – Burke County	9/07/2023	Hail	0.75 in.	0	0	0.00K	0.00K
Totals:				0	0	53.00K	0.00K

Table A- 3: Hail events summary from the NCDC between 2000-2023

Location	Date	Episode Narrative
Caldwell Mountains (Zone)	11/14/2018	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. While most areas saw around a tenth of an inch or less of ice accretion, damaging ice accumulations were reported across the high elevations of Caldwell and Burke Counties, as well as eastern portions of Avery County.
Burke Mountains (Zone)		
Burke Mountains (Zone)	11/24/2018	For the second time in 10 days, a freezing rain event developed across portions of the mountains and foothills of North Carolina. Precipitation developed during the overnight, as a wave of low pressure moved along the Gulf Coast. Precipitation began as rain and snow, but transitioned to freezing rain across all but the highest elevations (where more of a wintry mix was reported), as a wedge of cold air locked in near the Blue Ridge. As freezing rain continued through daybreak, damaging accumulations of ice, generally between one quarter and one half inch were reported across the area. Quite a few trees and power lines, along with numerous power outages were reported across the area.
Greater Caldwell (Zone)		
Greater Burke (Zone)		
Caldwell Mountains (Zone)		
Alexander (Zone)	1/12/2019	Moist air flowing over a wedge of cold air banked against the eastern slopes of the Appalachians resulted in precipitation development across the Blue Ridge and surrounding areas beginning during the evening of the 12th. The atmosphere quickly cooled to or below freezing near the escarpment and out across the lower elevations of the foothills and far northwest Piedmont. This resulted in much of the precipitation falling as freezing rain in these areas. The freezing rain continued through the overnight across the Blue Ridge and surrounding areas before tapering off around daybreak on the 13th. Total ice accretion of one quarter to one half inch was reported, with the heaviest amounts being across the foothills and immediately along the Blue Ridge escarpment. Scattered downed trees and power outages were reported throughout the area.
Burke Mountains (Zone)		
Caldwell Mountains (Zone)		
Catawba (Zone)		
Greater Burke (Zone)		
Greater Caldwell (Zone)		
Burke Mountains (Zone)	2/17/2021	Moisture and precipitation overspread the western North Carolina 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 trapped along the eastern Blue Ridge escarpment to allow much of this precipitation to fall as freezing rain. By the time the precipitation tapered off during the morning of the 18th, total ice accretion was generally around one quarter inch, although spotty amounts closer to one half inch were reported. Due to warm road temperatures, accretion was primarily limited to elevated surfaces and limited travel difficulties.
Caldwell Mountains (Zone)		

Table A- 4: Ice storms from the NCDC storm events database between 2018 and 2023

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Calvin	4/15/2018	0	0	0	Media reported trees and power lines blown down on Lions Hill St.	Scattered to numerous afternoon thunderstorms developing ahead of a cold front moved into the North Carolina Piedmont from South Carolina during the early afternoon. Several of the storms produced severe weather in the form of large to very large hail and locally damaging winds.
	Enola		0	0	0	County comms reported several trees blown down and blocking trails in South Mountains State Park.	
Caldwell	Hudson		0	0	0	County comms reported a few trees blown down in the Hudson area.	
Burke	Valdese	5/10/2018	0	0	0	Media reported multiple trees blown down.	Isolated to scattered thunderstorms developed across the Blue Ridge during the afternoon and moved into the Piedmont during the evening. Some of the storms produced severe weather in the form of large hail and locally damaging winds. Strong to severe supercell thunderstorms developed repeatedly and trained across portions of the foothills, particularly in Polk County, such that some locations received multiple periods of up to golf ball size hail.
Alexander	Stony Pt		0	0	0		
Caldwell	Gamewell	6/1/2018	0	0	0	Ham radio operator reported several trees blown down around the Highway 18 and Rocky Road area.	Scattered to numerous thunderstorms developed across western North Carolina throughout the afternoon and evening. Several of the storms produced brief severe weather in the form of damaging wind gusts.

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Enola	6/3/2018	0	0	0	Media reported trees blown down on Jenkins Rd.	Scattered thunderstorms developed across the southern Appalachians throughout the afternoon and moved southeast. Several storms produced brief severe weather in the form of large hail and damaging winds across the North Carolina mountains and foothills.
Burke	Oak Hill	6/11/2018	0	0	0	Media reported multiple trees and power lines blown down in the Oak Hill area.	Isolated thunderstorms developed during the afternoon across the North Carolina foothills. One of these storms produced occasional severe weather as it moved south across the far western Piedmont. Then, as a cold front moved southwest across the area throughout the evening, scattered to numerous showers and storms developed along it, producing additional brief severe weather.

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Table Rock	6/25/2018	0	0	0	Spotter reported numerous trees and power lines blown down in western Burke County. Media reported numerous trees down in the Morganton area, especially along the Catawba River. At least one road was closed in Morganton due to falling trees. Additional sporadic tree damage was also reported outside of this corridor, including at Highway 18 and Antioch Rd near the Caldwell County line.	For the third day in a row, multiple thunderstorm clusters, some producing damaging winds moved from East Tennessee into western North Carolina during the afternoon into the evening. While severe weather was confined to the mountains on the 23rd and 24th, storms on the 25th also produced severe weather in the foothills and northwest Piedmont.
Caldwell	Gamewell		0	0	\$200,000	Multiple sources reported numerous trees blown down in the Gamewell area. Trees fell on and destroyed one house and severely damaged two others. Roads blocked by downed trees included Miller Hill Rd, Dulatown Rd, and Connelly Springs Rd in Granite Falls.	
Alexander	All Healing Spgs		0	0	0	Media reported multiple trees blown down on Mountain Ridge Church Road.	
Catawba	Longview		0	0	0	Media reported trees blown down along Highway 321.	
	Claremont		0	0	0	Broadcast media reported several trees blown down along River Bend Rd. Public also reported (via social media) reported numerous small trees blown down in the Catfish community.	
Caldwell	Yadkin Vly	7/6/2018	1	2	5000	EM reported a large tree was blown down on a vehicle in Green Mountain Park killing a 78-year-old occupant and causing minor injuries to two others. A few other trees were blown down in Lenoir and areas just east of the city.	Scattered thunderstorms developed across the North Carolina mountains and foothills during the afternoon and moved into the western Piedmont by early evening. A few of the

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							storms produced strong to damaging winds that caused tree damage, with one tree falling on a vehicle north of Lenoir, killing one of the occupants.
Burke	Valdese	7/21/2018	0	0	0	Media reported trees and power lines blown down in the area around Church St. NW and Dixie Ave NW.	Scattered thunderstorms developed during the afternoon across the North Carolina mountains and foothills and moved east. A few of the storms produced brief severe weather in the form of large hail and damaging winds.
Catawba	Claremont	7/22/2018	0	0	1000	Public reported large tree limbs blown down and minor roof damage on Highway 10.	Scattered to numerous thunderstorms developed along a cold front across the North Carolina Piedmont during the afternoon and evening. A few of the storms produced brief large hail and damaging winds. While most of the severe weather was marginal, a significant downburst did occur in the Concord area.
Catawba	Conover	8/6/2018	0	0	10000	EM reported multiple trees blown down on the north side of Conover, with a tree down on a mobile home on County Home Rd and several trees blocking I-40 near mile marker 132.	Scattered thunderstorms developed across the North Carolina foothills during the afternoon and moved southeast. One storm produced brief damaging winds in the Conover area.
Catawba	Duan	8/8/2018	0	0	0	Spotter reported trees blown down on Rome Jones Rd.	Scattered thunderstorms developed across the North Carolina Blue Ridge during the
	Startown		0	0	0	Spotter reported trees blown down on Hardwood Cir.	

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Brindletown		0	0	0	Spotter reported trees blown down along Jenkins Rd.	afternoon, with storms developing gradually along outflows into the Piedmont throughout the afternoon and into the evening. A few of the storms produced brief damaging winds.
Catawba	Hickory		0	0	10000	Public reported a tree blown down on a house on 13th Ave Northwest.	
Catawba	Startown	8/31/2018	0	0	0	County comms reported trees blown down along Robinson Rd.	Isolated thunderstorms developed during the afternoon and evening over the foothills and western Piedmont of North Carolina. A few of the storms produced brief damaging winds.
Burke	Glen Alpine	9/1/2018	0	0	0	Media reported multiple trees blown down on Powerhouse Rd.	Isolated thunderstorms developed over the North Carolina Piedmont and foothills during the evening. A couple of the storms produced brief severe weather.
Burke	Morganton	9/2/2018	0	0	0	County comms reported multiple trees blown down across the south side of Morganton. One tree fell on a house and took down a power line on Mt Home Church Ave.	Isolated thunderstorms developed across the foothills and western Piedmont during the afternoon and evening. A couple of the storms produced brief damaging winds.
Catawba	Newton		0	0	0	County comms reported a few trees blown down near the intersection of Shannonbrook Dr and Radio Station Rd.	
Catawba	Startown	9/27/2018	0	0	0	FD reported two trees blown down on Robinson Rd.	A cluster of thunderstorms producing pockets of damaging wind gusts moved into the North Carolina Piedmont from Upstate South Carolina during the evening. Several areas of wind damage were reported along the I-77 corridor.
	Olivers Xrds		0	0	0	Ham radio operator reported multiple trees blown down near Maiden.	

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Calvin	4/13/2019	0	0	0	County comms reported trees down on Highway 126.	Scattered clusters of heavy rain showers and thunderstorms developed in the vicinity of a stationary front across western North Carolina throughout the 13th. Repeated movement of showers and storms resulted in flash flooding developing across Cabarrus County beginning in the morning. Meanwhile, an isolated supercell thunderstorm produced large hail and isolated damaging wind gusts across Burke County during the afternoon.
	Drexel		0	0	0	County comms reported multiple trees blown down on Mountain View Dr.	
Burke	Morganton	4/14/2019	0	0	50000	NWS storm survey reported numerous trees blown down throughout Morganton and vicinity, with several trees down on homes, including along West Fleming Dr, King St, and Antioch Rd.	Numerous showers along with strong to severe thunderstorms developed across western North Carolina throughout the 14th in advance of a strong frontal system. Some of these storms produced areas of wind damage throughout the afternoon and evening.
Burke	Pleasant Grove Brke		0	0	0	County comms reported multiple trees and power lines blown down on River Meadows Ln at the intersection Of River Rd.	
Burke	Enola		0	0	0	County comms reported multiple trees blown down near the intersection of Watershed Rd and Enola Rd.	
Catawba	Cotton Factory	4/19/2019	0	0	10000	EM reported a large tree blown down on a garage at Main Street and North 9th Avenue. Possible tornado.	A large area of moderate to heavy rain showers, along with embedded clusters of strong to severe thunderstorms moved slowly across western North Carolina throughout the morning and into the afternoon of the 19th ahead of a slow-moving cold front. Some of the storms produced a couple of isolated, weak tornadoes and locally
Alexander	Taylorsville		0	0	0	Ham radio operator reported multiple trees blown down in Taylorsville, with some blocking roads.	

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							damaging winds. However, the larger impact was from flash flooding resulting from a swath of 4 to 7 inches of rain that fell across portions of the mountains.
Burke	Table Rock	6/22/2019	0	0	0	County comms reported multiple trees blown down on Highway 181.	A line of strong to severe thunderstorms developing in association with an area of low pressure across Tennessee moved into the North Carolina mountains around midnight on the morning of the 22nd, and produced areas of wind damage before weakening.
Alexander	Taylorville Arpt	7/4/2019	0	0	0	Fire dept reported numerous trees and power lines blown down on Highway 16 near Taylorville.	Scattered thunderstorms and storm clusters developed across the North Carolina Piedmont during the afternoon. A couple of the storms produced damaging wind gusts.
Caldwell	Collettsville	7/8/2019	0	0	1000	Fire dept reported trees blown down on Yellow Belle PI, with a tree on power lines and another on an outbuilding.	Isolated thunderstorms developed near the North Carolina Blue Ridge during the late afternoon. One storm produced brief damaging winds in Caldwell County.
Catawba	Oyama	7/11/2019	0	0	0	Media reported multiple small trees uprooted.	Scattered to numerous thunderstorms developed across western North Carolina during the afternoon. A few of the storms produced damaging wind gusts and even some large hail.
	Startown		0	0	0	Media reported one large hardwood tree uprooted and several smaller trees split near the intersection of Highway 10 and Jarrett Farm Rd.	
Burke	Calvin	7/20/2019	0	0	10000	County comms reported the roof was blown off a building at a flea market on Jamestown Rd. Numerous	Scattered to numerous thunderstorms developed across

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
						trees were blown down in this area as well, with more sporadic wind damage extending north past the Catawba River to near Highway 126.	northern North Carolina during the afternoon. A few of the storms produced brief damaging wind gusts and some hail.
Caldwell	Joyceton	7/20/2019	0	0	10000	County comms reported the roof of a mobile home collapsed on Mount Herman Rd.	Scattered to numerous thunderstorms developed across northern North Carolina during the afternoon. A few of the storms produced brief damaging wind gusts and some hail.
Burke	Morganton	8/7/2019	0	0	0	Spotter reported trees fell along E Parker Rd and Bethel Rd, with one tree falling on a vehicle.	Isolated thunderstorms developed along the Blue Ridge during the late afternoon and moved east. One storm produced brief damaging winds in the Morganton area.
Burke	Morganton	8/13/2019	0	0	0	Spotter reported trees blown down on Valley View St.	Widely scattered thunderstorms developed along the Blue Ridge during the afternoon and moved southeast. Several storms produced brief severe weather across the Piedmont, mainly in the form of damaging wind gusts.
Alexander	Bethlehem		0	0	5000	Amateur radio operator reported two trees blown down and blocking traffic near the intersection of Highway 127 and Telephone Exchange Rd. Spotter reported minor damage to a structure on Highway 127. Power lines were also blown down in the area.	
Catawba	Oyama		0	0	0	County comms reported a tree blown down and blocking Snow Creek Rd NE and multiple trees and power lines down along Laurel Springs Dr, Lee Cline Rd, and County Home Rd.	
	Bandy		0	0	0	Public reported a tree and multiple large limbs blown down.	
Burke	Rutherford College	8/21/2019	0	0	0	County comms and media reported multiple trees and power lines blown down from the Rutherford College area through the Rhodiss and Icard area.	Scattered to numerous thunderstorms developed near the North Carolina Blue Ridge during the afternoon into early evening. Several storm clusters organized as the storms moved
Caldwell	Granite Falls		0	0	0	County comms reported trees and power lines blown down in the Granite Falls area. Ham radio operator reported power lines down in the Northlakes area.	

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Alexander	Millersville		0	0	50000	County comms reported multiple trees and power lines blown down in the Lake Hickory. One large tree fell on and split a house in half. Numerous trees and power lines were also blown down between Vashti and Hiddenite with one tree shut down due to trees blocking the road.	southeast across the foothills and western Piedmont. Several of these clusters produced small swaths of damaging wind gusts, some of which were fairly significant.
Catawba	Claremont		0	0	0	Fire dept reported trees blown down on River Bend Rd and Rest Home Rd.	
Caldwell	Valmead	8/22/2019	0	0	0	County comms reported a tree down across Powell Rd near Camelot Ct and another tree down along with downed power lines in the Green Mountain Park area.	Scattered to numerous thunderstorms developed near the Blue Ridge escarpment during the afternoon and moved southeast to affect the foothills and western Piedmont into the late afternoon. Several of the storms produced brief damaging winds.
	Mt Herman		0	0	0	Spotter reported trees blown down on Norwood St.	
Alexander	Taylorsville		0	0	0	County comms reported a few power lines blown down in the Taylorsville area.	
Burke	Icard		0	0	0	County comms reported trees blown down in far eastern Burke County.	
Burke	Oak Hill	9/13/2019	0	0	0	Media reported multiple trees blown down northwest of Morganton, with a few down across Highway 181.	Scattered to numerous thunderstorms and storm clusters developed over western North Carolina during the afternoon and evening in association with a back door cold front. A couple of the storms produced large hail, brief damaging winds, and/or heavy rainfall.
Burke	Morganton	10/31/2019	0	0	0	County comms reported multiple trees blown down in the Morganton area.	Multiple lines of heavy rain showers and thunderstorms moved across western North Carolina throughout Halloween Day along and ahead of a potent cold front. Several pockets of strong to damaging winds were

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							reported in association with some of the thunderstorms and heaviest showers.
Catawba	Brookford	1/11/2020	0	0	0	Ham radio operator reported multiple trees blown down across Catawba County.	Multiple lines of thunderstorms developed across the western Carolinas in advance of a cold front during the late afternoon and evening. Some of these lines produced swaths of wind damage across the southern mountains, foothills, and mainly the northern Piedmont.
Caldwell	Gamewell	4/13/2020	0	0	0	County comms reported trees blown down on Highway 18 in Gamewell. Spotter reported a large tree down on Connolly Springs Rd.	A strong storm system impacted the Southeast, resulting in an area of widespread heavy rain and embedded strong to severe thunderstorms that moved across western North Carolina during the late night and early morning hours. Localized flash flooding, some of which was quite significant developed across the mountains. Isolated severe weather also occurred, mainly in the form of damaging wind gusts. Strong southerly gradient winds also caused some damage across mainly the high elevations of western North Carolina.
Burke	Drexel		0	0	0	Media reported several trees blown down along John Berry Rd.	
Catawba	Hickory		0	0	50000	Public reported a tree and power line fell on a vehicle and structure in the Hickory area. Spotter reported multiple trees down along I-40 east of Hickory.	
Burke	Morganton	4/25/2020	0	0	0	Public reported (via Social Media) a few large trees blown down in Catawba Meadows Park.	Isolated thunderstorms developed in the vicinity of a warm front across the mountains of southwest North Carolina and the northern foothills during the

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							evening. In addition, a couple of supercell thunderstorms moved into the southern Piedmont from upstate South Carolina. Several of these storms produced large hail and brief damaging winds.
Burke	Morganton	7/10/2020	0	0	0	Media reported a tree blown down near the intersection of Valley View St and Highway 18. Law enforcement reported multiple trees and power lines down near Piedmont Rd and Belvidere Ln. Public reported (via Social Media) a couple of trees down in the Chesterfield community.	Scattered thunderstorms developed across western North Carolina during the afternoon and evening. A couple of the storms produced brief severe weather.
Burke	Bridgewater	7/18/2020	0	0	0	Media reported multiple trees blown down off Dysartsville Rd.	Scattered to numerous thunderstorms developed across western North Carolina throughout the afternoon and evening. Several of the storms produced brief damaging wind gusts.
Burke	(Hky)Hickory Muni Ar	7/18/2020	0	0	0	Media reported multiple trees blown down along Airport Rhodiss Rd.	Scattered to numerous thunderstorms developed across western North Carolina throughout the afternoon and evening. Several of the storms produced brief damaging wind gusts.
Catawba	Hickory		0	0	0	Public reported (via Social Media) large tree limbs blown down along Highway 127.	
Burke	Chesterfield	7/21/2020	0	0	0	Spotter reported multiple trees blown down along Highway 64 in the Chesterfield community.	Numerous thunderstorms and scattered storm clusters developed across western North Carolina during the afternoon and evening. Multiple severe thunderstorms developed, mainly producing brief damaging wind gusts.
Catawba	Bandy		0	0	0	Fire Dept reported trees blown down on Bandys Cross Rd.	

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Chesterfield	7/23/2020	0	0	0	County comms reported trees and power lines blown down long Smokey Creek Rd and at Foothills Regional Airport.	Scattered thunderstorms developed across western North Carolina during the afternoon. One storm produced brief damaging winds in Burke County.
Burke	Icard	7/31/2020	0	0	0	Media reported trees and power lines blown down on Cape Hickory Rd.	Scattered to numerous thunderstorms and storm clusters developed across western North Carolina during the evening. Several of the storms produced brief damaging wind gusts and/or heavy rainfall. A small area of flash flooding developed in downtown Asheville.
Alexander	All Healing Spgs		0	0	0	Media reported trees blown down and blocking Antioch Church Rd.	
Catawba	Oyama		0	0	0	Public reported (via Social Media) a tree blown down on 46th Ave NE in Hickory. Ham radio operator reported multiple trees blown down along Rockbarn Rd NE in Conover.	
Catawba	Oyama	8/2/2020	0	0	0	Fire dept reported trees blown down at County Home Rd and Lee Cline Rd on Herman Sipe Rd and on 1st Ave Place NE.	Scattered to numerous thunderstorms developed along a cold front across western North Carolina during the afternoon. A couple of the storms produced brief damaging winds across the northern foothills.
Alexander	Hiddenite		0	0	20000	Fire dept reported part of a chicken house destroyed and numerous trees and a few power lines blown down at the intersection of Sulfur Springs Rd and Hiddenite Church Rd.	
Burke	Drexel	8/6/2020	0	0	0	County comms reported trees and power lines blown down in the Drexel area.	Numerous thunderstorms and scattered storm clusters developed along a stationary front across western North Carolina during the afternoon and evening. One storm produced brief damaging winds in Burke County. Locally heavy to excessive rainfall also

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							occurred, resulting in isolated flash flooding in Catawba County.
Burke	Morganton	3/27/2021	0	0	0	Public reported a few large tree limbs blown down in the Morganton area.	Scattered thunderstorms and storm clusters developed over western North Carolina throughout the afternoon. A few of the storms produced isolated large hail and damaging wind gusts.
Burke	Oak Hill	4/10/2021	0	0	0	Media reported numerous trees blown down on Highway 181 at Bowman Ave and trees and power lines down on Highway 64 north of Morganton.	A line of heavy rain showers and thunderstorms moved over the North Carolina foothills during the late afternoon and evening in advance of a cold front. A couple of areas of isolated damaging winds along with weak tornadoes were reported as the line swept across the area.
Caldwell	Piney		0	0	0	NWS storm survey reported a small area of downburst damage along Playmore Beach Rd. Numerous trees were snapped and/or uprooted from Braswell Place to just west of Celia Creek Rd.	
Alexander	Taylorsville Arpt	6/8/2021	0	0	0	Trees and utility lines were blown down along Highway 16.	Isolated thunderstorms developed across western North Carolina during the afternoon and evening. One of the storms produced brief damaging wind gusts in Alexander County.
Catawba	Claremont	7/17/2021	0	0	0	Multiple trees were blown down or heavily damaged in Riverbend Park. Additional large limbs were also blown down.	Widely scattered thunderstorms developed over western North Carolina throughout the afternoon. One of the storms produced brief damaging wind gusts in Catawba County.
Burke	Morganton	7/27/2021	0	0	30000	Spotter reported a tree blown down across on 3 cars and another tree on a house in the city of Morganton.	Scattered thunderstorms and storm clusters developed across western North Carolina during the afternoon and early evening.

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							A couple of the storms produced brief damaging wind gusts over the foothills.
Burke	Oak Hill	8/14/2021	0	0	0	Media reported multiple trees and power lines blown down along Frank Whisnant Rd.	Numerous thunderstorms developed over western North Carolina throughout the afternoon. A number of the storms produced brief damaging wind gusts and some hail.
Caldwell	Baton		0	0	0	County comms reported trees and power lines blown down on Clarks Chapel Rd and on Calico Rd.	
Burke	Morganton	8/26/2021	0	0	0	Fire dept reported several trees blown down in and around Morganton.	Scattered thunderstorms developed over the mountains and adjacent foothills throughout the afternoon. A couple of the storms produced brief damaging wind gusts in the foothills.
Burke	Pleasant Grove Brke	8/31/2021	0	0	0	County comms reported a few trees blown down in the Pleasant Grove area.	Moisture associated with the far outer circulation of the remnants of Hurricane Ida resulted in development of numerous rain showers and thunderstorms across the North Carolina foothills during the afternoon. One small line of heavy showers and thunderstorms produced pockets of damaging winds as it moved north-northeast across the area.
	Glen Alpine		0	0	0	County comms reported a tree blown down on Lytle Dr. Public reported multiple trees down near Bethel Park in Morganton.	
Burke	Morganton	3/23/2022	0	0	0	County comms reported trees and power lines blown down throughout the Morganton area, including at the intersection Of Propst Rd and Highway 64, and Sanford Rd at Tate St, and on Lenoir Rd and Kirksey Dr.	A cold front moving across the region resulted in development of a line of scattered thunderstorms over western Nouth Carolina during the late afternoon and evening. A couple of the storms produced locally damaging wind gusts in addition

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							to an EF1 tornado in Alexander County. Additionally, heavy rainfall resulted in some localized flooding in the southern mountains.
Caldwell	Baton	5/6/2022	0	0	0	Public reported 10 to 20 trees, a few of them large blown down along J M Craig Road. A few of the trees were quite large and uprooted. A tree limb punctured the wall of an old sawmill.	Scattered to numerous thunderstorms developed ahead of a frontal system throughout the afternoon and evening across western North Carolina. Several of the storms produced brief large hail and damaging winds, while an EF1 tornado developed in Swain County.
Caldwell	Baton		0	0	0	Public reported (via Social Media) several trees blown down on Baton School Road.	Scattered to numerous thunderstorms developed ahead of a frontal system throughout the afternoon and evening across western North Carolina. Several of the storms produced brief large hail and damaging winds, while an EF1 tornado developed in Swain County.
Burke	Icard	5/26/2022	0	0	0	Media reported multiple trees and power lines blown down.	A broad band of moderate to heavy rain showers with embedded strong to severe thunderstorms moved over western North Carolina throughout the afternoon into the evening. Several strong to severe thunderstorms produced locally damaging wind gusts, brief large hail, and even a couple of tornadoes, including a strong tornado in Iredell County.
Catawba	Startown		0	0	0	Media reported multiple trees blown down on power lines in the Startown community.	

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Morganton	6/2/2022	0	0	0	Media reported trees and power lines blown down on Piedmont Rd near Highway 18.	Scattered thunderstorms developed over the North Carolina mountains and foothills during early-to-mid afternoon and steadily developed into the Piedmont during mid-to-late afternoon. A few of the storms produced hail and brief damaging wind gusts.
	Joy		0	0	0	Media reported trees and power lines blown down at a couple of campgrounds along Steele Creek and Upper Creek.	
Caldwell	Saw Mills		0	0	5000	Media reported three pine trees blown down off Powder Creek Ct and a tree on a vehicle on Pooveys Chapel Church Rd.	
Burke	Oak Hill		0	0	0	County comms reported multiple trees blown down northwest of Morganton, including on Jay Clark Rd.	
Burke	Ramsey	6/8/2022	0	0	5000	Media reported a tree was blown down on a truck along Highway 18.	Isolated thunderstorms developed over western North Carolina during the afternoon. Some of the storms produced gusty winds.
Catawba	Brookford	6/14/2022	0	0	0	Spotter reported multiple trees blown down on Zion Church Rd.	A line of thunderstorms moved south across western North Carolina during the morning. A few of the storms became strong-to-severe, producing hail and damaging wind gusts.
Catawba	Duan	6/16/2022	0	0	10000	Public reported a large tree was blown down on a house along Highway 16 south of Newton.	Scattered thunderstorms developed over western North Carolina during the afternoon and moved southeast. Some of the storms organized into small clusters. Several of the clusters and individual cells produced large hail and damaging wind gusts.
Caldwell	Kings Creek	7/5/2022	0	0	0	Public reported multiple trees blown down in the Kings Creek community.	A line of thunderstorms moved southeast across western North Carolina during the evening. Several of the embedded storms
Burke	Pleasant Grove Brke		0	0	0	County comms reported trees blown down on Corn Hill Rd.	

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County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Morganton		0	0	0	Media reported trees blown down near the intersection of Enola Rd and Highway 18.	produced locally damaging wind gusts.
Catawba	Newton		0	0	0	County comms reported a few trees blown down across Catawba County.	
Catawba	Plateau		0	0	0	County comms reported a few trees blown down off Cooksville Rd.	
Alexander	Bethlehem	7/6/2022	0	0	0	Media reported trees blown down in Bethlehem and along Lake Hickory near Highway 16.	Scattered thunderstorms and storm clusters developed over western North Carolina during the afternoon into the early evening. Several of the storms produced locally damaging wind gusts.
Burke	Burke Chapel		0	0	50000	Public reported multiple trees blown down with one on a trailer, part of the roof removed from a house, and a destroyed barn on Buzz Lowman St. Media reported numerous trees blown down nearby on Old Laurel Rd and significant damage to the roof of a manufacturing building on Claude Britton Rd. Ham radio operator reported multiple large trees down on Highway 18.	
Burke	Glen Alpine	7/23/2022	0	0	0	County comms reported trees blown down on Linville St.	Scattered thunderstorms developed over western North Carolina, mainly during the evening. A few of the storms produced brief damaging wind gusts.
Alexander	Bethlehem	7/25/2022	0	0	0	Fire dept reported two pine trees blown down just north of Bethlehem.	Scattered thunderstorms and storm clusters developed over western North Carolina during the afternoon and evening. Several of the storms produced strong-to-damaging wind gusts.
Burke	Pleasant Grove Brke		0	0	0	Park service reported multiple large tree limbs blown down across South Mountains State Park.	
Catawba	Conover	8/12/2022	0	0	0	Multiple trees and power lines were blown down in the city of Conover and power lines were blown down in Newton.	Isolated thunderstorms developed over the North Carolina foothills and Piedmont during the late afternoon and evening. One of the storms produced locally damaging wind gusts across several counties.

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Burke	Brindletown	8/15/2022	0	0	0	Media reported two trees blown down near the intersection of Hayes Water Rd and Conley Rd.	Scattered thunderstorms developed over western North Carolina during the afternoon. Several of the storms produced brief damaging wind gusts.
Burke	Morganton	3/3/2023	0	0	0	County comms reported trees and power lines blown down along Wesley Rd.	Multiple lines and clusters of thunderstorms moved into western North Carolina during the late afternoon and evening ahead of a cold front. Multiple reports of wind damage were received, mainly across the mountains.
Burke	Chesterfield	7/28/2023	0	0	0	Public reported trees and power lines blown down on Antioch Rd.	Scattered thunderstorms developed over western North Carolina during the afternoon and evening. A few of these storms produced brief damaging wind gusts.
Burke	Icard		0	0	0	County comms reported multiple trees blown down throughout the Icard area.	
Caldwell	Collettsville	7/29/2023	0	0	0	Ham radio operator reported several trees blown down across Caldwell County.	A line of strong-to-severe thunderstorms moved into western North Carolina from east Tennessee during the late afternoon and evening. Isolated embedded cells produced locally damaging wind gusts.
Burke	Chesterfield		0	0	0	Ham radio operator and spotter reported multiple trees and power lines blown down on roads in the Drexel area, including on Antioch Rd, at N Drexel Rd and Butler Rd, and on Settlemyre Rd.	
Catawba	Longview		0	0	0	Ham radio operators reported multiple trees blown down across the Hickory area, with multiple large trees down and blocking roads in Conover.	
Burke	Pleasant Grove Brke		0	0	0	County comms reported trees blown down on Sugar Loaf Rd.	
Catawba	Startown	8/6/2023	0	0	1000	Emergency manager reported several trees blown down in a wooded area off of Zion Church Rd, with a small tree down on an outbuilding in the vicinity.	An area of showers and thunderstorms moved across the North Carolina Piedmont during the afternoon. Some of the embedded storms became

Appendix A: Severe Weather Occurrences (2018-2024)

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
							briefly severe, producing damaging wind gusts.
Burke	Glen Alpine	8/7/2023	0	0	2000	County comms and spotter reported numerous trees and some power lines blown down from Glen Alpine across Morganton and vicinity. One tree fell on an outbuilding near Glen Alpine.	Numerous thunderstorms and storm clusters moved across western North Carolina throughout the afternoon. Many of these storms produced severe weather, mainly in the form of damaging wind gusts, some of which were fairly long-lived. A couple of weak tornadoes also developed in the Piedmont, including a long-track EF1.
Caldwell	Hudson		0	0	0	Emergency manager reported a billboard blown over along Highway 321 near Hudson. Ham radio operator reported a tree blown down on power lines in Sawmills.	
Alexander	Bethlehem		0	0	50000	Fire dept reported multiple trees and some power lines blown down, some blocking roads across southern Alexander County. Structural damage occurred to a couple of buildings, including a structure at Alexander County fairgrounds.	
Burke	Hildebran		0	0	10000	Public reported (via Social Media) a tree blown down on a home.	
Catawba	Brookford		0	0	200000	NWS storm survey found a swath of intense straight line wind damage across central Catawba County, from Mountain View and Hickory to Conover and Newton. Large numbers of trees were snapped and/or uprooted with numerous large tree branches downed. Several power poles were snapped and a few structures were damaged, including a building at the Hickory American Legion Fairgrounds and a greenhouse that was destroyed.	
Catawba	Maiden		0	0	0	Public reported (via Social Media) numerous trees and power lines blown down across Maiden and vicinity.	
Catawba	Claremont		0	0	0	Public reported (via Social Media) trees blown down on I-40 in the Claremont area, and additional trees down on nearby Rock Barn Rd.	
Alexander	Bethlehem	8/27/2023	0	0	0	County comms reported a few trees blown to the south of Ellendale.	Scattered thunderstorms and storm clusters developed across

County	Location	Date	Deaths	Injuries	Property Damage (\$)	Event Narrative	Episode Narrative
Alexander	Millersville		0	0	0	County comms reported at least two trees blown down in the vicinity of Highway 16 across southern Alexander County.	western North Carolina throughout the afternoon into the evening. Some storms produced brief damaging wind gusts.
Burke	Connellys Spgs	9/7/2023	0	0	0	Public reported trees blown down at Rhodhiss Rd and Knob Ave.	Widely scattered thunderstorms along with a couple of storm clusters developed over western North Carolina, mainly during the evening. Several of the storms produced brief damaging wind gusts and/or large hail.
Catawba	Conover	9/13/2023	0	0	0	County comms reported a tree blown down on a vehicle on Conover Blvd West. Fire dept reported a tree down on and blocking Highway 10.	Scattered thunderstorms and storm clusters developed across western North Carolina during the late afternoon. A couple of storms produced brief damaging wind gusts in the northern Piedmont.
Total			1	2	\$750,000		

Table A- 5: NCDC Thunderstorm Winds reported between 2018 and 2023

County	Jurisdiction	Date	Event Type	Deaths	Injuries	Property Damage
Burke Co.	Glen Alpine	4/15/2018	Flash Flood	0	0	1000
Caldwell Co.	Edgemont	5/18/2018	Flash Flood	0	0	50000
Burke Co.	Joy	5/18/2018	Flood	0	0	5000
Caldwell Co.	Edgemont	5/19/2018	Flood	0	0	5000
Caldwell Co.	Yadkin Vly	5/29/2018	Flash Flood	0	0	2000
Burke Co.	Table Rock	5/29/2018	Flash Flood	0	0	3000
Caldwell Co.	Edgemont	5/29/2018	Flash Flood	0	0	2000

Appendix A: Severe Weather Occurrences (2018-2024)

County	Jurisdiction	Date	Event Type	Deaths	Injuries	Property Damage
Caldwell Co.	Collettsville	5/30/2018	Flood	0	0	500
Burke Co.	Joy	5/30/2018	Flood	0	0	1000
Caldwell Co.	Edgemont	5/31/2018	Flash Flood	0	0	5000
Burke Co.	Pleasant Grove Brke	9/16/2018	Flash Flood	0	0	1000
Caldwell Co.	Edgemont	9/16/2018	Flood	0	0	1000
Burke Co.	Joy	9/17/2018	Flood	0	0	1000
Burke Co.	Joy	9/23/2018	Flash Flood	0	0	2000
Caldwell Co.	Edgemont	10/11/2018	Flash Flood	0	0	1000
Burke Co.	Joy	10/11/2018	Flood	0	0	2000
Caldwell Co.	Edgemont	10/11/2018	Flood	0	0	500
Burke Co.	Joy	12/21/2018	Flood	0	0	1000
Burke Co.	Joy	12/28/2018	Flood	0	0	2000
Catawba Co.	Brookford	6/7/2019	Flash Flood	0	0	5000
Burke Co.	Calvin	6/8/2019	Flash Flood	0	0	50000
Caldwell Co.	Lenoir	6/8/2019	Flash Flood	0	0	10000
Catawba Co.	Longview	6/8/2019	Flash Flood	0	0	50000
Caldwell Co.	Edgemont	6/8/2019	Flood	0	0	1000
Burke Co.	Joy	6/8/2019	Flood	0	0	2000
Catawba Co.	Catawba	6/9/2019	Flood	0	0	250000
Catawba Co.	Oyama	6/9/2019	Flash Flood	0	0	10000
Alexander Co.	Bethlehem	6/9/2019	Flash Flood	0	0	10000
Catawba Co.	Oyama	6/9/2019	Flood	0	0	1000
Alexander Co.	Bethlehem	6/9/2019	Flood	0	0	1000
Caldwell Co.	Edgemont	6/9/2019	Flash Flood	0	0	30000
Burke Co.	Joy	6/9/2019	Flash Flood	0	0	2000
Burke Co.	Joy	1/12/2020	Flood	0	0	1000
Catawba Co.	Conover	2/6/2020	Flash Flood	0	0	10000

County	Jurisdiction	Date	Event Type	Deaths	Injuries	Property Damage
Burke Co.	Brindletown	2/6/2020	Flash Flood	0	0	25000
Caldwell Co.	Lenoir	2/6/2020	Flash Flood	0	0	2000
Alexander Co.	Taylorsville	2/6/2020	Flash Flood	0	0	2000
Burke Co.	Joy	2/6/2020	Flood	0	0	25000
Catawba Co.	Catawba	2/6/2020	Flood	0	0	50000
Caldwell Co.	Globe	4/13/2020	Flash Flood	0	0	100000
Burke Co.	Joy	4/13/2020	Flash Flood	0	0	1000
Burke Co.	Joy	4/13/2020	Flood	0	0	1000
Catawba Co.	Propst Xrds	6/19/2020	Flash Flood	0	0	500
Catawba Co.	Drums Xrds	8/6/2020	Flash Flood	0	0	500
Catawba Co.	Hickory	8/15/2020	Flash Flood	0	0	50000
Caldwell Co.	Yadkin Vly	10/29/2020	Flash Flood	0	0	3000
Burke Co.	Joy	10/29/2020	Flash Flood	0	0	5000
Caldwell Co.	Whitnel	10/29/2020	Flood	0	0	1000
Burke Co.	Joy	10/29/2020	Flood	0	0	1000
Caldwell Co.	Richland	11/12/2020	Flash Flood	0	0	50000
Alexander Co.	Vashti	11/12/2020	Flash Flood	5	0	350000
Catawba Co.	Catawba	11/12/2020	Flash Flood	0	0	500000
Burke Co.	Chesterfield	11/12/2020	Flash Flood	0	0	10000
Catawba Co.	Longview	11/12/2020	Flash Flood	0	0	1000
Alexander Co.	Vashti	11/12/2020	Flood	1	0	100000
Catawba Co.	Catawba	11/12/2020	Flood	0	0	10000
Caldwell Co.	Collettsville	8/17/2021	Flood	0	0	500
Burke Co.	Joy	8/17/2021	Flood	0	0	1000
Burke Co.	Enola	10/7/2021	Flash Flood	0	0	10000
Burke Co.	Joy	11/11/2022	Flood	0	0	1000
Caldwell Co.	Collettsville	11/11/2022	Flood	0	0	500
Caldwell Co.	Edgemont	11/11/2022	Flash Flood	0	0	500

County	Jurisdiction	Date	Event Type	Deaths	Injuries	Property Damage
Alexander Co.	All Healing Spgs	7/15/2023	Flash Flood	1	1	10000
Caldwell Co.	Yadkin Vly	7/15/2023	Flash Flood	0	0	2000
Burke Co.	Joy	12/26/2023	Flood	0	0	1000
Caldwell Co.	Valmead	1/9/2024	Flash Flood	0	0	5000
Alexander Co.	Taylorville Arpt	1/9/2024	Flash Flood	0	0	1000
Burke Co.	Joy	1/9/2024	Flood	0	0	1000
Caldwell Co.	Collettsville	1/9/2024	Flood	0	0	1000
Catawba Co.	Propst Xrds	1/9/2024	Flash Flood	0	0	1000

Table A- 6: Flooding Events from 2018-2024 from the NCDC Storm Events Database

Incident Name	County	Discovery Date and Time	Cause	Acre s	Landown er Category	Landown er Kind	Initial Lat	Initial Lon	Estimated Cost
Dam Cove Rd	Catawba	2024-04-18 19:33:00	Human	0.4	Private	Private			1200
Henry Fork	Burke	2024-04-15 17:36:00	Undetermine d	211	State	Other			3000
OVERLOOK	Burke	2024-01-22 16:35:31	Human	0.1	USFS	Federal	36.03246	-81.7928	
Winchester Road	Caldwell	2023-11-07 18:25:00	Human	2	Private	Private			600
TRUCKSTOP	Burke	2023-11-03 20:02:51	Human	0.1	USFS	Federal	35.92275	-81.8203	
BABEL TOWER	Burke	2023-04-25 18:13:00	Natural	12	USFS	Federal	35.91848	-81.9184	
181	Burke	2023-03-06 15:24:00	Undetermine d	0.1	USFS	Federal	35.92307	-81.8203	
OVERLOOK	Burke	2022-03-22 21:36:00	Undetermine d	0.2	USFS	Federal	35.90136	-81.906	
RACKETT BRANCH	Caldwell	2022-03-05 22:28:00	Human	30	USFS	Federal	36.08051	-81.7615	

HAWKSBILL	Burke	2021-04-20 16:18:00	Human	4.5	USFS	Federal	35.91469	-81.8783
UPPER CREEK FALLS	Burke	2021-03-22 22:01:00	Unknown	0.1	USFS	Federal	35.95921	-81.8614
GRF Dobson Knob RX	Burke	2020-03-01 12:44:07	Unknown				35.81644	-81.9371
BARKHOUSE	Burke	2019-11-10 20:37:00	Human	0.1	USFS	Federal	35.95392	-81.8497
UPPER CREEK	Burke	2019-10-19 14:59:00	Human	0.1	USFS	Federal	35.93225	-81.8051
TABLE ROCK	Burke	2019-06-02 22:43:00	Human	0.5			35.8898	-81.8839
BRUSHY RIDGE	Burke	2019-04-28 20:22:00	Human	3	USFS	Federal	35.92333	-81.9182
UPPER CREEK	Burke	2018-04-30 23:06:00	Human	1	USFS	Federal	35.91933	-81.8038
CORN FIELD	Caldwell	2018-03-17 18:48:00	Human	42			36.01123	-81.6516
WOLF PIT	Burke	2018-03-04 20:59:00	Human	0.25			35.81	-81.8707
CABIN TRAIL	Burke	2017-10-25 17:35:00	Human	0.4	USFS	Federal		
WILSON CREEK	Caldwell	2017-07-07 19:04:00	Human		USFS	Federal		
STAIRCASE	Caldwell	2017-06-03 22:00:00	Natural	10				
MCNAB	Burke	2017-04-28 12:10:00	Human	25	USFS	Federal		
Bartley	Caldwell	2017-03-24 18:44:00		5				3500
WHITE CREEK	Burke	2017-03-16 19:45:00	Natural	5500				937840.56
Chestnut Knob	Burke	2016-11-06 13:00:00	Undetermined	6435				4600000
PADDY'S CREEK	Burke	2016-10-24 20:10:00	Human	12	USFS	Federal		

Upper creek	Burke	2016-06-07 21:30:00	Natural	169	USFS	Federal	250000
THUNDERHOLE	Caldwell	2015-09-04 20:30:00	Natural	0.5	USFS	Federal	
HWY 105	Burke	2015-05-04 18:31:00	Human	0.5	USFS	Federal	
BLUE GRAVEL	Burke	2015-04-11 18:30:00	Undetermined	521	USFS	Federal	264194
PERCY CREEK	Burke	2014-12-13 19:15:00	Human		USFS	Federal	
Silver Creek	Burke	2014-12-13 8:00:00	Undetermined	300			3362
Jon Johnson	Burke	2014-11-11 16:55:00	Human	0.1			
HIGHWAY 105	Burke	2014-10-25 19:30:00	Human		USFS	Federal	

Table A- 7: Documented wildfires from the National Interagency Fire Center Database for the Unifour Counties.

Appendix B: Critical Facilities, Historical Properties, and Emergency Services

Table B- 1: Healthcare and vulnerable facilities According to the NC Department of Health and Human Services Division of Health Service Regulation..... B-3

Table B- 2: Emergency Medical Services, Fire Stations, and Law Enforcement centers according to NC One Map..... B-9

Table B- 3: Historic Places, Buildings, Districts, and Structures from the NRI Register of Historic Places..... B-13

County	City or Town	Facility Type	Facility Name
Burke	Morganton	Hospital	UNC Health Blue Ridge
		Intermediate Care Facilities for Adults	Hartland Group Home
			Chesterfield Group Home
			SCI-Burke ICF/MR Group Home
		Nursing Facility	Autumn Care of Drexel
			Magnolia Lane Nursing and Rehabilitation Center
			Grace Ridge
			Grace Heights Health and Rehabilitation
		Cardiac Rehabilitation Facility	UNC Health Blue Ridge- Cardiac Rehabilitation
		Family Care Homes	Quaker Meadows Family Care
			Chesterfield Family Care Home
			Perkins Care Home
			The Patterson House Family Care Home
			Clara's Cottage # 2
			Clara's Cottage # 1
			McCurry Family Care Home
			Country Pines II
			Days of Comfort Family Care Home
		Adult Care Homes / Homes for the Aged	Burke Assisted Living
	Cambridge House		
	The Berkeley		
	McAlpine Adult Care		
	Morganton Long Term Care, Southview Facility		
Connely Springs	Nursing Facility	College Pines Health and Rehabilitation	
		Carolina Rehab Center of Burke	
	Family Care Homes	East View Family Care	

Appendix B: Critical Facilities, Historical Properties, and Emergency Services

County	City or Town	Facility Type	Facility Name
	Glen Alpine	Family Care Homes	Glen Alpine Family Care
	Hildebran	Adult Care Homes / Homes for the Aged	Cambridge House
	Jonas Ridge	Adult Care Homes / Homes for the Aged	Jonas Ridge Adult Care
Caldwell	Lenoir	Hospital	Caldwell Memorial Hospital
		Intermediate Care Facilities for Adults	Creekside Group Home
		Nursing Facility	Gateway Rehabilitation and Healthcare
			Lenoir Health and Rehabilitation Center
			Shaire Nursing Center
		Family Care Homes	DalyCares
		Cardiac Rehabilitation Facility	UNC Heart and Vascular
		Adult Care Homes / Homes for the Aged	Brookdale Lenoir
			The Shaire Center
	Grandview Villa Assisted Living		
	Granite Falls	Intermediate Care Facilities for Adults	VOCA-Laurel Group Home
		Nursing Facility	Hickory Falls Health and Rehabilitation
		Adult Care Homes / Homes for the Aged	Grace Village Assisted Living & Memory Care
			Brockford Inn
	Morganton	Intermediate Care Facilities for Adults	Playmore Group Home
			Lower Creek Group Home
	Catawba	Hickory	Hospital
Frye Regional Medical Center			
Nursing Facility			The Greens at Viewmont
			Trinity Ridge
			Trinity Village
			The Greens at Hickory
Cardiac Rehabilitation Facility			Catawba Valley Medical Center CRP
			Frye Regional Medical Center Cardiopulmonary Rehab. Prg
Family Care Homes			Serenity Family Care Home
Adult Care Homes / Homes for the Aged			Hickory Village
		Springs of Catawba	
		Brookdale Hickory Northeast	
		Brookdale Falling Creek	
Claremont		Intermediate Care Facilities for Adults	Penny Lane #1
			Penny Lane II

County	City or Town	Facility Type	Facility Name	
	Maiden	Intermediate Care Facilities for Adults	Wendover Home	
	Newton	Intermediate Care Facilities for Adults	23rd Street Home	
			Shannonbrook Home	
		Nursing Facility	Abernethy Laurels	
		Adult Care Homes / Homes for the Aged	Piedmont Village at Newton	
			TerraBella Newton	
	Conover	Nursing Facility	Conover Nursing and Rehabilitation Center	
		Family Care Homes	Mulberry Place	
		Adult Care Homes / Homes for the Aged	Austin Adult Care	
			Heritage Place II	
			Heritage Care of Conover	
	Alexander	Taylorsville	Intermediate Care Facilities for Adults	Little River Group Home
				VOCA-Second Avenue Group Home
Ellendale Group Home				
Nursing Facility		Valley Nursing and Rehabilitation Center		
Family Care Homes		Sarah's House		
Adult Care Homes / Homes for the Aged		Heritage Care Home of Taylorsville		
		Faith Assisted Living Facility		
		Taylorsville House		

Table B- 1: Healthcare and vulnerable facilities According to the NC Department of Health and Human Services Division of Health Service Regulation

Facility Type	Facility Name	Address	City	County
Fire Station	Hiddenite Fire Department Incorporated	45 FIRE DEPARTMENT COURT ROAD	Hiddenite	Alexander
Fire Station	Hiddenite Fire Department, Inc.	4975 E. NC 90 Hwy		
Fire Station	Hiddenite Fire Department, Inc.	4472 Cheatham Ford Road		
Fire Station	Stony Point Volunteer Fire Department	501 Ruritan Park	Stony Point	
Fire Station	Stony Point Volunteer Fire Department, Inc.			
Fire Station	Stony Point Volunteer Fire Department, Inc.			
Fire Station	Sugarloaf Volunteer Fire Department Incorporated	3564 STATE HIGHWAY 16 NORTH	Taylorsville	
Fire Station	Bethlehem Community Volunteer Fire Department Incorporated	235 TEAGUE TOWN ROAD		
Fire Station	Ellendale Community Volunteer Fire Department Incorporated	70 ELLENDALE FIRE DEPARTMENT ROAD		
Fire Station	Central Alexander Fire Department Incorporated	EMERGENCY STREET		
Fire Station	Vashti Volunteer Fire Department Incorporated	21 VASHTI FIRE DEPARTMENT ROAD		
Fire Station	Wittenburg Volunteer Fire Department	45 WITTENBURG ROAD		

Appendix B: Critical Facilities, Historical Properties, and Emergency Services

Facility Type	Facility Name	Address	City	County
EMS	Alex Rescue Squad And Emergency Medical Services Incorporated	197 EMERGENCY STREET		
EMS	Alexander County Emergency Medical Services Station 1	2430 STATE HIGHWAY 90 EAST		
Fire Station	Bethlehem Community Fire & Rescue, Inc.	7373 NC Hwy 127		
Fire Station	Central Alexander Fire Department, Inc.	173 Emergency Street		
Fire Station	Ellendale Community Volunteer Fire Department, Inc.	30 Ellendale Road		
Fire Station	Sugar Loaf Volunteer Fire Department, Inc.	4272 N. NC 16 Hwy N		
Fire Station	Vashti Volunteer Fire Department, Inc.	21 Vashti Fire Department Road		
Fire Station	Wittenburg Volunteer Fire Department	77 Wittenburg Road		
Law Enforcement	Alexander County Sheriffs Office	91 Commercial Park		
Law Enforcement	City Of Taylorsville Police Department	67 MAIN AVENUE DRIVE		
EMS	Alexander County Emergency Medical Services - Bethlehem Base	9110 STATE HIGHWAY 127		
Fire Station	George Hildebran Fire And Rescue Department Inc.	7470 George Hildebran School Road		Burke
Fire Station	Icard Township Fire Rescue, Inc.	3475 Miller Bridge Road		
Fire Station	Lovelady Volunteer Fire & Rescue Department, Incorporated	1008 US 70 Hwy		
Fire Station	South Mountains Fire Rescue, Inc.	8204 Gus Peeler Road	Connelly Springs	
EMS	Burke County Emergency Services Station 2	750 MALCOLM BOULEVARD		
Fire Station	Rhodhiss Volunteer Fire Department	200 BURKE STREET		
Law Enforcement	Rhodhiss Police Department	200 BURKE STREET		
Law Enforcement	North Carolina Division Of Parks - South Mountains State Park	3001 SOUTH MOUNTAIN PARK AVENUE		
Fire Station	Drexel Fire Department	202 Church Street		
Law Enforcement	Drexel Police Department	202 CHURCH STREET	Drexel	
Fire Station	Glen Alpine Volunteer Fire Department	104 Catawba Street	Glen Alpine	
Fire Station	Hickory Fire Department Station 4 - Airport	3101 9TH AVENUE DRIVE NORTHWEST	Hickory	
Fire Station	Drowning Creek Volunteer Fire Department, Inc.	1630 Airport Rhodhiss Road		
EMS	Burke County Emergency Services Station 4	705 UNITED STATES HIGHWAY 70 WEST	Hildebran	
Fire Station	Icard Township Fire Rescue, Inc.	100 First Avenue North East		
Fire Station	Jonas Ridge Volunteer Fire & Rescue Department, Inc.	6680 Dogwood Knob Road	Jonas Ridge	Burke
EMS	Burke County Emergency Services Station 1	108 FOOTHILLS DRIVE	Morganton	
EMS	Burke County Emergency Services Station 3	50 CATAWBA STREET		
EMS	Burke County Rescue Squad	120 SAINT MARYS CHURCH ROAD		
Fire Station	Brendletown Fire Protection And Rescue Association, Inc.	5157 US Hwy 64		
Fire Station	Brendletown Fire Protection And Rescue Association, Inc.	3646 Bennet Road		
Fire Station	Chesterfield Fire And Rescue Protection Association, Inc.	2160 Hwy. 18 N. and U.S. 64		

Facility Type	Facility Name	Address	City	County
Fire Station	Enola Volunteer Fire Rescue	2559 Enola Road	Morganton	Burke
Fire Station	Lake James Fire And Rescue, Inc.	3222 Hwy. 126		
Fire Station	Morganton Department Of Public Safety	231 Avery Avenue		
Fire Station	Morganton Department Of Public Safety	801 Carbon City Road		
Fire Station	Morganton Department Of Public Safety	840 Burkemont Avenue		
Fire Station	Oak Hill Fire And Rescue Protection Association, Inc.	2400 NC 181 Hwy		
Fire Station	Oak Hill Fire And Rescue Protection Association, Inc.	3000 Brown Mountian Beach Road		
Fire Station	Salem Community Fire And Rescue Protection Association, Inc	1315 Salem Rd		
Fire Station	Salem Community Fire And Rescue Protection Association, Inc	3461 NC 18 South		
Fire Station	Triple Community Fire Department, Inc.	505 Mountain View Drive		
Fire Station	West End Volunteer Fire Department, Incorporated	3776 Jamestown Rd.		
Fire Station	West End Volunteer Fire Department, Incorporated	1908 Jamestown Road		
Law Enforcement	Town Of Glen Alpine Police Department	103 PITTS STREET		
Law Enforcement	Broughton State Mental Hospital Police Department	1000 SOUTH STERLING STREET		
Law Enforcement	Burke County Sheriffs Department	150 GOVERNMENT DRIVE		
Law Enforcement	North Carolina State Highway Patrol Troop F District I	260 ENOLA ROAD		
Law Enforcement	Morganton Department Of Public Safety	304 SOUTH COLLEGE STREET	Nebo	
Fire Station	Longtown Volunteer Fire Department, Inc.	7765 South Mountain Institute Rd.		
Fire Station	West End Volunteer Fire Department, Incorporated	5731 Benfield's Landing Road		
Law Enforcement	North Carolina Division Of Parks - Lake James State Park	2785 STATE HIGHWAY 126	Newland	
EMS	Burke County Emergency Services Station 5	6680 DOGWOOD KNOB ROAD		
Fire Station	Lovelady Volunteer Fire & Rescue Department, Incorporated	748 Malcolm Blvd.	Rutherford College	
Fire Station	Valdese Fire Department	121 Faet Street SW	Valdese	
Law Enforcement	City Of Valdese Police Department	121 FAET STREET		
Fire Station	Collettsville Volunteer Fire And Rescue Department Incorporated	5430 ADAKO ROAD	Collettsville	
Fire Station	Collettsville Volunteer Fire And Rescue Department, Inc.	5430 Adako Road		
Fire Station	Granite Falls Fire Department	119 NORTH MAIN STREET	Granite Falls	
Fire Station	Grace Chapel Volunteer Fire Department	4470 GRACE CHAPEL ROAD		
Fire Station	Sawmills Volunteer Fire Department Incorporated	4068 UNITED STATES HIGHWAY 321A		
EMS	Lovelady Rescue Squad	5584 YORK ROAD		
Fire Station	Grace Chapel Volunteer Fire Department	4548 Grace Chapel Road		

Appendix B: Critical Facilities, Historical Properties, and Emergency Services

Facility Type	Facility Name	Address	City	County	
Fire Station	Granite Falls Fire Department	119 North Main Street		Caldwell	
Fire Station	Sawmills Volunteer Fire & Rescue, Inc.	4068 US 321-A			
Law Enforcement	City Of Granite Falls Police Department	5 FALLS AVENUE			
Fire Station	Rhodhiss Fire Department	200 Burke Street	Hickory		
Fire Station	Hudson Fire And Rescue Squad Incorporated	122 MOUNT HERMAN ROAD	Hudson		
Fire Station	The Hudson Volunteer Fire Department, Inc.	122 Mount Herman Road			
Law Enforcement	Town Of Hudson Police Department	550 CENTRAL STREET			
Law Enforcement	North Carolina State Highway Patrol Troop F District Iii	309 PINE MOUNTAIN ROAD			
Fire Station	Little River Fire Department Incorporated	4800 OAKHILL SCHOOL ROAD	Lenoir		Caldwell
Fire Station	Gamewell Volunteer Fire Department Incorporated	2806 MORGANTON BOULEVARD SOUTHWEST			
Fire Station	Patterson Volunteer Fire Department Incorporated	1414 YADKIN RIVER ROAD			
Fire Station	Yadkin Valley Volunteer Fire Department	2815 STATE HIGHWAY 268			
Fire Station	North Catawba Fire - Rescue Department Incorporated	2064 CONNELLY SPRINGS ROAD			
Fire Station	Lenoir Fire Department Station 2	1927 NORWOOD STREET SOUTHWEST			
Fire Station	Kings Creek Volunteer Fire Department Incorporated	3420 WILKESBORO BOULEVARD			
Fire Station	Valmead Volunteer Fire Department Incorporated	1757 NORTH MAIN STREET			
Fire Station	Lenoir Fire Department Station 1	602 HARPER AVENUE NORTHWEST			
EMS	Caldwell County Emergency Medical Services	616 WEST AVENUE NORTHWEST			
EMS	Lenoir Rescue Squad	420 FAIRVIEW DRIVE SOUTHWEST			
Fire Station	Collettsville Volunteer Fire And Rescue Department, Inc.	6370 Globe Creek Place			
Fire Station	King's Creek Volunteer Fire Department, Inc.	3420 Wilkesboro Blvd			
Fire Station	Lenoir Fire Department	602 Harper Ave. NW			
Fire Station	Lenoir Fire Department	1927 Norwood Street			
Fire Station	Lenoir Fire Department	1015 Wilkesboro Blvd. NE			
Fire Station	Little River Fire Department, Inc.	4800 Oak Hill School Road			
Fire Station	North Catawba Fire-Rescue Department, Inc.	2064 Connelly Springs Road			
Fire Station	Patterson Fire-Rescue Department Inc.	1414 Yadkin River Rd.			
Fire Station	Patterson Fire-Rescue Department Inc.	4500 Blowing Rock Blvd			
Fire Station	The Gamewell Volunteer Fire Department, Inc.	2806 Morganton Blvd.			
Fire Station	Valmead Volunteer Fire-Rescue Department, Inc.	1757 North Main Street			
Fire Station	Yadkin Valley Volunteer Fire-Rescue Department, Inc.	2815 NC Hwy 268			
Law Enforcement	Caldwell County Sheriffs Department / Caldwell County Jail	2351 MORGANTON BOULEVARD SOUTHWEST			

Facility Type	Facility Name	Address	City	County
Law Enforcement	North Carolina Department Of Environment And Natural Resources Division Of Forest Resources - District 2	1543 WILKESBORO BOULEVARD NORTHEAST		
Law Enforcement	City Of Lenoir Police Department	1035 WEST AVENUE NORTHWEST		
Fire Station	Catawba Volunteer Fire Department Station 8	108 NORTH MAIN STREET	Catawba	Catawba
Fire Station	Bandys Crossroads Volunteer Fire Department Station 9 Base 1	1611 BUFFALO SHOALS ROAD		
EMS	Catawba Rescue Squad Incorporated	300 ROSENWALD SCHOOL STREET		
Fire Station	Bandys Crossroads Volunteer Fire Department, Incorporated	1611 Buffalo Shoals Road		
Fire Station	Catawba Volunteer Fire Department, Inc.	108 N Main St		
Law Enforcement	Catawba Police Department	107 SOUTH MAIN STREET		
Fire Station	Oxford Fire Department Station 2 - Catfish Fire District	5710 STATE HIGHWAY 16 NORTH		
Fire Station	Claremont Fire Department	2850 FIREHOUSE LANE		
EMS	Claremont Rescue Squad	2748 SOUTH OXFORD STREET		
Fire Station	Claremont Fire Department	2850 Fire House Lane		
Fire Station	Oxford Fire Department, Inc.	5688 Oxford School Rd		
Fire Station	Oxford Fire Department, Inc.	5710 NC Hwy 16 North		
Law Enforcement	Claremont Police Department	3301 EAST MAIN STREET		
Fire Station	Saint Stephens Fire Department Station 4 Base 2	4060 SPRINGS ROAD	Conover	
Fire Station	Conover Fire Department Station 1	1225 CONOVER BOULEVARD EAST		
Fire Station	Conover Fire Department Station 3	1776 VILLAGE SQUARE NORTHWEST		
Fire Station	Conover Fire Department Station 2	1110 FIRST STREET WEST		
Fire Station	Conover Fire Department	1225 Conover Blvd E		
Fire Station	Conover Fire Department	1011 1st Street W		
Fire Station	Conover Fire Department	1776 Village Square NW		
Fire Station	St. Stephens Fire Department, Inc.	4060 Springs Road		
Law Enforcement	North Carolina Alcohol Law Enforcement District 7 Station	3305-13 16TH AVENUE SOUTHEAST		
Law Enforcement	Conover Police Department	115 2ND AVENUE NORTHEAST		
Fire Station	Sherrills Ford - Terrell Fire & Rescue, Inc.	4582 Burris Rd	Denver	
Fire Station	Saint Stephens Fire Department Station 4 Base 1	2810 SPRINGS ROAD NORTHEAST	Hickory	Catawba
Fire Station	Mountain View Volunteer Fire Department Station 12	3323 STATE HIGHWAY 127 SOUTH		
Fire Station	Hickory Fire Department Station 6 - Viewmont	3036 NORTH CENTER STREET		
Fire Station	Hickory Fire Department Station 5 - Fairbrook	1425 21ST STREET DRIVE SOUTHEAST		
Fire Station	Hickory Fire Department Station 2 - Highland	1305 9TH AVENUE NORTHEAST		
Fire Station	Hickory Fire Department Station 1 - Headquarters	19 2ND STREET DRIVE NORTHEAST		

Appendix B: Critical Facilities, Historical Properties, and Emergency Services

Facility Type	Facility Name	Address	City	County
EMS	Hickory Rescue Squad Incorporated	320 3RD STREET DRIVE SOUTHWEST	Hickory	Catawba
Fire Station	Hickory Fire Department Station 7 - Southeast	465 CATAWBA VALLEY BOULEVARD SOUTHEAST		
Fire Station	Hickory Fire Department Station 3 - West Hickory	135 11TH STREET NORTHWEST		
Fire Station	Hickory Fire Department	19 2nd Street NE		
Fire Station	Hickory Fire Department	1305 9th Ave NE		
Fire Station	Hickory Fire Department	135 11th Street NW		
Fire Station	Hickory Fire Department	3101 9th Avenue		
Fire Station	Hickory Fire Department	1425 21st Street Drive SE		
Fire Station	Hickory Fire Department	3036 North Center Street		
Fire Station	Hickory Fire Department	465 Catawba Valley Blvd		
Fire Station	Long View Fire Department	2404 1ST AVE SW		
Fire Station	Mountain View Volunteer Fire Department Of Catawba County, Inc.	3323 Hwy # 127 South		
Fire Station	Mountain View Volunteer Fire Department Of Catawba County, Inc.	1540 Henry River Road		
Fire Station	Mountain View Volunteer Fire Department Of Catawba County, Inc.	3571 NC Hwy 127 South		
Fire Station	St. Stephens Fire Department, Inc.	2810 Springs Road		
Law Enforcement	Federal Bureau Of Investigation - Hickory Resident Agency	231 GOVERNMENT AVENUE SOUTHWEST		
Law Enforcement	Brookford Police Department	1700 SOUTH CENTER STREET		
Law Enforcement	Longview Police Department	2404 1ST AVENUE SOUTHWEST		
Law Enforcement	City Of Hickory Police Department	347 2ND AVENUE SOUTHWEST		
Law Enforcement	North Carolina Bureau Of Investigation - Hickory Office	1060 ZION CHURCH ROAD		
Law Enforcement	United States Internal Revenue Service Criminal Investigation Division - Hickory	115 5TH AVENUE NORTHWEST		
Fire Station	Long View Fire Department Station 2	2404 1ST AVENUE SOUTHWEST	Long View	
Fire Station	Maiden Fire Department Station 10	110 WEST MAIN STREET	Maiden	
Fire Station	Bandys Crossroads Volunteer Fire Department, Incorporated	3679 Buffalo Shoals Road		
Fire Station	Bandys Crossroads Volunteer Fire Department, Incorporated	4849 NC 16 Hwy S		
Fire Station	Maiden Fire Department	110 W Main St		
Fire Station	Maiden Fire Department	5911 Startown Rd.		
Law Enforcement	Maiden Police Department	201 WEST MAIN STREET		
Fire Station	Newton Fire Department Station 2 - Northside	560 WEST 21ST STREET	Newton	
Fire Station	Bandys Crossroads Volunteer Fire Department Station 9 Base 2	1598 BUFFALO SHOALS ROAD		
EMS	Newton-Conover Rescue Squad Incorporated	327 EAST A STREET		
Fire Station	Propst Crossroads Volunteer Fire Department	3169 PLATEAU ROAD		
Fire Station	Newton Fire Department Station 1 - Headquarters	116 WEST A STREET		

Facility Type	Facility Name	Address	City	County
EMS	Maiden Rescue Squad Incorporated	3496 SAINT JAMES CHURCH ROAD	Newton	Caldwell
EMS	Catawba County Emergency Medical Services	1101 SOUTH BRADY AVENUE		
Fire Station	Newton Fire Department	119 S. Brady Ave.		
Fire Station	Newton Fire Department	560 W 21St Street		
Fire Station	Newton Fire Department	4197 Startown Road		
Fire Station	Propst Cross Roads Volunteer Fire Department No. 5	3169 Plateau Rd		
Law Enforcement	North Carolina State Highway Patrol Troop F - Headquarters	1033 SMYRE FARM ROAD		
Law Enforcement	North Carolina State Highway Patrol Troop F District V	3265 UNITED STATES HIGHWAY 70 SOUTHEAST		
Law Enforcement	Catawba County Sheriffs Office / Catawba County Jail	100 SOUTHWEST BOULEVARD		
Law Enforcement	Newton City Police Department	411 NORTH COLLEGE AVENUE	Sherrills Ford	Caldwell
Fire Station	Sherrills Ford Terrell Fire And Rescue Station 2	4385 MOUNT PLEASANT ROAD		
Fire Station	Sherrills Ford Terrell Fire And Rescue - Headquarters	4011 SLANTING BRIDGE ROAD		
Fire Station	Sherrills Ford Terrell Fire And Rescue	8073 SHERRILLS FORD ROAD		
Fire Station	Sherrills Ford - Terrell Fire & Rescue, Inc.	4011 Slanting Bridge Rd		
Fire Station	Sherrills Ford - Terrell Fire & Rescue, Inc.	4385 Mt. Pleasant Rd		
Fire Station	Sherrills Ford - Terrell Fire & Rescue, Inc.	2080 Mollys Backbone Road		
Fire Station	Cooksville Volunteer Fire Department Station 14	6942 OLD SHELBY ROAD	Vale	Caldwell
Fire Station	Cooksville Volunteer Fire Department No. 8	6942 Old Shelby Road		

Table B- 2: Emergency Medical Services, Fire Stations, and Law Enforcement centers according to NC One Map

County	Property Name	Property Type
Alexander	Lucas Mansion	Building
	Taylorville Milling Company Roller Mill	
	Alexander County Courthouse (29 Main Ave)	
	Cline's Florist (46 main street)	
	Smithey's Department Store (II) (34, 46, 36, 42 Main Ave)	
	Warehouse (180, 209, 214, 197 Town Alley)	
	Smithey's Hardware Store (200 Town Alley)	
	Hedrick Office Building (22 West Main Ave)	
	Merchants & Farmers Bank (16 w main Ave)	
	(former) People's Drug Store (12 w main Ave)	
	Commercial Building (11 E Main Ave)	
	United Variety Store (21 E Main Ave)	

Appendix B: Critical Facilities, Historical Properties, and Emergency Services

County	Property Name	Property Type
	Rhodes-Day-Elledge Furniture Co. (23 E Main Ave)	
	R-D-E Warehouse (Town Alley)	
	Commercial Building (31,35 E Main Ave)	
	Rowe Campbell Building (53 E Main Ave)	
	Commercial Building (69 E Main Ave)	
	Commercial Building (73 E Main Ave)	
	Commercial Building (81 E Main Ave)	
	Commercial Building (85 E Main Ave)	
	Commercial Building (97, 99 E Main Ave)	
	Commercial Building (103 E Main Ave)	
	Commercial Building (109, 111, 115, 117, 121 E Main Ave)	
	Hotel Campbell (125, 131, 133, 135 E Main Ave and 15, 21 Linney’s Mtn Rd)	
	Pure Oil Service Station (163 E Main Street)	
	Bank Building (1, 7, 9 S Center Street)	
	Herman Building (19 S Center St)	
	Taylorville Times Building (24 E Main Street)	
	Alexander County Jail (72 Main Ave Dr)	
	Commercial Building (92 Main Ave Dr)	
	Walker Building (118, 124, 128, 130, 134 Main Ave Dr)	
	Burke	
Avery Avenue School		Building
Avery, Alphonse Calhoun, House		Building
Bellevue		Building
Broughton Hospital Historic District		District
Burke County Courthouse		Building
Creekside		Building
Dale's, USB Market		Building
Dalmas, Jean-Pierre Auguste, House		Building
Dunavant Cotton Manufacturing Company		Building
Forney, Jacob, Jr., House		Building
Franklin-Penland House		Building
Gaither House		Building
Garrou-Morganton Full-Fashioned Hosiery Mills		Building
Gaston Chapel		Building
Gilboa Methodist Church		Building
Henry River Mill Village Historic District		District
Hunting Creek Railroad Bridge		Structure
Jonesboro Historic District		District
Lackey, John Alexander, House		Building
Magnolia Place	Building	

County	Property Name	Property Type
	Magnolia Place (Boundary Decrease)	Building
	Morganton Downtown Historic District	District
	Mountain View	Building
	North Carolina School for the Deaf Historic District	District
	North Carolina School for the Deaf: Main Building	Building
	North Green Street-Bouchelle Street Historic District	District
	Quaker Meadows	Building
	Quaker Meadows Cemetery	Site
	Riddle, Dr. Joseph Bennett, House	Building
	Sloan-Throneburg Farm	Building
	South King Street Historic District	District
	Southern Railway Freight Station	Building
	Swan Ponds	Building
	Tate House	Building
	Tate, Franklin Pierce, House	Building
	Valdese Elementary School	Building
	Waldensian Presbyterian Church	Building
	Waldensian Swiss Embroidery Company–Valdese Weavers, Inc. Mill	Building
	West Union Street Historic District	District
	Western North Carolina Insane Asylum	Building
White Street-Valdese Avenue Historic District	District	
Caldwell	Bernhardt, J.M., Planing Mill and Box Factory-Steele Cotton Mill	Building
	Caldwell County Courthouse	Building
	Carolina and Northwestern Railway Freight Station	Building
	Clover Hill	Building
	Dula-Horton Cemetery	Site
	Fort Defiance	Building
	Fountain, The	Building
	Hagler, William, House	Building
	Hudson Cotton Manufacturing Company	Building
	Lenoir Cotton Mill-Blue Bell Inc. Plant	Building
	Lenoir Downtown Historic District	District
	Lenoir Downtown Historic District (Boundary Increase)	District
	Lenoir Grammar School	Building
	Lenoir High School	District
	Lenoir, Walter James, House	Building
	Mariah's Chapel	Building
Mary's Grove	Building	

Appendix B: Critical Facilities, Historical Properties, and Emergency Services

County	Property Name	Property Type
	Patterson School Historic District	District
	Poe, Edgar Allan, House	Building
	Riverside	Building
Catawba	Anthony, Abraham, Farm	District
	Balls Creek Campground	District
	Bandy Farms Historic District	District
	Bolick Historic District	District
	Bost-Burris House	Building
	Bunker Hill Covered Bridge	Structure
	Catawba County Courthouse	Building
	Catawba Historic District	District
	Claremont High School Historic District	District
	Claremont High School Historic District (Boundary Increase)	District
	Elliott-Carnegie Library	Building
	First Presbyterian Church	Building
	Foil-Cline House	Building
	Frye, Dr. Glenn R., House	Building
	Geitner, Clement, House	Building
	George, Lee & Helen, House	Building
	Grace Reformed Church	Building
	Grace Union Church and Cemetery	District
	Harris Arcade	Building
	Hickory Municipal Building	Building
	Hickory Southwest Downtown Historic District	District
	Highland School	Building
	Hollar Hosiery Mills-Knit Sox Knitting Mills	Building
	Houck's Chapel	Building
	Huffman, George, Farm	District
	Keever-Cansler Farm	District
	Kenworth Historic District	District
	Kenworth Historic District (Boundary Increase)	District
	Lentz, John A., House	Building
	Long, McCorkle and Murray Houses	District
	Lyerly Full Fashioned Mill	Building
	Memorial Reformed Church	Building
	Miller-Cansler House	Building
	Moore, Alexander, Farm	District
	Moretz, John Alfred, House	Building
	Munday House	Building
Murray's Mill Historic District	District	
Neill-Turner-Lester House	Building	
Newton Downtown Historic District	District	
North Main Avenue Historic District	District	

County	Property Name	Property Type
	Oakwood Historic District	District
	Oakwood Historic District (Boundary Increase)	District
	Perkins House	Building
	Piedmont Wagon Company	Building
	Powell-Trollinger Lime Kilns	Structure
	Propst House	Building
	Propst, David F., House	Building
	Reinhardt, Franklin D., and Harren-Hood Farms	District
	Reinhardt, William Pinckney, House	Building
	Ridgeview Public Library, (Former)	Building
	Rock Barn Farm	Building
	Rudisill-Wilson House	Building
	Self-Trott-Bickett House	Building
	Sharpe-Gentry Farm	District
	Sherrill, Miles Alexander, House	Building
	Shuford House	Building
	Shuford-Hoover House	Building
	St. Paul's Church and Cemetery	Building
	St. Paul's Reformed Church	Building
	Terrell Historic District	District
	Warlick-Huffman Farm	District
	Weidner Rock House	Building
	Wesley's Chapel Arbor and Cemetery	District
	Whisnant Hosiery Mills	Building
	Wilfong-Wilson Farm	District
	Yoder's Mills	District
	Historic District	

Table B- 3: Historic Places, Buildings, Districts, and Structures from the NRI Register of Historic Places¹

¹ National Register Database and Research - National Register of Historic Places (U.S. National Park Service). (n.d.). <https://www.nps.gov/subjects/nationalregister/database-research.htm#table>

Appendix C: Flooding Sources and Historical Flooding (2005-2018)

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Table C- 3: Historical Flooding Occurrences from NCDC between 2005-2018.....	55

Sources	Riverine Sources		Affected Communities
	From	To	
Abingdon Creek	Approximately 940 feet upstream of Huffman Road	Approximately 325 feet upstream of M.W. Setzer Road	Caldwell County
Amos Creek	The confluence with Mulberry Creek	Approximately 1.4 miles upstream of the confluence with Mulberry Creek	Caldwell County
Angley Creek	The confluence with Gunpowder Creek	Approximately 600 feet upstream of SE Starcross Road	Caldwell County, City of Lenoir, Town of Hudson
Angley Creek Tributary 1	The confluence with Angley Creek	Approximately 1.2 miles upstream of the confluence with Angley Creek	Caldwell County, City of Lenoir
Anthony Creek	Approximately 55 feet upstream of the confluence with Prong Creek and Racket Creek	Approximately 1.4 miles upstream of the confluence with Prong Creek and Rocket Creek	Caldwell County
Back Creek	The confluence with Irish Creek	Approximately 0.5 mile upstream of the confluence with Irish Creek	Burke County
Bailey Fork	Approximately 0.8 mile upstream of I-40	At US-64	Burke County, City of Morganton
Bakers Creek Tributary	The confluence with Bakers Creek	Approximately 1.4 miles upstream of Swinging Bridge Road	Catawba County
Bakers Creek Tributary 1	The confluence with Bakers Creek	Approximately 0.7 mile upstream of Stratford Drive (SR 3000)	Catawba County
Balls Creek	The confluence with Catawba River	Approximately 970 feet upstream of Little Mountain Road	Catawba County, Town of Catawba
Barger Branch	The confluence with Henry Fork	Approximately 200 feet upstream of 8th Avenue SE	City of Hickory, Town of Brookford
Barger Branch Tributary 1	The confluence with Barger Branch	Approximately 800 feet upstream of 8th Avenue SE	City of Hickory

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Barger Branch Tributary 2	The confluence with Barger Branch Tributary 1	Approximately 1,050 feet upstream of confluence with Barger Branch Tributary 1	City of Hickory
Barger Branch Tributary 3	The confluence with Barger Branch	Approximately 130 feet upstream of 8th Avenue SE	City of Hickory
Beaver Branch	The confluence with Lambert Creek	Approximately 500 feet upstream of SR 1307	Alexander County
Beaver Creek	The confluence with Yadkin River	Approximately 1.5 miles upstream of the Wilkes / Caldwell County boundary	Caldwell County
Beaverdam Creek	The confluence with Big Branch into South Yadkin River	Approximately 2.5 miles upstream of Vashti Road (SR 1403)	Alexander County
Big Branch	The confluence with Elk Shoals Creek	Approximately 550 feet upstream of SR 1619	Alexander County
Big Branch into South Yadkin River	The confluence with South Yadkin River	Approximately 0.5 mile upstream of Vashti Cemetery Road (SR 1430)	Alexander County
Bills Branch	Approximately 830 feet upstream of US 321	Approximately 0.5 mile upstream of US Highway 321	Catawba County, City of Newton, Town of Maiden
Billy Branch	The confluence with Gunpowder Creek	Approximately 0.6 mile upstream of North Highland Avenue	Town of Granite Falls
Blairs Fork Creek	Approximately 130 feet upstream of Collettsville Road / NC-90	Approximately 780 feet upstream of Parson's Park Drive	Caldwell County
Blairs Fork Creek	The confluence with Lower Creek	Approximately 130 feet upstream of Collettsville Road / NC-90	Caldwell County, City of Lenoir
Blue Creek	The confluence with Kings Creek 1 and Little Kings Creek	Approximately 2.9 miles upstream of Grandin Road (SR 1552)	Caldwell County
Boone Fork	The confluence with Mulberry Creek	Approximately 2.1 miles upstream of the confluence with Mulberry Creek	Caldwell County
Bristol Creek	The confluence with Lower Creek	Approximately 180 feet downstream of the Burke / Caldwell County boundary	Burke County, Caldwell County

	Riverine Sources		
Sources	From	To	Affected Communities
Bristol Creek Tributary 1	The confluence with Bristol Creek	Approximately 0.4 mile upstream of the confluence with Bristol Creek	Burke County
Camp Creek	The confluence with Jacob Fork	Approximately 0.5 mile downstream of SR 1736	Burke County, Catawba County
Camp Creek	The confluence with Wilson Creek	The confluence of Raider Camp Creek and Harper Creek	Caldwell County
Canoe Creek	Approximately 150 feet upstream of NC 126	Approximately 0.4 mile upstream of SR 1254	Burke County, City of Morganton
Carroll Creek	The confluence with Parks Creek	Approximately 1,000 feet upstream of SR 1424	Burke County
Catawba River	Approximately 0.6 mile downstream of Hudson Chapel Road	Toe at Lookout Shoals Dam	Catawba County, Town of Catawba
Catawba River	Approximately 0.9 mile upstream of confluence of Elk Shoal Creek	Lake Hickory/ Oxford Dam	Alexander County, Catawba County
Catawba River	Approximately 1,100 feet upstream of Watermill Glen Alpine Road (SR 1147)	At Bridgewater Dam (Power Plant)	Burke County, Town of Glen Alpine
Catawba River	Approximately 1,100 feet upstream of Watermill Glen Alpine Road (SR1147)	Approximately 1,100 feet downstream of SR 1501	Burke County
Catawba River	At Malcolm Boulevard	The confluence of Johns River	Burke County, Caldwell County, City of Morganton, Town of Rutherford College, Town of Valdese
Catawba River	North Center Street/State Highway 127	At Lake Rhodhiss Dam	Alexander County, Burke County, Caldwell County, Catawba County, City of Hickory, Town of Granite Falls, Town of Rhodhiss
Catawba River	The confluence of Johns River	Approximately 1,100 feet upstream of Watermill Glen Alpine Road (SR 1147)	Burke County, City of Morganton, Town of Glen Alpine
Catawba River Tributary 1	Approximately 370 feet downstream of 39th Avenue Drive NW	Approximately 1,080 feet upstream of 31st Avenue NW	Catawba County, City of Hickory
Catawba River Tributary 1	The confluence with Catawba River	Approximately 0.5 mile upstream of SR 1223	Burke County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Catawba River Tributary 2	The confluence with Catawba River	Approximately 2.8 miles upstream of the confluence with Catawba River	Burke County
Celia Creek	The confluence with Husband Creek	Approximately 1.0 mile upstream of Celia Creek Road	Caldwell County
Clarks Creek	Approximately 100 feet downstream of confluence of Clarks Creek Tributary 2	Approximately 310 feet upstream of the Catawba/Lincoln County boundary	Catawba County
Clarks Creek	Approximately 310 feet upstream of Catawba/Lincoln County line	Approximately 60 feet downstream of 15th Street SE	Catawba County, City of Hickory, City of Newton, Town of Maiden
Clear Creek	The confluence with Silver Creek	Approximately 500 feet upstream of US 64	Burke County
Cline Creek	Approximately 30 feet downstream of the confluence of Cline Creek Tributary 1	Approximately 150 feet downstream of Interstate 40	City of Conover
Cline Creek	The confluence with Clarks Creek	Approximately 30 feet downstream of confluence of Cline Creek Tributary 1	Catawba County, City of Conover, City of Newton
Cline Creek North	Approximately 0.4 mile upstream of Rifle Range Road	Approximately 2.0 miles upstream of the confluence of Cline Creek North Tributary 1	Catawba County
Cline Creek North Tributary 1	The confluence with Cline Creek North	Approximately 0.5 mile upstream of Rifle Range Road	Catawba County
Cline Creek Tributary 1	The confluence with Cline Creek	Approximately 450 feet upstream of Interstate 40	City of Conover
Cline Creek Tributary 2	The confluence with Cline Creek	Approximately 1,300 feet upstream of Interstate 40	City of Conover
Cold Water Creek	The confluence with Johns River	Approximately 1.7 miles upstream of the confluence with Johns River	Caldwell County
Conover Creek	The confluence with Lyle Creek	Approximately 1,420 feet upstream of 5th Street Place NE	Catawba County, City of Conover
Cow Branch	The confluence with Pott Creek	Approximately 0.8 mile upstream of Grace Church Road	Catawba County

	Riverine Sources		
Sources	From	To	Affected Communities
Craig Creek	The confluence with Wilson Creek	Approximately 1.9 miles upstream of the confluence with Wilson Creek	Caldwell County
Cripple Creek	The confluence with Frye Creek and Horseford Creek	Approximately 1,000 feet upstream of 4th Street Drive NW	City of Hickory
Cripple Creek Tributary 1	The confluence with Cripple Creek	Approximately 1,910 feet upstream of confluence with Cripple Creek	City of Hickory
Cub Creek	The confluence with Henry Fork	Approximately 200 feet downstream of SR 1737	Burke County
Dellinger Creek	The confluence with Elk Shoal Creek	Approximately 725 feet upstream of Rest Home Road (SR 1702)	Catawba County
Dennis Creek	The confluence with Yadkin River	Approximately 0.8 mile upstream of Hines Branch Road	Caldwell County
Double Branch	The confluence with McGalliard Creek	Approximately 1,800 feet upstream of I-40	Burke County, Town of Valdese
Double Branch Tributary 1	The confluence with Double Branch	Approximately 900 feet upstream of SR 1722	Burke County
Douglas Creek	The confluence with Jacob Fork	Approximately 0.4 mile downstream of Old Rock Quarry Road	Burke County, Catawba County
Drowning Creek	Approximately 300 feet downstream of SR 1621	Approximately 1.8 miles upstream of I-40	Burke County
Drowning Creek Tributary 1	Approximately 800 feet upstream of Wilson Road	Approximately 1,700 feet upstream of Cline Park Drive	Town of Hildebran
Drowning Creek Tributary 2	Approximately 100 feet downstream of the confluence of Drowning Creek Tributary 2B	Approximately 200 feet downstream of the Railroad	Burke County
Drowning Creek Tributary 2B	The confluence with Drowning Creek Tributary 2	Approximately 150 feet downstream of the Railroad	Burke County
Duck Creek	The confluence with Middle Little River	The confluence of Holsclaw Creek and White Creek	Alexander County
Dye Branch	The confluence with McGalliard Creek	Approximately 150 feet downstream of Ribet Avenue SE	Burke County, Town of Valdese

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Elk Branch	The confluence with Jones Creek	Approximately 1,310 feet upstream of Old Sampson Road (SR 1574)	Caldwell County
Elk Shoal Creek	The confluence with Catawba River	Approximately 1,980 feet upstream of Rest Home Road (SR 1702)	Catawba County
Elk Shoals Creek	The confluence with Catawba River	Approximately 350 feet upstream of SR 1631	Alexander County
Elk Shoals Creek Tributary 1	The confluence with Elk Shoals Creek	Approximately 0.5 mile upstream of the confluence with Elk Shoals Creek	Alexander County
Elk Shoals Creek Tributary 2	The confluence with Elk Shoals Creek	Approximately 0.5 mile upstream of confluence with Elk Shoals Creek	Alexander County
Estes Mill Creek	The confluence with Wilson Creek	Approximately 1.2 miles upstream of the confluence with Wilson Creek	Caldwell County
Falling Creek	Approximately 0.4 mile downstream of Cloninger Mill Road NE	Approximately 50 feet downstream of 12th Avenue NE	Catawba County, City of Hickory
Falling Creek Tributary 1	The confluence with Falling Creek	Approximately 275 feet upstream of 14th Avenue NE	City of Hickory
Falling Creek Tributary 2	The confluence with Falling Creek	Approximately 380 feet upstream of 12th Avenue NE	City of Hickory
Fiddle Creek	The confluence with Mulberry Creek	Approximately 1,620 feet upstream of the confluence with Mulberry Creek	Caldwell County
Franklin Branch	The confluence with Johns River	Approximately 1,500 feet upstream of the confluence with Franklin Branch Tributary 1	Caldwell County
Franklin Branch Tributary 1	The confluence with Franklin Branch	Approximately 1,540 feet upstream of the confluence with Franklin Branch	Caldwell County
Freemason Creek	The confluence with Catawba River	Approximately 300 feet upstream of Stamey Road	Caldwell County, Town of Sawmills

	Riverine Sources		
Sources	From	To	Affected Communities
Freemason Creek Tributary 1	The confluence with Freemason Creek	Approximately 1.5 miles upstream of the confluence with Freemason Creek	Caldwell County, Town of Sawmills
Freemason Creek Tributary 1A	The confluence with Freemason Creek Tributary 1	Approximately 1,690 feet upstream of Hickory Nut Ridge Road	Town of Sawmills
Freemason Creek Tributary 2	The confluence with Freemason Creek	Approximately 0.8 mile upstream of Horseshoe Bend Road	Town of Sawmills
Freemason Creek Tributary 2A	The confluence with Freemason Creek Tributary 2	Approximately 620 feet upstream of Lafayette Avenue	Town of Sawmills
Frye Creek	The confluence with Cripple Creek and Horseford Creek	Approximately 425 feet upstream of 33rd Street NW	City of Hickory, Town of Long View
Geitner Branch	The confluence with Henry Fork	Approximately 1,900 feet upstream of 7th Avenue SW	City of Hickory
Geitner Branch Tributary 1	The confluence with Geitner Branch	Approximately 1,250 feet upstream of confluence with Geitner Branch	City of Hickory
Geitner Branch Tributary 2	The confluence with Geitner Branch	Approximately 1,670 feet upstream of 7th Avenue SW	City of Hickory
Ginger Creek	The confluence with Middle Little River	Approximately 0.7 mile upstream of Draco Road	Caldwell County
Ginger Creek Tributary 1	The confluence with Ginger Creek	Approximately 1.3 miles upstream of Scout Road	Caldwell County
Glade Creek	The confluence with Lower Little River	Approximately 1.1 miles upstream of SR 1604	Alexander County
Glade Creek Tributary 1	The confluence with Glade Creek	Approximately 0.8 mile upstream of SR 1607	Alexander County, Town of Taylorsville
Grassy Creek	The confluence with Lower Little River	Approximately 0.4 mile upstream of SR 1344	Alexander County
Grassy Creek Tributary 1	The confluence with Grassy Creek	Approximately 0.7 mile upstream of the confluence with Grassy Creek	Alexander County
Grassy Creek Tributary 2	The confluence with Grassy Creek	Approximately 0.7 mile upstream of NC 16	Alexander County
Greasy Creek	The confluence with Lower Little River	Approximately 0.4 mile upstream of SR 1344	Alexander County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Greasy Creek Tributary 1	The confluence with Grassy Creek	Approximately 0.7 mile upstream of the confluence with Grassy Creek	Alexander County, Town of Taylorsville
Green Rock Branch	The confluence with Buffalo Creek	Approximately 1.5 miles upstream of Buffalo Cove Road (SR 1504)	Caldwell County
Gunpowder Creek	Approximately 785 feet upstream of SE Starcross Road	Approximately 600 feet upstream of SE Applegate Court	City of Lenoir
Gunpowder Creek	The confluence with Catawba River	Approximately 0.5 mile upstream of Pine Mountain Road (SR 1809)	Caldwell County, City of Hickory, Town of Granite Falls, Town of Hudson
Gunpowder Creek Tributary 1	The confluence with Gunpowder Creek	Approximately 280 feet downstream of Temple Hill Church Road	Caldwell County
Gunpowder Creek Tributary 2	The confluence with Gunpowder Creek	Approximately 45 feet downstream of Christie Road (SR 1717)	Caldwell County
Gunpowder Creek Tributary 2A	The confluence with Gunpowder Creek Tributary 2	Approximately 1,550 feet upstream of Christie Road (SR 1717)	Caldwell County, Town of Hudson
Gunpowder Creek Tributary 3	The confluence with Gunpowder Creek	Approximately 2,340 feet upstream of the confluence with Gunpowder Creek	Town of Hudson
Gunpowder Creek Tributary 4	The confluence with Gunpowder Creek	Approximately 0.6 mile upstream of the confluence with Gunpowder Creek	Town of Hudson
Gunpowder Creek Tributary 5	The confluence with Gunpowder Creek	Approximately 1,115 feet upstream of SE Eastwood Park Circle	City of Lenoir
Gunpowder Creek Tributary 6	The confluence with Gunpowder Creek	Approximately 0.5 mile upstream of Renwick Street	City of Lenoir
Guys Branch	The confluence with Elk Shoals Creek	Approximately 0.5 mile upstream of the confluence with Elk Shoals Creek	Alexander County
Haas Creek	The confluence with Pott Creek	Approximately 0.8 mile upstream of Grace Church Road	Catawba County
Hall Creek	The confluence with Silver Creek	Approximately 0.4 mile upstream of US 64	Burke County

	Riverine Sources		
Sources	From	To	Affected Communities
Harper Creek	The confluence with Camp Creek and Raider Camp Creek	The confluence of South Harper Creek	Caldwell County
Hayes Mill Creek	The confluence with Catawba River	Approximately 0.6 mile upstream of Helton Road	Caldwell County, Town of Granite Falls, Town of Sawmills
Hayes Mill Creek Tributary 1	The confluence with Hayes Mill Creek	Approximately 1,700 feet upstream of the confluence with Hayes Mill Creek	Town of Granite Falls, Town of Sawmills
Hayes Mill Creek Tributary 2	The confluence with Hayes Mill Creek	Approximately 1,900 feet upstream of the confluence with Hayes Mill Creek	Town of Sawmills
Henry Fork	Approximately 0.6 mile upstream of SR 1002	Approximately 0.9 mile upstream of SR 1918	Burke County
Henry Fork	The confluence with South Fork Catawba River and Jacob Fork	The Catawba/Burke County boundary	Catawba County, City of Hickory, City of Newton, Town of Brookford, Town of Long View
Henry Fork Tributary 1	The confluence with Henry Fork	Approximately 0.5 mile upstream of Catawba Valley Boulevard SE	City of Hickory
Henry Fork Tributary 2	The confluence of Henry Fork	Approximately 1,930 feet upstream of Brookford Boulevard	City of Hickory, Town of Brookford
Henry Fork Tributary 3	The confluence with Henry Fork	Approximately 2,000 feet upstream of Robinson Road	Catawba County
Hildebran Creek	The confluence with Clarks Creek	Approximately 150 feet upstream of A. C. Little Drive	City of Newton
Holdsclaw Creek	The confluence with Catawba River	Approximately 1,500 ft upstream of the confluence of Holdsclaw Creek Tributary 1	Catawba County
Holdsclaw Creek Tributary 1	The confluence with Holdsclaw Creek	Approximately 1,450 feet upstream of the confluence with Holdsclaw Creek	Catawba County
Holly Branch	Approximately 220 feet downstream of the confluence of Holly Branch Tributary 1 and Shady Branch	The confluence of Shady Branch and Holly Branch Tributary 1	Town of Maiden

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	Riverine Sources		
Sources	From	To	Affected Communities
Holly Branch Tributary 1	The confluence with Holly Branch	Approximately 200 feet upstream of South Main Avenue	Town of Maiden
Holsclaw Creek	The confluence with Duck Creek	Approximately 0.8 mile upstream of SR 1302	Alexander County
Hop Creek	The confluence with Holly Branch	Approximately 200 feet upstream of South Main Avenue	Catawba County
Horseford Creek	Approximately 1,520 feet upstream of confluence with Catawba River	The confluence of Frye Creek and Cripple Creek	Catawba County, City of Hickory
Howard Creek	The confluence with Catawba River	Approximately 850 feet upstream of SR 1512	Burke County, Town of Drexel, Town of Valdese
Howard Creek Tributary 1	The confluence with Howard Creek	Approximately 350 feet upstream of Railroad	Town of Drexel
Howards Creek	The confluence with South Fork Catawba River	Approximately 500 feet upstream of the Catawba/Lincoln County boundary	Catawba County
Hoyle Creek	The confluence with Catawba River	Approximately 1,500 feet upstream of the confluence with Micol Creek	Burke County, Town of Rutherford College, Town of Valdese
Hoyle Creek Tributary 1	The confluence with Hoyle Creek	Approximately 0.9 mile upstream of the confluence with Hoyle Creek	Burke County, Town of Rutherford College, Town of Valdese
Hoyle Creek Tributary 2	The confluence with Hoyle Creek	Approximately 0.7 mile upstream of the confluence with Hoyle Creek	Town of Rutherford College, Town of Valdese
Hunting Creek	Approximately 250 feet upstream of the confluence of Hunting Creek Tributary 3	Approximately 1,100 feet upstream of SR 2002	Burke County, City of Morganton
Hunting Creek Tributary 2	The confluence with Hunting Creek	Approximately 0.7 mile upstream of Walker Road (SR 1942)	City of Morganton
Hunting Creek Tributary 3	The confluence with Hunting Creek	Approximately 0.4 mile upstream of the confluence with Hunting Creek	Burke County, City of Morganton
Husband Creek	The confluence with Lower Creek	Approximately 1,925 feet upstream of Rocky Road (SR 1143)	Caldwell County, Town of Gamewell

	Riverine Sources		
Sources	From	To	Affected Communities
Husband Creek Tributary 1	The confluence with Husband Creek	Approximately 140 feet downstream of Fleming Chapel Church Road (SR 1322)	Caldwell County
Husband Creek Tributary 2	The confluence with Husband Creek	Approximately 750 feet upstream of Crooked Creek Way	Caldwell County
Indian Creek	The Lincoln/Gaston County boundary	Approximately 550 ft upstream of the Catawba/Lincoln County boundary	Catawba County
Irish Creek	The confluence with Upper Creek and Warrior Fork	Approximately 800 feet upstream of the confluence with Reedys Fork Creek	Burke County
Irish Creek Tributary 1	The confluence with Irish Creek	At SR 1240	Burke County
Isaac Creek	The confluence with Upper Little River	Approximately 0.7 mile upstream of SR 1143	Alexander County
Island Creek	The confluence with Catawba River	Approximately 0.4 mile upstream of SR 1621	Alexander County
Island Creek	The confluence with Catawba River	Approximately 0.7 mile upstream of I-40	Burke County, Town of Connelly Springs, Town of Rutherford College
Jackson Camp Creek	The confluence with Yadkin River	Approximately 1.0 mile upstream of Richland Road (SR 1372)	Caldwell County
Jacob Fork	Approximately 220 feet upstream of Providence Church Road	Approximately 990 feet upstream of the Catawba/Burke County boundary	Burke County, Catawba County
Jacob Fork	Approximately 990 feet upstream of the Catawba/Burke County boundary	Approximately 450 feet upstream of SR 1904	Burke County
Jacob Fork Tributary 1	The confluence with Jacob Fork	Approximately 1.3 miles upstream of Cooksville Road	Catawba County
Jesse Fork	The confluence with Buffalo Creek	Approximately 0.8 mile upstream Stone Mountain Road (SR 1503)	Caldwell County
Jesse Fork Tributary 1	The confluence with Jesse Fork	Approximately 330 feet upstream of Wallace Coffey Place	Caldwell County

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	Riverine Sources		
Sources	From	To	Affected Communities
Johns River	Approximately 1.1 miles upstream of Triple T Lane	Approximately 3.8 miles upstream of the confluence of Thunderhole Creek	Caldwell County
Johns River	The confluence with Catawba River	Approximately 1,500 feet upstream of the Burke / Caldwell County boundary	Burke County, Caldwell County, City of Morganton
Jones Creek	The confluence with Buffalo Creek	Approximately 50 feet downstream of the Watauga / Caldwell County boundary	Caldwell County
Jumping Run	The confluence with Rock Creek	Approximately 500 feet upstream of NC 127	Alexander County
Kings Creek 1	The confluence with Yadkin River	The confluence of Little Kings Creek and Blue Creek	Caldwell County
Kings Creek 2	The confluence with Blue Creek	Approximately 1.9 miles upstream of the confluence of Kings Creek 2 Tributary 1	Caldwell County
Kings Creek 2 Tributary 1	The confluence with Kings Creek 2	Approximately 1.6 miles upstream of Blue Door School Road	Caldwell County
Lambert Creek	The confluence with Lower Little River	Approximately 0.8 mile upstream of SR 1307	Alexander County
Lambert Creek Tributary 1	The confluence with Lambert Creek	Approximately 800 feet upstream of SR 1307	Alexander County
Laurel Creek	The confluence with Henry Fork	Approximately 1.2 miles upstream of Shoupe Way	Burke County
Laurel Creek	The confluence with Wilson Creek	Approximately 1.1 miles upstream of the confluence with Wilson Creek	Caldwell County
Laytown Creek	The confluence with Yadkin River	Approximately 1.8 miles upstream of Laytown Road (SR 1507)	Caldwell County
Linville River	Approximately 2.6 miles upstream of NC 126	Approximately 800 feet downstream of the Land Harbors Dam	Burke County
Linville River	The confluence with Catawba River	Approximately 0.7 mile downstream of NC 126	Burke County
Lippard Creek	The confluence with Sawmill Branch and Leepers Creek	Approximately 1,940 feet upstream of the Catawba/Lincoln County boundary	Catawba County

	Riverine Sources		
Sources	From	To	Affected Communities
Little Creek	The confluence with Upper Little River	Approximately 1.4 miles upstream of Cove Mountain Lane	Caldwell County
Little Gunpowder Creek (near City of Lenoir)	Approximately 700 feet upstream of SW Walt Arney Road	Approximately 1,075 feet upstream of Connelly Springs Road	Town of Cajah's Mountain
Little Gunpowder Creek (near Town of Hudson)	Approximately 0.8 mile upstream of Little Gunpowder Creek Drive (SR 1133)	Approximately 1.4 miles upstream of Little Gunpowder Creek Drive (SR 1133)	Caldwell County, Town of Cajah's Mountain
Little Gunpowder Creek (near Town of Hudson)	The confluence with Gunpowder Creek	Approximately 0.8 mile upstream of Little Gunpowder Creek Drive (SR 1133)	Caldwell County, Town of Granite Falls, Town of Hudson, Town of Sawmills
Little Gunpowder Creek (near Town of Hudson) Tributary 1	The confluence with Little Gunpowder Creek (near Town of Hudson)	Approximately 50 feet upstream of Madison MHP Drive	Town of Hudson
Little Gunpowder Creek (near Town of Hudson) Tributary 2	The confluence with Little Gunpowder Creek (near Town of Hudson)	Approximately 0.4 mile upstream of Chickadee Trail Place	Town of Hudson
Little Kings Creek	The confluence with Kings Creek and Blue Creek	Approximately 1,620 feet upstream of Zacks Fork Road (SR 1511)	Caldwell County
Little Mulberry Creek 1	The confluence with Mulberry Creek	Approximately 0.5 mile upstream of Planters Way	Caldwell County
Little Mulberry Creek 2	The confluence with Mulberry Creek	Approximately 0.4 mile upstream of Shallow Creek Road (SR 1530)	Caldwell County
Little Silver Creek	Approximately 0.6 mile upstream of Causby Road (SR 1147)	Approximately 1.1 miles upstream of Ceramic Tile Drive	Burke County, City of Morganton, Town of Glen Alpine
Long Creek	The confluence with McLin Creek	Approximately 1,450 feet upstream of Railroad	City of Claremont, City of Conover
Long Shoal Creek	The confluence with Catawba River (Lake Hickory)	Approximately 0.4 mile upstream of Pinecrest Drive NE	Catawba County, City of Hickory
Long View Creek	The confluence with Henry Fork	Approximately 1,500 feet upstream of US-70 SW	City of Hickory, Town of Long View
Long View Creek Tributary 1	The confluence with Long View Creek	Approximately 100 feet upstream of US-70	City of Hickory
Long View Creek Tributary 2	The confluence with Long View Creek	Approximately 1,460 feet upstream of confluence with Long View Creek	Town of Long View

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Lost Cove Creek	The confluence with Wilson Creek	Approximately 2.1 miles upstream of the confluence with Gragg Prong Creek	Caldwell County
Lower Creek	Approximately 800 feet downstream of the confluence of Abingdon Creek	Approximately 1,830 feet upstream of the second crossing of Cedar Rock Circle (SR 1706)	Caldwell County, City of Lenoir, Town of Gamewell
Lower Creek	The confluence with Catawba River	Approximately 1,290 feet downstream of the confluence with Husband Creek	Burke County, Caldwell County
Lower Creek Tributary 1	The confluence with Lower Creek	Approximately 0.7 mile upstream of SE Haigler Road	City of Lenoir
Lower Little River	The confluence with Catawba River	Approximately 0.9 mile upstream of SR 1332	Alexander County
Lower Little River Tributary 1	The confluence with Lower Little River	Approximately 1.9 miles upstream of the confluence with Lower Little River	Alexander County
Lower Little River Tributary 2	The confluence with Lower Little River	Approximately 1,600 feet upstream of SR 1124	Alexander County
Lower Little River Tributary 2A	The confluence with Lower Little River Tributary 2	Approximately 1,600 feet upstream of confluence with Lower Little River Tributary 2	Alexander County
Lower Little River Tributary 3	The confluence with Lower Little River	Approximately 1.4 miles upstream of SR 1110	Alexander County
Lower Little River Tributary 4	The confluence with Lower Little River	Approximately 1,000 feet upstream of SR 1104	Alexander County, Town of Taylorsville
Lyle Creek	Approximately 0.6 miles downstream of confluence of Bakers Creek	Approximately 550 feet upstream of 18th Street NE	Catawba County, City of Conover, City of Hickory
Lyle Creek Tributary	The confluence with Lyle Creek	Approximately 1,950 feet upstream of Community Road	Catawba County
Lyle Creek Tributary 1	The confluence with Lyle Creek	Approximately 1.0 mile upstream of Crossing Creek Drive (SR 2454)	Catawba County
Maiden Creek	Approximately 1.3 miles upstream of Providence Mill Road	Approximately 80 feet downstream of North Olivers Cross Road	Catawba County

	Riverine Sources		
Sources	From	To	Affected Communities
McGalliard Creek	Approximately 250 feet upstream of confluence of McGalliard Creek Tributary 2	The confluence of Double Branch	Burke County, Town of Valdese
McGalliard Creek	The confluence of Double Branch	Approximately 400 feet upstream of SR 1722	Burke County
McGalliard Creek	The confluence with Catawba River	Approximately 1.1 miles upstream of the confluence with Catawba River	Burke County, Town of Valdese
McGalliard Creek Tributary 1	The confluence with McGalliard Creek	Approximately 1,800 feet upstream of Louise Avenue NE	Burke County, Town of Valdese
McGalliard Creek Tributary 2	The confluence with McGalliard Creek	Approximately 600 feet downstream of I-40	Burke County, Town of Drexel
McGalliard Creek Tributary 2A	The confluence with McGalliard Creek Tributary 2	Approximately 800 feet upstream of Drexel Road	Town of Drexel
McGalliard Creek Tributary 2B	The confluence with McGalliard Creek Tributary 2	Approximately 200 feet downstream of SR 1721	Burke County, Town of Drexel
McLin Creek Tributary 1	The confluence with McLin Creek	Approximately 1,250 feet upstream of Frazier Drive	City of Claremont
McRory Creek	The confluence with Upper Little River	Approximately 0.6 mile upstream of McRory Creek Road (SR 1721)	Caldwell County
Micol Creek	The confluence with Hoyle Creek	Approximately 350 feet downstream of I-40	Burke County, Town of Valdese
Micol Creek Tributary 1	The confluence with Micol Creek	Approximately 0.5 mile upstream of Montonya View Drive	Burke County, Town of Rutherford College, Town of Valdese
Micol Creek Tributary 1A	The confluence with Micol Creek Tributary 1	Approximately 75 feet downstream of SR 1001	Burke County, Town of Rutherford College
Micol Creek Tributary 1A1	The confluence with Micol Creek Tributary 1A	Approximately 0.4 mile upstream of the confluence with Micol Creek Tributary 1A	Burke County
Middle Little River	The confluence with Catawba River/Lake Hickory	Approximately 280 feet upstream of the Alexander / Caldwell County boundary	Alexander County, Caldwell County
Middle Little River	The most downstream crossing of the Alexander / Caldwell County boundary	Approximately 0.4 mile upstream of Brush Mountain Road (SR 1733)	Alexander County, Caldwell County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Middle Little River Tributary 2	The confluence with Middle Little River	Approximately 300 feet downstream of SR 1152	Alexander County
Middle Little River Tributary 3	The confluence with Middle Little River	Approximately 1,480 feet upstream of Taylorsville Road	Caldwell County
Middle Little River Tributary 4	The confluence with Middle Little River	Approximately 1,300 feet upstream of Duck Creek Road (SR 1730)	Caldwell County
Middle Little River Tributary 5	The confluence with Middle Little River	Approximately 0.5 mile upstream of the confluence with Middle Little River	Caldwell County
Mill Creek	The confluence with South Yadkin River	Approximately 0.4 mile upstream of the confluence with South Yadkin River	Alexander County
Mill Creek	The confluence with Upper Little River	Approximately 1.0 mile upstream of Petra Mill Road (SR 1740)	Caldwell County
Mill Creek (into Yadkin River)	The confluence with Yadkin River	Approximately 1.2 miles upstream of NC Highway 268	Caldwell County
Miller Branch	The confluence with Clarks Creek	Approximately 1.9 miles upstream of confluence with Clarks Creek	City of Hickory
Miller Creek	The confluence with South Yadkin River	Approximately 260 feet upstream of Sprinkle Dairy Road (SR 1475)	Alexander County
Morris Creek	The confluence with Upper Little River	Approximately 490 feet upstream of Sheriffs Road (SR 1730)	Caldwell County
Mountain Creek	The confluence with Catawba River (Lake Norman)	Approximately 1.6 miles upstream of the confluence of Mountain Creek Tributary 3	Catawba County
Mountain Creek	The confluence with Middle Little River	Approximately 200 feet upstream of SR 1150	Alexander County
Mountain Creek Tributary 2	The confluence with Mountain Creek	Approximately 1.6 miles upstream of the confluence with Mountain Creek	Catawba County
Mountain Creek Tributary 2A	The confluence with Mountain Creek Tributary 2	Approximately 1.4 miles upstream of the confluence with Mountain Creek Tributary 2	Catawba County

	Riverine Sources		
Sources	From	To	Affected Communities
Mountain Creek Tributary 3	The confluence with Mountain Creek	Approximately 1.0 mile upstream of the confluence with Mountain Creek	Catawba County
Mountain Creek Tributary 3A	The confluence with Mountain Creek Tributary 3	Approximately 0.5 mile upstream of the confluence with Mountain Creek Tributary 3	Catawba County
Mountain Run	The confluence with Upper Little River	Approximately 125 feet upstream of Fox Road (SR 1726)	Caldwell County
Muddy Creek	Approximately 0.4 mile downstream of Robinson Road (SR 1146)	The confluence of Muddy Creek Tributary 2 and Muddy Creek Tributary 3	Catawba County
Muddy Creek	The confluence of Old Catawba River	The confluence of North Muddy Creek and South Muddy Creek	Burke County
Muddy Creek Tributary 1	The confluence with Muddy Creek	Approximately 0.7 mile upstream of Robinwood Road (SR 1148)	Catawba County
Muddy Creek Tributary 2	The confluence with Muddy Creek	Approximately 0.6 mile upstream of Robinwood Road (SR 1148)	Catawba County
Muddy Creek Tributary 3	The confluence with Muddy Creek	Approximately 1.3 miles upstream of the confluence with Muddy Creek	Catawba County, City of Hickory
Muddy Fork Creek	The confluence with Lower Little River	Approximately 600 feet downstream of SR 1405	Alexander County, Town of Taylorsville
Muddy Fork Creek Tributary 1	The confluence with Muddy Fork Creek	Approximately 1.6 miles upstream of Old Wilkesboro Road	Alexander County, Town of Taylorsville
Mulberry Creek	Approximately 90 feet downstream of Collettsville Road	Approximately 0.7 mile upstream of the confluence of Amos Creek	Caldwell County
Mull Creek	The confluence with Lyle Creek	Approximately 500 feet upstream of 9th Avenue NE	Catawba County, City of Claremont, City of Conover
Mundy Creek	The confluence with Reed Creek	Approximately 500 feet upstream of Lineberger Road	Catawba County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Mundy Creek Tributary 1	The confluence with Mundy Creek	Approximately 1,400 feet upstream of Grassy Creek Road	Catawba County
Naked Creek	Approximately 0.5 mile downstream of St. Peters Church Road (SR 1453)	Approximately 0.5 mile upstream of Timber Ridge Road	Catawba County
Nolden Creek	The confluence with Catawba River	Approximately 1,900 feet upstream of Nolden Creek Road	Burke County, Town of Connelly Springs
Old Catawba River	The confluence with Catawba River	The Burke / McDowell County boundary	Burke County
Old Field Branch	The confluence with Buffalo Creek	Approximately 1.7 miles upstream of the confluence with Buffalo Creek	Caldwell County
Ooten Creek	The confluence with Yadkin River	Approximately 0.6 mile upstream of the confluence with Yadkin River	Caldwell County
Paddy Creek	The confluence with Catawba River	Approximately 2.9 miles upstream of SR 1237	Burke County
Parks Creek	The confluence with Johns River	Approximately 100 feet downstream of SR 1405	Burke County
Pearcy Creek	The confluence with Parks Creek	Approximately 1.1 miles upstream of SR 1405	Burke County
Pearcy Creek Tributary 1	The confluence with Pearcy Creek	Approximately 20 feet downstream of SR 1405	Burke County
Pilot Branch	The confluence with Upper Little River	Approximately 440 feet upstream of Burns Road (SR 1749)	Caldwell County
Pinch Gut Creek	Approximately 120 feet upstream of Saint James Church Road	Approximately 0.9 mile upstream of Saint James Church Road	Catawba County
Pinch Gut Creek Tributary 1	The confluence with Pinch Gut Creek	Approximately 0.5 mile upstream of the confluence with Pinch Gut Creek	Catawba County
Poplar Creek	The confluence with Lambert Creek	Approximately 0.5 mile upstream of SR 1305	Alexander County
Pott Creek	The confluence with South Fork Catawba River	Approximately 1.9 miles upstream of Plateau Road	Catawba County

	Riverine Sources		
Sources	From	To	Affected Communities
Preston Creek	The confluence with Yadkin River	Approximately 650 feet upstream of Kirby Mountain Road (SR 1370)	Caldwell County
Prong Creek	The confluence with Johns River	Approximately 65 feet downstream of the confluence Racket Creek and Anthony Creek	Caldwell County
Propst Creek	Approximately 1.9 miles upstream of confluence with Lyle Creek	Approximately 75 feet downstream of Sipe Road (SR 1492)	Catawba County, City of Hickory
Racket Creek	Approximately 65 feet downstream of the confluence with Prong Creek and Anthony Creek	Approximately 145 feet upstream of the confluence with Ballew Creek	Caldwell County
Raider Camp Creek	The confluence with Camp Creek	Approximately 1,795 feet upstream of the confluence with Camp Creek	Caldwell County
Reed Creek	The confluence with Mountain Creek	Approximately 1.1 miles upstream of Mount Pleasant Road (SR 1849)	Catawba County
Reedys Fork Creek	The confluence with Irish Creek	Approximately 0.5 mile upstream of the confluence with Irish Creek	Burke County
Rhodes Mill Creek	The confluence with Pott Creek	Approximately 1,100 feet upstream of Leatherman Road	Catawba County
Rhodes Mill Creek Tributary 1	The confluence with Rhodes Mill Creek	Approximately 0.4 mile upstream of the confluence with Rhodes Mill Creek	Catawba County
Rock Creek	The confluence with Middle Little River	The confluence of Jumping Run	Alexander County
Rock Creek	The confluence with Upper Little River	Approximately 200 feet downstream of Fowler Road (SR 1747)	Caldwell County
Rock Creek Tributary 1	The confluence with Rock Creek	Approximately 1,000 feet upstream of confluence with Rock Creek	Alexander County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Rockhouse Creek	The confluence with Buffalo Creek	Approximately 30 feet downstream of the Watauga / Caldwell County boundary	Caldwell County
Rockhouse Creek	The confluence with Lost Cove Creek	Approximately 0.4 mile upstream of Avery/Caldwell County boundary	Caldwell County
Rocky Creek	The confluence with South Yadkin River	The Alexander/Iredell County boundary	Alexander County
Rocky Creek	The Iredell/Alexander County boundary	Approximately 1.0 mile upstream of the confluence of Rocky Creek Tributary 1	Alexander County
Roses Creek	The confluence with Irish Creek	Approximately 1.7 miles upstream of SR 1262	Burke County
Roses Creek Tributary 1	The confluence with Roses Creek	Approximately 0.6 mile upstream of the confluence with Roses Creek	Burke County
Rush Branch	The confluence with Mulberry Creek	Approximately 0.9 mile upstream of the confluence with Mulberry Creek	Caldwell County
Russell Creek	The confluence with Irish Creek	Approximately 1.6 miles upstream of SR 1240	Burke County
Secrets Creek	The confluence with Howard Creek	Approximately 0.8 mile upstream of South Main Street	Town of Drexel, Town of Valdese
Shady Branch	The confluence with Holly Branch	Approximately 500 feet upstream of South 11th Avenue	Town of Maiden
Shady Branch Tributary 1	The confluence with Shady Branch	Approximately 1,800 feet upstream of South 8th Avenue	Town of Maiden
Silver Creek	Approximately 1.6 miles upstream of I-40	Approximately 1,800 feet upstream of US 64	Burke County, City of Morganton
Silver Creek	The confluence with Gunpowder Creek	Approximately 0.6 mile upstream of Falls Avenue (SR 1107)	Caldwell County, Town of Granite Falls
Silver Creek Tributary 1	The confluence with Silver Creek	Approximately 100 feet downstream of the Railroad	City of Morganton

	Riverine Sources		
Sources	From	To	Affected Communities
Simpson Creek	The confluence with Roses Creek	Approximately 1.5 miles upstream of the confluence with Roses Creek	Burke County
Smokey Creek	The confluence with Catawba River	The Burke / Caldwell County boundary	Burke County
Smokey Creek Tributary 1	The confluence with Smokey Creek	Approximately 0.4 mile upstream of the confluence with Smokey Creek	Burke County
Smyre Creek	Approximately 120 feet downstream of the confluence of Smyre Creek Tributary 1	Approximately 50 feet downstream of NC-16	Catawba County, City of Newton
Smyre Creek Tributary 1	The confluence with Smyre Creek	Approximately 1,500 feet upstream of the confluence with Smyre Creek	Catawba County, City of Newton
Snow Creek	The confluence with Catawba River	Approximately 1,040 feet upstream of 15th Avenue NE	Catawba County, City of Hickory
Snow Creek	The confluence with South Yadkin River	Approximately 260 feet upstream of Mountain View Road (SR 1614E)	Alexander County
Snow Hill Branch	The confluence with Town Creek	Approximately 1,100 feet upstream of East 11th Street	City of Newton
South Fork Catawba River	Approximately 2.6 miles upstream of the confluence of Howards Creek	Approximately 125 feet downstream of NC-10	Catawba County, City of Newton
South Fork Catawba River Tributary 6	The confluence with South Fork Catawba River	Approximately 530 feet upstream of Herter Road (SR 2022)	Catawba County
South Fork Catawba River Tributary 7	The confluence with South Fork Catawba River	Approximately 0.9 mile upstream of the confluence with South Fork Catawba River	Catawba County
South Fork Catawba River Tributary 8	The confluence with South Fork Catawba River	Approximately 0.7 mile upstream of Wilfong Road (SR 2020)	Catawba County
South Fork Catawba River Tributary 9	The confluence with South Fork Catawba River	Approximately 1.1 miles upstream of US Highway 321	Catawba County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
South Fork Catawba River Tributary 9A	The confluence with South Fork Catawba River Tributary 9	Approximately 1,500 feet upstream of the confluence with South Fork Catawba River Tributary 9	Catawba County
South Muddy Creek	The confluence with Muddy Creek	Approximately 0.7 mile upstream of SR 1780	Burke County
South Muddy Creek Tributary 1	The confluence with South Muddy Creek	Approximately 920 feet upstream of McDowell/Burke County boundary	Burke County
South Yadkin River	The confluence with Yadkin River	Approximately 510 feet downstream of Vashti Road (SR 1403)	Alexander County
Spainhour Creek	The confluence with Blairs Fork Creek	Approximately 1,800 feet upstream of Blowing Rock Boulevard	City of Lenoir
Spring Creek	The confluence with Lower Little River	Approximately 1.7 miles upstream of SR 1121	Alexander County
Stirewalt Creek	The confluence with Lower Little River	Just upstream of the Railroad	Alexander County, Town of Taylorsville
Stratford Creek	The confluence with Catawba River	Approximately 130 feet downstream of Lee Pearson Road (SR 1136)	Caldwell County
Stratford Creek Tributary 1	The confluence with Stratford Creek	Approximately 1,815 feet upstream of Baton School Road (SR 1139)	Caldwell County
Terrapin Creek	The confluence with Catawba River (Lake Norman)	Approximately 1.2 miles upstream of the confluence of Terrapin Creek Tributary 1	Catawba County
Terrapin Creek Tributary 1	The confluence with Terrapin Creek	Approximately 1 mile upstream of the confluence with Terrapin Creek	Catawba County
Third Creek	Approximately 1,130 feet downstream of Interstate 40	Approximately 0.5 mile upstream of Lentz Road	Alexander County
Thorps Creek	The confluence with Wilson Creek	Approximately 1,375 feet upstream of Edgemont Road	Caldwell County
Thunderhole Creek	The confluence with Johns River	Approximately 0.4 mile upstream of the confluence of New Years Creek	Caldwell County

	Riverine Sources		
Sources	From	To	Affected Communities
Tims Creek	The confluence with Henry Fork	Approximately 1.3 miles upstream of SR 1788	Burke County
Town Branch	The confluence with Catawba River	Approximately 0.5 mile upstream of 2nd Street S.W.	Town of Catawba
Town Creek	Approximately 1,400 feet upstream of St. James Church Road	Approximately 0.8 miles upstream of State Route 10	City of Newton
Tributary to Lyle Creek Tributary	The confluence with Lyle Creek Tributary	Approximately 0.7 mile upstream of the confluence with Lyle Creek Tributary	Catawba County
Upper Creek	The confluence with Irish Creek and Warrior Fork	Approximately 0.5 mile upstream of SR 1405	Burke County
Upper Little River	The confluence with Catawba River	Approximately 0.7 mile upstream of Teaberry Lane	Alexander County, Caldwell County
Upper Little River Tributary 1	The confluence with Upper Little River	Approximately 2,380 feet upstream of Charlie Little Road (SR 1741)	Caldwell County
Wallace Creek	The confluence with South Yadkin River	Approximately 1,200 feet upstream of the confluence of Greasy Creek	Alexander County
Walnut Bottom Creek	The confluence with Johns River	Approximately 0.6 mile upstream of the confluence with Johns River	Caldwell County
Warrior Creek	The confluence with Yadkin River	Approximately 210 feet upstream of Warrior Road (SR 1346)	Caldwell County
Warrior Fork	Approximately 0.5 mile upstream of the confluence of Wilson Creek	The confluence of Irish Creek and Upper Creek	Burke County, City of Morganton
White Creek	The confluence with Duck Creek	Approximately 1.9 miles upstream of SR 1304	Alexander County
Wilson Creek	Approximately 1.1 miles upstream of Adako Road (SR 1337)	Approximately 500 feet upstream of the confluence of Cary Flat Branch	Caldwell County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Yadkin River	Approximately 90 feet upstream of Whisnant Road (SR 1517)	Approximately 2.2 miles upstream of the confluence of Ooten Creek	Caldwell County
Yadkin River	The confluence of Elk Creek	Approximately 0.5 mile upstream of the confluence of Mill Creek (into Yadkin River)	Caldwell County
Yadkin River Tributary 25	The confluence with Yadkin River	Approximately 1.3 miles upstream of NC Highway 268	Caldwell County
Zacks Fork Creek	The confluence with Lower Creek	Approximately 900 feet downstream of NE Georgetown Road	City of Lenoir
Zacks Fork Creek Tributary 1	The confluence with Zacks Fork Creek	Approximately 1.2 miles upstream of the confluence with Zacks Fork Creek	Caldwell County, City of Lenoir

Table C- 1: Flooding Sources

	Riverine Sources		
Sources	From	To	Affected Communities
Abingdon Creek	The confluence with Lower Creek	Approximately 940 feet upstream of Huffman Road	Caldwell County, City of Lenoir, Town of Gamewell
Allen Creek	The confluence with Maiden Creek	Approximately 50 feet downstream of Jim Beard Road (SR 1867)	Catawba County, Town of Maiden
Bailey Fork	The confluence with Silver Creek	Approximately 0.8 mile upstream of I-40	City of Morganton
Bakers Creek	The confluence with Lyle Creek	Approximately 900 feet downstream of Lee Cline Road (SR 1486)	Catawba County
Betts Branch	The confluence with Clarks Creek	Approximately 2.0 miles upstream of Sigmon Dairy Road	Catawba County
Bills Branch	The confluence with Clarks Creek	Approximately 830 feet upstream of US Highway 321	Catawba County, City of Newton
Canoe Creek	The confluence with Catawba River	Approximately 150 feet upstream of NC 126	Burke County, City of Morganton

	Riverine Sources		
Sources	From	To	Affected Communities
Catawba River	At Lake Rhodhiss Dam	At Malcolm Boulevard	Burke County, Caldwell County, City of Lenoir, Town of Connelly Springs, Town of Granite Falls, Town of Rhodhiss, Town of Rutherford College, Town of Sawmills
Catawba River (Lake Hickory)	Lake Hickory / Oxford Dam	NC 127	Alexander County, Catawba County, City of Hickory
Catawba River (Lake Norman)	Cowans Ford Dam	Approximately 0.6 mile downstream of Hudson Chapel Road (SR 1004)	Catawba County
Catawba River (Lookout Shoals Lake)	Toe at Lookout Shoals Dam	Approximately 0.4 mile upstream of the confluence of Elk Shoal Creek	Alexander County, Catawba County
Cline Creek North	The confluence with Lyle Creek	Approximately 0.4 mile upstream of Rifle Range Road (SR 1488)	Catawba County, City of Conover
Drowning Creek	The confluence with Catawba River	Approximately 300 feet downstream of SR 1621	Burke County
Drowning Creek Tributary 1	The confluence with Drowning Creek	Approximately 800 feet upstream of Wilson Road	Burke County, Town of Hildebran
Drowning Creek Tributary 2	The confluence with Drowning Creek	Approximately 100 feet downstream of the confluence of Drowning Creek Tributary 2B	Burke County, Town of Hildebran
Drowning Creek Tributary 2A	The confluence with Drowning Creek Tributary 2	Approximately 1,600 feet upstream of the confluence with Drowning Creek Tributary 2	Burke County
East Prong Creek	The confluence with Hunting Creek	Approximately 500 feet downstream of Mount Home Church Road	City of Morganton
East Tributary to McLin Creek	The confluence with McLin Creek	Approximately 0.5 mile upstream of confluence with McLin Creek	City of Conover
Fiddlers Run	The confluence with East Prong Creek	Approximately 100 feet downstream of Old Colony Road	City of Morganton

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

	Riverine Sources		
Sources	From	To	Affected Communities
Fitz Creek	The confluence with Cripple Creek	Approximately 175 feet upstream of 2nd Avenue NW	City of Hickory
Greasy Creek	The confluence with Lower Creek	Approximately 0.4 mile upstream of SW Morganton Boulevard	City of Lenoir
Gunpowder Creek	Approximately 0.5 mile upstream of Pine Mountain Road (SR 1809)	Approximately 785 feet upstream of SE Starcross Road	City of Lenoir, Town of Hudson
Hagan Fork Creek	The confluence with McLin Creek	Upstream side of Mount Olive Church Road	Catawba County
Henry Fork	Burke / Catawba County boundary	Approximately 0.6 mile upstream of SR 1002	Burke County, Catawba County
Herman Branch Creek	The confluence with Lyle Creek	Approximately 25 feet downstream of 26th Street NE	Catawba County, City of Hickory
Hickory Creek	The confluence with Lyle Creek	Approximately 1,350 ft upstream of 20th Street NE	City of Hickory
Holly Branch	The confluence with Maiden Creek	Approximately 220 feet downstream of the confluence of Holly Branch Tributary 1 and Shady Branch	Town of Maiden
Howard Creek	Approximately 850 feet upstream of SR 1512	Approximately 300 feet upstream of US-70	Burke County, Town of Drexel, Town of Valdese
Hunting Creek	The confluence with Catawba River	Approximately 250 feet upstream of the confluence of Hunting Creek Tributary 3	Burke County, City of Morganton
Hunting Creek Tributary 1	The confluence with Hunting Creek	Approximately 0.7 mile upstream of the confluence with Hunting Creek	Burke County, City of Morganton
Jacob Fork	The confluence with Henry Fork and South Fork Catawba River	Approximately 220 feet upstream of Providence Church Road	Catawba County, City of Newton
Johns River	Approximately 1,500 feet upstream of the Burke / Caldwell County boundary	Approximately 1.1 miles upstream of Triple T Lane	Caldwell County
Lake Norman	Cowans Ford Dam	Approximately 0.6 mile downstream of Hudson Chapel Road (SR 1004)	Catawba County

	Riverine Sources		
Sources	From	To	Affected Communities
Linville River	Approximately 0.7 mile downstream of NC 126	Approximately 2.6 miles upstream of NC 126	Burke County
Little Gunpowder Creek (near City of Lenoir)	The confluence with Gunpowder Creek	Approximately 700 feet upstream of SW Walt Arney Road	City of Lenoir, Town of Cahah's Mountain, Town of Hudson
Little Silver Creek	The confluence with Silver Creek	Approximately 0.6 mile upstream of Causby Road (SR 1147)	City of Morganton, Town of Glen Alpine
Lower Creek	Approximately 1,830 feet upstream of the second crossing of Cedar Rock Circle (SR 1706)	Approximately 1,900 feet upstream of K and B Farm Lane	Caldwell County, Village of Cedar Rock
Lower Creek	The Burke / Caldwell County boundary	Approximately 800 feet downstream of the confluence of Abingdon Creek	Burke County, Caldwell County, Town of Gamewell
Lyle Creek	The confluence with Catawba River	Approximately 0.6 mile downstream of the confluence of Bakers Creek	Catawba County, City of Claremont, City of Conover, Town of Catawba
Maiden Creek	The confluence with Clarks Creek	Approximately 1.3 miles upstream of Providence Mill Road	Catawba County, Town of Maiden
McGalliard Creek	Approximately 1.1 miles upstream of the confluence with Catawba River	Approximately 250 feet upstream of the confluence of McGalliard Creek Tributary 2	Burke County, Town of Valdese
McLin Creek	The confluence with Lyle Creek	Approximately 0.8 mile upstream of East 20th Street	Catawba County, City of Claremont, City of Conover, City of Newton, Town of Catawba
Mulberry Creek	The confluence with Johns River	Approximately 90 feet downstream of Collettsville Road	Caldwell County
Pinch Gut Creek	The confluence with Maiden Creek	Approximately 120 feet upstream of Saint James Church Road	Catawba County, Town of Maiden
Propst Creek	The confluence with Lyle Creek	Approximately 1.9 miles upstream of the confluence with Lyle Creek	Catawba County, City of Conover

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	Riverine Sources		
Sources	From	To	Affected Communities
Sandy Run	The confluence with Hunting Creek	Approximately 2.4 miles upstream of the confluence with Hunting Creek	Burke County, City of Morganton
Silver Creek	The confluence with Catawba River	Approximately 1.6 miles upstream of I-40	Burke County, City of Morganton
Smokey Creek	The Burke / Caldwell County boundary	Approximately 1,500 feet upstream of Smokey Creek Road (SR 1134)	Burke County, Caldwell County
Smyre Creek	The confluence with Clarks Creek	Approximately 120 feet downstream of the confluence of Smyre Creek Tributary 1	Catawba County, City of Newton
South Fork Catawba River	Approximately 125 feet downstream of NC 10	The confluence of Jacob Fork and Henry Fork	Catawba County, City of Newton
Town Creek	The confluence with Smyre Creek	Approximately 1,400 feet upstream of St. James Church Road	City of Newton
Warrior Fork	The confluence with Catawba River	Approximately 0.5 mile upstream of the confluence of Wilson Creek	Burke County, City of Morganton
West Tributary McLin Creek	The confluence with McLin Creek	Approximately 850 feet upstream of Ann Avenue	City of Newton
Wilson Creek	The confluence with Johns River	Approximately 1.1 miles upstream of Adako Road (SR 1337)	Caldwell County
Wilson Creek	The confluence with Warrior Fork	Approximately 0.8 mile upstream of St. Mary's Church Road (SR 1414)	Burke County, City of Morganton
Yadkin River	Approximately 0.5 mile upstream of the confluence of Mill Creek	Approximately 90 feet upstream of Whisnant Road (SR 1517)	Caldwell County
Zacks Fork Branch	The confluence with Zacks Fork Creek	Approximately 100 feet upstream of NE Sherlee Street	City of Lenoir
Zacks Fork Creek	Approximately 900 feet downstream of NE Georgetown Road	Approximately 1.1 miles upstream of Westover Heights Road	Caldwell County, City of Lenoir

	Riverine Sources		
Sources	From	To	Affected Communities
	Riverine Sources		
Sources	From	To	Affected Communities
Abingdon Creek	Approximately 940 feet upstream of Huffman Road	Approximately 325 feet upstream of M.W. Setzer Road	Caldwell County
Amos Creek	The confluence with Mulberry Creek	Approximately 1.4 miles upstream of the confluence with Mulberry Creek	Caldwell County
Angley Creek Tributary 1	The confluence with Angley Creek	Approximately 1.2 miles upstream of the confluence with Angley Creek	Caldwell County, City of Lenoir
Anthony Creek	Approximately 55 feet upstream of the confluence with Prong Creek and Racket Creek	Approximately 1.4 miles upstream of the confluence with Prong Creek and Rocket Creek	Caldwell County
Back Creek	The confluence with Irish Creek	Approximately 0.5 mile upstream of the confluence with Irish Creek	Burke County
Bailey Fork	Approximately 0.8 mile upstream of I-40	At US-64	Burke County, City of Morganton
Bakers Creek Tributary	The confluence with Bakers Creek	Approximately 1.4 miles upstream of Swinging Bridge Road	Catawba County
Bakers Creek Tributary 1	The confluence with Bakers Creek	Approximately 0.7 mile upstream of Stratford Drive (SR 3000)	Catawba County
Balls Creek	The confluence with Catawba River	Approximately 970 feet upstream of Little Mountain Road	Catawba County, Town of Catawba
Beaver Branch	The confluence with Lambert Creek	Approximately 500 feet upstream of SR 1307	Alexander County
Beaver Creek	The confluence with Yadkin River	Approximately 1.5 miles upstream of the Wilkes / Caldwell County boundary	Caldwell County
Beaverdam Creek	The confluence with Big Branch into South Yadkin River	Approximately 2.5 miles upstream of Vashti Road (SR 1403)	Alexander County
Big Branch	The confluence with Elk Shoals Creek	Approximately 550 feet upstream of SR 1619	Alexander County

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	Riverine Sources		
Sources	From	To	Affected Communities
Big Branch into South Yadkin River	The confluence with South Yadkin River	Approximately 0.5 mile upstream of Vashti Cemetery Road (SR 1430)	Alexander County
Bills Branch	Approximately 830 feet upstream of US 321	Approximately 0.5 mile upstream of US Highway 321	Catawba County, City of Newton, Town of Maiden
Billy Branch	The confluence with Gunpowder Creek	Approximately 0.6 mile upstream of North Highland Avenue	Town of Granite Falls
Blairs Fork Creek	Approximately 130 feet upstream of Collettsville Road / NC-90	Approximately 780 feet upstream of Parson's Park Drive	Caldwell County
Blue Creek	The confluence with Kings Creek 1 and Little Kings Creek	Approximately 2.9 miles upstream of Grandin Road (SR 1552)	Caldwell County
Boone Fork	The confluence with Mulberry Creek	Approximately 2.1 miles upstream of the confluence with Mulberry Creek	Caldwell County
Bristol Creek	The confluence with Lower Creek	Approximately 180 feet downstream of the Burke / Caldwell County boundary	Burke County, Caldwell County
Bristol Creek Tributary 1	The confluence with Bristol Creek	Approximately 0.4 mile upstream of the confluence with Bristol Creek	Burke County
Camp Creek	The confluence with Jacob Fork	Approximately 0.5 mile downstream of SR 1736	Burke County, Catawba County
Camp Creek	The confluence with Wilson Creek	The confluence of Raider Camp Creek and Harper Creek	Caldwell County
Canoe Creek	Approximately 150 feet upstream of NC 126	Approximately 0.4 mile upstream of SR 1254	Burke County, City of Morganton
Carroll Creek	The confluence with Parks Creek	Approximately 1,000 feet upstream of SR 1424	Burke County
Catawba River	Approximately 0.6 mile downstream of Hudson Chapel Road	Toe at Lookout Shoals Dam	Catawba County, Town of Catawba
Catawba River	Approximately 0.9 mile upstream of confluence of Elk Shoal Creek	Lake Hickory/ Oxford Dam	Alexander County, Catawba County

	Riverine Sources		
Sources	From	To	Affected Communities
Catawba River	Approximately 1,100 feet upstream of Watermill Glen Alpine Road (SR 1147)	At Bridgewater Dam (Power Plant)	Burke County, Town of Glen Alpine
Catawba River	Approximately 1,100 feet upstream of Watermill Glen Alpine Road (SR1147)	Approximately 1,100 feet downstream of SR 1501	Burke County
Catawba River	At Malcolm Boulevard	The confluence of Johns River	Burke County, Caldwell County, City of Morganton, Town of Rutherford College, Town of Valdese
Catawba River	North Center Street/State Highway 127	At Lake Rhodhiss Dam	Alexander County, Burke County, Caldwell County, Catawba County, City of Hickory, Town of Granite Falls, Town of Rhodhiss
Catawba River Tributary 1	The confluence with Catawba River	Approximately 0.5 mile upstream of SR 1223	Burke County
Catawba River Tributary 2	The confluence with Catawba River	Approximately 2.8 miles upstream of the confluence with Catawba River	Burke County
Celia Creek	The confluence with Husband Creek	Approximately 1.0 mile upstream of Celia Creek Road	Caldwell County
Clarks Creek	Approximately 100 feet downstream of confluence of Clarks Creek Tributary 2	Approximately 310 feet upstream of the Catawba/Lincoln County boundary	Catawba County
Clear Creek	The confluence with Silver Creek	Approximately 500 feet upstream of US 64	Burke County
Cline Creek	Approximately 30 feet downstream of the confluence of Cline Creek Tributary 1	Approximately 150 feet downstream of Interstate 40	City of Conover
Cline Creek North	Approximately 0.4 mile upstream of Rifle Range Road	Approximately 2.0 miles upstream of the confluence of Cline Creek North Tributary 1	Catawba County
Cline Creek North Tributary 1	The confluence with Cline Creek North	Approximately 0.5 mile upstream of Rifle Range Road	Catawba County
Cline Creek Tributary 1	The confluence with Cline Creek	Approximately 450 feet upstream of Interstate 40	City of Conover

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	Riverine Sources		
Sources	From	To	Affected Communities
Cline Creek Tributary 2	The confluence with Cline Creek	Approximately 1,300 feet upstream of Interstate 40	City of Conover
Cold Water Creek	The confluence with Johns River	Approximately 1.7 miles upstream of the confluence with Johns River	Caldwell County
Cow Branch	The confluence with Pott Creek	Approximately 0.8 mile upstream of Grace Church Road	Catawba County
Craig Creek	The confluence with Wilson Creek	Approximately 1.9 miles upstream of the confluence with Wilson Creek	Caldwell County
Cub Creek	The confluence with Henry Fork	Approximately 200 feet downstream of SR 1737	Burke County
Dennis Creek	The confluence with Yadkin River	Approximately 0.8 mile upstream of Hines Branch Road	Caldwell County
Double Branch Tributary 1	The confluence with Double Branch	Approximately 900 feet upstream of SR 1722	Burke County
Douglas Creek	The confluence with Jacob Fork	Approximately 0.4 mile downstream of Old Rock Quarry Road	Burke County, Catawba County
Drowning Creek	Approximately 300 feet downstream of SR 1621	Approximately 1.8 miles upstream of I-40	Burke County
Drowning Creek Tributary 1	Approximately 800 feet upstream of Wilson Road	Approximately 1,700 feet upstream of Cline Park Drive	Town of Hildebran
Drowning Creek Tributary 2	Approximately 100 feet downstream of the confluence of Drowning Creek Tributary 2B	Approximately 200 feet downstream of the Railroad	Burke County
Drowning Creek Tributary 2B	The confluence with Drowning Creek Tributary 2	Approximately 150 feet downstream of the Railroad	Burke County
Elk Branch	The confluence with Jones Creek	Approximately 1,310 feet upstream of Old Sampson Road (SR 1574)	Caldwell County
Elk Shoals Creek	The confluence with Catawba River	Approximately 350 feet upstream of SR 1631	Alexander County
Elk Shoals Creek Tributary 1	The confluence with Elk Shoals Creek	Approximately 0.5 mile upstream of the confluence with Elk Shoals Creek	Alexander County

	Riverine Sources		
Sources	From	To	Affected Communities
Elk Shoals Creek Tributary 2	The confluence with Elk Shoals Creek	Approximately 0.5 mile upstream of confluence with Elk Shoals Creek	Alexander County
Estes Mill Creek	The confluence with Wilson Creek	Approximately 1.2 miles upstream of the confluence with Wilson Creek	Caldwell County
Fiddle Creek	The confluence with Mulberry Creek	Approximately 1,620 feet upstream of the confluence with Mulberry Creek	Caldwell County
Franklin Branch	The confluence with Johns River	Approximately 1,500 feet upstream of the confluence with Franklin Branch Tributary 1	Caldwell County
Franklin Branch Tributary 1	The confluence with Franklin Branch	Approximately 1,540 feet upstream of the confluence with Franklin Branch	Caldwell County
Freemason Creek	The confluence with Catawba River	Approximately 300 feet upstream of Stamey Road	Caldwell County, Town of Sawmills
Freemason Creek Tributary 1	The confluence with Freemason Creek	Approximately 1.5 miles upstream of the confluence with Freemason Creek	Caldwell County, Town of Sawmills
Freemason Creek Tributary 1A	The confluence with Freemason Creek Tributary 1	Approximately 1,690 feet upstream of Hickory Nut Ridge Road	Town of Sawmills
Freemason Creek Tributary 2	The confluence with Freemason Creek	Approximately 0.8 mile upstream of Horseshoe Bend Road	Town of Sawmills
Freemason Creek Tributary 2A	The confluence with Freemason Creek Tributary 2	Approximately 620 feet upstream of Lafayette Avenue	Town of Sawmills
Ginger Creek	The confluence with Middle Little River	Approximately 0.7 mile upstream of Draco Road	Caldwell County
Ginger Creek Tributary 1	The confluence with Ginger Creek	Approximately 1.3 miles upstream of Scout Road	Caldwell County
Glade Creek	The confluence with Lower Little River	Approximately 1.1 miles upstream of SR 1604	Alexander County
Glade Creek Tributary 1	The confluence with Glade Creek	Approximately 0.8 mile upstream of SR 1607	Alexander County, Town of Taylorsville

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	Riverine Sources		
Sources	From	To	Affected Communities
Grassy Creek	The confluence with Lower Little River	Approximately 0.4 mile upstream of SR 1344	Alexander County
Grassy Creek Tributary 1	The confluence with Grassy Creek	Approximately 0.7 mile upstream of the confluence with Grassy Creek	Alexander County
Grassy Creek Tributary 2	The confluence with Grassy Creek	Approximately 0.7 mile upstream of NC 16	Alexander County
Greasy Creek	The confluence with Lower Little River	Approximately 0.4 mile upstream of SR 1344	Alexander County
Greasy Creek Tributary 1	The confluence with Grassy Creek	Approximately 0.7 mile upstream of the confluence with Grassy Creek	Alexander County, Town of Taylorsville
Green Rock Branch	The confluence with Buffalo Creek	Approximately 1.5 miles upstream of Buffalo Cove Road (SR 1504)	Caldwell County
Gunpowder Creek	Approximately 785 feet upstream of SE Starcross Road	Approximately 600 feet upstream of SE Applegate Court	City of Lenoir
Gunpowder Creek Tributary 1	The confluence with Gunpowder Creek	Approximately 280 feet downstream of Temple Hill Church Road	Caldwell County
Gunpowder Creek Tributary 2	The confluence with Gunpowder Creek	Approximately 45 feet downstream of Christie Road (SR 1717)	Caldwell County
Gunpowder Creek Tributary 2A	The confluence with Gunpowder Creek Tributary 2	Approximately 1,550 feet upstream of Christie Road (SR 1717)	Caldwell County, Town of Hudson
Gunpowder Creek Tributary 3	The confluence with Gunpowder Creek	Approximately 2,340 feet upstream of the confluence with Gunpowder Creek	Town of Hudson
Gunpowder Creek Tributary 4	The confluence with Gunpowder Creek	Approximately 0.6 mile upstream of the confluence with Gunpowder Creek	Town of Hudson
Gunpowder Creek Tributary 5	The confluence with Gunpowder Creek	Approximately 1,115 feet upstream of SE Eastwood Park Circle	City of Lenoir
Gunpowder Creek Tributary 6	The confluence with Gunpowder Creek	Approximately 0.5 mile upstream of Renwick Street	City of Lenoir

	Riverine Sources		
Sources	From	To	Affected Communities
Guys Branch	The confluence with Elk Shoals Creek	Approximately 0.5 mile upstream of the confluence with Elk Shoals Creek	Alexander County
Haas Creek	The confluence with Pott Creek	Approximately 0.8 mile upstream of Grace Church Road	Catawba County
Hall Creek	The confluence with Silver Creek	Approximately 0.4 mile upstream of US 64	Burke County
Harper Creek	The confluence with Camp Creek and Raider Camp Creek	The confluence of South Harper Creek	Caldwell County
Hayes Mill Creek Tributary 1	The confluence with Hayes Mill Creek	Approximately 1,700 feet upstream of the confluence with Hayes Mill Creek	Town of Granite Falls, Town of Sawmills
Hayes Mill Creek Tributary 2	The confluence with Hayes Mill Creek	Approximately 1,900 feet upstream of the confluence with Hayes Mill Creek	Town of Sawmills
Henry Fork	Approximately 0.6 mile upstream of SR 1002	Approximately 0.9 mile upstream of SR 1918	Burke County
Henry Fork Tributary 3	The confluence with Henry Fork	Approximately 2,000 feet upstream of Robinson Road	Catawba County
Holdsclaw Creek	The confluence with Catawba River	Approximately 1,500 ft upstream of the confluence of Holdsclaw Creek Tributary 1	Catawba County
Holdsclaw Creek Tributary 1	The confluence with Holdsclaw Creek	Approximately 1,450 feet upstream of the confluence with Holdsclaw Creek	Catawba County
Holly Branch	Approximately 220 feet downstream of the confluence of Holly Branch Tributary 1 and Shady Branch	The confluence of Shady Branch and Holly Branch Tributary 1	Town of Maiden
Holly Branch Tributary 1	The confluence with Holly Branch	Approximately 200 feet upstream of South Main Avenue	Town of Maiden
Hop Creek	The confluence with Holly Branch	Approximately 200 feet upstream of South Main Avenue	Catawba County
Howard Creek	The confluence with Catawba River	Approximately 850 feet upstream of SR 1512	Burke County, Town of Drexel, Town of Valdese

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	Riverine Sources		
Sources	From	To	Affected Communities
Howard Creek Tributary 1	The confluence with Howard Creek	Approximately 350 feet upstream of Railroad	Town of Drexel
Howards Creek	The confluence with South Fork Catawba River	Approximately 500 feet upstream of the Catawba/Lincoln County boundary	Catawba County
Hoyle Creek	The confluence with Catawba River	Approximately 1,500 feet upstream of the confluence with Micol Creek	Burke County, Town of Rutherford College, Town of Valdese
Hoyle Creek Tributary 1	The confluence with Hoyle Creek	Approximately 0.9 mile upstream of the confluence with Hoyle Creek	Burke County, Town of Rutherford College, Town of Valdese
Hoyle Creek Tributary 2	The confluence with Hoyle Creek	Approximately 0.7 mile upstream of the confluence with Hoyle Creek	Town of Rutherford College, Town of Valdese
Hunting Creek	Approximately 250 feet upstream of the confluence of Hunting Creek Tributary 3	Approximately 1,100 feet upstream of SR 2002	Burke County, City of Morganton
Hunting Creek Tributary 3	The confluence with Hunting Creek	Approximately 0.4 mile upstream of the confluence with Hunting Creek	Burke County, City of Morganton
Husband Creek	The confluence with Lower Creek	Approximately 1,925 feet upstream of Rocky Road (SR 1143)	Caldwell County, Town of Gamewell
Husband Creek Tributary 1	The confluence with Husband Creek	Approximately 140 feet downstream of Fleming Chapel Church Road (SR 1322)	Caldwell County
Husband Creek Tributary 2	The confluence with Husband Creek	Approximately 750 feet upstream of Crooked Creek Way	Caldwell County
Indian Creek	The Lincoln/Gaston County boundary	Approximately 550 ft upstream of the Catawba/Lincoln County boundary	Catawba County
Irish Creek	The confluence with Upper Creek and Warrior Fork	Approximately 800 feet upstream of the confluence with Reedys Fork Creek	Burke County
Irish Creek Tributary 1	The confluence with Irish Creek	At SR 1240	Burke County
Isaac Creek	The confluence with Upper Little River	Approximately 0.7 mile upstream of SR 1143	Alexander County

	Riverine Sources		
Sources	From	To	Affected Communities
Island Creek	The confluence with Catawba River	Approximately 0.4 mile upstream of SR 1621	Alexander County
Island Creek	The confluence with Catawba River	Approximately 0.7 mile upstream of I-40	Burke County, Town of Connelly Springs, Town of Rutherford College
Jackson Camp Creek	The confluence with Yadkin River	Approximately 1.0 mile upstream of Richland Road (SR 1372)	Caldwell County
Jacob Fork	Approximately 220 feet upstream of Providence Church Road	Approximately 990 feet upstream of the Catawba/Burke County boundary	Burke County, Catawba County
Jacob Fork	Approximately 990 feet upstream of the Catawba/Burke County boundary	Approximately 450 feet upstream of SR 1904	Burke County
Jacob Fork Tributary 1	The confluence with Jacob Fork	Approximately 1.3 miles upstream of Cooksville Road	Catawba County
Jesse Fork	The confluence with Buffalo Creek	Approximately 0.8 mile upstream Stone Mountain Road (SR 1503)	Caldwell County
Jesse Fork Tributary 1	The confluence with Jesse Fork	Approximately 330 feet upstream of Wallace Coffey Place	Caldwell County
Johns River	Approximately 1.1 miles upstream of Triple T Lane	Approximately 3.8 miles upstream of the confluence of Thunderhole Creek	Caldwell County
Johns River	The confluence with Catawba River	Approximately 1,500 feet upstream of the Burke / Caldwell County boundary	Burke County, Caldwell County, City of Morganton
Jones Creek	The confluence with Buffalo Creek	Approximately 50 feet downstream of the Watauga / Caldwell County boundary	Caldwell County
Jumping Run	The confluence with Rock Creek	Approximately 500 feet upstream of NC 127	Alexander County
Kings Creek 1	The confluence with Yadkin River	The confluence of Little Kings Creek and Blue Creek	Caldwell County
Kings Creek 2	The confluence with Blue Creek	Approximately 1.9 miles upstream of the confluence of Kings Creek 2 Tributary 1	Caldwell County

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	Riverine Sources		
Sources	From	To	Affected Communities
Kings Creek 2 Tributary 1	The confluence with Kings Creek 2	Approximately 1.6 miles upstream of Blue Door School Road	Caldwell County
Lambert Creek	The confluence with Lower Little River	Approximately 0.8 mile upstream of SR 1307	Alexander County
Lambert Creek Tributary 1	The confluence with Lambert Creek	Approximately 800 feet upstream of SR 1307	Alexander County
Laurel Creek	The confluence with Henry Fork	Approximately 1.2 miles upstream of Shoupe Way	Burke County
Laurel Creek	The confluence with Wilson Creek	Approximately 1.1 miles upstream of the confluence with Wilson Creek	Caldwell County
Laytown Creek	The confluence with Yadkin River	Approximately 1.8 miles upstream of Laytown Road (SR 1507)	Caldwell County
Linville River	Approximately 2.6 miles upstream of NC 126	Approximately 800 feet downstream of the Land Harbors Dam	Burke County
Linville River	The confluence with Catawba River	Approximately 0.7 mile downstream of NC 126	Burke County
Lippard Creek	The confluence with Sawmill Branch and Leepers Creek	Approximately 1,940 feet upstream of the Catawba/Lincoln County boundary	Catawba County
Little Creek	The confluence with Upper Little River	Approximately 1.4 miles upstream of Cove Mountain Lane	Caldwell County
Little Gunpowder Creek (near City of Lenoir)	Approximately 700 feet upstream of SW Walt Arney Road	Approximately 1,075 feet upstream of Connelly Springs Road	Town of Cahaj's Mountain
Little Gunpowder Creek (near Town of Hudson)	Approximately 0.8 mile upstream of Little Gunpowder Creek Drive (SR 1133)	Approximately 1.4 miles upstream of Little Gunpowder Creek Drive (SR 1133)	Caldwell County, Town of Cahaj's Mountain
Little Gunpowder Creek (near Town of Hudson) Tributary 1	The confluence with Little Gunpowder Creek (near Town of Hudson)	Approximately 50 feet upstream of Madison MHP Drive	Town of Hudson
Little Gunpowder Creek (near Town of Hudson) Tributary 2	The confluence with Little Gunpowder Creek (near Town of Hudson)	Approximately 0.4 mile upstream of Chickadee Trail Place	Town of Hudson
Little Kings Creek	The confluence with Kings Creek and Blue Creek	Approximately 1,620 feet upstream of Zacks Fork Road (SR 1511)	Caldwell County

	Riverine Sources		
Sources	From	To	Affected Communities
Little Mulberry Creek 2	The confluence with Mulberry Creek	Approximately 0.4 mile upstream of Shallow Creek Road (SR 1530)	Caldwell County
Lost Cove Creek	The confluence with Wilson Creek	Approximately 2.1 miles upstream of the confluence with Gragg Prong Creek	Caldwell County
Lower Creek	The confluence with Catawba River	Approximately 1,290 feet downstream of the confluence with Husband Creek	Burke County, Caldwell County
Lower Creek Tributary 1	The confluence with Lower Creek	Approximately 0.7 mile upstream of SE Haigler Road	City of Lenoir
Lower Little River	The confluence with Catawba River	Approximately 0.9 mile upstream of SR 1332	Alexander County
Lower Little River Tributary 1	The confluence with Lower Little River	Approximately 1.9 miles upstream of the confluence with Lower Little River	Alexander County
Lower Little River Tributary 2	The confluence with Lower Little River	Approximately 1,600 feet upstream of SR 1124	Alexander County
Lower Little River Tributary 2A	The confluence with Lower Little River Tributary 2	Approximately 1,600 feet upstream of confluence with Lower Little River Tributary 2	Alexander County
Lower Little River Tributary 3	The confluence with Lower Little River	Approximately 1.4 miles upstream of SR 1110	Alexander County
Lower Little River Tributary 4	The confluence with Lower Little River	Approximately 1,000 feet upstream of SR 1104	Alexander County, Town of Taylorsville
Lyle Creek Tributary	The confluence with Lyle Creek	Approximately 1,950 feet upstream of Community Road	Catawba County
Lyle Creek Tributary 1	The confluence with Lyle Creek	Approximately 1.0 mile upstream of Crossing Creek Drive (SR 2454)	Catawba County
Maiden Creek	Approximately 1.3 miles upstream of Providence Mill Road	Approximately 80 feet downstream of North Olivers Cross Road	Catawba County
McGalliard Creek	The confluence of Double Branch	Approximately 400 feet upstream of SR 1722	Burke County
McGalliard Creek	The confluence with Catawba River	Approximately 1.1 miles upstream of the confluence with Catawba River	Burke County, Town of Valdese

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	Riverine Sources		
Sources	From	To	Affected Communities
McGalliard Creek Tributary 1	The confluence with McGalliard Creek	Approximately 1,800 feet upstream of Louise Avenue NE	Burke County, Town of Valdese
McGalliard Creek Tributary 2	The confluence with McGalliard Creek	Approximately 600 feet downstream of I-40	Burke County, Town of Drexel
McGalliard Creek Tributary 2A	The confluence with McGalliard Creek Tributary 2	Approximately 800 feet upstream of Drexel Road	Town of Drexel
McGalliard Creek Tributary 2B	The confluence with McGalliard Creek Tributary 2	Approximately 200 feet downstream of SR 1721	Burke County, Town of Drexel
McLin Creek Tributary 1	The confluence with McLin Creek	Approximately 1,250 feet upstream of Frazier Drive	City of Claremont
McRory Creek	The confluence with Upper Little River	Approximately 0.6 mile upstream of McRory Creek Road (SR 1721)	Caldwell County
Micol Creek Tributary 1	The confluence with Micol Creek	Approximately 0.5 mile upstream of Montonya View Drive	Burke County, Town of Rutherford College, Town of Valdese
Micol Creek Tributary 1A	The confluence with Micol Creek Tributary 1	Approximately 75 feet downstream of SR 1001	Burke County, Town of Rutherford College
Micol Creek Tributary 1A1	The confluence with Micol Creek Tributary 1A	Approximately 0.4 mile upstream of the confluence with Micol Creek Tributary 1A	Burke County
Middle Little River	The most downstream crossing of the Alexander / Caldwell County boundary	Approximately 0.4 mile upstream of Brush Mountain Road (SR 1733)	Alexander County, Caldwell County
Middle Little River Tributary 2	The confluence with Middle Little River	Approximately 300 feet downstream of SR 1152	Alexander County
Middle Little River Tributary 3	The confluence with Middle Little River	Approximately 1,480 feet upstream of Taylorsville Road	Caldwell County
Middle Little River Tributary 4	The confluence with Middle Little River	Approximately 1,300 feet upstream of Duck Creek Road (SR 1730)	Caldwell County
Middle Little River Tributary 5	The confluence with Middle Little River	Approximately 0.5 mile upstream of the confluence with Middle Little River	Caldwell County
Mill Creek	The confluence with South Yadkin River	Approximately 0.4 mile upstream of the confluence with South Yadkin River	Alexander County

	Riverine Sources		
Sources	From	To	Affected Communities
Mill Creek	The confluence with Upper Little River	Approximately 1.0 mile upstream of Petra Mill Road (SR 1740)	Caldwell County
Mill Creek (into Yadkin River)	The confluence with Yadkin River	Approximately 1.2 miles upstream of NC Highway 268	Caldwell County
Miller Creek	The confluence with South Yadkin River	Approximately 260 feet upstream of Sprinkle Dairy Road (SR 1475)	Alexander County
Morris Creek	The confluence with Upper Little River	Approximately 490 feet upstream of Sheriffs Road (SR 1730)	Caldwell County
Mountain Creek	The confluence with Catawba River (Lake Norman)	Approximately 1.6 miles upstream of the confluence of Mountain Creek Tributary 3	Catawba County
Mountain Creek	The confluence with Middle Little River	Approximately 200 feet upstream of SR 1150	Alexander County
Mountain Creek Tributary 2	The confluence with Mountain Creek	Approximately 1.6 miles upstream of the confluence with Mountain Creek	Catawba County
Mountain Creek Tributary 2A	The confluence with Mountain Creek Tributary 2	Approximately 1.4 miles upstream of the confluence with Mountain Creek Tributary 2	Catawba County
Mountain Creek Tributary 3	The confluence with Mountain Creek	Approximately 1.0 mile upstream of the confluence with Mountain Creek	Catawba County
Mountain Creek Tributary 3A	The confluence with Mountain Creek Tributary 3	Approximately 0.5 mile upstream of the confluence with Mountain Creek Tributary 3	Catawba County
Mountain Run	The confluence with Upper Little River	Approximately 125 feet upstream of Fox Road (SR 1726)	Caldwell County
Muddy Creek	Approximately 0.4 mile downstream of Robinson Road (SR 1146)	The confluence of Muddy Creek Tributary 2 and Muddy Creek Tributary 3	Catawba County
Muddy Creek	The confluence of Old Catawba River	The confluence of North Muddy Creek and South Muddy Creek	Burke County

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	Riverine Sources		
Sources	From	To	Affected Communities
Muddy Creek Tributary 1	The confluence with Muddy Creek	Approximately 0.7 mile upstream of Robinwood Road (SR 1148)	Catawba County
Muddy Creek Tributary 2	The confluence with Muddy Creek	Approximately 0.6 mile upstream of Robinwood Road (SR 1148)	Catawba County
Muddy Creek Tributary 3	The confluence with Muddy Creek	Approximately 1.3 miles upstream of the confluence with Muddy Creek	Catawba County, City of Hickory
Muddy Fork Creek	The confluence with Lower Little River	Approximately 600 feet downstream of SR 1405	Alexander County, Town of Taylorsville
Muddy Fork Creek Tributary 1	The confluence with Muddy Fork Creek	Approximately 1.6 miles upstream of Old Wilkesboro Road	Alexander County, Town of Taylorsville
Mulberry Creek	Approximately 90 feet downstream of Collettsville Road	Approximately 0.7 mile upstream of the confluence of Amos Creek	Caldwell County
Mundy Creek	The confluence with Reed Creek	Approximately 500 feet upstream of Lineberger Road	Catawba County
Mundy Creek Tributary 1	The confluence with Mundy Creek	Approximately 1,400 feet upstream of Grassy Creek Road	Catawba County
Nolden Creek	The confluence with Catawba River	Approximately 1,900 feet upstream of Nolden Creek Road	Burke County, Town of Connelly Springs
Old Catawba River	The confluence with Catawba River	The Burke / McDowell County boundary	Burke County
Old Field Branch	The confluence with Buffalo Creek	Approximately 1.7 miles upstream of the confluence with Buffalo Creek	Caldwell County
Ooten Creek	The confluence with Yadkin River	Approximately 0.6 mile upstream of the confluence with Yadkin River	Caldwell County
Paddy Creek	The confluence with Catawba River	Approximately 2.9 miles upstream of SR 1237	Burke County
Parks Creek	The confluence with Johns River	Approximately 100 feet downstream of SR 1405	Burke County
Pearcy Creek	The confluence with Parks Creek	Approximately 1.1 miles upstream of SR 1405	Burke County

	Riverine Sources		
Sources	From	To	Affected Communities
Pearcy Creek Tributary 1	The confluence with Pearcy Creek	Approximately 20 feet downstream of SR 1405	Burke County
Pilot Branch	The confluence with Upper Little River	Approximately 440 feet upstream of Burns Road (SR 1749)	Caldwell County
Pinch Gut Creek	Approximately 120 feet upstream of Saint James Church Road	Approximately 0.9 mile upstream of Saint James Church Road	Catawba County
Pinch Gut Creek Tributary 1	The confluence with Pinch Gut Creek	Approximately 0.5 mile upstream of the confluence with Pinch Gut Creek	Catawba County
Poplar Creek	The confluence with Lambert Creek	Approximately 0.5 mile upstream of SR 1305	Alexander County
Pott Creek	The confluence with South Fork Catawba River	Approximately 1.9 miles upstream of Plateau Road	Catawba County
Preston Creek	The confluence with Yadkin River	Approximately 650 feet upstream of Kirby Mountain Road (SR 1370)	Caldwell County
Prong Creek	The confluence with Johns River	Approximately 65 feet downstream of the confluence Racket Creek and Anthony Creek	Caldwell County
Racket Creek	Approximately 65 feet downstream of the confluence with Prong Creek and Anthony Creek	Approximately 145 feet upstream of the confluence with Ballew Creek	Caldwell County
Raider Camp Creek	The confluence with Camp Creek	Approximately 1,795 feet upstream of the confluence with Camp Creek	Caldwell County
Reed Creek	The confluence with Mountain Creek	Approximately 1.1 miles upstream of Mount Pleasant Road (SR 1849)	Catawba County
Reedys Fork Creek	The confluence with Irish Creek	Approximately 0.5 mile upstream of the confluence with Irish Creek	Burke County
Rhodes Mill Creek	The confluence with Pott Creek	Approximately 1,100 feet upstream of Leatherman Road	Catawba County

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	Riverine Sources		
Sources	From	To	Affected Communities
Rhodes Mill Creek Tributary 1	The confluence with Rhodes Mill Creek	Approximately 0.4 mile upstream of the confluence with Rhodes Mill Creek	Catawba County
Rock Creek	The confluence with Middle Little River	The confluence of Jumping Run	Alexander County
Rock Creek	The confluence with Upper Little River	Approximately 200 feet downstream of Fowler Road (SR 1747)	Caldwell County
Rock Creek Tributary 1	The confluence with Rock Creek	Approximately 1,000 feet upstream of confluence with Rock Creek	Alexander County
Rockhouse Creek	The confluence with Buffalo Creek	Approximately 30 feet downstream of the Watauga / Caldwell County boundary	Caldwell County
Rockhouse Creek	The confluence with Lost Cove Creek	Approximately 0.4 mile upstream of Avery/Caldwell County boundary	Caldwell County
Rocky Creek	The Iredell/Alexander County boundary	Approximately 1.0 mile upstream of the confluence of Rocky Creek Tributary 1	Alexander County
Roses Creek	The confluence with Irish Creek	Approximately 1.7 miles upstream of SR 1262	Burke County
Roses Creek Tributary 1	The confluence with Roses Creek	Approximately 0.6 mile upstream of the confluence with Roses Creek	Burke County
Rush Branch	The confluence with Mulberry Creek	Approximately 0.9 mile upstream of the confluence with Mulberry Creek	Caldwell County
Russell Creek	The confluence with Irish Creek	Approximately 1.6 miles upstream of SR 1240	Burke County
Secrets Creek	The confluence with Howard Creek	Approximately 0.8 mile upstream of South Main Street	Town of Drexel, Town of Valdese
Shady Branch	The confluence with Holly Branch	Approximately 500 feet upstream of South 11th Avenue	Town of Maiden
Shady Branch Tributary 1	The confluence with Shady Branch	Approximately 1,800 feet upstream of South 8th Avenue	Town of Maiden

	Riverine Sources		
Sources	From	To	Affected Communities
Silver Creek	Approximately 1.6 miles upstream of I-40	Approximately 1,800 feet upstream of US 64	Burke County, City of Morganton
Silver Creek	The confluence with Gunpowder Creek	Approximately 0.6 mile upstream of Falls Avenue (SR 1107)	Caldwell County, Town of Granite Falls
Silver Creek Tributary 1	The confluence with Silver Creek	Approximately 100 feet downstream of the Railroad	City of Morganton
Simpson Creek	The confluence with Roses Creek	Approximately 1.5 miles upstream of the confluence with Roses Creek	Burke County
Smokey Creek	The confluence with Catawba River	The Burke / Caldwell County boundary	Burke County
Smokey Creek Tributary 1	The confluence with Smokey Creek	Approximately 0.4 mile upstream of the confluence with Smokey Creek	Burke County
Smyre Creek	Approximately 120 feet downstream of the confluence of Smyre Creek Tributary 1	Approximately 50 feet downstream of NC-16	Catawba County, City of Newton
Smyre Creek Tributary 1	The confluence with Smyre Creek	Approximately 1,500 feet upstream of the confluence with Smyre Creek	Catawba County, City of Newton
Snow Creek	The confluence with South Yadkin River	Approximately 260 feet upstream of Mountain View Road (SR 1614E)	Alexander County
South Fork Catawba River	Approximately 2.6 miles upstream of the confluence of Howards Creek	Approximately 125 feet downstream of NC-10	Catawba County, City of Newton
South Fork Catawba River Tributary 6	The confluence with South Fork Catawba River	Approximately 530 feet upstream of Herter Road (SR 2022)	Catawba County
South Fork Catawba River Tributary 7	The confluence with South Fork Catawba River	Approximately 0.9 mile upstream of the confluence with South Fork Catawba River	Catawba County
South Fork Catawba River Tributary 8	The confluence with South Fork Catawba River	Approximately 0.7 mile upstream of Wilfong Road (SR 2020)	Catawba County
South Fork Catawba River Tributary 9	The confluence with South Fork Catawba River	Approximately 1.1 miles upstream of US Highway 321	Catawba County

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	Riverine Sources		
Sources	From	To	Affected Communities
South Fork Catawba River Tributary 9A	The confluence with South Fork Catawba River Tributary 9	Approximately 1,500 feet upstream of the confluence with South Fork Catawba River Tributary 9	Catawba County
South Muddy Creek	The confluence with Muddy Creek	Approximately 0.7 mile upstream of SR 1780	Burke County
South Muddy Creek Tributary 1	The confluence with South Muddy Creek	Approximately 920 feet upstream of McDowell/Burke County boundary	Burke County
South Yadkin River	The confluence with Yadkin River	Approximately 510 feet downstream of Vashti Road (SR 1403)	Alexander County
Spring Creek	The confluence with Lower Little River	Approximately 1.7 miles upstream of SR 1121	Alexander County
Stirewalt Creek	The confluence with Lower Little River	Just upstream of the Railroad	Alexander County, Town of Taylorsville
Stratford Creek	The confluence with Catawba River	Approximately 130 feet downstream of Lee Pearson Road (SR 1136)	Caldwell County
Stratford Creek Tributary 1	The confluence with Stratford Creek	Approximately 1,815 feet upstream of Baton School Road (SR 1139)	Caldwell County
Terrapin Creek	The confluence with Catawba River (Lake Norman)	Approximately 1.2 miles upstream of the confluence of Terrapin Creek Tributary 1	Catawba County
Terrapin Creek Tributary 1	The confluence with Terrapin Creek	Approximately 1 mile upstream of the confluence with Terrapin Creek	Catawba County
Third Creek	Approximately 1,130 feet downstream of Interstate 40	Approximately 0.5 mile upstream of Lentz Road	Alexander County
Thorps Creek	The confluence with Wilson Creek	Approximately 1,375 feet upstream of Edgemont Road	Caldwell County
Thunderhole Creek	The confluence with Johns River	Approximately 0.4 mile upstream of the confluence of New Years Creek	Caldwell County
Tims Creek	The confluence with Henry Fork	Approximately 1.3 miles upstream of SR 1788	Burke County

	Riverine Sources		
Sources	From	To	Affected Communities
Town Creek	Approximately 1,400 feet upstream of St. James Church Road	Approximately 0.8 miles upstream of State Route 10	City of Newton
Tributary to Lyle Creek Tributary	The confluence with Lyle Creek Tributary	Approximately 0.7 mile upstream of the confluence with Lyle Creek Tributary	Catawba County
Upper Creek	The confluence with Irish Creek and Warrior Fork	Approximately 0.5 mile upstream of SR 1405	Burke County
Upper Little River	The confluence with Catawba River	Approximately 0.7 mile upstream of Teaberry Lane	Alexander County, Caldwell County
Upper Little River Tributary 1	The confluence with Upper Little River	Approximately 2,380 feet upstream of Charlie Little Road (SR 1741)	Caldwell County
Wallace Creek	The confluence with South Yadkin River	Approximately 1,200 feet upstream of the confluence of Greasy Creek	Alexander County
Walnut Bottom Creek	The confluence with Johns River	Approximately 0.6 mile upstream of the confluence with Johns River	Caldwell County
Warrior Creek	The confluence with Yadkin River	Approximately 210 feet upstream of Warrior Road (SR 1346)	Caldwell County
Warrior Fork	Approximately 0.5 mile upstream of the confluence of Wilson Creek	The confluence of Irish Creek and Upper Creek	Burke County, City of Morganton
White Creek	The confluence with Duck Creek	Approximately 1.9 miles upstream of SR 1304	Alexander County
Wilson Creek	Approximately 1.1 miles upstream of Adako Road (SR 1337)	Approximately 500 feet upstream of the confluence of Cary Flat Branch	Caldwell County
Yadkin River	Approximately 90 feet upstream of Whisnant Road (SR 1517)	Approximately 2.2 miles upstream of the confluence of Ooten Creek	Caldwell County
Yadkin River	The confluence of Elk Creek	Approximately 0.5 mile upstream of the confluence of Mill Creek (into Yadkin River)	Caldwell County

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

		Riverine Sources		
Sources	From	To	Affected Communities	
Yadkin River Tributary 25	The confluence with Yadkin River	Approximately 1.3 miles upstream of NC Highway 268	Caldwell County	
Zacks Fork Creek Tributary 1	The confluence with Zacks Fork Creek	Approximately 1.2 miles upstream of the confluence with Zacks Fork Creek	Caldwell County, City of Lenoir	

Table C- 2: Flooding Sources Studied by Detailed Methods: Limited Detailed

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Alexander								
Alexander County (Unincorporated Area)	10/08/05	Flood	0	0	0	\$0	0	\$0
Alexander County (Unincorporated Area)	05/26/09	Flash Flood	0	0	\$0	\$0	\$0	\$0
Alexander County (Unincorporated Area)	06/03/09	Flash Flood	0	0	\$0	\$0	\$0	\$0
Alexander County (Unincorporated Area)	01/24/10	Flash Flood	0	0	\$0	\$0	\$0	\$0
Alexander County (Unincorporated Area)	01/24/10	Flash Flood	0	0	\$0	\$0	\$0	\$0
Alexander County (Unincorporated Area)	05/14/12	Flash Flood	0	0	\$0	\$0	\$0	\$0
Alexander County (Unincorporated Area)	07/11/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
Subtotal Alexander	7 Events		0	0	\$0	\$0	\$0	\$0
Burke								

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Burke County (Unincorporated Area)	08/26/08	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	05/26/09	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	01/24/10	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	01/25/10	Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	08/15/10	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	03/06/11	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	04/16/11	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	04/16/11	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	04/16/11	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	04/16/11	Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	11/29/11	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	09/18/12	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	05/05/13	Flood	0	0	\$30,000	\$24,254	\$0	\$0
Burke County (Unincorporated Area)	07/04/13	Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	07/04/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
Burke County (Unincorporated Area)	07/04/13	Flood	0	0	\$0	\$0	\$0	\$0

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Burke County (Unincorporated Area)	07/12/13	Flash Flood	0	0	\$60,000	\$48,827	\$0	\$0
Burke County (Unincorporated Area)	04/19/15	Flood	0	0	\$1,000	\$865	\$0	\$0
Burke County (Unincorporated Area)	12/02/15	Flood	0	0	\$500	\$442	\$0	\$0
Burke County (Unincorporated Area)	12/24/15	Flash Flood	0	0	\$1,000	\$885	\$0	\$0
Burke County (Unincorporated Area)	02/03/16	Flash Flood	0	0	\$5,000	\$4,443	\$0	\$0
Burke County (Unincorporated Area)	10/23/17	Flood	0	0	\$1,000	\$943	\$0	\$0
Burke County (Unincorporated Area)	04/15/18	Flash Flood	0	0	\$1,000	\$959	\$0	\$0
Burke County (Unincorporated Area)	05/18/18	Flood	0	0	\$5,000	\$4,808	\$0	\$0
Burke County (Unincorporated Area)	05/29/18	Flash Flood	0	0	\$3,000	\$2,888	\$0	\$0
Burke County (Unincorporated Area)	05/30/18	Flood	0	0	\$1,000	\$963	\$0	\$0
Burke County (Unincorporated Area)	09/16/18	Flash Flood	0	0	\$1,000	\$973	\$0	\$0
Burke County (Unincorporated Area)	09/17/18	Flood	0	0	\$1,000	\$973	\$0	\$0
Burke County (Unincorporated Area)	09/23/18	Flash Flood	0	0	\$2,000	\$1,946	\$0	\$0
Burke County (Unincorporated Area)	10/11/18	Flood	0	0	\$2,000	\$1,950	\$0	\$0
Burke County (Unincorporated Area)	12/21/18	Flood	0	0	\$1,000	\$981	\$0	\$0
Burke County (Unincorporated Area)	12/28/18	Flood	0	0	\$2,000	\$1,964	\$0	\$0

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
City of Morganton	05/19/05	Flash Flood	0	0	0	\$0	0	\$0
City of Morganton	07/19/05	Flash Flood	0	0	0	\$0	0	\$0
City of Morganton	07/27/05	Flash Flood	0	0	0	\$0	0	\$0
City of Morganton	08/17/05	Flash Flood	0	0	0	\$0	0	\$0
City of Morganton	09/12/14	Flash Flood	0	0	\$100,000	\$84,720	\$0	\$0
City of Morganton	09/12/14	Flood	0	0	\$10,000	\$8,472	\$0	\$0
Town of Drexel	06/09/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
Subtotal Burke	39 Events		0	0	\$227,500	\$192,255	\$0	\$0
Caldwell								
Caldwell County (Unincorporated Area)	07/03/05	Flash Flood	0	0	\$20,000	\$12,347	0	\$0
Caldwell County (Unincorporated Area)	08/18/05	Flash Flood	0	0	0	\$0	0	\$0
Caldwell County (Unincorporated Area)	08/26/08	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	05/16/09	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	03/06/11	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	04/16/11	Flash Flood	0	1	\$50,000	\$37,671	\$0	\$0
Caldwell County (Unincorporated Area)	05/14/12	Flash Flood	0	0	\$0	\$0	\$0	\$0

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Caldwell County (Unincorporated Area)	05/14/12	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	05/14/12	Flash Flood	0	0	\$300,000	\$234,584	\$0	\$0
Caldwell County (Unincorporated Area)	05/14/12	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	07/11/12	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	08/09/12	Flash Flood	0	0	\$5,000	\$3,941	\$0	\$0
Caldwell County (Unincorporated Area)	01/30/13	Flash Flood	0	0	\$50,000	\$40,064	\$0	\$0
Caldwell County (Unincorporated Area)	05/05/13	Flood	0	0	\$30,000	\$24,254	\$0	\$0
Caldwell County (Unincorporated Area)	06/09/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	07/04/13	Flash Flood	0	0	\$300,000	\$243,966	\$0	\$0
Caldwell County (Unincorporated Area)	07/07/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
Caldwell County (Unincorporated Area)	07/12/13	Flash Flood	0	0	\$50,000	\$40,689	\$0	\$0
Caldwell County (Unincorporated Area)	09/01/13	Flash Flood	0	0	\$0	\$0	\$0	\$0

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Caldwell County (Unincorporated Area)	04/19/15	Flood	0	0	\$1,000	\$865	\$0	\$0
Caldwell County (Unincorporated Area)	02/03/16	Flash Flood	0	0	\$5,000	\$4,443	\$0	\$0
Caldwell County (Unincorporated Area)	05/24/17	Flash Flood	0	0	\$500	\$465	\$0	\$0
Caldwell County (Unincorporated Area)	10/23/17	Flood	0	0	\$1,000	\$943	\$0	\$0
Caldwell County (Unincorporated Area)	05/18/18	Flash Flood	0	0	\$50,000	\$48,077	\$0	\$0
Caldwell County (Unincorporated Area)	05/19/18	Flood	0	0	\$5,000	\$4,808	\$0	\$0
Caldwell County (Unincorporated Area)	05/29/18	Flash Flood	0	0	\$2,000	\$1,925	\$0	\$0
Caldwell County (Unincorporated Area)	05/29/18	Flash Flood	0	0	\$2,000	\$1,925	\$0	\$0
Caldwell County (Unincorporated Area)	05/30/18	Flood	0	0	\$500	\$481	\$0	\$0
Caldwell County (Unincorporated Area)	05/31/18	Flash Flood	0	0	\$5,000	\$4,814	\$0	\$0
Caldwell County (Unincorporated Area)	09/16/18	Flood	0	0	\$1,000	\$973	\$0	\$0
Caldwell County (Unincorporated Area)	10/11/18	Flash Flood	0	0	\$1,000	\$975	\$0	\$0

Appendix C: Flooding Sources and Historical Flooding (2005 – 2018)

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
Caldwell County (Unincorporated Area)	10/11/18	Flood	0	0	\$500	\$487	\$0	\$0
City of Lenoir	06/07/05	Flash Flood	0	0	\$15,000	\$9,238	0	\$0
City of Lenoir	06/08/05	Flash Flood	0	0	0	\$0	0	\$0
City of Lenoir	06/10/09	Flash Flood	0	0	\$20,000	\$14,139	\$0	\$0
City of Lenoir	06/09/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
Town of Hudson	07/27/17	Flash Flood	0	0	\$500	\$468	\$0	\$0
Village of Cedar Rock	07/02/13	Flood	0	0	\$0	\$0	\$0	\$0
Subtotal Caldwell	38 Events		0	1	\$915,000	\$732,543	\$0	\$0
Catawba								
Catawba County (Unincorporated Area)	01/24/10	Flash Flood	0	0	\$0	\$0	\$0	\$0
Catawba County (Unincorporated Area)	05/14/12	Flash Flood	0	0	\$20,000	\$15,639	\$0	\$0
Catawba County (Unincorporated Area)	05/06/13	Flood	0	0	\$2,000,000	\$1,616,958	\$0	\$0
Catawba County (Unincorporated Area)	06/05/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
Catawba County (Unincorporated Area)	07/27/13	Flash Flood	0	0	\$1,000,000	\$814,901	\$0	\$0
Catawba County (Unincorporated Area)	06/02/16	Flash Flood	0	0	\$500	\$449	\$0	\$0
City of Conover	07/27/13	Flash Flood	0	0	\$900,000	\$733,411	\$0	\$0
City of Hickory	05/19/05	Flash Flood	0	0	\$5,000	\$3,073	0	\$0

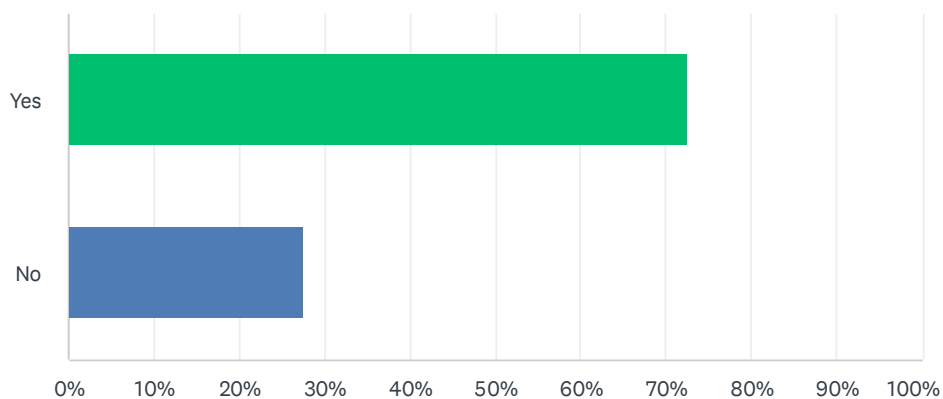
Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Property Damage (PV)	Reported Crop Damage	Reported Crop Damage (PV)
City of Hickory	07/07/05	Flash Flood	0	0	0	\$0	0	\$0
City of Hickory	07/09/13	Flash Flood	0	0	\$0	\$0	\$0	\$0
City of Hickory	07/27/13	Flash Flood	0	0	\$1,500,000	\$1,222,352	\$0	\$0
City of Hickory	07/27/13	Flash Flood	0	0	\$200,000	\$162,980	\$0	\$0
City of Hickory	07/27/13	Flash Flood	0	0	\$1,500	\$1,222	\$0	\$0
City of Hickory	07/27/13	Flood	0	0	\$100,000	\$81,490	\$0	\$0
City of Hickory	02/03/16	Flash Flood	0	0	\$2,000	\$1,777	\$0	\$0
City of Newton	08/27/08	Flash Flood	0	0	\$0	\$0	\$0	\$0
Town of Long View	07/21/12	Flash Flood	0	0	\$1,000	\$787	\$0	\$0
Town of Maiden	08/17/08	Flash Flood	0	0	\$50,000	\$34,365	\$0	\$0
Subtotal Catawba	18 Events		0	0	\$5,780,000	\$4,689,405	\$0	\$0
TOTAL PLAN	102 Events		0	1	\$6,922,500	\$5,614,203	\$0	\$0

Table C- 3: Historical Flooding Occurrences from NCDC between 2005-2018.

Appendix D: Public Survey Results

Q1 Have you ever experienced or been impacted by a disaster?

Answered: 577 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	72.44%	418
No	27.56%	159
TOTAL		577

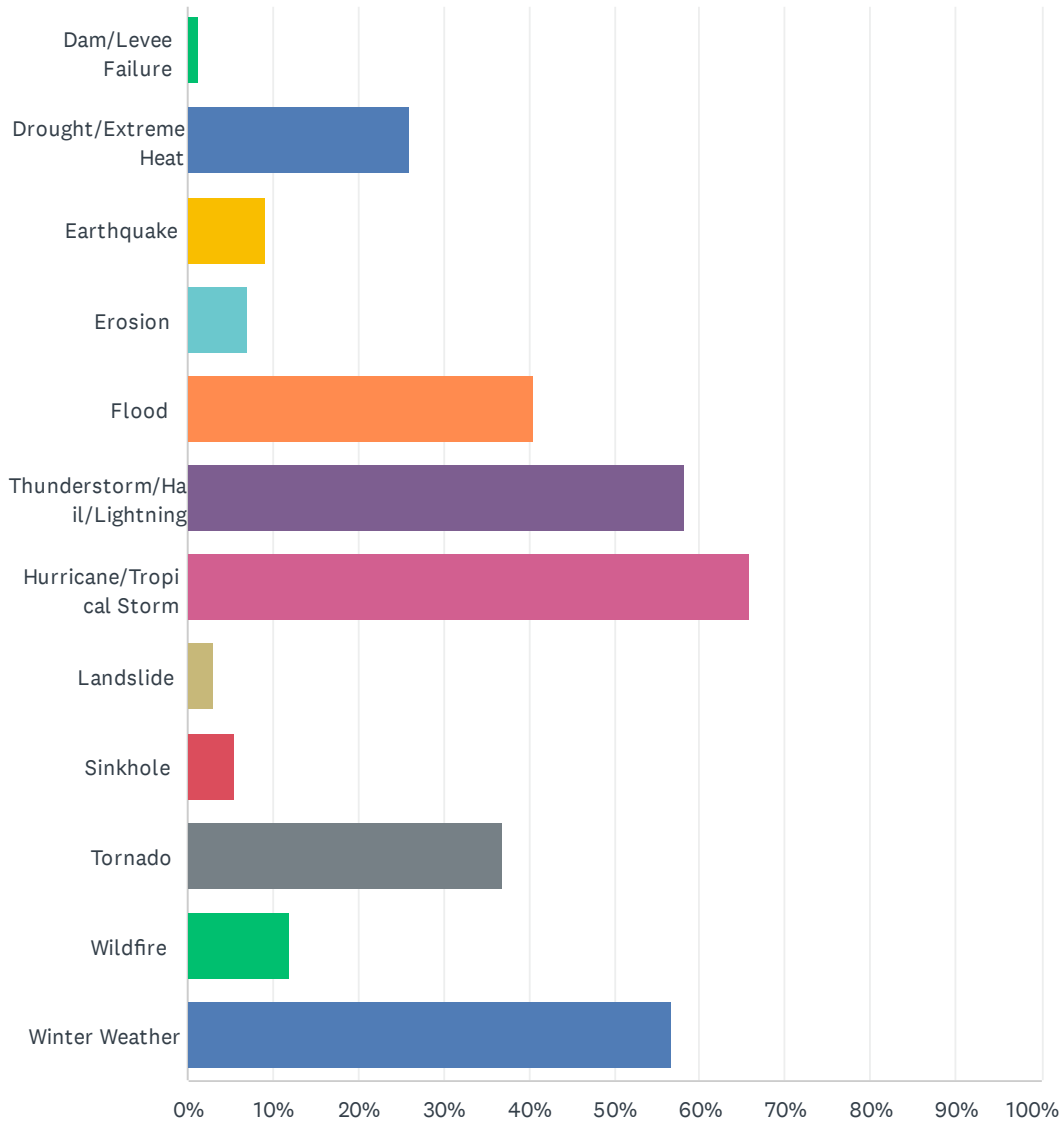
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

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Q2 If yes, Which of these natural hazards have you experienced or been impacted by? (Check all that apply.)

Answered: 439 Skipped: 140



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

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ANSWER CHOICES	RESPONSES	
Dam/Levee Failure	1.37%	6
Drought/Extreme Heat	25.97%	114
Earthquake	9.11%	40
Erosion	7.06%	31
Flood	40.55%	178
Thunderstorm/Hail/Lightning	58.31%	256
Hurricane/Tropical Storm	65.83%	289
Landslide	2.96%	13
Sinkhole	5.47%	24
Tornado	36.90%	162
Wildfire	11.85%	52
Winter Weather	56.72%	249
Total Respondents: 439		

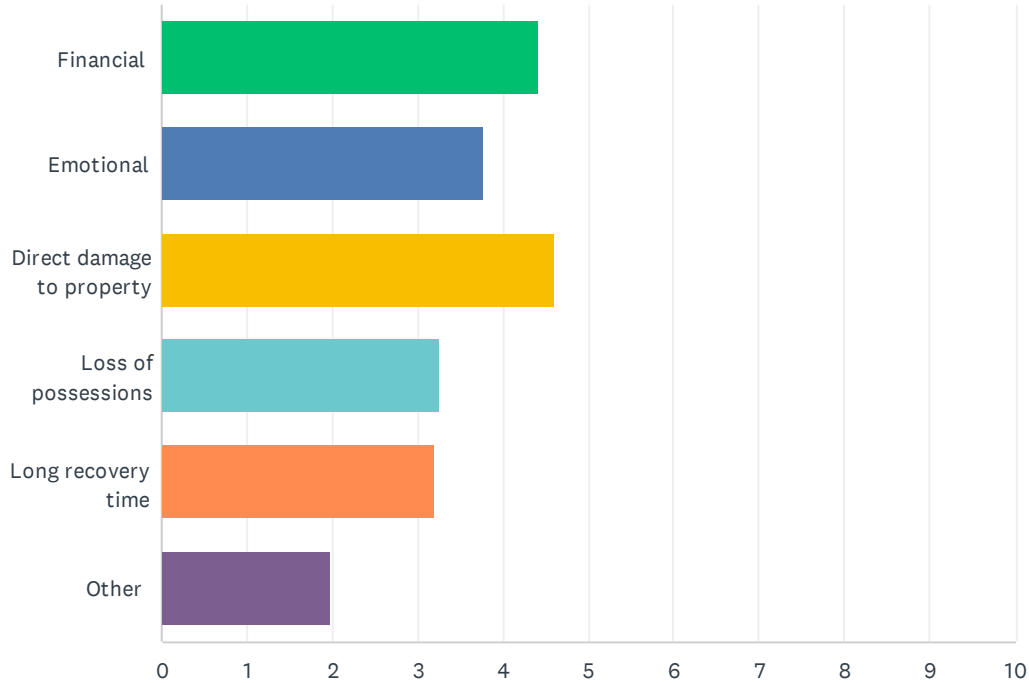
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

Q3 What was the most difficult part for you in recovering from past disasters that you have experienced? (1 being most difficult and 6 being least difficult.)

Answered: 467 Skipped: 112



	1	2	3	4	5	6	TOTAL	SCORE
Financial	27.75% 96	27.75% 96	19.08% 66	13.29% 46	7.23% 25	4.91% 17	346	4.41
Emotional	16.42% 56	17.89% 61	22.87% 78	19.06% 65	17.01% 58	6.74% 23	341	3.77
Direct damage to property	35.90% 140	24.36% 95	17.95% 70	11.79% 46	5.64% 22	4.36% 17	390	4.60
Loss of possessions	5.69% 19	14.67% 49	20.06% 67	29.64% 99	20.06% 67	9.88% 33	334	3.27
Long recovery time	10.05% 38	11.38% 43	17.72% 67	19.58% 74	31.22% 118	10.05% 38	378	3.19
Other	10.83% 26	2.08% 5	5.42% 13	5.42% 13	9.17% 22	67.08% 161	240	1.99

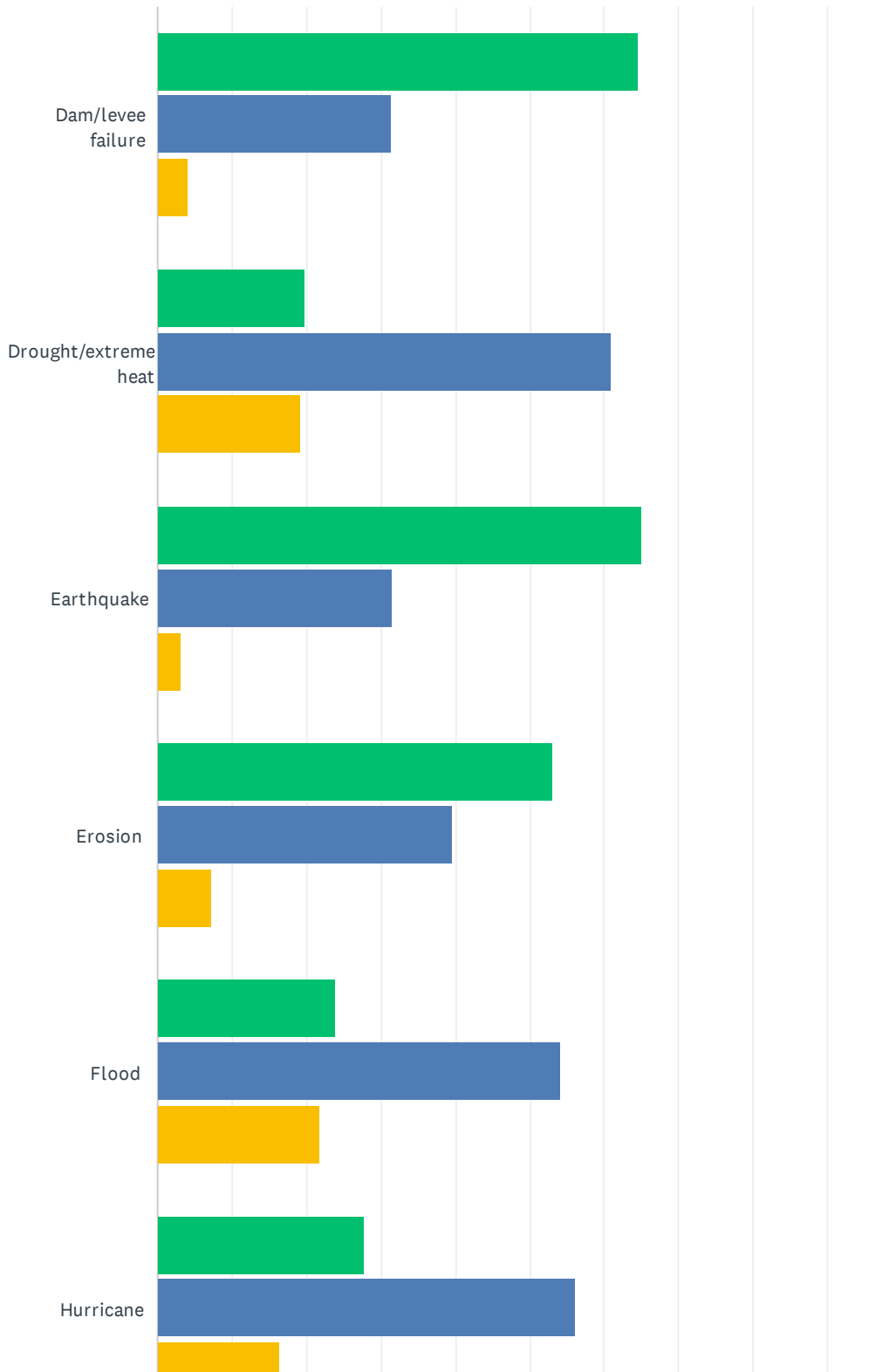
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

Q4 How concerned are you about the possibility of your community being impacted by each of these natural hazards? (Check the corresponding circle for each natural hazard.)

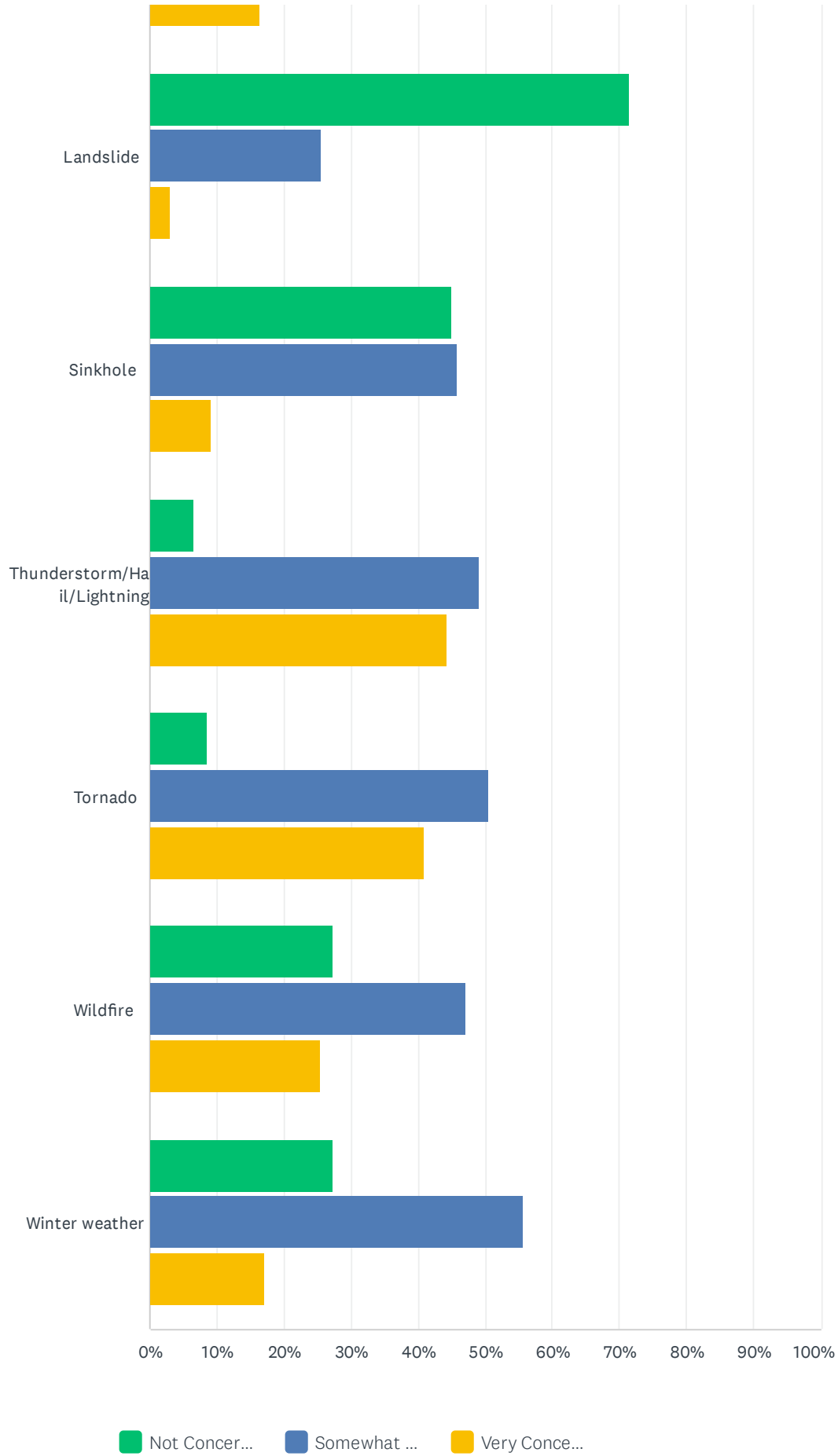
Answered: 576 Skipped: 3



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

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	NOT CONCERNED	SOMEWHAT CONCERNED	VERY CONCERNED	TOTAL	WEIGHTED AVERAGE
Dam/levee failure	64.62% 358	31.41% 174	3.97% 22	554	1.39
Drought/extreme heat	19.82% 112	60.88% 344	19.29% 109	565	1.99
Earthquake	65.11% 362	31.65% 176	3.24% 18	556	1.38
Erosion	53.06% 295	39.75% 221	7.19% 40	556	1.54
Flood	23.94% 136	54.23% 308	21.83% 124	568	1.98
Hurricane	27.66% 156	56.03% 316	16.31% 92	564	1.89
Landslide	71.32% 393	25.59% 141	3.09% 17	551	1.32
Sinkhole	44.95% 249	45.85% 254	9.21% 51	554	1.64
Thunderstorm/Hail/Lightning	6.53% 37	49.03% 278	44.44% 252	567	2.38
Tornado	8.47% 48	50.62% 287	40.92% 232	567	2.32
Wildfire	27.37% 153	47.23% 264	25.40% 142	559	1.98
Winter weather	27.22% 153	55.69% 313	17.08% 96	562	1.90

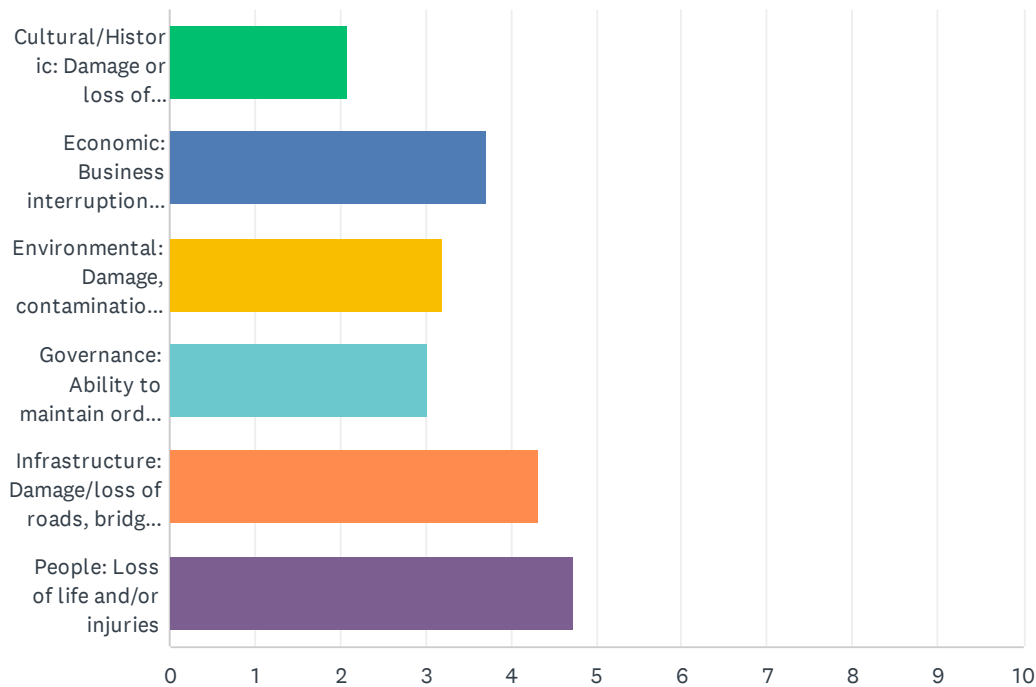
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

Q5 In your opinion, which of the following categories are most susceptible to natural hazards in your community? (Rank the community assets in order of vulnerability, 1 being most vulnerable and 6 being least vulnerable.) Please note, the list will automatically re-order itself as you make your selections. You can also drag and drop the items on the list to reorder them.

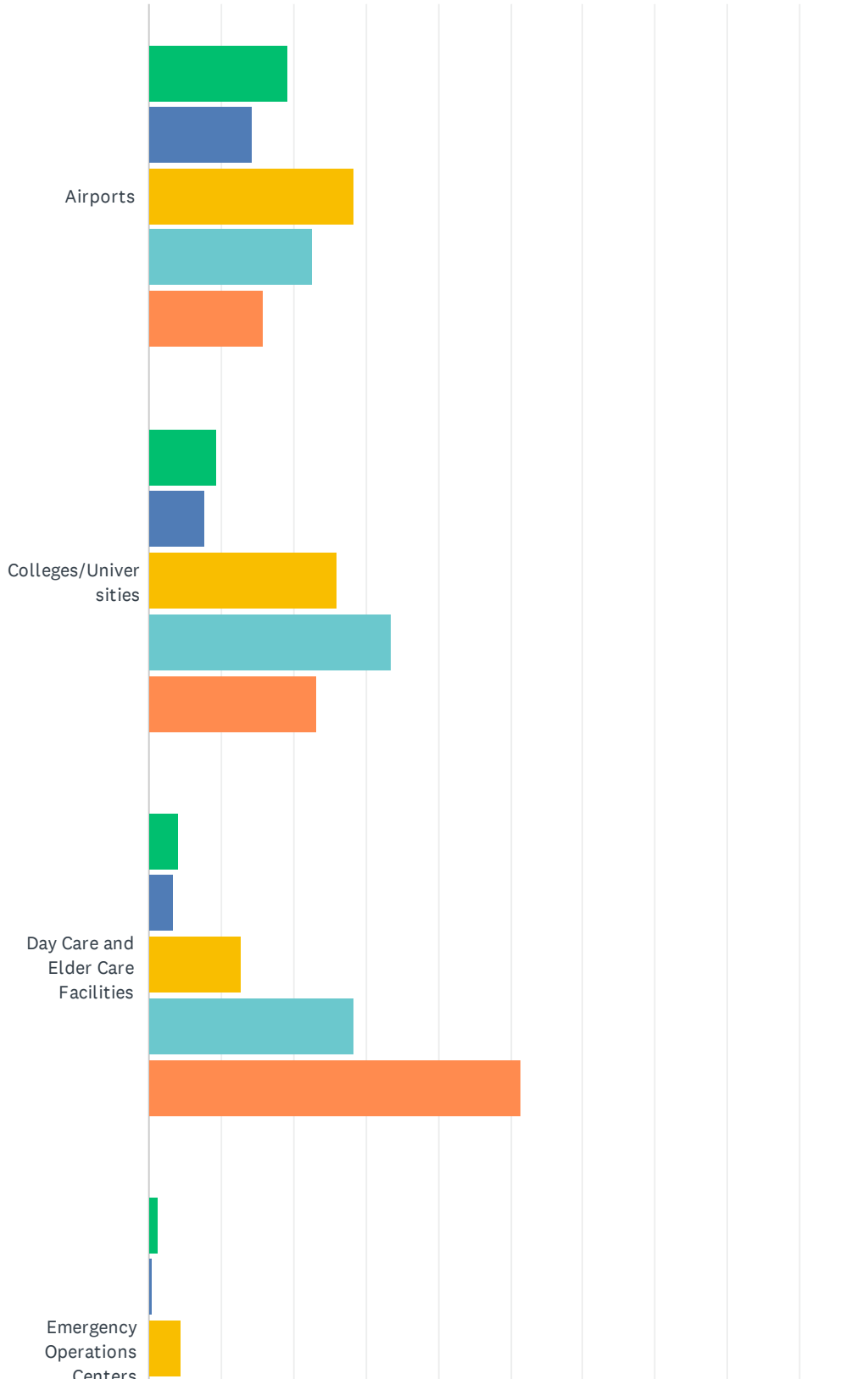
Answered: 572 Skipped: 7



	1	2	3	4	5	6	TOTAL	SCORE
Cultural/Historic: Damage or loss of libraries, museums, historic properties, etc.	5.31% 28	5.31% 28	6.83% 36	10.25% 54	20.49% 108	51.80% 273	527	2.09
Economic: Business interruptions/closures, job losses, etc.	11.00% 57	16.99% 88	28.76% 149	23.75% 123	13.51% 70	5.98% 31	518	3.70
Environmental: Damage, contamination or loss of forests, wetlands, waterways, etc.	7.37% 39	13.42% 71	18.15% 96	23.82% 126	26.28% 139	10.96% 58	529	3.19
Governance: Ability to maintain order and/or provide public amenities and services	5.79% 31	12.71% 68	17.01% 91	24.67% 132	22.06% 118	17.76% 95	535	3.02
Infrastructure: Damage/loss of roads, bridges, utilities, schools, etc.	17.53% 95	38.93% 211	19.56% 106	10.52% 57	10.15% 55	3.32% 18	542	4.33
People: Loss of life and/or injuries	52.41% 294	13.55% 76	11.94% 67	7.66% 43	5.70% 32	8.73% 49	561	4.73

Q6 How important is each of the following specific community assets to you? (Check the appropriate circle for each asset.)

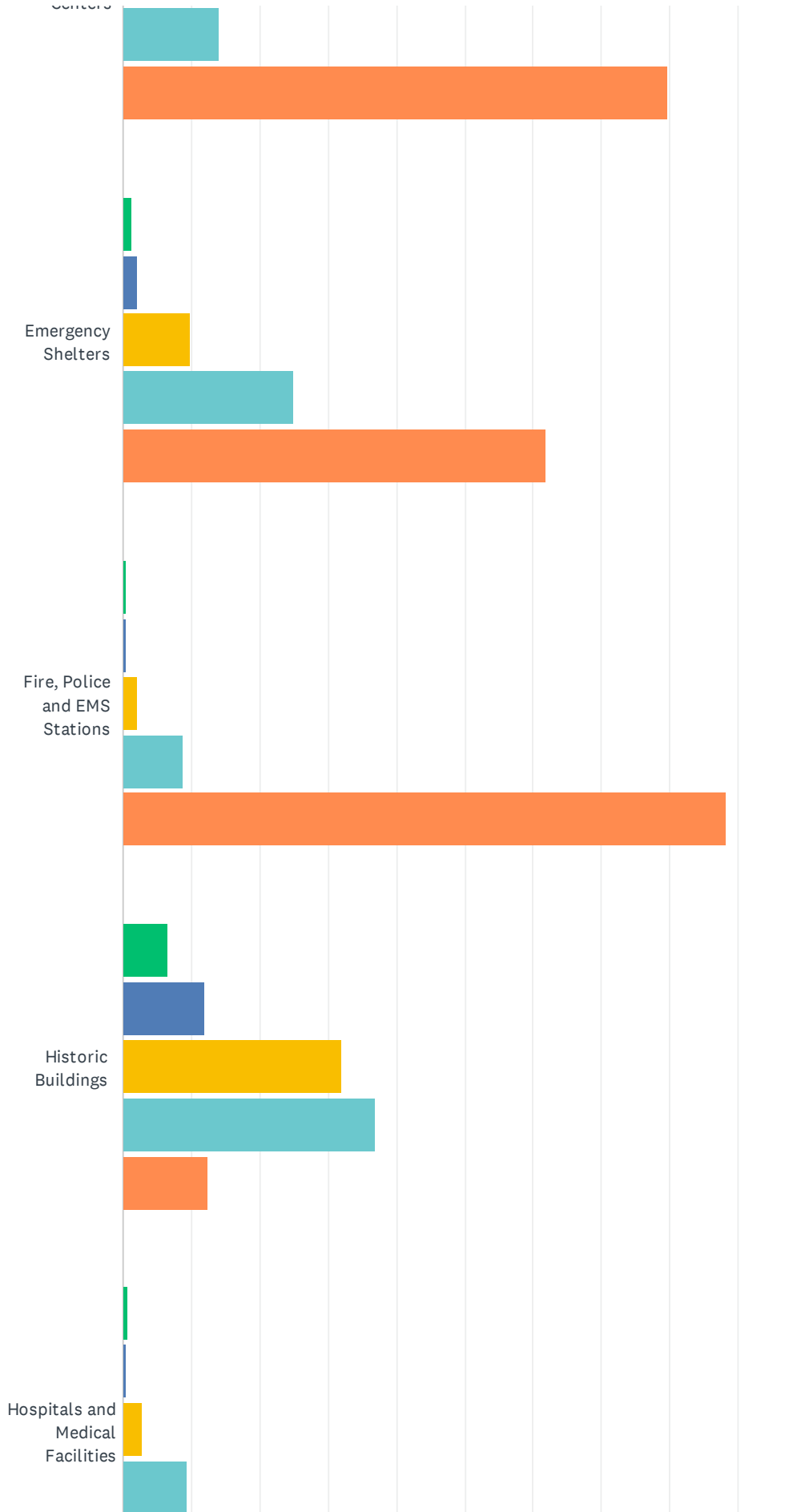
Answered: 576 Skipped: 3



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

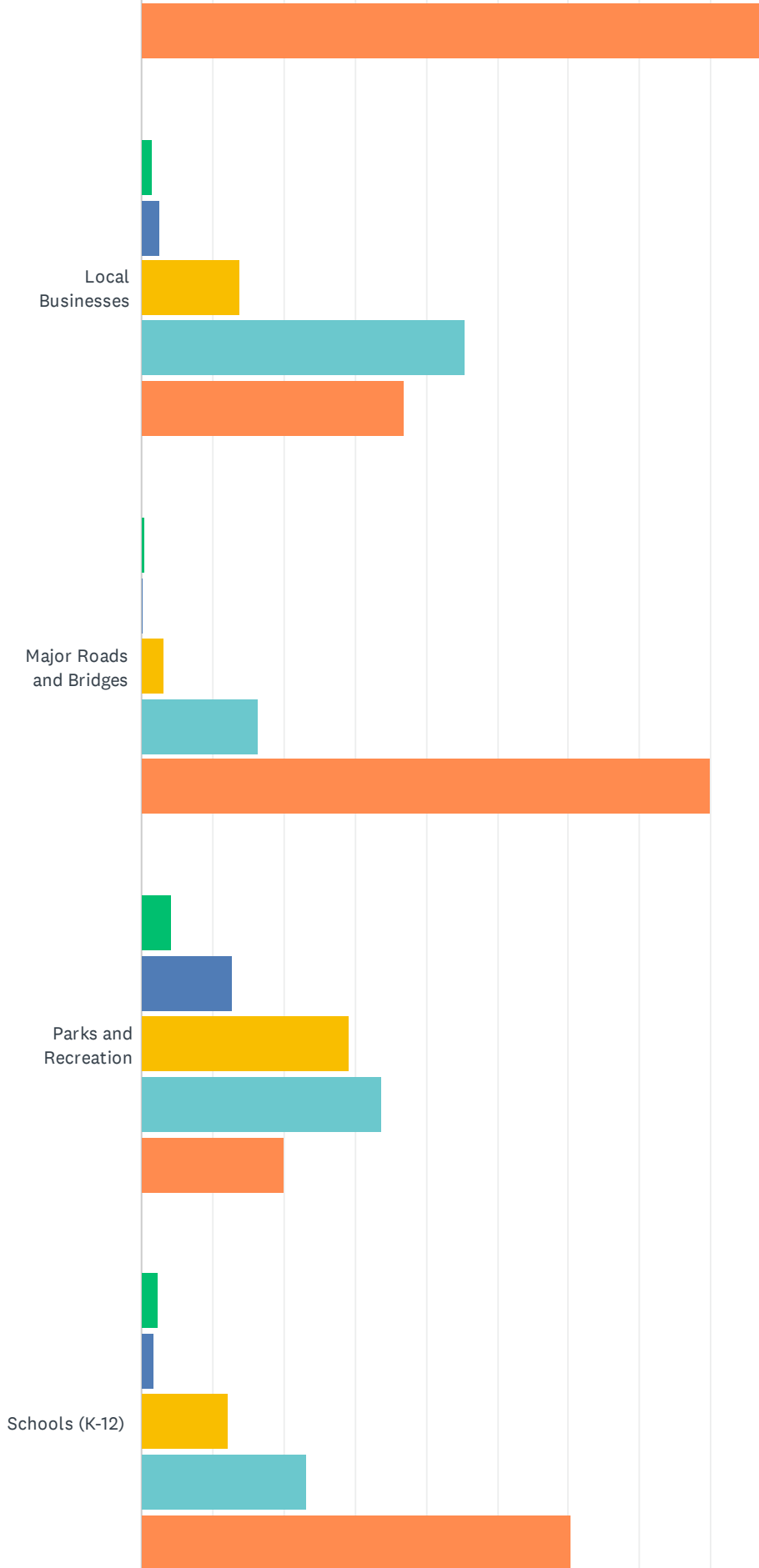
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Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

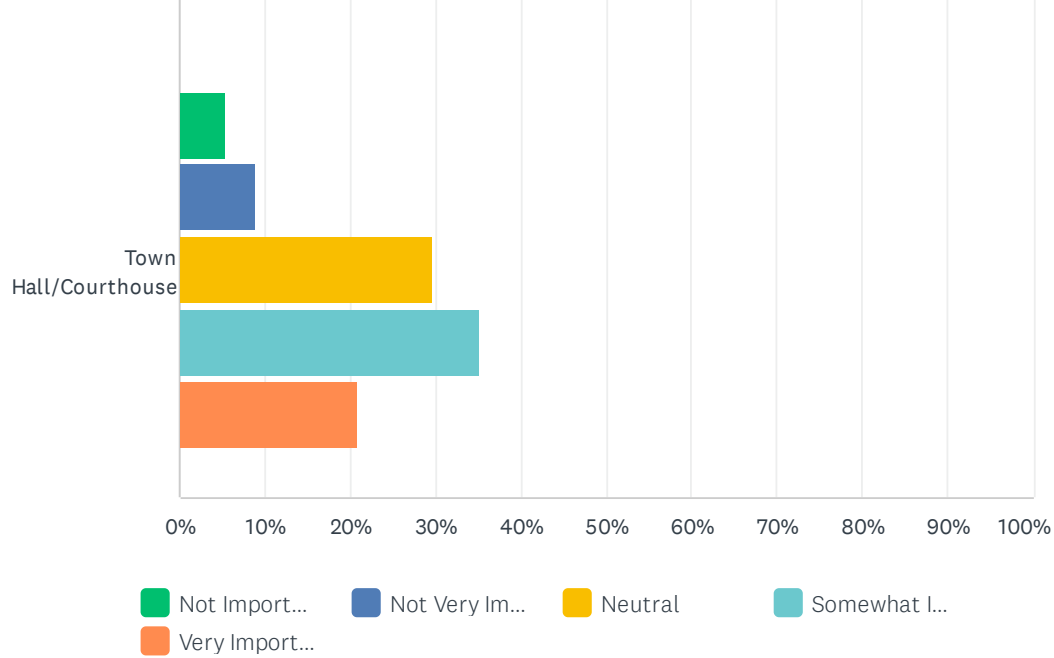
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Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey



	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Airports	19.11% 107	14.29% 80	28.39% 159	22.50% 126	15.71% 88	560	3.01
Colleges/Universities	9.35% 53	7.76% 44	26.10% 148	33.51% 190	23.28% 132	567	3.54
Day Care and Elder Care Facilities	4.01% 23	3.49% 20	12.74% 73	28.27% 162	51.48% 295	573	4.20
Emergency Operations Centers	1.22% 7	0.52% 3	4.51% 26	14.06% 81	79.69% 459	576	4.70
Emergency Shelters	1.22% 7	2.09% 12	9.91% 57	25.04% 144	61.74% 355	575	4.44
Fire, Police and EMS Stations	0.52% 3	0.35% 2	2.09% 12	8.70% 50	88.35% 508	575	4.84
Historic Buildings	6.65% 38	11.91% 68	32.05% 183	36.95% 211	12.43% 71	571	3.37
Hospitals and Medical Facilities	0.70% 4	0.35% 2	2.78% 16	9.39% 54	86.78% 499	575	4.81
Local Businesses	1.40% 8	2.62% 15	13.79% 79	45.38% 260	36.82% 211	573	4.14
Major Roads and Bridges	0.35% 2	0.17% 1	3.13% 18	16.35% 94	80.00% 460	575	4.75
Parks and Recreation	4.18% 24	12.89% 74	29.27% 168	33.62% 193	20.03% 115	574	3.52
Schools (K-12)	2.45% 14	1.75% 10	12.24% 70	23.25% 133	60.31% 345	572	4.37
Town Hall/Courthouse	5.24% 30	8.90% 51	29.67% 170	35.25% 202	20.94% 120	573	3.58

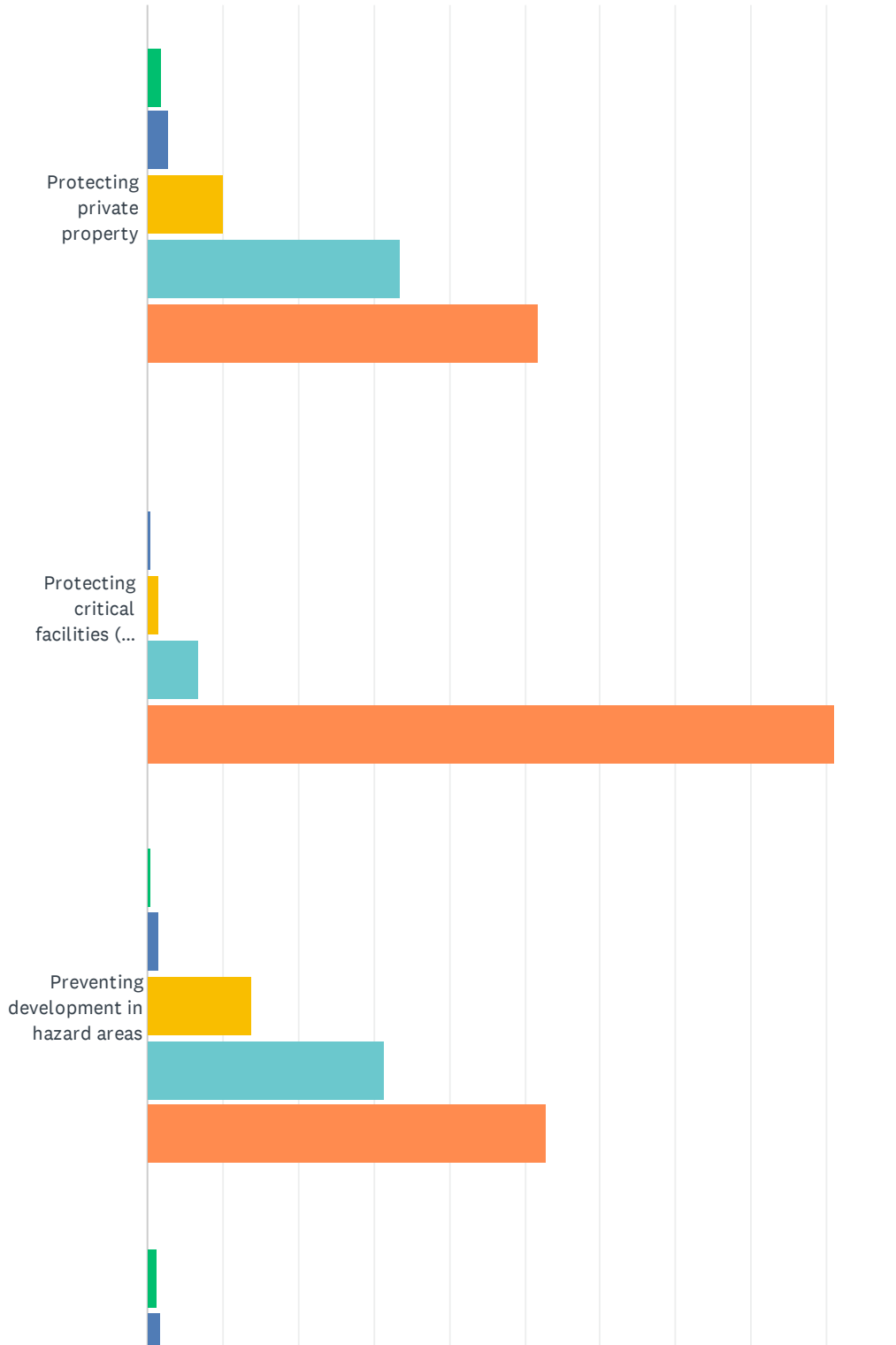
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

Q7 Natural hazards can have a significant impact on a community, but planning for these types of events can help lessen the impacts. Please tell us how important each statement is to you by checking the appropriate circle for each.

Answered: 576 Skipped: 3



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

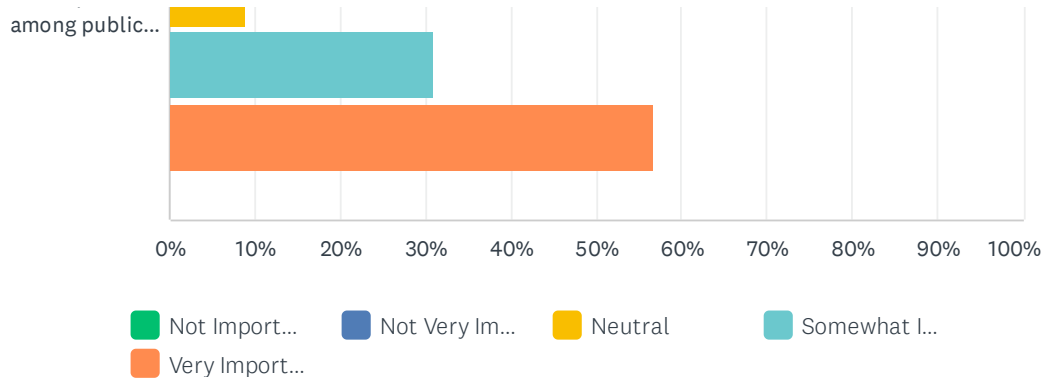
SurveyMonkey



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey



	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Protecting private property	1.82% 10	2.73% 15	10.02% 55	33.52% 184	51.91% 285	549	4.31
Protecting critical facilities (for example, hospitals, police stations, fire stations, etc.)	0.00% 0	0.52% 3	1.57% 9	6.81% 39	91.10% 522	573	4.88
Preventing development in hazard areas	0.35% 2	1.40% 8	13.96% 80	31.41% 180	52.88% 303	573	4.35
Enhancing the function of natural features (for example, streams, wetlands, etc.)	1.23% 7	1.75% 10	18.95% 108	41.23% 235	36.84% 210	570	4.11
Protecting historical and cultural landmarks	5.81% 33	7.92% 45	30.11% 171	37.85% 215	18.31% 104	568	3.55
Protecting and reducing damage to utilities	0.00% 0	0.00% 0	3.84% 22	21.29% 122	74.87% 429	573	4.71
Strengthening emergency services (for example, police, fire, ambulance)	0.17% 1	0.52% 3	2.97% 17	11.54% 66	84.79% 485	572	4.80
Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses	1.74% 10	1.57% 9	8.89% 51	31.01% 178	56.79% 326	574	4.40

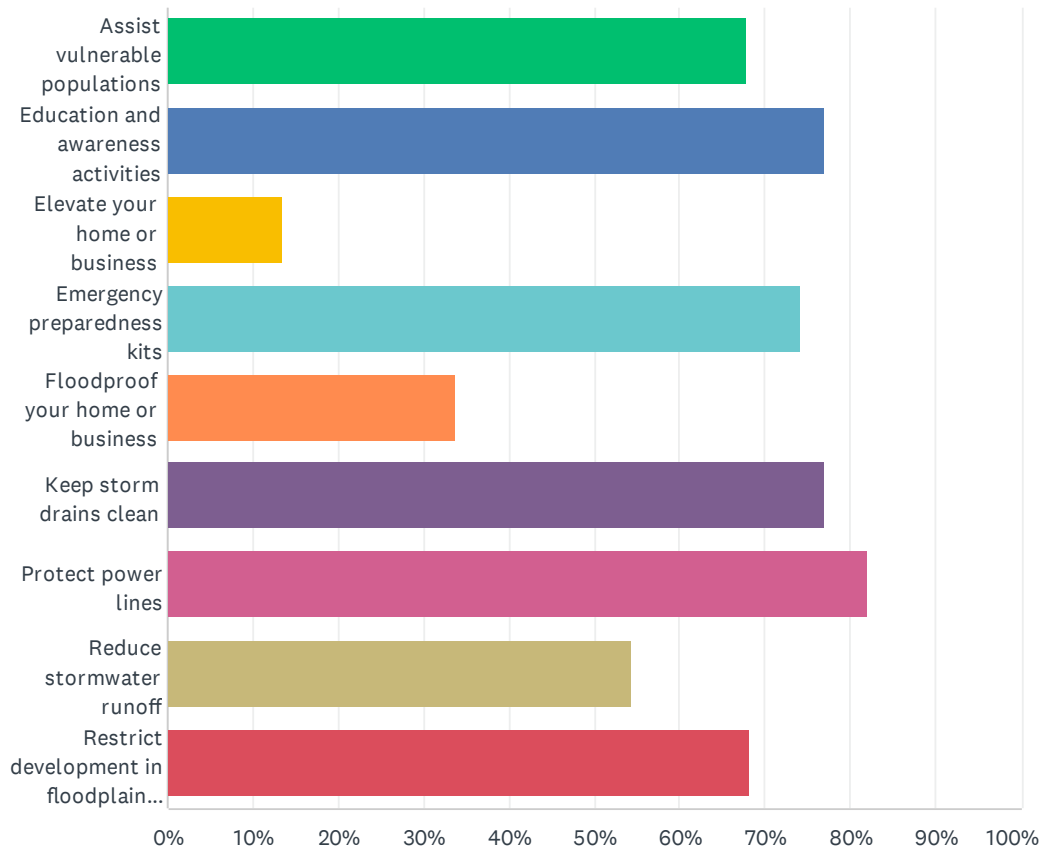
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

Q8 What are some steps that you and/or your local government could take to reduce or eliminate the risk of future natural hazard damages in your neighborhood?

Answered: 571 Skipped: 8



ANSWER CHOICES	RESPONSES
Assist vulnerable populations	67.78% 387
Education and awareness activities	77.06% 440
Elevate your home or business	13.49% 77
Emergency preparedness kits	74.26% 424
Floodproof your home or business	33.63% 192
Keep storm drains clean	76.88% 439
Protect power lines	82.14% 469
Reduce stormwater runoff	54.47% 311
Restrict development in floodplain areas	68.13% 389
Total Respondents: 571	

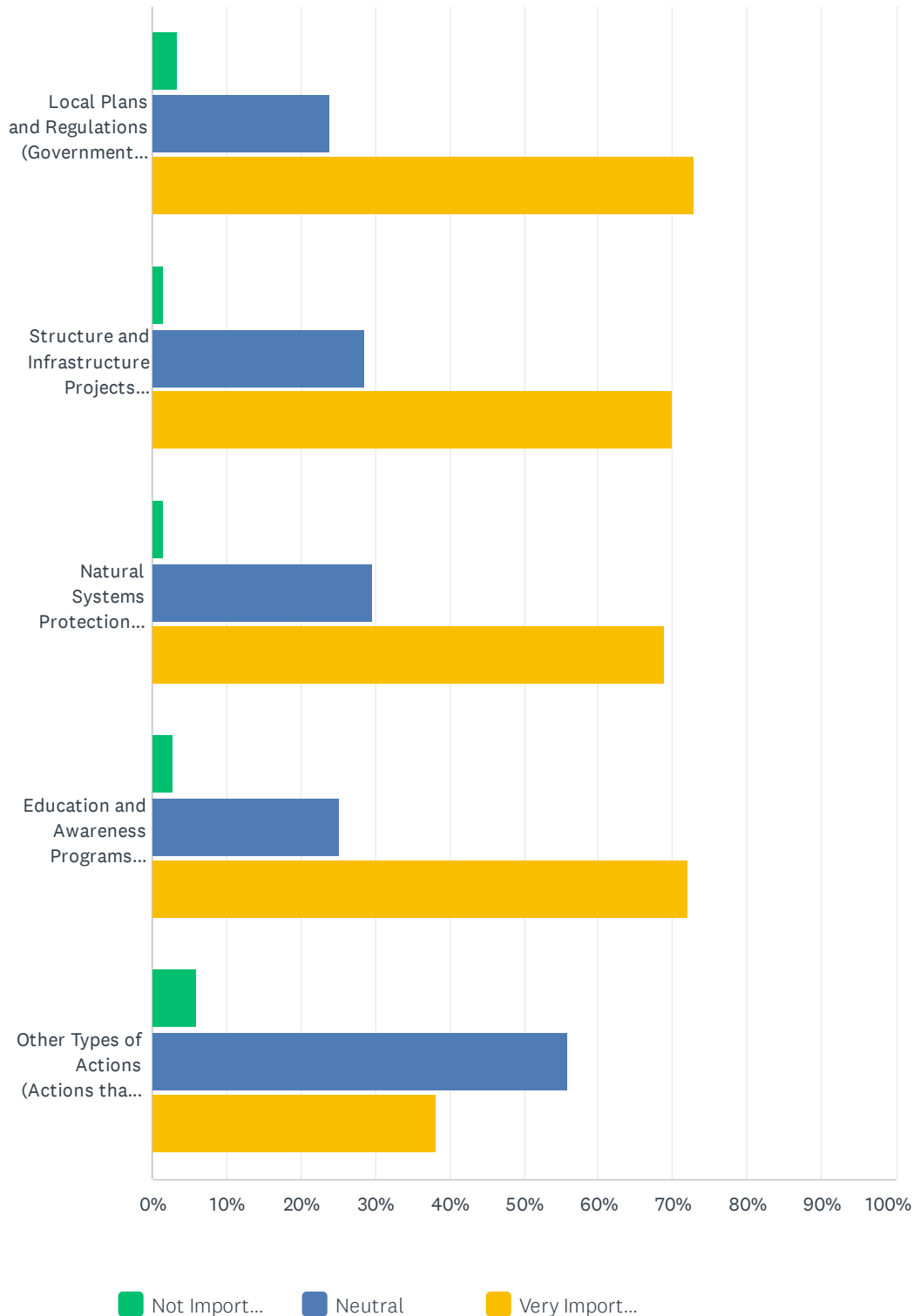
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

Q9 A number of community-wide activities can reduce risk from natural hazards. Please tell us how important you think each one is for your community to consider pursuing.

Answered: 572 Skipped: 7



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

	NOT IMPORTANT	NEUTRAL	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Local Plans and Regulations (Government policies or codes that influence the way land and buildings are developed and built.)	3.32% 19	23.78% 136	72.90% 417	572	2.70
Structure and Infrastructure Projects (Modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area.)	1.40% 8	28.60% 163	70.00% 399	570	2.69
Natural Systems Protection (Actions that minimize damage and losses and also preserve or restore the functions of natural systems.)	1.41% 8	29.70% 169	68.89% 392	569	2.67
Education and Awareness Programs (Actions that inform and educate citizens, elected officials and property owners about hazards and potential ways to mitigate them.)	2.81% 16	25.09% 143	72.11% 411	570	2.69
Other Types of Actions (Actions that are related to mitigation in ways that make sense to the local government that do not fall into one of the categories above.)	6.05% 34	55.87% 314	38.08% 214	562	2.32

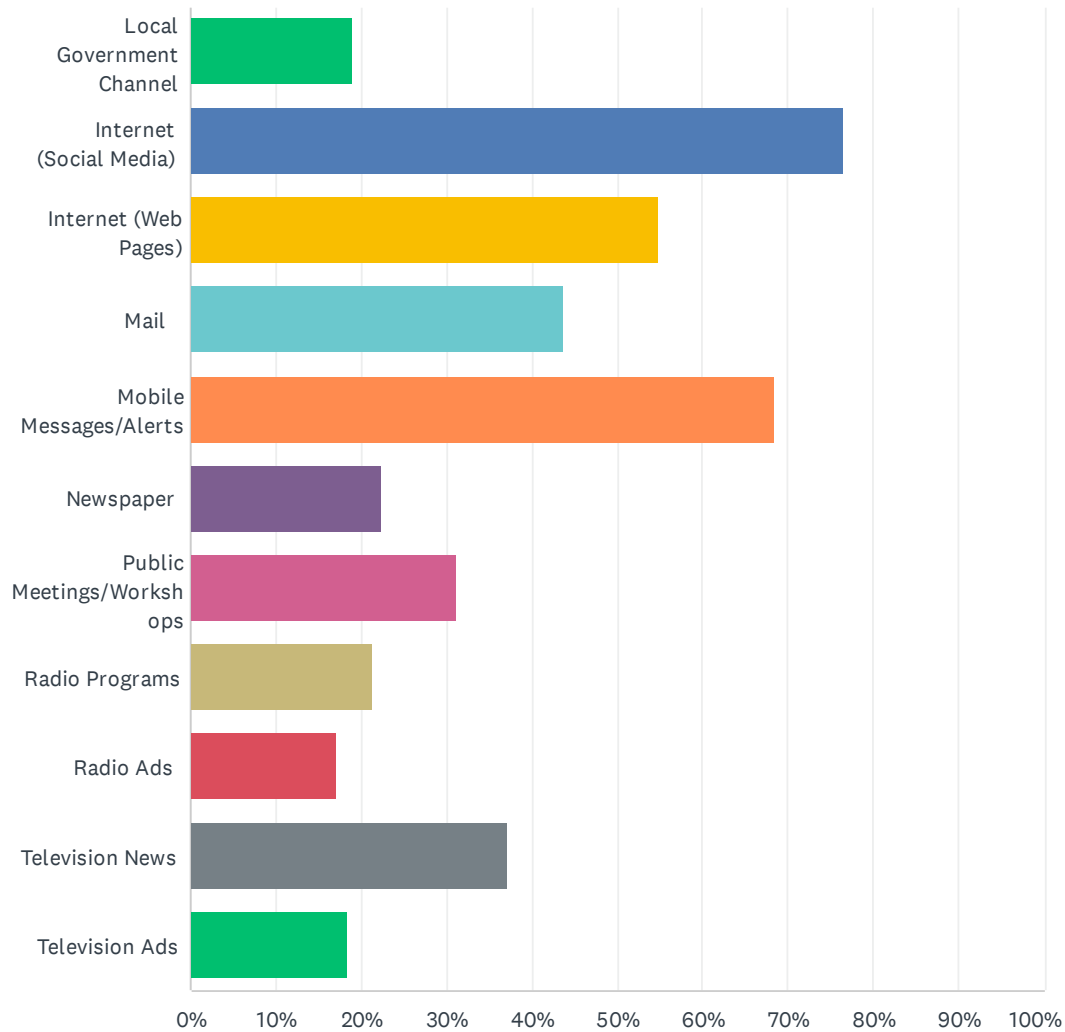
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

Q10 What are the most effective ways for you to receive information about how to make your home and neighborhood more resistant to natural hazards?

Answered: 570 Skipped: 9



Appendix D: Public Survey Results

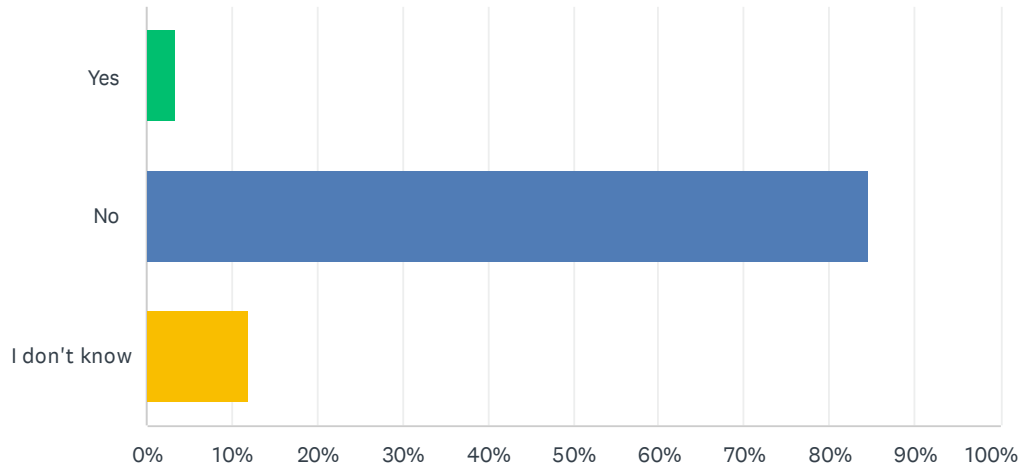
2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey

ANSWER CHOICES	RESPONSES	
Local Government Channel	18.95%	108
Internet (Social Media)	76.49%	436
Internet (Web Pages)	54.74%	312
Mail	43.68%	249
Mobile Messages/Alerts	68.42%	390
Newspaper	22.46%	128
Public Meetings/Workshops	31.05%	177
Radio Programs	21.23%	121
Radio Ads	17.02%	97
Television News	37.19%	212
Television Ads	18.42%	105
Total Respondents: 570		

Q11 Is your home located in a floodplain?

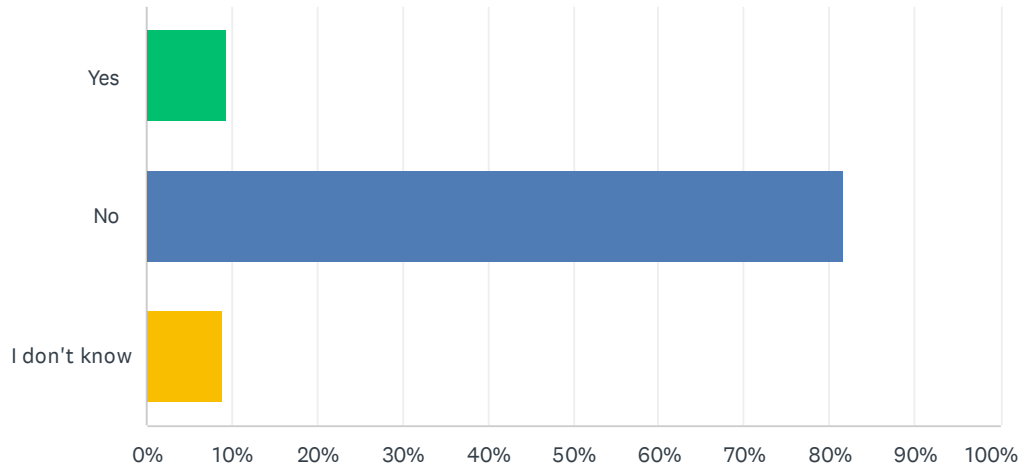
Answered: 574 Skipped: 5



ANSWER CHOICES	RESPONSES
Yes	3.48% 20
No	84.67% 486
I don't know	11.85% 68
TOTAL	574

Q12 Do you have flood insurance?

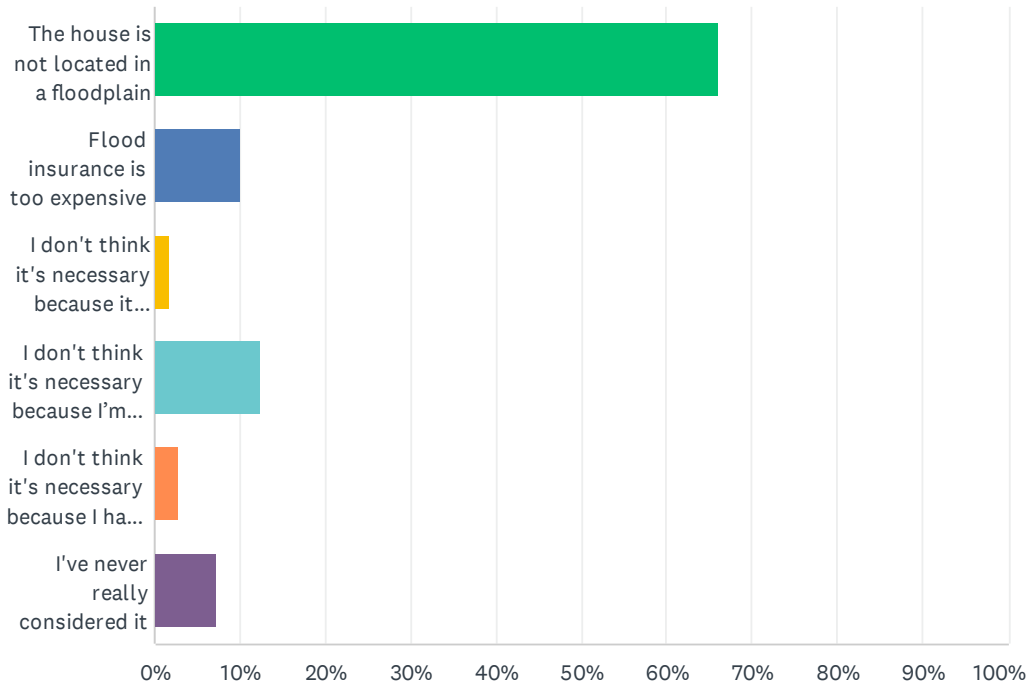
Answered: 575 Skipped: 4



ANSWER CHOICES	RESPONSES
Yes	9.39% 54
No	81.57% 469
I don't know	9.04% 52
TOTAL	575

Q13 If "No," why not?

Answered: 487 Skipped: 92

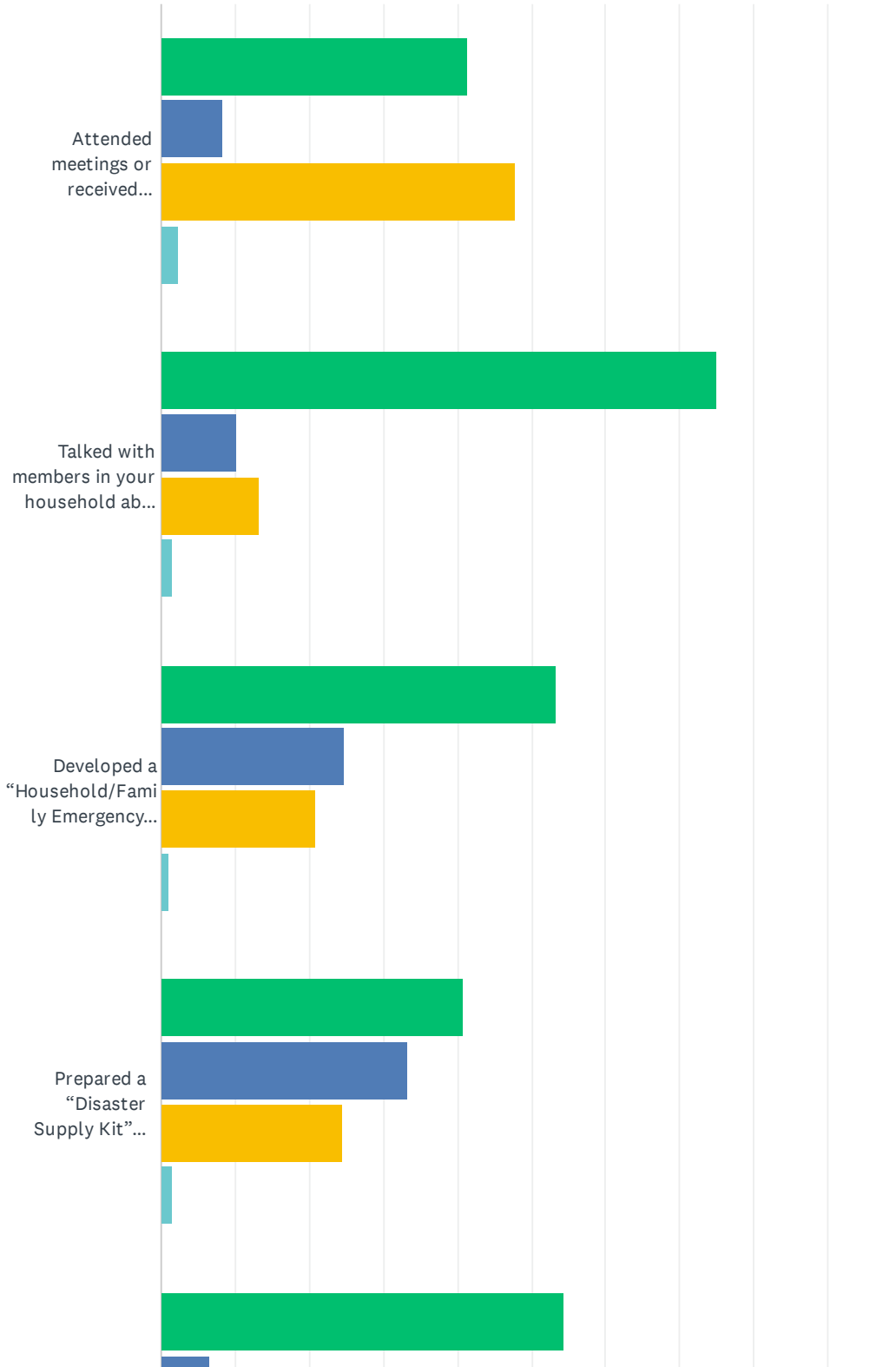


ANSWER CHOICES	RESPONSES	
The house is not located in a floodplain	66.12%	322
Flood insurance is too expensive	10.06%	49
I don't think it's necessary because it never floods	1.64%	8
I don't think it's necessary because I'm elevated or otherwise protected	12.32%	60
I don't think it's necessary because I have homeowners insurance	2.67%	13
I've never really considered it	7.19%	35
TOTAL		487

Appendix D: Public Survey Results

Q14 In the following list, please check the activities that you have done in your household, plan to do in the near future, have not done, or are unable to do. (Please check one response for each preparedness activity.)

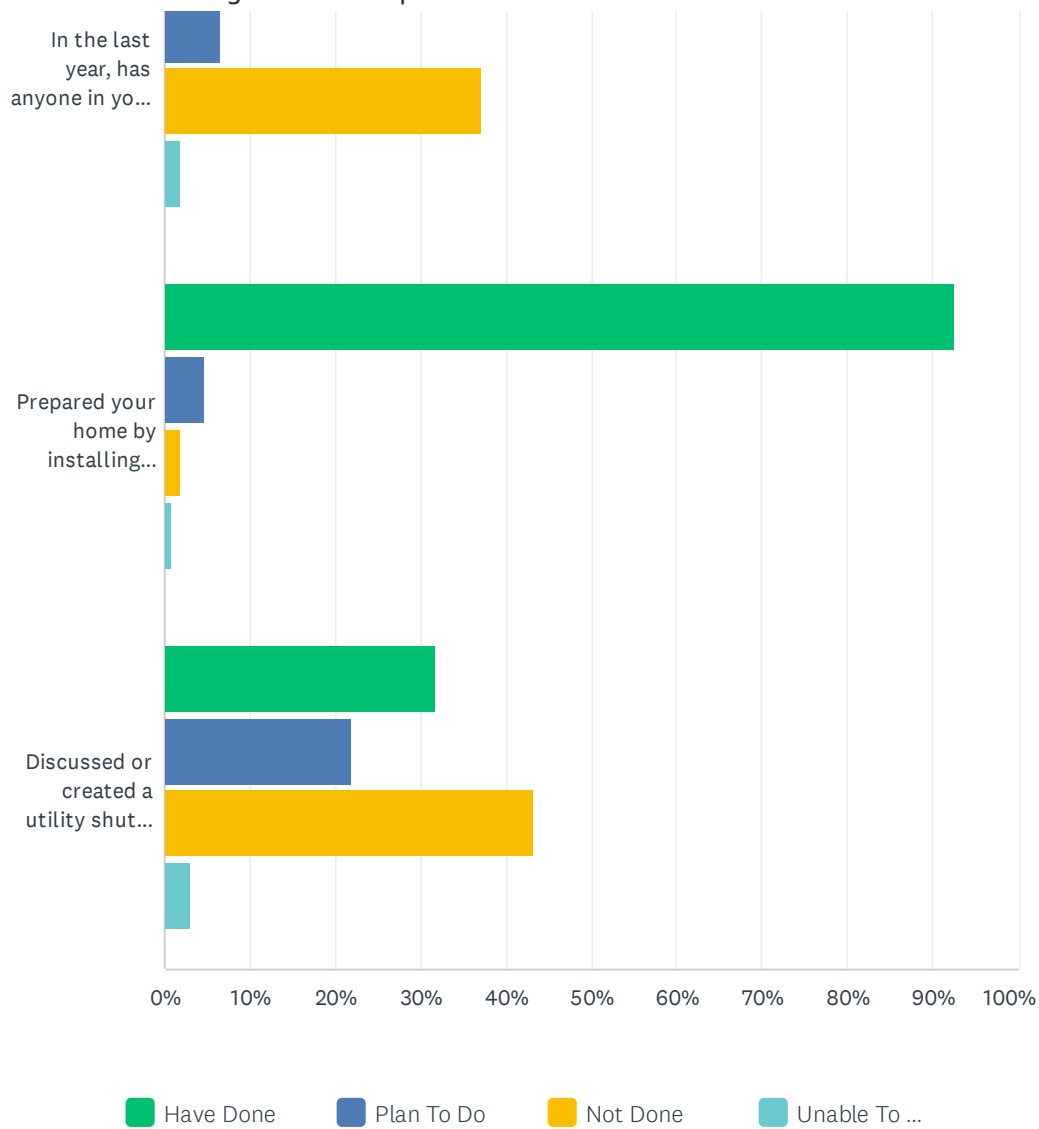
Answered: 574 Skipped: 5



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

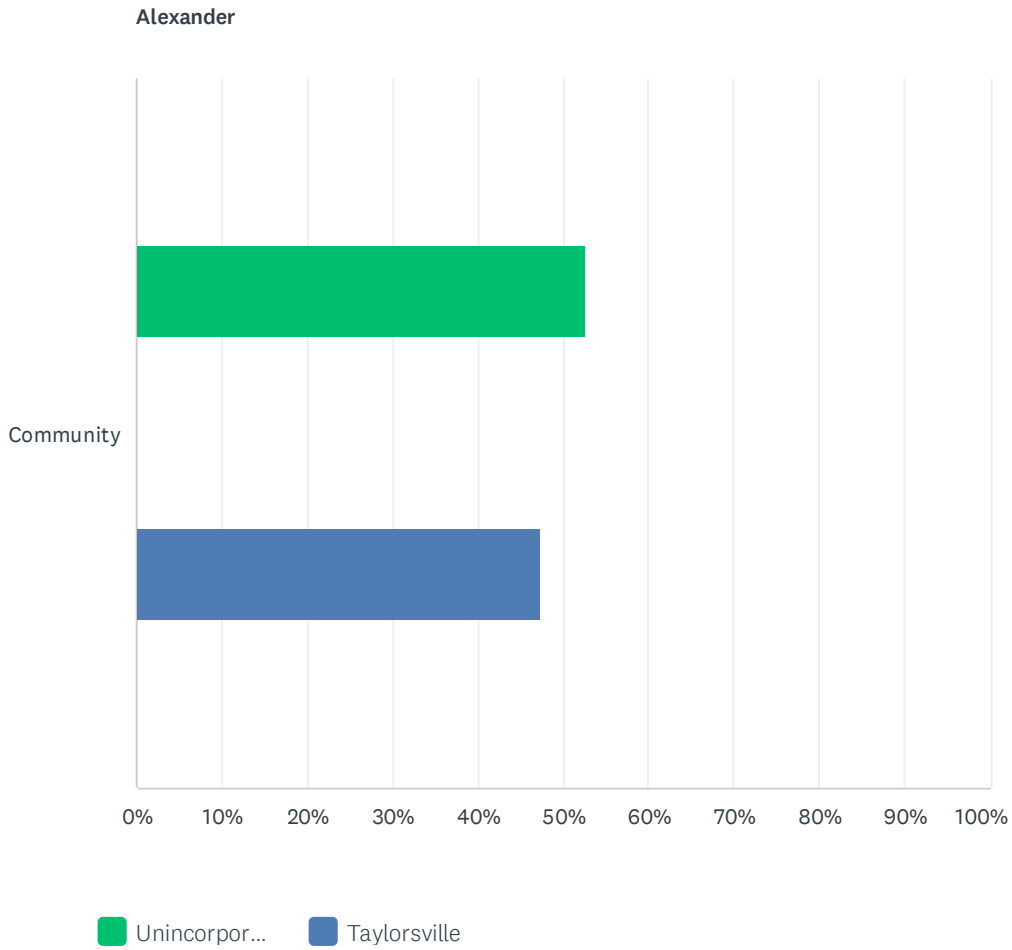
SurveyMonkey



	HAVE DONE	PLAN TO DO	NOT DONE	UNABLE TO DO	TOTAL
Attended meetings or received written information on natural disasters or emergency preparedness?	41.46% 238	8.36% 48	47.74% 274	2.44% 14	574
Talked with members in your household about what to do in case of a natural disaster or emergency?	74.96% 428	10.33% 59	13.31% 76	1.40% 8	571
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	53.32% 305	24.65% 141	20.98% 120	1.05% 6	572
Prepared a "Disaster Supply Kit" (stored extra food, water, batteries or other emergency supplies)?	40.77% 234	33.28% 191	24.56% 141	1.39% 8	574
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?	54.36% 312	6.62% 38	37.11% 213	1.92% 11	574
Prepared your home by installing smoke detectors on each level of the house?	92.48% 529	4.72% 27	1.92% 11	0.87% 5	572
Discussed or created a utility shutoff procedure in the event of a natural disaster?	31.82% 182	22.03% 126	43.18% 247	2.97% 17	572

Q15 In which community do you live?

Answered: 543 Skipped: 36



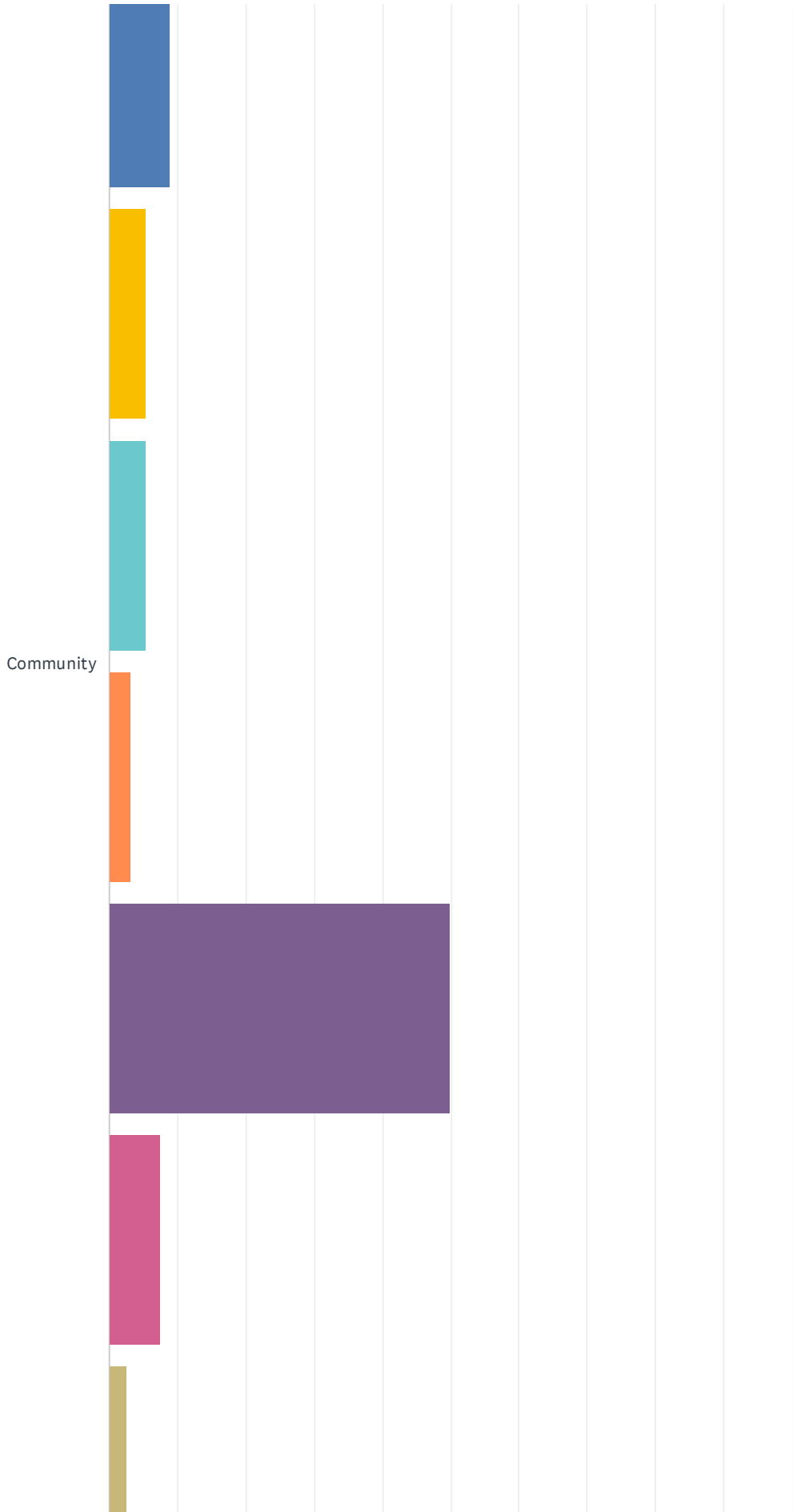
Burke



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

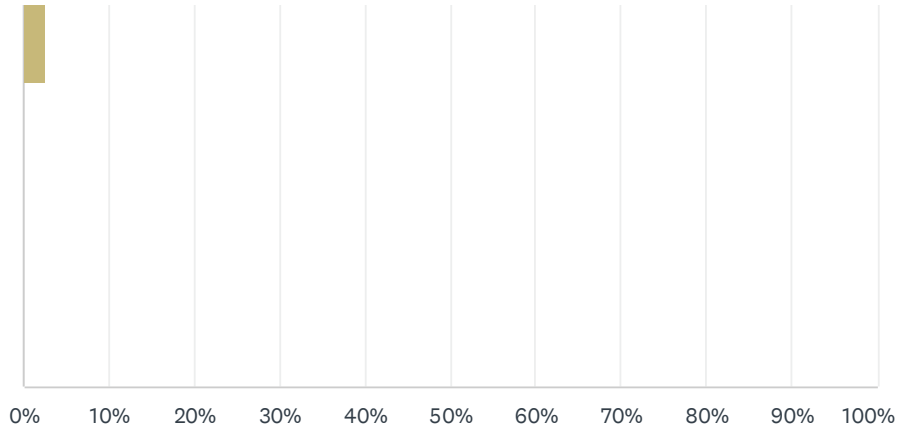
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Appendix D: Public Survey Results

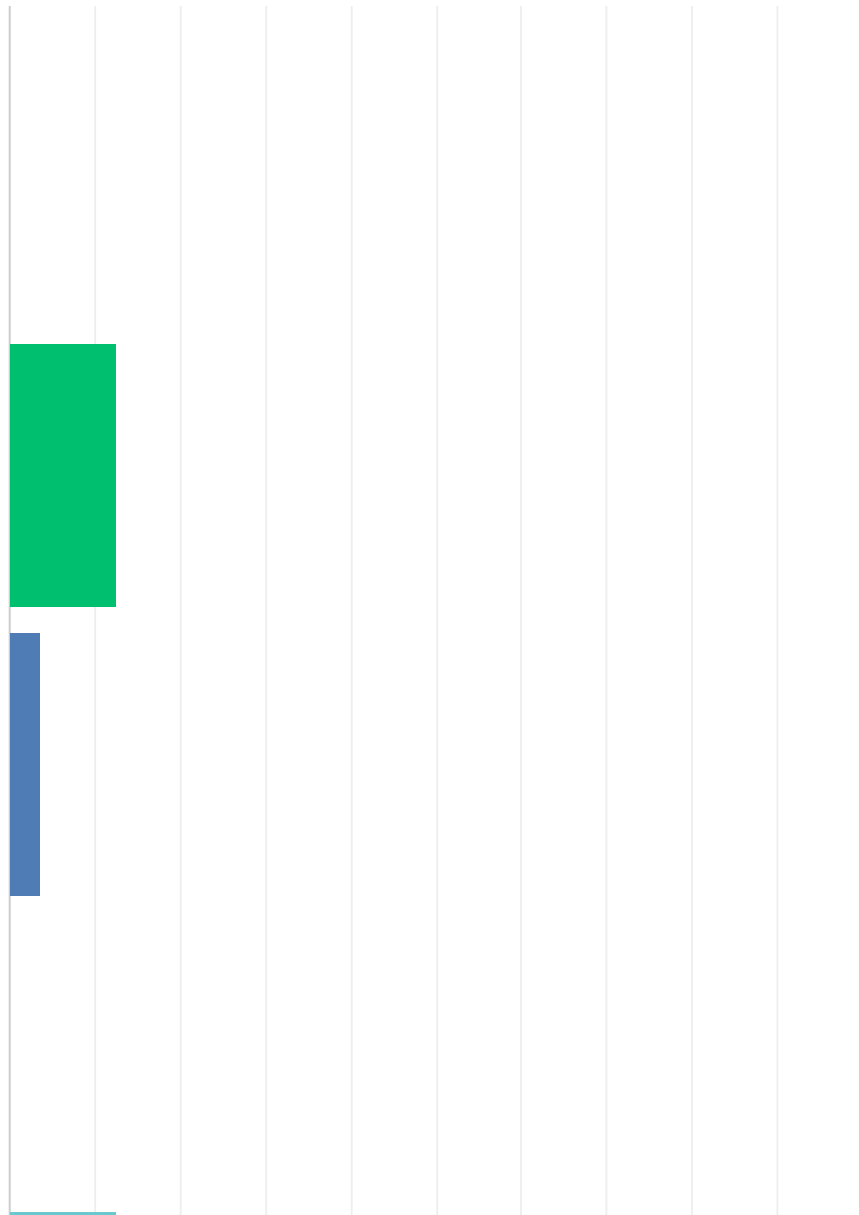
2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey



- Unincorporated
- Hildebran
- Connelly Sp...
- Morganton
- Drexel
- Valdese
- Glen Alpine
- Rutherford ...

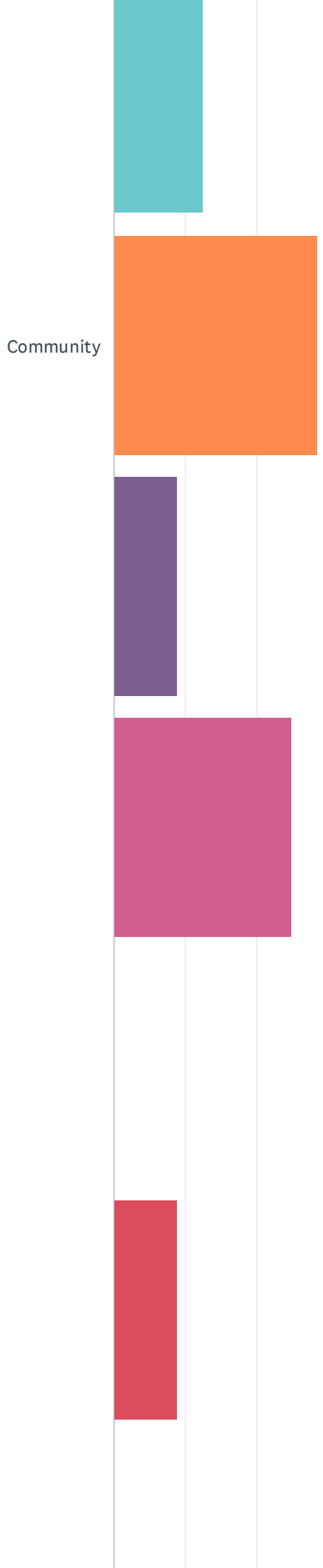
Caldwell



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

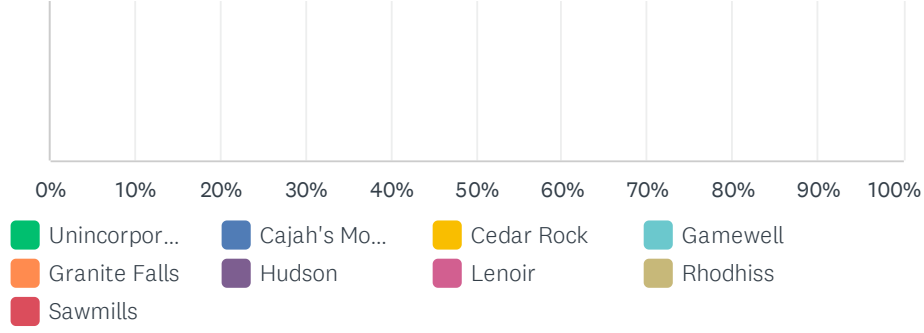
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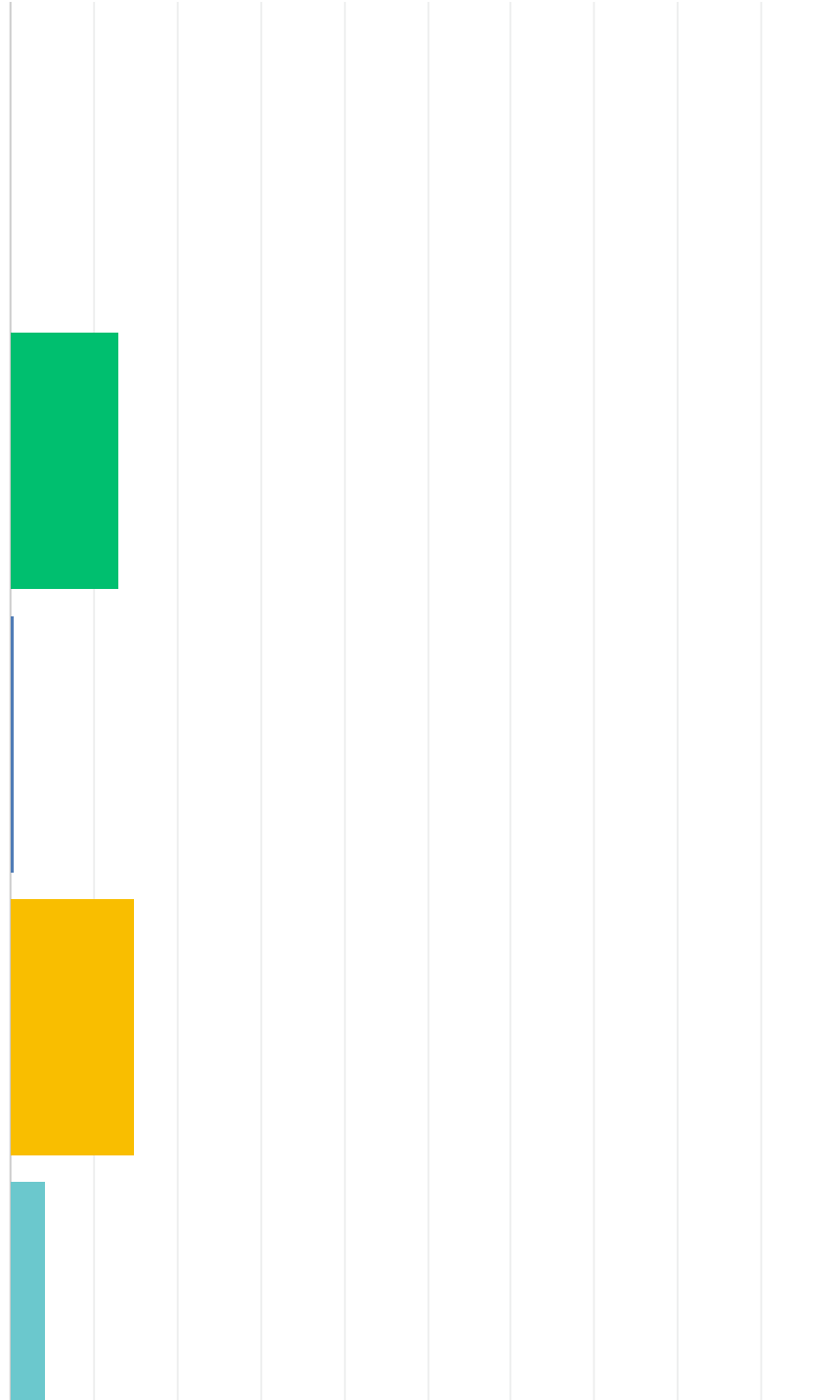
Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey



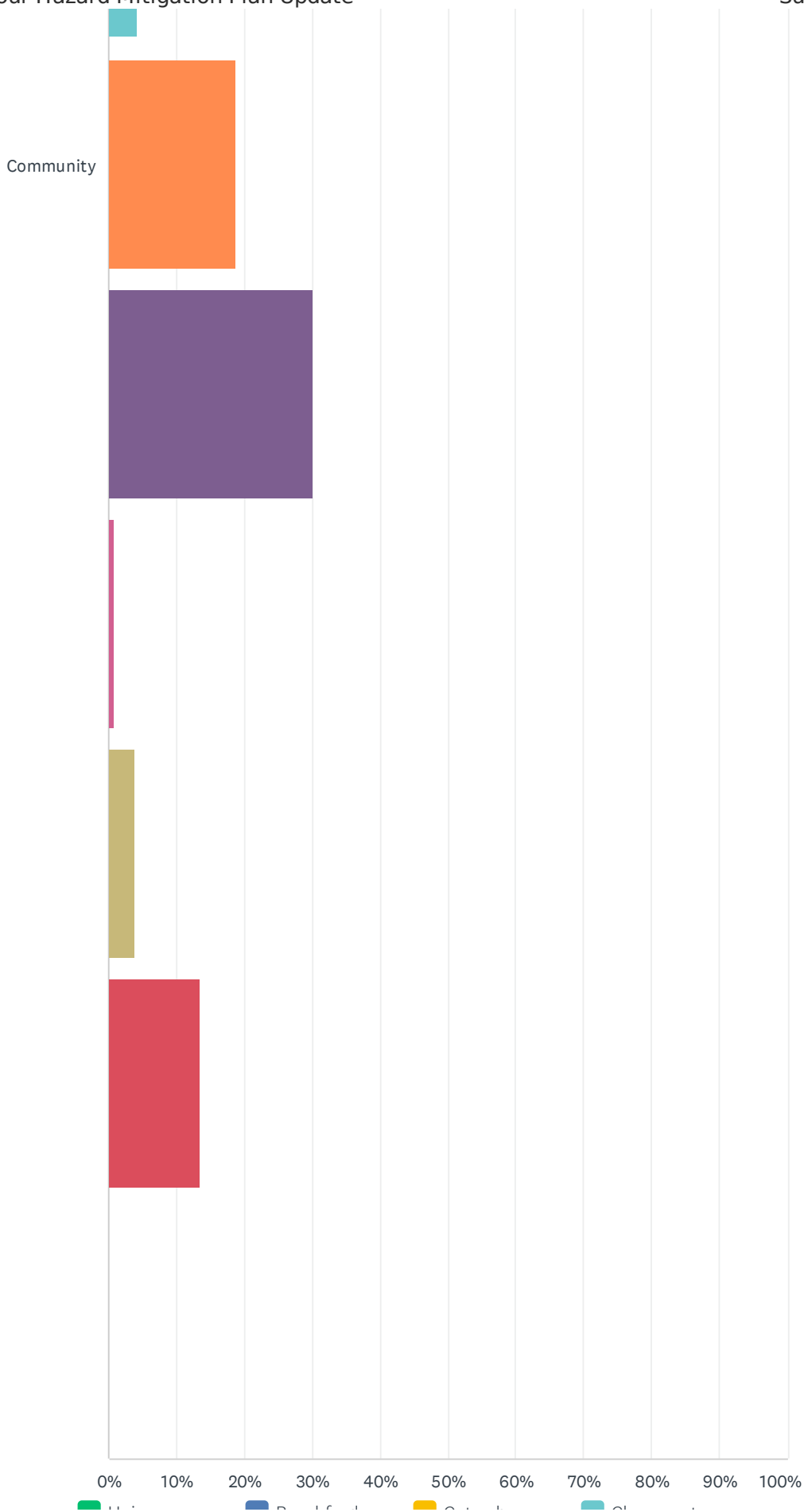
Catawba



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

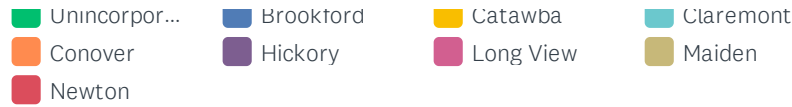
SurveyMonkey



Appendix D: Public Survey Results

2024 Unifour Hazard Mitigation Plan Update

SurveyMonkey



Alexander									
	UNINCORPORATED				TAYLORSVILLE				TOTAL
Community	52.70%				47.30%				74
	39				35				

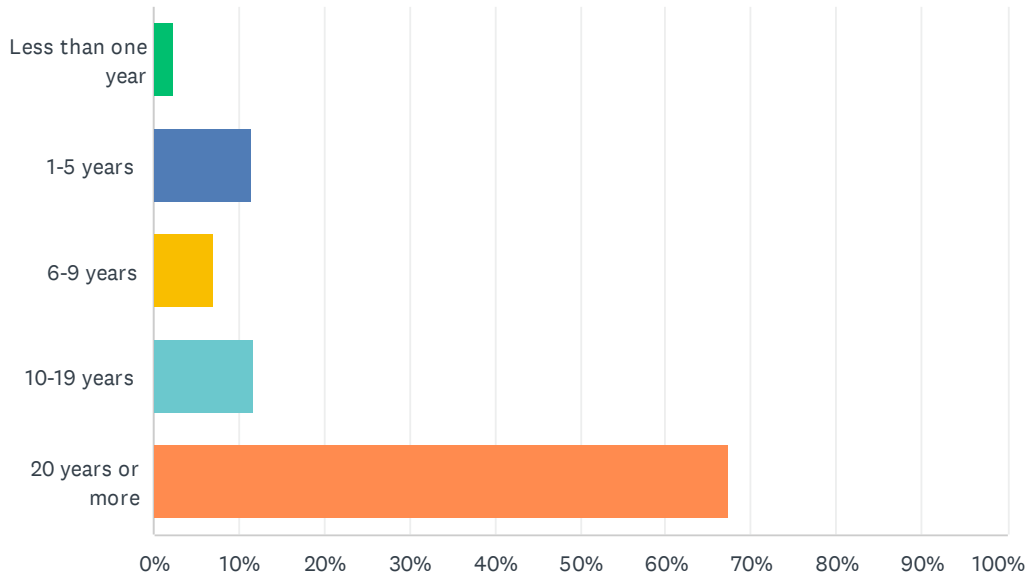
Burke									
	UNINCORPORATED	CONNELLY SPRINGS	DREXEL	GLEN ALPINE	HILDEBRAN	MORGANTON	VALDESE	RUTHERFORD COLLEGE	
Community	17.37%	8.95%	5.26%	5.26%	3.16%	50.00%	7.37%		2
	33	17	10	10	6	95	14		

Caldwell									
	UNINCORPORATED	CAJAH'S MOUNTAIN	CEDAR ROCK	GAMEWELL	GRANITE FALLS	HUDSON	LENOIR	RHODHISS	SALISBURY
Community	12.50%	3.57%	0.00%	12.50%	28.57%	8.93%	25.00%	0.00%	
	7	2	0	7	16	5	14	0	

Catawba									
	UNINCORPORATED	BROOKFORD	CATAWBA	CLAREMONT	CONOVER	HICKORY	LONG VIEW	MAIDEN	
Community	13.10%	0.44%	14.85%	4.37%	18.78%	30.13%	0.87%	3.93%	
	30	1	34	10	43	69	2	9	

Q16 How long have you lived in the Unifour region?

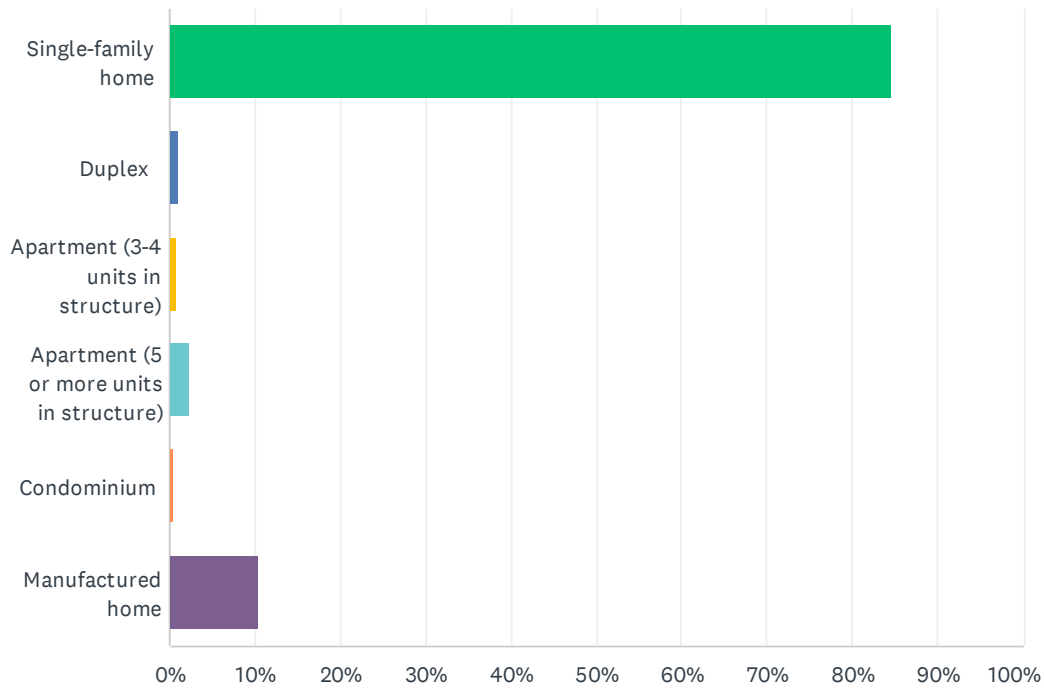
Answered: 573 Skipped: 6



ANSWER CHOICES	RESPONSES	
Less than one year	2.44%	14
1-5 years	11.52%	66
6-9 years	6.98%	40
10-19 years	11.69%	67
20 years or more	67.36%	386
TOTAL		573

Q17 What type of building do you live in?

Answered: 564 Skipped: 15



ANSWER CHOICES	RESPONSES	
Single-family home	84.75%	478
Duplex	1.06%	6
Apartment (3-4 units in structure)	0.89%	5
Apartment (5 or more units in structure)	2.30%	13
Condominium	0.53%	3
Manufactured home	10.46%	59
TOTAL		564

Q18 Additional Comments

Answered: 55 Skipped: 524

Appendix E: Plan Review Tools and Incorporation Worksheet

1. Comprehensive Plan	a. Plan Name	b. Plan Lead or Lead Agency
	c. Plan Status	<input type="checkbox"/> Implemented <input type="checkbox"/> Plan Development In Progress <input type="checkbox"/> Plan Implementation Delayed <input type="checkbox"/> Other:
	d. Next Designated Review Period or Public Meeting	Click or tap to enter a date. Meeting Details:
	e. Next Designated Time to Review Progress	Click or tap to enter a date. Meeting Details:
	f. What Progress is Expected to be Complete Before the Next Review Period?	
	g. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Comprehensive Plan and related actions:	
2. Capital Improvement Plan	a. Plan Name	b. Plan Lead or Lead Agency
	c. Plan Status	<input type="checkbox"/> Implemented <input type="checkbox"/> Plan Development In Progress <input type="checkbox"/> Plan Implementation Delayed <input type="checkbox"/> Other:
	d. Next Designated Review Period or Public Meeting	Click or tap to enter a date. Meeting Details:
		Click or tap to enter a date.

	e. Next Designated Time to Review Progress	Meeting Details:
	f. What Progress is Expected to be Complete Before the Next Review Period?	
	g. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Capital Improvement Plan and related actions:	
3. Economic Development Plan	a. Plan Name	b. Plan Lead or Lead Agency
	c. Plan Status	<input type="checkbox"/> Implemented <input type="checkbox"/> Plan Development In Progress <input type="checkbox"/> Plan Implementation Delayed <input type="checkbox"/> Other:
	d. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	e. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	f. What Progress is Expected to be Complete Before the Next Review Period?	
g. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Economic Development Plan and related actions:		
	a. Plan Name	b. Plan Lead or Lead Agency

4. Emergency Operations Plan		
	c. Plan Status	<input type="checkbox"/> Implemented <input type="checkbox"/> Plan Development In Progress <input type="checkbox"/> Plan Implementation Delayed <input type="checkbox"/> Other:
	d. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	e. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	f. What Progress is Expected to be Complete Before the Next Review Period?	
g. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Emergency Operations Plan and related actions:		
5. Transportation Plan	a. Plan Name	b. Plan Lead or Lead Agency
	c. Plan Status	<input type="checkbox"/> Implemented <input type="checkbox"/> Plan Development In Progress <input type="checkbox"/> Plan Implementation Delayed <input type="checkbox"/> Other:
	d. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	e. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
f. What Progress is Expected to be Complete Before the Next Review Period?		

	g. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Emergency Operations Plan and related actions:	
6. Housing Plan	a. Plan Name	b. Plan Lead or Lead Agency
	c. Plan Status	<input type="checkbox"/> Implemented <input type="checkbox"/> Plan Development In Progress <input type="checkbox"/> Plan Implementation Delayed <input type="checkbox"/> Other:
	d. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	e. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	f. What Progress is Expected to be Complete Before the Next Review Period?	
g. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Housing Plan and related actions:		
7. Building Codes	a. Responsible Agency	
	b. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
Meeting Details:		

	c. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	d. What design standards need to be implemented to ensure new development can withstand natural hazards?	
	e. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Building Codes related Requirements:	
8. Zoning Ordinances	a. Responsible Agency	
	b. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	c. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	d. What design standards need to be implemented to ensure new zoning ordinances can withstand natural hazards?	
e. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Zoning Ordinances:		

9. Natural Hazard Ordinance	a. Responsible Agency	
	b. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	c. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	d. What design standards need to be implemented to ensure new zoning ordinances can withstand natural hazards?	
e. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Zoning Ordinances:		
10. Maintenance Programs for Hazard Mitigation	a. Responsible Agency	
	b. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	c. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	d. What design standards need to be implemented to ensure new zoning ordinances can withstand natural hazards?	
e. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Zoning Ordinances:		

11. Maintenance Programs for Hazard Mitigation	a. Responsible Agency	
	b. Next Designated Review Period or Public Meeting	Click or tap to enter a date.
		Meeting Details:
	c. Next Designated Time to Review Progress	Click or tap to enter a date.
		Meeting Details:
	d. What design standards need to be implemented to ensure new zoning ordinances can withstand natural hazards?	
e. Questions to be considered in follow up meetings to ensure Hazard Mitigation Actions are included in the Zoning Ordinances:		

Technical Resources	Available (Yes/No)	Details	Changes Since Last Review	Considerations for Next Capability Review
12. Warning Systems	<input type="checkbox"/> Yes <input type="checkbox"/> No			
13. Hazard Data and Information	<input type="checkbox"/> Yes <input type="checkbox"/> No			
14. Grant Writing	<input type="checkbox"/> Yes <input type="checkbox"/> No			
15. Geographic Information Systems Analysis	<input type="checkbox"/> Yes <input type="checkbox"/> No			

Appendix E: Plan Review Tools and Incorporation Worksheet

Technical Resources	Available (Yes/No)	Details	Changes Since Last Review	Considerations for Next Capability Review
16. Fire Safety Programs	<input type="checkbox"/> Yes <input type="checkbox"/> No			
17. Natural Disaster Safety Programs	<input type="checkbox"/> Yes <input type="checkbox"/> No			
18. Gatherings and Celebrations Outreach Programs	<input type="checkbox"/> Yes <input type="checkbox"/> No			

Local Mitigation Plan Review Tool

Cover Page

The Local Mitigation Plan Review Tool (PRT) demonstrates how the local mitigation plan meets the regulation in 44 CFR § 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the local governments, including special districts.

1. The Multi-Jurisdictional Summary Sheet is a worksheet that is used to document how each jurisdiction met the requirements of the plan elements (Planning Process; Risk Assessment; Mitigation Strategy; Plan Maintenance; Plan Update; and Plan Adoption).
2. The Plan Review Checklist summarizes FEMA's evaluation of whether the plan has addressed all requirements.

For greater clarification of the elements in the Plan Review Checklist, please see Section 4 of this guide. Definitions of the terms and phrases used in the PRT can be found in Appendix E of this guide.

Plan Information	
Jurisdiction(s)	Alexander County: Taylorsville Burke County: Connelly Springs, Drexel, Glen Alpine, Hildebran, Morganton, Rutherford College, Valdese Catawba County: Brookford, Town of Catawba, Claremont, Conover, Hickory, Long View, Maiden, Newton Caldwell County: Cahah's Mountain, Cedar Rock, Gamewell, Granite Falls, Hudson, Lenoir, Rhodhiss, Sawmills
Title of Plan	Unifour Regional Hazard Mitigation Plan Update
New Plan or Update	Update
Single- or Multi-Jurisdiction	Multi-jurisdiction
Date of Plan	10/16/2024
Local Point of Contact	
Title	Jason Williams
Agency	Catawba County
Address	100 Government Drive Post Office Box 389 Newton, North Carolina 28658
Phone Number	(828) 465-5229
Email	JasonW@CatawbaCountyNC.gov

Additional Point of Contact	
Title	Kelly Keefe, Planner
Agency	AECOM
Address	1360 West Peachtree Road, Atlanta, GA
Phone Number	(954) 461-3374
Email	kelly.keefe@aecom.com

Review Information	
State Review	
State Reviewer(s) and Title	Carl Baker, Hazard Mitigation Planner
State Review Date	10/29/2024, 11/26/2024
FEMA Review	
FEMA Reviewer(s) and Title	Kymberly Kudla, Community Planner
Date Received in FEMA Region	11/26/2024
Plan Not Approved	Click or tap to enter a date.
Plan Approvable Pending Adoption	Click or tap to enter a date.
Plan Approved	2/5/2025

Multi-Jurisdictional Summary Sheet

In the boxes for each element, mark if the element is met (Y) or not met (N).

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
1	Alexander County	y	y	y	y	y	Y		
2	Town of Taylorsville	y	y	y	y	y	Y		
3	Burke County	y	y	y	y	y	Y		
4	City of Morganton	y	y	y	y	y	Y		
5	Town of Connelly Springs	y	y	y	y	y	Y		
6	Town of Drexel	y	y	y	y	y	Y		
7	Town of Glen Alpine	y	y	y	y	y	Y		
8	Town of Hildebran	y	y	y	y	y	Y		
9	Town of Rutherford College	y	y	y	y	y	Y		
10	Town of Valdese	y	y	y	y	y	Y		
11	Caldwell County	y	y	y	y	y	Y		
12	City of Lenoir	y	y	y	y	y	Y		
13	Town of Cahaj's Mountain	y	y	y	y	y	Y		
14	Town of Gamewell	y	y	y	y	y	Y		
15	Town of Granite Falls	y	y	y	y	y	Y		
16	Town of Hudson	y	y	y	y	y	Y		
17	Town of Rhodhiss	y	y	y	y	y	Y		
18	Town of Sawmills	y	y	y	y	y	Y		
19	Village of Cedar Rock	y	y	y	y	y	Y		

Local Mitigation Planning Policy Guide

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
20	Catawba County	y	y	y	y	y	Y		
21	City of Claremont	y	y	y	y	y	Y		
22	City of Conover	y	y	y	y	y	Y		
23	City of Hickory	y	y	y	y	y	Y		
24	City of Newton	y	y	y	y	y	Y		
25	Town of Brookford	y	y	y	y	y	Y		
26	Town of Catawba	y	y	y	y	y	Y		
27	Town of Long View	y	y	y	y	y	Y		
28	Town of Maiden	y	y	y	y	y	Y		

Plan Review Checklist

The Plan Review Checklist is completed by FEMA. States and local governments are encouraged, but not required, to use the PRT as a checklist to ensure all requirements have been met prior to submitting the plan for review and approval. The purpose of the checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been “met” or “not met.” FEMA completes the “required revisions” summary at the bottom of each element to clearly explain the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is “not met.” Sub-elements in each summary should be referenced using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each element and sub-element are described in detail in Section 4: Local Plan Requirements of this guide.

Plan updates must include information from the current planning process.

If some elements of the plan do not require an update, due to minimal or no changes between updates, the plan must document the reasons for that.

Multi-jurisdictional elements must cover information unique to all participating jurisdictions.

Element A: Planning Process

Element A Requirements	Location in Plan (section and/or page number)		Met / Not Met
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))			
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan’s development, as well as who was involved?	Section 2.3	PDF Page 28-34	MET
		Page 2-3 to 2-9	
	Section 2.4	PDF Page 34-39	
		Page 2-9 to 2-14	
		Concur	
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?	Section 2.3 and 2.4	PDF Page 28-39	MET
		Page 2-3 to 2-14	
		Concur, Appendix F&G	

Element A Requirements	Location in Plan (section and/or page number)		Met / Not Met
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process? (Requirement 44 CFR § 201.6(b)(2))			
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?	Identify Stakeholders: Section 2.7,	PDF Page 51-53	MET
		Page 2-26 to 2-28	
	How they were invited: Section 2.6	PDF Page 46-51	
		Page 2-21 to 2-26	
Concur			
A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))			
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?	Section 2.6, Section 2.7	PDF Page 46-53	MET
		Page 2-21 to 2-28	
	Appendix F	PDF Page 709-731	
		Page F-1 to F-23	
Concur			
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))			
A4-a. Does the plan document what existing plans, studies, reports and technical information were	Section 2.3.1.	PDF Page 33-34	MET

Element A Requirements	Location in Plan (section and/or page number)		Met / Not Met
reviewed for the development of the plan, as well as how they were incorporated into the document?		Page 2-8 to 2-9	
	Section 5.3.1.	PDF Page 352-357	
		Page 5-3 to 5-8	
	Concur		

ELEMENT A REQUIRED REVISIONS

NCEM 1st Review:

A1: No revision required. For Alternate Participation see Appendix G (Pg. 730).

A2: No revisions required. See Appendix F for stakeholder invitations.

A3: No revisions required.

A4: Update Table 5:1, Glen Alpine, Floodplain Damage Prevention Ordinance (2007).- Page 5-4 or PDF Page 351

NCEM 2nd Review:

A1: No revision required.

A2: No revisions required.

A3: No revisions required.

A4: No revisions required.

Element B: Risk Assessment

Element B Requirements	Location in Plan (section and/or page number)		Met / Not Met
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))			
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	4.2 Hazard Selection	PDF Page 78-85	MET
	Concur	Page 4-4 to 4-11	

Element B Requirements	Location in Plan (section and/or page number)		Met / Not Met	
B1-b. Does the plan include information on the location of each identified hazard?	River Flooding 4.5.2.	PDF Page 103-120	MET	
		Page 4-31 to 4-46		
	Levee Failure 4.5.3.	PDF Page 138		Page 4-46
		Wildfire 4.5.4.		PDF Page 145-160
	Tornado 4.5.5.			PDF Page 171-174
		Earthquake 4.5.6.		PDF Page 184-190
	Landslide 4.5.7.			PDF Page 201-205
		Snow 4.5.8.		PDF Page 210-240
	Dam Failure 4.5.9			PDF Page 246-250, 257
		Hail 4.5.10.		PDF Page 269- 271
	Drought 4.5.11.			PDF Page 282-284
		Hurricane Winds 4.5.12.		PDF Page 295 - 299
	Ice 4.5.13.			PDF Page 308-312
		Thunderstorm Wind 4.5.14.		PDF Page 322-326
	Erosion 4.5.15.			PDF Page 336
		Sinkholes 4.5.16.		PDF Page 341-342
Concur				
B1-c. Does the plan describe the extent for each identified hazard?	River Flooding 4.5.2.	PDF Page 120-122		
		Page 4-46 to 4-48		
	Levee Failure 4.5.3.	PDF Page 138		

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met	
		Page 4-64	
	Wildfire 4.5.4.	PDF Page 145-160 Page 4-71 to 4-86	
	Tornado 4.5.5.	PDF Page 174 Page 4-100	
	Earthquake 4.5.6	PDF Page 190 Page 4-116	
	Landslide 4.5.6.3.	PDF Page 205 Page 4-131	
	Snow 4.5.8.	PDF Page 240 Page 4-166	
	Dam Failure 4.5.9.	PDF Page 249 Page 4-175 to 4-176	
	Hail 4.5.10.	PDF Page 271-273 Page 4-197 to 4-199	
	Drought 4.5.11.	PDF Page 285 Page 4-211	
	Hurricane Winds 4.5.12.	PDF Page 300 Page 4-226	
	Ice 4.5.13.	PDF Page 313 Page 4-239	
	Thunderstorm Wind 4.5.14.	PDF Page 325-330 Page 4-251 to 256	
	Erosion 4.5.15.	PDF Page 334 Page 4-260	
	Sinkholes 4.5.16.	PDF Page 339 Page 4-265 Concur - MET	
B1-d. Does the plan include the history of previous hazard events for each identified hazard?	Disaster Declarations – Table 4-2, Section 4.2	PDF Page 79 Page 4-7	MET
	River Flooding 4.5.2.	PDF Page 122-128 Page 4-48 to 4-54	

Element B Requirements	Location in Plan (section and/or page number)		Met / Not Met
	Levee Failure 4.5.3.	PDF Page 138 Page 4-64	
	Wildfire 4.5.4.	PDF Page 160-161 Page 4-86 to 4-87	
	Tornado 4.5.5	PDF Page 175-176 Page 4-101 to 4-102	
	Earthquake 4.5.6.	PDF Page 191-192 Page 4-117 to 4-118	
	Landslide 4.5.7.	PDF Page 205 Page 4-131	
	Snow 4.5.8.	PDF Page 240-241 Page 4-166 to 4-167	
	Dam Failure 4.5.9.	PDF Page 247-257 Page 4-173 to 4-183	
	Hail 4.5.10.	PDF Page 273-276 Page 4-199 to 4-202	
	Drought 4.5.11.	PDF Page 286 Page 4-212	
	Hurricane Winds 4.5.12.	PDF Page 300-301 Page 4-226 to 4-227	
	Ice 4.5.13.	PDF Page 313-314 Page 4-239 to 4-240	
	Thunderstorm Wind 4.5.14.	PDF Page 325-330 Page 4-251 to 4-256	
	Erosion 4.5.15.	PDF Page 334 Page 4-260	
	Sinkholes 4.5.16.	PDF Page 340-341 Page 4-266 to 4-267 Concur, Appendix A&C	
Choose an item. B1-e. Does the plan include the probability of future events for each identified hazard? Does the plan describe the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature and sea levels), on the	River Flooding 4.5.2.	PDF Page 128-137 Page 4-48 to 4-46	MET
	Levee Failure 4.5.3.	PDF Page 138-143 Page 4-46 to 4-69	

Element B Requirements	Location in Plan (section and/or page number)		Met / Not Met	
type, location and range of anticipated intensities of identified hazards?	Wildfire 4.5.4.	PDF Page 161-165		
		Page 4-87 to 4-91		
	Tornado 4.5.5.	PDF Page 176-177		
		Page 4-102 to 4-103		
	Earthquake 4.5.6.	PDF Page 191-194		
		196-197		
	Page 4-118 to 4-120			
	Landslide 4.5.7.	PDF Page 205-207		
		210		
	Page 4-131 to 4-133			
	Snow 4.5.8.	PDF Page 241-245		
		Page 4-167 to 4-171		
	Dam Failure 4.5.9.	PDF Page 259-264		
		Page 4-185 to 4-190		
	Hail 4.5.10.	PDF Page 276-278		
		280		
Page 4-202 to 4-204				
Drought 4.5.11.	PDF Page 287-290			
	Page 4-213 to 4-216			
Hurricane Winds 4.5.12.	PDF Page 302-206			
	Page 4-228 to 4-232			
Ice 4.5.13.	PDF Page 314-318			
	Page 4-240 to 4-244			
Thunderstorm Wind 4.5.14.	PDF Page 330-333			
	Page 4-256 to 4-259			
Erosion 4.5.15.	PDF Page 334-339			
	Page 4-260 to 4-265			
Sinkholes 4.5.16.	PDF Page 341-343			
	Page 4-267 to 4-269			
Overall Risk Ratings, EAL, Risk Scores	PDF Page 344-347			
	Page 4-270 to 273			
Concur				

Element B Requirements	Location in Plan (section and/or page number)		Met / Not Met
B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?	Section 4 (4-16 to 4-271) identifies and describes hazards that are unique to specific jurisdictions within the planning area or that vary in their impact across different jurisdictions, especially considering hazards spatially defined like, riverine flooding, snow, dam failure and wildfire through jurisdiction's specific hazard history occurrence, maps, vulnerability, and impacts. (PDF page 90-345) Concur		MET
B2. Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))			
B2-a. Does the plan provide an overall summary of each jurisdiction's vulnerability to the identified hazards?	River Flooding 4.5.2.	PDF Page 131-137 Page 4-57 to 4-63	MET
	Levee Failure 4.5.3.	PDF Page 139-143 Page 4-65 to 4-69	
	Wildfire 4.5.4.	PDF Page 163-169 Page 4-89 to 4-95	
	Tornado 4.5.5.	PDF Page 177-180 Page 4-103 to 4-106	
	Earthquake 4.5.6.	PDF Page 194-197 Page 4-120 to 4-123	
	Landslide 4.5.7.	PDF Page 207-210 Page 4-133 to 4-136	
	Snow 4.5.8.	PDF Page 242-245 Page 4-168 to 4-171	
	Dam Failure 4.5.9.	PDF Page 260-267	

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
	<p data-bbox="1024 310 1295 342">Page 4-186 to 4-193</p> <p data-bbox="751 359 899 390">Hail 4.5.10.</p> <p data-bbox="1024 359 1263 390">PDF Page 278-280</p> <p data-bbox="1024 407 1289 438">Page 4-204 to 4-206</p> <p data-bbox="751 455 850 487">Drought 4.5.11.</p> <p data-bbox="1024 455 1263 487">PDF Page 288-290</p> <p data-bbox="1024 504 1289 535">Page 4-214 to 4-216</p> <p data-bbox="751 552 959 583">Hurricane Winds 4.5.12.</p> <p data-bbox="1024 552 1263 583">PDF Page 303-306</p> <p data-bbox="1024 600 1263 632">Page 4-229 to 232</p> <p data-bbox="751 648 792 680">Ice 4.5.13.</p> <p data-bbox="1024 648 1263 680">PDF Page 316-317</p> <p data-bbox="1024 697 1263 728">Page 4-242 to 243</p> <p data-bbox="751 745 997 777">Thunderstorm Wind 4.5.14.</p> <p data-bbox="1024 745 1263 777">PDF Page 330-333</p> <p data-bbox="1024 793 1289 825">Page 4-257 to 4-259</p> <p data-bbox="751 842 943 873">Erosion 4.5.15.</p> <p data-bbox="1024 842 1263 873">PDF Page 335-337</p> <p data-bbox="1024 890 1289 921">Page 4-261 to 4-263</p> <p data-bbox="751 938 971 970">Sinkholes 4.5.16.</p> <p data-bbox="1024 938 1263 970">PDF Page 342-343</p> <p data-bbox="1024 987 1263 1018">Page 4-268 to 269</p> <p data-bbox="751 1035 976 1066">Overall Risk Ratings, EAL, Risk Scores Section 4.6.1.</p> <p data-bbox="1024 1035 1263 1066">PDF Page 344-347</p> <p data-bbox="1024 1083 1263 1115">Page 4-270 to 273</p> <p data-bbox="1024 1194 1284 1268">Concur – Appendix B & H</p>	
B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction? .	<p data-bbox="751 1291 932 1344">River Flooding 4.5.2.</p> <p data-bbox="1024 1291 1279 1323">PDF Page 128-136</p> <p data-bbox="1024 1381 1263 1413">Page 4-54 to 4-62</p> <p data-bbox="751 1430 997 1461">Levee Failure 4.5.3.</p> <p data-bbox="1024 1430 1279 1461">PDF Page 138-142</p> <p data-bbox="1024 1478 1263 1509">Page 4-65 to 4-68</p> <p data-bbox="751 1526 927 1558">Wildfire 4.5.4.</p> <p data-bbox="1024 1526 1279 1558">PDF Page 161-196</p> <p data-bbox="1024 1575 1263 1606">Page 4-87 to 4-95</p> <p data-bbox="751 1623 932 1654">Tornado 4.5.5.</p> <p data-bbox="1024 1623 1279 1654">PDF Page 176-180</p> <p data-bbox="1024 1671 1263 1703">Page 4-102 to 4-106</p> <p data-bbox="751 1719 976 1751">Earthquake 4.5.6.</p> <p data-bbox="1024 1719 1279 1751">PDF Page 194-197</p> <p data-bbox="1024 1768 1263 1799">Page 4-120 to 4-123</p> <p data-bbox="751 1837 954 1869">Landslide 4.5.7.</p> <p data-bbox="1024 1837 1279 1869">PDF Page 207-210</p>	MET

Element B Requirements	Location in Plan (section and/or page number)		Met / Not Met
		Page 4-133 to 4-136	
	Snow 4.5.8.	PDF Page 243-245	
		Page 4-168 to 4-171	
	Dam Failure 4.5.9.	PDF Page 264-267	
		Page 4-190 to 4-193	
	Hail 4.5.10.	PDF Page 278-280	
		Page 4-204 to 4-206	
	Drought 4.5.11.	PDF Page 288-290	
		Page 4-214 to 4-216	
	Hurricane Winds 4.5.12.	PDF Page 303-306	
		Page 4-229 to 4-232	
	Ice 4.5.13.	PDF Page 316-318	
		Page 4-242 to 4-244	
	Thunderstorm Wind 4.5.14.	PDF Page 316-318	
		Page	
	Sinkholes 4.5.16.	PDF Page 342-343	
		Page 4-268 to 4-269	
	Erosion 4.5.15.	PDF Page 335-337	
		Page 4-261 to 4-263	
	Overall Risk Ratings, EAL, Risk Scores	PDF Page 344-347	
		Page 4-270 to 273 Concur 58-62, 64-73, 84, 90-92, and Appendix A	
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?	Table 4-18, Table 4-19, Table 4-20	PDF Page 135-137	MET
		Page 4-61 to 4-63	

Element B Requirements	Location in Plan (section and/or page number)		Met / Not Met
	Section 4.5.2.	PDF Page 127-128	
		Page 4-53 to 4-54	
		Concur	

ELEMENT B REQUIRED REVISIONS

NCEM 1st Review:

B1a: No revision required.

B1b: Snow is the only identified hazard that includes local town level hazard location maps.

Riverine Flooding (4-31 to 4-46), Wildfire (4-71 to 4-85), and snow (4-136 to 4-615) jurisdictional maps are included.

B2: Repetitive and Severe Repetitive Loss data must include estimates of the numbers and types of properties Table 4-19 seems to list single family residential twice.

Types of NFIP Multiple Loss Properties by Occupancy Type and by Loss Type on Page 4-63 and Total NFIP Repetitive Loss, Severe Repetitive Loss Properties, and Number of Total Losses 4-62.

*Earthquake: the Vulnerability and Climate Change are out of order compared to the other hazards in this section.

Order is changed.

NCEM 2nd Review:

B1a: No revision required.

B1b: No revision required.

B2: No revision required.

Element C: Mitigation Strategy

Element C Requirements	Location in Plan (section and/or page number)		Met / Not Met
C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))			
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion	Section 5.3	PDF Page 349-388	MET
		Page 5-2 to 5-40	

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met	Met / Not Met
of the existing building codes and land use and development ordinances or regulations?	Building Codes and Land Use and Development-5.3.1.	PDF Page 350-362 Page 5-3 to 5-15 Concur	
C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?	Section 5.3	PDF Page 349-388 Page 5-2 to 5-41 Concur	MET
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))			
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?	FIRM Adoption: 4.5.2. Section 5.3 Appendix J	PDF Page 128, 363-366 Page 4-54, 5-16 to 5-19. PDF Page 801-811 Page J-1 to J-11 Concur	MET
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))			
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?	Section 6.2	PDF Page 390-391 Page 6-2 to 6-3 Concur	MET

Element C Requirements	Location in Plan (section and/or page number)		Met / Not Met
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))			
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?	Section 7.1., 7.2, 7.3	Page 7-1 to 7-3	MET
		PDF Page 395-397 Concur	
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment?	Section 7.1, Section 7.2, Section 7.3, Section 7.4, Section 7.5	PDF Page 395-510	MET
		PDF Page 395-510 Concur	
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))			
C5-a. Does the plan describe the criteria used for prioritizing actions?	Section 7.1	PDF Page 395-397	MET
		Page 7-1 Concur	
C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?	Section 7.2, Section 7.3, Section 7.4, Section 7.5	Page 6-1 to 6-3	MET
		PDF Page 395-510 Concur	

ELEMENT C REQUIRED REVISIONS

NCEM 1st Review:

C1a: Section 5.3 subsections are misnumbered/out of order. **Corrected**

C1b: Updated Capabilities are discussed throughout Section 5.3. Section 5.4.1 addresses Equity in the Capability Assessment.

C2: Verify Date Joined NFIP dates in Table 5-2 for all jurisdictions. Dates conflict with Table 4-15. Some dates listed are consistent with initial FIRM dates from the Community Status Book.

Corrected

Table 5-4 documents each jurisdiction has a designated Floodplain Manager. (C2a requirement)

Element C2a of the Local Mitigation Planning Policy Guide (2023) states NFIP participating communities must describe how the substantial improvement/substantial damage provisions of their floodplain management regulations are implemented following an event.

Addressed in Appendix J

C3: No revisions required.

C4a: Section 6.3 states that the planning committee classified four categories of mitigation techniques: local plans and regulations, structure and infrastructure projects, natural systems protection, and education and awareness programs. Section 7.1 states that the Mitigation Action Plan is organized by mitigation strategy category: prevention, property protection, natural resource protection, structural projects, emergency services, or public education. The Mitigation Action Plan tables in sections 7.2 - 7.5 "Type of Mitigation Action" column lists various combinations of both lists as well as others not previously defined.

Addressed in applicable columns in PDF Page 398- 510 or Page 7-3 to 7-116.

C4b: Hazards Addressed column of the Mitigation Action Plan tables do not match the natural hazards identified in Section 4 Risk Assessment. Emergency Services mitigation actions while allowed, do not count towards the required one action per hazard (or one all hazard action) for each jurisdiction.

Addressed in applicable columns in PDF Page 398- 510 or Page 7-3 to 7-116.

C5a: No revision required.

C5b: No revision required.

NCEM 2nd Review:

C1a: No revision required.

C1b: No revision required.

C2: No revision required.

C3: No revisions required.

C4a: No revisions required.

C4b: No revisions required.

Element D: Plan Maintenance

Element D Requirements	Location in Plan (section and/or page number)		Met / Not Met
D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))			
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?	Section 8.3	PDF Page 515	MET
		Page 8-5	
		Concur	
D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))			
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?	Section 8.2,	PDF Page 512-515	MET
		Page 8-2 to 8-5	
	Appendix E.	PDF Page 685-706	
		Page E-1 to E-22 Concur	
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.	Section 8.2	PDF Page 512-515	MET
		Page 8-2 to 8-5 Concur	
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?	Section 8.2	PDF Page 512-515	MET
		Page 8-2 to 8-5 Concur	

Element D Requirements	Location in Plan (section and/or page number)		Met / Not Met
D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))			
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?	Section 8.1	PDF Page 511-512 Page 8-1 to 8-2 Concur	MET
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?	Section 5.3.1.	PDF Page 350-355 Page 5-3 to 5-8 Concur	MET
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?	Table 5-1, Section 5.3.	PDF Page 351-388 Page 5-2 to 5-41 Concur	MET
ELEMENT D REQUIRED REVISIONS			
<p>NCEM 1st Review:</p> <p>D1a: No revisions required.</p> <p>D2a: No revisions required.</p> <p>D2b: No revisions required.</p> <p>D2c: No revisions required.</p> <p>NCEM 2nd Review:</p> <p>D1: No revisions required.</p> <p>D2: No revisions required.</p> <p>D3: No revisions required.</p>			

Element E: Plan Update

Element E Requirements	Location in Plan (section and/or page number)		Met / Not Met
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))			
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?	Section 3 PDF	Page 55-74	
		Page 3-1 to 3-20	
		Changes in development are also referenced by hazard in Section 4 in future vulnerability and problem statement analysis in each hazard profile.	
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))			
E2-a. Does the plan describe how it was revised due to changes in community priorities?	Section 6.1	PDF Page 389-391	MET
		Page 6-1 to 6-3 Concur, 396	
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?	Section 7	PDF Page 395-510	MET
		Page 7-1 to 7-116 Concur	
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?	Section 6.5	PDF Page 392	MET
		Page 6-4 356-370	

ELEMENT E REQUIRED REVISIONS
<p>NCEM 1st Review:</p> <p>E1: Update element location in plan. Updated location in the element</p> <p>E2: No revisions required.</p> <p>NCEM 2nd Review:</p> <p>E1: No revisions required.</p> <p>E2: No revisions required.</p>

Element F: Plan Adoption

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F1-a. Does the participant include documentation of adoption?	Adoption resolutions will occur after APA and will be in Appendix I	
F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F2-a. Did each participant adopt the plan and provide documentation of that adoption?	Adoption resolutions will occur after APA and will be in Appendix I	
ELEMENT F REQUIRED REVISIONS		
<p>Required Revision:</p> <p>F2-a. To receive approval, the participants must adopt the plan and provide documentation that the adoption has occurred.</p>		

Element G: High Hazard Potential Dams (Optional) UNDER REVIEW

HHPD Requirements	Location in Plan (section and/or page number)		Met / Not Met
HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?			
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?	Section 4.5.9	PDF Page 245-247	
		Page 4-171-173	
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?	Section 4.5.9., Figure 4-127, Table 4-53	Page 4-175 to 4-184	
		PDF Page 249-258	
HHPD2. Did the plan address HHPDs in the risk assessment?			
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?	Section 4.5.9.	PDF Page 249-267	
		Page 4-175 to 4-193	
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?	Section 4.5.9.	PDF Page 260-264	
		Page 4-186 to 4-190	
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?			
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?	Section 4.5.9.	PDF Page 260-264	
		Page 4-186 to 4-190	
	Section 4.5.9.	PDF Page 260-264	

HHPD Requirements	Location in Plan (section and/or page number)		Met / Not Met
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?		Page 4-186 to 4-190	
HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?			
HHPD4-a. Does the plan describe specific actions to address HHPDs?	Section 7	PDF Page 395-510 Page 7-1 to 7-116	
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?	Section 7.1	PDF Page – 395- 397 Page 7-1 to 7-3	
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?	Section 7	PDF Page 395-510 Page 7-1 to 7-116	

HHPD Required Revisions**NCEM 1st Review:**

HHPD1a: Section 4.5.8.5 does not clearly define how each local government in the planning area coordinated with local dam owners and the state dam safety agency.

“Each local government collected and shared relevant data such as dam inspection findings, according to the NC State Dam Safety Program and shared Emergency Action Plans (EAPs), inundation maps, and potential impacts on critical infrastructure with local dam owners through public meeting and draft plan reviews. The jurisdictions in the planning area are expected to continue assisting with and continue to maintain compliance with regulatory requirements in cooperation with private, utility, and local government dam owners.” Page 4-169

HHPD1b: Tables and figures include state sourced dam information other than the agency listed.

Source Changed to the correct Dam Information

HHPD2a: No revision required.

HHPD2b: No revision required.

HHPD3a: No revision required.

HHPD3b: No revision required.

HHPD4a: No revision required.

HHPD4b: No revision required.

HHPD4c: No revision required.

Plan Assessment

These comments can be used to help guide your annual/regularly scheduled updates and the next plan update.

Element A. Planning Process

Strengths

The overall plan is organized and detailed. Each element is broken down for better reference in each section. A survey was distributed and 579 responses were received. Jurisdictions were also given a questionnaire on social equity to help better understand how each jurisdiction in the planning area could be best represented and include in the planning process. A good number of stakeholders were involved including non-profits and community based organizations.

Element B. Risk Assessment

Strengths/ Opportunities for Improvement

- Vulnerability of underserved populations and the natural environment addressed. Current and future land use was thorough and detailed for each County. Hurricane Helene was also included though it is noted that planning process was nearly completed at time of occurrence. Each hazard notes mitigation actions to be considered as well. Recommend including previous flood extents for element B1.c.

Element C. Mitigation Strategy

Strengths/ Opportunities for Improvement

- A range of actions considered and linked to the vulnerabilities and impacts identified in the risk assessment. Recommend further review of each jurisdiction's SI/SD process.

Element E. Plan Update

Strengths

- Included a list and description of the progress in local hazard mitigation efforts.

Element G. HHPD Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Appendix F - Meeting Sign-in Sheets and Participation Invitations

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Announcement

Unifour Regional Hazard Mitigation Plan Public Meeting

What: Public meeting to obtain and incorporate communities' thoughts and concerns about the Unifour Regional Hazard Mitigation Plan

When: Wednesday, June 12th, 2024
"Come and go" anytime starting at 11:30am to 12:30pm ET

Where: 25 Government Drive, Newton, NC 28658, 2nd Floor Meeting Room



Floods, Wildfires, Tornadoes, Winter Storms, Hurricanes...What Concerns You?

Do you have ideas for helping our community become better prepared for future natural disasters?

You are invited to come share your thoughts and concerns about your community's resiliency against natural disasters and leave your comments for the final decision-making process.

About the Unifour Regional Hazard Mitigation Plan

The counties of the Unifour Region in coordination with their participating municipal jurisdictions, are finalizing a regional hazard mitigation plan that covers the multi-county area. The Unifour Regional Hazard Mitigation Plan identifies local policies and actions for reducing risk and future losses from natural hazards such as floods, severe storms, wildfires, and winter weather.

For More Information

If you would like to learn more, please contact one of the following county coordinators for this project:

Daniel Fox, Alexander County Emergency Management 828.352.7709/ dfox@alexandercountync.gov	Michael Willis, Burke County Emergency Management 828.413.5229/ Michael.willis@burkenc.org
Vic Misenheimer, Caldwell County Emergency Management 828.757.1419/ vmisenheimer@caldwellcountync.org	Jason Williams, Catawba County Emergency Management 828.465.8989/ JasonW@catawbacountyNC.gov

You can also visit <https://www.ncdps.gov/our-organization/emergency-management/hazard-mitigation/hazard-mitigation-plans#UnifourRegionalPlan-6718> for more information

We hope to see you June 12th, 2024!

Figure F-1: Invitation for the Unifour Regional Hazard Mitigation Plan Public Meeting on June 12, 2024 in person in Newton, NC.

Name	Role
Houston, McKenzie M	Organizer
Jimmy E Drum	Attendee
Caleb Bynum	Attendee
Curt Willis	Attendee
Catawba County	Attendee
Franks, Richard (Clifton)	Attendee
Baker, Carl (NCEM)	Attendee
Alex Fulbright	Attendee
Bryan Blanton	Attendee
Keefe, Kelly	Presenter
Burgess, Brian	Attendee
Cal Overby	Attendee
Hamby, Karen (NCEM)	Attendee
Jason Williams, Catawba County	Attendee
Peterson, Kelsey	Attendee
Mello, John (NCEM)	Attendee
Holbrook, Seth	Attendee
Chris Timberlake	Attendee
Larry Johnson	Attendee
Martha Blanton	Attendee
Samuel Abernethy	Attendee
City of Morganton (Guest)	Attendee
Michael Willis	Attendee
Crew, Chris (NCEM)	Attendee
Greene, Russell (NCEM)	Attendee
Daniel Fox	Attendee
Teresa Kinney	Attendee
Daniel Fox	Attendee

Table F- 1: Unifour HMP Kickoff Meeting Attendance Sheet from Virtual Meeting (02/16/2024)

Name	Role
Houston, McKenzie M	Organizer
Catawba County Government Center	Presenter
Mario Sclarandis (Guest)	Presenter
Chaiyo Vang-Caldwell County	Presenter
Michael Willis	Presenter
Bill Carroll (Drexel)	Presenter
Kudla, Kymberly	Presenter
Jodie Yoder- Program Manager Samaritan's Purse U.S. Disaster Relief	Presenter
Baker, Carl (NCEM)	Presenter
Peterson, Kelsey	Presenter

Appendix F: Plan Adoption Resolutions, Meeting Sign-ins, Participation Invitations

Cal Overby	Presenter
Ashure Ministry - Kristal Manning	Presenter
Holbrook, Seth	Presenter
Crew, Chris (NCEM)	Presenter
Cramer, Jordan	Presenter
Curt Willis	Presenter
Russell Greene	Presenter
Truman Walton, Town of Valdese	Presenter
Katelyn Smith	Presenter
Teresa Kinney	Presenter

Table F- 2: Attendance sign in for the virtual Unifour Hazard Mitigation Planning Meeting #2 (4/11/2024)

Unifour Hazard Mitigation

Name	Affiliation
kelly keefe Frank Ballentine	AECOM Planner Catawba Co EMS
Bryan Blanton	Catawba Co ES
Daniel Fox	Alex Co. Em
Chaiya Vang	Caldwell HD
Charles Mullis	Long View
Alex Fulbright	Newton
Jon Greed	Hudson
Shelley Swain	Caldwell Co.

Unifour Hazard Mitigation

Name	Affiliation
Jose Williams	Catawba County CM
Brian Boyes	Alexander County

Figure F- 2: In-Person Sign in sheet for the Unifour HMP Meeting #2 (Emails and phone numbers redacted) (6-12-2024)

Unifour 4/11/2024

NAME	TITLE / AFFILIATION	
RICHARD FRANKS	AECOM	97
Russell Greene	NCEM 12	821 5
Karen Hawley	NCEM	8
GREG ACHLEY	NCEM	7
Chris Timberlake	Planning Dir Cat. County	821
Shelley Stevens	Planning Director Caldwell Co	81
Danny Higgs	Town Mgr	8
Frank Ballentine	Catawba Co Em Project Specialist	82

NAME	TITLE / AFFILIATION
DAN K. MOORE	ASST. SUPT. Cat Co Schools
Devin Houston	Asst. Director of construction & maintenance Cat Co Schools
Blake Wright	Planning Director Maiden
Charles Mullis	Planning Log View
Laurie Iolicero	Cat. Co. Planning
Greg Foster	Alex Co
Daniel Fox	Alex Co
Jon Greer	Town of Hudson

Figure F-3: Unifour HMP Meeting Sign in from the 04/11/2024 in person meeting (emails and phone numbers redacted)

Name	Affiliation
Mckenzie Houston	AECOM, Planner
Curt Willis	Emergency Management Planner, WPCOG
Chris Crew	NCEM, Mitigation Plans Manager
Blake Wright	Planning Director, Town of Maiden
Caleb Bynum	Senior Utilities Engineer, City of Hickory
Kaine Riggan	NCDPS, BRIC Development Lead
Marti Blanton	Burke County EM
Gerg Wilson	Town Planner, Granite Falls
Dustin Millsaps	WPCOG (Town of Catawba and Town Sawmills)
Daniel Odom	WPCOG, Village of Cedar Rock
Jonathan Cook	EMS Director, Caldwell County EMS
Dallas Goodnight	WPCOG, GIS Specialist
Seth Holbrook	GIS Specialist, AECOM

Name	Affiliation
Kelly Christensen	GIS Tech, WPCOG
Chad Fisher	Deputy Chief, Hickory Fire Department
Mario Sclarandis	Director of Development and City Engineering
Wendy Smith	Director of Development and Design Services
Vic Misenheimer	Caldwell County EM
Russell Greene	NCEM
Stephen Craig	Fire Marshal, Hickory Fire Department
Kelsey Peterson	Environmental Planner, AECOM
Katelyn Smith	WPCOG, Town of Hildebran and Rutherford College
Greg Foster	911 EM Director, Alexander County

Table F- 3: Unifour Hazard Mitigation Meeting Sign in from June 12, 2024

Alexander County, North Carolina
Published by Gary Herman · Just now ·

Interested persons are invited to share their input regarding the Unifour Regional Hazard Mitigation Plan on Wednesday, June 12 from 11:30 a.m. to 12:30 p.m. in Newton.

Unifour Regional Hazard Mitigation Plan Public Meeting

What: Public meeting to obtain and incorporate communities' thoughts and concerns about the Unifour Regional Hazard Mitigation Plan

When: Tuesday, June 12th, 2024
"Come and go" anytime starting at 11:30am to 12:30pm ET

Where: 25 Government Drive, Newton, NC 28658, 2nd Floor Meeting Room

Floods, Wildfires, Tornadoes, Winter Storms, Hurricanes...What Concerns You?
Do you have ideas for helping our community become better prepared for future natural disasters?

You are invited to come share your thoughts and concerns about your community's resiliency against natural disasters and leave your comments for the final decision-making process.

About the Unifour Regional Hazard Mitigation Plan
The counties of the Unifour Region in coordination with their participating municipal jurisdictions, are finalizing a regional hazard mitigation plan that covers the multi-county area. The Unifour Regional Hazard Mitigation Plan identifies local policies and actions for reducing risk and future losses from natural hazards such as floods, severe storms, wildfires, and winter weather.

For More Information
If you would like to learn more, please contact one of the following county coordinators for this project:

Daniel Fox , Alexander County Emergency Management 828.352.7709/ dfox@alexandercountync.gov	Michael Willis , Burke County Emergency Management 828.413.5229/ Michael.willis@burkenc.org
Vic Misenheimer , Caldwell County Emergency Management 828.757.1419/ vmisenheimer@caldwellcountync.org	Jason Williams , Catawba County Emergency Management 828.465.8989/ jasonw@catawbacountync.gov

You can also visit [https://www.ncdps.gov/our-organization/emergency-management/hazard-mitigation/hazard-mitigation-plans#UnifourRegionalPlan-6718](https://www.ncdps.gov/our-organization/emergency-management/hazard-mitigation/plans#UnifourRegionalPlan-6718) for more information

We hope to see you June 12th, 2024!

Figure F- 4: Alexander County Facebook Post and Alexander County Health Department inviting the public and stakeholders to participate in the in-person Unifour Public Meeting on June 12, 2024

Name	Organization	Title
Mckenzie Houston	AECOM	Planner
Kelly Keefe	AECOM	Planner
Peyton Campbell	AECOM	Planner
Greg Foster	Alexander County	911 & EM Director
Daniel Fox	Alexander County	EM Coordinator
Fulbright Alex	City of Newton	Assistant Planning Director
Danny Hipps	Town of Catawba	Town Manager
Jason Williams	Catawba County	Emergency Management Coordinator
Bryan Blanton	Catawba County	Emergency Services Director
Karen Hamby	NCEM	
Chaiyo Vang	Caldwell County	Preparedness
Curt Willis	Western Piedmont Council of Governments (WPCOG)	EM Coordinator
Caleb Bynum	City of Hickory	Senior Utilities Engineer
Truman Walton	Town of Valdese	Safety Director
Laurie LoCicero	Catawba County	Planning
Chris Timberlake	Catawba County	Assistant Planning Director
Mario Sclarandis	City of Morganton	
Chris Crew	NCEM	Hazard Mitigation Plan Manager
Kenny		
Norman Staines	City of Lenoir	Town of Valdese
Jon Greer	Town of Hudson	Town Manager
Marti Blanton	Burke County	EM Planner
Katelyn Smith	Town of Hildebran	WPCOG Planner
Kenny Nelson	City of Lenoir	Fire Department
Chris Jacobs	City of Lenoir	
Jason Williams	Catawba County	
Alex Fulbright	City of Newton	Planning Director
Samuel Abernethy	City of Hickory	Civil Engineer
Haleigh Hopkins		
Jonathan Greer	Town of Hudson	Town Manager

Table F- 4: Meeting Virtual Sign in from 7-9-2024 meeting

Appendix F: Plan Adoption Resolutions, Meeting Sign-ins, Participation Invitations

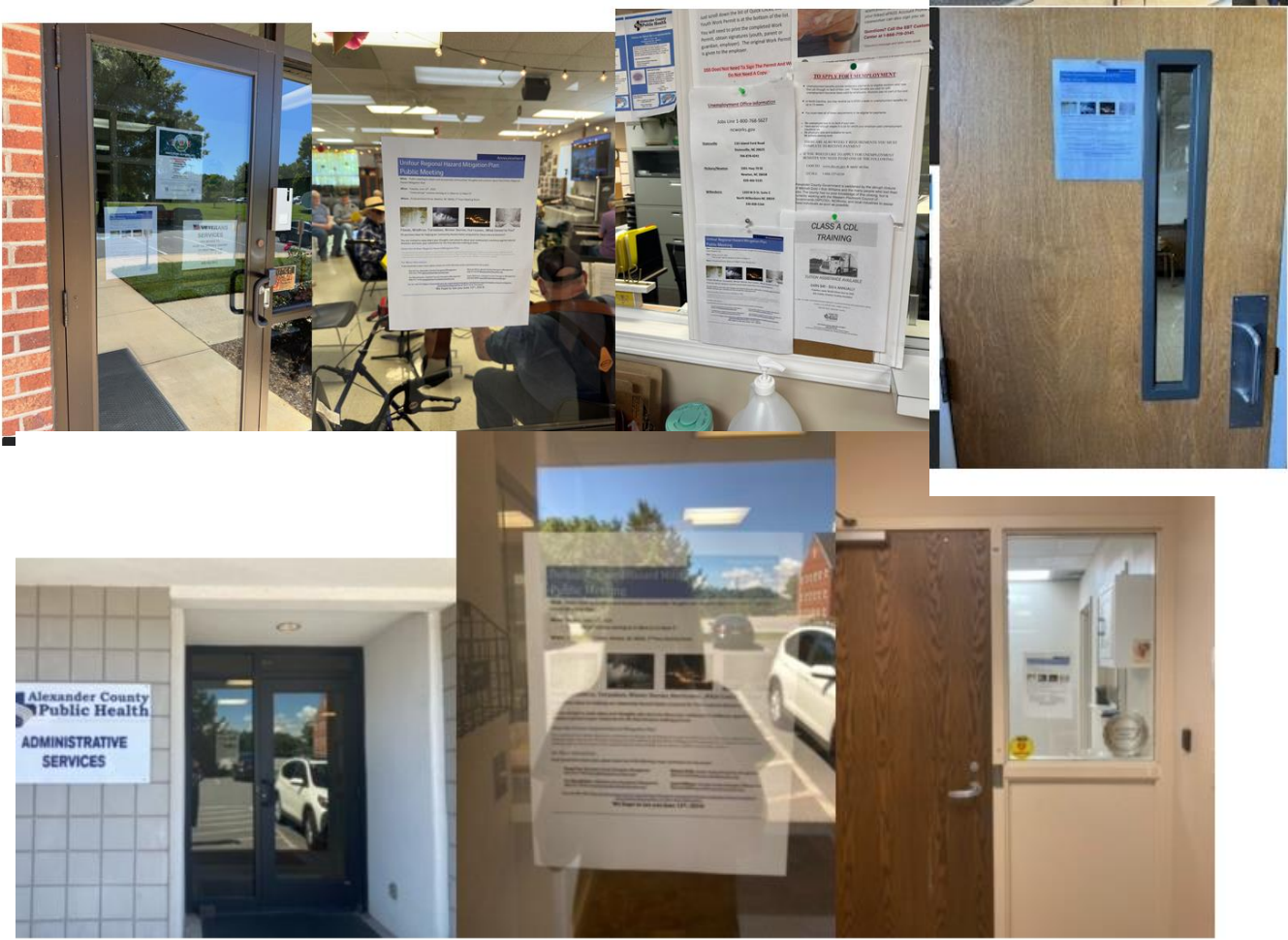


Figure F- 5: Flyers placed around the Alexander County County Administration, Senior Center, Department of Social Services, Health Department, and Volunteer Rescue Squad inviting the public to participate in the Unifour HMP Update Process for the public meeting on

Name	Organization	Title
Mckenzie Houston	AECOM	Planner
Holbrook, Seth	AECOM	Planner
Richard (Clifton) Franks	AECOM	Planner
Peyton Campbell	AECOM	Planner
Kelly Keefe	AECOM	Planner
Kelsey Peterson	AECOM	Planner
Stephen Craig	City of Hickory	Fire Marshal
Kymerly Kudla	FEMA Region 4	Community Planner

Name	Organization	Title
Joshua Holland	Lincoln County Emergency Management	
Amy Bucknum	Alexander County	Planner
Greg Foster	Alexander County 911 & Emergency Management	Director
Mark Howell	Lincoln County Emergency Management	
Daniel Fox	Alexander County Emergency Management	Emergency Management Coordinator
Chris Crew	NCEM	CFM Mitigation Plans Manager
Chris Jacobs	Lenoir Emergency Management	
Charles Mullis	Town of Long View	Planner
Martha Blanton	Burke County Emergency Management	Emergency Management Planner
Karen Hamby	North Carolina Emergency Management	Area 11 Coordinator
Truman Walton	Town of Valdese	Safety Director
Jonathan Maness	Rutherford County Emergency Management & Fire Marshal's Office	Fire Marshal
Cal Overby	City of Hickory Planning	Principle Planner
read.ai meeting notes		
Jason Reavis	Wilkes County	Emergency Management Coordinator
Blake Wright	Town of Maiden	Planning Director
Caleb Bynum	City of Hickory Public Utilities	Utilities Engineer
Eric Wiseman	NCEM	Area Coordinator
Carl Baker	NCEM	Hazard Mitigation Planner
Jason Williams	Catawba County Emergency Management	Emergency Management Coordinator
Katelyn Smith	Rutherford College and Hildebran	Community and Regional Planner
Ronald		
Catawba County Planning		
Alex Fulbright	City of Newton Planning	Planning Director
Kenny Nelson	Lenoir Fire Department	Deputy Chief
Sindy Connell	The Salvation Army	Social Services Directory
Greg Wilson	Town of Granite Falls	Town Planner
Russell Greene	NCEM	Area 11 Coordinator

Appendix F: Plan Adoption Resolutions, Meeting Sign-ins, Participation Invitations

Name	Organization	Title
Mario Sclarandis	City of Morganton	City Engineer
Blake Wright	Town of Maiden	Planning Director
Jeff Icard	North Carolina Department of Agriculture	County Ranger
Kenny Nelson	Lenior Fire Department	Deputy Chief
Chris Timberlake	Catawba County Planning	Planning Director
Laurie LoCicero	Catawba County Planning	Assistant Planning Director
Chad Fisher	City of Hickory	Deputy Chief of Administration
Wendy Smith	City of Morganton	Director

Table F- 5: Meeting Attendance from Unifour Wrap up Meeting on 9-18-2024

catawbacountync.gov/news/seeking-input-hazard-mitigation-plan/


25 Government Drive Newton, NC

catawba county
MAKING. LIVING. BETTER.

MAKING. LIVING. BETTER. ▾ GOVERNMENT COUNTY SERVICES ▾ ONLINE SERVICES ▾

Home / News / Seeking Input: Hazard Mitigation Plan

Catawba County News



Seeking Input: Hazard Mitigation Plan

📅 Published: September 23, 2024

As part of our ongoing efforts to enhance the safety and resilience of our community, we are in the process of updating our Hazard Mitigation Plan. This plan is crucial for identifying and addressing potential hazards that could impact our area, and your input is invaluable to us.

We invite you to review the draft Hazard Mitigation Plan and provide your comments, suggestions, and feedback. Your insights will help us ensure that the plan is comprehensive and reflects the needs and concerns of our community.

How to Participate:

Review the Draft Plan: The draft plan can be reviewed [HERE](#).

Submit Your Comments: Please send your comments and suggestions to the following link by October 1, 2024: <https://tinyurl.com/Unifour-HMP-Feedback>

Your participation is crucial in helping us create a safer and more prepared community. We look forward to hearing from you and working together to mitigate potential hazards.

Thank you for your time and contribution. If you have any questions, please contact Catawba County Emergency Services at (828) 465-8230.

Categories

- Animal Services
- Board of Commissioners
- Budget
- Building Codes & Services
- Clerk of Court
- County Manager
- E911 Communication
- Elections
- Emergency Medical Services
- Emergency Services
- Environmental Health
- Finance
- Geospatial Information
- Human Resources
- Library
- Parks
- Permit Center
- Planning & Parks
- Public Health
- Purchasing
- Register of Deeds
- Sheriff's Office
- Social Services
- Soil & Water Conservation
- Solid Waste/Recycling
- Tax
- Technology
- Utilities & Engineering
- Veteran's Services
- Featured Catawbans
- My Catawba County

Recent News

Figure F- 6: Catawba County HMP Public Participation Invitation

whky.com/citizens-input-sought-for-catawba-county-hazard-mitigation-plan/

WHKY

1290AM/102.3FM

NEWS

CONNECTED TO OUR LOCAL COMMUNITY

Citizen's Input Sought For Catawba County Hazard Mitigation Plan



Photo courtesy of Catawba County Government

Citizen's Input Sought For Catawba County Hazard Mitigation Plan

September 24, 2024 | Rob Eastwood - Reporter | NEWS

As part of Catawba County's ongoing efforts to enhance the safety and resilience of the community, officials are in the process of updating the Hazard Mitigation Plan. This plan is crucial for identifying and addressing potential hazards that could impact the area, and citizens' input is invaluable to the county.

Citizens are invited to review the draft Hazard Mitigation Plan and provide their comments, suggestions, and feedback. Citizens' insights will help county officials ensure that the plan is comprehensive and reflects the needs and concerns of the community.

The draft plan can be reviewed at this site:
https://catawbacountync.gov/site/assets/files/50843/draft_2024_unifour_hazard_mitigation_plan.pdf

Send your comments and suggestions to the following link by October 1, 2024:
<https://tinyurl.com/Unifour-HMP-Feedback>. If you have any questions, please contact Catawba County Emergency Services at (828) 465-8230.

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Figure F- 7: WHKY News Draft Plan Public Review Invitation on September 24, 2024



A wonderful place to live, work and play.

Public input sought for Hazard Mitigation Plan

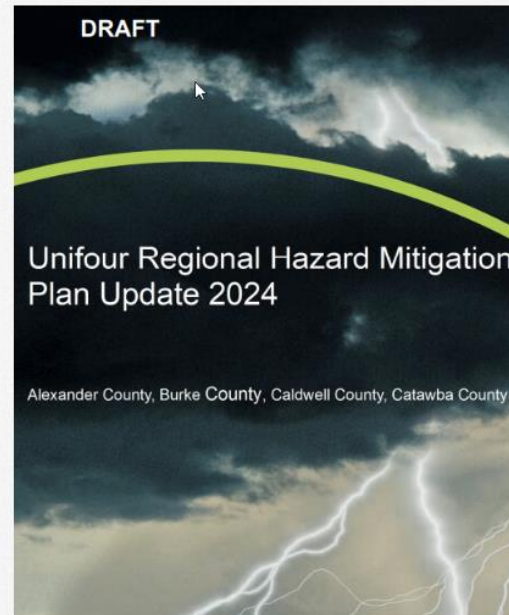
September 23, 2024 By Alexander County

As part of ongoing efforts to enhance the safety and resilience of the community, emergency management officials are in the process of updating the 2024 Unifour Hazard Mitigation Plan. This plan is crucial for identifying and addressing potential hazards that could impact the area, and public input is encouraged.

Citizens are being asked to review the [draft Hazard Mitigation Plan](#) and provide comments, suggestions, and feedback. Public input will help ensure that the plan is comprehensive and reflects the needs and concerns of the community.

How to Participate:

1. Review the draft plan, which is available for review [here](#).
2. After reviewing the draft plan, please send comments and suggestions by October 1 to this [link](#).



Share this post:




Figure F- 8: Alexander County Public Input Invitation on the Alexander County Website as of September 23, 2024

ci.longview.nc.us/single-post/2024-unifour-hazard-mitigation-public-survey

Long View North Carolina
The Official Website of the Town of Long View, NC

[Home](#) [Government](#) [Departments](#) [New Business](#) [Visitors](#) [Contact Us](#) [About U](#)

2024 Unifour Hazard Mitigation Public Survey



The Unifour Region is updating its Hazard Mitigation Plan to minimize negative effects from hazards.

We are seeking input from residents and stakeholders to enhance the plan. This survey aims to gather valuable feedback to shape the draft of the plan.

Your participation is crucial, and the survey should take approximately 10 minutes to complete.
All your answers will remain confidential.

Featured Posts

Check back soon

Once posts are published, you'll see them here.

Recent Posts

Figure F- 9: Town of Long View Public Participation Survey Invitation



2024 Unifour Hazard Mitigation Plan Public Survey

/ APRIL 24, 2024

The Unifour Region is updating its Hazard Mitigation Plan to minimize negative effects from hazards. One step in this process is a public survey of experiences and perceived disaster risk. Your participation is crucial, and the survey should only take about 10 minutes to complete. All of your answers will remain confidential. Please help us by sharing your valuable feedback.

2024 Unifour Hazard Mitigation Public Survey:

<https://www.surveymonkey.com/r/UNIFOUR2024>

Figure F- 10: Unifour HMP Public Survey Link and Invitation for the City of Hickory

The screenshot shows the Burke County website interface. At the top, there is a navigation bar with the Burke County logo and the tagline "ALL ABOUT ADVANCING". The navigation menu includes "GOVERNMENT", "SERVICES", "RESIDENTS", "BUSINESS", and "HOW DO I...". There are also social media icons for Facebook, Twitter, and YouTube. Below the navigation bar is a large banner image of a tree against a sunset sky. The main content area features a blue sidebar on the left and a main content area on the right. The main content area displays a news flash titled "2024 UNIFOUR HAZARD MITIGATION PUBLIC SURVEY" under the "EMERGENCY MANAGEMENT" category. The text of the news flash states that the Unifour Region is updating its Hazard Mitigation Plan and is seeking input from residents and stakeholders. It provides a link to the survey and mentions that participation is crucial and should take approximately 10 minutes. A "Next" button is visible at the bottom right of the main content area. On the right side of the page, there is a "MODULE SEARCH" section with a search input field and a dropdown menu for "All categories". Below the search section are "TOOLS" (RSS, Notify Me®, View Archived) and "CATEGORIES" (All Categories, Community Spotlights, Board of Commissioners, Water & Sewer, Emergency Management, County Administration, Social Services, Public Notices). A "Next" button is also present at the bottom right of the page.

Home > News Flash

EMERGENCY MANAGEMENT

Posted on: April 30, 2024

2024 UNIFOUR HAZARD MITIGATION PUBLIC SURVEY

The Unifour Region is updating its Hazard Mitigation Plan to minimize negative effects from hazards. We are seeking input from residents and stakeholders to enhance the plan. This survey aims to gather valuable feedback to shape the draft of the plan.

Your participation is crucial, and the survey should take approximately 10 minutes to complete.

All your answers will remain confidential.

2024 UNIFOUR HAZARD MITIGATION PUBLIC SURVEY
<https://www.surveymonkey.com/r/UNIFOUR2024>

EMERGENCY MANAGEMENT
BURKE COUNTY

Next =>
Press Releases - AT&T Wireless Outage

MODULE SEARCH
Word or Phrase
All categories

TOOLS
RSS
Notify Me®
View Archived

CATEGORIES
All Categories
Community Spotlights
Board of Commissioners
Water & Sewer
Emergency Management
County Administration
Social Services
Public Notices

Explor

Figure F- 11: Burke County website Unifour Hazard Mitigation Public Survey Post



[Home](#) > News Flash

PUBLIC NOTICES

Posted on: June 10, 2024 | Last Modified on: June 10, 2024

NOTICE OF PUBLIC MEETING - UNIFOUR REGIONAL HAZARD MITIGATION PLAN

Do you have ideas for helping our community become better prepared for future natural disasters?

You are invited to come share your thoughts and concerns about your community's resiliency against natural disasters

[Additional Info...](#)



[← Previous](#)

[Notice of Public Hearing - ZMA 2024-04](#)



[Next ⇒](#)

[Notice of Public Meeting - ZMA 2024-03](#)

MODULE SEARCH

Word or Phrase
All categories

TOOLS

-  RSS
-  Notify Me
-  View Archived

CATEGORIES

- All Categories
- Community Spotlights
- Board of Commissioners
- Water & Sewer

Figure F- 12: Burke County Public Meeting Notice for July 12th, 2024 meeting.

Appendix F: Plan Adoption Resolutions, Meeting Sign-ins, Participation Invitations

The screenshot shows a web browser window with the URL <https://usws211dgisww01.na.aecomnet.com/hmp/RegionalPlan/32>. The browser's address bar and tabs are visible at the top. The website header features the logo for the Hazard Mitigation Plan - Unifour Regional Plan and navigation links for EVENTS, DOCUMENTS, and LINKS. The main content area is titled "Unifour Regional Plan" and contains three large blue-tinted cards:

- EVENTS**: View Meetings And Associated Documents
- DOCUMENTS**: View All Planning Documents For Your Region.
- USEFUL LINKS**: Visit Useful Hazard Planning Related Websites.

Below these cards, the page is organized into sections:

- EVENTS**: VISIT HERE TO GET A LIST OF BOTH PUBLIC AND COMMITTEE EVENTS AS WELL AS VIEW ANY EVENT DOCUMENTATION
- DOCUMENTS**: DOWNLOAD AND VIEW HAZARD MITIGATION PLAN DOCUMENTS FOR YOUR REGION
[DRAFT_2024 Unifour Hazard Mitigation Plan.pdf](#)
- USEFUL LINKS**: FOLLOW THE BELOW LINKS FOR USEFUL HAZARD RELATED INFORMATION
- COMMUNITY SURVEY**: TAKE THE TIME TO COMPLETE A BRIEF COMMUNITY SURVEY
[TAKE SURVEY](#)

Figure F- 13: HMP Unifour Regional Plan Update Public Comment Link



Seeking public input for 2024 Unifour Hazard Mitigation Plan

/ SEPTEMBER 24, 2024

As part of our ongoing efforts to enhance the safety and resilience of our community, the Unifour Region is in the process of updating our Hazard Mitigation Plan. This plan is crucial for identifying and addressing potential hazards that could impact our area, and your input is invaluable to us.

We invite you to review the draft Hazard Mitigation Plan and provide your comments, suggestions, and feedback. Your insights will help us ensure that the plan is comprehensive and reflects the needs and concerns of our community.

How to Participate:

- **Review the Draft Plan:** The draft plan can be reviewed [HERE](#).
- **Submit Your Comments:** Please send your comments and suggestions to the following link by Oct. 1, 2024: tinyurl.com/Unifour-HMP-Feedback

Your participation is crucial in helping us create a safer and more prepared community. We look forward to hearing from you and working together to mitigate potential hazards.

Thank you for your time and contribution. If you have any questions, please contact Catawba County Emergency Services at 828-465-8230.

Figure F- 14: Request for public comment on the draft HMP on the Hickory, NC website

Appendix F: Plan Adoption Resolutions, Meeting Sign-ins, Participation Invitations

This email message will be sent to about 29 recipients.
 Attendee responses: 17 accepted, 1 tentatively accepted, 0 declined.

Mitigation Planning

Send Update

Title: **Unifour Regional Hazard Mitigation Plan Kickoff** Meeting Insight

Required ● Keefe, Kelly; karen.hamby@ncdps.gov; Russell.Greene@ncdps.gov; dmfox@alex.andercountync.gov; Michael.Willis <michael.willis@burkenc.org>; ymsisenheimer@caldwelldelcountync.org; Jason.Williams <JasonW@CatawbaCountyNC.gov>; Martha.Blanton <martha.blanton@burkenc.org>; hblanton@catawba-countync.gov; ctimberlake@catawba-countync.gov; FrankB@CatawbaCountyNC.gov; jbrown@cityofclaremont.org; tom.hart@conovernc.gov; sabernethy@hickorync.gov; goverby@hickorync.gov; afulbright@newtonnc.gov; townofbrookford@yahoo.com; +5 others

Optional ● Curt.Willis <curt.willis@wpcog.org>; John.Crew@ncdps.gov; carl.baker@ncdps.gov; John.Mello@ncdps.gov; Peterson, Kelsey; Holbrook, Seth; Franks, Richard (Clifton)

Start time: Fri 2/16/2024 10:00 AM Eastern Time (US & Cana) All day Time zones

End time: Fri 2/16/2024 12:00 PM Eastern Time (US & Cana) [Make Recurring](#)

Location: Microsoft Teams Meeting Room Find

Unifour Kick-Off (2024-02-16).pdf 19 KB

Please join us on Friday, February 16th for the virtual Unifour Regional HMP Kick-off meeting.

We currently do not have everyone's contact information, and ask that you please share invitation with county leads and municipalities, if they are not already included on this invite.

Figure G- 2: Kick off Meeting Invitation for 2/16/2024

This email message will be sent to about 72 recipients.
 Attendee responses: 26 accepted, 3 tentatively accepted, 3 declined.

Mitigation Planning

Send Update

Title: **UNIFOUR: Hazard Mitigation Planning Meeting #2** Meeting Insight

Required ● Keefe, Kelly; eric.wiseman@ncdps.gov; dmfox@alex.andercountync.gov; bburgess@alex.andercountync.gov; mearfe@alex.andercountync.gov; russell.greene@ncdps.gov; Atchley, Greg (NCCEM) <Greg.Atchley@ncdps.gov>; millsapmichael@yahoo.com; dgillispie618@gmail.com; michael.willis@burkenc.org; martha.blanton@burkenc.org; townmanager@townofdrexel.net; msclarandis@morgantonncc.gov; ljohnson@valdesenc.gov; twalton@valdesenc.gov; ymsisenheimer@caldwelldelcountync.org; Jason.Williams <JasonW@CatawbaCountyNC.gov>; +43 others

Optional ● John.Crew@ncdps.gov; carl.baker@ncdps.gov; John.Mello@ncdps.gov; Peterson, Kelsey; Holbrook, Seth; Franks, Richard (Clifton); kymberly.kudla@fema.dhs.gov; Bill.Carroll <bcarroll@townofdrexel.net>; Wiseman, Eric (NCCEM) <eric.wiseman@ncdps.gov>; Laurie.LoCicero <LLoCicero@CatawbaCountyNC.gov>; Teresa.Kinney <Teresa.Kinney@wpcog.org>; Rachel.Wooster <rachel.wooster@wpcog.org>

Start time: Thu 4/11/2024 2:00 PM Eastern Time (US & Cana) All day Time zones

End time: Thu 4/11/2024 3:30 PM Eastern Time (US & Cana) [Make Recurring](#)

Location: 25 Government Drive, Newton, NC 28658, 2nd Floor Meeting Room; Microsoft Teams Meeting Room Find

Unifour Kick-Off (2024-04-11).docx 33 KB

All,

Please join us for the HMP Meeting #2 on **Thursday, April 11th at 2pm ET** at the **Catawba County Government Center (25 Government Dr, 2nd Floor Meeting Room, Newton, NC 28658)**. Please share this invitation with municipalities or community stakeholders that may not be included on this invite.

This will be a hybrid meeting. For those who are unable attend in-person, a meeting link is provided below.

the agenda is attached and is subject to change

Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Figure G- 1: Meeting Invitation for 4/11/2024

This email message will be sent to about 82 recipients.
 Attendee responses: 13 accepted, 2 tentatively accepted, 7 declined.

Mitigation Planning

Title UNIFOUR HMP: Planning Meeting (hybrid) Meeting Insights

Required Keefe, Kelly; Campbell, Peyton; Storzbach, Ryan; Peterson, Kelsey; Franks, Richard (Clifton); Holbrook, Seth; Baker, Carl <carl.baker@ncdps.gov>; Crew, John <John.Crew@ncdps.gov>; greg.atchley@ncdps.gov; teresa.kinney@wpcog.org; karen.hamby@ncdps.gov; russell.greene@ncdps.gov; eric.wiseman@ncdps.gov; dmfox@alexandercountync.gov; bburgess@alexandercountync.gov; gfoster@alexandercountync.gov; millsapsmichael@yahoo.com; dgillispie618@gmail.com; michael.willis@burkenc.org; martha.blanton@burkenc.org; townmanager@townofdrexel.net +55 others

Optional kymberly.kudla@fema.dhs.gov; Graves, Kaitlyn <kgansrow@alexandercountync.gov>; Bill Carroll <bcarroll@townofdrexel.net>; Kaine, Riggan@ncdps.gov; Frank, Ballentine <FBallentine@CatawbaCountyNC.gov>; Trey, Schweitzer <trey.schweitzer@wpcog.org>

Start time Wed 6/12/2024 10:30 AM Eastern Time (US & Cana) All day Time zones

End time Wed 6/12/2024 12:30 PM Eastern Time (US & Cana) [Make Recurring](#)

Location 25 Government Drive, Newton, NC 28658, 2nd Floor Meeting Room; Microsoft Teams Meeting Room Finder

Unifour_Agenda_6-12-24.docx 33 KB

All,

Please join us for the in-person/virtual Planning Meeting on **Wednesday, June 12th at 10:30am ET**.

Please note that we have made an effort to include everyone that we currently have contact information for, however we realize that we do not have everyone's email address. Please forward as necessary.

Thank you!

Microsoft Teams [Need help?](#)

[Join the meeting now](#)

Meeting ID: 254 558 857 269
 Passcode: pDGeQd

Figure G- 4: Unifour Planning Meeting Invitation for meeting on 6/12/2024

This email message will be sent to about 66 recipients.
 We've found some ways to make your message more accessible. [Review accessibility issues](#)

Mitigation Planning

Title UNIFOUR HMP: Virtual Capability Assessment Workshop Meeting Insights

Required Keefe, Kelly; Campbell, Peyton; Baker, Carl <carl.baker@ncdps.gov>; Crew, John <John.Crew@ncdps.gov>; greg.atchley@ncdps.gov; teresa.kinney@wpcog.org; karen.hamby@ncdps.gov; russell.greene@ncdps.gov; eric.wiseman@ncdps.gov; dmfox@alexandercountync.gov; bburgess@alexandercountync.gov; gfoster@alexandercountync.gov; millsapsmichael@yahoo.com; dgillispie618@gmail.com; michael.willis@burkenc.org; martha.blanton@burkenc.org; townmanager@townofdrexel.net; msclarandis@morgantonncc.gov; wsmith@morgantonncc.gov +49 others

Optional kymberly.kudla@fema.dhs.gov; Crystal Reed <creed@townofgalenapine.org>; Warburton, Thomas <twarburton@morgantonncc.gov>

Start time Mon 5/13/2024 10:30 AM Eastern Time (US & Cana) All day Time zones

End time Mon 5/13/2024 11:30 AM Eastern Time (US & Cana) [Make Recurring](#)

Location Microsoft Teams Meeting Room Finder

Unifour_CapabilityAssessment.xlsx 40 KB

This is a friendly reminder to please join us for the virtual Capability Assessment Workshop Meeting on **Monday, May 13th at 10:30am ET**. Performing a Capability Assessment is one step of a FEMA-approved hazard mitigation plan update.

Pease fill out as much as you can before or on May 13th for the Capability Assessment Virtual Workshop. We are available to answer your questions anytime and look forward to discussing these further on May 13th at 10:30 am.

We need to have all jurisdictions' worksheets in by **COB May 28th**.

- This worksheet helps assess your community's regulatory, technical, and financial resources. By understanding these capabilities, you can identify and implement effective mitigation actions.
1. Planning and Regulatory Capabilities:
 - o These capabilities involve plans, policies, codes, and ordinances that aim to prevent and reduce the impacts of hazards.
 2. Technical Capabilities:
 - o These capabilities refer to the tools, equipment, and expertise available within your community.
 3. Financial Capabilities:
 - o These capabilities are the resources to fund mitigation actions.
 4. Outreach Capabilities:
 - o These capabilities are programs and methods that can communicate about and encourage risk reduction.
 5. Mitigation Capabilities:
 - o These capabilities describe your experience with mitigation activities.
 6. Political Capabilities:
 - o These unique capabilities determine a jurisdiction's ability to undertake mitigation

Please note that we have made an effort to include everyone that we currently have contact information for, however we realize that we do not have everyone's email address. Please forward as necessary.

Thank you!

Figure G- 3: Meeting invitation for Capability Assessment Workshop on 5/13/2024

Appendix F: Plan Adoption Resolutions, Meeting Sign-ins, Participation Invitations

This email message will be sent to about 69 recipients.
We've found some ways to make your message more accessible. [Review accessibility issues](#)
Attendee responses: 13 accepted, 5 tentatively accepted, 1 declined.

Title: UNIFOUR HMP: Virtual Mitigation Actions Workshop Meeting Insights

Required: [Keefe, Kelly](#), [Campbell, Peyton](#), [Baker, Carl <carl.baker@ncdps.gov>](#), [Crew, John <John.Crew@ncdps.gov>](#), [greg.atchley@ncdps.gov](#), [teresa.kinney@wpcog.org](#), [karen.hamby@ncdps.gov](#), [russell.greene@ncdps.gov](#), [eric.wiseman@ncpdps.gov](#), [dmfox@alexandercountync.gov](#), [bburgess@alexandercountync.gov](#), [gfozter@alexandercountync.gov](#), [millsapsmichael@yahoo.com](#), [dgillispie618@gmail.com](#), [michael.willis@burkenc.org](#), [martha.blanton@burkenc.org](#), [townmanager@townofdrexel.net](#), [msclarandis@morgantonncc.gov](#), [wsmith@morgantonncc.gov](#), **+49 others**

Optional: [kymberly.kudla@fema.dhs.gov](#)

Start time: Tue 7/9/2024 10:30 AM Eastern Time (US & Cana) All day Time zones

End time: Tue 7/9/2024 11:30 AM Eastern Time (US & Cana) [Make Recurring](#)

Location: Microsoft Teams Meeting Room Finder

All,

Please join us for the virtual Mitigation Actions Workshop Meeting on **Tuesday, July 11th at 10:30am ET**.

Please note that we have made an effort to include everyone that we currently have contact information for, however we realize that we do not have everyone's email address. Please forward as necessary.

Thank you!

agenda is forthcoming

Microsoft Teams [Need help?](#)

[Join the meeting now](#)

Meeting ID: 274 111 236 050
Passcode: RCvHgJ

Figure G- 5: Virtual Mitigation Action Workshop Invitation for 7/9/2024

This email message will be sent to about 116 recipients.
We've found some ways to make your message more accessible. [Review accessibility issues](#)

Mitigation Planning

 Title: **REMINDER: UNIFOUR: HMP Draft Review** 

Required            
         **+90 others**

Optional     

Start time: Wed 9/18/2024 11:00 AM Eastern Time (US & Cana) All day Time zones

End time: Wed 9/18/2024 12:00 PM Eastern Time (US & Cana) [Make Recurring](#)

Location: [Microsoft Teams Meeting](#) 

All,

This is a friendly reminder to please join us **tomorrow, September 18th at 11am ET** for the Unifour Hazard Mitigation Plan Draft review.

If you have any questions ahead of tomorrow's meeting, please let us know.

Thanks!

Microsoft Teams [Need help?](#)

[Join the meeting now](#)

Meeting ID: 214 719 119 665

Passcode: E757fj

Figure G- 6: Unifour Public Draft Review Meeting invitation for 9/18/2024



FEMA

May 27, 2025

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: Unifour NC Regional Hazard Mitigation Plan

Dear Mr. McGugan:

This is a follow-up to our previous correspondence of February 8, 2025, in which we approved the Unifour NC Regional Hazard Mitigation Plan and all participating jurisdictions that originally submitted adoption resolutions. We have recently received and approved additional resolution(s) for inclusion. FEMA approval does not include the review or approval of content that exceeds the applicable FEMA mitigation planning requirements.

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)

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

If you or any plan participant need assistance, please do not hesitate to contact Kymberly Kudla, of my staff, at (202) 655-6712.

Sincerely,

A handwritten signature in blue ink that reads "Kristen M. Martinenza".

Kristen M. Martinenza, P.E.
Risk Analysis Branch Chief

Enclosure

Enclosure: Plan Participant Status List

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

Jurisdiction Name	Jurisdiction Status by FEMA	Date Approved
1) Alexander County	Approved	2/7/25
2) Brookford town	Approved	5/27/25
3) Burke County	Approved	5/27/25
4) Cahah's Mountain town	Approved	5/27/25
5) Caldwell County	Approved	5/27/25
6) Catawba County	Approved	5/27/25
7) Catawba town	Approved	5/27/25
8) Cedar Rock village	Approved	5/27/25
9) Claremont city	Approved	2/10/25
10) Connelly Springs town	Approved	5/27/25
11) Conover city	Approved	5/27/25
12) Drexel town	Approved	5/27/25
13) Gamewell town	Approved	5/27/25
14) Glen Alpine town	Approved	5/27/25
15) Granite Falls town	Approved	5/27/25
16) Hickory city	Approved	2/7/25
17) Hildebran town	Approved	5/27/25
18) Hudson town	Approved	5/27/25
19) Lenoir city	Approved	2/10/25
20) Long View town	Approved	5/27/25
21) Maiden town	Approved	5/27/25
22) Morganton city	Approved	5/27/25
23) Newton city	Approved	5/27/25
24) Rhodhiss town	Approved	5/27/25
25) Rutherford College town	Approved	2/7/25
26) Sawmills town	Approved	5/27/25
27) Taylorsville town	Approved	5/27/25
28) Valdese town	Approved	5/27/25



Alexander County Administration

621 Liledoun Road, Taylorsville, NC 28681
Phone (828) 632-9332 ~ Fax (828) 632-0059

RESOLUTION ADOPTING UNIFOUR REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within Alexander County are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of Alexander County are particularly vulnerable to drought, extreme heat, hailstorms, hurricanes and tropical storms, lightning, thunderstorm winds / high winds, tornados, winter storms and freezes, floods, hazardous material incidents, and wildfires; and

WHEREAS, Alexander County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five-year cycle; and

WHEREAS, Alexander County has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said Plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management; and

WHEREAS, it is the intent of the Board of Commissioners of Alexander County to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County.

NOW, THEREFORE, be it resolved that the Alexander County Board of Commissioners hereby:

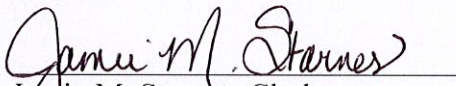
1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests Alexander County Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with federal, state and local agencies and private firms which undertake to study, survey, map, and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Alexander County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all state and federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Alexander County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

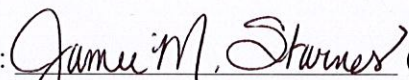
Adopted this the 3rd day of February, 2025.



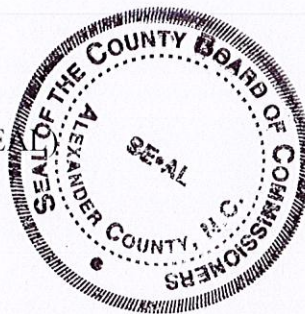
Marty A. Pennell, Chairman
Alexander County Board of Commissioners

Attest:


Jamie M. Starnes, Clerk

Certified by:  (SE

Date: 2/3/25





RESOLUTION NO. 2025-06
**ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN**

WHEREAS, the citizens and property within the Town of Taylorville are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Taylorville desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

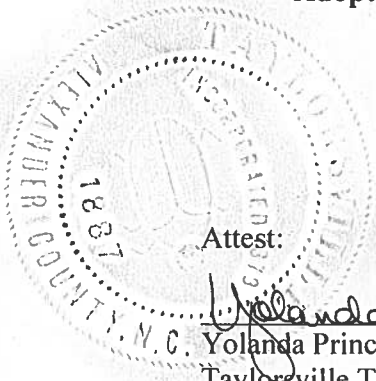
WHEREAS, the Town of Taylorville has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.


WHEREAS, it is the intent of the Town Council of the Town of Taylorsville to fulfill this obligation in order that the Town will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Town Council of Taylorsville hereby:

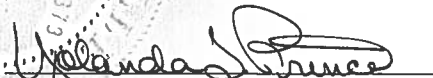
1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests Alexander County Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Alexander County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Alexander County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 18th day of March, 2025.




George B. Holleman, Mayor
Taylorsville Town Council

Attest:


Yolanda Prince, Clerk
Taylorsville Town Council

Certified by:  (SEAL)

Date: 3/24/2025



**BURKE COUNTY
NORTH CAROLINA**

**RESOLUTION OF ADOPTION
UNIFOUR HAZARD MITIGATION PLAN**

WHEREAS, the citizens and property within Burke County are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to flooding, tornadoes, high winds, snow storms, landslides, etc. and

WHEREAS, the County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Part 6, Article 21 of Chapter 143; Parts 3, 5, and 8 of Article 19 of Chapter 160A; and Article 8 of Chapter 160A of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has in Section 1 Part 166A of the North Carolina General Statutes (adopted in Session Law 2001-214 --- Senate Bill 300 effective July 1, 2001), states therein in Item (a) (2) "For a state of disaster proclaimed pursuant to G.S. 166A-6(a) after August 1, 2002, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act"; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, Burke County has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

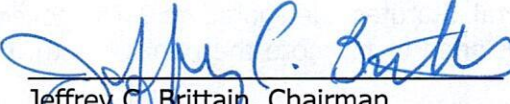
WHEREAS, it is the intent of the Board of Commissioners of Burke County to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, therefore, be it resolved that the Board of Commissioners of Burke County hereby:

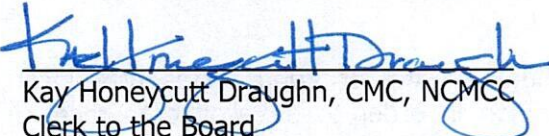
1. Adopts the Unifour Hazard Mitigation Plan; and
2. Vests Burke County Emergency Management Office with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints the Burke County Emergency Management Office to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Board of Commissioners of Burke County for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.



Adopted this 17th day of February 2024.


Jeffrey C. Brittain, Chairman
Burke County Board of Commissioners

ATTEST:


Kay Honeycutt Draughn, CMC, NCMCC
Clerk to the Board



TOWN OF CONNELLY SPRINGS
RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN
RESOLUTION NO. 2025-01

WHEREAS, the citizens and property within the Town of Connelly Springs are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Connelly Springs desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town of Connelly Springs has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Aldermen of the Town of Connelly Springs to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Board of Aldermen of the Town of Connelly Springs hereby:

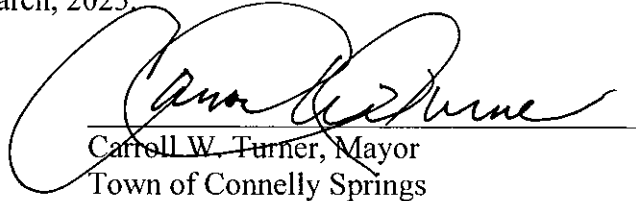
1. Adopts the Unifour Regional Hazard Mitigation Plan.

2. Vests Burke County Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

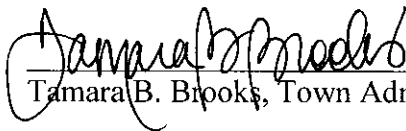
3. Appoints Burke County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Burke County Board of Commissioners for consideration.

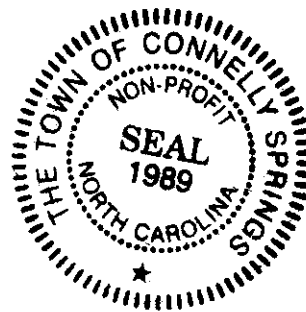
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 3rd day of March, 2025.


Carroll W. Turner, Mayor
Town of Connelly Springs

Attest:


Tamara B. Brooks, Town Administrator



Date: 03.03.2025

RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Drexel are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Drexel desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

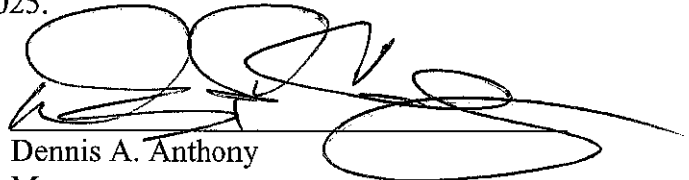
WHEREAS, the Town of Drexel has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Aldermen of the Town of Drexel to fulfill this obligation in order that the town/county will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the town/county;

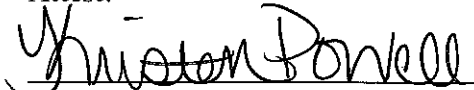
NOW, THEREFORE, be it resolved that the Board of Aldermen of Drexel hereby:

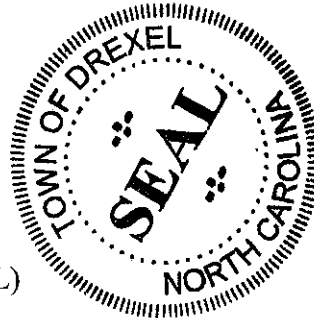
1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests Burke County Emergency Management with responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Burke County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Drexel Board of Aldermen for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 13th day of May, 2025.


Dennis A. Anthony
Mayor

Attest:


Kristen Powell
Town Clerk



Certified by: Melissa Carnwell (SEAL)

Date: 5/13/25

RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within Glen Alpine are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Burke County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Glen Alpine has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Commissioners of Glen Alpine to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Board of Commissioners of Glen Alpine hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests Burke County/Glen Alpine Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Burke County/Glen Alpine Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Glen Alpine County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 13th day of May, 2025.

Michelle Lewis, Mayor

Name, Chair
Glen Alpine Board of Commissioners

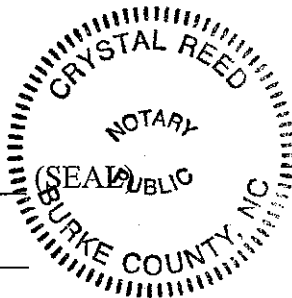
Attest:

Crystal Reed

Name, Clerk
Glen Alpine Board of Commissioners

Certified by: Crystal Reed

Date: 5/13/25



RESOLUTION
ADOPTING TOWN OF HILDEBRAN REGIONAL
HAZARD MITIGATION PLAN

RESOLUTION # 02-24-25

WHEREAS, the citizens and property within the Town of Hildebran are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Burke County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

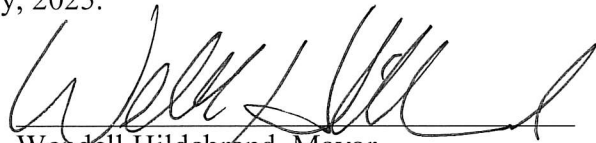
WHEREAS, the Town of Hildebran has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Town Council of the Town of Hildebran to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Town Council of the Town of Hildebran hereby:

1. Adopts the Town of Hildebran Regional Hazard Mitigation Plan.
2. Vests Burke County Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Burke County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Burke County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 24th day of February, 2025.



Wendell Hildebrand, Mayor
Town of Hildebran

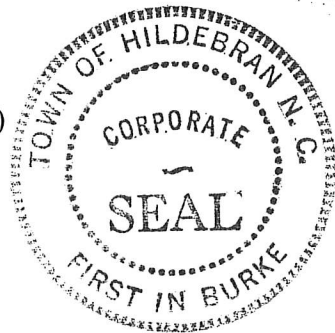
Attest:



Alice Sanders, Town Clerk
Town of Hildebran

Certified by: Alice Sanders (SEAL)

Date: 2/27/25



RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the City of Morganton are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the city are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the City of Morganton desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the City of Morganton has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the City Council of Morganton to fulfill this obligation in order that the City will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the City;

NOW, THEREFORE, be it resolved that the City Council of Morganton hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

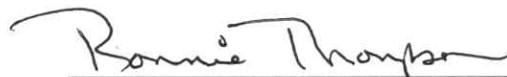
2. Vests City of Morganton Emergency Management with responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints City of Morganton Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the City Council of Morganton for consideration.


4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 3rd day of March, 2025.



Mayor, Ronnie Thompson,
City of Morganton

Attest:



Renee C. Carswell, City Clerk
City of Morganton

Certified by: Renee C. Carswell

Date: 3/3/2025



RESOLUTION #02032025
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Rutherford College are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Rutherford College desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town of Rutherford College has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Town Council of the Town of Rutherford College to fulfill this obligation in order that the Town will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Town Council of Rutherford College hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

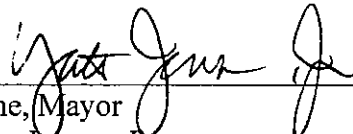
2. Vests Burke County Emergency Management with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints Burke County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Burke County Board of Commissioners for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

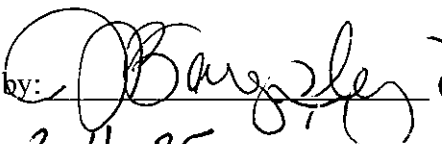
Adopted this the 3rd day of February 2025.

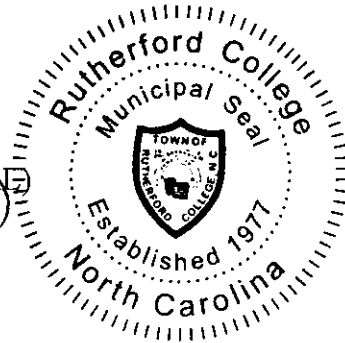


 Name, Mayor
 Yates Jensen, Jr.

Attest:


 Name, Clerk
 Terra Brieno

Certified by:  (SEAL)
 Date: 2-4-25



RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Valdese are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the Town are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Town Council of Valdese to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the Town;

NOW, THEREFORE, be it resolved that the Town Council of the Town of Valdese hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

2. Vests Valdese Emergency Management with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints Valdese Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Town Council for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 3rd day of March, 2025.

L. Charles Watts
L. Charles Watts, Mayor
Town of Valdese

Attest:

Jessica Lail
Jessica Lail, Clerk
Town of Valdese

Certified by: B. [Signature]
Date: 03/03/2025



RESOLUTION

09 -2025



RESOLUTION ADOPTING UNIFOUR REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within Caldwell County are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Caldwell County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, Caldwell County has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Commissioners of Caldwell County to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Board of Commissioners of Caldwell County hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests Caldwell County Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Caldwell County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Caldwell County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 14th day of April, 2025.



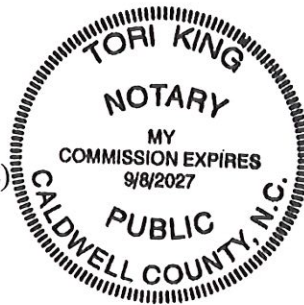
Randy T. Church, Chair
Caldwell County Board of Commissioners

Attest:



Abby Rich, NCCCC
County Clerk

Certified by: Tori King (SEAL)
Date: 4/14/25



Town Council

Ronnie Setzer, Mayor
Lloyd Robbins, Mayor Pro Tem
Cheryl Pritchard
Jeff Bolick
Richard Andrews



Town Manager

Randy Feierabend

TOWN OF CAJAH'S MOUNTAIN, NC

1800 Connelly Springs Road
Cajah's Mountain, North Carolina 28645
Phone (828) 728-5053 • Fax (828) 728-4166

RESOLUTION
TOWN OF CAJAH'S MOUNTAIN, NC IN CALDWELL COUNTY
ADOPTING UNIFOUR REGIONAL
RESOLUTION 09 - 2025
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Cajah's Mountain in Caldwell County, North Carolina are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Caldwell County, NC desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and


WHEREAS, the TOWN OF CAJAH'S MOUNTIAN IN CALDWELL COUNTY has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the CAJAH'S MOUNTIAN TOWN COUNCIL TO ALLOW CALDWELL COUNTY, NC to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the CAJAH'S MOUNTIAN TOWN COUNCIL LOCATED IN CALDWELL COUNTY, NC hereby:

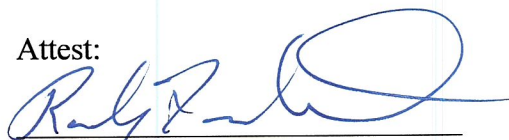
1. Adopts the **Unifour** Regional Hazard Mitigation Plan and Caldwell County Mitigation Plan; and.
2. Vests **CALDWELL COUNTY** Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints **Caldwell County** Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the **Cajah's Mountain Town Council located in Caldwell County, NC** for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 5th day of May, 2025.

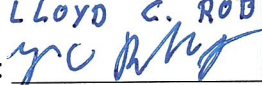


 Ronnie Setzer, Mayor
 Town of Cajah's Mountain

Attest:



 Randy Feierabend, Town Manager
 Town of Cajah's Mountain, NC

LLOYD C. ROBBINS JR
 Certified by:  (SEAL)

Date: 05-05-25

CALDWELL CO.
 My Comm. Exp. 07-14-29

VILLAGE OF CEDAR ROCK
RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Village of Cedar Rock are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Village desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Village has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Councilors of the Village of Cedar Rock to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Village Council of Cedar Rock hereby:

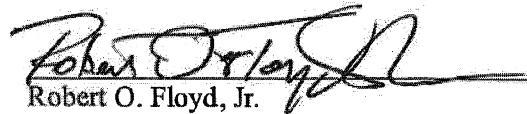
1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests Cedar Rock Emergency Management with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints Cedar Rock Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Village Council for consideration.

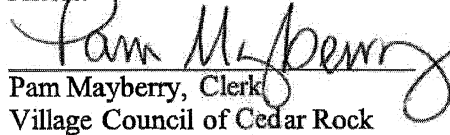
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 18th day of February, 2025.


Robert O. Floyd, Jr.

Mayor, Village of Cedar Rock

Attest.


Pam Mayberry, Clerk
Village Council of Cedar Rock

Certified by:  (SEAL)

Date: 2/18/25



RESOLUTION
TOWN OF GAMEWELL, NC IN CALDWELL COUNTY
ADOPTING UNIFOUR REGIONAL
RESOLUTION 09 - 2025
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Gamewell in Caldwell County, North Carolina are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Caldwell County, NC desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and


WHEREAS, the TOWN OF GAMEWELL IN CALDWELL COUNTY has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the GAMEWELL TOWN COUNCIL TO ALLOW CALDWELL COUNTY, NC to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the GAMEWELL TOWN COUNCIL LOCATED IN CALDWELL COUNTY, NC hereby:


1. Adopts the Unifour Regional Hazard Mitigation Plan and Caldwell County Mitigation Plan; and.
2. Vests CALDWELL COUNTY Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Caldwell County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Gamewell Town Council located in Caldwell County, NC for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 12th day of May, 2025.



Barbara C. Pennell, Mayor
Town of Gamewell, NC

Attest:



Bonnie C. Caudle, Town Administrator/Clerk
Town of Gamewell, NC

Certified by: _____ (SEAL)

Date: May 12, 2025





TOWN OF GRANITE FALLS *North Carolina*

Dr. Caryl B. Burns Mayor • Mike Mackie Mayor Pro Tem • Daniel P. Cobb Town Manager
Council Members Ritch Bolick • Larry Knight • Jim Mackie • Martin D. Townsend • Tracy Townsend

RESOLUTION ADOPTING UNIFOUR REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Granite Falls are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Granite Falls desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and


WHEREAS, the Town of Granite Falls has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Granite Falls Town Council to fulfill this obligation in order that the Town will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the Town;

NOW, THEREFORE, be it resolved that the Granite Falls Town Council hereby:

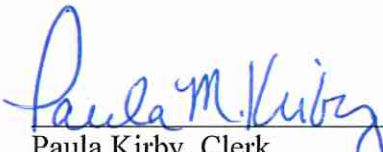
1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests the Town Manager with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Town Manager to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Granite Falls Town Council for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 17th day of February, 2025.



Dr. Caryl Burns, Mayor
Town of Granite Falls

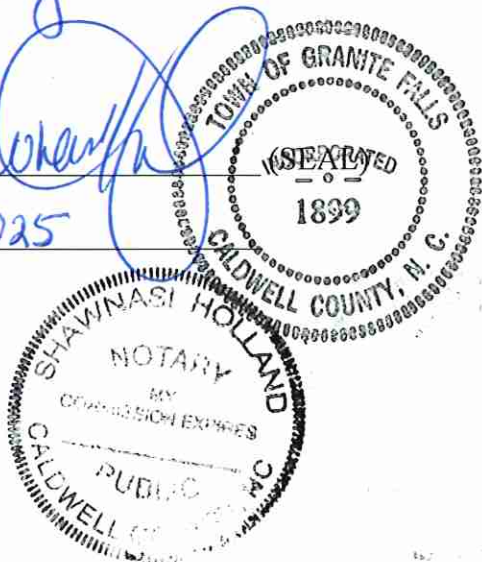
Attest:



Paula Kirby, Clerk
Town of Granite Falls

Certified by: 

Date: 2/17/2025



RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Hudson are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Hudson desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five-year cycle; and

WHEREAS, the Town of Hudson has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Commissioners of Town of Hudson to fulfill this obligation in order that the Town will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the Town;

NOW, THEREFORE, be it resolved that the Board of Commissioners of Town of Hudson hereby:

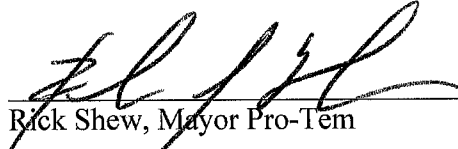
1. Adopts the Unifour Regional Hazard Mitigation Plan.


2. Vests Town of Hudson with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

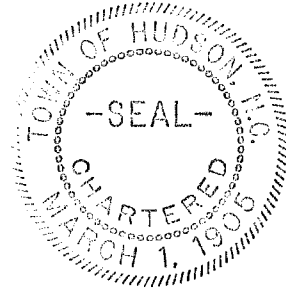
3. Appoints Town of Hudson Administration to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Town of Hudson Board of Commissioners for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 18th day of February, 2025.


Rick Shew, Mayor Pro-Tem

Attest:

Tamra Swanson, Town Clerk



Certified by  (SEAL)

Date: 2-18-2025

RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the City of Lenoir are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the City of Lenoir desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five-year cycle; and

WHEREAS, the City of Lenoir has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the City Council of the City of Lenoir to fulfill this obligation in order that the County and City will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County/City;

NOW, THEREFORE, be it resolved that the City Council of the City of Lenoir hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

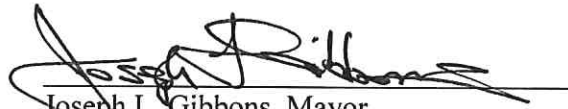
2. Vests the City of Lenoir Emergency Management with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints the City of Lenoir Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the City of Lenoir City Council for consideration.

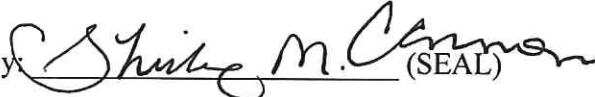
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 4th day of February 2025.


Joseph L. Gibbons, Mayor
City of Lenoir

Attest:


Shirley M. Cannon, Clerk
City of Lenoir

Certified by:  (SEAL)

Date: 2-4-2025

CITY OF LENOIR, NC
CHARTERED
JANUARY 28, 1851

SEAL

ADOPTING UNIFOUR REGIONAL
RESOLUTION OF ADOPTION
TOWN OF RHODHISS
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Rhodhiss are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the county desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town of Rhodhiss has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Commissioners of the Town of Rhodhiss to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Board of Commissioners of the Town of Rhodhiss hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests the Town of Rhodhiss with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Caldwell/Burke Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Town of Rhodhiss County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 17th day of March, 2025.

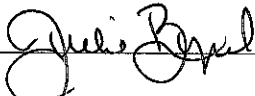


Allen Spencer
Mayor

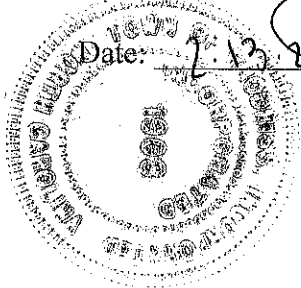
Attest:



Julie Byrd
Town Clerk

Certified by:  (SEAL)

Date: 3.13.25



STATE OF NORTH CAROLINA

TOWN OF SAWMILLS
RESOLUTION ADOPTING UNIFOUR
REGIONAL HAZARD MITIGATION PLAN

COUNTY OF CALDWELL

WHEREAS, the citizens and property within the Town of Sawmills are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Sawmills along with Caldwell County desire to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town of Sawmills has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Town Council of the Town of Sawmills along with the Caldwell County Commissioners to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Town Council of the Town of Sawmills hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests Town Manager in Coordinating with the Caldwell County Emergency Management Director with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints the Town Manager to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Town Council for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

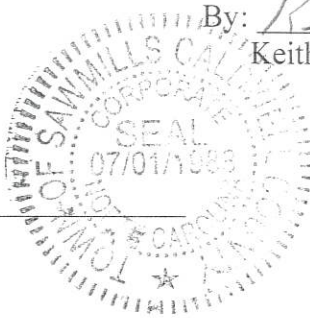
Adopted this the 18th day of February, 2025.

TOWN OF SAWMILLS

By: Keith Warren
Keith Warren, Mayor

ATTEST:

Julie Good
Julie Good, Town Clerk



APPROVED TO FORM:

Terry Taylor
Terry Taylor, Town Attorney

RESOLUTION ADOPTING UNIFOUR REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within Catawba County are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the County are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five-year cycle; and

WHEREAS, the County has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Catawba County Board of Commissioners to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Catawba County Board of Commissioners hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests the Catawba County Departments of Planning and Emergency Services with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Catawba County Emergency Services to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Catawba County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

This the 17th day of March, 2025.



C. Randall Isenhower, Chair
Catawba County Board of Commissioners

Attest:



Dale R. Stiles, Clerk
Catawba County Board of Commissioners

RESOLUTION 0225
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within Town of Brookford are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Catawba County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town of Brookford has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Alderman of Brookford to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Board of Alderman of Brookford hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.


2. Vests Catawba County Emergency Management with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints Catawba County Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Catawba County Board of Commissioners for consideration.

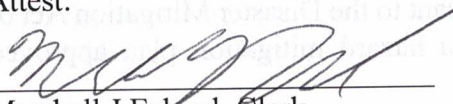
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 17th day of February 2025.

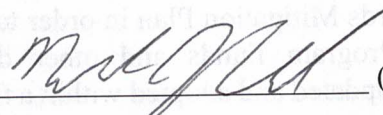


 Thomas Schronce, Mayor
 Brookford Board of Alderman

Attest:



 Marshall J Eckard, Clerk
 Brookford Board of Alderman

Certified by:  (SEAL)

Date: 2/17/25



RESOLUTION 2025-2

**ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN**

WHEREAS, the citizens and property within Town of Catawba are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Catawba County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town of Catawba has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Town Council of Catawba to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Town Council of Catawba hereby:


1. Adopts the Unifour Regional Hazard Mitigation Plan.

2. Vests Town of Catawba Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

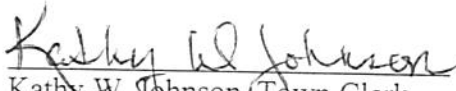
3. Appoints Town of Catawba Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Catawba County Board of Commissioners for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 17th Day of February, 2025.

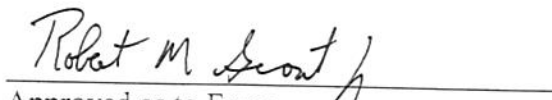

Donald R. Robinson, Mayor
Town of Catawba

Attest:


Kathy W. Johnson, Town Clerk
Town of Catawba

Certified by: Kathy W. Johnson (SEAL)

Date: 2-17-2025


Approved as to Form
Robert M. Grant, Jr.

**CITY OF CLAREMONT
RESOLUTION 14-25
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN**

WHEREAS, the citizens and property within the City of Claremont are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the City of Claremont desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the City of Claremont, along with all municipal and county governments in the Unifour Region, has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the City Council of City of Claremont to fulfill this obligation in order that the City will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Claremont City Council of hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

2. Vests City of Claremont administrative personnel with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints the City Manager to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Claremont City Council for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this, the 3rd day of February, 2025.



Shawn R. Brown, Mayor

ATTEST:



Wendy L. Helms, City Clerk

APPROVED AS TO FORM:



Robert M. Grant, Jr., City Attorney

**CITY OF CONOVER
RESOLUTION 13-25**

**RESOLUTION ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN**

WHEREAS, the citizens and property within the City of Conover (“the City”) are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the City desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the City has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

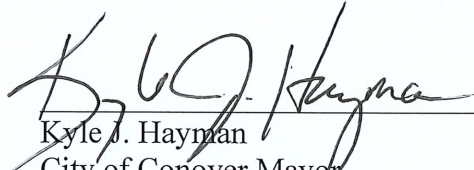
WHEREAS, it is the intent of the City of Conover Council to fulfill this obligation in order that the City will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the City;

NOW, THEREFORE, BE IT RESOLVED that the City of Conover Council hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.
2. Vests the Catawba County Departments of Planning and Emergency Services with the responsibility, authority, and the means to:


- (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints Catawba County Emergency Services to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Catawba County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

This the 7th day of April, 2025.



Kyle J. Hayman
City of Conover Mayor

Attest:


Stephanie C. Watson, City Clerk
City of Conover



RESOLUTION
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within Town of Long View are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Catawba County desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five-year cycle; and

WHEREAS, the Town of Long View has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Aldermen of the Town of Long View to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Board of Aldermen of Town of Long View hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

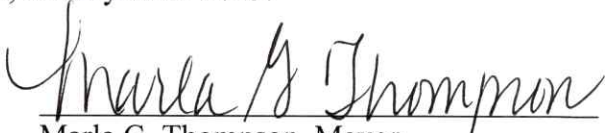
2. Vests Catawba County Emergency Management with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.


3. Appoints Catawba County Emergency Management/Town of Long View Public Information Officer to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Town of Long View Board of Aldermen for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 10th day of March, in the year of 2025.


Marla G. Thompson, Mayor
Town of Long View Board of Aldermen

Attest:


Heather T Minor, NCCMC Clerk
Town of Long View

Certified by: Heather T. Minor (SEAL)

Date: 3/10/2025



RESOLUTION NO. 25-06

A RESOLUTION OF THE HICKORY CITY COUNCIL ADOPTING THE 2024 UNIFOUR REGIONAL HAZARD MITIGATION PLAN.

WHEREAS, the citizens and property within the City of Hickory are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the City are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the City desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the City has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the City Council of the City of Hickory to fulfill this obligation in order that the City will be eligible for federal and state assistance in the event a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the City Council of the City of Hickory hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

Resolution 25-06
Hickory City Council
Page 1 of 2

2. Vests the Hickory Planning Department with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints the Hickory Planning Department to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Hickory City Council for consideration.


4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

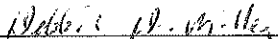
ORDAINED by the City Council of Hickory, North Carolina, this, the 11th day of February, 2024. 5



THE CITY OF HICKORY, a
North Carolina Municipal Corporation

Attest:


By: 
Hank Guess, Mayor


Debbie D. Miller, City Clerk

Approved as to form this 30th day of JANUARY, 2024. 5


Attorney for the City of Hickory

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.


Kari Dunlap
City of Hickory
Finance Officer

Resolution 25-06
Hickory City Council
Page 2 of 2

RESOLUTION #02-2025
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the Town of Maiden are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the Town are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the Town of Maiden desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the Town of Maiden has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Town Council of Town of Maiden to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Town Council of Town of Maiden hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

2. Vests Maiden Emergency Management with the responsibility, authority, and the means to:

- (a) Inform all concerned parties of this action.
- (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints Maiden Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Town of Maiden council for consideration.

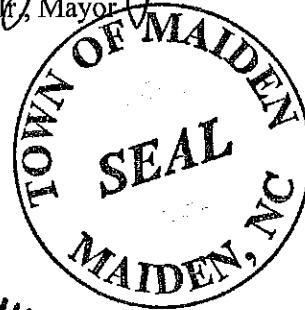
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 10th day of February, 2025.

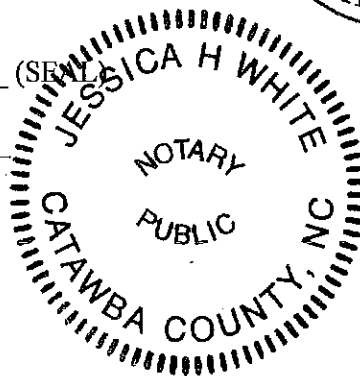
Max Bumgarner, Jr.
 Max Bumgarner, Jr., Mayor

Attest:

Anna Hughey
 Anna Hughey, Clerk
 Town of Maiden



Certified by Jessica H White
 Date: 2/10/2025



RESOLUTION 02-2025
ADOPTING UNIFOUR REGIONAL
HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the City of Newton are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, the City of Newton desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the City of Newton has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Commissioners of the City of Newton to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the City Council of the City of Newton hereby:

1. Adopts the Unifour Regional Hazard Mitigation Plan.

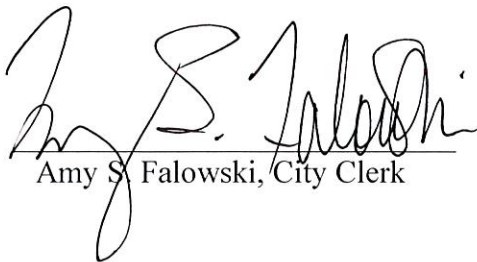
2. Vests the City Manager or his designee with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints the City Manager or his designee to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the City Council of Newton North Carolina for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 4th day of February, 2025.


Jerry Hodge, Mayor


Amy S. Falowski, City Clerk



Appendix G: Alternate Participation

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- **Alternate participation** refers to participation in the HMP update process by one-on-one meetings with AECOM planners to make plan edits and ensure complete participation with all jurisdictions in the planning area.

Re: Unifour Hazard Mitigation Plan Update (Connelly Springs)

Tamara Brooks <clerk@ci.connelly-springs.nc.us>

Thu 9/5/2024 7:15 PM

To: Keefe, Kelly <kelly.keefe@aecom.com>

Cc: sjp@ci.connelly-springs.nc.us <sjp@ci.connelly-springs.nc.us>; Martha Blanton <martha.blanton@burkenc.org>; Houston, McKenzie M <McKenzie.Houston@aecom.com>; Campbell, Peyton <peyton.campbell@aecom.com>

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Good evening,

I have attempted to access the link provided for the Town of Connelly Springs, however it seems to be sending information for/to the Town of Brookford. Can someone take a look and send the correct link?

Regards,

Tamara Brooks

Town Administrator / Notary Public

Ph: (828) 879-2321

Fax: (828) 879-2325



On Thu, Aug 29, 2024 at 3:48 PM Keefe, Kelly <kelly.keefe@aecom.com> wrote:

Hello!

Can we work together to get Connelly Springs' Mitigation Actions complete?

We have a link to complete your mitigation actions here:

[Section7 Mitigation Action Plans 4 10 24.xlsx](#)

Attached is a tutorial to help walk with through the process so that you can view just your jurisdictions mitigation actions.

Kelly Keefe, CFM

Senior Planner

AECOM, a member of Compass PTS JV

M +1-954-461-3374

kelly.keefe@aecom.com

From: Keefe, Kelly

Sent: Friday, August 16, 2024 1:06 PM

To: michael.willis@burkenc.org; Martha Blanton <martha.blanton@burkenc.org>; clerk@ci.connelly-springs.nc.us

Cc: Houston, McKenzie M <McKenzie.Houston@aecom.com>; Campbell, Peyton

<peyton.campbell@aecom.com>

Subject: Unifour Hazard Mitigation Plan Update (Connelly Springs)

Hello,

Can we work together to get Connelly Springs Capability Assessment and Connelly Springs Mitigation Actions complete?

We assume the Capability Assessment will be similar to the county's but we need to verify.

This email communication is in lieu of Connelly Springs in person attendance at the HMPC meeting.

Thanks,

Kelly Keefe, CFM

Senior Planner

AECOM, a member of Compass PTS JV

M +1-954-461-3374

kelly.keefe@aecom.com

Figure G- 1: Connelly Springs Participation email

Re: Unifour Hazard Mitigation Plan Updates (Glen Alpine)

Crystal Reed <creed@townofglenalpine.org>

Mon 8/19/2024 9:02 AM

To: Martha Blanton <martha.blanton@burkenc.org>

Cc: Keefe, Kelly <kelly.keefe@aecom.com>; Michael Willis <michael.willis@burkenc.org>; Campbell, Peyton <peyton.campbell@aecom.com>; Houston, McKenzie M <McKenzie.Houston@aecom.com>

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That would be great!

On Fri, Aug 16, 2024 at 3:22 PM Martha Blanton <martha.blanton@burkenc.org> wrote:

I will follow up with both municipalities.

Thanks,

Marti Blanton
Emergency Management Planner
Burke County
200 Avery Avenue
Morganton, NC 28655
828.764.9320 Office
828.764.3708 Cell
martha.blanton@burkenc.org

From: Keefe, Kelly <kelly.keefe@aecom.com>

Sent: Friday, August 16, 2024 12:55:17 PM

To: Michael Willis <michael.willis@burkenc.org>; Martha Blanton <martha.blanton@burkenc.org>;
creed@townofglenalpine.org <creed@townofglenalpine.org>

Cc: Campbell, Peyton <peyton.campbell@aecom.com>; Houston, McKenzie M <McKenzie.Houston@aecom.com>

Subject: Unifour Hazard Mitigation Plan Updates (Glen Alpine)

CAUTION: Don't be quick to click! We're counting on you! This email is from an external sender! **Don't click** on links or open attachments from unknown sources. If you know this is spam delete the message. If you believe this message is a phish attack, Click the Phish Alert button above. If you are unsure what to do, contact the helpdesk at 9410.

Figure G- 2: Town of Glen Alpine Participation Email

Hello,

Can we work together to get [Glen Alpine's Capability Assessment](#) complete? We assume it will be similar to the county's but we want to verify.

We are also in receipt of Glen Alpine's Mitigation Actions (thank you) and this email communication is in lieu of Glen Alpine's n person attendance at the HMPC meeting.

Thanks,

Kelly Keefe, CFM
Senior Planner

AECOM, a member of Compass PTS JV
M +1-954-461-3374
kelly.keefe@aecom.com

--
Crystal Reed
Town Administrator/Clerk
Glen Alpine
103 Pitts Street
Glen Alpine, NC
828-584-2622 office

FW: Unifour Hazard Mitigation Plan Update (Brookford)

Keefe, Kelly <kelly.keefe@aecom.com>

Fri 8/16/2024 1:57 PM

To: Campbell, Peyton <peyton.campbell@aecom.com>

Can you walk Brookford through the mitigation actions process and the capability assessment?

Thanks,

Kelly Keefe, CFM

Senior Planner

AECOM, a member of Compass PTS JV

M +1-954-461-3374

kelly.keefe@aecom.com

From: Town of Brookford <townofbrookford@yahoo.com>

Sent: Friday, August 16, 2024 1:15 PM

To: Keefe, Kelly <kelly.keefe@aecom.com>

Subject: Re: Unifour Hazard Mitigation Plan Update (Brookford)

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You have not previously corresponded with this sender.

Absolutely what do you need from me.

Marshall

On Friday, August 16, 2024 at 01:02:59 PM EDT, Keefe, Kelly <kelly.keefe@aecom.com> wrote:

Hello,

Can we work together to get [Brookford's Capability Assessment](#) and Brookford's Mitigation Actions complete?

We assume the Capability Assessment will be similar to the county's but we need to verify.

This email communication is in lieu of Brookford's in person attendance at the HMPC meeting.

Thanks,

Kelly Keefe, CFM

Senior Planner

AECOM, a member of Compass PTS JV

M +1-954-461-3374

kelly.keefe@aecom.com

Figure G- 3: Town of Brookford Participation email

RE: Unifour Hazard Mitigation Plan Update (Claremont)

Bryce Carter <Bcarter@cityofclaremont.org>

Wed 9/11/2024 8:58 AM

To: Keefe, Kelly <kelly.keefe@aecom.com>; Jason Brown <jbrown@cityofclaremont.org>

Cc: Campbell, Peyton <peyton.campbell@aecom.com>; Houston, McKenzie M <McKenzie.Houston@aecom.com>

1 attachments (39 KB)

Unifour_CapabilityAssessment Claremont.xlsx

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This message came from outside your organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

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Kelly,

Here is Claremont's Capability Assessment. Let me know if there is anything else I need to do.



Bryce Carter, MPA, CZO

Planning Director

3288 E Main St

Claremont, NC 28610

(828) 466-7255 - (c) (704) 437-2526

From: Keefe, Kelly <kelly.keefe@aecom.com>

Sent: Friday, August 16, 2024 3:05 PM

To: Bryce Carter <Bcarter@cityofclaremont.org>

Cc: Campbell, Peyton <peyton.campbell@aecom.com>; Houston, McKenzie M <McKenzie.Houston@aecom.com>

Subject: RE: Unifour Hazard Mitigation Plan Update (Claremont)

Byrce,

Thank you so much. Reach out if you get hung up anywhere.

You will find lots of common ground with the county capability assessment. You can just edit that one based on your city's unique circumstances.

There are no "wrong" answers; just answer to the best of your ability.

Have a great weekend.

Kelly Keefe, CFM

Senior Planner

AECOM, a member of Compass PTS JV

M +1-954-461-3374

From: Keefe, Kelly

Sent: Friday, August 16, 2024 1:10 PM

To: JasonW@catawbacountync.gov; jbrown@cityofclaremont.org

Cc: Houston, McKenzie M <McKenzie.Houston@aecom.com>; Campbell, Peyton <peyton.campbell@aecom.com>

Subject: Unifour Hazard Mitigation Plan Update (Claremont)

Hello,

Can we work together to get **Claremont's Capability Assessment** complete? We assume it will be similar to the county's but we want to verify.

We are also in receipt of **Claremont's Mitigation Actions** (thank you) and this email communication is in lieu of **Claremont's** in person attendance at the HMPC meeting.

Thanks,

Kelly Keefe, CFM

Senior Planner

AECOM, a member of Compass PTS JV

M +1-954-461-3374

kelly.keefe@aecom.com

Figure G- 4: City of Claremont Email Participation

From: Randy Feierabend <manager@cajahsmtn.com>
Sent: Friday, September 20, 2024 3:22 PM
To: Keefe, Kelly <kelly.keefe@aecom.com>
Subject: Cajah's Mountain

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Kelly,

I think that as far as Cajah's Mtn goes there has been no changes that might impact your reports.
Randy

Reply

Reply all

Forward

Figure G- 5: Cajah's Mountain correspondence example

Appendix H: Hazard Vulnerability (Buildings, People, and Facilities at Risk)

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Jurisdiction	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
City Of Lenoir	379	301	\$17,973,761	78	\$30,328,912	0	\$0	379	\$48,302,673
Caldwell County	687	637	\$26,508,593	47	\$16,528,033	3	\$1,545,331	687	\$44,581,957
City Of Morganton	45	52	\$1,048,719	21	\$2,830,840	0	\$0	73	\$3,879,559
Burke County	202	244	\$1,554,714	18	\$317,043	0	\$0	262	\$1,871,758
Catawba County	122	249	\$1,372,089	10	\$223,464	0	\$0	259	\$1,595,553
Town Of Gamewell	26	24	\$981,720	2	\$134,226	0	\$0	26	\$1,115,946
City Of Hickory	70	67	\$278,389	21	\$827,123	0	\$0	88	\$1,105,512
Town Of Valdese	11	6	\$7,983	4	\$732,306	0	\$0	10	\$740,289
Town Of Granite Falls	9	9	\$480,712	0	\$0	0	\$0	9	\$480,712
Town Of Sawmills	14	14	\$357,559	0	\$0	0	\$0	14	\$357,559
City Of Newton	31	39	\$260,187	3	\$96,193	0	\$0	42	\$356,380
Town Of Long View	12	12	\$39,566	1	\$43,001	1	\$221,830	14	\$304,396
Town Of Maiden	10	10	\$8,490	4	\$257,352	0	\$0	14	\$265,843
Alexander County	62	59	\$204,491	3	\$13,654	0	\$0	62	\$218,146
City Of Conover	21	34	\$96,782	1	\$74,962	0	\$0	35	\$171,744
Town Of Cahaj's Mountain	6	6	\$138,425	0	\$0	0	\$0	6	\$138,425
Town Of Rhodhiss	4	9	\$123,250	0	\$0	0	\$0	9	\$123,250
Town Of Hudson	12	12	\$117,668	0	\$0	0	\$0	12	\$117,668
Town Of Drexel	13	14	\$37,205	1	\$39,831	0	\$0	15	\$77,036
Town Of Catawba	2	4	\$42,463	1	\$862	0	\$0	5	\$43,326
Town Of Brookford	3	2	\$15,539	1	\$27,653	0	\$0	3	\$43,192
Town Of Connelly Springs	5	2	\$1,464	3	\$18,539	0	\$0	5	\$20,003
City Of Claremont	1	1	\$4,567	0	\$0	0	\$0	1	\$4,567
Town Of Taylorsville	5	5	\$4,308	0	\$0	0	\$0	5	\$4,308
Town Of Glen Alpine	2	4	\$3,063	0	\$0	0	\$0	4	\$3,063
Town Of Rutherford College	2	2	\$1,251	0	\$0	0	\$0	2	\$1,251
Town Of Hildebran	0	0	\$0	0	\$0	0	\$0	0	\$0
Village Of Cedar Rock	0	0	\$0	0	\$0	0	\$0	0	\$0

Table H- 1: Buildings at risk for 100-year river flooding events

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Caldwell County	265	62	1,266
City Of Lenoir	117	33	594
Burke County	94	19	468
Catawba County	83	26	447
City Of Hickory	32	9	185
City Of Morganton	23	7	121
Alexander County	18	4	90
City Of Conover	11	5	71
City Of Newton	13	4	71
Town Of Gamewell	6	2	31
Town Of Sawmills	6	1	29
Town Of Hudson	5	1	27
Town Of Granite Falls	4	1	19
Town Of Long View	3	1	19
Town Of Drexel	4	1	17
Town Of Valdese	3	1	13
Town Of Rhodhiss	2	1	12
Town Of Cahah's Mountain	2	0	10
Town Of Maiden	2	1	10
Town Of Taylorsville	1	0	6
Town Of Catawba	1	0	6
Town Of Rutherford College	1	0	5
Town Of Connelly Springs	1	0	4
Town Of Glen Alpine	1	0	4
Town Of Brookford	0	0	3
City Of Claremont	0	0	2
Town Of Hildebran	0	0	0
Village Of Cedar Rock	0	0	0

Table H- 2: Population at risk for 100-year flooding event

Jurisdiction	Type	Number of Buildings	Damages
City Of Lenoir	Commercial	4	\$20,914,187
City Of Lenoir	Residential	2	\$2,267,513
City Of Morganton	Commercial	2	\$2,048,478
Caldwell County	Commercial	1	\$1,044,560
City Of Lenoir	Industrial	1	\$29,364
Catawba County	Residential	1	\$5,962

Table H- 3: High loss buildings at risk for 100-year flooding

Jurisdiction	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
Catawba County	12,007	23,174	\$2,582,382,492	1,343	\$1,181,138,300	181	\$518,177,348	24,698	\$4,281,698,141
Burke County	14,657	18,431	\$2,216,552,953	735	\$975,620,055	161	\$281,560,359	19,327	\$3,473,733,367
Alexander County	13,748	12,542	\$1,375,376,302	1,079	\$1,221,926,723	121	\$247,849,496	13,742	\$2,845,152,521
Caldwell County	13,092	12,466	\$1,715,392,289	531	\$604,548,450	95	\$223,514,208	13,092	\$2,543,454,947
City Of Lenoir	3,931	3,617	\$590,707,598	256	\$512,771,023	58	\$99,573,681	3,931	\$1,203,052,302
City Of Morganton	1,969	2,228	\$348,594,699	212	\$547,463,664	71	\$240,269,644	2,511	\$1,136,328,007
City Of Hickory	1,672	3,167	\$677,201,078	167	\$337,320,436	23	\$76,380,179	3,357	\$1,090,901,693
Town Of Granite Falls	2,805	2,576	\$527,137,825	182	\$365,320,715	47	\$105,655,791	2,805	\$998,114,331
Town Of Hudson	2,223	2,035	\$320,997,804	169	\$276,722,508	19	\$71,172,799	2,223	\$668,893,111

Jurisdiction	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
Town Of Sawmills	2,560	2,410	\$360,322,716	138	\$256,394,033	12	\$33,154,809	2,560	\$649,871,558
City Of Newton	753	1,135	\$156,570,212	106	\$432,560,556	8	\$53,449,181	1,249	\$642,579,949
City Of Conover	564	942	\$119,970,849	196	\$428,757,538	5	\$6,457,774	1,143	\$555,186,160
Town Of Hildebran	820	726	\$129,569,956	95	\$283,899,976	14	\$86,518,259	835	\$499,988,190
Town Of Maiden	955	1,218	\$150,988,475	211	\$325,194,293	11	\$16,937,185	1,440	\$493,119,953
Town Of Drexel	1,630	1,956	\$284,495,472	68	\$96,779,237	16	\$37,017,978	2,040	\$418,292,686
Town Of Gamewell	1,891	1,804	\$243,753,390	75	\$96,819,765	12	\$65,626,924	1,891	\$406,200,078
Town Of Taylorsville	1,495	1,316	\$171,723,956	132	\$166,581,545	45	\$54,751,422	1,493	\$393,056,923
Town Of Valdese	669	810	\$157,010,336	71	\$182,152,144	16	\$52,350,889	897	\$391,513,368
Town Of Cahah's Mountain	912	841	\$154,325,860	65	\$70,882,517	6	\$9,992,882	912	\$235,201,260
Town Of Rutherford College	442	479	\$77,366,136	35	\$51,037,205	12	\$28,960,241	526	\$157,363,581

Jurisdiction	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
Town Of Connelly Springs	650	729	\$93,118,369	35	\$26,858,488	7	\$21,637,277	771	\$141,614,134
Town Of Long View	227	307	\$55,131,042	25	\$46,335,422	2	\$27,143,330	334	\$128,609,794
City Of Claremont	268	230	\$30,909,969	33	\$69,714,054	5	\$12,954,399	268	\$113,578,423
Town Of Catawba	306	405	\$44,038,065	42	\$38,491,810	1	\$584,382	448	\$83,114,257
Town Of Rhodhiss	288	353	\$47,298,822	13	\$5,516,631	4	\$11,386,904	370	\$64,202,357
Town Of Glen Alpine	179	202	\$21,778,120	8	\$5,887,040	2	\$4,449,235	212	\$32,114,395
Village Of Cedar Rock	69	67	\$24,399,355	1	\$398,452	1	\$1,325,086	69	\$26,122,892
Town Of Brookford	15	21	\$3,462,061	0	\$0	0	\$0	21	\$3,462,061

Table H- 4: Wildfire vulnerability of buildings

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Catawba County	7,702	2,404	41,670
Burke County	7,134	1,442	35,432
Caldwell County	5,192	1,216	24,782
Alexander County	3,818	848	19,244
City Of Hickory	1,518	434	8,745
City Of Lenoir	1,415	397	7,158

Town Of Granite Falls	1,095	352	5,589
City Of Morganton	1,001	317	5,270
Town Of Sawmills	1,091	214	5,078
Town Of Hudson	767	203	4,570
Town Of Drexel	509	80	2,396
Town Of Gamewell	432	118	2,322
City Of Newton	368	125	2,081
City Of Conover	312	128	1,977
Town Of Valdese	436	118	1,706
Town Of Connelly Springs	278	107	1,587
Town Of Taylorsville	382	124	1,514
Town Of Cahaj's Mountain	276	66	1,454
Town Of Maiden	195	73	1,168
Town Of Rutherford College	307	68	1,100
Town Of Hildebran	183	74	1,072
Town Of Catawba	125	33	601
City Of Claremont	88	30	516
Town Of Long View	76	29	478
Town Of Rhodhiss	90	33	470
Town Of Glen Alpine	38	11	204
Village Of Cedar Rock	12	1	43
Town Of Brookford	4	3	30

Table H- 5: Wildfire vulnerability by population

Jurisdiction	Building Type	Number of Buildings	Damages
Alexander County	Agricultural	0	\$0
	Commercial	117	\$434,361,867
	Government	13	\$124,718,826
	Industrial	40	\$194,879,971
	Other	0	\$0
	Religious	20	\$54,155,582

Jurisdiction	Building Type	Number of Buildings	Damages
	Residential	11	\$38,096,625
	Utilities	6	\$60,000,000
Burke County	Agricultural	0	\$0
	Commercial	40	\$145,335,825
	Government	9	\$78,836,232
	Industrial	9	\$27,640,839
	Other	0	\$0
	Religious	4	\$17,563,717
	Residential	12	\$52,464,232
	Utilities	5	\$140,000,000
Caldwell County	Agricultural	0	\$0
	Commercial	21	\$98,935,328
	Government	8	\$115,221,202
	Industrial	6	\$17,552,497
	Other	0	\$0
	Religious	1	\$5,770,013
	Residential	4	\$6,574,222
	Utilities	0	\$0
Catawba County	Agricultural	0	\$0
	Commercial	26	\$92,545,225
	Government	19	\$396,522,898
	Industrial	6	\$171,795,449
	Other	0	\$0
	Religious	3	\$3,688,187
	Residential	6	\$8,972,739
	Utilities	5	\$35,585,357
City Of Claremont	Agricultural	0	\$0
	Commercial	1	\$1,110,809
	Government	1	\$9,371,990
	Industrial	2	\$45,200,697
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
City Of Conover	Agricultural	0	\$0
	Commercial	9	\$86,138,616
	Government	1	\$4,544,257
	Industrial	7	\$177,314,430
	Other	0	\$0
	Religious	0	\$0
	Residential	2	\$5,291,240
	Utilities	0	\$0
City Of Hickory	Agricultural	0	\$0
	Commercial	10	\$168,520,432
	Government	5	\$61,496,272
	Industrial	5	\$54,722,947
	Other	0	\$0
	Religious	1	\$6,410,104
	Residential	7	\$111,085,782
	Utilities	3	\$23,047,849
City Of Lenoir	Agricultural	0	\$0
	Commercial	15	\$153,399,022
	Government	5	\$50,071,954
	Industrial	7	\$110,646,079
	Other	0	\$0
	Religious	4	\$7,453,806
	Residential	8	\$46,938,002
	Utilities	0	\$0
City Of Morganton	Agricultural	0	\$0
	Commercial	22	\$218,104,216
	Government	8	\$137,571,730
	Industrial	6	\$93,082,925
	Other	0	\$0
	Religious	2	\$5,696,493
	Residential	26	\$87,158,315
	Utilities	3	\$20,000,000
City Of Newton	Agricultural	0	\$0
	Commercial	5	\$285,278,180

Jurisdiction	Building Type	Number of Buildings	Damages
	Government	2	\$48,127,772
	Industrial	1	\$29,430,254
	Other	0	\$0
	Religious	0	\$0
	Residential	1	\$1,115,300
	Utilities	0	\$0
Town Of Brookford	Agricultural	0	\$0
	Commercial	0	\$0
	Government	0	\$0
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	0	\$0
Town Of Cajah's Mountain	Agricultural	0	\$0
	Commercial	1	\$3,165,864
	Government	0	\$0
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	1	\$12,415,749
	Utilities	0	\$0
Town Of Catawba	Agricultural	0	\$0
	Commercial	1	\$19,921,357
	Government	0	\$0
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	0	\$0
Town Of Connelly Springs	Agricultural	0	\$0
	Commercial	0	\$0
	Government	0	\$0
	Industrial	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Other	0	\$0
	Religious	1	\$11,892,343
	Residential	0	\$0
	Utilities	0	\$0
Town Of Drexel	Agricultural	0	\$0
	Commercial	5	\$37,059,937
	Government	1	\$10,152,530
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	1	\$1,236,304
	Utilities	0	\$0
Town Of Gamewell	Agricultural	0	\$0
	Commercial	1	\$1,706,144
	Government	2	\$53,836,970
	Industrial	3	\$12,485,670
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	0	\$0
Town Of Glen Alpine	Agricultural	0	\$0
	Commercial	0	\$0
	Government	0	\$0
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	0	\$0
Town Of Granite Falls	Agricultural	0	\$0
	Commercial	10	\$110,105,784
	Government	5	\$64,138,602
	Industrial	2	\$28,078,517
	Other	0	\$0
	Religious	2	\$3,740,955

Jurisdiction	Building Type	Number of Buildings	Damages
	Residential	7	\$18,949,444
	Utilities	0	\$0
Town Of Hildebran	Agricultural	0	\$0
	Commercial	2	\$10,506,030
	Government	2	\$14,832,034
	Industrial	6	\$47,650,511
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	2	\$20,000,000
Town Of Hudson	Agricultural	0	\$0
	Commercial	5	\$24,112,033
	Government	5	\$49,369,088
	Industrial	7	\$51,594,684
	Other	0	\$0
	Religious	1	\$5,896,000
	Residential	5	\$16,330,642
	Utilities	0	\$0
Town Of Long View	Agricultural	0	\$0
	Commercial	1	\$9,622,102
	Government	1	\$26,679,023
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	0	\$0
Town Of Maiden	Agricultural	0	\$0
	Commercial	2	\$3,254,626
	Government	2	\$12,971,472
	Industrial	3	\$115,916,633
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	2	\$60,000,000

Jurisdiction	Building Type	Number of Buildings	Damages
Town Of Rhodhiss	Agricultural	0	\$0
	Commercial	1	\$2,553,834
	Government	1	\$10,106,825
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	1	\$2,030,648
	Utilities	0	\$0
Town Of Rutherford College	Agricultural	0	\$0
	Commercial	2	\$5,606,106
	Government	1	\$5,298,387
	Industrial	2	\$20,019,988
	Other	0	\$0
	Religious	0	\$0
	Residential	1	\$1,125,324
	Utilities	0	\$0
Town Of Sawmills	Agricultural	0	\$0
	Commercial	8	\$26,469,958
	Government	1	\$14,920,509
	Industrial	1	\$1,551,285
	Other	0	\$0
	Religious	0	\$0
	Residential	1	\$1,053,025
	Utilities	0	\$0
Town Of Taylorsville	Agricultural	0	\$0
	Commercial	26	\$89,371,654
	Government	4	\$27,527,578
	Industrial	8	\$37,731,204
	Other	0	\$0
	Religious	4	\$9,231,316
	Residential	7	\$18,776,669
	Utilities	2	\$49,957,250
Town Of Valdese	Agricultural	0	\$0
	Commercial	5	\$23,142,156

Jurisdiction	Building Type	Number of Buildings	Damages
	Government	4	\$45,341,260
	Industrial	3	\$70,982,237
	Other	0	\$0
	Religious	0	\$0
	Residential	2	\$5,733,410
	Utilities	2	\$34,348,494
Village Of Cedar Rock	Agricultural	0	\$0
	Commercial	0	\$0
	Government	0	\$0
	Industrial	0	\$0
	Other	0	\$0
	Religious	0	\$0
	Residential	0	\$0
	Utilities	0	\$0

Table H- 6: Wildfire High Loss Building Vulnerability

Jurisdiction	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
Alexander County	24,659	22,615	\$2,587,377,119	1,813	\$1,746,609,916	218	\$463,592,340	24,646	\$4,797,579,376
Burke County	21,153	26,748	\$3,215,840,078	1,101	\$1,262,398,753	228	\$418,396,748	28,077	\$4,896,635,579
Caldwell County	20,643	19,598	\$2,717,449,838	882	\$894,056,811	163	\$302,251,263	20,643	\$3,913,757,913
Catawba County	22,162	47,038	\$5,603,021,911	2,691	\$1,890,926,748	270	\$596,671,871	49,999	\$8,090,620,529
City Of Claremont	1,323	1,107	\$162,514,516	230	\$517,473,433	14	\$17,305,710	1,351	\$697,293,658

Jurisdiction	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
City Of Conover	2,883	4,131	\$623,674,207	930	\$1,555,954,089	21	\$85,386,004	5,082	\$2,265,014,300
City Of Hickory	15,056	19,038	\$3,328,597,584	3,246	\$4,027,712,518	184	\$400,435,120	22,468	\$7,756,745,223
City Of Lenoir	10,254	9,158	\$1,798,777,084	937	\$1,819,539,433	159	\$336,127,165	10,254	\$3,954,443,681
City Of Morganton	8,981	9,268	\$1,597,458,762	1,135	\$1,810,257,846	300	\$554,899,973	10,703	\$3,962,616,581
City Of Newton	5,620	6,695	\$883,104,825	903	\$1,332,713,528	48	\$104,445,871	7,646	\$2,320,264,224
Town Of Brookford	274	267	\$29,364,962	36	\$29,399,165	1	\$85,274	304	\$58,849,401
Town Of Cahaj's Mountain	1,350	1,250	\$220,193,354	87	\$96,555,540	13	\$16,943,622	1,350	\$333,692,515
Town Of Catawba	706	901	\$87,819,289	107	\$98,150,133	8	\$39,127,850	1,016	\$225,097,272
Town Of Connelly Springs	735	843	\$110,953,586	38	\$27,172,654	8	\$22,803,935	889	\$160,930,175
Town Of Drexel	2,428	2,824	\$393,649,103	98	\$125,802,358	26	\$44,086,925	2,948	\$563,538,386
Town Of Gamewell	2,062	1,971	\$266,646,309	78	\$97,984,440	13	\$64,614,061	2,062	\$429,244,810

Jurisdiction	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
Town Of Glen Alpine	848	1,033	\$121,556,433	44	\$33,426,998	9	\$25,905,378	1,086	\$180,888,809
Town Of Granite Falls	3,385	3,063	\$649,142,862	262	\$475,423,574	60	\$115,610,626	3,385	\$1,240,177,063
Town Of Hildebran	1,047	930	\$161,937,079	121	\$311,380,641	16	\$87,358,965	1,067	\$560,676,685
Town Of Hudson	3,039	2,774	\$423,989,467	229	\$324,546,471	36	\$93,255,340	3,039	\$841,791,278
Town Of Long View	2,247	2,392	\$287,368,461	305	\$434,008,044	19	\$38,553,150	2,716	\$759,929,656
Town Of Maiden	2,192	2,788	\$334,055,885	417	\$588,756,350	18	\$67,381,398	3,223	\$990,193,632
Town Of Rhodhiss	378	465	\$60,124,423	17	\$13,726,960	8	\$11,771,158	490	\$85,622,541
Town Of Rutherford College	682	755	\$142,107,285	49	\$60,224,842	23	\$32,235,123	827	\$234,567,250
Town Of Sawmills	3,229	3,041	\$455,428,258	174	\$277,120,687	14	\$38,517,653	3,229	\$771,066,597
Town Of Taylorsville	2,823	2,436	\$314,082,405	309	\$410,996,824	76	\$82,946,096	2,821	\$808,025,325
Town Of Valdese	1,711	1,912	\$375,603,551	177	\$385,505,328	31	\$62,011,948	2,120	\$823,120,828

Jurisdiction	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
Village Of Cedar Rock	135	131	\$45,579,958	3	\$2,479,298	1	\$1,286,261	135	\$49,345,518

Table H- 7: Buildings at risk for an EF4 tornado

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Catawba County	15,628	4,878	84,555
City Of Hickory	9,130	2,611	52,596
Burke County	10,353	2,093	51,416
Caldwell County	8,164	1,912	38,969
Alexander County	6,885	1,530	34,702
City Of Morganton	4,139	1,310	21,797
City Of Lenoir	3,583	1,006	18,129
City Of Newton	2,169	738	12,277
City Of Conover	1,369	560	8,678
Town Of Granite Falls	1,301	418	6,642
Town Of Sawmills	1,376	270	6,407
Town Of Hudson	1,046	277	6,230
Town Of Valdese	1,026	277	4,017
Town Of Long View	596	227	3,724
Town Of Drexel	735	116	3,459
Town Of Taylorsville	707	230	2,801
Town Of Maiden	446	167	2,673
Town Of Gamewell	472	129	2,537
City Of Claremont	422	143	2,461
Town Of Cahah's Mountain	411	99	2,169
Town Of Connelly Springs	322	124	1,835
Town Of Rutherford College	483	107	1,731

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Town Of Hildebran	234	95	1,373
Town Of Catawba	279	74	1,336
Town Of Glen Alpine	192	55	1,042
Town Of Rhodhiss	118	44	619
Town Of Brookford	45	34	385
Village Of Cedar Rock	23	2	84

Table H- 8: Population at risk for a EF4 Tornado

Jurisdiction	Building Type	Number of Buildings	Damages
Alexander County	Commercial	172	\$549,484,472
	Industrial	62	\$268,707,776
	Government	23	\$170,176,383
	Religious	28	\$167,129,898
	Utilities	13	\$117,254,759
	Residential	17	\$48,083,618
	Agricultural	0	\$0
	Other	0	\$0
Burke County	Commercial	53	\$166,788,428
	Utilities	7	\$160,000,000
	Government	11	\$147,429,681
	Residential	15	\$55,895,090
	Industrial	13	\$34,183,275
	Religious	5	\$19,560,396
	Agricultural	0	\$0
	Other	0	\$0
Caldwell County	Commercial	34	\$143,064,979
	Government	12	\$123,324,014
	Industrial	9	\$28,912,104
	Residential	8	\$13,476,777
	Religious	2	\$8,384,557

Jurisdiction	Building Type	Number of Buildings	Damages
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Catawba County	Utilities	23	\$551,480,337
	Government	22	\$429,438,856
	Industrial	8	\$174,047,700
	Commercial	40	\$123,054,083
	Residential	20	\$29,014,193
	Religious	4	\$4,752,192
	Agricultural	0	\$0
	Other	0	\$0
City Of Claremont	Industrial	12	\$253,038,160
	Commercial	10	\$88,688,388
	Government	2	\$11,782,542
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
City Of Conover	Industrial	23	\$369,051,481
	Commercial	35	\$234,087,412
	Government	5	\$72,024,708
	Utilities	6	\$53,371,404
	Residential	6	\$19,035,386
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
City Of Hickory	Commercial	207	\$1,352,962,810
	Industrial	33	\$388,339,985

Jurisdiction	Building Type	Number of Buildings	Damages
	Government	35	\$264,550,550
	Residential	40	\$167,265,501
	Utilities	26	\$161,470,586
	Religious	4	\$35,093,679
	Agricultural	0	\$0
	Other	0	\$0
City Of Lenoir	Commercial	52	\$532,861,322
	Industrial	19	\$338,976,163
	Residential	29	\$298,127,448
	Government	14	\$143,950,045
	Religious	8	\$37,207,156
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
City Of Morganton	Commercial	72	\$530,616,826
	Government	49	\$275,040,188
	Industrial	25	\$271,379,506
	Utilities	18	\$175,642,035
	Residential	42	\$126,467,296
	Religious	3	\$8,167,738
	Agricultural	0	\$0
	Other	0	\$0
City Of Newton	Commercial	26	\$374,216,161
	Industrial	17	\$271,391,035
	Government	9	\$81,525,291
	Utilities	10	\$79,999,999
	Residential	3	\$5,254,273
	Religious	1	\$1,713,928
	Agricultural	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
Town Of Brookford	Other	0	\$0
	Residential	0	\$0
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Cajah's Mountain	Other	0	\$0
	Residential	1	\$12,415,749
	Commercial	3	\$10,734,698
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Catawba	Other	0	\$0
	Government	2	\$35,971,283
	Commercial	1	\$19,863,585
	Residential	0	\$0
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Connelly Springs	Other	0	\$0
	Religious	1	\$11,892,343
	Residential	2	\$2,570,949
	Commercial	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Drexel	Utilities	1	\$60,000,000
	Commercial	6	\$37,961,630
	Government	1	\$9,855,061
	Residential	2	\$2,605,924
	Religious	1	\$1,867,485
	Industrial	0	\$0
	Agricultural	0	\$0
	Other	0	\$0
Town Of Gamewell	Government	2	\$52,259,546
	Industrial	3	\$12,485,670
	Commercial	1	\$1,706,144
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Glen Alpine	Government	1	\$9,320,342
	Residential	1	\$2,211,754
	Commercial	1	\$1,305,342
	Industrial	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Granite Falls	Commercial	12	\$113,962,821
	Government	5	\$62,348,559
	Industrial	2	\$28,078,517
	Residential	7	\$18,949,444
	Religious	2	\$3,740,955
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Hildebran	Industrial	6	\$47,650,511
	Commercial	3	\$21,404,116
	Utilities	2	\$20,000,000
	Government	2	\$14,397,455
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
	Residential	0	\$0
Town Of Hudson	Government	9	\$62,882,708
	Industrial	7	\$51,594,684
	Commercial	8	\$30,653,554
	Residential	5	\$16,330,642
	Religious	1	\$5,896,000

Jurisdiction	Building Type	Number of Buildings	Damages
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Long View	Commercial	5	\$40,536,184
	Government	2	\$31,537,386
	Industrial	2	\$13,827,981
	Residential	1	\$1,675,719
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Maiden	Industrial	7	\$205,948,270
	Utilities	7	\$128,757,610
	Government	4	\$58,360,194
	Commercial	7	\$28,358,901
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Town Of Rhodhiss	Government	1	\$9,810,695
	Commercial	1	\$2,546,428
	Residential	1	\$2,030,648
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Utilities	0	\$0
	Other	0	\$0
Town Of Rutherford College	Residential	3	\$20,587,119
	Industrial	2	\$20,019,988
	Commercial	2	\$5,581,851
	Government	1	\$5,143,144
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Sawmills	Commercial	8	\$26,253,621
	Government	2	\$18,988,267
	Industrial	2	\$3,302,587
	Residential	1	\$1,053,025
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Taylorsville	Commercial	53	\$179,651,936
	Industrial	17	\$140,585,772
	Utilities	2	\$49,957,250
	Government	5	\$33,578,827
	Religious	7	\$21,518,293
	Residential	8	\$20,418,073
	Agricultural	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Other	0	\$0
Town Of Valdese	Utilities	9	\$119,072,175
	Industrial	4	\$80,539,982
	Government	5	\$45,237,851
	Commercial	9	\$43,305,819
	Residential	3	\$15,461,335
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Village Of Cedar Rock	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
	Residential	0	\$0
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0

Table H- 9: High loss buildings at risk from EF4 tornados

Jurisdiction	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
Alexander County	24,659	22,615	\$2,519,470	1,813	\$3,799,702	218	\$832,526	24,646	\$7,151,698
Burke County	21,153	26,748	\$4,707,018	1,101	\$3,473,867	228	\$991,228	28,077	\$9,172,114
Caldwell County	20,643	19,598	\$3,325,827	882	\$2,227,180	163	\$645,814	20,643	\$6,198,821

Jurisdiction	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
Alexander County	24,659	22,615	\$2,519,470	1,813	\$3,799,702	218	\$832,526	24,646	\$7,151,698
Catawba County	22,162	47,038	\$6,212,037	2,691	\$4,505,524	270	\$1,046,722	49,999	\$11,764,282
City Of Claremont	1,323	1,107	\$162,577	230	\$1,702,128	14	\$35,576	1,351	\$1,900,281
City Of Conover	2,883	4,131	\$637,163	930	\$4,722,624	21	\$130,675	5,082	\$5,490,462
City Of Hickory	15,056	19,038	\$3,731,931	3,246	\$10,635,789	184	\$769,296	22,468	\$15,137,015
City Of Lenoir	10,254	9,158	\$2,356,725	937	\$5,218,128	159	\$728,058	10,254	\$8,302,911
City Of Morganton	8,981	9,268	\$2,472,893	1,135	\$6,070,776	300	\$1,570,028	10,703	\$10,113,697
City Of Newton	5,620	6,695	\$993,734	903	\$3,663,780	48	\$209,396	7,646	\$4,866,911
Town Of Brookford	274	267	\$36,285	36	\$92,410	1	\$120	304	\$128,815
Town Of Cahaj's Mountain	1,350	1,250	\$288,918	87	\$252,100	13	\$42,191	1,350	\$583,210
Town Of Catawba	706	901	\$93,930	107	\$240,258	8	\$63,487	1,016	\$397,676
Town Of Connelly Springs	735	843	\$169,930	38	\$89,206	8	\$41,400	889	\$300,536
Town Of Drexel	2,428	2,824	\$608,810	98	\$408,777	26	\$147,651	2,948	\$1,165,238
Town Of Gamewell	2,062	1,971	\$343,225	78	\$232,124	13	\$160,236	2,062	\$735,585
Town Of Glen Alpine	848	1,033	\$182,504	44	\$109,643	9	\$67,576	1,086	\$359,723
Town Of Granite Falls	3,385	3,063	\$821,587	262	\$1,271,232	60	\$257,851	3,385	\$2,350,670
Town Of Hildebran	1,047	930	\$251,974	121	\$1,252,700	16	\$151,926	1,067	\$1,656,600
Town Of Hudson	3,039	2,774	\$565,042	229	\$938,926	36	\$193,752	3,039	\$1,697,719
Town Of Long View	2,247	2,392	\$366,989	305	\$1,194,546	19	\$64,396	2,716	\$1,625,931
Town Of Maiden	2,192	2,788	\$391,857	417	\$1,908,631	18	\$113,711	3,223	\$2,414,198
Town Of Rhodhiss	378	465	\$86,060	17	\$53,639	8	\$28,516	490	\$168,215
Town Of Rutherford College	682	755	\$195,013	49	\$201,553	23	\$71,283	827	\$467,849
Town Of Sawmills	3,229	3,041	\$612,045	174	\$823,478	14	\$82,570	3,229	\$1,518,094
Town Of Taylorsville	2,823	2,436	\$314,733	309	\$1,003,619	76	\$161,098	2,821	\$1,479,450

Jurisdiction	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
Alexander County	24,659	22,615	\$2,519,470	1,813	\$3,799,702	218	\$832,526	24,646	\$7,151,698
Town Of Valdese	1,711	1,912	\$625,635	177	\$1,297,154	31	\$157,344	2,120	\$2,080,132
Village Of Cedar Rock	135	131	\$59,640	3	\$8,794	1	\$2,830	135	\$71,264

Table H- 10: Buildings vulnerable to earthquakes for a 500-year earthquake event

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Catawba County	15,628	4,878	84,555
City Of Hickory	9,130	2,611	52,596
Burke County	10,353	2,093	51,416
Caldwell County	8,164	1,912	38,969
Alexander County	6,885	1,530	34,702
City Of Morganton	4,139	1,310	21,797
City Of Lenoir	3,583	1,006	18,129
City Of Newton	2,169	738	12,277
City Of Conover	1,369	560	8,678
Town Of Granite Falls	1,301	418	6,642
Town Of Sawmills	1,376	270	6,407
Town Of Hudson	1,046	277	6,230
Town Of Valdese	1,026	277	4,017
Town Of Long View	596	227	3,724
Town Of Drexel	735	116	3,459
Town Of Taylorsville	707	230	2,801
Town Of Maiden	446	167	2,673
Town Of Gamewell	472	129	2,537
City Of Claremont	422	143	2,461
Town Of Cahah's Mountain	411	99	2,169
Town Of Connelly Springs	322	124	1,835
Town Of Rutherford College	483	107	1,731

Town Of Hildebran	234	95	1,373
Town Of Catawba	279	74	1,336
Town Of Glen Alpine	192	55	1,042
Town Of Rhodhiss	118	44	619
Town Of Brookford	45	34	385
Village Of Cedar Rock	23	2	84

Table H- 11: Earthquake population vulnerability assessment for a 500-year earthquake event

Jurisdiction	Building Type	Number of Buildings	Damages
Alexander County	Commercial	172	\$1,039,200
	Industrial	62	\$748,428
	Utilities	13	\$350,474
	Religious	28	\$326,967
	Government	23	\$269,055
	Residential	17	\$56,325
	Agricultural	0	\$0
	Other	0	\$0
Burke County	Utilities	7	\$769,390
	Commercial	53	\$481,401
	Government	11	\$342,379
	Residential	15	\$163,447
	Industrial	13	\$80,706
	Religious	5	\$39,220
	Agricultural	0	\$0
	Other	0	\$0
Caldwell County	Commercial	34	\$282,716
	Government	12	\$267,008
	Industrial	9	\$75,558
	Residential	8	\$23,119
	Religious	2	\$21,931
	Agricultural	0	\$0
	Utilities	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Other	0	\$0
Catawba County	Utilities	23	\$1,729,462
	Government	22	\$719,606
	Industrial	8	\$519,109
	Commercial	40	\$255,841
	Residential	20	\$31,865
	Religious	4	\$9,211
	Agricultural	0	\$0
	Other	0	\$0
	City Of Claremont	Industrial	12
Commercial		10	\$219,816
Government		2	\$23,759
Residential		0	\$0
Agricultural		0	\$0
Religious		0	\$0
Utilities		0	\$0
Other		0	\$0
City Of Conover	Industrial	23	\$1,343,953
	Commercial	35	\$522,557
	Utilities	6	\$175,977
	Government	5	\$104,261
	Residential	6	\$21,876
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
City Of Hickory	Commercial	207	\$2,920,531
	Industrial	33	\$1,461,483
	Utilities	26	\$540,160
	Government	35	\$463,487

Jurisdiction	Building Type	Number of Buildings	Damages
	Residential	40	\$260,068
	Religious	4	\$83,246
	Agricultural	0	\$0
	Other	0	\$0
City Of Lenoir	Commercial	52	\$1,393,591
	Industrial	19	\$1,248,331
	Residential	29	\$459,800
	Government	14	\$277,450
	Religious	8	\$78,514
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
City Of Morganton	Commercial	72	\$1,540,554
	Industrial	25	\$1,151,555
	Government	49	\$710,000
	Utilities	18	\$685,273
	Residential	42	\$380,930
	Religious	3	\$24,326
	Agricultural	0	\$0
	Other	0	\$0
City Of Newton	Industrial	17	\$1,007,081
	Commercial	26	\$763,606
	Utilities	10	\$268,880
	Government	9	\$157,944
	Residential	3	\$11,074
	Religious	1	\$4,441
	Agricultural	0	\$0
	Other	0	\$0
Town Of Brookford	Residential	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Cahaj's Mountain	Residential	1	\$29,239
	Commercial	3	\$23,681
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Catawba	Other	0	\$0
	Government	2	\$57,124
	Commercial	1	\$45,819
	Residential	0	\$0
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Connelly Springs	Other	0	\$0
	Religious	1	\$18,076
	Residential	2	\$4,969
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Utilities	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
Town Of Drexel	Utilities	1	\$225,660
	Commercial	6	\$152,294
	Government	1	\$24,996
	Religious	1	\$6,574
	Residential	2	\$5,509
	Industrial	0	\$0
	Agricultural	0	\$0
	Other	0	\$0
Town Of Gamewell	Government	2	\$128,408
	Industrial	3	\$12,623
	Commercial	1	\$2,329
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Glen Alpine	Government	1	\$20,759
	Residential	1	\$4,638
	Commercial	1	\$3,799
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Granite Falls	Commercial	12	\$260,843
	Government	5	\$134,691
	Industrial	2	\$92,986
	Residential	7	\$27,783
	Religious	2	\$7,558
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Hildebran	Industrial	6	\$206,872
	Utilities	2	\$69,820

Jurisdiction	Building Type	Number of Buildings	Damages
	Commercial	3	\$46,512
	Government	2	\$29,536
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
	Residential	0	\$0
Town Of Hudson	Industrial	7	\$192,502
	Government	9	\$118,359
	Commercial	8	\$83,248
	Residential	5	\$30,132
	Religious	1	\$16,473
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Long View	Commercial	5	\$87,561
	Industrial	2	\$58,279
	Government	2	\$46,608
	Residential	1	\$2,142
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Maiden	Industrial	7	\$726,112
	Utilities	7	\$441,817
	Government	4	\$96,444
	Commercial	7	\$65,872
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Town Of Rhodhiss	Government	1	\$22,761
	Commercial	1	\$9,505
	Residential	1	\$2,640
	Industrial	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Rutherford College	Industrial	2	\$84,963
	Residential	3	\$27,617
	Commercial	2	\$14,453
	Government	1	\$8,361
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Sawmills	Other	0	\$0
	Commercial	8	\$55,234
	Government	2	\$37,969
	Industrial	2	\$8,779
	Residential	1	\$1,415
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Taylorsville	Other	0	\$0
	Industrial	17	\$402,605
	Commercial	53	\$366,144
	Utilities	2	\$151,090
	Government	5	\$65,553
	Religious	7	\$41,600
	Residential	8	\$26,018
	Agricultural	0	\$0
Town Of Valdese	Other	0	\$0
	Utilities	9	\$467,622
	Industrial	4	\$335,692
	Commercial	9	\$124,434
	Government	5	\$113,540
	Residential	3	\$29,273
	Agricultural	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Religious	0	\$0
	Other	0	\$0
Village Of Cedar Rock	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
	Residential	0	\$0
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0

Table H- 12: Earthquake building vulnerability assessment for a 500-year earthquake event

Jurisdiction	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
Alexander County	24,659	22,615	\$6,633,071	1,813	\$3,165,173	218	\$941,547	24,646	\$10,739,791
Burke County	21,153	26,748	\$7,006,399	1,101	\$2,810,375	228	\$612,920	28,077	\$10,429,694
Caldwell County	20,643	19,598	\$5,982,979	882	\$2,104,776	163	\$715,569	20,643	\$8,803,324
Catawba County	22,162	47,038	\$13,659,234	2,691	\$3,608,498	270	\$1,168,066	49,999	\$18,435,797
City Of Claremont	1,323	1,107	\$367,934	230	\$337,226	14	\$12,214	1,351	\$717,373
City Of Conover	2,883	4,131	\$1,437,522	930	\$1,025,448	21	\$253,488	5,082	\$2,716,458
City Of Hickory	15,056	19,038	\$7,983,018	3,246	\$3,906,219	184	\$585,529	22,468	\$12,474,766
City Of Lenoir	10,254	9,158	\$3,447,140	937	\$2,116,315	159	\$345,666	10,254	\$5,909,122
City Of Morganton	8,981	9,268	\$3,201,408	1,135	\$1,937,780	300	\$648,187	10,703	\$5,787,374
City Of Newton	5,620	6,695	\$1,969,560	903	\$1,099,510	48	\$48,248	7,646	\$3,117,317
Town Of Brookford	274	267	\$60,183	36	\$11,066	1	\$10	304	\$71,259
Town Of Cahaj's Mountain	1,350	1,250	\$519,561	87	\$229,029	13	\$37,752	1,350	\$786,341
Town Of Catawba	706	901	\$204,036	107	\$90,650	8	\$110,801	1,016	\$405,488
Town Of Connelly Springs	735	843	\$194,059	38	\$61,019	8	\$32,275	889	\$287,354
Town Of Drexel	2,428	2,824	\$770,484	98	\$210,306	26	\$44,751	2,948	\$1,025,541
Town Of Gamewell	2,062	1,971	\$600,542	78	\$159,269	13	\$171,923	2,062	\$931,735

Jurisdiction	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
Town Of Glen Alpine	848	1,033	\$254,545	44	\$40,236	9	\$52,738	1,086	\$347,519
Town Of Granite Falls	3,385	3,063	\$1,160,785	262	\$548,595	60	\$79,696	3,385	\$1,789,076
Town Of Hildebran	1,047	930	\$338,634	121	\$480,669	16	\$389,899	1,067	\$1,209,202
Town Of Hudson	3,039	2,774	\$816,105	229	\$289,624	36	\$46,298	3,039	\$1,152,028
Town Of Long View	2,247	2,392	\$720,069	305	\$491,825	19	\$38,675	2,716	\$1,250,568
Town Of Maiden	2,192	2,788	\$860,530	417	\$413,083	18	\$60,042	3,223	\$1,333,656
Town Of Rhodhiss	378	465	\$105,985	17	\$12,190	8	\$3,672	490	\$121,847
Town Of Rutherford College	682	755	\$237,829	49	\$64,400	23	\$55,935	827	\$358,163
Town Of Sawmills	3,229	3,041	\$993,060	174	\$1,016,762	14	\$71,254	3,229	\$2,081,075
Town Of Taylorsville	2,823	2,436	\$649,263	309	\$413,070	76	\$61,696	2,821	\$1,124,029
Town Of Valdese	1,711	1,912	\$654,412	177	\$267,431	31	\$24,132	2,120	\$945,974
Village Of Cedar Rock	135	131	\$80,511	3	\$6,343	1	\$303	135	\$87,158

Table H- 13: Vulnerable buildings for a 100 year hurricane event

Jurisdiction	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
Alexander County	24,546	22,502	\$2,005,399	1,813	\$627,222	218	\$180,192	24,533	\$2,812,814
Burke County	21,048	26,564	\$2,020,172	1,101	\$561,662	228	\$120,589	27,893	\$2,702,423
Caldwell County	20,554	19,509	\$1,733,939	882	\$423,286	163	\$137,351	20,554	\$2,294,575
Catawba County	22,026	46,756	\$3,927,358	2,691	\$719,533	270	\$228,237	49,717	\$4,875,128
City Of Claremont	1,321	1,101	\$102,172	230	\$80,233	14	\$3,106	1,345	\$185,512
City Of Conover	2,871	4,093	\$422,495	930	\$239,556	21	\$47,103	5,044	\$709,154
City Of Hickory	14,993	18,909	\$2,353,695	3,246	\$846,694	184	\$117,549	22,339	\$3,317,939
City Of Lenoir	10,227	9,131	\$993,610	937	\$471,627	159	\$71,560	10,227	\$1,536,797
City Of Morganton	8,964	9,245	\$959,728	1,135	\$430,157	300	\$135,574	10,680	\$1,525,459
City Of Newton	5,569	6,630	\$583,438	903	\$231,115	48	\$14,117	7,581	\$828,670
Town Of Brookford	271	263	\$17,353	36	\$3,689	1	\$1	300	\$21,043

Jurisdiction	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
Town Of Cahah's Mountain	1,349	1,249	\$166,455	87	\$46,381	13	\$7,576	1,349	\$220,412
Town Of Catawba	697	888	\$59,703	107	\$20,486	8	\$20,822	1,003	\$101,011
Town Of Connelly Springs	731	834	\$55,149	38	\$12,165	8	\$6,132	880	\$73,445
Town Of Drexel	2,393	2,788	\$229,268	98	\$44,362	26	\$10,499	2,912	\$284,129
Town Of Gamewell	2,060	1,969	\$170,737	78	\$31,746	13	\$32,988	2,060	\$235,471
Town Of Glen Alpine	846	1,027	\$71,368	44	\$8,051	9	\$9,935	1,080	\$89,354
Town Of Granite Falls	3,382	3,060	\$331,774	262	\$118,591	60	\$18,941	3,382	\$469,306
Town Of Hildebran	1,046	929	\$98,131	121	\$102,715	16	\$78,905	1,066	\$279,751
Town Of Hudson	3,029	2,764	\$224,162	229	\$67,975	36	\$10,751	3,029	\$302,888
Town Of Long View	2,246	2,386	\$212,862	305	\$109,030	19	\$11,453	2,710	\$333,345
Town Of Maiden	2,168	2,763	\$261,025	417	\$96,041	18	\$9,790	3,198	\$366,856
Town Of Rhodhiss	378	464	\$28,992	17	\$3,004	8	\$1,301	489	\$33,297
Town Of Rutherford College	682	753	\$65,420	49	\$14,575	23	\$11,555	825	\$91,550
Town Of Sawmills	3,228	3,040	\$288,286	174	\$203,135	14	\$15,313	3,228	\$506,735
Town Of Taylorsville	2,780	2,393	\$194,099	309	\$83,511	76	\$15,544	2,778	\$293,155
Town Of Valdese	1,711	1,904	\$190,072	177	\$70,549	31	\$7,562	2,112	\$268,184
Village Of Cedar Rock	134	130	\$18,653	3	\$1,236	1	\$132	134	\$20,021

Table H- 14: Vulnerable buildings for a 25 year hurricane event

Jurisdiction	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
Alexander County	24,546	22,502	\$2,005,399	1,813	\$627,222	218	\$180,192	24,533	\$2,812,814
Burke County	21,048	26,564	\$2,020,172	1,101	\$561,662	228	\$120,589	27,893	\$2,702,423
Caldwell County	20,554	19,509	\$1,733,939	882	\$423,286	163	\$137,351	20,554	\$2,294,575
Catawba County	22,026	46,756	\$3,927,358	2,691	\$719,533	270	\$228,237	49,717	\$4,875,128
City Of Claremont	1,321	1,101	\$102,172	230	\$80,233	14	\$3,106	1,345	\$185,512
City Of Conover	2,871	4,093	\$422,495	930	\$239,556	21	\$47,103	5,044	\$709,154
City Of Hickory	14,993	18,909	\$2,353,695	3,246	\$846,694	184	\$117,549	22,339	\$3,317,939
City Of Lenoir	10,227	9,131	\$993,610	937	\$471,627	159	\$71,560	10,227	\$1,536,797
City Of Morganton	8,964	9,245	\$959,728	1,135	\$430,157	300	\$135,574	10,680	\$1,525,459
City Of Newton	5,569	6,630	\$583,438	903	\$231,115	48	\$14,117	7,581	\$828,670
Town Of Brookford	271	263	\$17,353	36	\$3,689	1	\$1	300	\$21,043
Town Of Cahaj's Mountain	1,349	1,249	\$166,455	87	\$46,381	13	\$7,576	1,349	\$220,412
Town Of Catawba	697	888	\$59,703	107	\$20,486	8	\$20,822	1,003	\$101,011
Town Of Connelly Springs	731	834	\$55,149	38	\$12,165	8	\$6,132	880	\$73,445
Town Of Drexel	2,393	2,788	\$229,268	98	\$44,362	26	\$10,499	2,912	\$284,129
Town Of Gamewell	2,060	1,969	\$170,737	78	\$31,746	13	\$32,988	2,060	\$235,471
Town Of Glen Alpine	846	1,027	\$71,368	44	\$8,051	9	\$9,935	1,080	\$89,354
Town Of Granite Falls	3,382	3,060	\$331,774	262	\$118,591	60	\$18,941	3,382	\$469,306
Town Of Hildebran	1,046	929	\$98,131	121	\$102,715	16	\$78,905	1,066	\$279,751
Town Of Hudson	3,029	2,764	\$224,162	229	\$67,975	36	\$10,751	3,029	\$302,888
Town Of Long View	2,246	2,386	\$212,862	305	\$109,030	19	\$11,453	2,710	\$333,345
Town Of Maiden	2,168	2,763	\$261,025	417	\$96,041	18	\$9,790	3,198	\$366,856
Town Of Rhodhiss	378	464	\$28,992	17	\$3,004	8	\$1,301	489	\$33,297
Town Of Rutherford College	682	753	\$65,420	49	\$14,575	23	\$11,555	825	\$91,550
Town Of Sawmills	3,228	3,040	\$288,286	174	\$203,135	14	\$15,313	3,228	\$506,735

Jurisdiction	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
Town Of Taylorsville	2,780	2,393	\$194,099	309	\$83,511	76	\$15,544	2,778	\$293,155
Town Of Valdese	1,711	1,904	\$190,072	177	\$70,549	31	\$7,562	2,112	\$268,184
Village Of Cedar Rock	134	130	\$18,653	3	\$1,236	1	\$132	134	\$20,021

Table H- 15: Vulnerable buildings for a 50 year hurricane event

Jurisdiction	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
Alexander County	24,659	22,615	\$45,570,687	1,813	\$29,314,273	218	\$8,724,059	24,646	\$83,609,020
Burke County	21,153	26,748	\$41,836,291	1,101	\$23,186,579	228	\$5,893,388	28,077	\$70,916,259
Caldwell County	20,643	19,598	\$37,143,709	882	\$17,407,092	163	\$6,119,055	20,643	\$60,669,856
Catawba County	22,162	47,038	\$91,847,935	2,691	\$32,881,949	270	\$10,642,888	49,999	\$135,372,772
City Of Claremont	1,323	1,107	\$2,379,055	230	\$3,980,025	14	\$141,856	1,351	\$6,500,936
City Of Conover	2,883	4,131	\$9,868,819	930	\$11,945,168	21	\$2,276,118	5,082	\$24,090,104
City Of Hickory	15,056	19,038	\$52,428,166	3,246	\$41,452,177	184	\$5,652,000	22,468	\$99,532,344
City Of Lenoir	10,254	9,158	\$23,370,199	937	\$19,533,648	159	\$3,853,768	10,254	\$46,757,616
City Of Morganton	8,981	9,268	\$21,832,492	1,135	\$19,354,100	300	\$6,651,791	10,703	\$47,838,383
City Of Newton	5,620	6,695	\$12,533,235	903	\$18,962,292	48	\$771,686	7,646	\$32,267,213
Town Of Brookford	274	267	\$377,533	36	\$161,302	1	\$273	304	\$539,108
Town Of Cahaj's Mountain	1,350	1,250	\$3,653,683	87	\$1,868,007	13	\$326,273	1,350	\$5,847,963

Jurisdiction	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
Town Of Catawba	706	901	\$1,297,348	107	\$962,232	8	\$1,008,794	1,016	\$3,268,374
Town Of Connelly Springs	735	843	\$1,311,977	38	\$493,694	8	\$342,072	889	\$2,147,743
Town Of Drexel	2,428	2,824	\$5,020,773	98	\$1,875,156	26	\$393,741	2,948	\$7,289,670
Town Of Gamewell	2,062	1,971	\$3,694,595	78	\$1,614,933	13	\$1,620,910	2,062	\$6,930,438
Town Of Glen Alpine	848	1,033	\$1,502,178	44	\$433,718	9	\$498,680	1,086	\$2,434,575
Town Of Granite Falls	3,385	3,063	\$8,966,406	262	\$5,827,321	60	\$1,003,248	3,385	\$15,796,975
Town Of Hildebran	1,047	930	\$2,235,486	121	\$4,529,954	16	\$2,199,826	1,067	\$8,965,266
Town Of Hudson	3,039	2,774	\$5,023,559	229	\$3,140,878	36	\$581,979	3,039	\$8,746,415
Town Of Long View	2,247	2,392	\$4,475,534	305	\$5,024,016	19	\$222,279	2,716	\$9,721,829
Town Of Maiden	2,192	2,788	\$5,550,451	417	\$5,443,408	18	\$976,140	3,223	\$11,969,998
Town Of Rhodhiss	378	465	\$752,866	17	\$119,753	8	\$49,010	490	\$921,629
Town Of Rutherford College	682	755	\$1,672,134	49	\$656,232	23	\$533,890	827	\$2,862,256
Town Of Sawmills	3,229	3,041	\$7,058,487	174	\$6,744,939	14	\$606,739	3,229	\$14,410,166
Town Of Taylorsville	2,823	2,436	\$5,079,405	309	\$4,671,769	76	\$641,476	2,821	\$10,392,650
Town Of Valdese	1,711	1,912	\$4,655,019	177	\$2,682,347	31	\$320,155	2,120	\$7,657,521

Jurisdiction	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
Village Of Cedar Rock	135	131	\$476,951	3	\$56,061	1	\$2,985	135	\$535,997

Table H- 16: Vulnerable buildings for a 300 year hurricane event

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Alexander County	6,885	1,530	34,702
Burke County	10,353	2,093	51,416
Caldwell County	8,164	1,912	38,969
Catawba County	15,628	4,878	84,555
City Of Claremont	422	143	2,461
City Of Conover	1,369	560	8,678
City Of Hickory	9,130	2,611	52,596
City Of Lenoir	3,583	1,006	18,129
City Of Morganton	4,139	1,310	21,797
City Of Newton	2,169	738	12,277
Town Of Brookford	45	34	385
Town Of Cahah's Mountain	411	99	2,169
Town Of Catawba	279	74	1,336
Town Of Connelly Springs	322	124	1,835
Town Of Drexel	735	116	3,459
Town Of Gamewell	472	129	2,537
Town Of Glen Alpine	192	55	1,042
Town Of Granite Falls	1,301	418	6,642
Town Of Hildebran	234	95	1,373
Town Of Hudson	1,046	277	6,230
Town Of Long View	596	227	3,724
Town Of Maiden	446	167	2,673
Town Of Rhodhiss	118	44	619
Town Of Rutherford College	483	107	1,731
Town Of Sawmills	1,376	270	6,407

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Town Of Taylorsville	707	230	2,801
Town Of Valdese	1,026	277	4,017
Village Of Cedar Rock	23	2	84

Table H- 17: Population at risk of a 100 year hurricane event

Jurisdiction	Type of Building	Number of Buildings	Damages
Alexander County	Commercial	172	\$1,312,034
	Religious	28	\$508,642
	Industrial	62	\$413,160
	Government	23	\$260,762
	Residential	17	\$46,612
	Utilities	13	\$25,112
	Agricultural	0	\$0
	Other	0	\$0
Burke County	Commercial	53	\$309,718
	Government	11	\$145,918
	Industrial	13	\$108,048
	Residential	15	\$38,275
	Utilities	7	\$33,290
	Religious	5	\$21,185
	Agricultural	0	\$0
	Other	0	\$0
Caldwell County	Commercial	34	\$620,218
	Government	12	\$382,696
	Industrial	9	\$58,674
	Religious	2	\$10,220
	Residential	8	\$9,121
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Catawba County	Government	22	\$892,048
	Commercial	40	\$304,247
	Utilities	23	\$148,882

Jurisdiction	Type of Building	Number of Buildings	Damages
	Industrial	8	\$98,728
	Residential	20	\$44,258
	Religious	4	\$7,524
	Agricultural	0	\$0
	Other	0	\$0
City Of Claremont	Industrial	12	\$107,178
	Commercial	10	\$53,242
	Government	2	\$2,968
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
City Of Conover	Government	5	\$238,988
	Industrial	23	\$175,954
	Commercial	35	\$163,867
	Residential	6	\$16,187
	Utilities	6	\$13,959
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
City Of Hickory	Commercial	207	\$1,597,355
	Government	35	\$449,805
	Industrial	33	\$184,552
	Residential	40	\$131,443
	Religious	4	\$55,751
	Utilities	26	\$32,505
	Agricultural	0	\$0
	Other	0	\$0
City Of Lenoir	Industrial	19	\$612,623
	Residential	29	\$409,273
	Commercial	52	\$297,992
	Government	14	\$163,252
	Religious	8	\$22,831

Jurisdiction	Type of Building	Number of Buildings	Damages
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
City Of Morganton	Commercial	72	\$634,523
	Government	49	\$415,659
	Industrial	25	\$233,401
	Residential	42	\$60,577
	Utilities	18	\$38,006
	Religious	3	\$11,082
	Agricultural	0	\$0
	Other	0	\$0
City Of Newton	Commercial	26	\$418,057
	Industrial	17	\$121,998
	Government	9	\$31,356
	Utilities	10	\$16,284
	Residential	3	\$6,746
	Religious	1	\$809
	Agricultural	0	\$0
	Other	0	\$0
Town Of Brookford	Residential	0	\$0
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Cahaj's Mountain	Commercial	3	\$10,539
	Residential	1	\$2,538
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0

Jurisdiction	Type of Building	Number of Buildings	Damages
	Other	0	\$0
Town Of Catawba	Government	2	\$108,892
	Commercial	1	\$8,920
	Residential	0	\$0
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Connelly Springs	Religious	1	\$13,839
	Residential	2	\$2,164
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Drexel	Commercial	6	\$14,705
	Utilities	1	\$11,446
	Government	1	\$2,370
	Residential	2	\$1,390
	Religious	1	\$688
	Industrial	0	\$0
	Agricultural	0	\$0
	Other	0	\$0
Town Of Gamewell	Government	2	\$155,303
	Industrial	3	\$31,587
	Commercial	1	\$796
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Glen Alpine	Government	1	\$10,239

Jurisdiction	Type of Building	Number of Buildings	Damages
	Residential	1	\$2,064
	Commercial	1	\$1,335
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Granite Falls	Commercial	12	\$86,443
	Government	5	\$29,363
	Industrial	2	\$13,413
	Residential	7	\$8,064
	Religious	2	\$1,446
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Hildebran	Industrial	6	\$12,420
	Commercial	3	\$9,809
	Utilities	2	\$4,432
	Government	2	\$3,003
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
	Residential	0	\$0
Town Of Hudson	Government	9	\$26,111
	Industrial	7	\$19,781
	Commercial	8	\$13,444
	Residential	5	\$11,557
	Religious	1	\$2,515
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Long View	Commercial	5	\$87,218
	Government	2	\$27,833
	Industrial	2	\$3,308

Jurisdiction	Type of Building	Number of Buildings	Damages
	Residential	1	\$1,185
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Maiden	Industrial	7	\$91,000
	Government	4	\$54,322
	Utilities	7	\$33,908
	Commercial	7	\$12,451
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Town Of Rhodhiss	Commercial	1	\$9,562
	Government	1	\$2,723
	Residential	1	\$1,025
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Rutherford College	Commercial	2	\$19,622
	Residential	3	\$11,863
	Industrial	2	\$5,447
	Government	1	\$2,376
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Sawmills	Commercial	8	\$63,138
	Industrial	2	\$19,724
	Government	2	\$11,772
	Residential	1	\$641
	Agricultural	0	\$0

Jurisdiction	Type of Building	Number of Buildings	Damages
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Taylorsville	Commercial	53	\$220,098
	Industrial	17	\$152,204
	Religious	7	\$40,844
	Utilities	2	\$12,156
	Residential	8	\$9,947
	Government	5	\$9,580
	Agricultural	0	\$0
	Other	0	\$0
Town Of Valdese	Industrial	4	\$26,534
	Utilities	9	\$25,961
	Government	5	\$13,301
	Commercial	9	\$11,510
	Residential	3	\$2,725
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Village Of Cedar Rock	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
	Residential	0	\$0
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0

Table H- 18: High loss buildings vulnerable to 100 year hurricane winds

Jurisdiction	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
Alexander County	24,659	22,615	\$3,869,682	1,813	\$1,436,539	218	\$420,004	24,646	\$5,726,225

Jurisdiction	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
Burke County	21,149	26,741	\$3,999,127	1,101	\$1,286,641	228	\$276,316	28,070	\$5,562,084
Caldwell County	20,639	19,594	\$3,428,760	882	\$965,960	163	\$320,387	20,639	\$4,715,107
Catawba County	22,162	47,034	\$7,783,562	2,691	\$1,649,005	270	\$532,733	49,995	\$9,965,301
City Of Claremont	1,323	1,107	\$207,411	230	\$161,899	14	\$6,082	1,351	\$375,391
City Of Conover	2,883	4,131	\$825,653	930	\$492,204	21	\$111,092	5,082	\$1,428,949
City Of Hickory	15,056	19,038	\$4,604,499	3,246	\$1,831,126	184	\$267,927	22,468	\$6,703,553
City Of Lenoir	10,254	9,158	\$1,940,273	937	\$1,009,658	159	\$158,076	10,254	\$3,108,007
City Of Morganton	8,981	9,268	\$1,851,943	1,135	\$916,716	300	\$297,833	10,703	\$3,066,492
City Of Newton	5,620	6,695	\$1,137,628	903	\$494,557	48	\$25,144	7,646	\$1,657,329
Town Of Brookford	274	267	\$34,320	36	\$6,049	1	\$3	304	\$40,372
Town Of Cahaj's Mountain	1,350	1,250	\$311,271	87	\$105,619	13	\$17,099	1,350	\$433,988
Town Of Catawba	706	901	\$117,015	107	\$42,643	8	\$48,678	1,016	\$208,336
Town Of Connelly Springs	735	843	\$108,764	38	\$27,862	8	\$14,343	889	\$150,970
Town Of Drexel	2,428	2,824	\$444,000	98	\$97,589	26	\$21,790	2,948	\$563,379
Town Of Gamewell	2,062	1,971	\$341,788	78	\$71,753	13	\$75,981	2,062	\$489,522
Town Of Glen Alpine	848	1,033	\$143,752	44	\$18,176	9	\$23,439	1,086	\$185,368
Town Of Granite Falls	3,385	3,063	\$652,394	262	\$253,990	60	\$38,161	3,385	\$944,545
Town Of Hildebran	1,047	930	\$192,149	121	\$221,238	16	\$184,231	1,067	\$597,618
Town Of Hudson	3,039	2,774	\$454,104	229	\$138,685	36	\$22,075	3,039	\$614,864
Town Of Long View	2,247	2,392	\$417,171	305	\$232,202	19	\$21,411	2,716	\$670,784
Town Of Maiden	2,192	2,788	\$503,563	417	\$197,271	18	\$25,073	3,223	\$725,907
Town Of Rhodhiss	378	465	\$58,792	17	\$5,967	8	\$2,164	490	\$66,923
Town Of Rutherford College	682	755	\$130,867	49	\$30,408	23	\$25,309	827	\$186,584
Town Of Sawmills	3,229	3,041	\$566,116	174	\$473,521	14	\$33,284	3,229	\$1,072,921
Town Of Taylorsville	2,823	2,436	\$374,335	309	\$189,696	76	\$30,990	2,821	\$595,021
Town Of Valdese	1,711	1,912	\$367,520	177	\$136,712	31	\$13,008	2,120	\$517,239
Village Of Cedar Rock	135	131	\$42,369	3	\$2,828	1	\$206	135	\$45,40

Table H- 19: Buildings vulnerable to 25-year thunderstorm winds

Jurisdiction	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
Alexander County	24,659	22,615	\$6,633,071	1,813	\$3,165,173	218	\$941,547	24,646	\$10,739,791
Burke County	21,153	26,748	\$7,006,399	1,101	\$2,810,375	228	\$612,920	28,077	\$10,429,694
Caldwell County	20,643	19,598	\$5,982,979	882	\$2,104,776	163	\$715,569	20,643	\$8,803,324
Catawba County	22,162	47,038	\$13,659,234	2,691	\$3,608,498	270	\$1,168,066	49,999	\$18,435,797
City Of Claremont	1,323	1,107	\$367,934	230	\$337,226	14	\$12,214	1,351	\$717,373
City Of Conover	2,883	4,131	\$1,437,522	930	\$1,025,448	21	\$253,488	5,082	\$2,716,458
City Of Hickory	15,056	19,038	\$7,983,018	3,246	\$3,906,219	184	\$585,529	22,468	\$12,474,766
City Of Lenoir	10,254	9,158	\$3,447,140	937	\$2,116,315	159	\$345,666	10,254	\$5,909,122
City Of Morganton	8,981	9,268	\$3,201,408	1,135	\$1,937,780	300	\$648,187	10,703	\$5,787,374
City Of Newton	5,620	6,695	\$1,969,560	903	\$1,099,510	48	\$48,248	7,646	\$3,117,317
Town Of Brookford	274	267	\$60,183	36	\$11,066	1	\$10	304	\$71,259
Town Of Cahaj's Mountain	1,350	1,250	\$519,561	87	\$229,029	13	\$37,752	1,350	\$786,341
Town Of Catawba	706	901	\$204,036	107	\$90,650	8	\$110,801	1,016	\$405,488
Town Of Connelly Springs	735	843	\$194,059	38	\$61,019	8	\$32,275	889	\$287,354
Town Of Drexel	2,428	2,824	\$770,484	98	\$210,306	26	\$44,751	2,948	\$1,025,541
Town Of Gamewell	2,062	1,971	\$600,542	78	\$159,269	13	\$171,923	2,062	\$931,735
Town Of Glen Alpine	848	1,033	\$254,545	44	\$40,236	9	\$52,738	1,086	\$347,519
Town Of Granite Falls	3,385	3,063	\$1,160,785	262	\$548,595	60	\$79,696	3,385	\$1,789,076
Town Of Hildebran	1,047	930	\$338,634	121	\$480,669	16	\$389,899	1,067	\$1,209,202
Town Of Hudson	3,039	2,774	\$816,105	229	\$289,624	36	\$46,298	3,039	\$1,152,028
Town Of Long View	2,247	2,392	\$720,069	305	\$491,825	19	\$38,675	2,716	\$1,250,568
Town Of Maiden	2,192	2,788	\$860,530	417	\$413,083	18	\$60,042	3,223	\$1,333,656
Town Of Rhodhiss	378	465	\$105,985	17	\$12,190	8	\$3,672	490	\$121,847
Town Of Rutherford College	682	755	\$237,829	49	\$64,400	23	\$55,935	827	\$358,163
Town Of Sawmills	3,229	3,041	\$993,060	174	\$1,016,762	14	\$71,254	3,229	\$2,081,075

Jurisdiction	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
Town Of Taylorsville	2,823	2,436	\$649,263	309	\$413,070	76	\$61,696	2,821	\$1,124,029
Town Of Valdese	1,711	1,912	\$654,412	177	\$267,431	31	\$24,132	2,120	\$945,974
Village Of Cedar Rock	135	131	\$80,511	3	\$6,343	1	\$303	135	\$87,158

Table H- 20: Buildings at risk to 50-year thunderstorm winds

Jurisdiction	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
Alexander County	24,659	22,615	\$10,480,668	1,813	\$6,381,367	218	\$1,933,361	24,646	\$18,795,396
Burke County	21,153	26,748	\$11,130,619	1,101	\$5,541,229	228	\$1,246,595	28,077	\$17,918,443
Caldwell County	20,643	19,598	\$9,464,239	882	\$4,137,506	163	\$1,433,028	20,643	\$15,034,773
Catawba County	22,162	47,038	\$21,914,176	2,691	\$7,200,704	270	\$2,320,871	49,999	\$31,435,751
City Of Claremont	1,323	1,107	\$588,082	230	\$685,208	14	\$23,880	1,351	\$1,297,170
City Of Conover	2,883	4,131	\$2,298,264	930	\$2,079,305	21	\$519,320	5,082	\$4,896,890
City Of Hickory	15,056	19,038	\$12,653,276	3,246	\$7,839,136	184	\$1,167,991	22,468	\$21,660,402
City Of Lenoir	10,254	9,158	\$5,659,052	937	\$4,088,989	159	\$712,649	10,254	\$10,460,690
City Of Morganton	8,981	9,268	\$5,106,250	1,135	\$3,861,093	300	\$1,322,140	10,703	\$10,289,484
City Of Newton	5,620	6,695	\$3,117,748	903	\$2,462,954	48	\$96,551	7,646	\$5,677,252
Town Of Brookford	274	267	\$95,950	36	\$21,450	1	\$27	304	\$117,426
Town Of Cahaj's Mountain	1,350	1,250	\$806,537	87	\$449,627	13	\$76,522	1,350	\$1,332,685
Town Of Catawba	706	901	\$325,945	107	\$184,764	8	\$233,564	1,016	\$744,273
Town Of Connelly Springs	735	843	\$319,281	38	\$120,911	8	\$66,130	889	\$506,322
Town Of Drexel	2,428	2,824	\$1,229,935	98	\$418,605	26	\$86,273	2,948	\$1,734,813
Town Of Gamewell	2,062	1,971	\$950,418	78	\$325,761	13	\$350,326	2,062	\$1,626,505

Jurisdiction	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
Town Of Glen Alpine	848	1,033	\$405,416	44	\$83,229	9	\$108,410	1,086	\$597,055
Town Of Granite Falls	3,385	3,063	\$1,916,650	262	\$1,112,187	60	\$161,781	3,385	\$3,190,618
Town Of Hildebran	1,047	930	\$550,951	121	\$964,330	16	\$702,367	1,067	\$2,217,648
Town Of Hudson	3,039	2,774	\$1,329,516	229	\$580,786	36	\$94,708	3,039	\$2,005,010
Town Of Long View	2,247	2,392	\$1,128,530	305	\$977,092	19	\$65,571	2,716	\$2,171,193
Town Of Maiden	2,192	2,788	\$1,344,647	417	\$852,976	18	\$131,139	3,223	\$2,328,762
Town Of Rhodhiss	378	465	\$174,683	17	\$23,737	8	\$6,889	490	\$205,309
Town Of Rutherford College	682	755	\$396,620	49	\$131,117	23	\$114,287	827	\$642,024
Town Of Sawmills	3,229	3,041	\$1,607,168	174	\$1,905,943	14	\$140,494	3,229	\$3,653,604
Town Of Taylorsville	2,823	2,436	\$1,050,659	309	\$836,085	76	\$118,414	2,821	\$2,005,158
Town Of Valdese	1,711	1,912	\$1,087,152	177	\$501,248	31	\$46,606	2,120	\$1,635,006
Village Of Cedar Rock	135	131	\$132,628	3	\$13,278	1	\$494	135	\$146,400

Table H- 21: Buildings at risk to 100-year thunderstorm winds

Jurisdiction	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
Alexander County	24,659	22,615	\$26,568,502	1,813	\$19,186,915	218	\$5,804,570	24,646	\$51,559,987
Burke County	21,153	26,748	\$26,029,184	1,101	\$15,749,054	228	\$3,823,531	28,077	\$45,601,768
Caldwell County	20,643	19,598	\$22,570,256	882	\$11,751,998	163	\$4,146,225	20,643	\$38,468,480
Catawba County	22,162	47,038	\$54,795,976	2,691	\$21,459,006	270	\$6,918,106	49,999	\$83,173,089
City Of Claremont	1,323	1,107	\$1,429,819	230	\$2,369,266	14	\$81,230	1,351	\$3,880,314
City Of Conover	2,883	4,131	\$5,804,107	930	\$7,093,050	21	\$1,534,965	5,082	\$14,432,122
City Of Hickory	15,056	19,038	\$31,154,315	3,246	\$25,359,815	184	\$3,580,596	22,468	\$60,094,726
City Of Lenoir	10,254	9,158	\$14,309,583	937	\$12,272,416	159	\$2,354,691	10,254	\$28,936,689
City Of Morganton	8,981	9,268	\$12,891,095	1,135	\$12,111,888	300	\$4,198,212	10,703	\$29,201,195
City Of Newton	5,620	6,695	\$7,535,639	903	\$10,399,790	48	\$397,416	7,646	\$18,332,846
Town Of Brookford	274	267	\$230,759	36	\$85,661	1	\$142	304	\$316,561

Jurisdiction	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
Town Of Cahaj's Mountain	1,350	1,250	\$2,068,294	87	\$1,269,758	13	\$224,198	1,350	\$3,562,250
Town Of Catawba	706	901	\$794,130	107	\$597,689	8	\$696,959	1,016	\$2,088,778
Town Of Connelly Springs	735	843	\$806,511	38	\$341,244	8	\$212,487	889	\$1,360,241
Town Of Drexel	2,428	2,824	\$3,034,031	98	\$1,238,740	26	\$254,687	2,948	\$4,527,459
Town Of Gamewell	2,062	1,971	\$2,242,502	78	\$1,028,999	13	\$1,077,997	2,062	\$4,349,498
Town Of Glen Alpine	848	1,033	\$936,939	44	\$271,478	9	\$327,882	1,086	\$1,536,298
Town Of Granite Falls	3,385	3,063	\$5,186,179	262	\$3,619,090	60	\$581,531	3,385	\$9,386,799
Town Of Hildebran	1,047	930	\$1,375,626	121	\$2,964,847	16	\$1,632,537	1,067	\$5,973,010
Town Of Hudson	3,039	2,774	\$3,177,521	229	\$1,910,015	36	\$335,666	3,039	\$5,423,202
Town Of Long View	2,247	2,392	\$2,694,295	305	\$3,104,051	19	\$155,970	2,716	\$5,954,317
Town Of Maiden	2,192	2,788	\$3,277,037	417	\$3,089,808	18	\$527,269	3,223	\$6,894,114
Town Of Rhodhiss	378	465	\$451,743	17	\$73,661	8	\$26,595	490	\$551,999
Town Of Rutherford College	682	755	\$1,020,274	49	\$416,521	23	\$353,392	827	\$1,790,187
Town Of Sawmills	3,229	3,041	\$4,162,326	174	\$4,829,357	14	\$406,958	3,229	\$9,398,642
Town Of Taylorsville	2,823	2,436	\$2,874,442	309	\$2,778,663	76	\$378,441	2,821	\$6,031,546
Town Of Valdese	1,711	1,912	\$2,841,716	177	\$1,583,994	31	\$173,603	2,120	\$4,599,313
Village Of Cedar Rock	135	131	\$305,091	3	\$39,119	1	\$1,628	135	\$345,837

Table H- 22: buildings at risk to 300-year thunderstorm winds

Jurisdiction	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
Alexander County	24,659	22,615	\$26,568,502	1,813	\$19,186,915	218	\$5,804,570	24,646	\$51,559,987
Burke County	21,153	26,748	\$26,029,184	1,101	\$15,749,054	228	\$3,823,531	28,077	\$45,601,768

Jurisdiction	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
Caldwell County	20,643	19,598	\$22,570,256	882	\$11,751,998	163	\$4,146,225	20,643	\$38,468,480
Catawba County	22,162	47,038	\$59,988,153	2,691	\$22,165,946	270	\$6,958,386	49,999	\$89,112,485
City Of Claremont	1,323	1,107	\$1,429,819	230	\$2,369,266	14	\$81,230	1,351	\$3,880,314
City Of Conover	2,883	4,131	\$5,804,107	930	\$7,093,050	21	\$1,534,965	5,082	\$14,432,122
City Of Hickory	15,056	19,038	\$31,154,315	3,246	\$25,359,815	184	\$3,580,596	22,468	\$60,094,726
City Of Lenoir	10,254	9,158	\$14,309,583	937	\$12,272,416	159	\$2,354,691	10,254	\$28,936,689
City Of Morganton	8,981	9,268	\$12,891,095	1,135	\$12,111,888	300	\$4,198,212	10,703	\$29,201,195
City Of Newton	5,620	6,695	\$7,535,639	903	\$10,399,790	48	\$397,416	7,646	\$18,332,846
Town Of Brookford	274	267	\$230,759	36	\$85,661	1	\$142	304	\$316,561
Town Of Cahaj's Mountain	1,350	1,250	\$2,068,294	87	\$1,269,758	13	\$224,198	1,350	\$3,562,250
Town Of Catawba	706	901	\$794,130	107	\$597,689	8	\$696,959	1,016	\$2,088,778
Town Of Connelly Springs	735	843	\$806,511	38	\$341,244	8	\$212,487	889	\$1,360,241
Town Of Drexel	2,428	2,824	\$3,034,031	98	\$1,238,740	26	\$254,687	2,948	\$4,527,459
Town Of Gamewell	2,062	1,971	\$2,242,502	78	\$1,028,999	13	\$1,077,997	2,062	\$4,349,498
Town Of Glen Alpine	848	1,033	\$936,939	44	\$271,478	9	\$327,882	1,086	\$1,536,298
Town Of Granite Falls	3,385	3,063	\$5,186,179	262	\$3,619,090	60	\$581,531	3,385	\$9,386,799
Town Of Hildebran	1,047	930	\$1,375,626	121	\$2,964,847	16	\$1,632,537	1,067	\$5,973,010
Town Of Hudson	3,039	2,774	\$3,177,521	229	\$1,910,015	36	\$335,666	3,039	\$5,423,202
Town Of Long View	2,247	2,392	\$2,694,295	305	\$3,104,051	19	\$155,970	2,716	\$5,954,317
Town Of Maiden	2,192	2,788	\$3,277,037	417	\$3,089,808	18	\$527,269	3,223	\$6,894,114
Town Of Rhodhiss	378	465	\$451,743	17	\$73,661	8	\$26,595	490	\$551,999
Town Of Rutherford College	682	755	\$1,020,274	49	\$416,521	23	\$353,392	827	\$1,790,187
Town Of Sawmills	3,229	3,041	\$4,162,326	174	\$4,829,357	14	\$406,958	3,229	\$9,398,642
Town Of Taylorsville	2,823	2,436	\$2,874,442	309	\$2,778,663	76	\$378,441	2,821	\$6,031,546
Town Of Valdese	1,711	1,912	\$2,841,716	177	\$1,583,994	31	\$173,603	2,120	\$4,599,313
Village Of Cedar Rock	135	131	\$305,091	3	\$39,119	1	\$1,628	135	\$345,837

Table H- 23: buildings at risk to 700-year thunderstorm winds

Jurisdiction	Elderly at Risk	Children at Risk	Total at Risk
Alexander County	6,885	1,530	34,702
Burke County	10,353	2,093	51,416
Caldwell County	8,164	1,912	38,969
Catawba County	15,628	4,878	84,555
City Of Claremont	422	143	2,461
City Of Conover	1,369	560	8,678
City Of Hickory	9,130	2,611	52,596
City Of Lenoir	3,583	1,006	18,129
City Of Morganton	4,139	1,310	21,797
City Of Newton	2,169	738	12,277
Town Of Brookford	45	34	385
Town Of Cajah's Mountain	411	99	2,169
Town Of Catawba	279	74	1,336
Town Of Connelly Springs	322	124	1,835
Town Of Drexel	735	116	3,459
Town Of Gamewell	472	129	2,537
Town Of Glen Alpine	192	55	1,042
Town Of Granite Falls	1,301	418	6,642
Town Of Hildebran	234	95	1,373
Town Of Hudson	1,046	277	6,230
Town Of Long View	596	227	3,724
Town Of Maiden	446	167	2,673
Town Of Rhodhiss	118	44	619
Town Of Rutherford College	483	107	1,731
Town Of Sawmills	1,376	270	6,407
Town Of Taylorsville	707	230	2,801
Town Of Valdese	1,026	277	4,017
Village Of Cedar Rock	23	2	84

Table H- 24: Population at risk of 100 year thunderstorm winds

Jurisdiction	Building Type	Number of Buildings	Damages
Alexander County	Commercial	172	\$2,612,234
	Religious	28	\$1,049,110
	Industrial	62	\$841,148

Jurisdiction	Building Type	Number of Buildings	Damages
	Government	23	\$537,993
	Residential	17	\$86,444
	Utilities	13	\$44,033
	Agricultural	0	\$0
	Other	0	\$0
Burke County	Commercial	53	\$620,698
	Government	11	\$300,679
	Industrial	13	\$211,733
	Residential	15	\$64,955
	Utilities	7	\$54,803
	Religious	5	\$45,637
	Agricultural	0	\$0
	Other	0	\$0
Caldwell County	Commercial	34	\$1,179,073
	Government	12	\$776,355
	Industrial	9	\$120,210
	Religious	2	\$20,727
	Residential	8	\$20,273
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Catawba County	Government	22	\$1,762,607
	Commercial	40	\$606,076
	Utilities	23	\$280,236
	Industrial	8	\$192,123
	Residential	20	\$79,513
	Religious	4	\$15,764
	Agricultural	0	\$0
	Other	0	\$0
City Of Claremont	Industrial	12	\$216,561
	Commercial	10	\$104,248
	Government	2	\$5,321
	Residential	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
City Of Conover	Government	5	\$489,630
	Industrial	23	\$348,819
	Commercial	35	\$335,977
	Residential	6	\$30,949
	Utilities	6	\$25,219
	Agricultural	0	\$0
	Religious	0	\$0
City Of Hickory	Other	0	\$0
	Commercial	207	\$3,268,905
	Government	35	\$892,129
	Industrial	33	\$385,794
	Residential	40	\$259,138
	Religious	4	\$118,103
	Utilities	26	\$53,481
	Agricultural	0	\$0
City Of Lenoir	Other	0	\$0
	Industrial	19	\$1,149,485
	Residential	29	\$772,961
	Commercial	52	\$601,040
	Government	14	\$341,317
	Religious	8	\$47,689
	Agricultural	0	\$0
	Utilities	0	\$0
City Of Morganton	Other	0	\$0
	Commercial	72	\$1,255,514
	Government	49	\$850,345
	Industrial	25	\$475,832
	Residential	42	\$123,798
	Utilities	18	\$62,622

Jurisdiction	Building Type	Number of Buildings	Damages
	Religious	3	\$23,008
City Of Newton	Commercial	26	\$1,077,415
	Industrial	17	\$254,122
	Government	9	\$62,142
	Utilities	10	\$26,793
	Residential	3	\$11,936
	Religious	1	\$1,638
	Agricultural	0	\$0
	Other	0	\$0
Town Of Brookford	Residential	0	\$0
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Cahaj's Mountain	Commercial	3	\$22,121
	Residential	1	\$6,846
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Catawba	Government	2	\$229,702
	Commercial	1	\$17,711
	Residential	0	\$0
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0

Jurisdiction	Building Type	Number of Buildings	Damages
Town Of Connelly Springs	Religious	1	\$28,762
	Residential	2	\$4,605
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Drexel	Commercial	6	\$28,281
	Utilities	1	\$18,804
	Government	1	\$3,881
	Residential	2	\$3,115
	Religious	1	\$1,351
	Industrial	0	\$0
	Agricultural	0	\$0
	Other	0	\$0
Town Of Gamewell	Government	2	\$317,265
	Industrial	3	\$65,937
	Commercial	1	\$1,508
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Glen Alpine	Government	1	\$21,285
	Residential	1	\$3,415
	Commercial	1	\$2,802
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Granite Falls	Commercial	12	\$186,662

Jurisdiction	Building Type	Number of Buildings	Damages
	Government	5	\$58,836
	Industrial	2	\$29,050
	Residential	7	\$19,092
	Religious	2	\$3,072
	Agricultural	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Hildebran	Commercial	3	\$21,404
	Industrial	6	\$21,328
	Utilities	2	\$7,306
	Government	2	\$4,872
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Town Of Hudson	Residential	0	\$0
	Government	9	\$55,786
	Industrial	7	\$38,170
	Commercial	8	\$28,442
	Residential	5	\$21,016
	Religious	1	\$4,833
	Agricultural	0	\$0
	Utilities	0	\$0
Town Of Long View	Other	0	\$0
	Commercial	5	\$160,849
	Government	2	\$45,811
	Industrial	2	\$5,717
	Residential	1	\$2,726
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
Town Of Maiden	Other	0	\$0
	Industrial	7	\$185,590
	Government	4	\$118,916

Jurisdiction	Building Type	Number of Buildings	Damages
	Utilities	7	\$65,176
	Commercial	7	\$34,979
	Residential	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Town Of Rhodhiss	Commercial	1	\$19,244
	Government	1	\$4,846
	Residential	1	\$2,406
	Industrial	0	\$0
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Rutherford College	Commercial	2	\$40,725
	Residential	3	\$27,628
	Industrial	2	\$10,086
	Government	1	\$4,578
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Sawmills	Commercial	8	\$121,989
	Industrial	2	\$37,098
	Government	2	\$21,846
	Residential	1	\$1,523
	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
Town Of Taylorsville	Commercial	53	\$441,619
	Industrial	17	\$314,180
	Religious	7	\$79,088

Jurisdiction	Building Type	Number of Buildings	Damages
	Residential	8	\$21,837
	Utilities	2	\$20,516
	Government	5	\$17,429
	Agricultural	0	\$0
	Other	0	\$0
Town Of Valdese	Industrial	4	\$48,622
	Utilities	9	\$42,783
	Government	5	\$24,057
	Commercial	9	\$20,936
	Residential	3	\$6,819
	Agricultural	0	\$0
	Religious	0	\$0
	Other	0	\$0
Village Of Cedar Rock	Agricultural	0	\$0
	Religious	0	\$0
	Utilities	0	\$0
	Other	0	\$0
	Residential	0	\$0
	Commercial	0	\$0
	Industrial	0	\$0
	Government	0	\$0

Table H- 25: High risk properties at risk for 100 year thunderstorm winds

**RESOLUTION
ADOPTING **PLAN NAME** REGIONAL
HAZARD MITIGATION PLAN**

WHEREAS, the citizens and property within **County/Town** are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience that certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, **the County** desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Part 6, Article 21 of Chapter 143; Parts 3, 5, and 8 of Article 19 of Chapter 160A; and Article 8 of Chapter 160A of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five year cycle; and

WHEREAS, the **County/Town** has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Board of Commissioners of **County/Town** to fulfill this obligation in order that the County will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the County;

NOW, THEREFORE, be it resolved that the Board of Commissioners of XXXXXX hereby:

1. Adopts the Plan Name Regional Hazard Mitigation Plan.
2. Vests County/Town Agency Emergency Management with the responsibility, authority, and the means to:
 - (a) Inform all concerned parties of this action.
 - (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.
3. Appoints County/Town Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the XXXXX County Board of Commissioners for consideration.
4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the xxth day of xxxxx, xxxx.

Name, Chair
XXXXXX Board of Commissioners

Attest:

Name, Clerk
XXXXXX Board of Commissioners

Certified by: _____ (SEAL)

Date: _____

Appendix J – NFIP Participation Information

All communities within the planning area that participate in the NFIP follow all NFIP requirements, including enforcement of regulations as outlined by applicable state and county regulations. Unless otherwise specified, each community that participates in the NFIP fully complies with all regulations. Each jurisdiction in the planning area **communicates** substantial damage/substantial improvement requirements through various channels. Property owners are notified by mail about property revaluations and can request reviews if their assessments do not reflect damage. Additionally, the counties provide information on their website and encourage property owners to contact the Tax Department or designated agency that regulates floodplain regulations and permitting for further assistance.

* Indicates jurisdictions that do not regulate their own NFIP compliance

Table J- 1: NFIP Survey Responses and Documentation.

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
Alexander County	Yes, the County has adopted the minimum NFIP management criteria via local regulation in the new Land development code on May 5, 2024.	A Floodplain Development Permit is required prior to any development activities within the SFHAs. The floodplain manager reviews applications to ensure all new construction and substantial improvements are designed or modified to prevent flotation, collapse, or lateral movement of the structure. New residential construction and	The floodplain administrator performs the duties of the local flood damage prevention ordinance as adopted on May 5, 2024, including administration permits, interpretation of regulation, inspections and enforcement of substantial damage and violations. Alexander County Planning Department is designated to address	The process used to make determinations of damage sustained by a structure during any one-year period where the cost of restoration would equal or exceed 50 percent of the market value of the structure prior before the damage occurred. Improvements, modifications, and additions to existing buildings are counted cumulatively for at least five years. Nonconforming structures shall not be repaired/reconstructed except in

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
		<p>substantial improvement in the SFHA requires the top of the lowest floor to be elevated no lower than the Regulatory Flood Protection Elevation (BFE plus 2 ft. freeboard). Nonresidential construction must be elevated above the Regulatory Flood Protection Elevation or floodproofed. A floodplain permit is revoked for substantial departure from the approved application; for failure to comply with State and local laws; or misrepresentations made to secure the permit. Floodplain permits are required for all development occurring in the SFHA.</p>	<p>commitments and requirements of the NFIP.</p>	<p>conformity when there is substantial improvement or substantial damage as defined in our Land Development Code. Alexander County Planning Department makes SD/SI determinations. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.</p>
<p>Town of Taylorsville</p>	<p>Yes, the Town has adopted the Flood Damage Prevention Ordinance which includes Flood Hazard Reduction regulations as of June 2, 2009.</p>	<p>The Town of Taylorsville contracts with Alexander County for zoning permits and enforcement services. See Alexander County for details about implementation and enforcement of local floodplain management regulations.</p>	<p>Yes, the Ordinance has designated the Town Manager as “Floodplain Administrator” according to the Flood Damage Prevention Ordinance and the Town of Taylorsville contracts with Alexander County for zoning permits and enforcement services. See Alexander County for details.</p>	<p>The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. Improvements, modifications, and additions to existing buildings are counted cumulatively over at least five years. Nonconforming structures shall not be repaired or reconstructed except in conformity with substantial improvement or substantial damage definitions in our Land Development Code. The Alexander County Planning Department makes SD/SI determinations for</p>

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
				the Town of Taylorsville. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations. Properties with substantial improvement or substantial damage in SFHAs must adhere to current floodplain management standards addressed in the floodplain regulations. The Flood Damage Prevention Ordinance for Taylorsville defines substantial damage and substantial improvement.
Burke County	Yes, Burke County also has a Flood Damage Prevention Ordinance that applies to all areas within Burke County	Yes, if a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. Burke County outlines floodplain management regulations for all SFHAs in the County which require all new construction and any substantial improvements in SFHAs to follow provisions for flood hazard reductions which minimize flood damage.	Yes, the Chief Building Inspector is appointed administrator of Flood Hazard Reduction ordinances for Burke County and follows determined processes to determine SD/SI. The Western Piedmont Council of Governments also conducts education and outreach. The floodplain manager reviews development plans, inspects construction for compliance with floodplain management standards, enforces substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations.	Yes, it is required by Burke County that all new construction or substantial improvements in a SFHA adhere to Flood Hazard Reduction regulations. It is specified that all development in Burke County must adhere to Flood Hazard Regulation procedures and permitting requirements. The Chief Building Inspector makes SD/SI determinations . The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
City of Morganton	The City has a Flood Damage Prevention	If a property in the SFHA is damaged for any reason and the cost to repair it	The director of development and design services or his designee,	All new construction and substantial improvements in SFHAs must follow

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
	Ordinance, and the County has flood damage prevention ordinance.	is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. In the City of Morganton our Ordinance says that we use a 1-year period for 50% or greater of overall market value for substantial renovations/improvements instead of the 10-year period. Floodplain Damage Prevention Ordinance requires that any development in SFHAs apply for a permit and the floodplain administrator is responsible for regulation, review, approval, and maintenance of permits.	hereinafter called the floodplain administrator, is hereby appointed to administer, and implement this chapter's provisions by making determinations about existing or future development in areas regulated by the NFP. The floodplain administrator follows the process outlined by the City of Morganton to maintain NFIP compliance. The Director of Development and Design is Wendy Smith according to the Morganton Website.	processes and regulations outlined for flood hazard reductions which minimize flood damage. The Director of Development makes SD/SI determinations . The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Connelly Springs	The Town of Connelly Springs adopted initial flood damage prevention ordinances on October 6, 2003. Burke County also has a Flood Damage Prevention Ordinance that applies to all area within Burke County which Connelly Springs	All new construction and any substantial improvements in SFHAs follow provisions for flood hazard reductions which minimize flood damage. If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. Burke County outlines floodplain management regulations for all SFHAs in the County which requires	Burke County Community Development has an agreement with the Town of Connelly Springs to manage zoning permits and Burke County Community Development determines the required processes to ensure NFIP compliance.	It is required by Burke County that all new construction or substantial improvements in a SFHA adhere to Flood Hazard Reduction regulations. It is specified that all development in Burke County must adhere to Flood Hazard Regulation procedures and permitting requirements. Burke County Community Development makes SD/SI determinations . The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. These officials are trained to meet the requirements of the North Carolina

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
				Building Code and community floodplain regulations.
Town of Drexel	Yes. Burke County also has a Flood Damage Prevention Ordinance that applies to the whole county.	Yes, if a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. Burke County outlines floodplain management regulations for all SFHAs in the County which require all new construction and any substantial improvements in SFHAs to follow provisions for flood hazard reductions which minimize flood damage.	Town Planner is designated as the Floodplain Administrator. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties.	There has been no issue until the event of Hurricane Helene, but it is specified that all development in Burke County must adhere to Flood Hazard Regulation procedures and permitting requirements which includes the Burke County's Substantial Improvement and Damage regulations. The Town Planner makes SD/SI determinations and adheres to processes that the Town of Drexel and or Burke County have designated to maintain compliance with the NFIP and related requirements. Development makes SD/SI determinations . The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Glen Alpine	Burke County also has a Flood Damage Prevention Ordinance that applies to the whole county. Glen Alpine	If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. Burke County	The Town Clerk is designated as the Floodplain Administrator for the Town of Glen Alpine according to the Flood Damage Prevention Ordinance. The Floodplain Administrator is responsible for reviewing floodplain development	The Town Flood Damage Prevention ordinance outlines the requirements of substantial improvements to adhere to regulations outlined by the Flooding Ordinances. It is also required by Burke County that all new construction or substantial

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
	has adopted a Flood Damage Prevention Ordinance to establish the floodplain management criteria in the Town.	outlines floodplain management regulations for all SFHAs in the County which requires All new construction and any substantial improvements in SFHAs to follow provisions for flood hazard reductions which minimize flood damage. The Town of Glen Alpine has also established a Floodplain Damage Prevention Ordinance to regulate SFHAs	applications and assuring that new development adheres to floodplain damage prevention ordinances, including applicable permitting, regulations, and enforcement.	improvements in a SFHA adhere to Flood Hazard Reduction regulations. It is specified that all development in Burke County must adhere to Flood Hazard Regulation processes and permitting requirements. The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. The Town Clerk makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Hildebran	WPCOG serves as code compliance in the Town of Hildebran. Burke County also has a Flood Damage Prevention Ordinance that applies to the whole county.	Burke County outlines floodplain management regulations and processes for all SFHAs in the County which requires all new construction and any substantial improvements in SFHAs to follow provisions for flood hazard reductions which minimize flood damage. If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.	The Chief Building Inspector is appointed as the administrator of Flood Hazard Reduction ordinances for Burke County. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage and improvement provisions in the floodplain management standards,	It is required by Burke County that all new construction or substantial improvements in a SFHA adhere to Flood Hazard Reduction regulations. It is specified that all development in Burke County must adhere to Flood Hazard Regulation procedures and permitting requirements. The Chief Building Inspector makes SD/SI determinations . The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. These officials are trained to meet the

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
			and issue penalties for violations including fines or other penalties.	requirements of the North Carolina Building Code and community floodplain regulations.
Town of Rutherford College	The Town of Rutherford College has adopted a Flood Damage Prevention Ordinance in their Land Use Ordinance which was adopted and adheres to the NFIP Minimum Floodplain Management Criteria.	If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. The Town of Rutherford College requires application, permits, and certifications for any development in the SFHAs which are reviewed by the Town Floodplain Administrator and are reviewed to meet requirements and adhere to determination processes outlined in the Flood Damage Prevention Ordinance.	The Town Planner is designated as the Floodplain Administrator according to the Flood Damage Prevention Ordinance for the Town of Rutherford College. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties.	All new construction and substantial improvements in SFHAs must follow provisions for flood hazard reductions which minimize flood damage. This includes adhering to all general standards of the Flood Damage Prevention Ordinance in all new construction or substantial improvements in SFHAs. The Town Planner makes SD/SI determinations . The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Valdese	Yes, Town of Valdese Flood Damage Prevention Ordinance	If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. Through the zoning permit process , any development in the Special Flood Hazard Areas must obtain a floodplain development permit before any	The Town of Valdese Planning Director. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage	The ordinance does not allow building in the flood plain and we have not experienced an event with substantial damage. The Town of Valdese Planning Director makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
		<p>construction or substantial improvement in the SFHAs to ensure that proposed development is reviewed for flood risks and comply with floodplain management regulations. The floodplain administrator reviews each application to ensure that construction is compliant with elevation requirements, flood damage prevention standards, and all new structures are elevated above the Base flood elevation. This includes ensuring development adheres to all applicable flood damage prevention regulations. Floodplain managers conduct inspections during construction and after construction is complete to ensure that SFHAs meet floodplain management regulations, focusing on elevation, floodproofing, and other minimum flood damage reduction requirements, including all substantial damage or substantial improvement regulations where applicable. Floodplain management issues fines, issue letters for non-compliant structures in the SFHAs, and monitors compliance to take corrective actions when necessary.</p>	<p>and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties.</p>	

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
Caldwell County	Yes, we have a floodplain ordinance and regulation.	The process used to determine the SD/SI of a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered damaged. Using our ordinance, based on model from State.	Yes, Caldwell County Planning Director, Shelley Stevens. The Planning Technician, Kim McGee, also issues floodplain permits. WPCOG contracted Code Enforcement Officer, Teresa Kinney, who currently enforces (except for large projects, such as a recent LOMR that was acquired after a large violation –the Planning Director handled that). The Code Enforcement Officer adheres to designated processes to ensure SI/SD development or development in floodplain areas adhere to NFIP requirement.	The Planning Director would have to read the ordinance. Floodplain permits do not come in daily. It is outlined in the Caldwell County Flood Damage Prevention Ordinance that all new construction and substantial improvements must adhere to flood hazard reduction regulations outlined by the Floodplain Ordinance. The Caldwell County Planning Director makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
City of Lenoir	Yes, Lenoir has a Flood Damage Prevention Ordinance in the Code of Ordinances.	The process used to determine damage is SD/SI is if a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. Lenoir has a Flood Damage Prevention Ordinance which requires any human-caused change in the floodplain or floodway to get a floodplain development permit, including SD/SI.	The Planning Director is the designated local floodplain administrator who reviews site plans for floodplain development and issues permits. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager, and the floodplain manager adheres to the determination processes outlined by the City of Lenoir. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards,	If a proposed work on a structure meets the criteria of substantial improvement or damage, the entire building must conform to the floodplain ordinance. The Planning Director and or floodplain administrator makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
			enforce substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties.	
Town of Cajah's Mountain	Town issue permits as needed and any special study areas as needed. Caldwell County also has a Flood Damage Prevention Ordinance which applies to the Town of Cajah's Mountain.	Yes, if a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged. Caldwell County Planning Department also requires permits for development in the SFHAs.	Town Planner. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager who adheres to processes determined by the Town of Cajah's Mountain to ensure compliance with NFIP requirements. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties.	Nothing major regarding perhaps until Hurricane Helene. Caldwell County Flood Damage Prevention Ordinance that all new construction and substantial improvements must adhere to flood hazard reduction regulations outlined by the Floodplain Ordinance. The Town Planner makes SD/SI determinations . The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Gamewell	Town issue permits as needed and any special study areas as needed. Caldwell County also has a Flood Damage Prevention	Yes, Caldwell County Planning Department also requires permits for development in the SFHAs. If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the	Town Planner. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The floodplain manager also follows processes to maintain NFIP compliance while also conducting	Nothing major regarding perhaps until Hurricane Helene. Caldwell County Flood Damage Prevention Ordinance that all new construction and substantial improvements must adhere to flood hazard reduction regulations outlined by the Floodplain Ordinance. The process used to determine

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
	Ordinance which applies to the Town of Cahah's Mountain.	damage, the property is considered substantially damaged.	education and outreach, reviewing development plans, inspecting construction for compliance with floodplain management standards, enforcing substantial damage and improving provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties.	damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. The Town Planner makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Granite Falls	The Town of Granite Falls adopted a Flood Damage Prevention Ordinance initially on April 28, 1978, and has been updated in 2021.	The Floodplain Damage Prevention Ordinance requires Floodplain Development Permits for any development in SFHAs and required application material is defined in Section B of the Ordinance. The process used to determine SD/SI is if a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered damaged.	The Granite Falls Town Planner is the administrator of the Floodplain Damage Prevention Ordinance and oversees implementing provisions outlined in the ordinance, including the processes outlined to determine NFIP compliance activities. Greg Wilson is currently listed as the Town Planner for Granite Falls.	The Town of Granite Falls Flood Damage Prevention Ordinance includes definitions for both "substantial damage" and "substantial improvement" along with a regulatory framework for making determinations in both cases. The Floodplain Damage Prevention Ordinance defines substantial damage and substantial improvement. The Ordinance specifies that any new construction or substantial improvements in the SFHA must be designed to adhere to SFHA regulations to reduce flood hazards. The Town Planner makes SD/SI determinations These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Hudson	Yes, Town adopted a new flood damage prevention ordinance.	Yes, require all data and paperwork as needed for development in SFHA and to ensure compliance with Flood Damage Ordinance. The process of	Town Planner. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The	Not needed until Hurricane Helene. Caldwell County Flood Damage Prevention Ordinance that all new construction and substantial improvements must adhere to flood hazard

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
		<p>determining if a property is considered a SD/SI is if the property is in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.</p>	<p>floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties. The Town Planner follows all processes outlined to maintain NFIP compliance outlined in the flood damage prevention ordinance.</p>	<p>reduction regulations outlined by the Floodplain Ordinance. The Town Planner makes SD/SI determinations. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.</p>
<p>Town of Rhodhiss</p>	<p>Yes, Caldwell and Burke County have adopted Flood Damage Prevention Ordinances that apply to Rhodhiss.</p>	<p>Require all documents needed before any development in the SFHA to ensure compliance with Flood Damage Ordinance. The process for determining SD/SI is that if a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.</p>	<p>Town Planner. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties. The Town Planner follows all processes outlined to maintain NFIP compliance</p>	<p>Not needed until the event of Hurricane Helene. Caldwell County Flood Damage Prevention Ordinance that all new construction and substantial improvements must adhere to flood hazard reduction regulations outlined by the Floodplain Ordinance. The Town Planner makes SD/SI determinations. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.</p>

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
			outlined in the flood damage prevention ordinance.	
Town of Sawmills	Yes. Town adopted the template FPDO provided by FEMA to comply with the NFIP program.	Yes, the process used determines whether a structure is in the floodplain or not using the provided floodplain maps before approving a zoning permit. The process is used to determine when a property is considered SD/SI is that if a building in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.	Yes, the Town Planner is the Town's designee to conduct the requirements of the NFIP Program. All development in the SFHAs must obtain floodplain development permits reviewed by the designated floodplain manager. The floodplain manager also conducts education and outreach, reviews development plans, inspects construction for compliance with floodplain management standards, enforce substantial damage and improvement provisions in the floodplain management standards, and issue penalties for violations including fines or other penalties.	Town has not had an event substantial enough to require the use of SI/SD provisions of the floodplain ordinance. But Sawmills does require any new development or substantial improvements to adhere to Flood Damage Prevention Ordinance regulations and applicable permitting processes . The Town Planner makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Village of Cedar Rock*	See Caldwell County Response	See Caldwell County Response	Caldwell County oversees addressing and implementing commitments and requirements of the NFIP, including determining the process that the community uses for determinations. Caldwell County follows all processes outlined to maintain NFIP compliance outlined in the flood damage prevention ordinance. See Caldwell County Response for more details.	It is outlined in the Caldwell County Flood Damage Prevention Ordinance that all new construction and substantial improvements must adhere to flood hazard reduction regulations outlined by the Floodplain Ordinance." The Caldwell County Planning Director makes SD/SI determinations . these officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
Catawba County	Catawba County adopted floodplain regulations per the model ordinance in 1980 and made it a part of the Unified Development Ordinance with an additional two-foot freeboard in 2007.	The ordinance requires floodplain development permits for all development occurring in a special flood hazard area. Other permits (zoning, building, etc.) are not issued without a floodplain development permit. Enforcement happens through review of Elevation Certificates when structures are involved. The process used to determine if a property in the SFHA is considered SD/SI is if the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.	The Unified Development Ordinance establishes the Planning Director and/or designee as the Floodplain Administrator. The Planning Director follows all processes to maintain NFIP compliance outlined in the flood damage prevention ordinance.	Catawba County communicates substantial damage/substantial improvement requirements through various channels. Property owners are notified by mail about property revaluations and can request reviews if their assessments do not reflect damage. Additionally, the county provides information on their website and encourages property owners to contact the Tax Department for further assistance. After an event, estimated or contracted building repairs are compared to the assessed value of the structure. Values are updated every four years. Catawba County requires any substantial damage and substantial improvement to adhere to floodplain regulations and applicable permitting processes and regulations associated with flood damage prevention ordinances. The Planning Director makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
City of Claremont	Flood Damage Prevention Ordinance in accordance with Articles 8 & 19 of 160A was adopted in 2002. The ordinance	Claremont requires floodplain development permitting and zoning permits require a site plan. If a property or development is in a floodplain, the City would require floodplain permitting. The process used to determine damage sustained by a	Planning Director enforces the Flood Damage Prevention Ordinance. City Staff and contracted engineer review all site plans for compliance with all city codes and adhere to processes required to ensure NFIP compliance within the City of Claremont.	The City of Claremont requires any substantial damage or improvement to adhere to Flood Damage Prevention Ordinance requirements and permitting processes. The Planning Director makes SD/SI determinations . These officials are trained to meet the requirements of the North

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
	was updated in September of 2024 to meet updated State standards.	structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage.		Carolina Building Code and community floodplain regulations.
City of Conover	Yes, the City of Conover has adopted a Flood Damage Prevention Ordinance.	Re-adopted modified state model ordinance in 2021. The City also requires floodplain development applications to be reviewed by the floodplain administrator to ensure that development in SFHAs adhere to applicable Flood Damage Prevention regulations. The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage. This includes if the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.	Planning Director or designee is a floodplain administrator and adheres to processes which the City of Conover uses to ensure that NFIP regulations are met in new development, where applicable.	The City has adopted a modified version of the State's "model ordinance." The ordinance has been modified to be more restrictive than the model by requiring a higher "freeboard" than the model. All requirements regarding permitting, inspections, design, floodproofing, remedies, etc., remain the same as the State's model. The Planning Director makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
City of Hickory	Yes, the Flood Damage Prevention ordinance has been adopted.	Yes, permit applications are reviewed to determine if SFHAs are present on the property. If SFHAs are found, requirements within the city's ordinance are enforced as part of the	The City's Planning Director is designated as the city's floodplain administrator. The Planning Director adheres to processes which the City of Hickory has developed to ensure	The City continues to review development permits to ensure improvements to structures in SFHAs are undertaken as required by the local ordinance. The Planning Director makes SD/SI determinations . These officials are

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
		development permit. Processes to determine if a property in the SFHA is SD/SI is that if any reason it is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.	that NFIP regulations are met in new developments, where applicable.	trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
City of Newton	The City of Newton has provisions for Flood Hazard Reduction and has adopted the Flood Damage Prevention Ordinance of the City of Newton Zoning Ordinances.	The City of Newton has provisions for Flood Hazard Reduction in the Flood Damage Prevention Ordinance of the Zoning Ordinances. The City of Newton requires applications for development in special flood hazard areas to be reviewed by the floodplain administrator. The Flood Damage Prevention Ordinance outlines permitting requirements in SFHAs. The processes to determine if a property in the SFHA is a SD/SI property is that if it is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged.	The Planning Director of Newton is listed as the floodplain administrator in the Flood Damage Prevention ordinance. The current planning director is listed as Randy Williams on the Newton website. The Planning Director follows all processes outlined to maintain NFIP compliance outlined in the flood damage prevention ordinance.	All Substantial Improvements are required to adhere to general flood hazard reduction standards when located in SFHAs according to the Flood Damage Prevention Ordinance. The Planning Director makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Brookford	Catawba County adopted model ordinance in 1980 and made it a part of	WPCOG serves as code compliance in the Town of Brookford. Town of Brookford is required to follow the Catawba County Flood Damage	The Planning Director in Catawba County is responsible for reviewing all floodplain development applications and reviewing all proposed	All Substantial Improvements must adhere to general flood hazard reduction standards in SFHAs according to the Flood Damage Prevention Ordinance for Catawba County.

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
	the Unified Development Ordinance with an additional two-foot freeboard in 2007.	Prevention Ordinances unless the jurisdiction has lawfully adopted regulations with equal or more stringent guidelines except where specific regulations are set forth. If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged and must follow the SD/SI process .	development within SFHAs to ensure that all state, federal, and local permits are received. The Planning Director adheres to processes which the Town of Brookford follows to ensure that NFIP regulations are met in new development and where applicable.	The Planning Director makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Catawba	WPCOG serves as code compliance in Town of Catawba.	If a property in the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged and must follow the SD/SI processes . The Town of Catawba Has implemented the Flood Damage Prevention Ordinance in the Code of Ordinances which regulates development in SFHAs and outlines requirements for permitting in the SFHAs within the Town.	The Town Planner is designated as the Floodplain Administrator according to the Flood Damage Prevention Ordinance. The Town Planner adheres to designated processes which the Town of Catawba follows to ensure that NFIP regulations are met in new developments and where applicable.	The Flood Damage Prevention Ordinance requires any substantial improvement to follow the Flood Damage Prevention Ordinance requirements in SFHAs. The Town Planner makes SD/SI determinations . These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.
Town of Long View	Yes, the Town of Long View has been enrolled in the regular phase of the	Yes, the Town of Long View has a Flood Damage Prevention Ordinance that regulates and permits development in SFHAs. If a property in	Yes, Charles Mullis is the Floodplain Administrator for the Town of Long View. The Floodplain Administrator adheres to designated processes	The Town of Long View has had no Substantial Improvements or Substantial Damage issues. Flood Development permits are handled and processed according to the

Jurisdiction	Has your jurisdiction met the requirement to adopt the NFIP minimum floodplain management criteria via local regulation? Please provide details	How has your jurisdiction implemented and enforced local floodplain management regulations to regulate and permit development in SFHAs? Please provide details.	Does your jurisdiction have a designee or agency to implement the addressed commitments and requirements of the NFIP? Please provide details	Please describe of how your jurisdiction has implemented the substantial improvement/ substantial damage provisions in the floodplain management regulations that apply to your jurisdiction after an event
	<p>NFIP program since September 3, 1980, thus making flood insurance and other Federal benefits available throughout the Town. The Town of Long View maintains all records pertaining to floodplain management indefinitely.</p>	<p>the SFHA is damaged for any reason and the cost to repair it is more than 50% of the overall market value of the property before the damage, the property is considered substantially damaged and must follow the process of substantial damage or improvement. The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage.</p>	<p>which the Town of Long View follows to ensure that NFIP regulations are met in new developments and where applicable.</p>	<p>FPA in this manner: A zoning permit must first be obtained; a site plan must be submitted to establish if the location is in a SFHA. From this point, Long View's floodplain regulations are explained to the applicant. If the development is inside the SFHA, all aspects of Long View's Flood Damage Prevention Ordinance are followed. The Floodplain Administrator makes SD/SI determinations. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.</p>
<p>Town of Maiden</p>	<p>WPCOG serves as code compliance in Town of Maiden. The Town of Maiden has adopted regulations in the Code of Ordinances to regulate floodplain development in the Provisions for Flood Hazard Reduction.</p>	<p>The Town of Maiden has a Floodplain Development Permit requirement and has implemented Provisions for Flood Hazard Reduction into the Town ordinances. This defines the SFHA regulation and outlines the floodplain management regulations. The process used to determine damage sustained by a structure during any one-year period considers whether the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage.</p>	<p>The Floodplain Administrator is the Town of Maiden planning director according to the code of ordinances/Unified Development Ordinances. The Floodplain Administrator follows all processes outlined to maintain NFIP compliance n the flood damage prevention ordinance.</p>	<p>The Maiden Unified Development Ordinance outlines the substantial improvement or substantial damage regulations. If the location of substantial damage/substantial improvement is in a SFHA, the Flood Hazard Reduction Provisions must be followed, including the permitting and all processes for SFHA development. The Floodplain Administrator makes SD/SI determinations. These officials are trained to meet the requirements of the North Carolina Building Code and community floodplain regulations.</p>

UNIFOUR: Social Equity Questionnaire

12 Responses

14:25 Average time to complete

Active Status

1. **County/Jurisdiction:** What county or jurisdiction are you representing today?

12 Responses

Latest Responses

"Long View"

"Caldwell"

"Catawba"

3 respondents (25%) answered **Caldwell** for this question.



2. **Identifying Communities and Populations Lacking Resources:** Which neighborhoods or groups of people do not have enough resources to prepare for disasters and become stronger against them?

11 Responses

Latest Responses

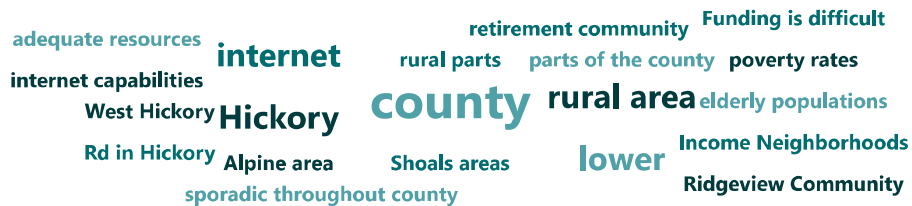
"None"

"Those who lack internet or other forms of mass communication. "

"The more rural areas such as near Springs Rd in Hickory and Claremont"

[Update](#)

3 respondents (25%) answered **county** for this question.



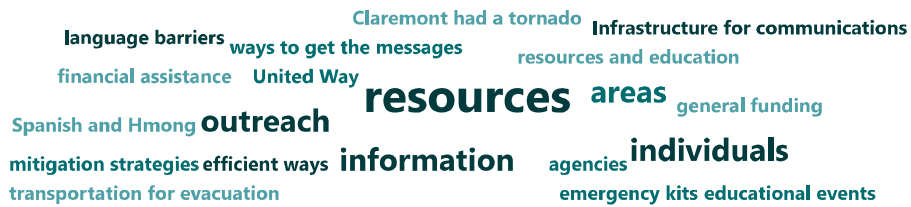
3. **Identifying Gaps:** What resources are missing that prevent these communities from getting the help that they need to plan for and reduce risks from natural, weather-related disasters?

12
Responses

Latest Responses

"None"
"Communication. Some individuals do not use internet, etc., so there needs to..."
"There are less resources close by. Thankfully, agencies such as United Way h..."

3 respondents (25%) answered **resources** for this question.



4. **Disproportionate Benefit to Wealthy Areas:** Do wealthier communities or neighborhoods get more support than under-resourced ones when it comes to preparing for disasters?

● Yes 7
● No 5



5. **Barriers to Preparedness:** What barriers make it harder for underserved communities to stay safe during disasters?

12
Responses

Latest Responses

"None"
"Lack of resources and received information. "
"It is mostly because these communities are simply not geographically close t..."

6 respondents (50%) answered **lack** for this question.



10/8/24, 5:18 PM

UNIFOUR: Social Equity Questionnaire

6. **Non-traditional Resources:** What other things (ie., resources or partnerships) besides money and the usual supports, can we use to make communities more prepared against natural disasters?

12
Responses

Latest Responses
"More information"

"Possibly include community agencies and faith based communities to help g...
"It might would be helpful to have educational classes on preparing your ho..."

4 respondents (33%) answered **communities** for this question.



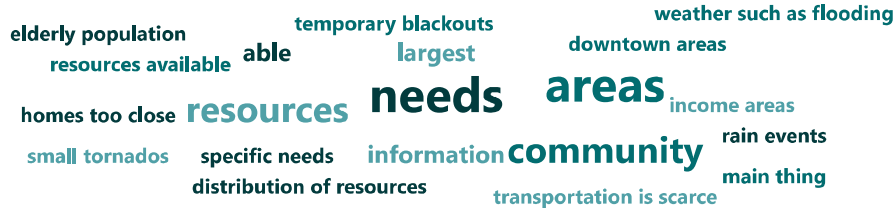
7. **Specific Concerns:** What issues do we need to consider when planning for disasters, preparing for support, and distributing resources in our area?

12
Responses

Latest Responses

"Taking into account our elderly population that is not as technically savvy."
"To ensure majority of community are able to hear and learn about the resou...
"This area rarely has natural disasters but in the last few years we have had ..."

4 respondents (33%) answered **needs** for this question.



8. **Engagement Strategies:** How can we get everyone in the community involved in disaster planning?

12
Responses

Latest Responses

"Public education meetings would help."
"Not sure that we can get everyone, but hopefully, if we utilize various resour...
"It is impossible to get everyone in the community involved but it is possible t..."

6 respondents (50%) answered **community** for this question.

