

Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan

Including Greenville County and the Cities of
Fountain Inn, Greenville, Greer, Mauldin,
Simpsonville, and Travelers Rest

April 2026



Greenville County Floodplain and
Emergency Management

Table of Revisions

Version	Date	Author	Changes
1.0	1/3/2025	Woolpert, Inc. / Greenville County	Initial Plan Update Draft
1.1	3/10/2025	Woolpert, Inc. / Greenville County	Address DMC and County Comments
1.2	3/28/2025	Woolpert, Inc. / Greenville County	Address SCEMD review comments – Round 1
1.3	3/12/2026	Woolpert, Inc. / Greenville County	Address FEMA review & County comments
1.4	4/13/2026	Woolpert, Inc. / Participating Communities	Added substantial damage program information

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List of Abbreviations

CDC – Centers for Disease Control and Prevention
CER – Community Emergency Response Team
CFM – Certified Floodplain Manager
CRS – Community Rating System
DMC – Disaster Mitigation Committee
EAP – Emergency Action Plan
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Map
FIS – Flood Insurance Study
GIS – Geographic Information System
HMGP – Hazard Mitigation Grant Program
HMP – Hazard Mitigation Plan
HMRP – Hazard Mitigation and Resiliency Plan
ISO – Insurance Services Office
LOS – Level of Service
NFIP – National Flood Insurance Program
NID – National Inventory of Dams
NOAA – National Oceanic and Atmospheric Administration
NRCS – Natural Resources Conservation Service
NWS – National Weather Service
SCDES – South Carolina Department of Environmental Services
SCDNR – South Carolina Department of Natural Resources
SCDOT – South Carolina Department of Transportation
SCDRO – South Carolina Disaster Recovery Office
SCEMD / EMD – South Carolina Emergency Management Division
SCFC – South Carolina Forestry Commission
SFHA – Special Flood Hazard Area
SVI – Social Vulnerability Index
USDM – United States Drought Monitor
USGS – United States Geological Survey
VOAD – Voluntary Organization Active in Response

Executive Summary

Greenville County created its initial Hazard Mitigation Plan (HMP) in January 2005 using Mitigation 20/20 software. The 2005 HMP was developed to comply with the Disaster Mitigation Act of 2000 to obtain credits under the Community Rating System (CRS), and it followed the ten (10) step Federal Emergency Management Agency (FEMA) planning process. A process for updating the status of mitigation initiatives annually and updating the entire plan every five (5) years was included in the 2005 Plan and subsequent revisions. Major revisions to the 2005 HMP were prepared in 2010, 2015, and 2020. The 2010 HMP converted the original plan to a multi-jurisdictional, multi-hazard plan and included the Cities of Greenville, Travelers Rest, Mauldin, Simpsonville, Fountain Inn, and Greer in the planning process. These communities also participated in the 2015 and 2020 HMP and are participants in the 2026 Plan.

The 2026 Plan contains another format revision to include resiliency elements required in the County's Comprehensive Land Use Plan. Specifically, the 2026 Hazard Mitigation and Resiliency Plan (HMRP) is designed to address the following Comprehensive Plan Element.

This element must "consider the impacts of flooding, high water, and natural hazards on individuals, communities, institutions, businesses, economic development, public infrastructure and facilities, and public health, safety and welfare. This element includes an inventory of existing resiliency conditions, promotes resilient planning, design and development, and is coordinated with adjacent and relevant jurisdictions and agencies. For the purposes of this item, "adjacent and relevant jurisdictions and agencies" means those counties, municipalities, public service districts, school districts, public and private utilities, transportation agencies, and other public entities that are affected by or have planning authority over the public project. For the purposes of this item, "coordination" means written notification by the local planning commission or its staff to adjacent and relevant jurisdictions and agencies of the proposed projects and the opportunity for adjacent and relevant jurisdictions and agencies to provide comment."

Additionally, "ownership" of the plan has shifted from the Floodplain Manager to the Director of Emergency Management. This shift is not just an organizational shift but emphasizes the multi-hazard aspect of the plan.

While this plan is being prepared per the requirements stated above, its real intent is to reduce the impact of multiple natural hazards on infrastructure and people across Greenville County. The County is threatened by several natural hazards that endanger the health and safety of the population and jeopardize its infrastructure and economic vitality. This plan addresses the following hazards:

- Floods
- Winter Storms
- High Winds / Tornados
- Wildfires
- Earthquakes
- Drought
- Landslides
- Hail

Additionally, the plan addresses climate change and health and social equity. Resiliency is addressed throughout the HMRP.

During the planning process, mitigation initiatives associated with each natural hazard were discussed and included as appropriate. The Risk Assessment conducted as part of Section 7.5.1 of the HMRP determined that Floods, Winter Storms, High Winds/Tornados, and Wildfires are the hazards that pose the highest risk to residents and

infrastructure in Greenville County. In 2022, the County prepared a comprehensive Paris Mountain Wildfire Mitigation Plan (See Appendix K). This plan recognized the unique vulnerability of the Paris Mountain planning area; however, wildfire is still a potential concern in other areas of Greenville County where wildlands and urbanized areas interface.

Climate change is an ongoing issue that has increasingly gained attention, particularly due to its significant potential impacts on coastal communities (e.g., sea level rise, and the intensified frequency of coastal storms and hurricanes). However, Greenville County has also experienced more extreme climate events, such as a decrease in annual precipitation and a rise in average annual temperatures. Despite the reduction in total annual precipitation, rainfall intensities have increased. As a result, Greenville County has incorporated climate change considerations into this plan. These climate trends are addressed in relation to individual hazards and are discussed in greater detail in the Climate Change section of this plan.

Since 2005, Greenville County and the associated jurisdictions have implemented many of the mitigation initiatives contained in previous plans. While it is difficult to quantify the amount of damage avoided by the implementation of mitigation initiatives, it appears that the program has been very successful in mitigating the impact of natural disasters. One example is the County's structure acquisition program which has acquired 222 properties and permanently removed them from the floodplain.

Greenville County Council and the governing bodies of each jurisdiction represented in the plan fully support the development and implementation of the 2026 HMRP. Resolutions supporting the 2026 HMRP are contained in Appendix G. The implementation, monitoring, and maintenance of the 2026 HMRP are the responsibility of the Disaster Mitigation Committee (DMC) (Section 4), which is coordinated by the Greenville County Director of Emergency Management. The policies and procedures of the DMC are addressed fully in Section 3 and Section 4. The "2026 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan" (2026 HMRP) will expire in five (5) years from the date of approval.

NOTE (03/20/2026): The 2020 HMP expired in July 2025. The 2026 HMRP was submitted for review, approval and adoption prior to the expiration of the 2020 HMP. However, due to partial government shutdowns, FEMA's review of this HMRP was delayed approximately nine (9) months.

1 Introduction

The intent of this plan is to document the process and results of the mitigation planning effort for the natural hazards that impact Greenville County, South Carolina and its incorporated communities. To assist in development of the plan, Greenville County retained Woolpert, Inc. to facilitate the plan update and formed a Disaster Mitigation Committee (DMC) to review hazards impacting the County and determine potential initiatives to mitigate loss of life and damage to infrastructure.

The DMC consists of representatives from each of the participating communities, various state and federal agencies, and members of the public. Each participating community has its own flood damage prevention ordinance and floodplain administrator. However, Greenville County and the City of Greenville, by virtue of their population and tax revenue, have more resources than the other participants. The City of Greenville participates in the preparation of the County plan and has created and maintains its own hazard mitigation plan in addition to and independent of this effort.

Additional information regarding each participating community's participation in the National Flood Insurance Program is summarized in Table 1 below. The Floodplain Management program for each community is adopted through specific Code of Ordinances. Each ordinance allows the community administrator to designate a Floodplain Manager, adopts the current effective Flood Insurance Rate Maps as the regulatory Special Flood Hazard Areas (SFHAs), provides for permitting of development within a SFHA, and provides requirements of the substantial improvement/substantial damage program. For Greenville County, floodplain management duties are administered through the Codes Enforcement Department by the County's Floodplain Manager.

The participating communities, their current National Flood Insurance Program (NFIP) status, and CRS Rating are listed in Table 1 below. A complete listing of the DMC membership can be found in Table 5 in Section 4.1 below.

Table 1. Participating Communities in the HMRP

Participating Community	Ordinance Administration	Population*	CID	NFIP Reg-Emer Date	CRS Class
Greenville County	Building Official or Designee	570,745**	450089C	12/02/80	7
City of Fountain Inn	Public Works Director or Designee	13,027	450209#	06/17/86	---
City of Greenville	City Manager or Designee	72,824	450091C	02/01/80	5
City of Greer	Building Official, City Engineer, or Designee	44,387	450200#	09/28/79	---
City of Mauldin	Business & Services Director or Designee	28,018	450198#	09/29/78	---
City of Simpsonville	Floodplain Manager	27,506	450092#	09/29/78	---
City of Travelers Rest	City Administrator or Designee	8,750	450264#	04/03/97	---

* July 1, 2023, population estimates by United States Census Bureau

**2024 population estimates by United States Census Bureau

While the planning process includes multiple jurisdictions within the County and is intended to serve those jurisdictions, it is the responsibility of each participant to prepare and present an analysis of its own unique hazards and associated risks. Mitigation activities identified in this plan impact all communities within the planning area, but the plan does not contain activities specific to each individual jurisdiction. All jurisdictions have been afforded the opportunity to include their hazard and risk analysis as well as location specific mitigation activities in the HMRP appendices. If a municipality developed an independent hazard mitigation plan (e.g., City of Greenville) or specific mitigation measures, those can be found in Appendix F. Additionally, each jurisdiction within this plan relies on its own policies, programs, and authorities for implementation of hazard mitigation activities. Where appropriate, all communities coordinate and share implementation responsibilities.

2 Plan Purpose

The 2026 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan represents an update to previous planning efforts. As such, it closely follows the format and content of the previous plans while updating critical information and data, including new sections regarding resiliency, high hazard potential dams, and more. This plan provides the following:

1. **A Methodical, Substantive Approach to Mitigation Planning**

The approach utilized by the DMC relies on a methodical process to identify vulnerabilities to future disasters and to propose the mitigation initiatives necessary to avoid or minimize those vulnerabilities. This process includes interviews, research, data collection, plan development, community involvement, work sessions, and implementation. Each step in the process builds upon the previous step so that there is a high level of assurance that the mitigation initiatives proposed by the participants have a valid basis for both their justification and priority for implementation. One key purpose of this plan is to document that process and to present its results to the community.

2. **Enhances Public Awareness and Understanding**

The DMC is interested in finding ways to make the community more aware of the natural hazards that threaten public health and safety, the economic vitality of businesses, and the operational capability of important facilities and institutions. The plan identifies the hazards threatening Greenville County, providing an assessment of the relative level of risk they pose. The plan also includes proposed ways to avoid or minimize those vulnerabilities. This information is essential for those looking to understand how the community can better prepare for and reduce the impacts of future disasters.

The DMC and its member organizations will continue to conduct community outreach and public information programs. The purpose of these programs is to engage the community in the mitigation planning process. The planning process includes shaping the goals, priorities, and content of the plan, as well as providing information and education to the public regarding ways to be more protected from the impacts of future disasters.

3. **Creates a Decision Tool for Management**

The 2026 HMRP provides information needed by the managers and leaders of local government, business and industry, community associations, and other key institutions and organizations to take action to address vulnerabilities to future disasters. It also provides proposals for specific projects and programs that are needed to eliminate or minimize the risks of specific hazards. The plan is based on the best available data that provides a solid foundation for hazard planning and future improvements.

These proposals, called “mitigation initiatives” in the plan, have been justified based on their economic benefits using a uniform technical analysis. These initiatives have also been prioritized. This approach is intended to provide a decision tool for the management of participating organizations and agencies regarding why the proposed mitigation initiatives should be implemented, which should be implemented first, and the economic and public welfare benefits of doing so.

4. **Promotes Compliance with State and Federal Program Requirements**

There are several state and federal grant programs, policies, and regulations that encourage or even mandate local government to develop and maintain a comprehensive hazard mitigation plan. This plan is specifically intended to assist the participating local governments to comply with these requirements and to enable them to respond more efficiently and effectively to state and federal funding opportunities for mitigation-related projects. Because the plan defines, justifies, and prioritizes mitigation initiatives that have been formulated through a technically valid hazard analysis and vulnerability assessment process, the participating organizations are better prepared to more quickly and easily develop the necessary grant application materials for seeking state and federal funding.

5. Enhances Local Policies for Hazard Mitigation Capability

A component of the hazard mitigation planning process conducted by the Greenville County DMC is the analysis of the existing policy, program, and regulatory basis for control of growth and development, as well as the functioning of key facilities and systems. This process involves cataloging the current mitigation-related policies of local government so that they can be compared against the hazards that threaten the jurisdiction and the relative risks these hazards pose to the community. When the risks posed to the community by a specific hazard are not adequately addressed in the community's policy or regulatory framework, the potential impacts of future disasters can be even more severe. Therefore, the planning process utilized by the DMC supports evaluation of the adequacy of the community's policies and programs considering the level of risk posed by specific hazards.

6. Integrates HMRP Requirements into Other County Plans

The Greenville County HMRP is supported by other County planning mechanisms and programs including the following:

- a. County Comprehensive Land Use Plan (The HMRP adds resiliency components for consideration in "Plan Greenville County", the County's comprehensive plan)
- b. Capital Improvement Program
- c. Emergency Operations Plan
- d. Stormwater Management Plan
- e. Land Development Regulations
- f. Flood Damage Prevention Ordinance
- g. Emergency Action Plan (EAP) for Dams
- h. Open Space Plan

Section 5.2 provides information on the types of support provided by these plans and programs to the Greenville County HMRP.

The following sections of the HMRP present detailed information to support these purposes. Section 4 describes the current DMC organization and its approach to managing the planning process. The plan provides a description of the mitigation-related characteristics of Greenville County, including its land use and population growth trends, the mitigation-related policies already in place, identified critical facilities present in the community, and properties repetitively damaged by flooding. The plan then summarizes the results of the hazard identification and vulnerability assessment process and the community capabilities assessment for Greenville County. The plan documents structural and non-structural mitigation initiatives to address the identified vulnerabilities. The plan further addresses the mitigation goals and objectives established by the DMC and actions to be taken to maintain, expand, and refine the HMRP and planning process. Finally, the past and planned efforts of the DMC to engage the entire community in the mitigation planning process are documented.

3 Mitigation Goals

The DMC has retained the nine (9) goals from the 2020 HMP update. The goals include educating the public and government officials, improving communications and response initiatives, and protecting structures and public safety to reduce loss of life and injury. Specific objectives were established for each goal, and initiatives were approved to meet the required objectives.

This Plan has also been developed to address resiliency in each element of the Comprehensive Land Use Plan. The HMRP and the Comprehensive Land Use Plan share common goals to mitigate disasters and promote resiliency across all segments of the population and geographic locations. Each Element of the Comprehensive Land Use Plan has been addressed in both the planning goals and objectives and in the identified mitigation initiatives. Table 3, Planning Goals and Objectives illustrates how each mitigation initiative not only meets an identified planning goal, but also how it promotes resilience within each Comprehensive Plan Element.

The Elements of the Comprehensive Land Use Plan addressed in this plan include the following:

- Population
- Economic Development
- Natural Resources
- Cultural Resources
- Community Facilities
- Housing
- Land Use
- Transportation
- Priority Investment
- Agriculture and Food Security

3.1 Mitigation Plan Goals and Objectives

The DMC affirmed the 2020 HMP goals and objectives to guide its work in the development of the 2026 plan update. The goals and objectives helped to focus the efforts of the group in the mitigation and resilience planning effort to achieve a result that matches the unique needs, capabilities, and desires of Greenville County and its Comprehensive Land Use Plan.

The goals and objectives for the planning process are listed below.

- 1. County government will have the capability to develop, maintain, and utilize hazard information**
 - a. Data and information needed for defining hazards, risk areas, and vulnerabilities in the community will be obtained
 - b. The capability to effectively utilize available data and information related to mitigation planning and program development will be available
 - c. The effectiveness of mitigation initiatives implemented in the community will be reviewed and documented
 - d. There will be a program to derive mitigation “lessons learned” from significant disaster events occurring in or near the community
- 2. The County will have the capability to initiate and sustain emergency response operations during and after a disaster**
 - a. Communications systems supporting emergency services operations will be available to provide for effective communication during times of disaster
 - b. Designated evacuation shelters will be capable of operating during and after disaster events

- c. Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations
 - d. Local emergency services facilities will be assessed, and County-owned service facilities will be capable of operating during a disaster event
 - e. Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts
- 3. The continuity of County government operations will not be significantly disrupted by disasters**
- a. Measures will be implemented to alert County personnel of impending disasters and corresponding action plans
 - b. County employees will be trained in disaster response and operations
- 4. The policies and regulations of County government will support effective hazard mitigation programming throughout the County**
- a. County government will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community
 - b. County government will protect high hazard natural areas from new or continuing development
 - c. Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk
 - d. Reconstruction and rehabilitation of structures and utilities in the County will incorporate appropriate hazard mitigation techniques
 - e. Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster
 - f. The County will continue participation in the National Flood Insurance Program and the associated Community Rating System
- 5. Residents of the County will have homes, institutions, and places of employment that are less vulnerable to disasters**
- a. Programs for removal, relocation or retrofitting of vulnerable utilities in high hazard areas will be established
 - b. The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized
- 6. The economic vitality of the County will not be significantly threatened by a disaster**
- a. County government emergency response and disaster recovery plans will appropriately consider the needs of key employers in the community
 - b. County government will encourage community businesses and industries to make their facilities and operations disaster resistant
 - c. County government will implement appropriate communications initiatives to address public concerns of community condition and functioning in the aftermath of a disaster
- 7. The availability and functioning of the County's infrastructure will not be significantly disrupted by a disaster**
- a. County government will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities
 - b. Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure due to a disaster
 - c. Transportation facilities and systems serving the County will be constructed and/or retrofitted to minimize the potential for disruption during a disaster

- 8. Key County employees will be trained to recognize hazards threatening local areas and the techniques to minimize vulnerability to those hazards. Information on hazard mitigation will be disseminated to the public.**
 - a. Interested individuals will be encouraged to participate in hazard mitigation planning and training activities
 - b. Education programs in risk communication and hazard mitigation will be established and implemented
 - c. Managers of public facilities will be knowledgeable in hazard mitigation techniques and the components of the County's mitigation plan
 - d. Technical training in mitigation planning and programming will be given to appropriate local government employees
 - e. The public will have facilitated access to information needed to understand their vulnerability to disasters and effective mitigation techniques
- 9. The County will protect public safety and prevent and/or reduce loss of life and injury**
 - a. Mitigation initiatives will be prioritized with emphasis on the number of citizens impacted by the initiative
 - b. Hazards with the highest potential to cause injury or risk to life will be given priority in the planning process
 - c. This plan will support the efforts of those responsible for emergency response during and immediately following a natural disaster

3.2 Goal Based Planning Process

The goals established by the Greenville County DMC are used to guide the long-term direction of the 2026 HMRP. As indicated in the list of goals and objectives above, each goal statement has one or more objectives that provide a more specific framework for actions to be taken by the DMC and its participants. The objectives define actions or results that can be placed into measurable terms by the DMC and translated into specific assignments for implementation by the participants in the DMC and associated agencies and organizations.

The objectives selected by the DMC are intended to create a specific framework for guiding the development of proposed mitigation initiatives for incorporation into the plan. Whenever feasible, the planning participants have attempted to associate each proposed mitigation initiative with the objective statement the initiative is intended to achieve. By associating a mitigation initiative with a specific objective, the proposed initiative is also intended to help achieve the broader goal statement to which the objective corresponds. Proposing mitigation initiatives that are consistent with the selected objectives is a principal mechanism for the DMC participants to achieve the stated goals of the mitigation planning program.

To illustrate this point, Table 3 shows a list of the mitigation initiatives contained in the 2026 HMRP and the objective statements which they are intended to help achieve (In the table, goals are identified by numbers and objectives by lower case letters). New initiatives added during the 2026 planning cycle are in blue text. Table 4 lists each Comprehensive Land Use Plan Element and the mitigation measures addressing each of those Elements. For a more detailed description of each mitigation initiative, see Section 8.1. This format allows the DMC to identify which of the established objectives will be addressed by the proposed initiative. The DMC considers achievement of a specific objective under an established goal as it reviews a proposed initiative for incorporation into the plan; or, as it assigns the initiative a priority or schedule for implementation. This approach creates a framework for "goal-based" planning by the DMC, focusing the group's efforts on proposing and implementing mitigation initiatives to achieve the established mitigation goals.

As the HMRP is reviewed and updated by the DMC, the goals and supporting objective statements are also reviewed to ensure they are still applicable to meeting the unique needs, interests, and desires of the community.

Table 2. Comprehensive Land Use Plan Element Codes

Element	Code
Population	GR (Grow)
Economic Development	WK (Work)
Agriculture & Food Safety	BL (Bloom)
Natural Resources	PR (Preserve)
Cultural Resources	EN (Enrich)
Community Facilities	SE (Serve)
Housing	LI (Live)
Land Use	BA (Balance)
Transportation	MO (Move)
Priority Investment	IM (Implement)

Table 3. Planning Goals and Objectives

Initiative Description		Planning Goal(s) Targeted	Planning Objective Satisfied	Comprehensive Plan Element
A. Prevention				
	Stormwater Utility Credit Manual Review	4	4a,c,d,e	LI, BA
	Floodplain Ordinance/Mapping Review	1, 4, 6	1a-b, 4, 6b	GR, WK, BL, PR, SE, LI, BA, IM
	Grant Writer/Administrator	Indirect support of all goals and objectives		GR, WK, BL, PR, EN, SE, LI, BA, MO, IM
	Repetitive Loss Area Plan Implementation	1, 4, 9	1a,c, 4, 9	GR, WK, BL, PR, SE, LI, BA
	Stormwater Ordinance/Design Manual Review	4	4a-e	LI, BA
	Proactive Maintenance of Stormwater Infrastructure	5, 7	5a, 7b	GR, WK, BL, SE, LI, MO, IM
	Heat Vulnerability Assessment	1, 9	1, 9	GR, WK, BL, PR, SE, LI
	Implement Appropriate Sections of the Paris Mountain Wildfire Plan County-wide	2, 4, 5	2, 4b,d, 5b	GR, EN, SE, LI, BA
	Update Existing Watershed Studies	1, 5	1a, 5b	GR, WK, BL, PR, EN, SE, LI, MO
	Wildfire Mitigation Planning/Potential Study	1, 2, 4, 5, 6, 8, 9	1, 2, 4a-c, 5b, 6a-b, 8, 9b	GR, WK, BL, PR, EN, SE, LI, BA, IM
	Landslide Risk Study	1, 2, 4, 5, 9	1a, 2, 4a-c,e, 5, 9	GR, WK, BL, PR, EN, SE, LI, BA, MO
B. Public Education & Awareness				
	Restoration Education Post Disaster Events	1, 2, 4, 5	1, 2e, 4d, 5	GR, WK, BL, PR, EN, SE, LI, BA, MO
	Protection Education	8	8a-e	BL, SE
	Realtor Flood Hazard Education	8	8a-e	BL, SE
	Enhance Hazards Education	3, 8	3b, 8a-e	GR, BL, SE

Initiative Description		Planning Goal(s) Targeted	Planning Objective Satisfied	Comprehensive Plan Element
	Emergency Public Communication	3	3a	GR
	Early Warning System Evaluation	3, 6, 9	3a, 6c, 9	GR, WK, BL, SE, IM,
	Enhanced GIS Database	1, 8	1a-b, 8c, 8e	WK, BL, PR, SE, LI
C. Natural Resources Protection				
	Stream Crossing Debris Removal	5, 7	5, 7b-c	GR, WK, BL EN, SE, LI, MO, IM
	Evaluate Tree Ordinance for Canopy Improvement	4	4e	LI, BA
	Riparian Area Management Plans	4	4a-e	LI, BA
	Stream Restoration	7	7b	BL, SE, IM
D. Emergency Services				
	Post Disaster Review Meetings	1, 2, 3, 6, 7, 8	1d, 2e, 3b, 6a-b, 7a, 8a	GR, WK, BL, PR, SE, LI, IM
	County CERT Program	6, 9	6a-b, 9c	GR, WK, BL, SE, IM,
	Comprehensive Training	3	3b	GR
	Coordinated Bridge De-icing	7	7c	BL, MO, IM
	Voluntary Organizations Active in Disaster (VOAD)	9	9c	GR, BL
	Evaluation of Emergency Routes	2	2c	GR, SE
	Early Warning System Enhancement	2, 3	2a, 2c, 2e, 3a	GR, SE
	Heating and Cooling	2, 5, 9	2e, 5b, 9	GR, BL, EN, SE
E. Property Protection				
	Elevation Grant Program (On-going)	5	5a	GR, WK, SE, LI, MO
	Flood Mitigation Acquisition Program (On-going)	5	5a	GR, WK, SE, LI, MO
	High Hazard Potential Dams	1, 2, 4, 5, 6	1, 2, 4, 5, 6	GR, WK, BL, PR, EN, SE, LI, BA, MO, IM
	Financial Assistance Program for Mitigation Activities	5	5a	GR, WK, SE, LI, MO
F. Structural Projects				
	County-owned Critical Facilities	2	2d	GR, SE
	Bridge/Culvert Replacement	1, 5	1a, 5b	GR, WK, BL, PR, EN, SE, LI,

Table 4. Mitigation Measures addressing Comprehensive Land Use Plan Elements

Initiative Description		GR	WK	BL	PR	EN	SE	LI	BA	MO	IM
A. Prevention											
	Stormwater Utility Credit Manual Review							X	X		
	Floodplain Ordinance/Mapping Review	X	X	X	X		X	X	X		X
	Grant Writer/Administrator	X	X	X	X	X	X	X	X	X	X
	Repetitive Loss Area Plan Implementation	X	X	X	X		X	X	X		
	Stormwater Ordinance/Design Manual Review							X	X		
	Proactive Maintenance of Stormwater Infrastructure	X	X	X			X	X		X	X
	Heat Vulnerability Assessment	X	X	X	X		X	X			
	Implement Appropriate Sections of the Paris Mountain Wildfire Plan County-wide	X				X	X	X	X		
	Update Existing Watershed Studies	X	X	X	X	X	X	X		X	
	Wildfire Mitigation Planning/Potential Study	X	X	X	X	X	X	X	X		X
	Landslide Risk Study	X	X	X	X	X	X	X	X	X	
B. Public Education & Awareness											
	Restoration Education Post Disaster Events	X	X	X	X	X	X	X	X	X	
	Protection Education			X			X				
	Realtor Flood Hazard Education			X			X				
	Enhance Hazards Education	X		X			X				
	Emergency Public Communication	X									
	Early Warning System Evaluation	X	X	X			X				X
	Enhanced GIS Database		X	X	X		X	X			
C. Natural Resources Protection											
	Stream Crossing Debris Removal	X	X	X		X	X	X		X	X
	Evaluate Tree Ordinance for Canopy Improvement							X	X		
	Riparian Area Management Plans							X	X		
	Stream Restoration			X			X				X
D. Emergency Services											
	Post Disaster Review Meetings	X	X	X	X		X	X			X
	County CERT Program	X	X	X			X				X
	Comprehensive Training	X									
	Coordinated Bridge De-icing			X						X	X
	Voluntary Organizations Active in Disaster (VOAD)	X		X							
	Evaluation of Emergency Routes	X					X				
	Early Warning System Enhancement	X					X				
	Heating and Cooling	X		X		X	X				
E. Property Protection											
	Elevation Grant Program (On-going)	X	X				X	X		X	
	Flood Mitigation Acquisition Program (On-going)	X	X				X	X		X	
	High Hazard Potential Dams	X	X	X	X	X	X	X	X	X	X
	Financial Assistance Program for Mitigation Activities	X	X				X	X		X	
F. Structural Projects											
	County-owned Critical Facilities	X					X				
	Bridge/Culvert Replacement	X	X	X	X	X	X	X			

4 Disaster Mitigation Committee

4.1 Organizational Structure

Greenville County created the DMC to provide for thorough representation of the public, business and industry stakeholders, and utility providers, as well as to provide hazard mitigation expertise from various local, state, and federal agencies and academics. Multiple departments of Greenville County were also represented in the DMC, including the County Planning Department.

Table 5 below contains the full membership of the DMC. Individual committee representatives may change during the planning cycle; however, it is anticipated that all the listed agencies, departments, and jurisdictions will maintain at least one representative on the committee throughout the five (5) year planning process.

Table 5. Disaster Mitigation Committee Membership Roster

Organization / Agency	Participating Member	Member's Title	Contact Information
Greenville County	Jessica Stumpf	Director of Emergency Management	jstumpf@greenvillecounty.org
	Brian Bishop	Floodplain Administrator	jbishop@greenvillecounty.org
	Mike Jankowski	Emergency Planning Coordinator	mJankowski@greenvillecounty.org
	Rashida Jeffers-Campbell	Planning Director	rjeffers-campbell@greenvillecounty.org
	Don Shuman	Parks Director	dshuman@greenvillecounty.org
	Bob Mihalic	Governmental Affairs Coordinator	bmihalic@greenvillecounty.org
	Hunter Crumley	County Engineer	hcrumley@greenvillecounty.org
	Judy Wortkoetter	County Engineer, Land Development Division	jwortkoetter@greenvillecounty.org
	Thomas (Tee) Coker	Assistant County Administrator for Community Planning and Development	tcoker@greenvillecounty.org Note: Since the beginning of the planning process, Tee Coker has taken a new position with the City of Simpsonville.
	Anna Stewart	Transportation Planner	AStewart@greenvillecounty.org
City of Greenville	Paul Dow	City Engineer	pdow@greenvillesc.gov
City of Greer	Catrina Woodruff	Assistant City Administrator	cwoodruff@cityofgreer.org
City of Travelers Rest	Shannon Herman	City Administrator	shannon@travelersrestsc.com
City of Simpsonville	Tee Coker	City Administrator	tcoker@simpsonville.com;
City of Fountain Inn	Shawn Bell	City Administrator	shawn.bell@fountaininn.org
City of Mauldin	Brian McHone	Fire Chief	bmchone@mauldinfire.com
	Seth Duncan	City Administrator	sduncan@mauldincitysc.com
Greenville County School District	Greg Porter	Director - Security, School Safety, and Emergency Preparedness	gporter@greenville.k12.sc.us
NOAA	Brian Campbell	Regional Maintenance Specialist	brian.campbell@noaa.gov
Furman University	Dr. Gustavo Coelho	Assistant Professor, Water Resources	gustavo.coelho@furman.edu

Organization / Agency	Participating Member	Member's Title	Contact Information
	Andrew Predmore	Executive Director, The Shi Institute for Sustainable Communities	andrew.predmore@furman.edu
	Suresh Muthukrishnan	Professor	suresh.muthukrishnan@gmail.com
	Mike Winiski	Director of the Center for Applied Sustainability Research	mike.winiski@furman.edu
ReWa	Zach Dukes	Engineering Infrastructure Program Manager	zachd@re-wa.org
	Jennifer Simmons	Asset and Sustainability Leader	jennifers@re-wa.org
	Toby Louris	Director of Technology	tobyl@re-wa.org
Greenville County Redevelopment Authority	Imma Nwobodu	Program Director	inwobodu@grca-sc.org
	Jose Reynoso	Community Planner	jreynoso@gcra-sc.org
Upstate Forever	Rebecca Wade	Clean Water Specialist	rwade@upstateforever.org
Home Builders Association	Taylor Lyles	CEO	tlyles@hbaofgreenville.com
Prisma Health	Shaun Brand	Emergency Management Specialist	shaun.brand@prismahealth.org
Colonial Pipeline Company	Brandon Grooms	Senior ROW Inspector/At-large member SC State Emergency Response Commission (SERC)	bgrooms@colpipe.com
SCDOT	Joel Smith	District Maintenance Engineer	smithjj@scdot.org
Duke Energy	Mason Smith	Operations Manager	mason.smith@duke-energy.com
Greenville Water	Mark Hattendorf	Director of Field Operations and Maintenance	mhattendorf@greenvillewater.com
Paris Mountain HOA	Bena Peek	Mountainside Garden Club Altamont Club Friends of Paris Mountain	Benapeek@gmail.com
	Travis Elmore	Paris Mountain Safety Com	travis.elmore@live.com
Save our Saluda & Easley Combined Utilities	Melanie Ruhlman	President – Save Our Saluda Watershed Manager for Easley Combined Utilities	info@saveoursaluda.org
Southern Environmental Law Center Naturaland Trust	Frank S. Holleman III	Senior Attorney President	fholleman@selcnc.org
Citizens for Quality Rural Living	Jim Moore	Citizen	comanche7093@aol.com
Woolpert, Inc.	Hal Clarkson	Program Director	Hal.Clarkson@woolpert.com
	Molly Brown	Project Manager	Molly.Brown@woolpert.com

Sign-in sheets for all three DMC meetings can be found in Appendix A.

The DMC is intended to represent a partnership between the public and private sectors of the community, working together to create a disaster resistant community. The proposed mitigation initiatives developed by the DMC and listed in this plan, when implemented, are intended to make the entire community safer from the impacts of future disasters for the benefit of every individual, neighborhood, business, and institution.

For all previous planning efforts, including this 2026 HMRP, the DMC has encouraged participation by all interested agencies, organizations, and individuals. In fact, the DMC has maintained full participation through all planning efforts, and it is anticipated that full participation will continue through this planning period. The result of an active membership is well thought out and meaningful mitigation initiatives.

The DMC is charged with meeting, at a minimum, on an annual basis to review mitigation initiatives that have been implemented, review lessons learned from disaster events that may have occurred since the last meeting of the DMC and revise the HMRP as appropriate. Annual updates can be found in Appendix D. Mitigation initiatives proposed for future implementation may also be reevaluated for consistency with the goals of the Plan and to incorporate lessons learned from ongoing or implemented initiatives.

Any proposed changes to the 2026 HMRP will be considered by the DMC and, if agreed upon, will be incorporated into the Plan. These changes will be presented to Greenville County Council for review as part of the annual report to Council. In addition, the DMC will promote public involvement in the planning process by posting the annual report on the County website and soliciting public comment to be shared with DMC members. It is also a function of the DMC to coordinate and exchange information with agencies and departments represented by individual committee members.

4.2 Operating Procedures

The DMC was organized as the guiding body for the creation of the 2026 HMRP with Woolpert, Inc. assisting through data gathering and analysis, meeting facilitation, and plan preparation. This planning cycle included three (3) meetings of the DMC during the plan development process as follows (full agendas and meeting minutes are contained in Appendix A).

DMC Meeting #1 (March 27, 2024): The Greenville County DMC met for the first time on March 27, 2024, to initiate the next update to the Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan (HMRP). The meeting was open to the public and had 35 attendees, with representatives from Greenville County, the City of Greenville, the City of Travelers Rest, the City of Fountain Inn, the City of Greer, members of the community, and other upstate agencies. After a brief introduction from Jessica Stumpf, Greenville County's Director of Emergency Management, members of the DMC introduced themselves to the group. Hal Clarkson and Molly Davis then presented an overview of the HMRP development process. The presentation included but was not limited to an explanation of the role/expectations of the committee members, the purpose of the HMRP, and a general discussion regarding possible hazards and associated mitigation techniques. The presentation ended with an assignment for all committee members to think about the hazards presented and come ready with potential mitigation measures to present to the group at the next meeting. Hal let the committee know that the ideas presented at the second meeting will be evaluated and ranked for inclusion in the 2026 HMRP.

DMC Meeting #2 (July 30, 2024): The Greenville County DMC held its second meeting on July 30, 2024. The main objective of the meeting was to brainstorm mitigation activities for the 2026 plan update. Twenty-seven (27) people attended the meeting with representatives from Greenville County, the City of Greenville, the City of Traveler's Rest, the City of Greer, the City of Fountain Inn, members of the community, and other upstate agencies. Hal Clarkson started the meeting with a brief presentation covering the purpose/goals of the plan as well as a refresher on the hazards to be addressed and the mitigation activity types. The committee members were split into tables for small group discussions. Each table produced mitigation activity ideas for each group of hazards. The hazard groupings are listed below.

- Flooding / High Hazard Potential Dams
- Winter Storms
- High Winds/Tornados/Hail
- Wildfires
- Heat/Drought
- Landslides & Earthquakes

The groups were given 15 minutes to discuss each topic, and the group reconvened to share ideas for 10 minutes following each topic. The mitigation activity ideas that came out of the meeting are included in Appendix A.

DMC Meeting #3 (January 27, 2025): The Greenville County DMC met for the third time on January 27, 2025, to discuss the impacts of Hurricane Helene, review the prioritized mitigation initiatives, and allow the DMC to comment on the draft plan. The draft plan was provided to committee members before the meeting to give them time to review. Comments and feedback received were incorporated into the HMRP update. The meeting included 18 attendees, with representatives from Greenville County, City of Greenville, City of Traveler's Rest, City of Greer, City of Fountain Inn, Furman University, members of the community, and other upstate agencies. The meeting began with a discussion about the impacts of Hurricane Helene and what could have been done before the storm to make response and recovery easier. The remaining time was spent reviewing the mitigation activities and scoring and addressing any comments/feedback from the committee's review of the draft plan.

As stated above, the DMC is tasked with providing annual review of the HMRP along with meeting to perform post disaster reviews. The County Emergency Management Director will notify the DMC members approximately two weeks prior to the meeting dates for annual and post disaster reviews.

During the annual review process, the DMC will be informed of the status of on-going mitigation initiatives as well as new proposed initiatives. Each initiative will be discussed to ensure it is still appropriate, to review potential funding sources, and to validate the current priority ranking. Any new mitigation ideas from the DMC and others will be evaluated, scored, and added to the mitigation initiative list, as appropriate. Post disaster review meetings are currently facilitated by EMD to discuss the successes and failures of actions taken during the disaster. As appropriate, priorities may be adjusted and new mitigation initiatives added to the list based on the items discussed during these meetings. A review of prioritized mitigation initiatives that may be eligible for funding due to a disaster declaration should also be identified and a plan of action created for seeking funding for eligible projects.

5 Previous Planning and Implementation Efforts

This plan is the fifth issuance of the Greenville County Hazard Mitigation Plan and constitutes a comprehensive update to the previous plans. In general, the previous plans built off the last five-year plan update. This planning process included a comprehensive review of the hazards affecting the County and the potential impacts of those hazards.

The goals of the previous plan were reviewed and updated as appropriate. In the previous planning cycle, consideration of the impact of hazards on human life was given renewed emphasis and is reflected in the addition of goal number 9 (See Section 3.1). Previous mitigation measures were also considered and incorporated into this plan.

Greenville County has done an excellent job addressing existing flooding issues over the last several decades, having purchased approximately 222 structures in the floodplain. Further, to help ensure that new problems are not being created, the County has incorporated several “higher standards” such as a four (4) foot freeboard requirement into their ordinance and has conducted watershed studies to identify structures at risk and appropriate solutions. In fact, the County has only issued twelve (12) permits for new buildings in Special Flood Hazard Areas since 2020.

Overall, the County is growing at a rapid pace. According to the US Census Bureau, Greenville County grew approximately 16% or by 74,000 people between 2010 and 2020. Projections for 2025 estimate additional growth of approximately 8%. This growth will produce a higher level of risk for the County (more buildings and people), but due to the County’s stormwater and floodplain management programs, building codes enforcement, and planning efforts, this growth is not expected to impact the County’s overall vulnerability. However, as this growth continues, it is incumbent on the DMC to monitor and evaluate changes, particularly to vulnerable populations and critical facilities, to ensure that risks do not increase more rapidly than growth. See the figure below from Plan Greenville 2020 for an illustration of population density across the County.

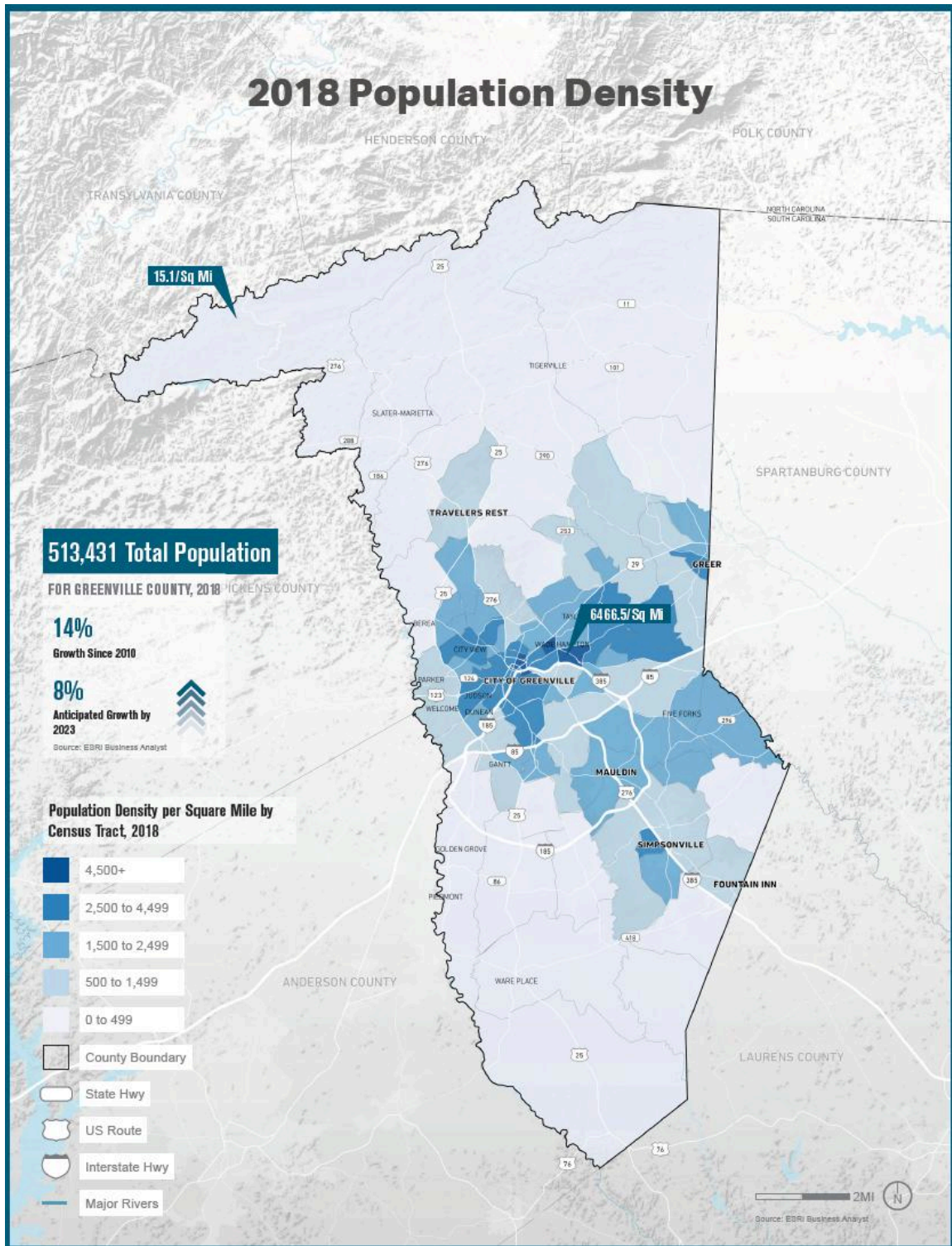


Figure 1. 2018 Population Density (Plan Greenville County 2020)

The following sections describe related planning efforts, outcomes of each of the previous hazard mitigation planning efforts, and some of the County's more successful mitigation efforts.

5.1 Previous Plans

5.1.1 2005 HMP

At the time of the first HMP in 2005, Greenville County had already been working on several mitigation initiatives, despite the Plan being in its infancy. The following initiatives were completed prior to the HMP development in 2005:

- Several drainage projects to reduce flooding impacts at key locations
- Improvements to emergency response based on recent natural hazard experiences
- Flood insurance re-study including digital floodplain mapping

In 2004, the Dwelling Elevation Program was initiated; the County funding assistance began being offered to qualifying residents.

5.1.2 2010 HMP

In 2010, the original initiative goals were reviewed, and progress had been made on most of the initiatives. Several watershed studies were initiated and completed, County GIS data was updated, Repetitive Loss Areas were delineated, and multiple structural projects were completed. The County made a lot of progress from 2005 to 2010; a full list of completed projects can be seen in Table 7.

5.1.3 2015 HMP

Between 2010 and 2015, the County continued to expand on its mitigation initiatives. Approximately, 16 stream gages and 20 rain gages have been installed on the Reedy River, Brushy Creek, Gilder Creek, and Mountain Creek Tributary 1. Watershed studies were completed, and several recommendations from the studies were implemented.

5.1.4 2020 HMP

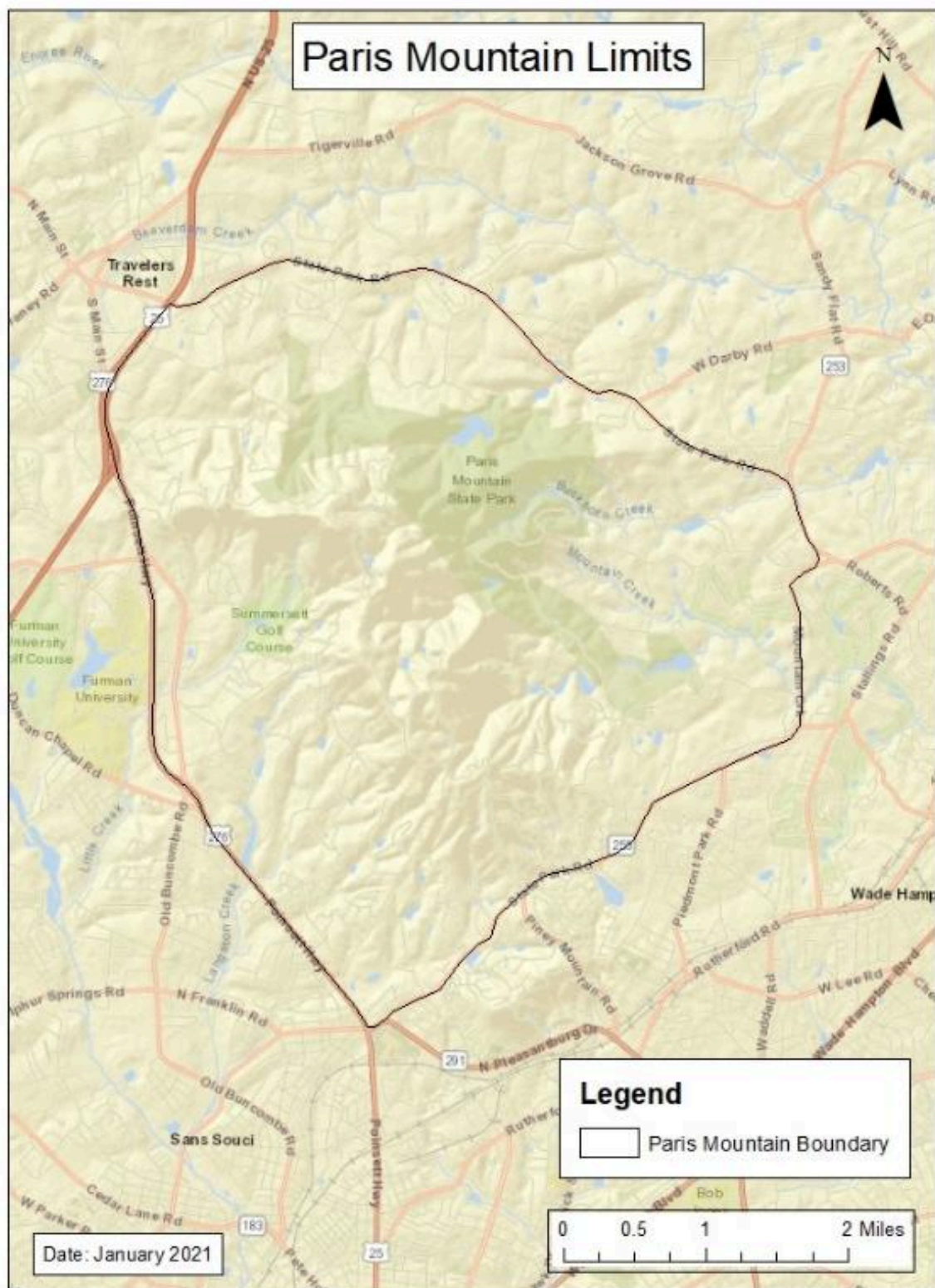
Between 2020 and 2025, Greenville County remained diligent in implementing its mitigation plan. More than a dozen bridges and culverts have been upgraded to provide a higher level of service and to reduce flooding. The Paris Mountain Wildfire Mitigation Plan was completed, and implementation of the plan has begun. Three (3) additional watershed plans are currently underway; 1) Lower Reedy River, 2) Middle Tyger Creek, and 3) Upper Enoree River watersheds. Over 3,000 residents have received mailers regarding floodplain management issues and public education and outreach continues to be a major part of mitigation efforts with numerous activities implemented. Grants were obtained to construct several streambank stabilization projects. These are just a few of the activities implemented from the 2020 HMP.

5.1.5 2022 Paris Mountain Wildfire Mitigation Plan

The Paris Mountain Wildfire Mitigation Plan was completed in February 2022 and followed a similar process that was used to develop the County HMP. This plan was developed specifically for the Paris Mountain planning area (See Figure 2), however, many of the mitigation measures identified in the Plan are applicable county-wide. The resulting plan contains twenty-two individual potential mitigation measures spread across each of seven broader mitigation categories including:

1. Community outreach and education
2. Fuel management
3. Fireproof structures
4. Fireproof landscapes
5. Improved fire response
6. Training
7. Research and risk assessment

This plan is included in Appendix K of this report.



5.2 Related Planning Efforts

To effectively prepare and implement a hazard mitigation plan, the plan must be coordinated with other community plans, policies, and programs. Personnel from a variety of departments participated in the hazard mitigation planning process including emergency management, parks and recreation, public works, engineering, floodplain management, stormwater management, land development, GIS, planning, and public outreach. Representation from these key departments helps ensure that issues and concerns from across the County are incorporated into the HMRP and that elements from the HMRP are appropriately incorporated into other County planning efforts, such as the comprehensive land use plan. Each representative city and town identified in the HMRP adopts the plan through Council resolution and uses the HMRP as a basis for developing their own emergency preparedness and response plans. Each community has confirmed that appropriate elements of this plan are incorporated into other planning tools within the community.

The Greenville County Comprehensive Land Use Plan, “Plan Greenville County” addresses a variety of planning related issues confronting the County including those issues posed by risk from natural hazards. In particular, strategies such as “Make floodplains a part of a tree and habitat protection plan” and “Require stream buffers sufficient to protect water quality, streambank integrity, and wildlife habitat” found in the Natural Resources Element are consistent with the goals of this plan. As well, this Hazard Mitigation and Resiliency Plan will be referenced in the “Plan Greenville County” document.

The County’s hazard mitigation effort is enhanced through participation in the National Flood Insurance Program and enforcement of the Flood Damage Prevention Ordinance. Also, this effort is supported by other County planning mechanisms and programs including those listed in the following table.

Municipal jurisdictions participating in this HMRP also have programs in place that enhance their mitigation efforts. The Cities of Greenville, Greer, Mauldin, Simpsonville, Ft. Inn, and Travelers Rest confirmed that they have and continue to implement policies and programs that reduce vulnerabilities to loss of life and property from natural hazards. These policies and programs include but are not limited to community specific comprehensive plans, floodplain management regulations, building codes, and capital improvement plans that help ensure sustainable growth while safeguarding public safety, infrastructure, and environmental resilience. More information related to the City of Greenville’s programs can be found in Appendix F.

Table 6. County Plans and Programs Supporting Hazard Mitigation

Plan or Program	Description
County Comprehensive Land Use Plan (Plan Greenville County)	The comprehensive plan is a policy document that is adopted by County Council to serve as a guide for future decisions on growth. Provides significant information on County services, transportation corridors, municipalities, mapping, etc. that is used in developing and evaluating mitigation initiatives. Zoning is a major component that considers natural resource protection and flood hazard area development.
Capital Improvement Program	Five (5) year program providing framework for funding non-recurring capital improvement projects, including those related to hazard mitigation (e.g., bridge upgrades, flood prone property acquisition, solid waste facilities).

Plan or Program	Description
Emergency Operations Plan	This plan is the guiding document for Greenville County to prepare for, respond to, and recover from disasters. The plan covers the whole community by ensuring community lifelines are monitored as a part of situational awareness during disasters.
Stormwater Management Program	The stormwater management program is administered through the Greenville County Land Development Division. This program addresses all aspects of stormwater management including runoff and water quality issues. Stormwater runoff rates, drainage easements and stream buffers, as well as detention pond design and maintenance, relate directly to flood control.
Land Development Regulations	These regulations address all aspects of land development including but not limited to drainage, transportation, natural areas, commercial structures and residential subdivisions. Their primary goal is to provide for orderly development considering both human and environmental factors. They help to minimize flood damage and ensure access to emergency services in developed areas.
Flood Damage Prevention Ordinance	It is the purpose of the “Flood Control, Drainage, Stormwater Management – Floods and Flood Control” ordinance to protect human life and health, minimize property damage, and encourage appropriate construction practices to minimize public and private losses due to flood conditions.
Emergency Action Plan (EAP) for Dams	An EAP is a formal document used to assist dam owners in identifying unusual or emergency conditions at the dam. The document also prescribes specific actions to reduce the potential for downstream loss of life and property damage in the event of a dam failure.
Open Space Plan	Greenville County is in the process of developing a comprehensive and community supported open space, recreation and trails expansion plan (Open Space Plan) for Greenville County, SC in furtherance of the 2020 Plan Greenville Comprehensive Plan and the 2010 Greenville County Comprehensive Greenways Plan. The plan will establish an on-going vision for open space, preservation goals for long-term growth management and sustainability, and an action plan for implementation for the next 10 years including strategic collaborations and community partnerships to leverage resources and expertise, policy recommendations for plan implementation, and a needs analysis for priority capital projects, land acquisitions, trail development, funding estimates and mechanisms. Additional outcomes of the Open Space Plan

Plan or Program	Description
	shall include high level concept plans, GIS maps and data of open space, recreation and trail expansion locations, and a web accessible interactive story map of the planning process and the importance of open space integration and active participation.

5.3 Plan Accomplishments

Greenville County has made considerable progress since the first HMP in 2005. Some of the major accomplishments are summarized below.

5.3.1 Dwelling Elevation Program

A dwelling elevation/flood mitigation program has been implemented by Greenville County to assist homeowners with the elevation of their dwellings. The goal of this program is to reduce repeated flooding by providing grants up to \$7,500 to go toward the elevation of homes. To date, 6 homeowners have elevated structures utilizing this program.

5.3.2 Acquisition Program

Greenville County has purchased a total of 222 properties within the floodplains of multiple watersheds. The removal of all structures restored property to use as a natural floodplain.

In addition, Greenville County has instituted a program to purchase properties within the floodplain during “tax sales” to eliminate the potential of those properties becoming future “loss” structures.

5.3.3 Watershed Studies

Five (5) watershed areas have been studied by the County to identify road/stream crossings and develop possible flood solutions and three (3) more are underway. Studies have been completed for the Brushy Creek, Gilder Creek, Grove Creek, Langston Creek / Upper Reedy River, Rocky Creek North watersheds. The Lower Reedy River, Middle Tyger Creek and Enoree River watersheds are currently undergoing detailed analysis and planning. As appropriate, these studies have either been submitted for a Letter of Map Change or incorporated into the latest map revision.

5.3.4 Grants

In addition to the Hazard Mitigation Grant Program (HMGP) request for this planning effort, Greenville County was awarded HMGP funding to assist with a public outreach effort related to wildfires and to prepare a wildfire mitigation plan for the Paris Mountain area. The County also received funding through grant number DR-4166 to purchase eleven (11) homes. The South Carolina Rural Infrastructure Agency and the South Carolina Department of Resilience provided funding to the County to restore several stream segments and to stabilize eroding streambanks.

5.3.5 NAFSMA Presentation

In August 2015, Greenville County was an active participant in the National Association of Flood and Stormwater Management Agencies (NAFSMA) annual conference in Jackson Hole, Wyoming. NAFSMA places special emphasis on floodplain management and offered the County an opportunity to showcase some of its efforts while learning from peers. The County was selected to present two different components of its stormwater program and presented the following topic related to its flood mitigation efforts: “Greenville County Floodplain Management”, by Paula

Gucker, Assistant County Administrator for Community Planning, Development & Public Works. This same presentation was later made to several other professional organizations.

FEMA has recognized Greenville County twice in recent years due to the County's floodplain management efforts. In 2016, FEMA produced a white paper titled, "Greenville County "Buys Down the Risk" With Property Acquisition Program". This paper highlighted the County's property acquisition program. In 2018, SCEMD and FEMA again recognized the County's flood mitigation efforts by including examples from "Greenville County's comprehensive plan to combat flood risk" in its document titled, "Hazard Mitigation Best Practices". Copies of these documents can be found in Appendix H. Greenville County also received the James Lee Watt "Local Award for Excellence in Floodplain Management" in 2020 through the Association of State Floodplain Managers.

5.4 Completed Initiatives

Table 7 below contains a listing of mitigation initiatives identified in previous plans that have been partially or fully implemented to date.

Table 7. Completed Mitigation Initiatives

Initiative	Description	HMP Cycle
Revisions to Flood Damage Prevention Ordinance	Flood Damage Prevention Ordinance Revisions (Feb/May 2007). Provided clarification and enhancement of requirements regarding floodplain studies/ encroachments.	2005
Brushy Creek Watershed Study	The Brushy Creek Stormwater Master Plan was completed May 2007. The study produced floodplain maps for the watershed and a mitigation alternatives analysis that targeted three major subdivisions. Over 90 flood prone structures located in the 1% Special Flood Hazard Area of this watershed have been removed as a result of this study.	2005
Rocky Creek Watershed Study	In August 2005, the Rocky Creek Stormwater Master Plan was submitted to FEMA with a request for a Physical Map Revision (PMR). FEMA notified the County that the Plan would be processed as a PMR when funding became available. The final report for this study was completed in May 2007. Several bridges in this watershed have been upgraded. The modeling data from this study as well as all other completed studies was submitted to FEMA to support the new County-wide Flood Insurance Study (FIS).	2005

Initiative	Description	HMP Cycle
Langston Creek / Upper Reedy River Watershed Study	The Upper Reedy Watershed Study was initiated in late 2007 and completed in November 2009. This study provided new floodplain maps for this watershed and an alternatives analysis with recommended flood mitigation measures for targeted areas. Over 25 homes located in the SFHA have been removed as a result of this study. Also, several bridges have been replaced with a resulting higher Level of Service (LOS) with regard to flooding.	2005
Gilder Creek Watershed Study	The Gilder Creek Watershed Study was initiated in late 2007 and completed in April 2010. This study produced new floodplain maps for this watershed and an alternatives analysis that recommended flood mitigation measures for targeted areas. Several bridges in this watershed have been upgraded to a higher LOS, and one home has been removed from the SFHA.	2010
Flood Pool Elevations	The County Floodplain Administrator's office maintains an elevation database for the nine (9) reservoirs included in the Rabon Creek, South Tyger, and Huff Creek Watershed Districts. The impoundment easements for these areas were added to the County GIS in 2012. Future construction within these easements is regulated.	2010
Bridge / Culvert Replacement	The County replaced and upgraded 7 stream crossings during the 2005 HMP cycle and 21 crossings during the 2010 HMP cycle. During the 2020 HMP cycle, the County completed the following bridge/culvert replacements: • 2021/2022 – 7 bridge/culvert replacements • 2022/2023 – 3 bridge replacements • 2023/2024 – 7 bridge and 6 culvert replacements • 2024/2025 – projected to replace 6 bridges These upgrades improved channel flow characteristics through the crossings, providing a higher level of service.	2005 2010 2020
Rain & River Gage Installation	In 2010, the County installed ten (10) rain gages across the County. That network has since been expanded to seventeen (17) rain gages. Additionally, the County operates thirteen (13) water quality and river gage stations in multiple watersheds. The National Weather Service utilizes the gage data in forecasting and issuing emergency alerts.	2010

Initiative	Description	HMP Cycle
Formal Agreements with Utility Providers	Greenville County has a Preferred Customer agreement with the electric utility provider to restore power to critical facilities first after a severe weather event.	2010
Enhance Hazard Updates	An informational page regarding Mandatory Purchase of Flood Insurance was added to all floodplain verifications performed for the public (2008). As part of our Community Rating System (CRS) program, the Codes Enforcement website was enhanced to include a floodplain management page with links to flood safety, FEMA, flood facts, elevation grant program, ordinance, permitting, and frequently asked questions. Also, a floodplain management section targeting building contractors was linked to this site. As part of CRS, Repetitive Loss Areas surrounding repetitive loss structures were delineated. An address list for parcels contained in these areas was developed and is used annually to send relevant information on flooding issues. Also, a Repetitive Loss Area map was generated on GIS.	2005/ 2010
Stream Crossing Debris Removal	NRCS spent \$1 million on stream bank stabilization and debris removal projects (2005). NRCS received \$250,000 in 2006 and \$750,000 in 2007 for stream bank stabilization and debris removal projects.	2005
Dwelling Elevation Program	Year 2005 - 15 N Chastain Dr. (Completed/\$7,500 disbursed) - 7 N Chastain Dr. (Completed/\$7,500 disbursed) - 2 Plano Dr. (Completed/ICC funds) - 12 N Chastain Dr. (Completed/ICC funds) - 6 N Chastain Dr. (Completed/ICC funds) Year 2007 - 302 Hillbrook Rd. (Fire Damage – Elev. Completed/\$7,500 disbursed)	2005

Initiative	Description	HMP Cycle
Develop Inter-Local Agreements	This initiative addresses agreements between municipalities and the National Weather Service (NWS) to share information on development or changes that may affect a downstream community. Currently, a statewide mutual aid agreement is in place. The County notifies the NWS of homes that are removed from the floodplain under our acquisition program. The County and NWS have Memorandums of Understanding for sharing data from County rain/stream gages. Also, an MOU is in place for the Mountain Creek Church Road stream gage where the gage equipment was supplied by the NWS.	2010
Neighborhood Drainage Improvement Projects	Numerous projects have been completed to improve localized drainage and stream flow. The following summarizes these drainage projects and structure acquisitions. 2005 – 3 drainage projects; 2 designs for improvements 2007 – 5 crossing/channel improvements; 1 det. pond 2010 – 4 drainage and culvert improvements 2011 – 6 drainage and culvert improvements 2012 – 8 drainage and culvert improvements	2005/ 2010
County Severe Weather Manual	A manual was completed addressing severe weather protocols.	2015
FIRM Updates	New FIRM maps were created, and became effective on August 18, 2014 The County's most current FIRM date is May 4, 2021.	2010/ 2020
Critical Facility Review	County critical facilities (e.g., hospitals, fire departments, police departments, and schools) have been identified. The Volunteer Service Corp. has evaluated the adequacy of several disaster shelters in the County. This evaluation was performed to determine if these shelters were designed and constructed to withstand potential disasters.	2015

Initiative	Description	HMP Cycle
Grove Creek Stormwater Master Plan	In June 2012, the County initiated a Stormwater Master Plan study of the Grove Creek Watershed located southwest of the City of Greenville. The field work and preliminary study model are complete. Preliminary data indicates that a minor number of existing structures are located within the modeled Special Flood Hazard Area. A Letter of Map Revision has been prepared and submitted to FEMA for this study so that the data can be incorporated into the FEMA Flood Insurance Rate Maps covering this area. On March 2, 2016, the County received a letter from FEMA stating that the FIRM and FIS report should be revised as a Physical Map Revision and will begin this process. Mitigation alternatives will be presented in the final report for areas and road crossings determined to be at risk for significant flooding. Met with FEMA, SCDNR on June 13, 2017, for our DFIRM Community Coordination Meeting (Grove Creek Maps). Plan to hold a community meeting in January 2018 for public comments. The new FEMA maps with effective date of January 18, 2019, were approved by County Council through the updated Flood Damage Prevention Ordinance # 5031 with effective date of November 6, 2018.	2015
Rocky Creek North Update 2015	In May 2015, the original 2001 Rocky Creek Stormwater Master plan was updated in response to the August 2014 storm event. The hydrologic and hydraulic models created for the 2001 study were imported into the current HEC-HMS and HEC-RAS model versions along with updated precipitation data, field survey, digital topography, and damage assessment. Also, for the Crosscreek Lane analysis, a XP-SWMM 1D/2D model was built. The recommendations from the update include buyouts of selected homes, minor improvements within the Mountainbrooke subdivision, and preparing a study of the drainage system within the Merrifield neighborhood. In April 2012, the Oak Grove Lake dam breached, releasing all of the water in the lake over a short period of time. No major flooding occurred as a result of the breach. However, in order to repair the dam, the County was required to perform a Dam Breach Analysis to determine potential impacts to downstream properties. Results show that a breach occurring with the reservoir filled to the top of the dam will be contained within the existing 500-year floodplain. Repairs to the dam were initiated and completed in 2013.	2015

Initiative	Description	HMP Cycle
Proactive Maintenance of Stormwater Infrastructure	2022/2023 – Upgraded 3 existing undersized and poorly functioning pipe drainage systems, and rehabbed existing CMP pipe. 2023/2024 – Upgraded 2 existing undersized and poorly functioning pipe drainage systems, rehabbed one pipe system and 2 large culverts.	2020
Paris Mountain Wildfire Plan	A FEMA hazard mitigation grant was awarded to Greenville County for the development of the Paris Mountain Wildfire Plan which was completed in February 2022.	2020
Repetitive Loss Area Plan Implementation	2021 – County is down from 53 RL structures to 13 over the last 6 years. 2022 – Repetitive Loss outreach letters were mailed. A total of 91 letters were sent to repetitive loss property owners and associated surrounding properties. 2023 – Repetitive Loss outreach letters were mailed. A total of 77 letters were sent to repetitive loss property owners and associated surrounding properties. 2024 - Repetitive Loss outreach letters were mailed. A total of 92 letters were sent to repetitive loss property owners and associated surrounding properties.	2020
Middle Tyger Creek Watershed Study	The County is preparing a watershed master plan for the Middle Tyger Creek basin identifying potential flooding problems and solutions.	2020
Lower Reedy River Watershed Study	The County is preparing a watershed master plan for the Lower Reedy River basin identifying potential flooding problems and solutions.	2020
Upper Enoree River Basin Study	The County was awarded a grant on September 25, 2023, to prepare a watershed master plan for the upper portion of the Enoree River Basin identifying potential flooding problems and solutions. The Contract to perform the study was awarded in March 2024 and the study is underway.	2020
Realtor Hazard Education	The County sends contact information and resources to the South Carolina Realtors Association annually to include in their newsletter which reaches approximately 3,000 members.	2020
Pre-Prepared Hazard Info Ads	Information brochures on the following hazards have been developed: floods, winter storms, tornadoes, drought, wildfires, and earthquakes. The materials are printed and ready for release as disasters occur. They are also available on whatwouldmartydo.com and the County's Facebook page. The Emergency Management Division also has	2020

Initiative	Description	HMP Cycle
	information on its website. The EMD also hosts an annual disaster preparedness event called “Get Ready Greenville County.” It is a family friendly event with many participating agencies helping the citizens of Greenville County learn more about preparing for disasters.	
Flood Signs	Signage is provided in known flood risk areas.	2020
Early Warning System Evaluation	The Emergency Management Division manages the CodeRED Emergency notification system for the county, which can send out alerts via IPAWS (integrated public alert and warning system). Greenville County also works alongside National Weather Service and local news agencies to get information out efficiently and effectively.	2020
Flood Mitigation Acquisition Program	2020/2021 - Finished last \$1.5M home acquisitions (11 structures) and applied for BRIC \$1.5M and FMA \$0.8M funding for an additional acquisition of 8 homes. 2021/2022 – 4 homes were purchased. 2022/2023 - To date the county has removed 219 structures from the special flood hazard areas representing 136.5 acres. 2023/2024 - To date the county has removed 221 structures from the special flood hazard areas representing 140.53 acres.	2020
Improvements to Radio Communications	Funding was provided and radio systems were upgraded.	2020
Comprehensive Training	2020/2021 - Damage Assessment training recently completed for Codes Enforcement and Floodplain Management staff. 2021/2022 - Mock Damage Assessment Field Activity was conducted during this period. 2022/2023 - Greenville County has 5 certified floodplain managers on staff and maintains their certification through webinars and conferences. Emergency Management has 4 SC certified emergency managers on staff. Also has a dedicated training coordinator on staff. 2023/2024 - Greenville County has 2 certified floodplain managers on staff and maintains their certification through webinars and conferences. Emergency Management has 4 SC certified emergency managers on staff. Also has a dedicated training coordinator on staff.	2020
Buffer Ordinance	Riparian buffer ordinance for new development in the draft Unified Development Ordinance is pending.	2020
Riparian Area Management Plans	2021/2022 - County is currently working with the planning department, Clemson Extension, Soil and Water	2020

Initiative	Description	HMP Cycle
	and Land Development to evaluate existing floodplain properties to enhance these areas. 2022/2023 - Greenville County Planning Department is currently working on plans for several communities containing large areas of county-owned floodplain properties. 2023/2024 - County was awarded two grants for stream restoration projects.	

6 Data Collection and Public Involvement

6.1 Data Collection

Hazard mitigation planning is data intensive. In addition to gathering and reviewing data from the County, Woolpert contacted sixteen (16) agencies and organizations to gather more information regarding the hazards affecting the County and the potential impacts. Below is a list of agencies that were contacted. More details regarding each contact are contained in Appendix B.

1. US ACE
2. NOAA
3. NWS
4. NRCS
5. FEMA
6. SC DOT
7. SC DNR – Flood Mitigation Program
8. SC DRO
9. SC EMD
10. SC DES – Dam Safety Program
11. SC Forestry Commission
12. Upstate Forever
13. Friends of the Reedy River
14. Save Our Saluda
15. Conestee Foundation
16. Appalachian Council of Governments

Table 8. Data Source Agencies and Organizations

Source Title	Applicable Hazard(s)
2023 SC State Hazard Mitigation Plan	All Hazards
State Climatology Office	All Hazards
City of Greenville GIS Information	All Hazards
Greenville County GIS Information	All Hazards
US Census Data	All Hazards
FEMA National Risk Index	All Hazards
Greenville County Emergency Management – Emergency Operations Plan	All Hazards
SHELDUS Version 22.0	All Hazards
NOAA (NWS SPC/NWPS/NCEI)	Climate/Floods/Hail/Tornados/Winds/Winter Weather
SCDNR	Climate/Winter Weather
US Drought Monitor	Drought
FEMA Flood Map Service Center	Floods
USGS Earthquake Hazards Program	Earthquakes
South Carolina Forestry Commission	Wildfires
SC State Climatology Office	Climate
Midwestern Regional Climate Center	Climate

Source Title	Applicable Hazard(s)
SCDES Dam Safety Program	Dams
National Inventory of Dams	Dams

The County also maintains an extensive network of rain gages, river stage gages, and water quality monitoring stations. See locations in

Figure 6 below. The County develops an annual Water Quality Monitoring Report that summarizes the data collected including annual and seasonal rainfall and discharge (flow and volume) from monitored watersheds, calculated recurrence intervals for all storms, and water surface levels compared to elevations in the FEMA Flood Insurance Study (FIS). Relevant data from that report is contained in Section 7.1.1.

6.2 Summary of Past Events

Hazard data was gathered from many sources including FEMA, NOAA, USGS, SCDES, SCDNR, and SC Forestry Commission, to name a few. A full listing of data sources can be found in Section 6.1 and Appendix B. The County also used the 2023 South Carolina Hazard Mitigation Plan and the SHELUS database to gather additional information about past events affecting Greenville County. SHELUS Version 22.0 was launched on January 15, 2024, and covers the period from January 1960 to December 2022. All hazard events included in the SHELUS database affecting Greenville County can be found in Appendix I. Hazardous events from 2023 and 2024 were added based on local knowledge and supplemental data. Section 7.1 details historical and recent events for each hazard.

Hurricane Helene

Hurricane Helene was the only declared disaster during the planning period (DR-4829-SC). Hurricane Helene began forming on September 22, 2024, in the Caribbean Sea and developed into a Category 4 hurricane as it made landfall across the southeastern United States. The storm entered the continental United States on September 26, 2024, around the Big Bend region of Florida. Its path continued through Florida, Georgia, South Carolina, North Carolina, Tennessee, and Virginia. However, the damage stretched across many surrounding states, including Indiana, West Virginia, Alabama, and Kentucky.

Helene entered Greenville County on the morning of September 27, 2024. During this time, South Carolina declared a state of emergency. Although the hurricane weakened as it moved inland, record rainfalls triggered widespread flooding. The high winds brought by the storm caused major damage throughout Greenville County.

Rain gauges in the county recorded between 7 to 13 inches of rainfall during this period. The highest rainfall recorded was in the Saluda River Watershed. Below are the maximum water levels recorded at various stream gage stations across the County during Hurricane Helene in September 2024. Stages at all stream gauge locations surpassed all previously recorded maximum depths except for the Keeler station. The maximum stage at the Keeler station was reached during the February 6, 2020, storm event.

Table 9. Maximum Recorded Water Levels

Site	Max Recorded Depth	100-yr Flood Stage	Flood Zone
Hudson	927.4	926.5	AE
Parkins	>822.4	821.0	AE
Landfill	817.5	813.0	AE
Log Shoals	733.9	735.0	AE
Hwy 418	677.2	678.3	AE
Hwy 76	>550.6	558.2	A
Mills Ave	892.3	891.8	AE
Keeler	920.2*	921.5	A
Tilly	981.3	979.0	A
Holland Ford	>654.6	650.5	AE
Dry Pocket	798.6	806.0	AE
East Georgia	>682.5	677.0	AE
Aiken Chapel	>849.4	847.5	AE

*Stage from 2/26/2020 storm event

Green = 100-year return interval

Blue = 500-year return interval

Note: Depths noted with > are minimum depths due to the station being damaged or the radar sensor became submerged during the event, and the station stopped recording depth.

Water quality monitoring stations records from stations across the County are available in Appendix J.

In Greenville County, around 6,000 power lines were damaged by the high winds and approximately 12,000 customers were left without power days after the storm. Many above ground power stations were also damaged, prompting county officials to reconsider the feasibility of underground power infrastructure.

According to AP News the death toll from Hurricane Helene reached 227, making it the deadliest hurricane to make landfall in the continental United States since Hurricane Katrina in 2005. In South Carolina, there were 51 fatalities attributed to the hurricane, seven of which occurred in Greenville County.

6.3 Existing Flood Study Data

Greenville County has engaged Woolpert, Inc. to prepare watershed master plans for multiple watersheds. These plans provide a higher level of detail than the FIRMs, determine the level of service for road/stream crossings, and consider solutions to potential structural flooding. When appropriate, the data has been submitted to FEMA through the Map Revision process.

The County has subsequently and systematically implemented the recommended solutions for these watersheds to reduce flooding. As a result, approximately 36% of the County's stream crossings in the most flood-prone watersheds have been evaluated for capacity and level of service. Nearly all of the County-owned bridges and culverts with severe level of service issues identified in those watershed studies have been addressed by the County.

Below is a comprehensive list of watersheds studied to date as well as a map outlining the watershed areas.

- Brushy Creek
- Gilder Creek
- Grove Creek
- Langston Creek / Upper Reedy River
- Rocky Creek North
- Upper Enoree River (Currently under study)
- Lower Reedy River (Currently under study)
- Middle Tyger Creek (Currently under study)

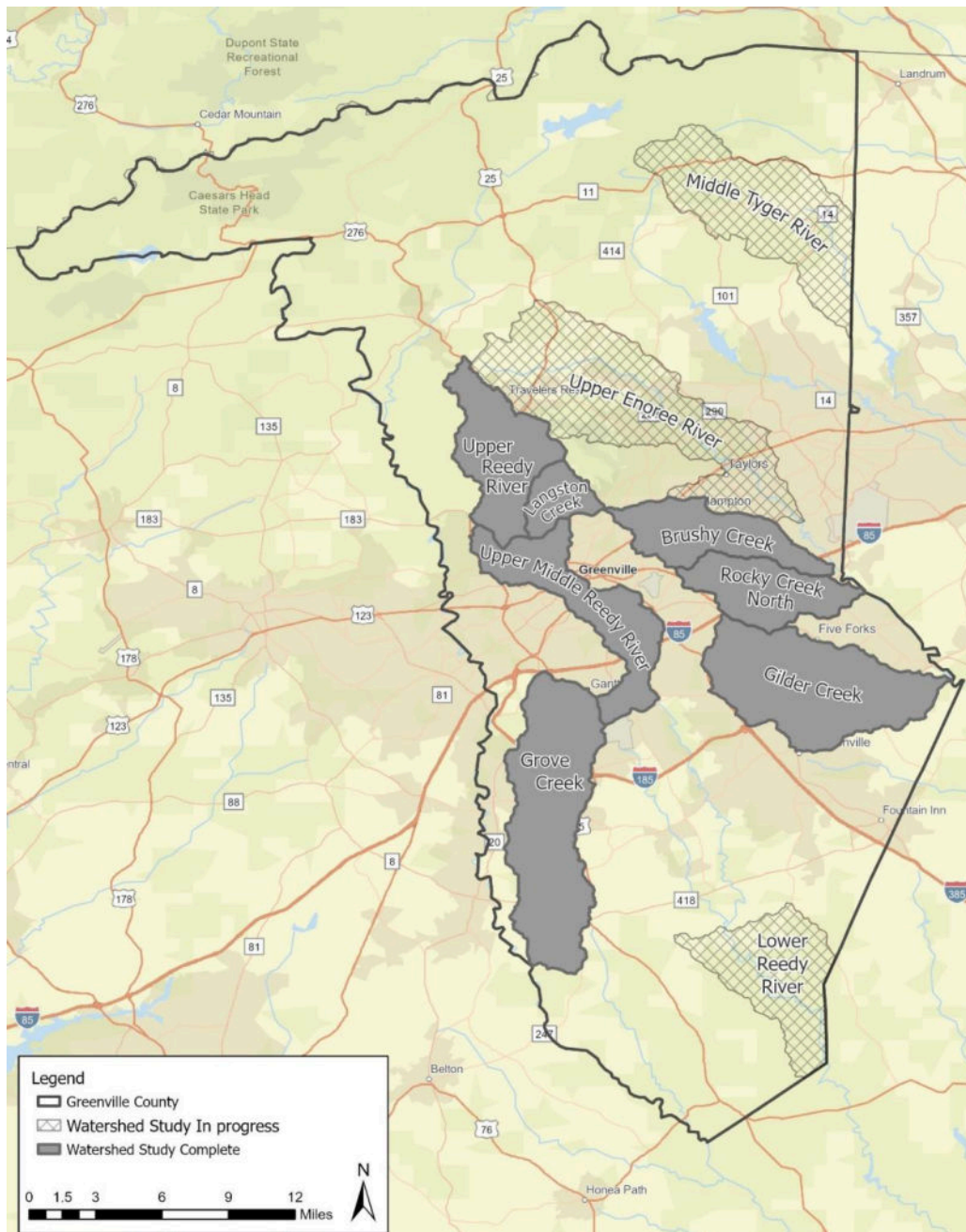


Figure 3. Watershed Study Areas – Complete and In Progress

6.4 Public Involvement

Public engagement is an important aspect of hazard mitigation planning and is crucial to understanding the needs of the community as well as an important forum for gathering data related to past events. The citizens of Greenville County were engaged throughout the planning process. The County held three public meetings throughout the planning process: one at the beginning of the plan update, one once the hazard and risk assessment was well underway, and one after the draft plan was complete. More information about these meetings is included below and in Appendix C. Members of the public were also involved in the DMC and all DMC meetings were open to the public for participation.

Comments were received both verbally and in writing and were documented on comment sheets. Any comments received during the meetings were reviewed and discussed with the County, then vetted through the DMC prior to inclusion in the plan. Section 4.2 and Section 9.3 provide further information regarding the process for including public input into the plan and plan updates.

Note: Comments received during the three (3) public meetings were all of a general nature and did not warrant revising or adding to the plan. Most dialogue with participating residents was related to the process and results.

Public Meeting #1 (April 18, 2024): The first public meeting for the 2026 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan update was held on April 18, 2024, from 5:00 PM – 7:00 PM at The Pavilion. Information about the meeting was posted publicly on the Greenville County website and LinkedIn. The meeting was an open house format. The County and Woolpert set up tables at the entrance of the Pavilion and spoke to citizens as they entered the recreation center. Information was provided about the plan update, the hazards affecting Greenville County, emergency preparedness, and how the public can get involved and provide information to help with the plan update. One citizen voiced concern about flooding in her backyard, and another citizen expressed interest in being a part of the plan development and participating in the CERT program.

Public Meeting #2 (August 20, 2024): The second public meeting for the 2026 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan update was held on August 20, 2024, from 4:00 PM – 6:00 PM at the Greenville County offices. Information about the meeting was posted publicly on the Greenville County Emergency Management and Floodplain Management web pages. The meeting was an open house format. The County and Woolpert set up tables in the lobby of the North Tower at the County offices in front of County Council chambers. Information was provided about the plan update, the hazards affecting Greenville County and their risk, emergency preparedness, and how the public can get involved to help with the plan update. We had the opportunity to speak with an incoming Council member, the County Administrator, several members of the public, and County employees in different departments to tell them more about what we are doing to plan for and mitigate the risk of hazards that have the potential to affect Greenville County.

Public Meeting #3 (March 4, 2025): The third public meeting for the 2026 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan update was held on March 4, 2025, from 4:00 PM – 6:00 PM at the Greenville County offices. Information about the meeting was posted publicly on the main Greenville County and Greenville County Emergency Management websites. The meeting was an open house format. The County and Woolpert set up tables in the lobby of the North Tower at the County offices in front of County Council chambers. The draft plan update was presented. This meeting allowed for additional public review of and input into the HMRP.

Comments from attendees were documented and considered when preparing the final plan.

Supplemental Meeting (March 4, 2026): To ensure that the Cities of Mauldin and Simpsonville were adequately represented in the planning process a meeting was held on March 4, 2026. During previous correspondence and at this meeting, the planning process was described to City officials and discussions were held regarding both City's plan involvement and potential mitigation measures. Subsequently, both Mauldin and Simpsonville supplied information regarding their mitigation capabilities, processes, and plans.

The following were in attendance at the Supplemental Meeting.

Name	Organization	Contact Information
Mike Jankowski	Greenville County EMD	MJankowski@greenvillecounty.org
Kathy Opalacz	Greenville County EMD	KOpalacz@greenvillecounty.org
Laura Ivie	Greenville County EMD	livie@greenvillecounty.org
Tee Coker	City of Simpsonville	tcoker@simpsonville.com
Seth Duncan	City of Mauldin	sduncan@mauldincitysc.com
Chief Brian McHone	City of Mauldin	McHone.Brian@mauldinfire.com
Tyler Spires	SCEMD	tspires@emd.sc.gov
Tyler Hoover	SCEMD	thoover@emd.sc.gov
Christine Burroughs	SCEMD	cborroughs@emd.sc.gov
Molly Brown, PE	Woolpert, Inc.	molly.brown@woolpert.com
Hal Clarkson, PE, CFM, IAM	Woolpert, Inc.	hal.clarkson@woolpert.com

7 Hazard and Risk Assessment

This section of the HMRP summarizes the various hazards as well as the risk associated with each. The intent of this section is to provide a compilation of information gathered and judgements made about the hazards threatening Greenville County. This information has been used to further identify relative risk associated with each hazard and to formulate mitigation initiatives and priorities.

In the following sections, the natural hazards that can pose a significant threat to Greenville County are discussed. Included is an evaluation of recent hazard events and an estimation of the risk for each of the hazards. The evaluation of the risk is followed by a section on vulnerability assessments for Greenville County.

It should be noted that only natural hazards are considered in this plan. The natural hazards of concern included in this plan are the following:

- Winter Weather
- Floods
- Tornados/High Winds
- Earthquakes
- Wildfires
- Drought
- Landslides
- Hail

Emerging Infectious Diseases is a relatively new component of the Hazard Mitigation Planning Process. This plan includes Section 7.4 to address this hazard.

Further, the list below contains the hazards included in the 2023 South Carolina State Hazard Mitigation Plan that are not contained within this plan and the rationale for not including these hazards.

- Extreme Temperature: This hazard is considered in the Drought section and discussed indirectly in the Climate Change section. The DMC did not believe this hazard warranted an independent discussion.
- Lightning: After reviewing the low probability of occurrence and potential consequences, the DMC opted to not include this hazard in an independent discussion.
- Severe Thunderstorms: The issues associated with severe thunderstorms (i.e., flooding, wind, lightning) are all covered in other sections (e.g., floods, tornados/high winds) and were, therefore, not included as an independent section.
- Tropical Cyclones: Similar to severe thunderstorms, the issues associated with cyclones are discussed in detail in other sections. Because the County was impacted by Hurricane Helene during the planning period, a discussion of that particular storm is included in the plan.
- Coastal Hazards: Not applicable.
- Multiple Man-made Disasters: Not applicable for this natural hazard plan.

It should be noted that the historical data on hazards in Greenville County is limited to knowledge that an event occurred. Little information on the extent of damage in terms of areas affected and costs could be found. However, the organizers of this plan have used what information is available to evaluate the risk of various hazards. It is believed that through the diverse group of those involved, including the public, that all hazards have been identified and appropriately assessed to prepare Greenville County for future events.

7.1 Hazard Assessment

While there may be some variation in the impact of natural hazards across jurisdictions, in general, all hazards included in the plan apply equally among all jurisdictions.

Assessment of hazards is based on available information that includes a review of historical events, especially those that occurred during the last planning cycle. Available information on the extent of damage in terms of areas affected and costs is limited. All relevant natural hazards have been identified and appropriately assessed to prepare Greenville County for future events. Maps of historical weather data were created to determine if a pattern exists, and if so, to identify infrastructure and people that are at a higher risk for certain extreme weather events.

7.1.1 Floods

The northern portion of Greenville County is located in the foothills of the Blue Ridge Mountains, therefore, many of the County's rivers and streams originate in the County. Over the past several decades, the County has experienced severe flooding across the County. While the County has addressed many of the flooding issues, floods remain a high priority for mitigation planning. To address flooding, the County continues to aggressively update existing watershed studies and convert watersheds with Approximate Zone 'A' Special Flood Hazard Areas (SFHAs) into detailed studies. The Upper Enoree River, Middle Tyger Creek and Lower Reedy River are examples of on-going mapping efforts where multiple storm events are being evaluated to determine the level of service of structures and stream crossings. Both current and future conditions are being evaluated and used to determine solutions to reduce flooding across the watersheds.

Flooding is typically associated with large infrequent rainfall events as well as hurricanes or tropical storms that have moved inland. Problem areas for flooding are commonly found in densely populated areas that have inadequate drainage systems or buildings located in flood-prone areas. Flash floods may occur in the steeply sloped mountainous regions and are extremely dangerous due to the velocity of the moving water and debris. Flooding can also affect the less hilly portions of the County due to higher density urbanization in the County's central region and accumulation of runoff.

The three primary flooding sources for the County include the Reedy River, the Enoree River, the Saluda River, and their tributaries. These three (3) major river systems generally flow from north to south originating in the foothills of the Blue Ridge Mountains and passing through both agricultural and highly urbanized lands. Figure 4 shows Special Flood Hazard Areas for a 100-year storm event. This flood map was used to determine infrastructure and people that are at risk of flood damage.

Greenville County Flood Hazard Zones

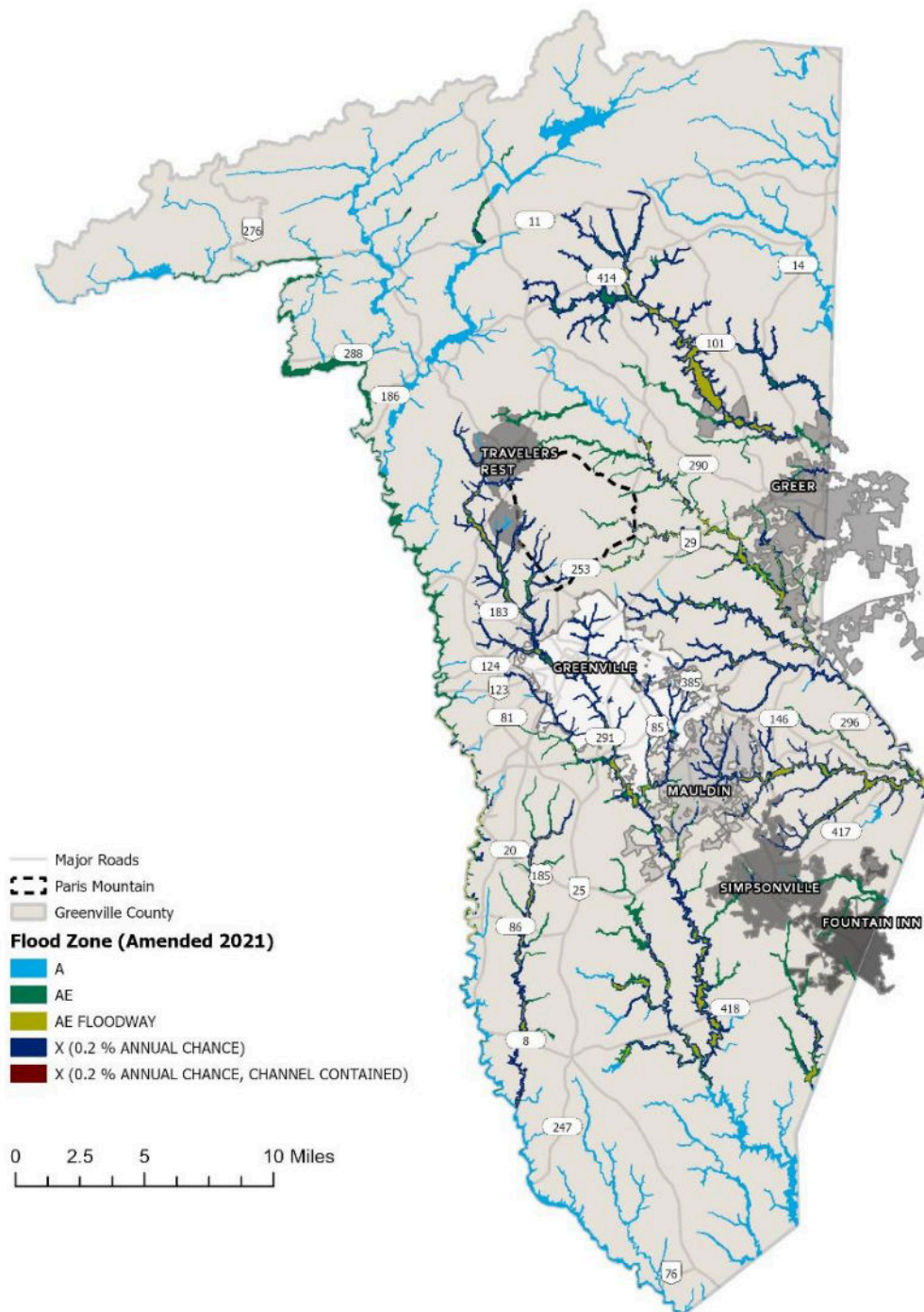


Figure 4. FEMA Flood Hazard Zones

FEMA's National Risk Index also computes a risk index score to determine a community's potential for negative impacts as a result of a natural hazard. More information about FEMA's National Risk Index and how it is calculated can be found in Section 7.5.1 below. Figure 5 below is the flood risk rating by census tract as determined by FEMA's Nation Flood Risk Index. The areas of higher risk correspond with FEMA's flood hazard zones throughout the County.

While flooding can have significant impacts on infrastructure including roads and buildings, it can also create problems for public health. Buildings affected by flooding become susceptible to mold which could lead to health effects such as stuffy nose, irritated eyes, wheezing, and skin irritation. Mold infections may develop in the lungs of people with weakened immune systems. Buildings without air conditioners or those that lose power during a storm are especially susceptible to mold growth; air conditioners work to remove moisture from the air, and the humidity creates an environment that fosters the growth of mold.

Additionally, according to the Centers for Disease Control and Prevention (CDC), exposure to floodwaters can pose a significant risk to health and safety. At any point, floodwater can contain:

- Downed power lines
- Human and livestock waste
- Household, medical, and industrial hazardous waste (chemical, biological, and radiological)
- Coal ash waste that can contain carcinogenic compounds such as arsenic, chromium, and mercury
- Other contaminants that can lead to illness
- Physical objects such as lumber, vehicles, and debris
- Wild or stray animals such as rodents and snakes

Exposure to contaminated floodwater can cause:

- Wound infections
- Skin rash
- Gastrointestinal illness
- Tetanus
- Leptospirosis (not common)

Greenville County Risk Index Rating: Floods

Risk Index Rating for Riverine Floods by Census Tract

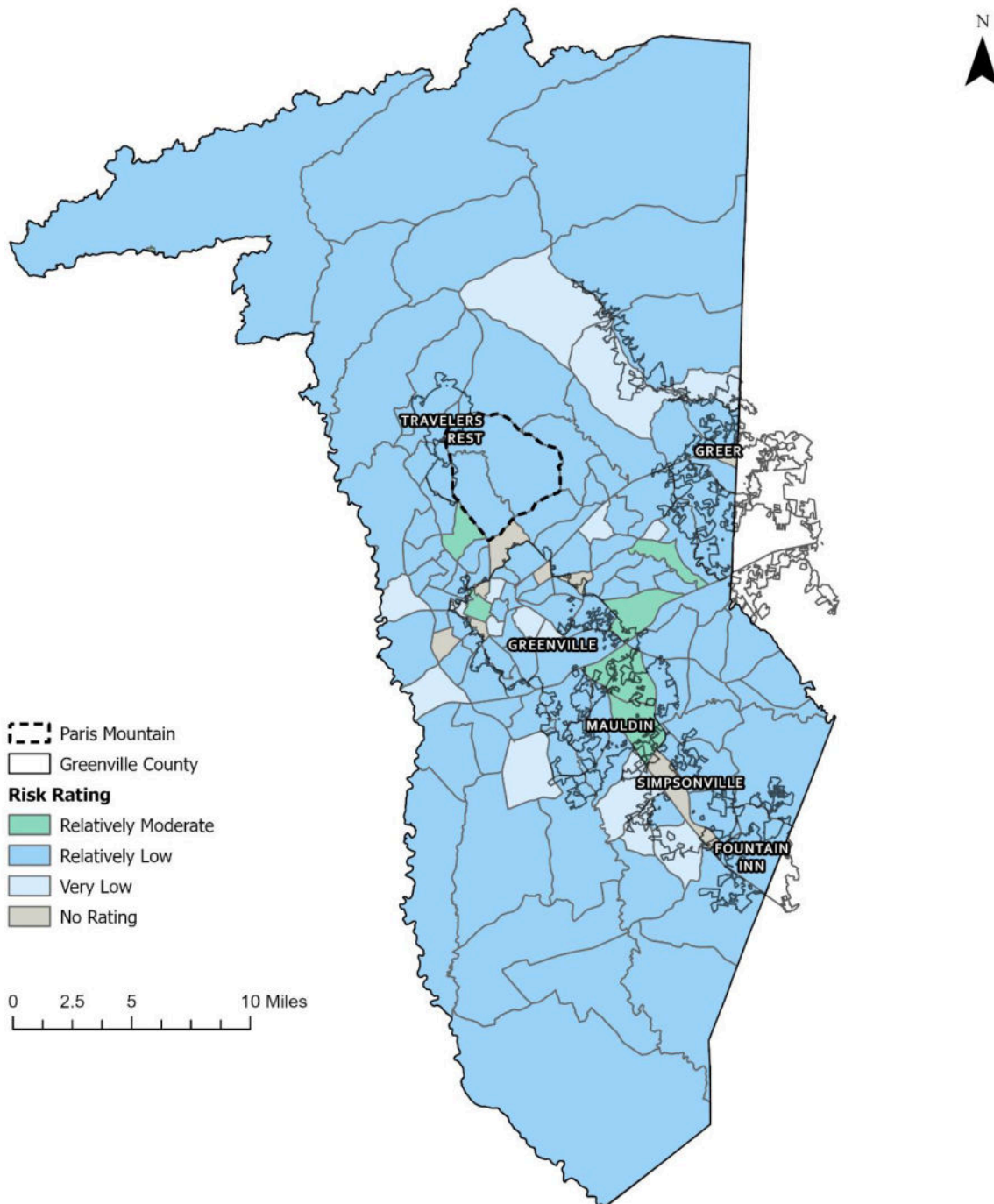


Figure 5. FEMA National Risk Index – Flooding Risk Rating

Natural Floodplain Functions

Being located in the foothills of the Blue Ridge Mountains, Greenville County is rich in natural resources. As noted above, the County is headwaters for the Reedy, Enoree, and Saluda Rivers and much of the County is still undeveloped. These rivers and their associated tributaries are not just valuable resources to Greenville County but also supply recreation and water supply to other communities downstream. The County recognizes that protecting the natural benefits of floodplains is critical to maintaining quality of life in Greenville and understands its responsibility to be “good neighbors” to downstream communities. The County has multiple efforts across a variety of departments and divisions to protect these resources.

In addition to a flood damage prevention ordinance that goes beyond the minimum standards for the NFIP, the County has implemented a robust land development ordinance and buffer ordinance with the intent of preserving crucial riparian areas to benefit both water quality and flood reduction.

According to Plan Greenville County, Comprehensive Plan dated October 2019 and approved January 2020:

“Floodplains provide critical habitat, protect the integrity and quality of our lakes and streams, and help distribute fertile soils. Many native trees are at home in floodplains, including box elder, honey locust, and pecan trees.”

To provide additional support for the natural and beneficial functions of floodplains, “Plan Greenville County” includes the following objectives.

- “Promote sustainable, low impact development practices including, but not limited to, stormwater management, green infrastructure, maintenance of vegetative cover, stream buffers, purchase of development rights, and conservation set-asides in development plans and the zoning code.”
- “Make floodplains a part of a tree and habitat protection plan.”
- “Require stream buffers sufficient to protect water quality, streambank integrity, and wildlife habitat.”

As additional evidence of the County’s efforts to protect natural floodplain areas, the County has an extensive network of preserved lands including protected open space, parks, wetlands, floodplains and floodways, and agricultural lands. A map depicting these areas can be found in the Plan Greenville County document at the following web address:

<https://www.greenvillecounty.org/LongRangePlanning/pdf/GREENVILLECOUNTY2019COMPREHENSIVEPLAN.pdf>

Water Quality/Quantity Monitoring Network

As part of the effort to mitigate flooding and protect water quality and as noted in the Data Collection Section (Section 6.1) of this report, the County maintains an extensive network of rainfall, stage, and flow monitoring systems. Subsets of this data can be found in

Figure 6 and Table 10 and Table 11 below. This data is evaluated and summarized each year in the “Greenville County Continuous Watershed Monitoring Report. In addition to the Watershed Monitoring Report’s intended purpose, it is also useful for analyzing rainfall and flow distribution across the County.

Data from the 2025 Watershed Monitoring Report includes:

- The average rainfall recorded at the County’s 21 rain gauges during Year 3 (2023 – 2024 reporting period) was 53.1 inches, which is slightly above the 50.7-inch calculated average reported by the National Oceanic and Atmospheric Administration (NOAA) from 1991- 2020 and significantly lower than the 61.9-inch average last year.
- Rain gauges in the Saluda River Basin averaged significantly more rain than the gauges in other basins.

- The maximum stage elevation reached for all monitored sites occurred on either January 9th or 10th, 2024. The rain event producing these elevations had a maximum estimated recurrence interval of 5- to 10-year across all watersheds. The storm that led to a 100-year flood event but only registered a 5- to 10-year rainfall event, occurred during January when soil in the County was approximately 90% saturated.

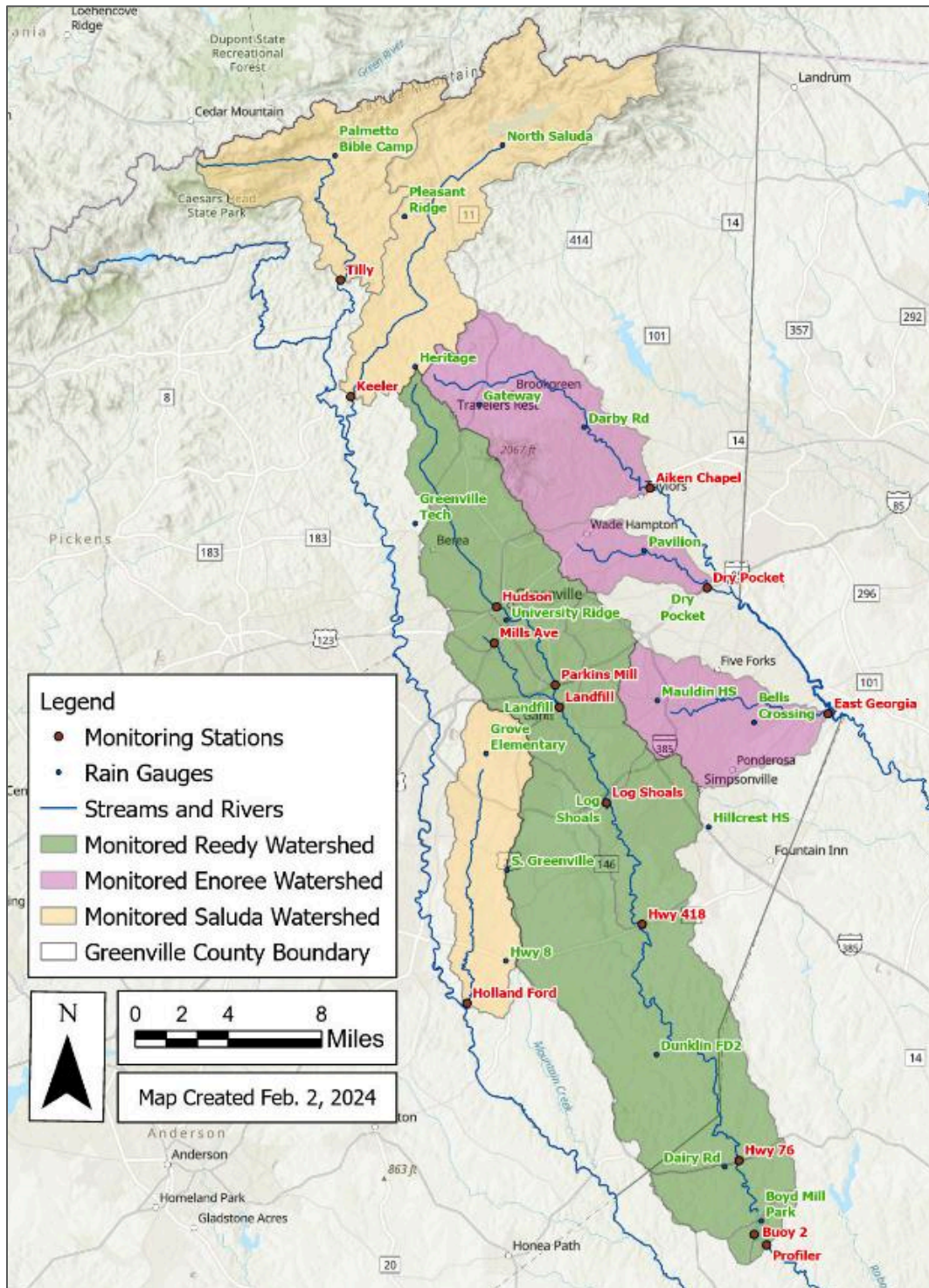


Figure 6. Greenville County Monitoring Network Coverage

Table 10. Summary of Maximum Water Surface Elevations, Associated Rainfall Depths, and Approximate Recurrence Intervals

Site	100-year flood Stage	Maximum Level Reached in Year 2	Date Reached	Rainfall Depth	Estimated Recurrence Interval
	(ft)	(ft)		(in)	(year)
Hudson	926.5	922.5	1/4/2023	3.72	2.5
Parkins	821	817.4	1/4/2023	3.72	2-5
Landfill	813	813.1	1/4/2023	3.72	2-5
Log Shoals	735	731.9	1/4/2023	3.72	2-5
Hwy 418	682	671.8	4/28/2023	5.06	2-5
Hwy 76	558.2	556.5	4/29/2023	5.06	2-5
Mills Ave	891.8	890.5	6/12/2023	3.79	10-25
Aiken Chapel	847.5	843.9	1/4/2023	3.72	2-5
Dry Pocket	806	793.7	4/28/2023	5.06	2-5
East Georgia	677	677.4	4/28/2023	5.06	2-5
Tilly	979	973.2	12/15/2022	2.69	<1
Keeler	921.5	911.5	12/15/2022	2.69	<1
Holland Ford	650.5	649.8	4/28/2023	5.06	2-5

Table 11. Counts of Varying Size Storm Events

Rain Gauge	Largest Storm	>3"	2-3"	1-2"	0.5-1"	0.25-0.5"	0.1-0.25"	Total # Storms
Palmetto BC	5.72	3	4	18	13	19	20	77
North Saluda	4.94	2	5	9	17	25	19	77
Pleasant Ridge	5.01	2	3	18	20	14	26	83
Heritage	4.66	3	3	10	11	25	20	72
Gateway	4.51	2	1	15	15	21	21	75
Darby Rd	4.42	2	3	10	16	19	21	71
Greenville Tech	4.15	2	2	9	14	23	25	75
Pavilion	4.51	2	1	10	14	20	27	74
Dry Pocket	4.66	2	4	10	14	19	25	74
University Ridge	4.43	2	2	9	17	16	27	73
Mauldin HS	4.57	1	3	10	17	18	19	68
Landfill	4.74	1	3	12	18	22	17	73
Bells Crossing	4.38	2	2	12	23	14	19	72
Grove Elementary	4.65	2	3	10	20	13	27	75
Log Shoals	4.76	1	3	15	17	14	16	66

Hillcrest	4.07	1	2	12	23	13	17	68
South Greenville	4.44	1	3	12	23	11	18	68
Hwy 8	4.38	1	4	9	16	11	18	59
Dunklin FD2	3.99	2	2	14	12	18	13	61
Dairy Rd	3.86	2	2	12	16	13	19	64
Boyd Mill Park	3.52	1	4	11	16	17	15	64

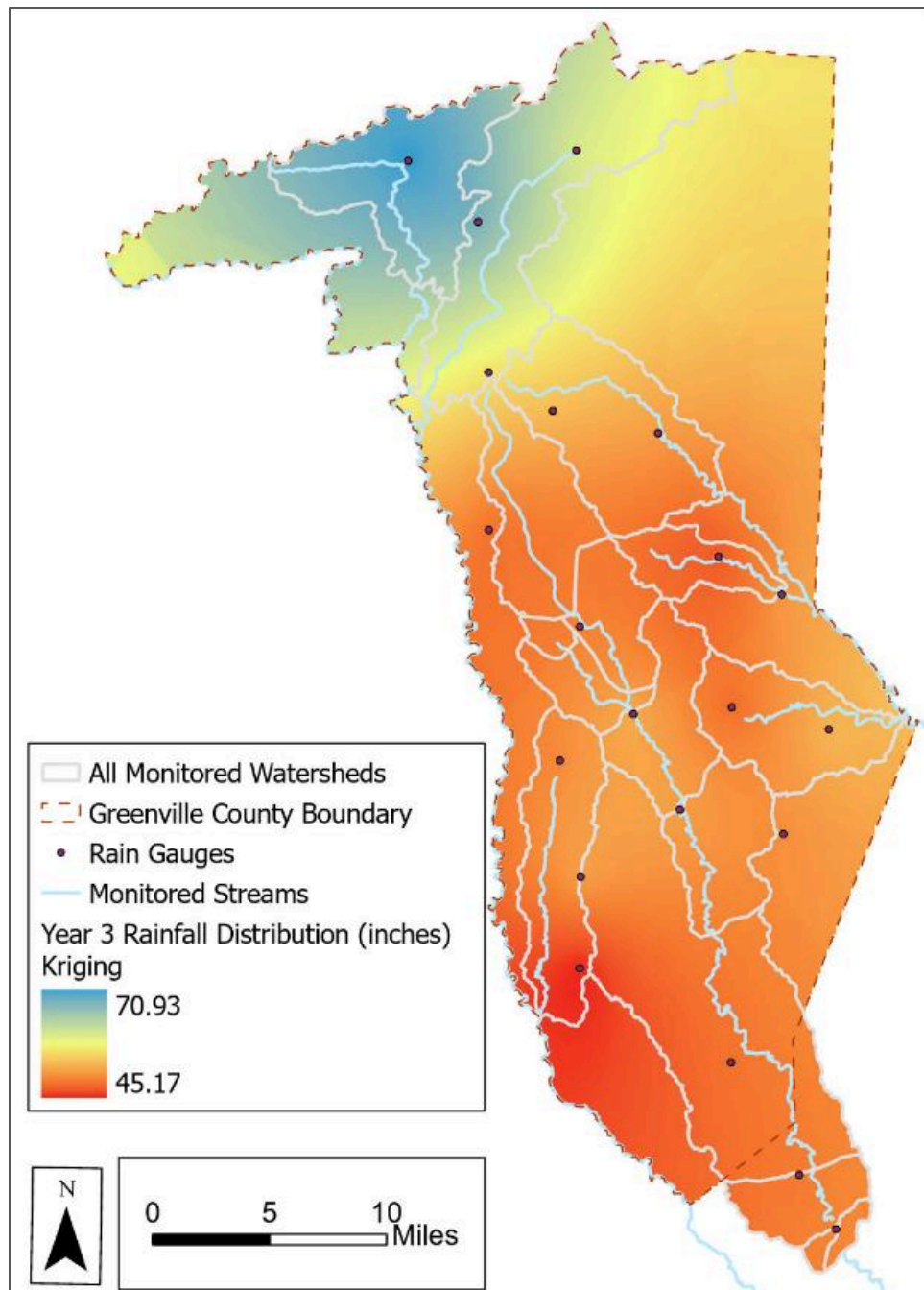


Figure 7. Greenville County Rainfall Distribution

7.1.2 Winter Storms

Greenville County experiences winter storms during the winter months, generally between November and February. Winter storms are commonly associated with precipitation in the form of ice or sleet and cold temperatures that cause major disruptions to many types of services such as water, power, and emergency assistance. Roads covered in ice or blocked by fallen trees prevent emergency services from reaching those in need. Overhead lines are commonly torn down by fallen trees or the weight of ice on the lines, and the weight of ice or snow on building roofs can cause them to collapse. Service disruptions can impact many people and are especially dangerous to vulnerable populations (e.g., poor, elderly, infirmed). Typically, as temperatures drop, house fires also increase. Winter storms can take several forms such as snow, sleet, and freezing rain; these variations are summarized in Table 12 below. This information was obtained from the National Severe Storms Laboratory at NOAA. Greenville County experiences snow, but ice storms are more common and have the potential to cause more safety risks and property damage.

Table 12. Winter Storm Types

Type	Description
Snow Flurries	Light snow falls for a short period of time. There is no accumulation or light dusting from a snow flurry.
Snow Showers	Snow falls for short durations at varying intensities. Some accumulation of snow is possible during a snow shower.
Snow Squalls	Short, intense snow showers that are joined with strong winds. Significant accumulation is possible during a snow squall.
Blowing Snow	Snow that is blown by the wind and reduces visibility. This may not be snow that is falling; it could already be on the ground and picked up by the wind.
Blizzards	Blizzards are snowstorms that have wind speeds over 35 mph and reduce visibility to 1/4 mile or less for a minimum of 3 hours. Blizzards could include blowing snow.
Sleet	Snow falls through a thin layer of warm air that partially melts the snow. The partially melted drops then pass through a thick layer of cold air and refreeze before hitting the ground.
Freezing Rain	Snow falls through a thick layer of warm air that fully melts the snow. The fully melted drops then pass through a thin layer of cold air and freeze when they come in contact with anything at or below 32°F. This can cause layers of ice to form on roads, trees, power lines, and other objects.
Ice Storms	Freezing rain that lasts several hours and creates a significant accumulation.

As depicted in the figures below, record mean annual snowfall ranges from 2-inches in the southern portion of the County to 7-inches in the upper elevations of the Blue Ridge Mountains. As with record mean snowfall depths, the probability of snowfall increases significantly from the southern portions (50%) of the County to the northern portions (90%).

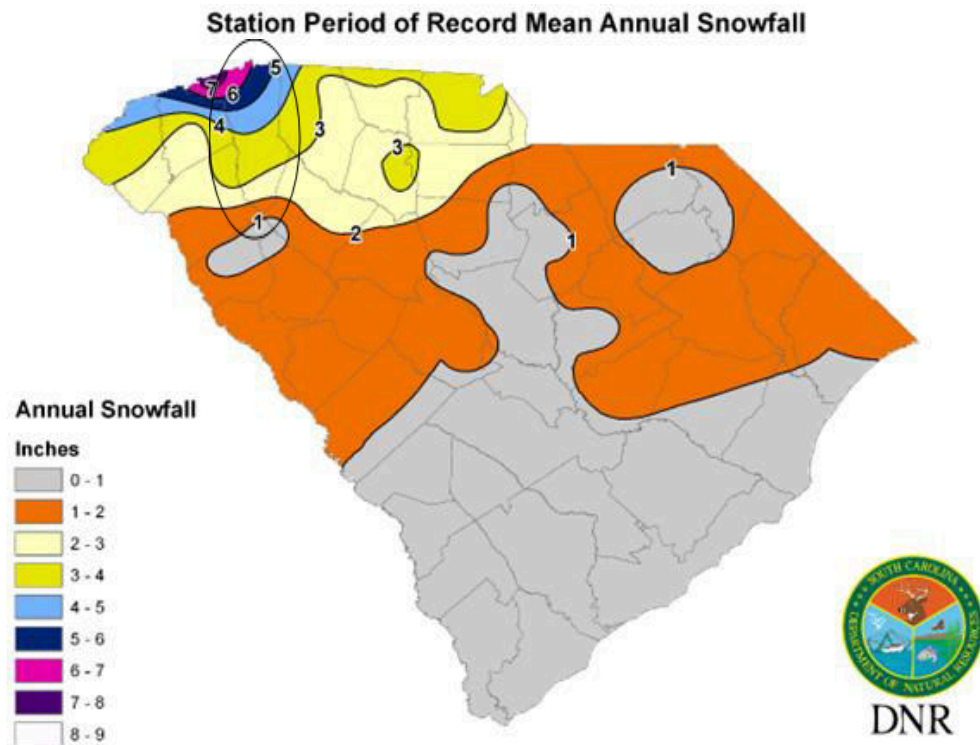


Figure 8. Record Mean Annual Snowfall (SCDNR)

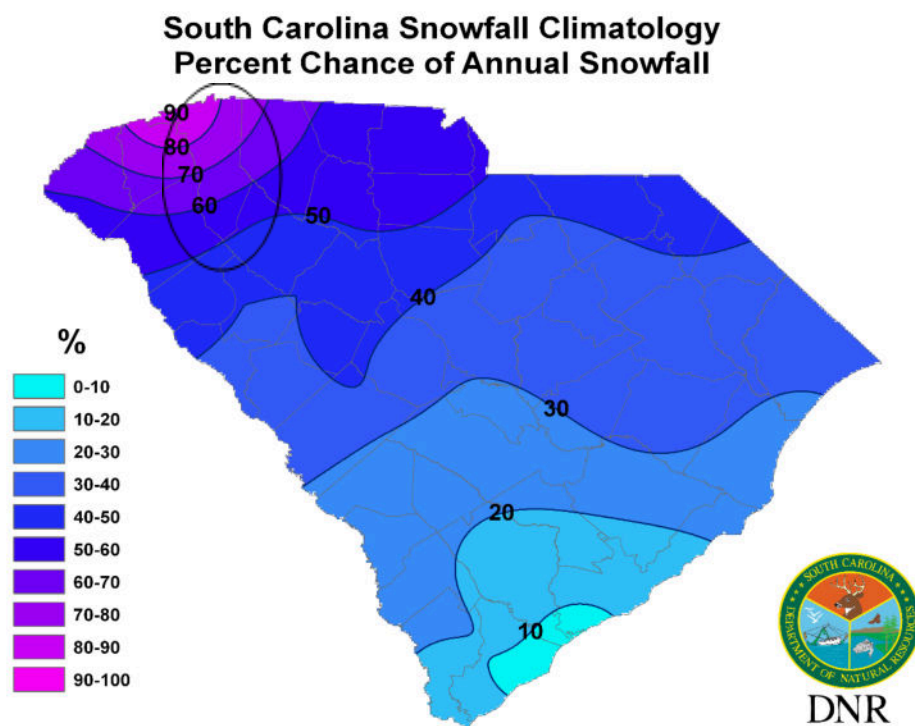


Figure 9. Percent Chance of Annual Snowfall (SCDNR)

Winter weather accounts for some of the highest monetary losses as well as deaths each year in Greenville County. The most notable winter storm during the planning period was on January 16, 2022. Greenville saw snowfall accumulation of 6.5" at the GSP airport which broke the previous record of 5.7" set back in 1965. Along with record snowfall, the storm brought high wind gusts in the 50-mph range and sleet/freezing rain making for dangerous conditions. This storm left several motorists stranded and more than 30,000 people across the upstate without power. Even so, the FEMA Risk Index Rating for Winter Weather suggests a low-risk rating for the County in comparison to other parts of the United States. However, ice storms indicate a very high risk for Greenville County which can be seen in Figure 11 below.

Greenville County Risk Index Rating: Winter Weather

Risk Index Rating for Winter Weather by Census Tract

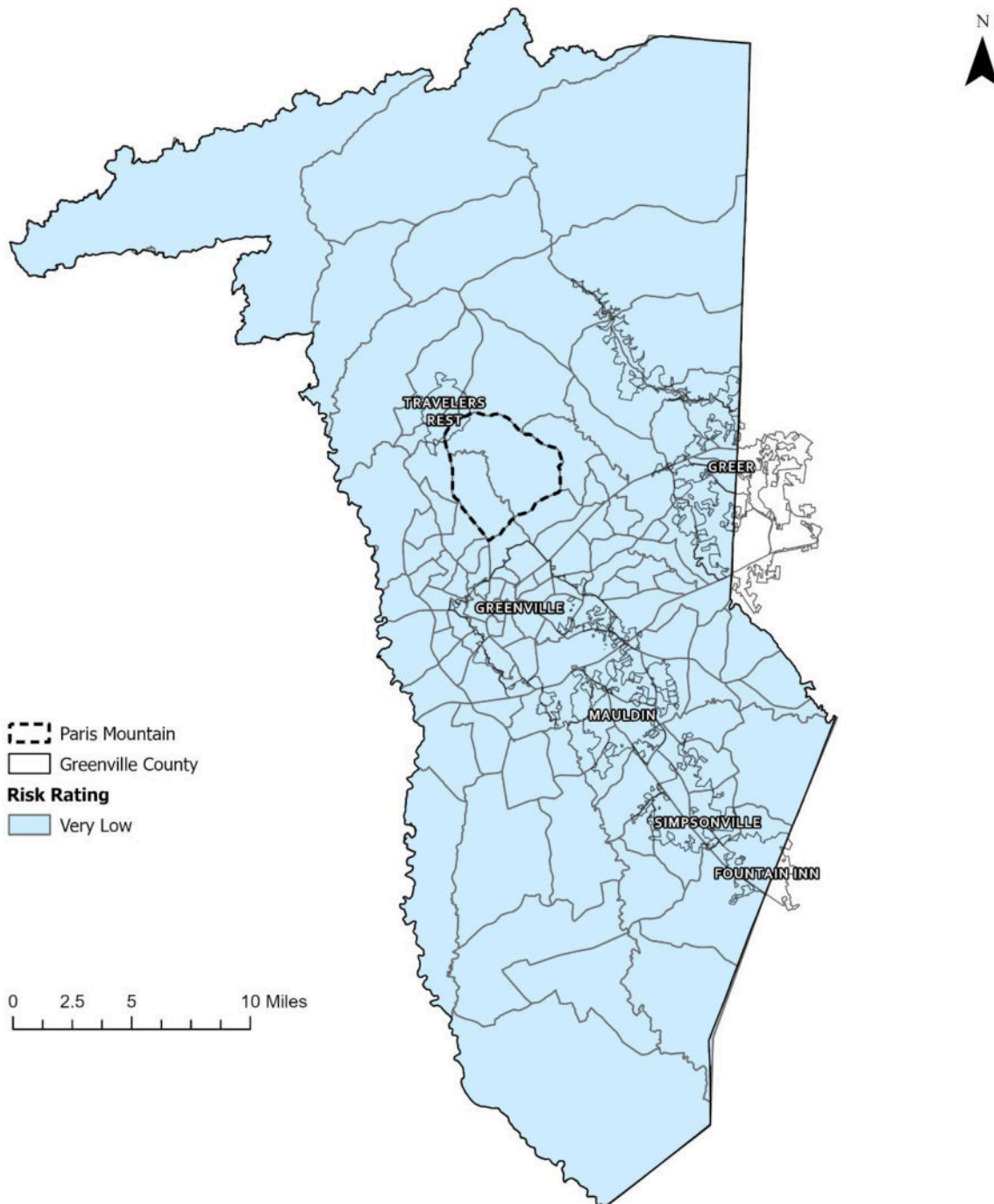


Figure 10. FEMA National Risk Index - Winter Weather Risk Rating

Greenville County Risk Index Rating: Ice Storms

Risk Index Rating for Ice Storms by Census Tract

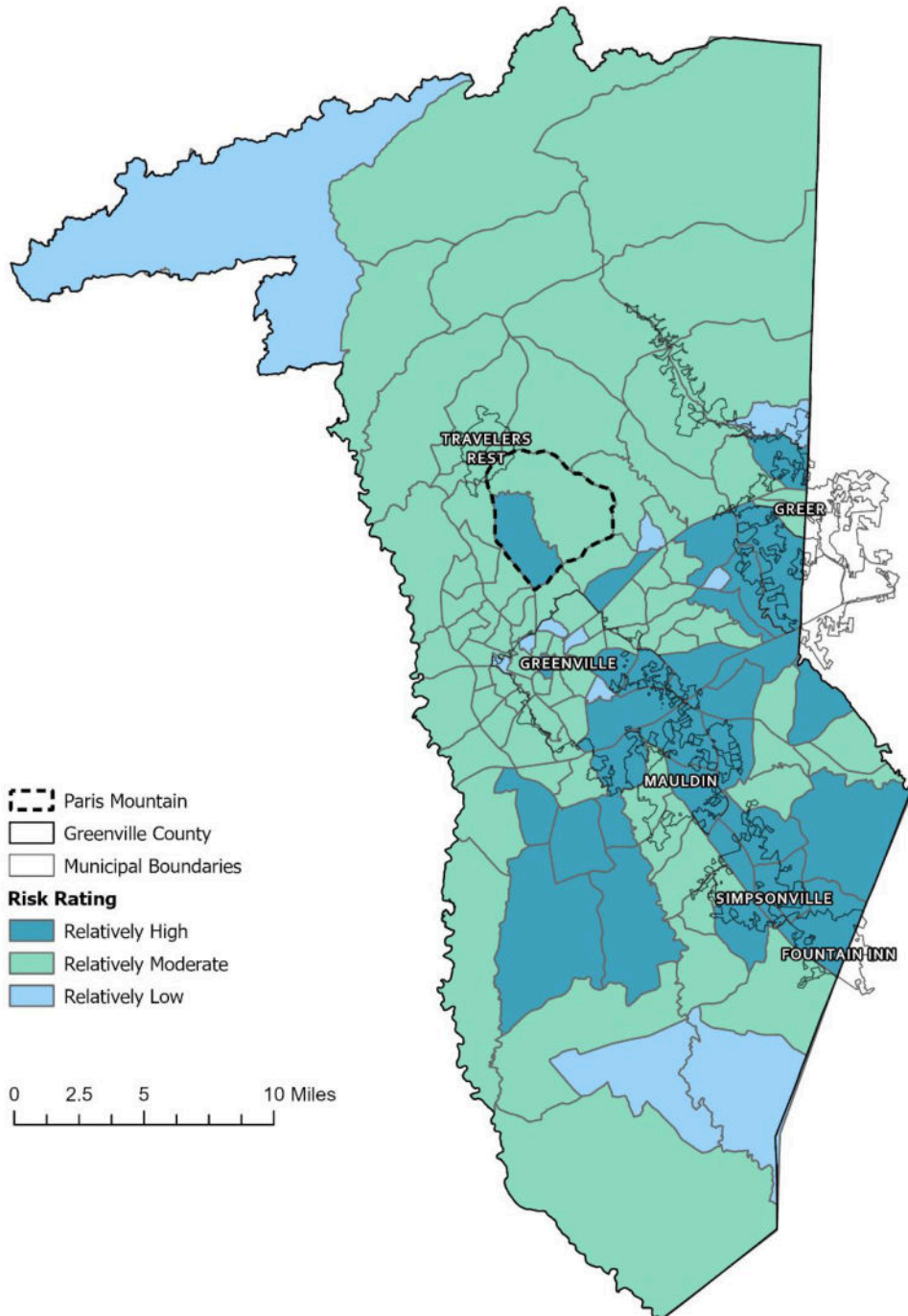


Figure 11. FEMA National Risk Index – Ice Storm Risk Rating

7.1.3 High Winds / Tornadoes

High winds in Greenville County are generally associated with severe thunderstorms and tornadoes and are often formed as part of larger thunderstorm systems or spin-offs from hurricanes. High winds may occur in all regions of the County and at any time of the year, but tornadoes are more prevalent from March through June.

Like winter storms, high winds and tornadoes can result in downed trees which may lead to damaged homes and electricity lines as well as blocked roads. Mobile and manufactured homes are more vulnerable to this type of weather. Tornado magnitude is measured on the Enhanced Fujita Scale (Table 13), and it ranges from EF0 to EF5, with EF0 being the weakest tornado on the scale.

Table 13. Enhanced Fujita Scale

Enhanced Fujita Scale (EF-Scale)	
EF0	65 to 85 MPH
EF1	86 to 110 MPH
EF2	111 to 135 MPH
EF3	136 to 165 MPH
EF4	166 to 200 MPH
EF5	201+ MPH

Figure 12 below shows the paths of historical tornado events in Greenville County from 1950-2022. Figure 13 provides information on recent tornado events occurring from 2016-2022, which includes two EF2 Tornado events in 2020 which caused major damage and some injuries.

Table 14. Historical Tornado Events (2016-2022)

Date	Time	Magnitude	Est. Property Loss	Length (miles)	Width (miles)
11/30/2016	15:41	EF1	\$500K	16.44	0.09
10/8/2017	15:37	EF1	\$50K	1.38	0.11
4/3/2017	12:13	EF0	\$50K	2.84	0.03
4/14/2019	18:51	EF1	Unknown	1.63	0.11
4/14/2019	20:03	EF1	< \$505K	6.9	0.06
4/13/2020	2:01	EF0	\$20K	0.68	0.02
4/25/2020	19:10	EF2	\$500K	5.47	0.23
4/13/2020	1:41	EF2	\$500 - \$500K	7.97	0.11
8/17/2021	12:53	EF1	< \$500K	2.4	0.04

Greenville County Historical Tornado Events (1950-2022)

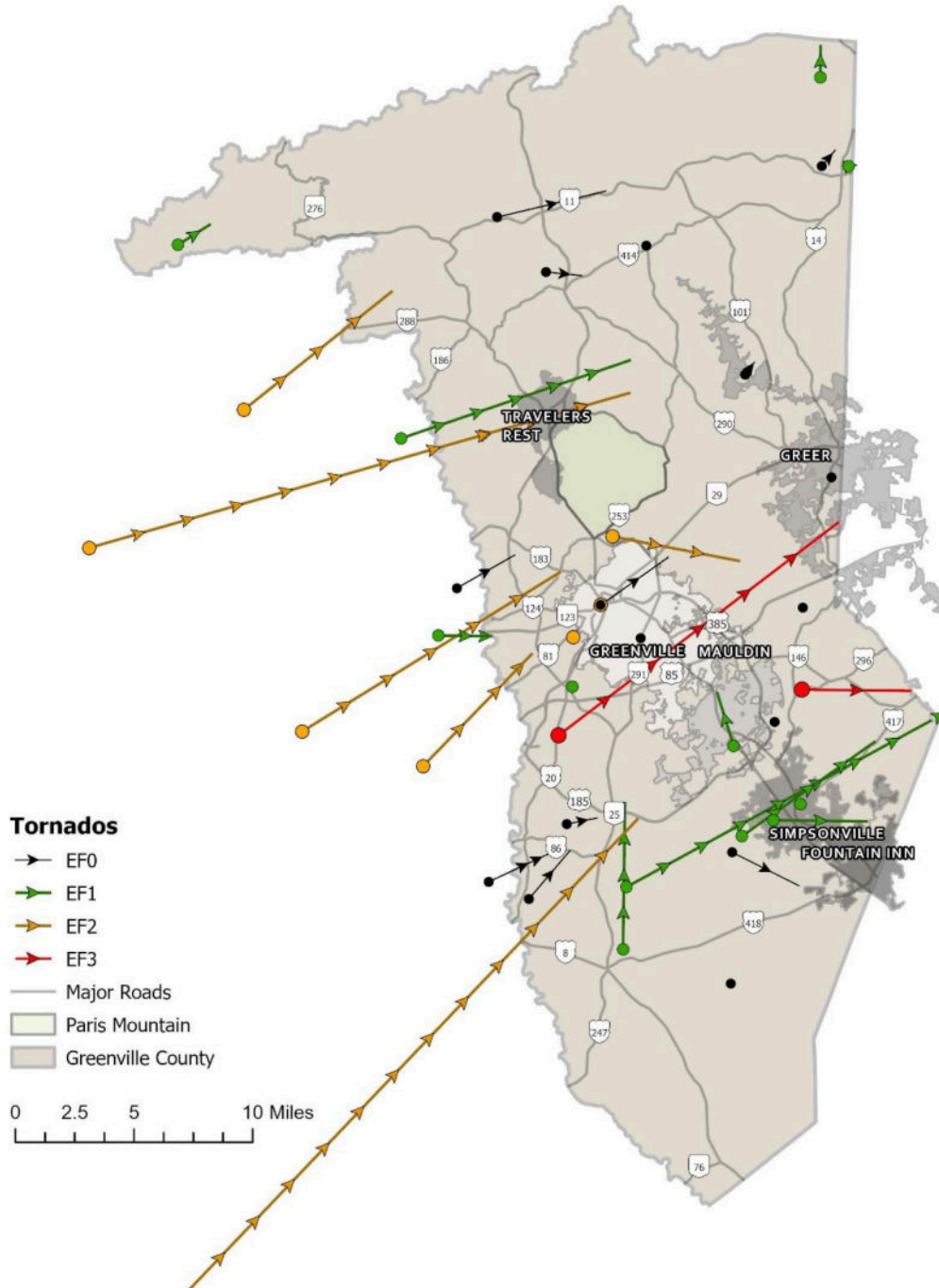


Figure 12. Historical Tornado Events (1950-2022)

Greenville County Historical Tornado Events (2016-2022)

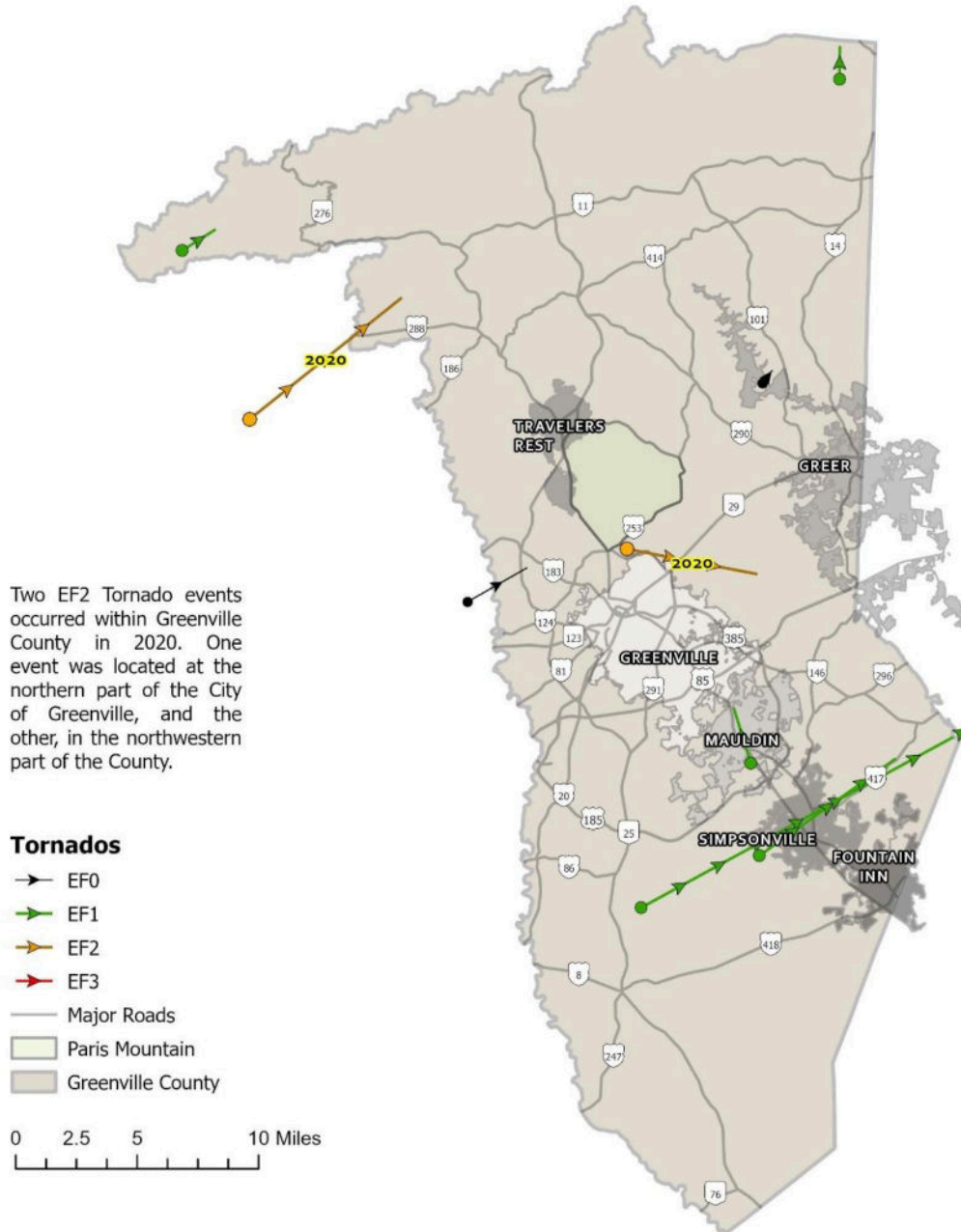


Figure 13. Historical Tornado Events (2016-2022)

Greenville County Risk Index Rating: Tornadoes

Risk Index Rating for Tornadoes by Census Tract

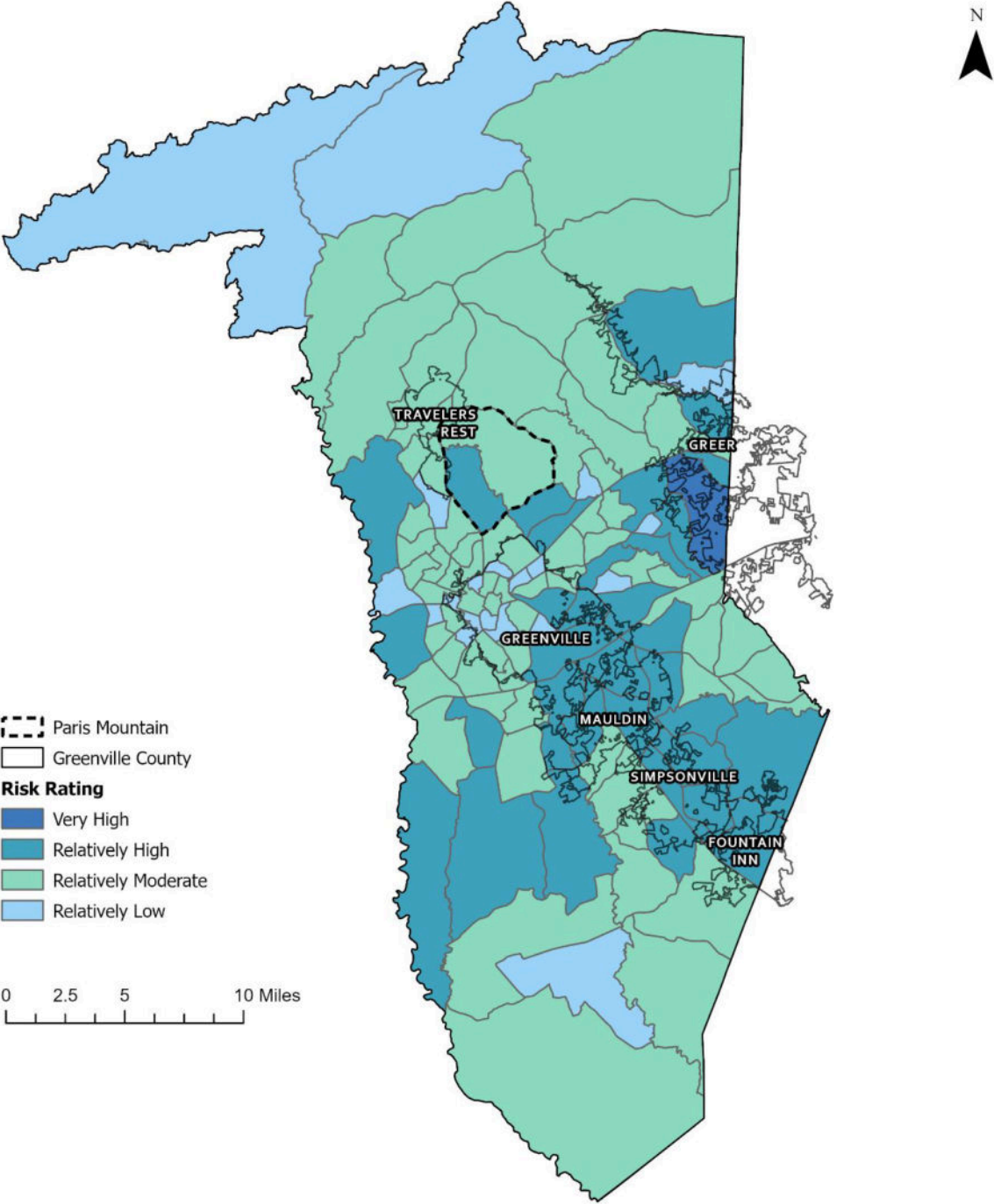


Figure 14. FEMA National Risk Index - Tornado Risk Rating

FEMA's National Risk Index rating for tornados (Figure 14) indicates that Greenville County has moderate to high risk for tornado events. While tornadoes in Greenville County are usually weaker than tornadoes in other areas, strong winds and large hail can cause extensive damage.

Figure 15 below illustrates historical damaging wind events in Greenville County (NWS data). The next figure, Figure 16 depicts wind events during the current planning period (2016 – 2022). In 2021, a wind event, upwards of 60 knots, occurred in the central portion of the County, within the City of Greenville. FEMA's National Risk Index rating for wind (Figure 17) indicates that Greenville County has moderate to high risk for wind events.

Greenville County Historical Wind Events (1955-2022)

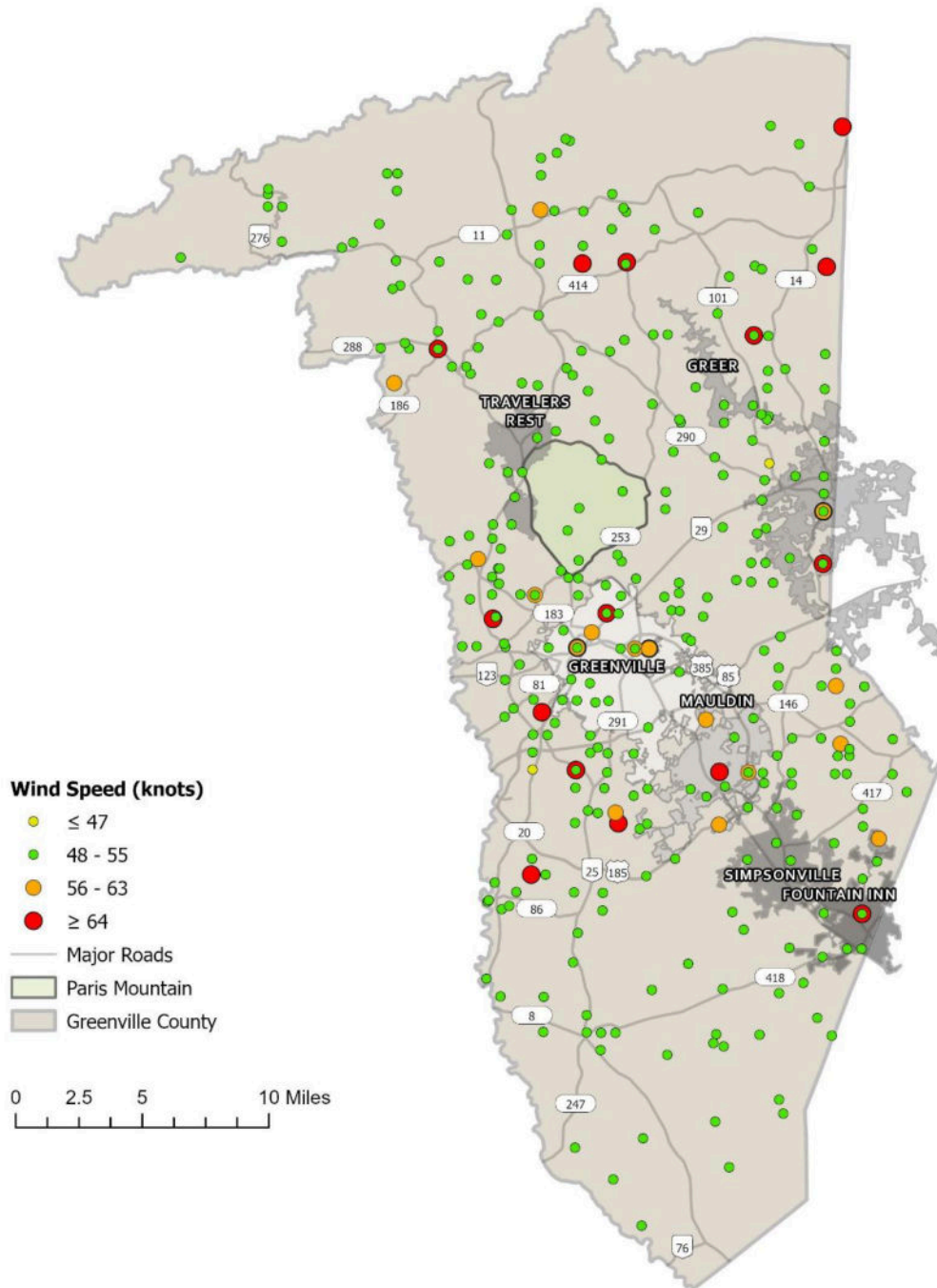


Figure 15. Historical Wind Events (1955-2022)

Greenville County Historical Wind Events (2016-2022)

July 2024

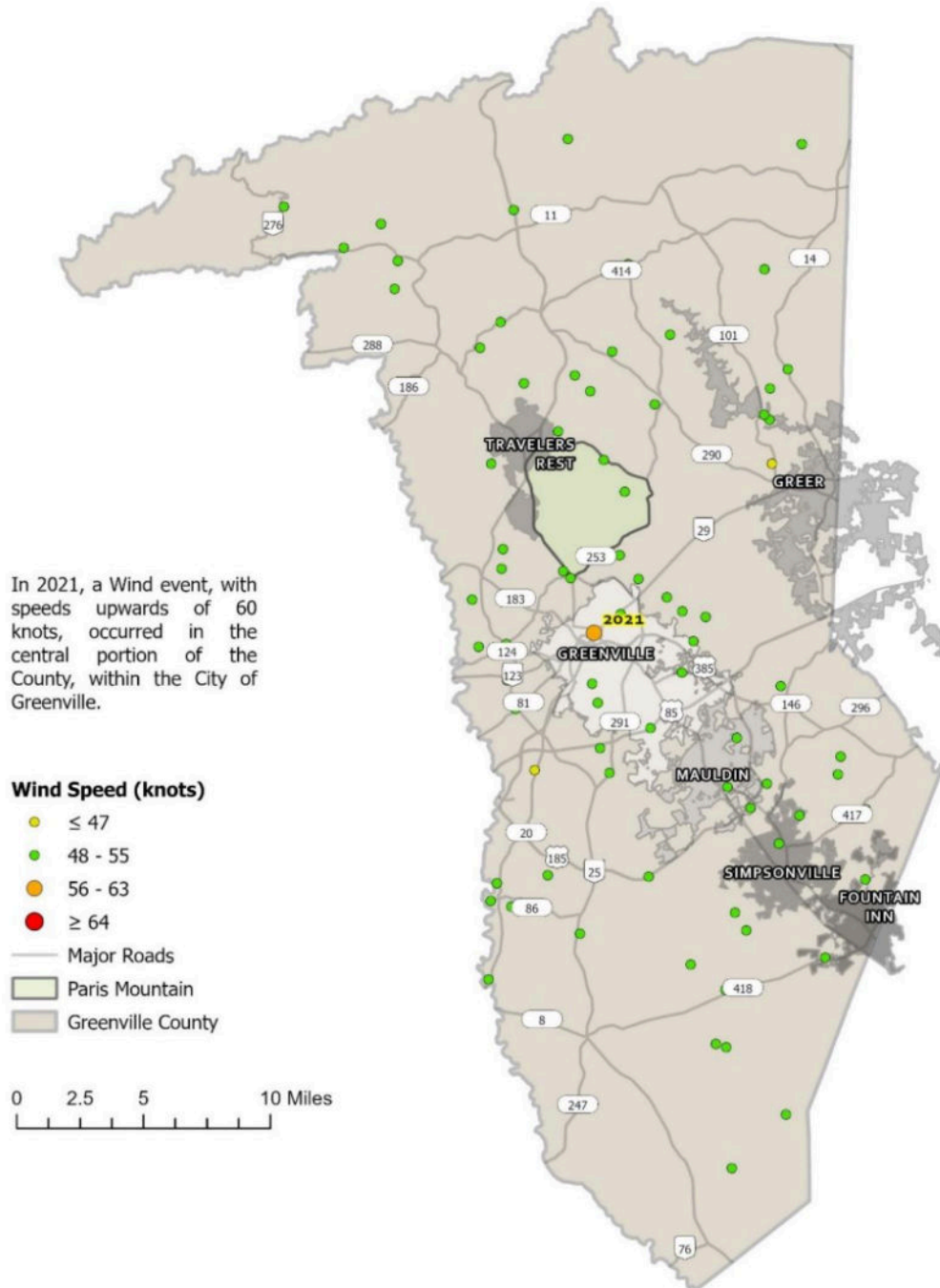


Figure 16. Historical Wind Events (2016-2022)

Greenville County Risk Index Rating: Winds

Risk Index Rating for Strong Winds by Census Tract

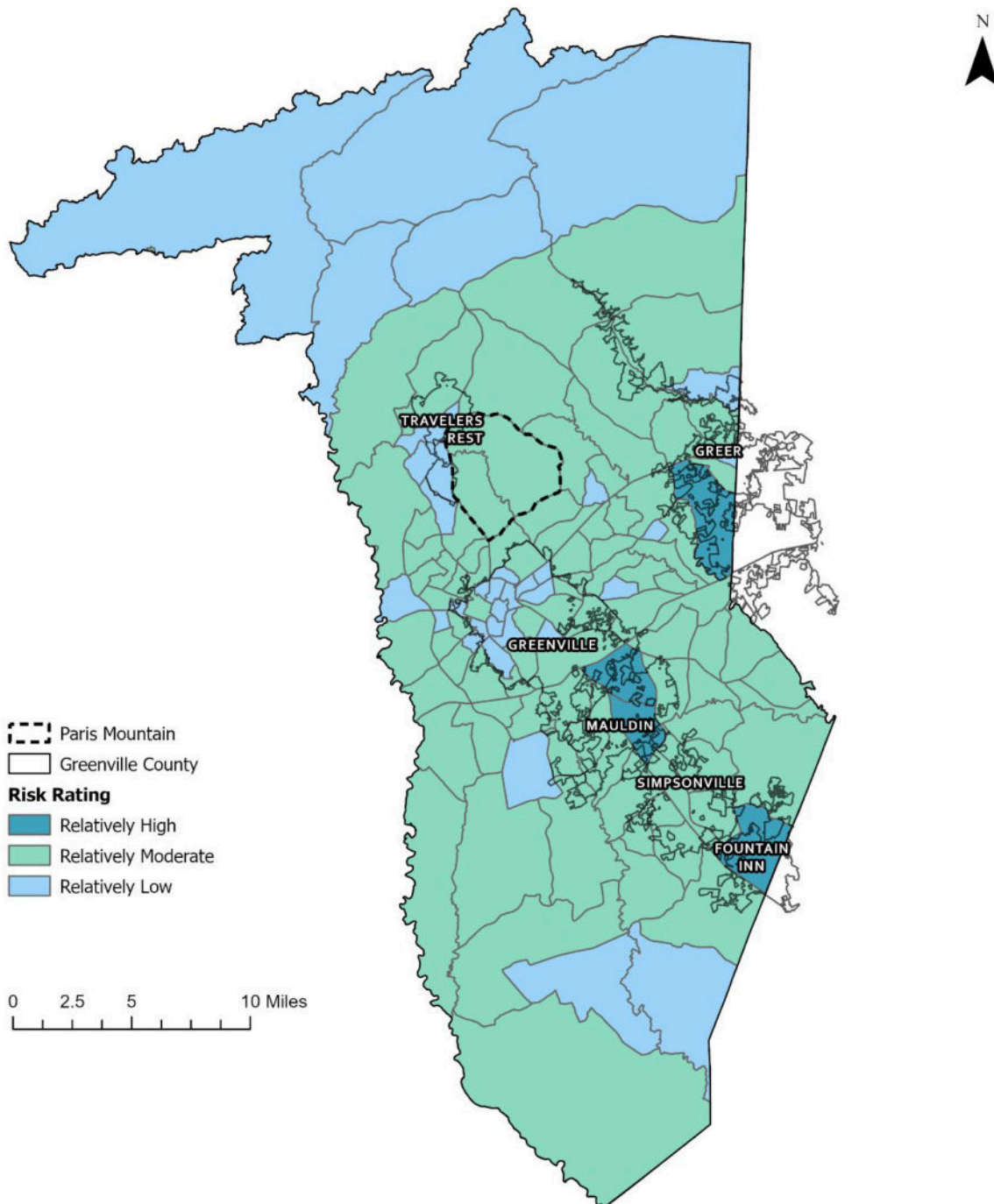


Figure 17. FEMA National Risk Index - Wind Risk Rating

7.1.4 Wildfires

Wildfire can be an extremely hazardous event, especially in the wildland urban interface where homes and businesses are mixed with forested areas. Wildfires are commonly more frequent during drought periods but can occur any time during the given year. Historically, Greenville County has not been impacted significantly by major wildfires. The 2016 Pinnacle Mountain wildfire in adjacent Pickens County, however, highlighted the potential for such an event occurring in Greenville County.

Wildfires are generally categorized into 4 common categories: Wildland, Interface, Intermix, and Prescribed.

1. **Wildland:** The wildland is an area where development is essentially non-existent except for transportation ways and the occasional structure. A wildland fire is defined as any non-structure fire that occurs in vegetation or natural fuels.
2. **Interface:** The wildland urban interface is an area where man-made structures are in or adjacent to areas prone to wildfire.
3. **Intermix:** The wildland urban intermix is where multiple single or clustered man-made structures are scattered in a wildland area. These areas are often difficult to access and surrounded by highly flammable unmanaged vegetation.
4. **Prescribed:** A prescribed fire or controlled burn is the application of fire by a team of fire experts under specified weather conditions to help meet a management objective.

There are also three basic types of wildfires with distinct characteristics. These can act individually or in conjunction with each other creating complex firefighting challenges. Figure 18 below illustrates the three types of wildfires.

1. **Ground:** Ground fires occur in areas where there is deep accumulation of highly burnable peat, humus, and several layers of dead vegetation that have become dry enough to burn. These fires can move extremely slowly but are very difficult to detect and control as they can burn under the surface for several months given the right conditions. Ground fires pose a risk to firefighting safety as well as increase the chance of re-ignition several days to several months after the main fire event.
2. **Surface:** Depending on weather conditions, surface fires may only burn the immediate surface litter and move more slowly with less intensity. Typically, these fires are relatively easy to control and cause the least amount of damage. However, under proper weather conditions and with the right kind of fuel on the ground, surface fires can burn more intensely, move faster, and cause significant damage.
3. **Crown:** Crown fires burn independently of ground fires moving from treetop to treetop. These fires spread very quickly through a forest with high intensity. These fires are very difficult to control and can cause extensive damage.



Figure 18. Wildfire Types

There are many factors that can influence the behavior of wildfires, fuel, weather, and topography. Fuel is anything that can burn to make the wildfire bigger, however it is the only fire behavior component that can be manipulated to decrease the risk of wildfires. Weather conditions have the heaviest influence on the behavior of fire: relative humidity, wind, temperature, and firestorms. At low relative humidity levels, measure of water vapor in air, the more dangerous the influence over wildfires. Wind is one of the most important considerations when considering wildfires, as it provides a constant source of oxygen for the fire and can enlarge the damaged area very rapidly. Topography can impact wildfires as they can move uphill quickly, steep slopes increase the difficulty of controlling the fire and can pose a threat to firefighters being caught in the fire.

Figure 19 below depicts historical wildfire events within Greenville County, and Figure 20 shows wildfire events from 2016-2023. Per the SC Forestry Commission, wildfire classes can be categorized by burn area, as seen in Table 15. In 2009, a class E wildfire occurred in the northern portion of the County. The wildfire was classified as a campfire event, totaling 351 acres of affected area. The wildfire datapoints were provided by the SC Forestry Commission, and they are scaled according to Fire Size Class, with E being the most detrimental and A being the least. It appears that the most damaging fires have occurred near the North Carolina border, but wildfires can occur anywhere in the County.

Table 15. Wildfire Class Categories

Fire Size Class	Acreage
A	<0.3
B	0.3 – 9.9
C	10 - 99
D	100 - 299
E	300 - 999

The population in Greenville County is continuing to expand north and south of the central, urbanized band, and these new developments have the highest risk of being affected by wildfires. They can occur from natural or man-made causes such as lightning or campfire; SC Emergency Management has estimated that 80% of wildfires in South Carolina are caused by negligent human behavior, while only 2% are caused by lightning. Even though the County's National Risk Index for wildfires (Figure 21) is low in comparison to the western United States, it is important for the County to properly plan to mitigation wildfire risk.

NOTE (03/20/2026): Near the end of the planning process, wildfires located on Table Rock and Persimmon Ridge in Pickens and Greenville Counties burned approximately 15,000 acres. The fires started on March 21, 2025, due to human negligence and were declared contained by the South Carolina Forestry Commission on April 8, 2025. No homes were lost or injuries sustained, but Table Rock State Park did suffer major damage to its forests and trail system. This event reinforces the 2026 HMRP's recommendations to continue significant wildfire planning across the County.

Greenville County Historical Wildfire Events (1998-2023)

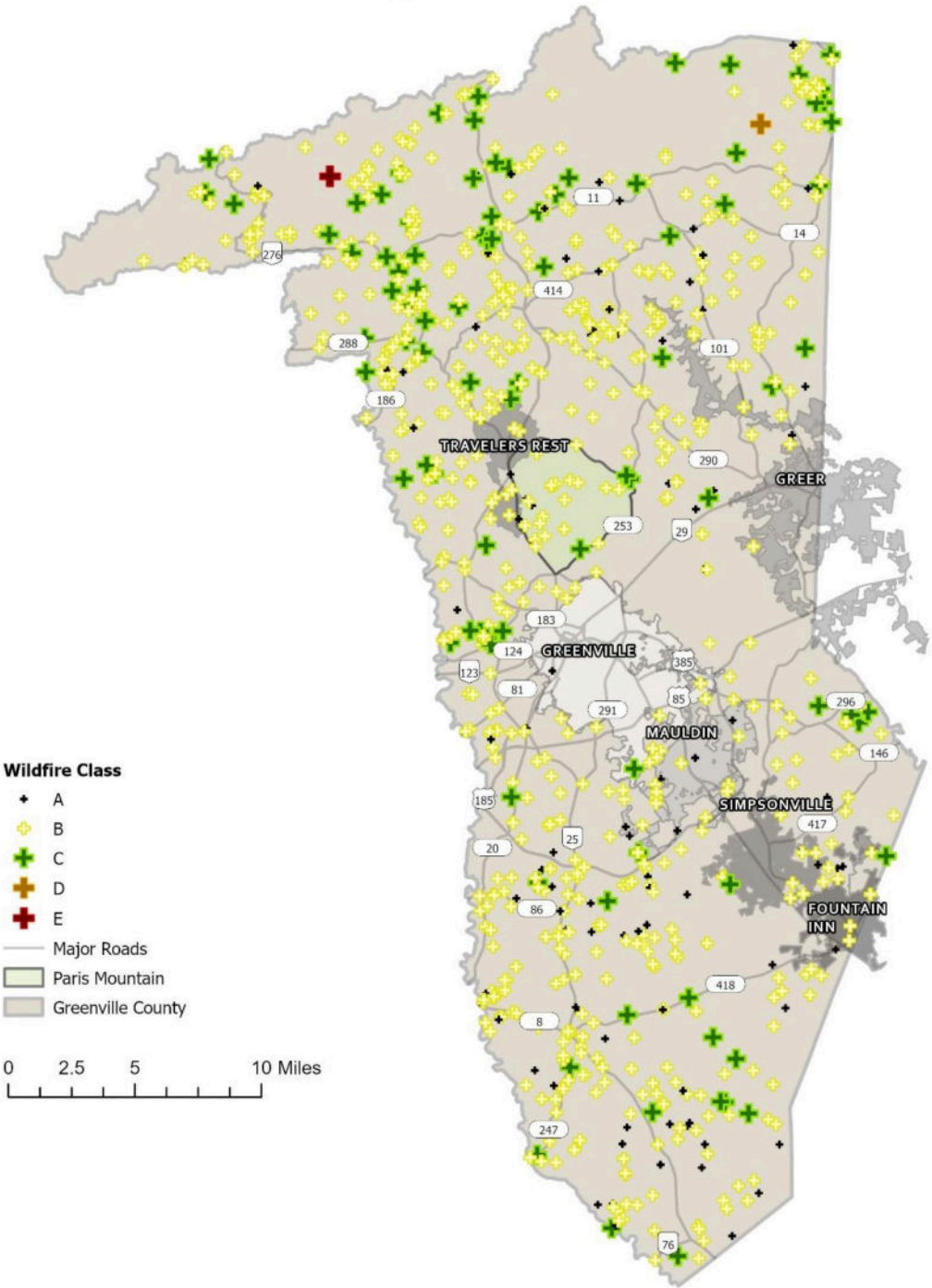


Figure 19. Historical Wildfire Events (1998-2023)

Greenville County Historical Wildfire Events (2016-2023)

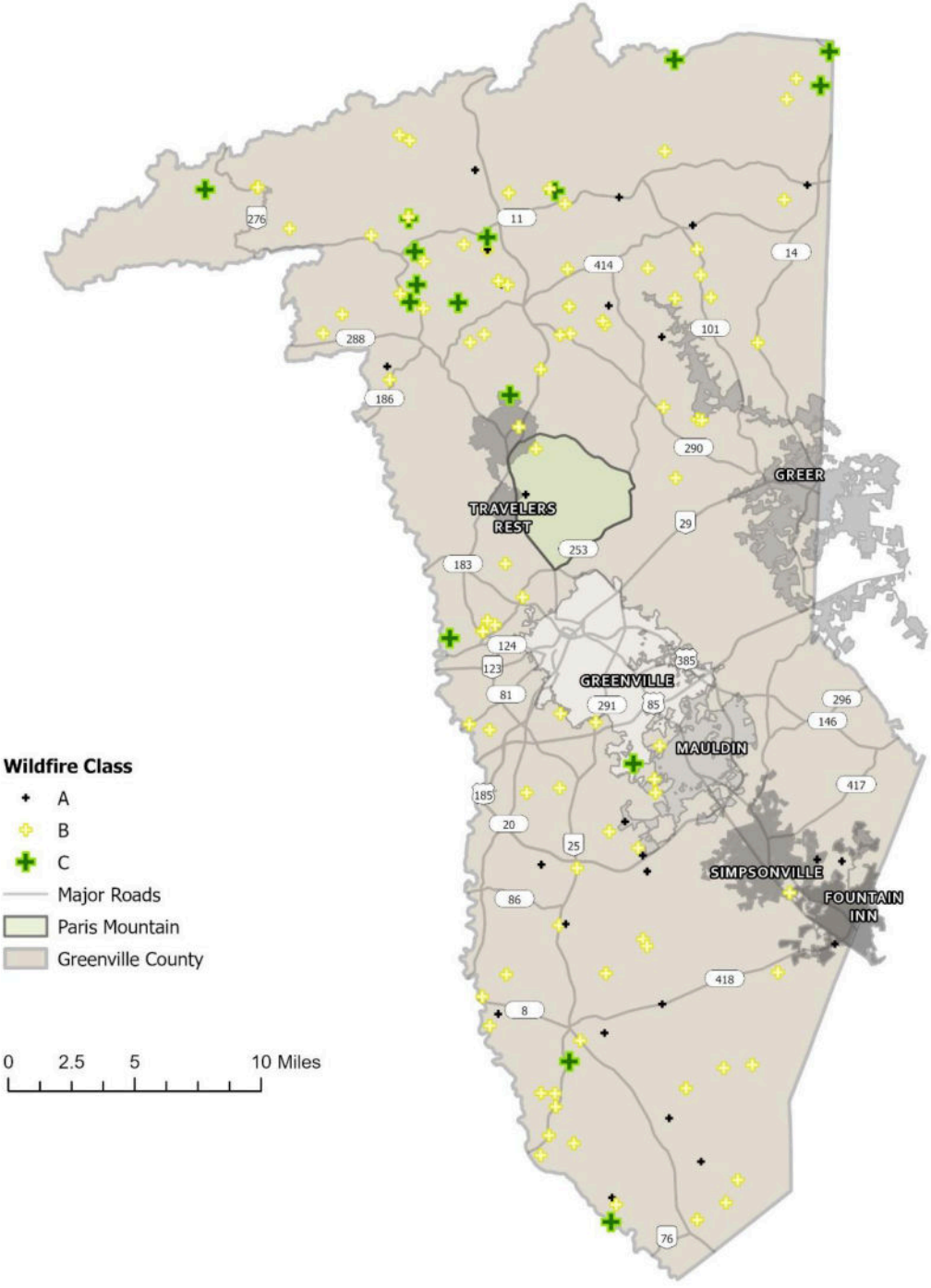


Figure 20. Historical Wildfire Events (2016-2023)

Greenville County Risk Index Rating: Wildfires

Risk Index Rating for Wildfires by Census Tract

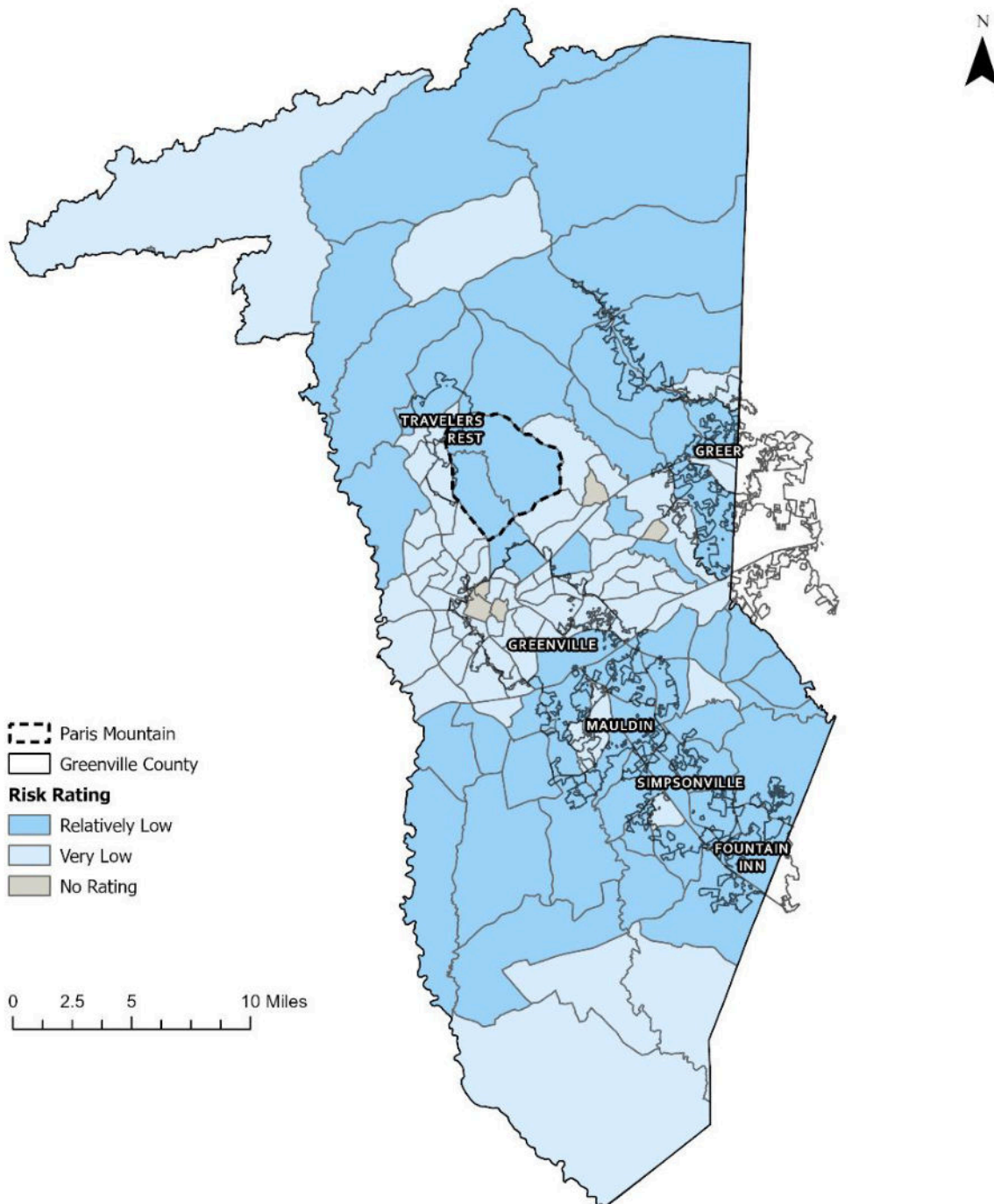


Figure 21. FEMA National Risk Index - Wildfires Rating

7.1.5 Earthquakes

Earthquakes occur when there is a sudden quick movement of large pieces of the earth. When stress builds up in the crust of the earth, it can cause rocks near the surface to break and slip. Slips occur along faults on the surface of the Earth. The types of fault systems can be seen in Figure 22. A strike-slip fault is a horizontal movement caused by shear stress within the tectonic setting of transform boundaries and causes a risk of earthquakes with lateral surface displacement hazards. Normal fault is a vertical movement caused by extension (tension) within the tectonic setting of rift zones and divergent boundaries can cause the risk of earthquakes with vertical displacement and ultimately forming valleys. Thrust fault is also a vertical movement caused by compression (convergence) within the tectonic setting of convergent boundaries can cause powerful earthquakes and responsible for the most destructive seismic events.

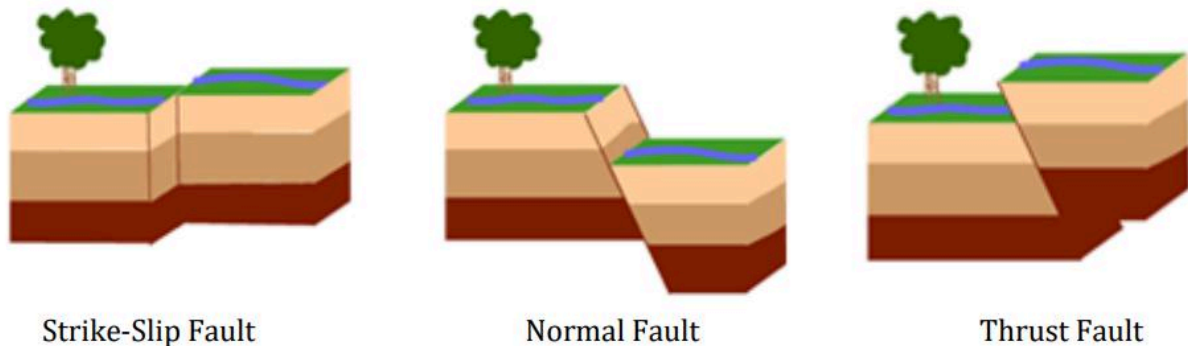


Figure 22. Types of Seismic Faults Classifications. (USGS)

Figure 23 below was obtained from the 2023 South Carolina Hazard Mitigation Plan, and it shows the vulnerability to various fault systems throughout the state. While Greenville County is susceptible to multiple Normal Faults in the northern region and a large Thrust Fault located in the southern region of the County, there is a low to medium risk of earthquakes. However, social vulnerability to earthquakes is high in some areas of the County.

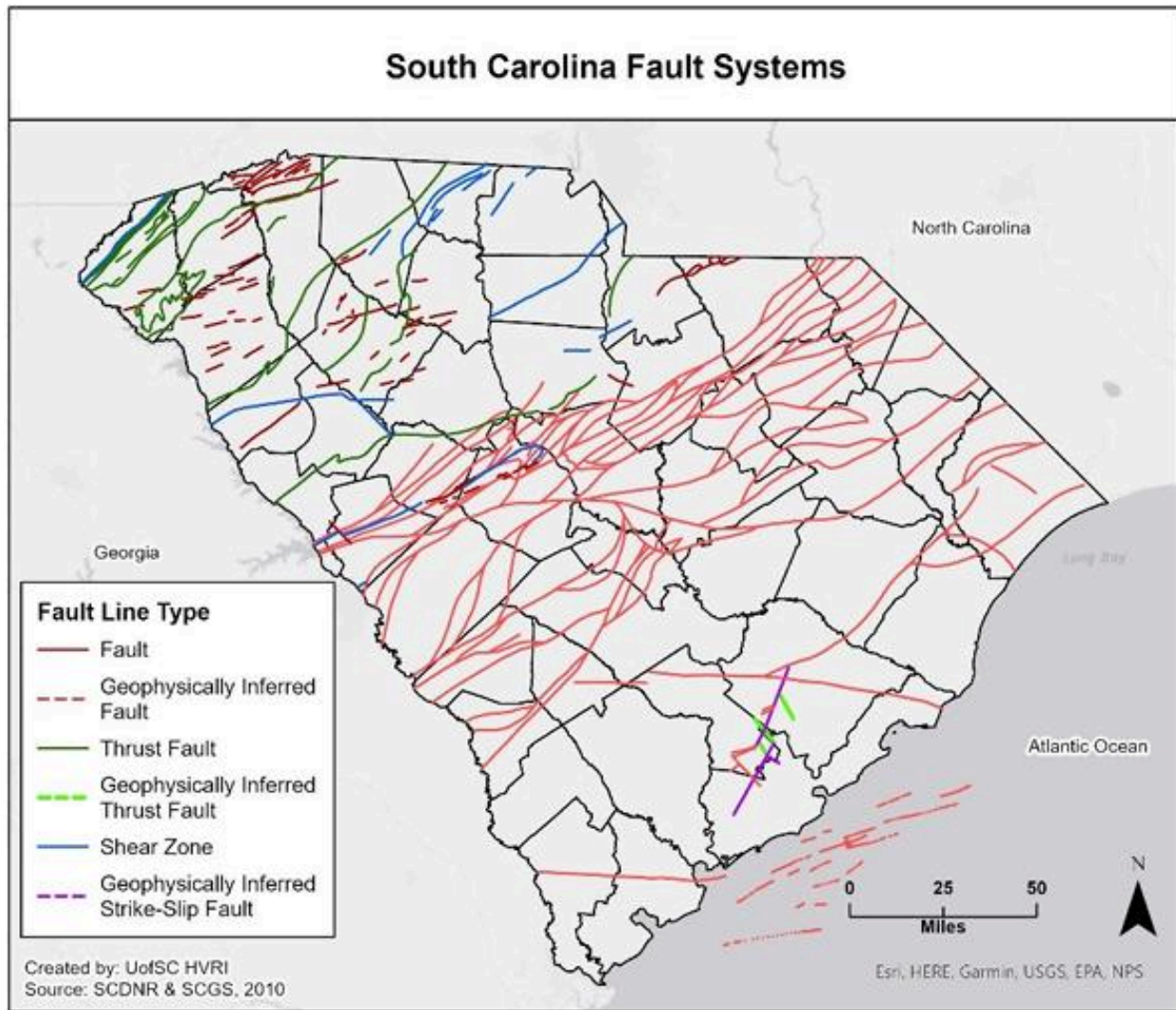


Figure 23. South Carolina Fault Systems (South Carolina Hazard Mitigation Plan, 2023)

The magnitude of earthquakes is measured on the Richter scale as seen in Table 16, which is a logarithmic scale of the amplitude of waves that are recorded by seismographs. Due to the logarithmic nature of the scale, each whole number step correlates to approximately 31 times more energy than the preceding whole number value. The Richter magnitude is calculated from the amplitude of the largest seismic wave recorded for the earthquake.

Table 16. Richter Magnitude Scale

Richter Magnitudes	Description	Earthquake Effects	Frequency of Occurrence
Less than 2.0	Micro	Microearthquakes, not felt.	About 8,000 per day
2.0-2.9	Minor	Generally, not felt but recorded.	About 1,000 per day
3.0-3.9		Often felt, but rarely causes damage.	49,000 per year (est.)
4.0-4.9	Light	Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.	6,200 per year (est.)

Richter Magnitudes	Description	Earthquake Effects	Frequency of Occurrence
5.0-5.9	Moderate	Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings.	800 per year
6.0-6.9	Strong	Can be destructive in areas up to about 160 kilometers (100 mi) across in populated areas.	120 per year
7.0-7.9	Major	Can cause serious damage over larger areas.	18 per year
8.0-8.9	Great	Can cause serious damage in areas several hundred miles across.	1 per year
9.0-9.9		Devastating in areas several thousand miles across.	1 per 20 years
10.0+	Epic	Never recorded; see below for equivalent seismic energy yield.	Extremely rare (Unknown)

Approximately 10 – 15 earthquakes are recorded in the State of South Carolina annually; the majority originating from the Middleton Place – Summerville seismic zone which is known as the epicenter for the 1886 Charleston earthquake – the most damaging earthquake reported on the east coast. Large-scale earthquakes can lead to major infrastructure damage as well as injuries and death.

Table 17 and Figure 24 below show the earthquakes reported in Greenville County from 1900-2023. Most recently, the USGS reported a 2.17 magnitude earthquake centered near Taylors (8 km NNW) which occurred on April 22, 2022. The magnitudes of the earthquakes recorded are only sometimes felt and rarely cause damage.

Table 17. Historical Earthquake Events (1900-2023)

Date	Magnitude	Place
4/22/2022	2.17	8 km NNW of Taylors, South Carolina
9/23/2000	2.4	4 km WSW of Tigerville, South Carolina
9/23/2000	2.2	North Carolina
8/16/2000	1.7	9 km SW of Saluda, North Carolina
10/30/1999	2.2-2.3	2 km S of Taylors, South Carolina

Greenville County's National Risk Index rating for earthquakes is relatively low for most of the County, with some areas of relatively low and relatively moderate risk in the eastern portion of the County (Figure 25).

Greenville County Historical Earthquake Events (1900-2023)

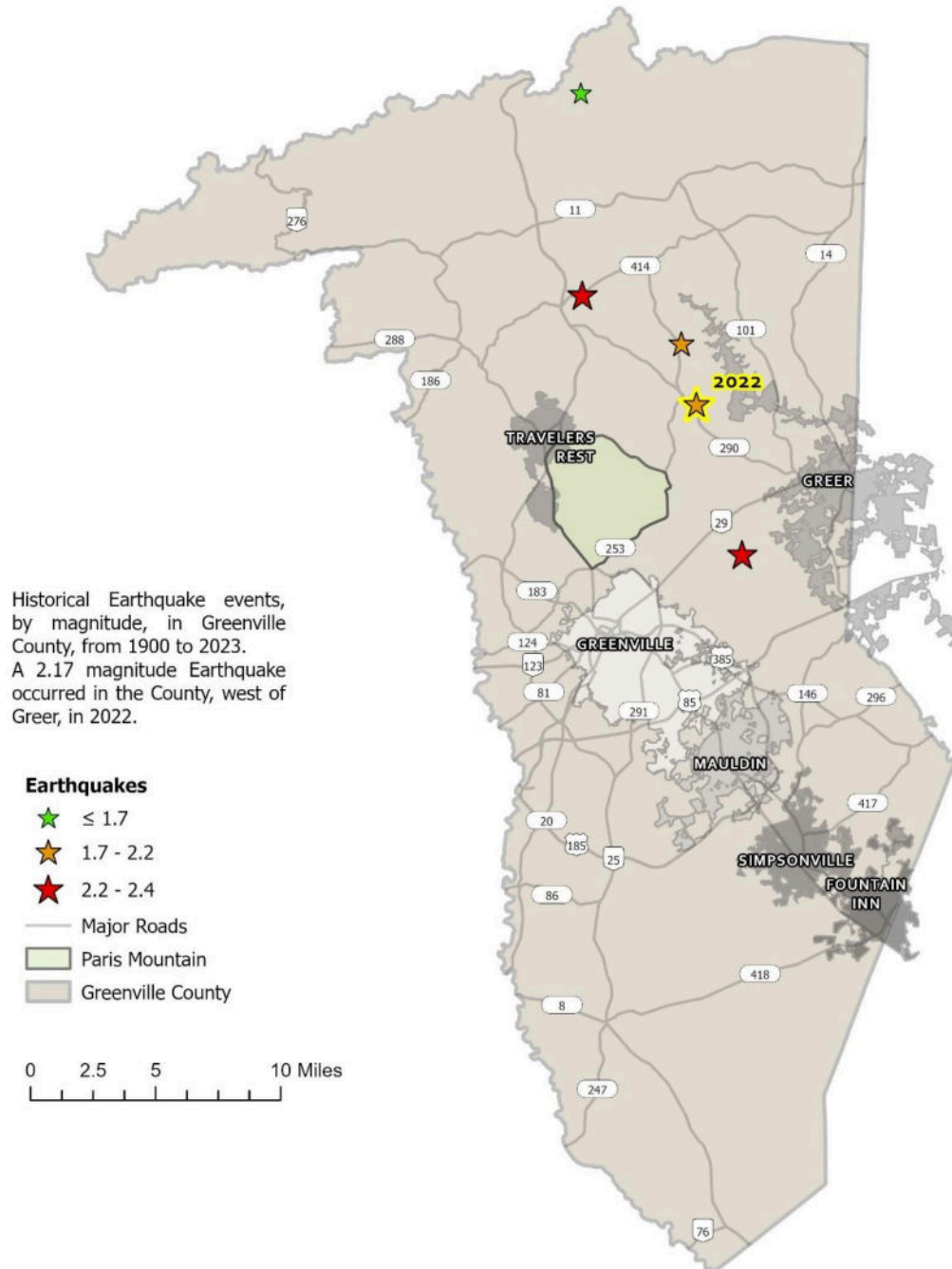


Figure 24. Historical Earthquakes Events (1900-2023)

Greenville County Risk Index Rating: Earthquakes

Risk Index Rating for Earthquakes by Census Tract

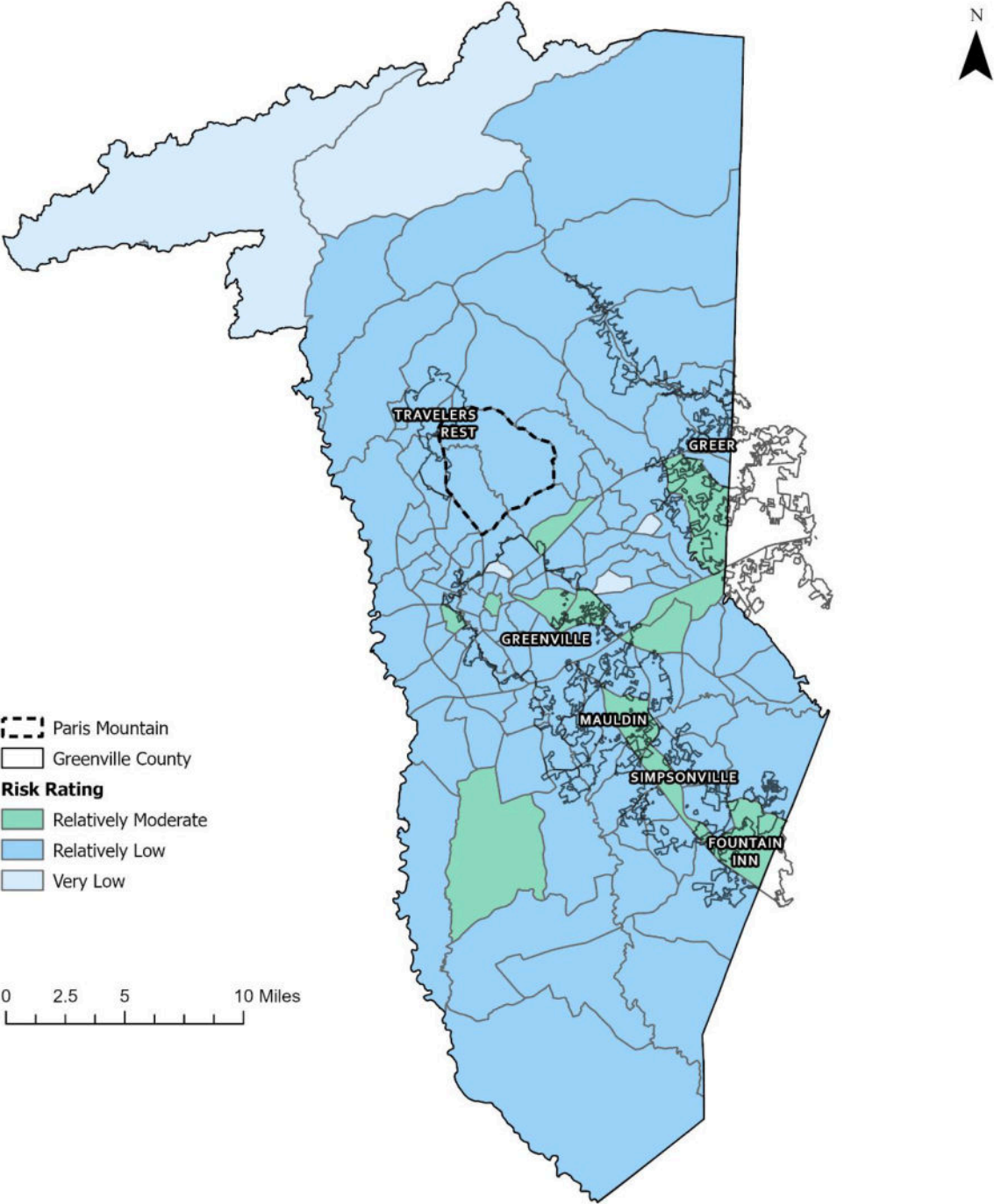


Figure 25. FEMA National Risk Index - Earthquake Risk Rating

7.1.6 Drought

Drought is characterized as an extended period when a region notes a deficiency in its water supply, generally caused by a region receiving consistent below average precipitation. As drought conditions worsen and water supplies decrease, water restrictions may be imposed on homeowners and businesses, and the cost of water treatment may increase. Agriculture and forestry activities could be severely impacted by drought as well. The County is susceptible to this hazard.

Figure 26 displays the annual average, in weeks, of drought throughout South Carolina between 2000 and 2021. Greenville County experiences anywhere from 14-21 weeks of drought per year.

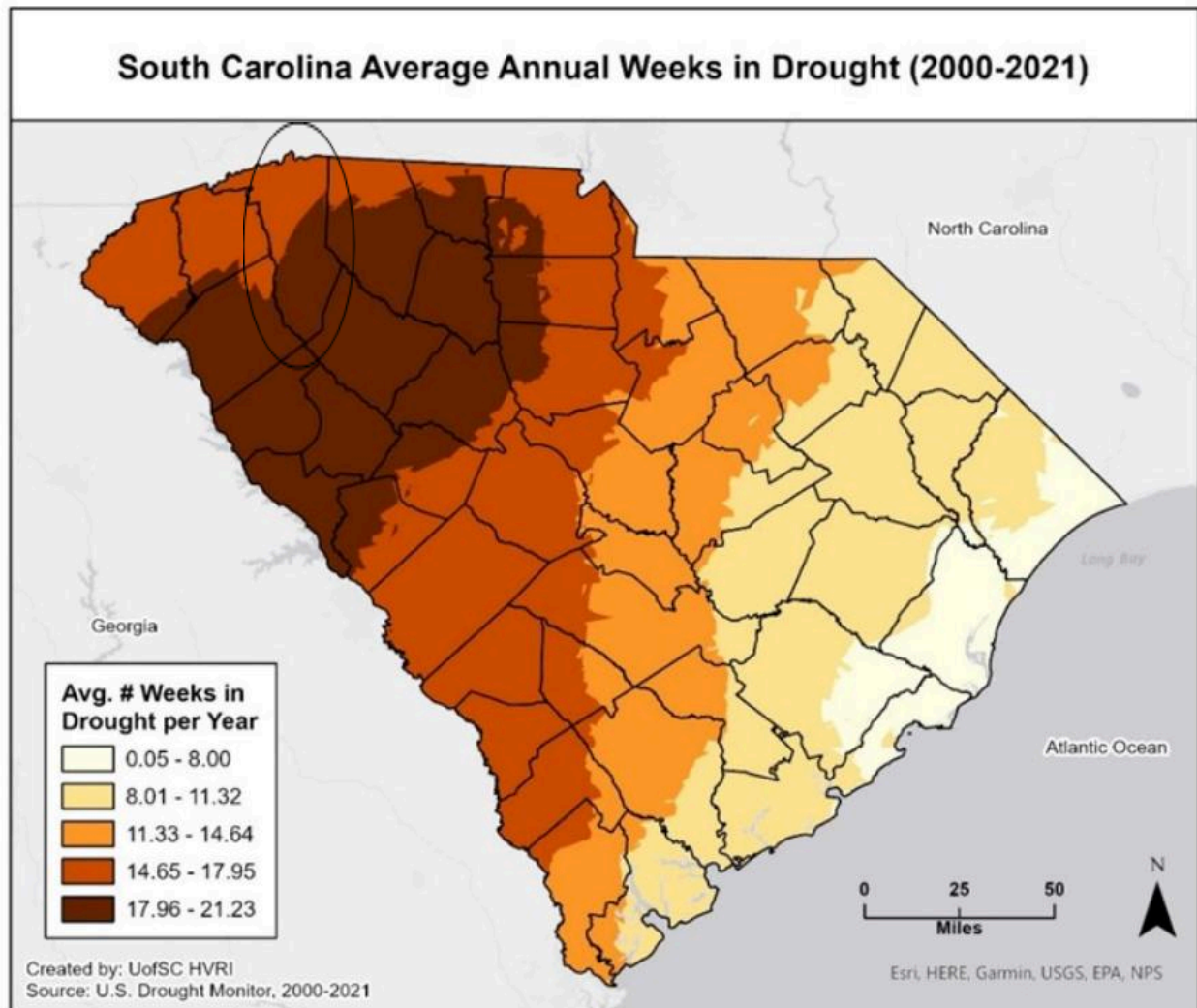


Figure 26. Drought, Average Annual in Weeks (South Carolina Hazard Mitigation Plan, 2023)

Droughts are measured on a scale from D0 to D4, with D4 being the most extreme. This scale was developed by the U.S. Drought Monitor (USDM), and the definitions can be seen in Table 18 below.

Table 18. Drought Monitor Scale

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

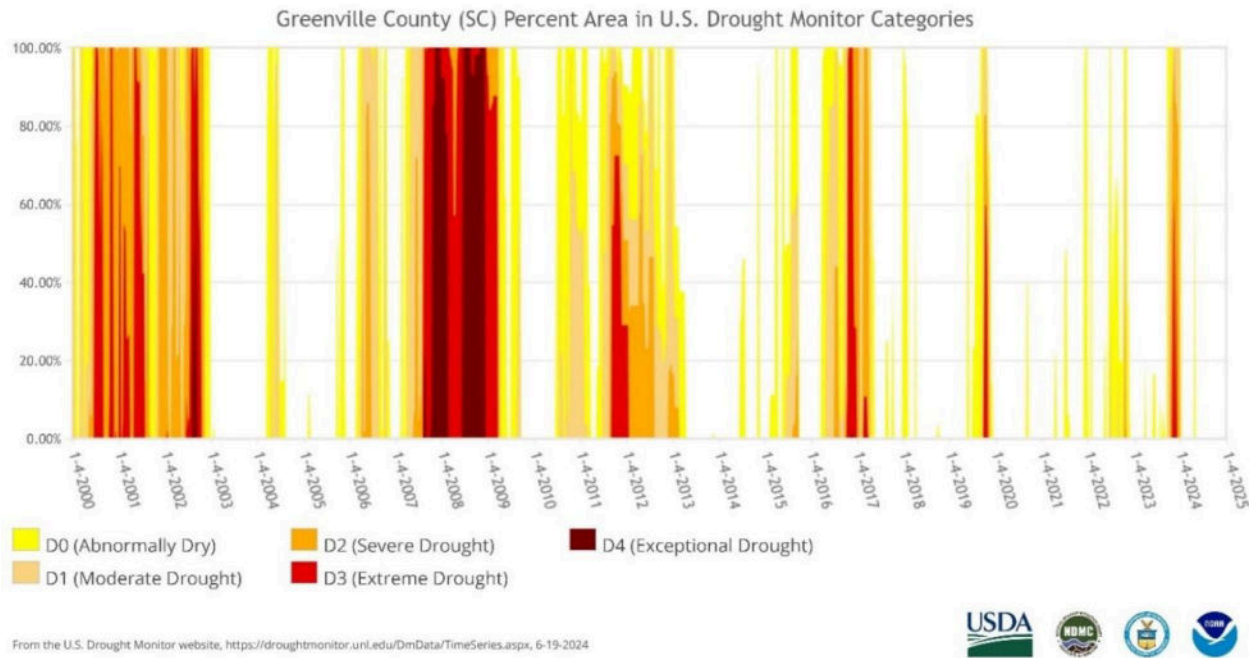


Figure 27. Drought Index Timeseries for Greenville County (U.S. Drought Monitor)

A timeseries of drought for Greenville County, from 2000 to 2024, can be seen in Figure 27. The County experienced exceptional drought during late 2007 through 2008. During the period of 2007 and 2008 the County was designated, by the NOAA, a -5 Palmer Index rating which uses temperature and rainfall information to formulate dryness. (The Palmer Index ranges from -6 (extreme drought) to +6 (extreme moist)). However, the County has a supply of potential potable water reserves and did not require any mandatory water use restrictions. Temperatures were as high as 97°F. Collectively the County accounted for \$14,058,478 in drought damage in 2008. Drought occurrence and frequency can vary depending on long-term and short-term forecast variables. Per the US Drought Monitor, in conjunction with NOAA's Climate Prediction Center, Monthly Drought Outlooks can be seen in Figure 28.

U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for July 2024
Released June 30, 2024

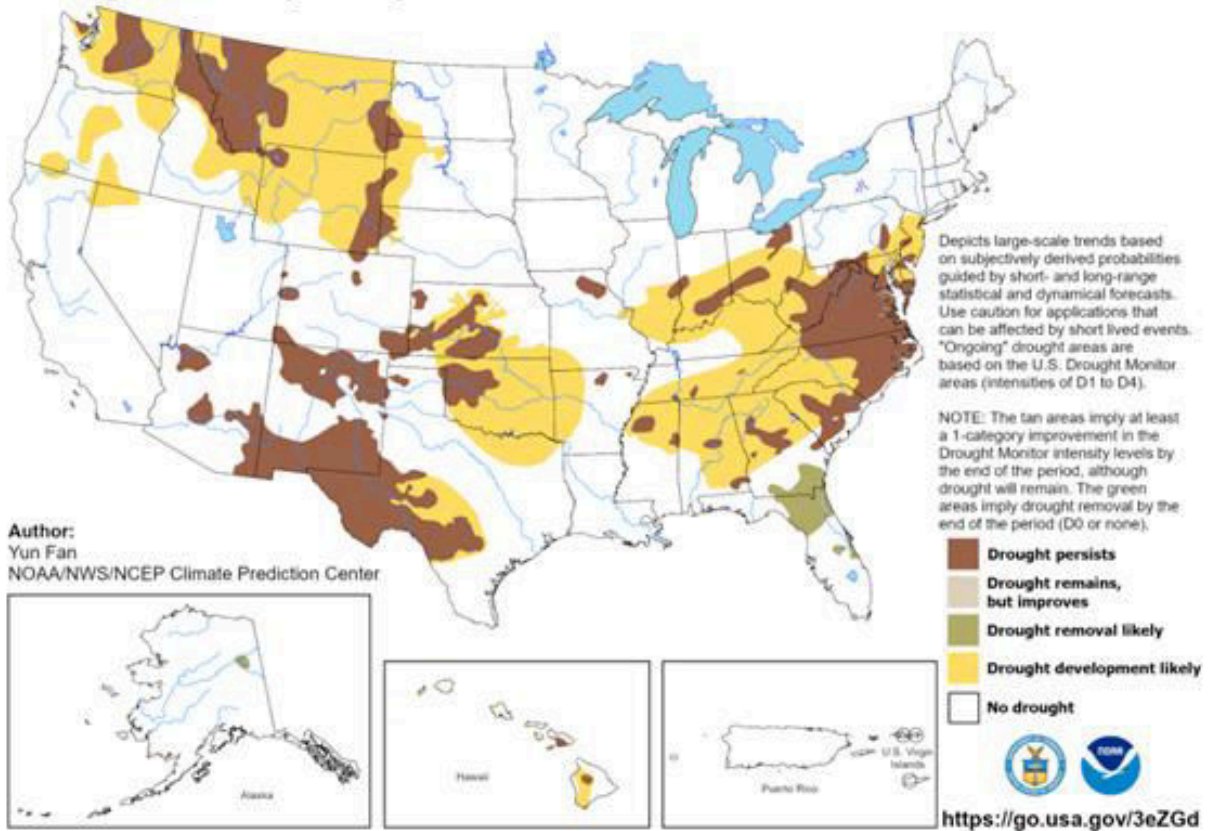


Figure 28. Monthly Drought Outlook (U.S. Drought Monitor)

The Drought Risk index for the census tracts within the County ranges from very low to relatively low with a portion of the County with no data (Figure 29). Although Greenville County's drought risk is low in comparison to other parts of the United States, the County is still susceptible to dry/drought conditions.

Greenville County Risk Index Rating: Drought

Risk Index Rating for Drought by Census Tract

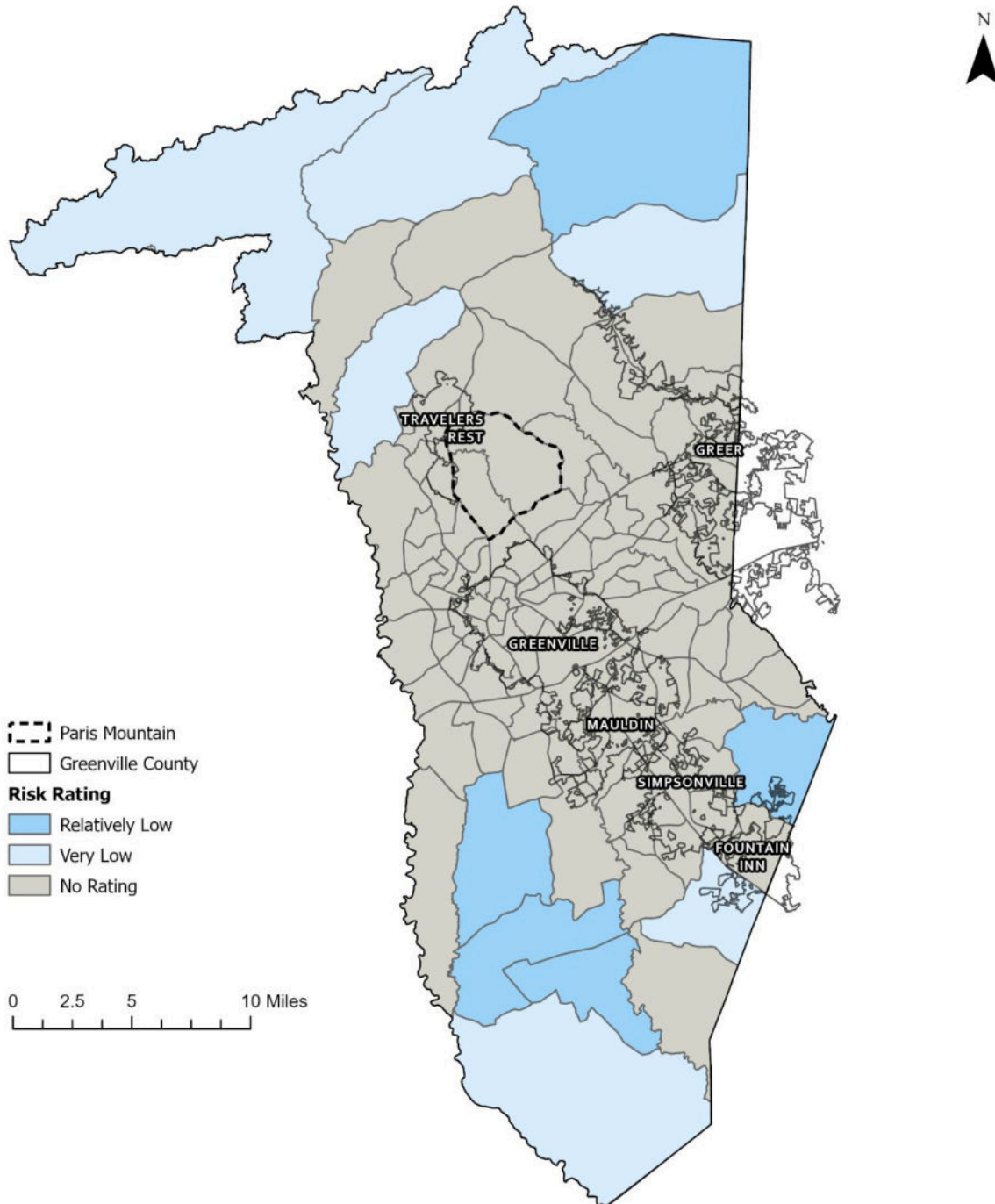


Figure 29. FEMA National Risk Index - Drought Risk Rating

7.1.7 Landslides

Landslides are a form of mass wasting, a broad term for the downward movement of rock material. Mass wasting also includes mudflow, earthflow, creep, rock fall, and slump; each characterized by the moisture content and the speed of the event. Landslides occur when there is a slope collapse or failure of slope. A new study looks at the correlation between precipitation and landslides in rural vs urban areas and found that urban areas can be more susceptible to slope instability during periods of high rainfall than rural areas. The presumption is that this is caused by human disruption during construction or changes to topography/vegetation. Historical occurrences of landslides in South Carolina are shown in Figure 30, per the SC Hazard Mitigation Plan. There are two previous occurrences of landslides included in SCEMD's map below. Details about each event are included below.

- June 26, 2006: A NWS survey team reported a significant debris flow in the Jones Gap State Park area of northern Greenville County. The debris flow carried trees, boulders, and other debris for several hundred yards. (NOAA, n.d.)
- May 22, 2013: A landslide occurred in the northern part of the county on Dividing Waters Road just off Highway 11 in Travelers Rest (Greenville County).

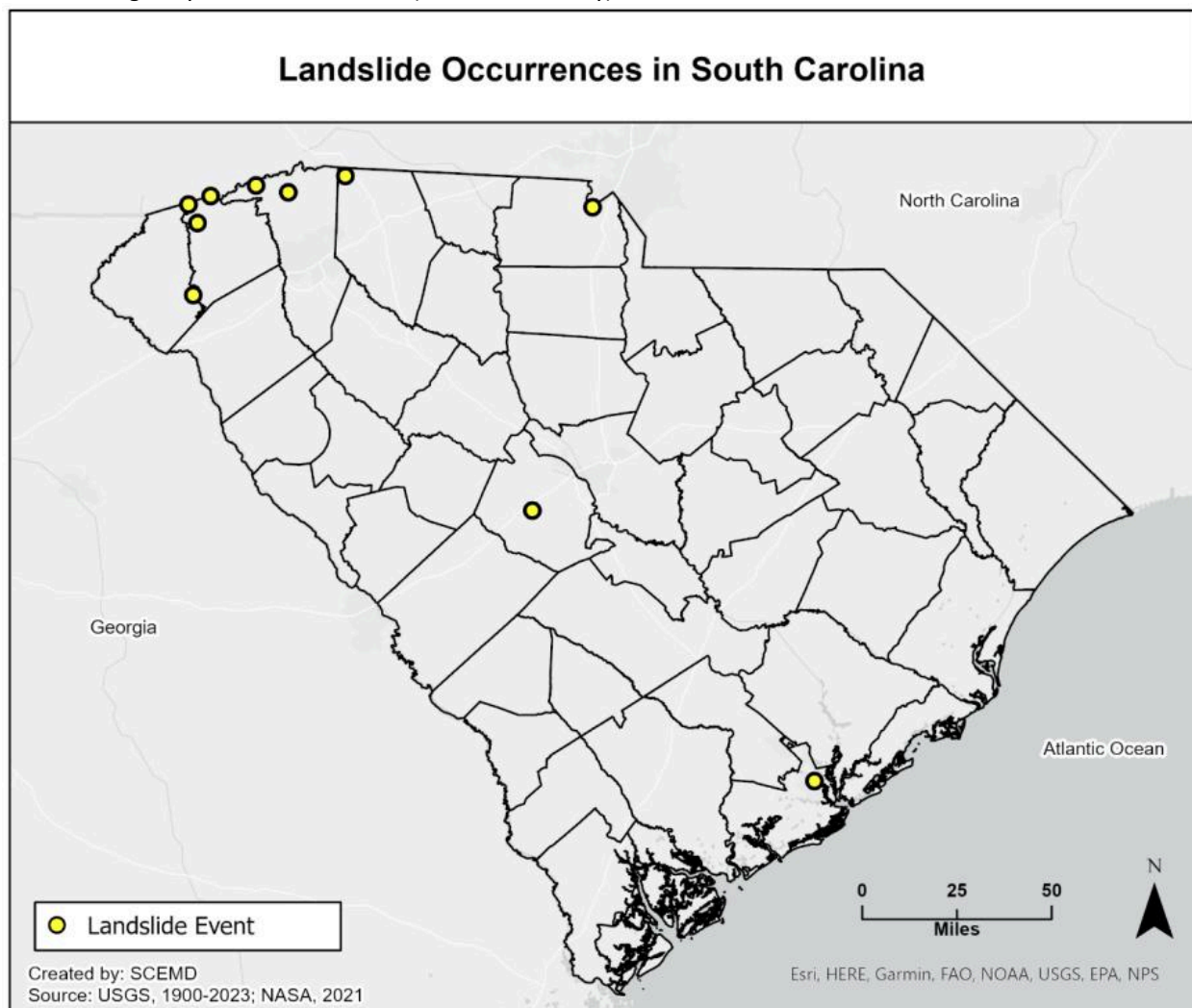


Figure 30. Landslide Occurrences (South Carolina Hazard Mitigation Plan, 2023)

While northern parts of Greenville County are more at risk of this hazard due to its steep slopes, the rest of Greenville County is less susceptible to a large slope failure (Figure 31). Small slope failures such as collapsing stream banks due

to disturbed soils are more common which could potentially cause problems with yards, homes, roads, and underground infrastructure if they are built close to a stream.

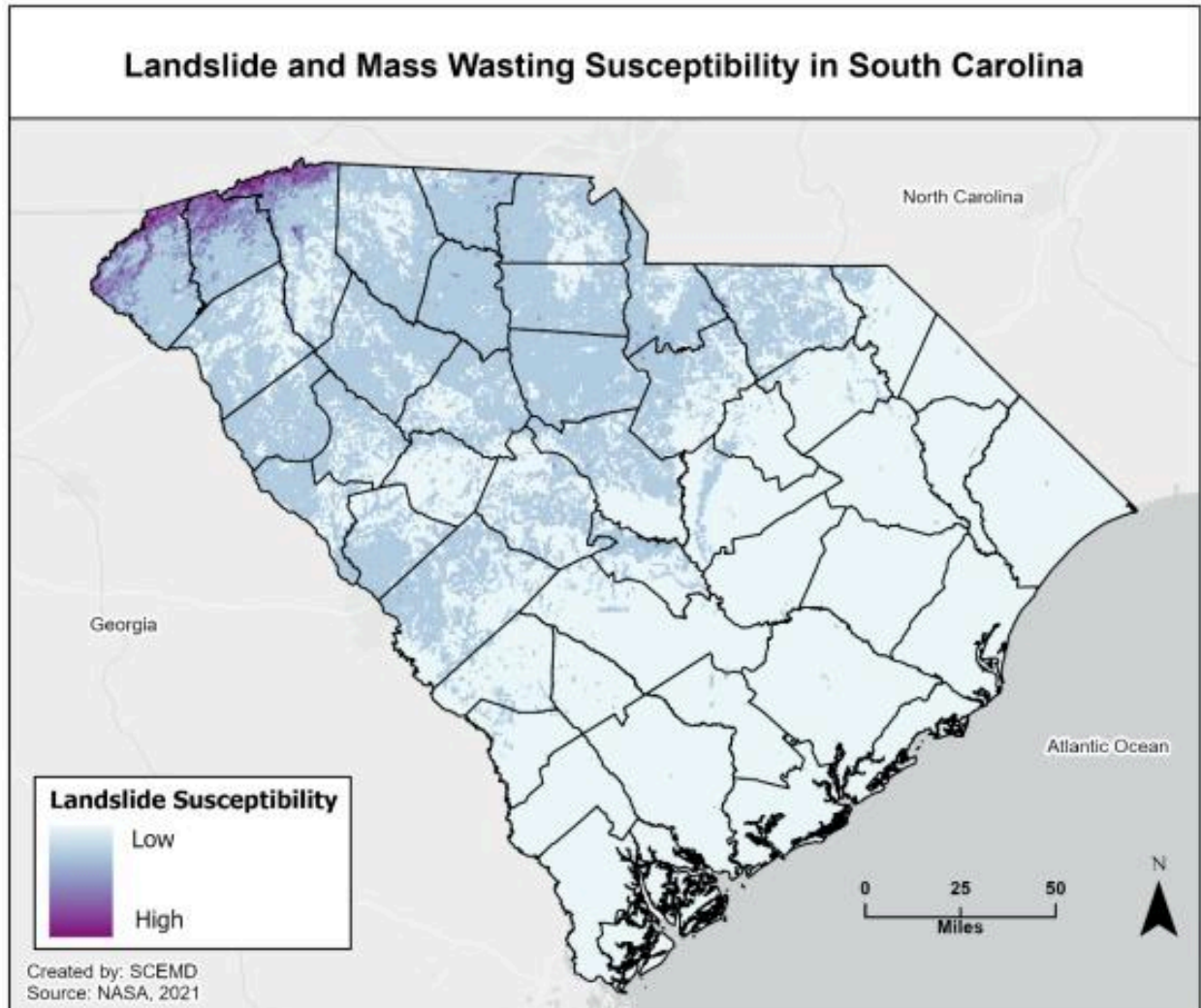


Figure 31. Landslide and Mass Wasting Susceptibility (South Carolina Hazard Mitigation Plan, 2023)

The Landslide Risk index for the census tracts within the County ranges from relatively low to relatively moderate (Figure 32). The northern part of the County ranks relatively high, the middle portion ranks relatively moderate, and the southern portion ranks very low. These rankings are consistent with topography. The northern portion of the county is known to be more mountainous, creating a bigger risk in this area for landslides.

Greenville County Risk Index Rating: Landslides

Risk Index Rating for Landslides by Census Tract

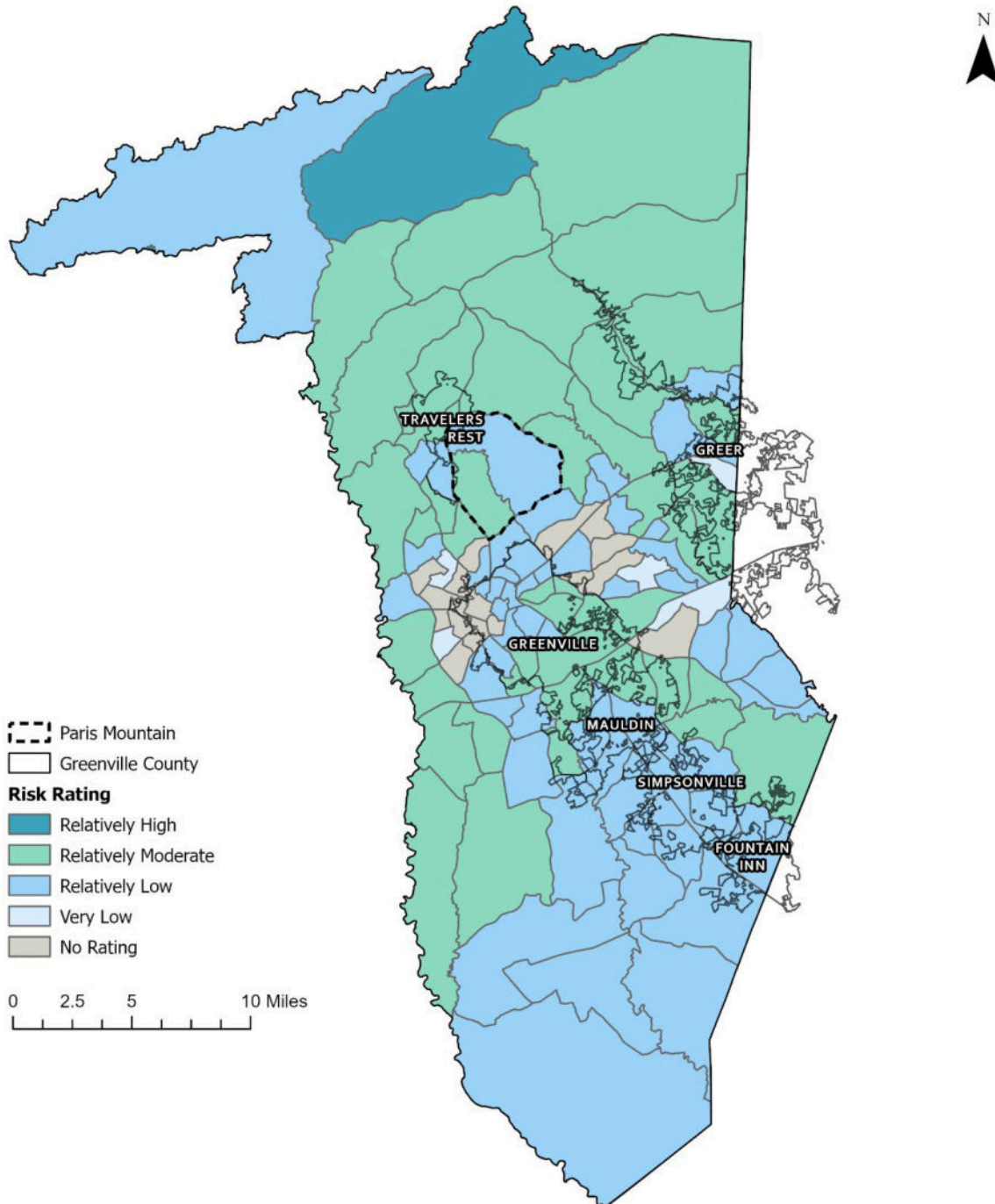


Figure 32. FEMA National Risk Index - Landslide Risk Index Rating

7.1.8 Hail

Hail is formed when water droplets are carried above the freezing level by strong thunderstorm updrafts, as seen in Figure 33. Hail continues to cycle through this motion, developing several layers of ice, until it becomes too heavy to be lifted again. At this time, the hail falls to the ground and can impact homes and vehicles. It can occur anywhere in the County because it is formed during severe thunderstorms. The size of the hail stones is relative to the intensity of the updraft caused by the storm, and in some cases, hail can become large enough to injure or kill livestock and people. Hail is typically a concern for property such as building rooftops and vehicles. Figure 33 was obtained from the 2023 South Carolina Hazard Mitigation Plan.

The magnitude of hail is measured on the TORRO Hailstorm Intensity Scale, which ranges from H0 to H10, with H10 being the largest and most destructive hail size. Table 19 was obtained from the Tornado and Storm Research Organization, and it summarizes the TORRO scale with hail diameters and typical damage that occurs during each of the events.

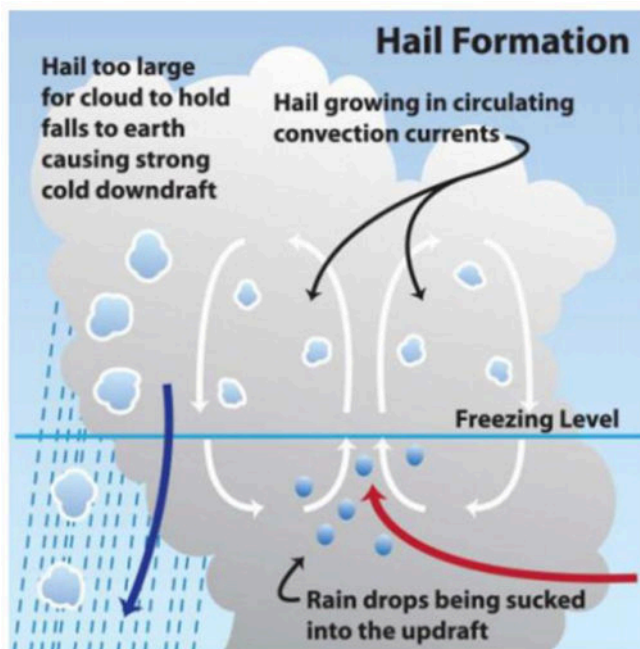


Figure 33. Formation of Hail (NOAA)

Table 19. TORRO Hailstorm Intensity Scale

Score	Description	Hailstone size	Measurement	
			Inches	Centimeters
H0	Hard Hail	bb	< ¼	<0.64
H1	Potentially Damaging	Pea	¼	0.64
H2	Significant	Dime	7/10	1.8
		Penny	¾	1.9
H3	Severe	Nickle	7/8	2.2
H4	Severe	Quarter	1	2.5
H5	Destructive	Half dollar	1 ¼	3.2
H6	Destructive	Golf ball	1 ¾	4.4
H7	Destructive	Billiard ball	2 1/8	5.4
H8	Destructive	Tennis ball	2 ½	6.4
H9	Super Hailstorm	Baseball	2 ¾	7.0
		Softball	3.8	9.7
H10	Super Hailstorm	Compact disk / DVD	4 ¾	12.1

The hail data displayed in Figure 34 was obtained from the National Weather Service, and it includes hail occurring from 1955 to 2022. The occurrence of hail events appears to be evenly spread across the County with most hail sizes in the 0 to 2 inch range. A handful of events have occurred with hail sizes over two inches, which is equivalent to a billiard ball or tennis ball, in the eastern and northeastern portions of the County. Figure 35 shows the hail events

during this planning period. The County has experienced several hail events annually from 2016-2022, with most events occurring in the spring and summer months, with a notable hail event occurring in March 2017 in the eastern portion of the County. According to the FEMA National Risk Index (Figure 36), the County is subject to very low to relatively low risk for hail in comparison to other communities across the United States. However, there are still mitigation actions that can be taken to reduce risk including monitoring the radar to alert citizens of impending hailstorms, so they know to seek shelter and public education to inform citizens about what they can do to prepare for hailstorms.

Greenville County Historical Hail Events (1955-2022)

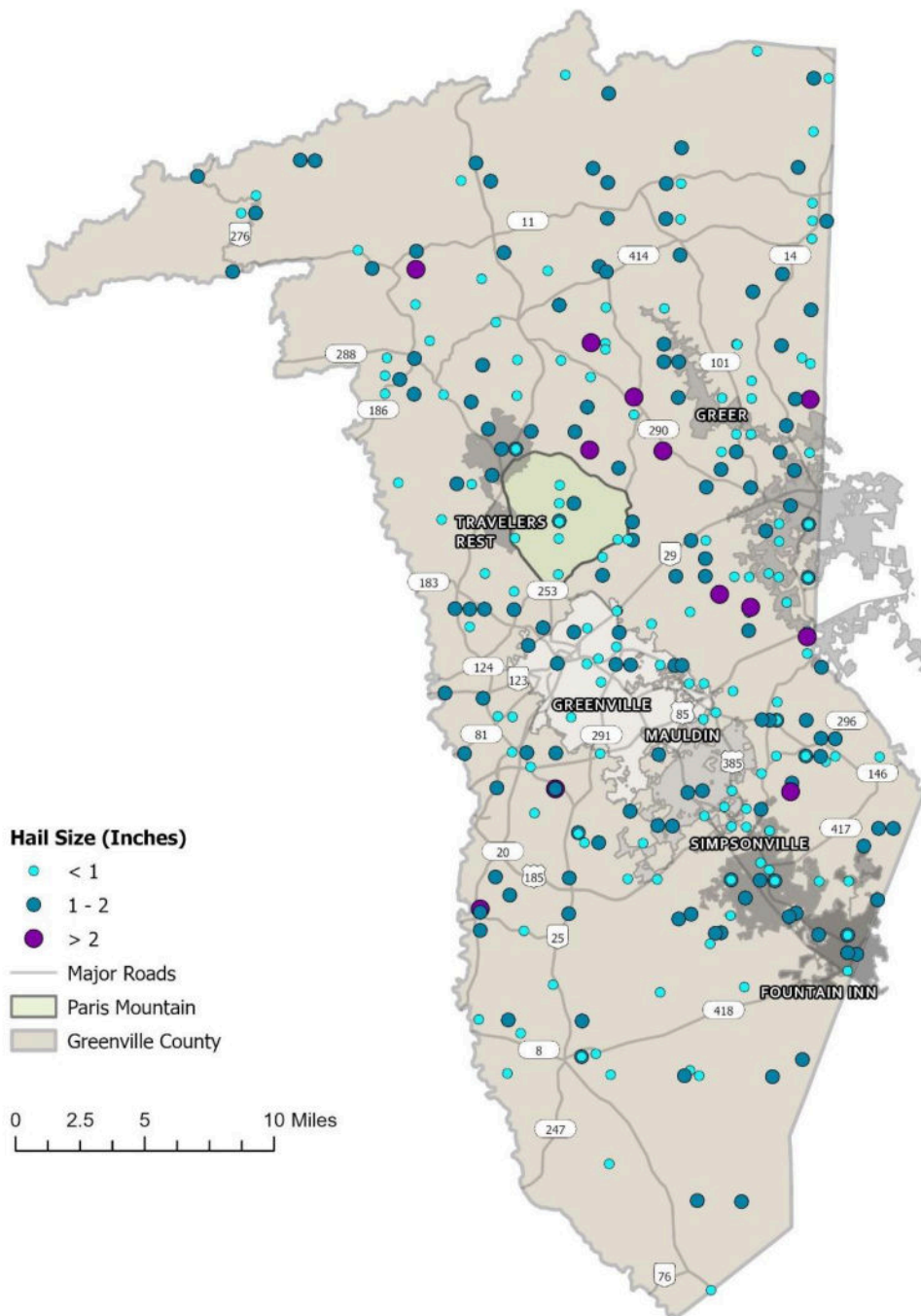


Figure 34. Historical Hail Events (1955-2022)

Greenville County Historical Hail Events (2016-2022)

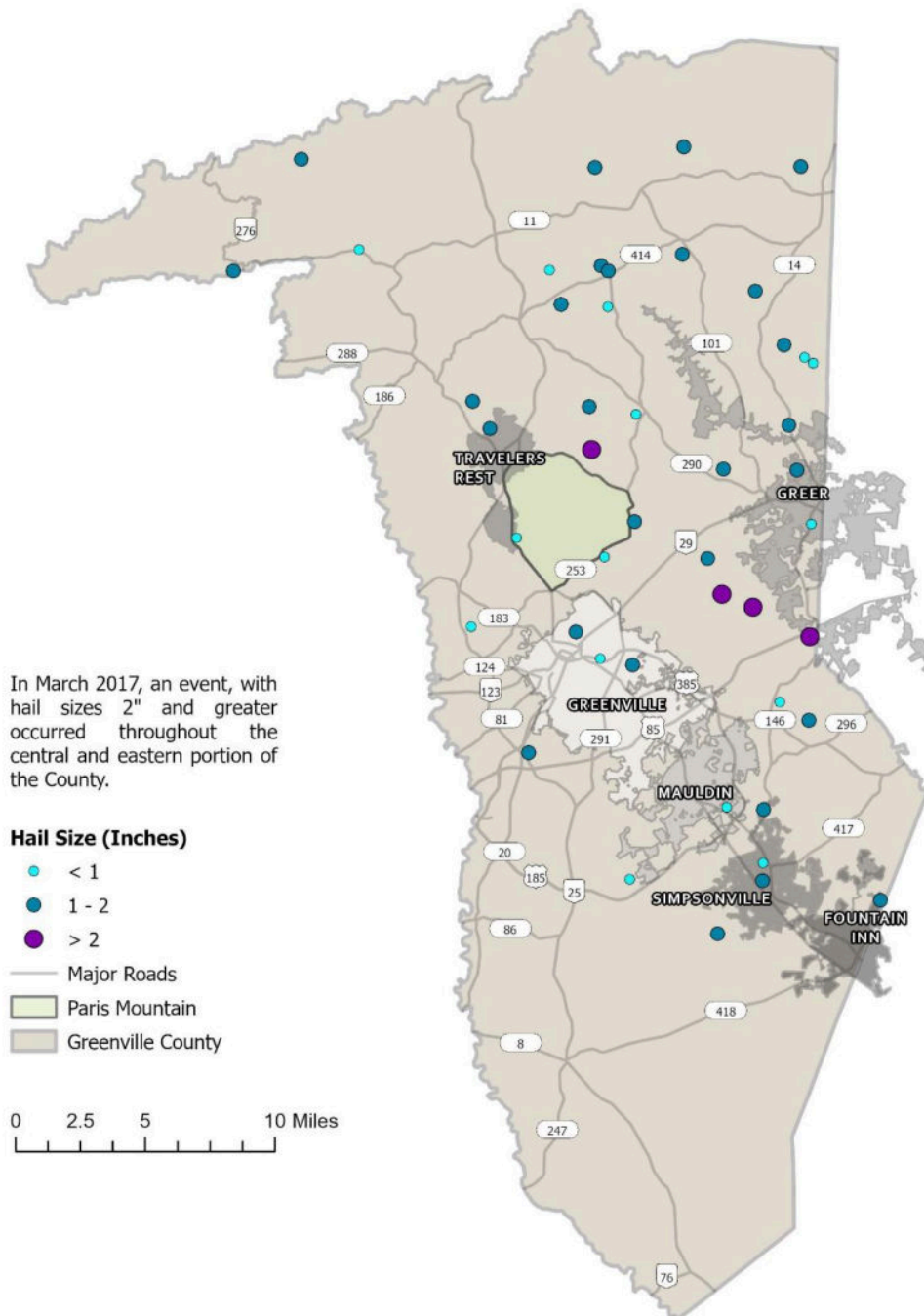


Figure 35. Greenville County Hail Events (2016-2022)

Greenville County Risk Index Rating: Hail

Risk Index Rating for Hail by Census Tract

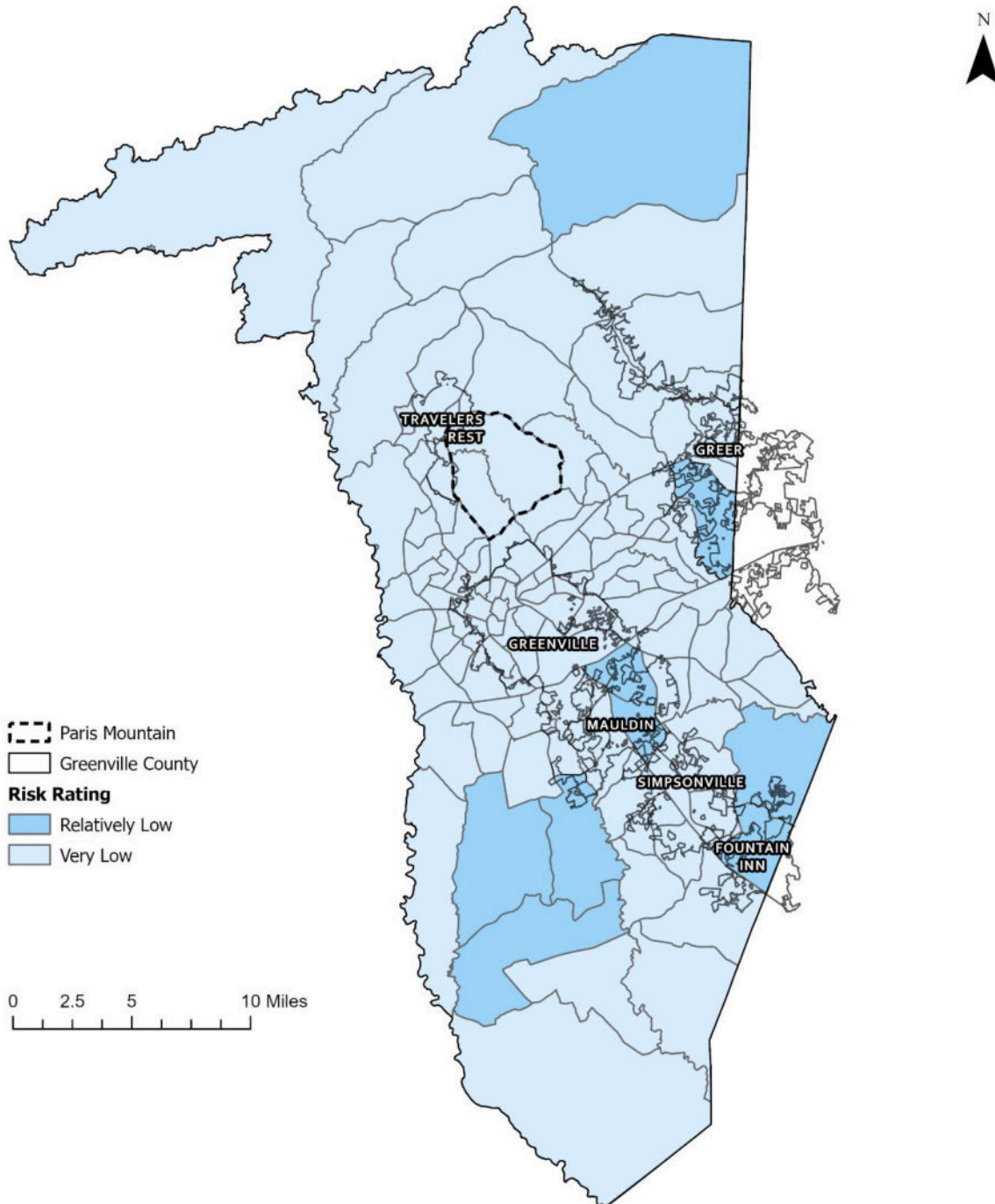


Figure 36. FEMA National Risk Index - Hail Risk Index Rating

7.2 High Hazard Potential Dams

7.2.1 HHPD Background and Planning Process

The South Carolina Department of Environmental Services (SCDES) is the regulatory agency that oversees dams in South Carolina. SCDES is responsible for maintaining an inventory of all state-regulated dams, performing dam inspections, providing best-practice maintenance guidance, and assisting dam owners with emergency planning, among other duties. The County works closely with SCDES when issues with dams are brought to the County's attention.

The potential impact of dams in the County was considered in the development of the HMRP. Table 20 lists the sixty-six High Hazard (Class 1) dams within the County that are currently regulated by SCDES. To be regulated, a dam must contain at least 50 ac-ft of water, be at least 25 feet tall, or pose a threat to life downstream (including overtopping major roads and impacting downstream homes). SCDES defines High Hazard Potential Dams (HHPDs) as dams whose "failure would likely result in loss of life."

Table 20. High Hazard Dams in Greenville County

Dam Name	NID ID	Height (ft.)	Storage (acre-feet)	Locality	Owner Type	Primary Purpose	EAP	EAP Latest revision	Year completed
SWAN LAKE DAM	SC00016	28	462	Travelers Rest	Private	Recreation	Yes	06/12/2019	1954
BROOKS POND DAM	SC01787	25	75	Simpsonville	Private	Recreation	Yes	06/19/2019	1969
MOON LAKE DAM	SC01800	22	74	Greer	Private	Fire Protection, Stock, or Small Fish Pond, Recreation	Yes	09/10/2003	1969
LAKE CUNNINGHAM DAM	SC00002	24	315	Greer	Public Utility	Water Supply	Yes	03/21/2017	1956
LAKE ROBINSON DAM	SC02328	73	45,000	Greer	Public Utility	Recreation, Water Supply	Yes	3/21/2017	1984
STONE LAKE DAM	SC01773	35	135	City of Greenville	Private	Recreation	Yes	06/02/2015	1952
PARKINS LAKE DAM	SC01774	45	257	City of Greenville	Private	Recreation	Yes	11/22/2015	1953
NORTH STONE LAKE DAM	SC02521	20	32.5	City of Greenville	Private	Recreation	Yes	10/13/2014	N/A
HUFF'S LAKE DAM	SCD5026	14	22	Greenville County	Private	Flood Risk Reduction	No	N/A	N/A
LAKE CALDWELL LOWER DAM	SCD5073	16	15	Greenville County	N/A	N/A	No	N/A	N/A
NORTH SALUDA RESERVOIR DAM	SC00025	175	80,648	Greenville County	Public Utility	Water Supply	Yes	11/09/2015	1956
TANKERSLEY LAKE DAM	SC01724	24	198	Greenville County	Private	Recreation	Yes	07/13/2015	1960
JB TANKERSLEY POND DAM	SC00017	43	165	Greenville County	Private	Recreation	Yes	08/19/1998	1954

Dam Name	NID ID	Height (ft.)	Storage (acre-feet)	Locality	Owner Type	Primary Purpose	EAP	EAP Latest revision	Year completed
SWEETWATER INC DAM	SC02251	35	122	Greenville County	Private	Recreation	Yes	06/12/2019	1968
LAKE LYNN DAM	SC01736	43	106	Greenville County	Private	Recreation	Yes	06/13/2019	1945
LAKE MOLLIRENE DAM	SC01739	37	106	Greenville County	Private	Recreation	Yes	01/27/2021	1952
MCCARTER POND DAM	SC01740	27	66	Greenville County	Private	Recreation	Yes	04/11/2018	1954
RICE POND DAM	SC01752	25	60	Greenville County	Private	Recreation	No	N/A	1969
LAKE PLACID DAM	SC01771	28	198	Greenville County	State	Recreation	Yes	04/16/2015	1889
JORDAN POND DAM	SC02337	21	72	Greenville County	Private	Recreation	Yes	05/28/2021	N/A
LAKE GINTOMO DAM	SC01717	37	106	Greenville County	Private	Recreation	Yes	06/12/2019	1966
FRIDDLE LAKE DAM	SC00018	37	156	Greenville County	Private	Recreation	Yes	06/12/2019	1960
SAM HOFFMAN POND DAM	SC01731	22	86	Greenville County	Private	Recreation	No	N/A	1957
STEVENS POND DAM	SC01741	30	69	Greenville County	Private	Recreation	Yes	06/12/2019	1971
LINDSEYS LAKE DAM	SC01743	24	80	Greenville County	Private	Recreation	No	N/A	1950
LOOK UP LODGE DAM	SC00021	47	231	Greenville County	Private	Recreation	Yes	04/18/2024	1952
PARIS MOUNTAIN RESERVOIR 3	SC00004	50	830	Greenville County	State	Water Supply	Yes	07/07/2015	1905
MOUNTAIN LAKE DAM	SC01755	40	53	Greenville County	State	Recreation	Yes	06/12/2019	1889
BRUCE LAKE DAM	SC01758	17	68	Greenville County	Private	Recreation	Yes	03/26/2015	1948
BECKYDON LAKE DAM	SC01527	30	136	Greenville County	Private	Recreation	No	N/A	1973
SOUTH TYGER RIVER WCD DAM 2C	SC01765	39	583	Greenville County	Private	Recreation	Yes	10/03/2023	1969
CARDINAL LAKE DAM	SC01770	22	96	Greenville County	Private	Recreation	Yes	06/12/2019	1960
HUFF CREEK WCD DAM 4C	SC00010	50	1,792	Greenville County	Private	Flood Risk Reduction	Yes	12/22/2011	1965
TROLLINGWOOD LAKE DAM	SC01775	31	600	Greenville County	Private	Recreation	Yes	04/21/2021	1971
HUFF CREEK WCD DAM 2A	SC00008	42	827	Greenville County	Private	Flood Risk Reduction	Yes	03/19/2015	1962

Dam Name	NID ID	Height (ft.)	Storage (acre-feet)	Locality	Owner Type	Primary Purpose	EAP	EAP Latest revision	Year completed
HUFF CREEK WCD DAM 3A	SC00009	42	943	Greenville County	Private	Flood Risk Reduction	Yes	04/04/2015	1961
SHELBY JOINES POND DAM	SC01777	27	38	Greenville County	Private	Recreation	Yes	03/07/2017	1967
SOUTH TYGER WCD DAM 5C	SC00011	51	708	Greenville County	Private	Recreation	Yes	10/3/2023	1969
ANTHONY LAKE DAM 1	SC01779	26	141	Greenville County	Private	Recreation	Yes	06/12/2019	1972
LAKE FAIRFIELD DAM	SC01780	23	110	Greenville County	Private	Recreation	Yes	06/12/2019	1955
J B GREEN POND DAM	SC01782	20	92	Greenville County	Private	Recreation	No	N/A	1964
HUFF CREEK WCD DAM 1B	SC00007	52	1,101	Greenville County	Private	Flood Risk Reduction	Yes	3/12/2015	1965
HUFF CREEK WCD DAM 5B	SC00006	48	1,722	Greenville County	Private	Flood Risk Reduction	Yes	12/22/2011	1962
CARISBROOKE SUBDIVISION DAM	SC01784	31	98	Greenville County	Private	Flood Risk Reduction, Recreation	Yes	01/26/2015	1958
OAK GROVE LAKE DAM	SC00022	29	340	Greenville County	Local Government	Recreation	Yes	06/12/2019	1949
HUNTINGTON LAKE DAM	SC00013	35	180	Greenville County	Private	Recreation	Yes	06/12/2019	1950
STONEBROOK FARM SD LAKE DAM	SC01791	26	150	Greenville County	Private	Flood Risk Reduction, Recreation	Yes	10/23/2008	1939
SHANNON LAKE DAM	SC01792	27	122	Greenville County	Private	Recreation	Yes	06/12/2019	1963
FAIRVIEW LAKE	SC01794	18	65	Greenville County	Private	Recreation	No	N/A	1959
H C HARPER POND DAM	SC00005	40	998	Greenville County	Private	Recreation	Yes	06/12/2019	1973
LAKE CALDWELL DAM	SC01714	36	94	Greenville County	Private	Recreation	Yes	03/15/2017	1968
ASBURY HILLS DAM	SC01716	30	54	Greenville County	Private	Recreation	Yes	08/21/2024	1960
LAKE LANIER DAM	SC00001	55	2,660	Greenville County	Local Government	Recreation, Water Supply	Yes	6/2/2015	1923
LAUREL LAKE SUBDIV DAM	SC02329	32	56	Greenville County	Private	Recreation	Yes	01/24/2017	N/A
BOLING POND DAM	SC02331	25	125	Greenville County	Private	Recreation	Yes	06/12/2019	1989
HALF MILE LAKE DAM	SC02562	27	180	Greenville County	Private	Recreation	Yes	09/14/2015	1990
RABON CREEK WCD DAM 20	SC02570	55	6,455	Greenville County	Private	Flood Risk Reduction	No	N/A	1985

Dam Name	NID ID	Height (ft.)	Storage (acre-feet)	Locality	Owner Type	Primary Purpose	EAP	EAP Latest revision	Year completed
MARVIN ATKINS DAM	SC02602	31	32	Greenville County	Private	Other, Recreation	Yes	06/12/2019	1987
STEVE WINGARD DAM	SC02661	28	65	Greenville County	Private	Fish and Wildlife Pond, Recreation	Yes	06/12/2019	1993
JIMMY RICE POND DAM	SC02678	27	15	Greenville County	Private	Fish and Wildlife Pond	No	N/A	1992
SALUDA LAKE DAM	SC00024	54	7,519	Greenville County	Private	Hydroelectric	Yes	6/13/2019	1905
HOLLIDAYS BRIDGE DAM	SC00559	50	7,384	Greenville County	Private	Hydroelectric	Yes	06/13/2019	1906
POOLE DAM	SC02809	32	45	Greenville County	Private	Fire Protection, Stock, Or Small Fish Pond	Yes	01/26/2023	2001
CLIFFS VALLEY DAM	SC02818	40	275	Greenville County	Private	Flood Risk Reduction, Recreation	Yes	06/13/2019	2002
CLIFF RIDGE POND DAM	SC02839	27	65	Greenville County	Private	Fish and Wildlife Pond, Irrigation, Recreation	No	N/A	N/A
ANNE PARKS SHORT BRANCH DAM	SC03514	26	40	Greenville County	Private	Fish and Wildlife Pond	No	N/A	1953
STROM DAM*	SC02492	19	35	Greenville County	Private	Recreation	Yes	05/20/2014	N/A

*Included in the National Inventory of Dams but not in the information provided by SCDES.

Greenville County High Hazard Dams

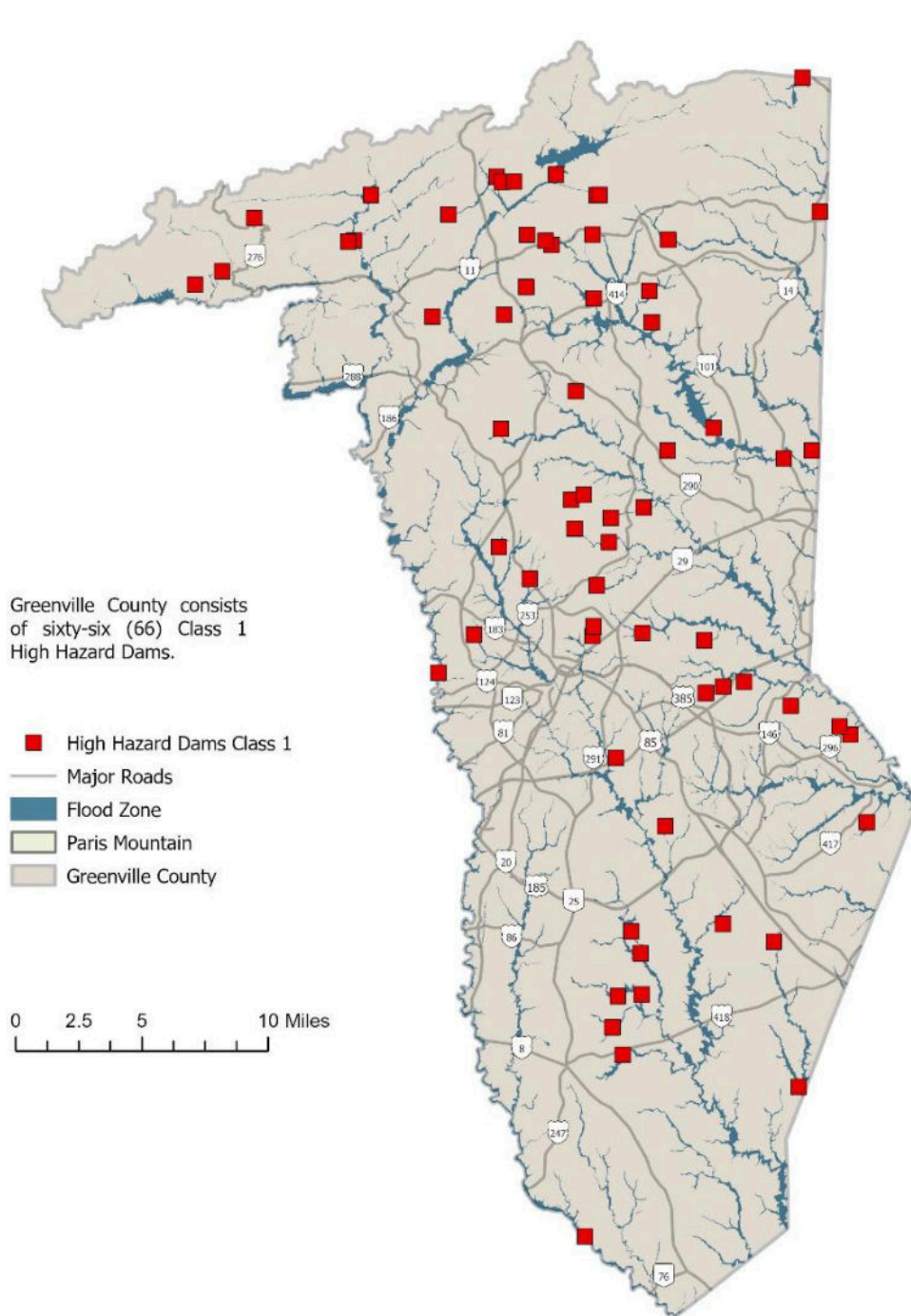


Figure 37. High Hazard Regulated Dams

SCDES was contacted for input on this plan, and they provided valuable insight and data to assist with this hazard mitigation effort. Data in this section was obtained from the SCDES as well as the National Inventory of Dams, which is an inventory database of dams by the U.S. Army Corps of Engineers.

7.2.2 HHPD Risk Assessment

When determining the risk associated with each regulated dam, SCDES evaluates the potential for loss of life and damage to downstream property. A HHPD classification means that dam failure could impact homes, businesses, roads, railroads, industrial facilities, and critical utilities such as water, sewer, electricity, and gas. SCDES has three hazard classifications that are defined below (Table 21).

Table 21. Dam Hazard Classifications

Class 1	Class 2	Class 3
High Hazard	Significant Hazard	Low Hazard
Dam failure will likely cause loss of life or serious damage to home(s), industrial and commercial facilities, important public utilities, main highway(s) or railroads.	Dam failure will not likely cause loss of life but may damage home(s), industrial and commercial facilities, secondary highway(s) or railroad(s), or interrupt the service of relatively important public utilities.	Dam failure may cause minimal property damage to others. Loss of life is not expected.

As stated previously, sixty-six dams within Greenville County limits are classified as High Hazard (Class 1). SCDES has created inundation maps for all HHPDs in the state. The SCDES Dam Safety program has a GIS viewer (<https://gis.dhec.sc.gov/scdams/>) that shows dam locations and classifications, inundation mapping, and other relevant data. Inundation maps are an important part of hazard mitigation planning as they help understand the extent of flooding resulting from dam failure. In the event of dam failure, this information can be used to contact downstream residents as well as make informed decisions about road closures and detour routes.

The completion year for each dam, found in Table 20, provides limited insight into the dam's potential condition but also indicates limitations as engineering and construction practices have evolved. Another risk associated with HHPDs includes the potential for negative environmental effects on surrounding areas. SCDES has plans to hire a consultant to assist in determining the potential social and environmental impacts of each HHPD in the state, and the County will add this information to its HMRP when the data becomes available to the County from SCDES (anticipated Fall 2025).

7.2.3 HHPD Risk Mitigation

High (Class 1), Significant (Class 2), and Low (Class 3) Hazard dams are required to have an up-to-date Emergency Action Plan (EAP). As seen in Table 20, many of the EAPs for the dams within the County are in need of an update, and there are several dams listed that do not have an EAP.

Multiple hazards can impact dams including storm events, earthquakes, and negligence. A multi-day rainfall event can be just as dangerous for dams as intense single day rainfall events which is why weather forecasting and preparation are crucial to ensure the community's safety. If the dam's spillway cannot safely pass the inflow of flood water, the reservoir water level will rise and can overtop the dam. Before a large storm event, the water level in a reservoir should be lowered if it can be done safely. Primary spillways that have not been exercised regularly over the years may become stuck when opened, which would cause the entire reservoir to empty and potentially impact downstream homes, businesses, and roads.

Not only is overtopping a concern during large storm events, but trees can also cause dam failure when high winds are present. Trees are hazardous because of their extensive root systems that infiltrate the dam and create pathways

for water to flow. If a tree falls on a dam, it could provide a path for water to flow through the dam (known as “piping”), which erodes the inside of the structure until it ultimately fails.

Seismic events can compromise the dam's structural integrity leading to immediate failure. Section 7.1.5 of this report discusses Greenville County's earthquake risk.

Another hazard is human negligence which is covered under the South Carolina Dams and Reservoir Safety Act – which makes it clear that “the owner of the dam or reservoir constructed in this state is solely responsible for maintaining the dam or reservoir in a safe condition throughout the life of the structure.” It is important to properly maintain a dam to remove potential hazards and allow for proper inspection. Prior to a SCDES inspection, grass and woody vegetation should be mowed and/or removed. This is an important measure that ensures the visibility of hazards such as erosion, seepage, and animal burrows. The SCDES website has several standard operating procedures (SOPs) for maintenance activities and tree removal that must be adhered to when addressing such issues.

The Dam Safety and Stormwater Permitting Division of the Bureau of Water administers the Dams and Reservoirs Safety Program (Dam Safety). Dam Safety staff conduct construction inspections and final inspections to ensure all work is performed according to the approved plans and specifications. Before a regulated dam or reservoir can be placed into operation, a written authorization to begin operations must be granted by the program. SCDES also inspects HHPDs every two (2) years and are followed up by a letter indicating what maintenance and/or repairs need to be performed to ensure compliance. Maintaining an up-to-date EAP and performing maintenance and repairs as required are crucial steps to reduce any vulnerabilities to and from HHPDs.



Source: US Army Corps of Engineers, <https://www.nwp.usace.army.mil/Missions/Flood-Risk-Management/Dam-Safety/Managing-Risk/>

Figure 38. Dam Safety and Managing Risk

7.3 Climate Change

Greenville County acknowledges that climate change has an impact on hazards affecting the County, however, the long-term nature of climate change indicates that impacts may not significantly increase during this planning cycle. The hazards identified in this plan that are susceptible to climate change impacts are listed in bold text here; **winter weather, floods**, tornados/high winds, earthquakes, **wildfires, drought, landslides**, and hail. As Greenville is an inland community, it is not susceptible to some impacts of climate change such as sea level rise and storm surge. However, the County has been impacted by the increased intensity of hurricanes and an increase in frequency and intensity of future rainfall events. Droughts and wildfires are also expected to increase in frequency. This could result in significant impacts on agriculture, fire-safety, water supply, flooding, and the overall safety of the general public.

Findings from "Potential Impacts of Future Extreme Precipitation Changes on Flood Engineering Design Across the Contiguous United States", Water Resources Research Article 10.1029/2021WR 031432 include the following:

- Southern regions are more susceptible to intensification of extreme precipitation.
- The current 100-year, 24-hr precipitation is projected to become approximately the 25-year in the remaining regions (including Greenville, SC) by 2100

Figure 39 and Figure 40 below were provided by Furman University Assistant Professor, Gustavo Coelho, Ph.D. Figure 39 shows the potential change of the current precipitation values provided by NOAA Atlas 14, and Figure 40 shows the relative increase (%) in precipitation for different return periods using the NOAA Atlas 14 historical data as reference.

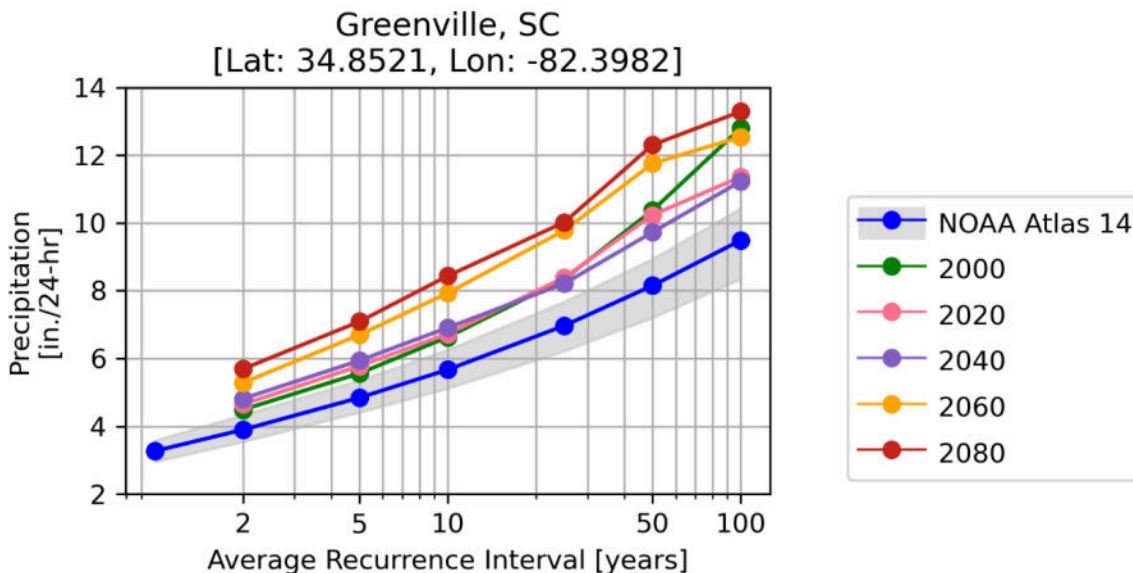


Figure 39. Potential Change of the Current Precipitation Values provided by NOAA Atlas 14

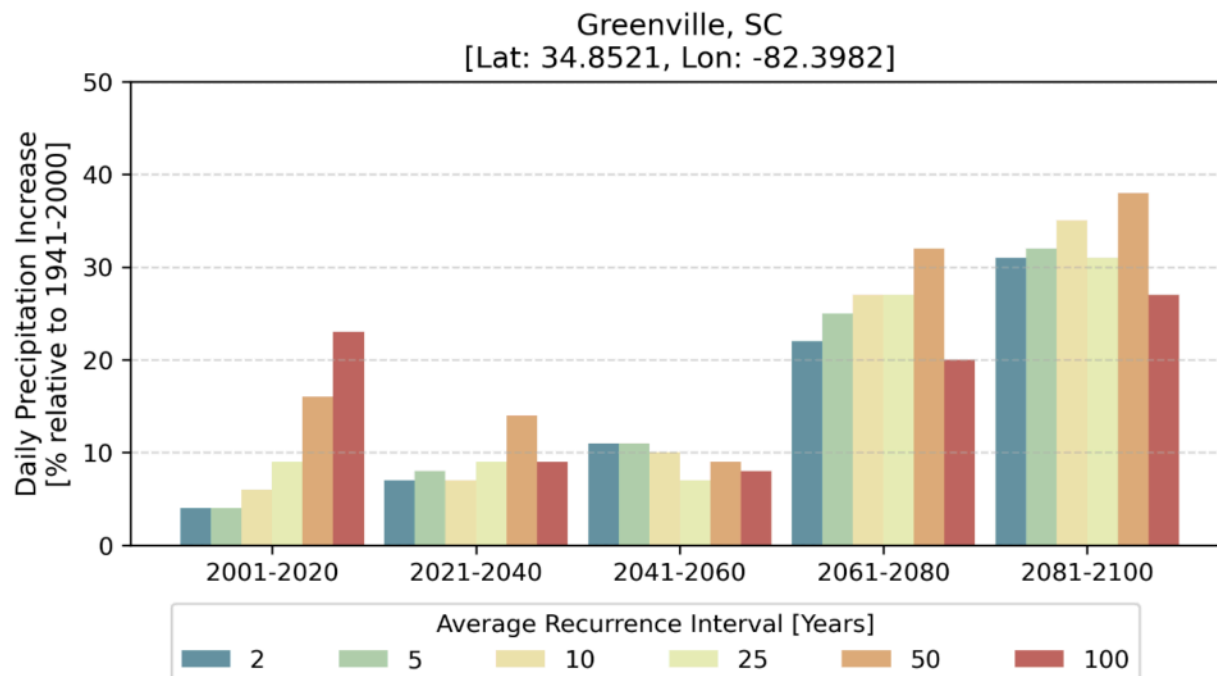


Figure 40. Relative Increase (%) in Precipitation for Different Return Periods

Figure 41 and Figure 42 illustrate the mean temperature and precipitation trends in South Carolina, Georgia, and North Carolina. These images show that the temperature in Greenville County has been rising since 1901, and precipitation has been declining. The South Carolina State Climatology Office has reported that between 1901 and 2015, Greenville County experienced a 0.51 °F increase in annual average temperature and a 5.60-inch decrease in annual average precipitation.

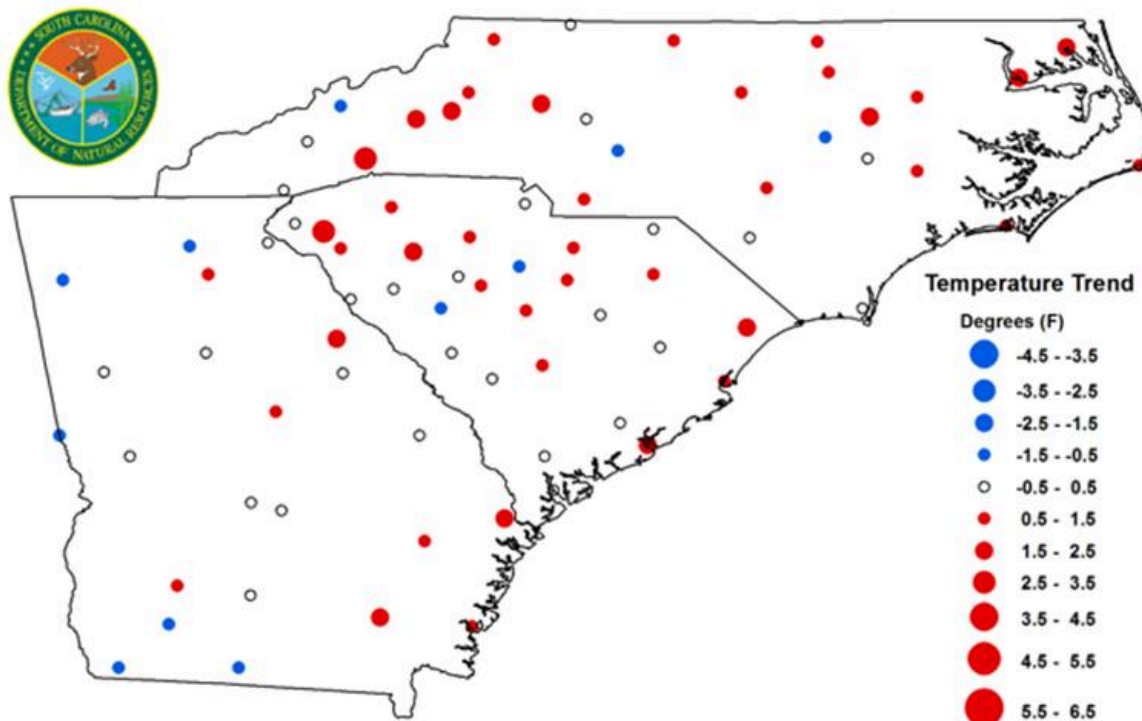


Figure 41. Annual Average Mean Temperature Trend, 1901 – 2015
(South Carolina State Climatology Office, 2015)

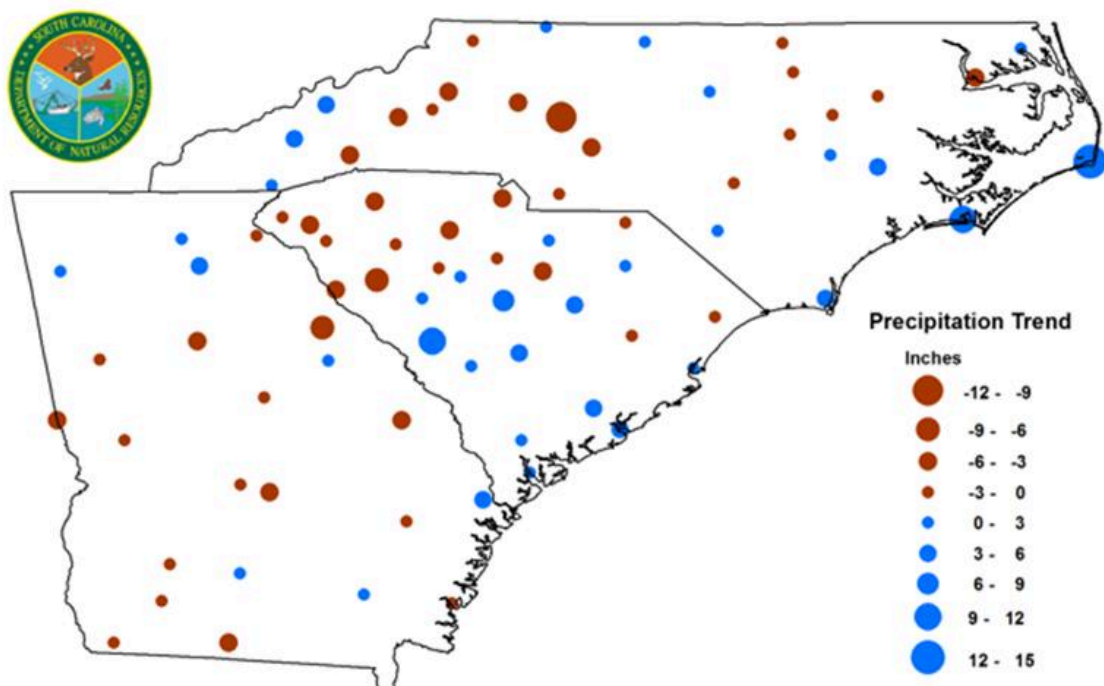


Figure 42. Annual Average Precipitation Trend, 1901 – 2015
(South Carolina State Climatology Office, 2015)

Figure 43, Figure 44, and Figure 45 display the average annual normal for precipitation and temperature, summer maximum and winter minimum, for South Carolina. Between 1991 and 2020, the average precipitation received within Greenville County ranged from 48 to 54 inches. This trend is similar to the majority of the State, with the exception of the northeastern portion. For the same time period, summer maximums reach values of 87 to 89 degrees, with winter minimums at 33 to 35 degrees.

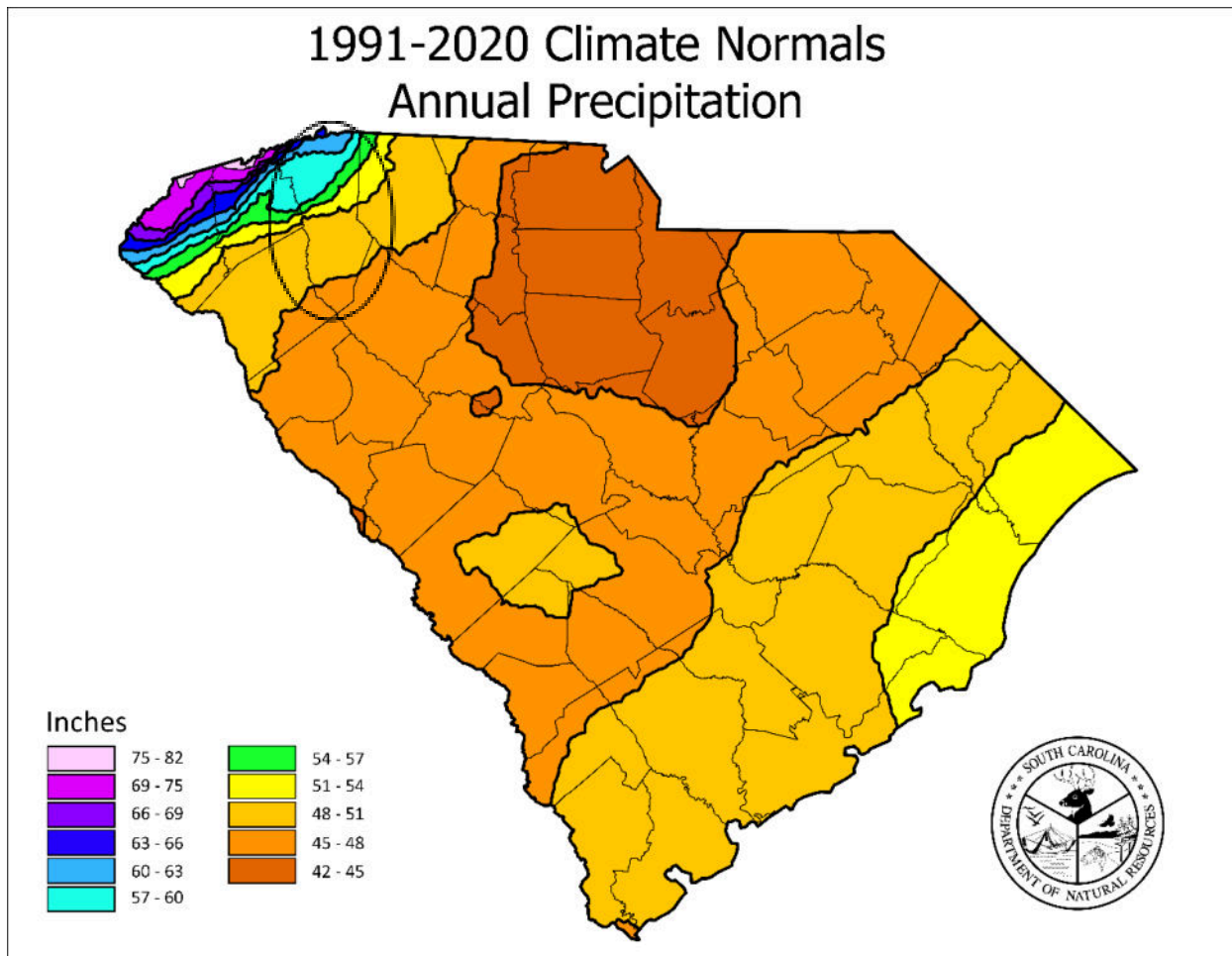


Figure 43. Annual Precipitation Climate Normals (SCDNR)

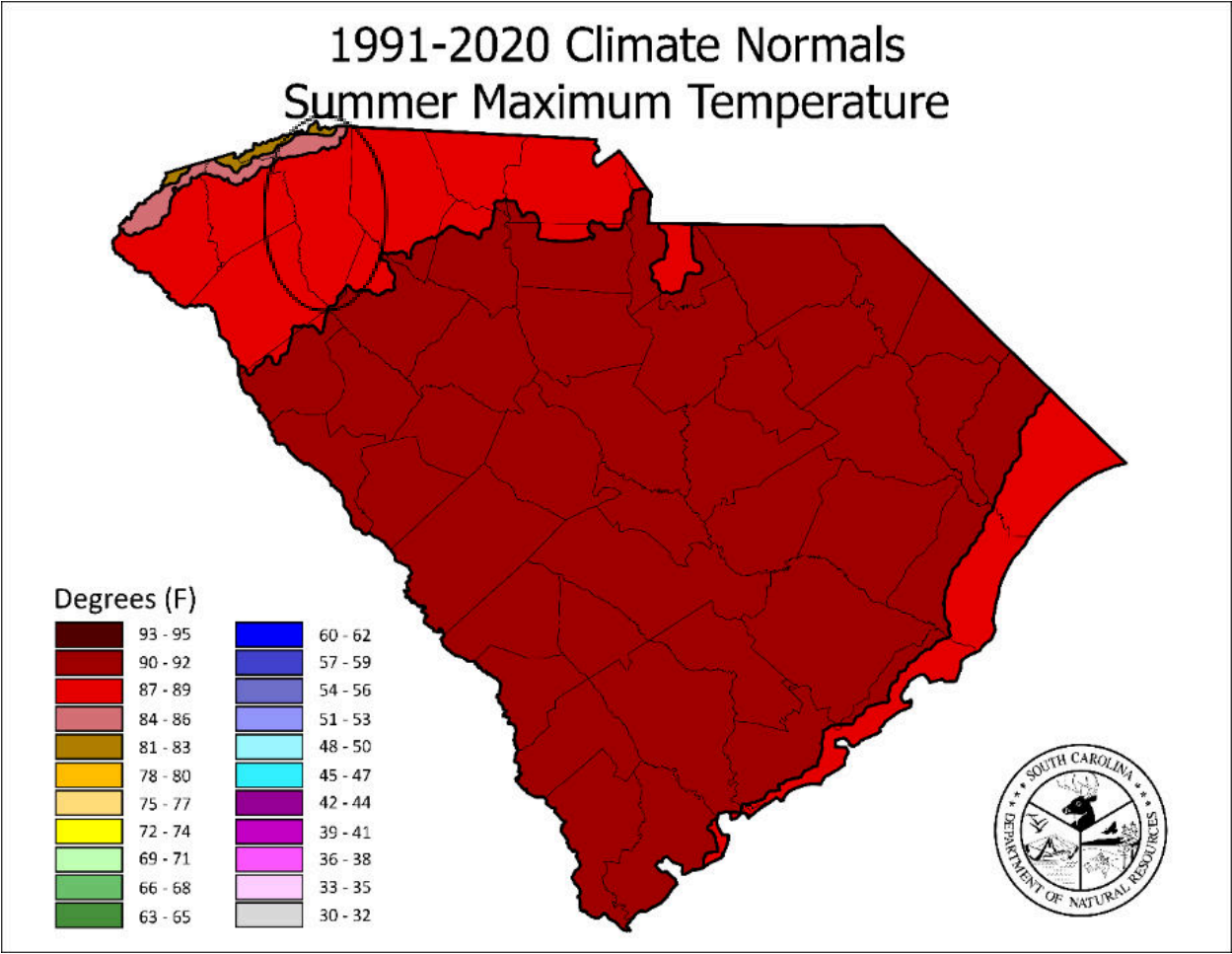


Figure 44. Summer Maximum Climate Normals (SCDNR)

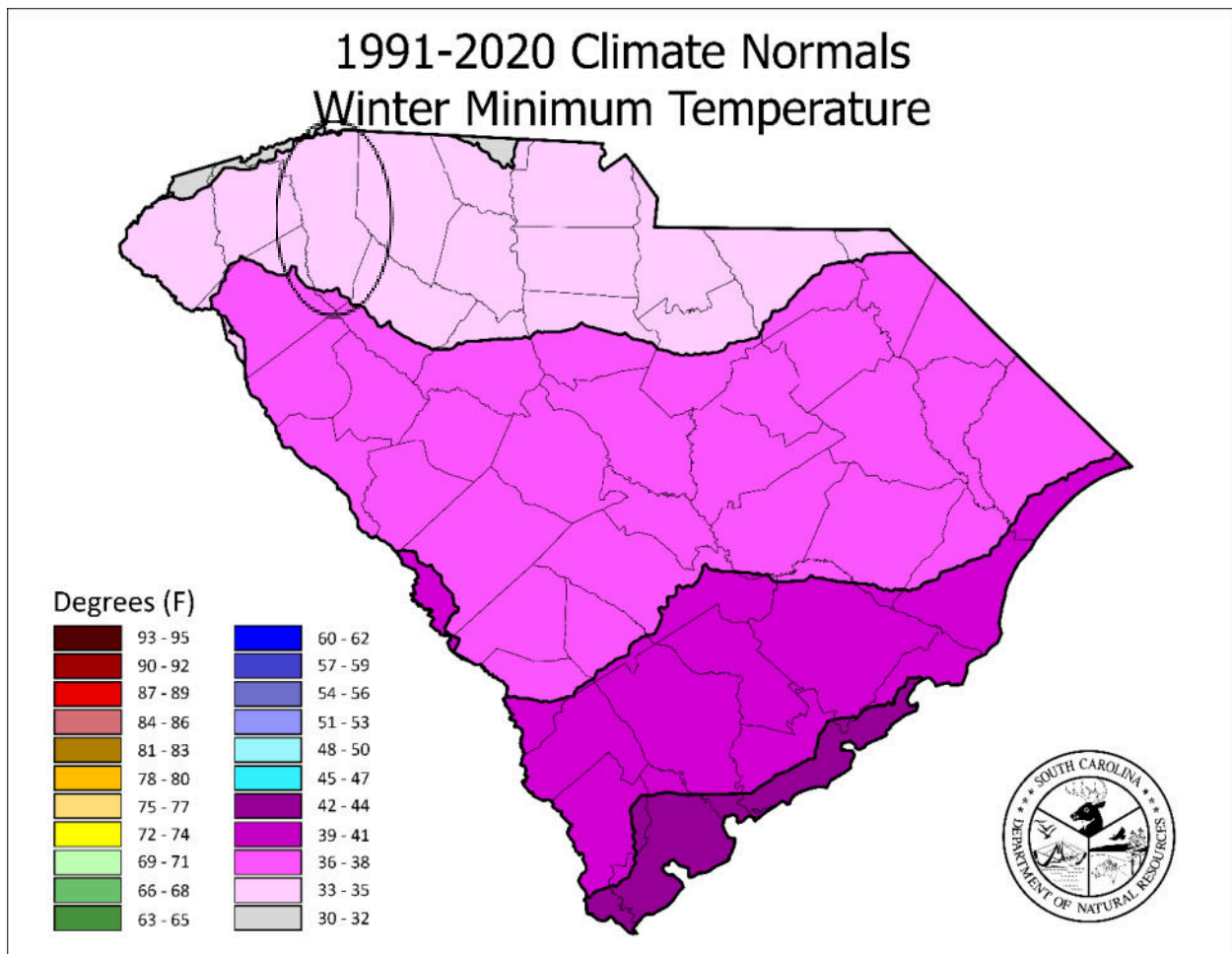


Figure 45. Winter Maximum Climate Normals (SCDNR)

Per the Midwestern Regional Climate Center, from 1973 through 2023, the average hours of Heat index above 90 degrees Fahrenheit, was recorded at 314. Approximately 19 of those hours were recorded at or above 100 degrees Fahrenheit. Figure 46, Annual Average Number of Days with ≥ 1 Hour at Heat Index $\geq 90^{\circ}\text{F}$, provides additional data related to heat issues in Greenville County.

The decrease in overall precipitation (not intensity) coupled with higher temperatures may ultimately impact agriculture, increase risk for wildfires, lead to longer droughts and intense heat waves. Extreme temperatures can intensify other hazards. For example, warmer temperatures may be more favorable to some disease agents or increase public health risk for heat related disorders. Prolonged exposure to increased temperatures with added relative humidity poses a severe public health risk, as shown in Figure 47.

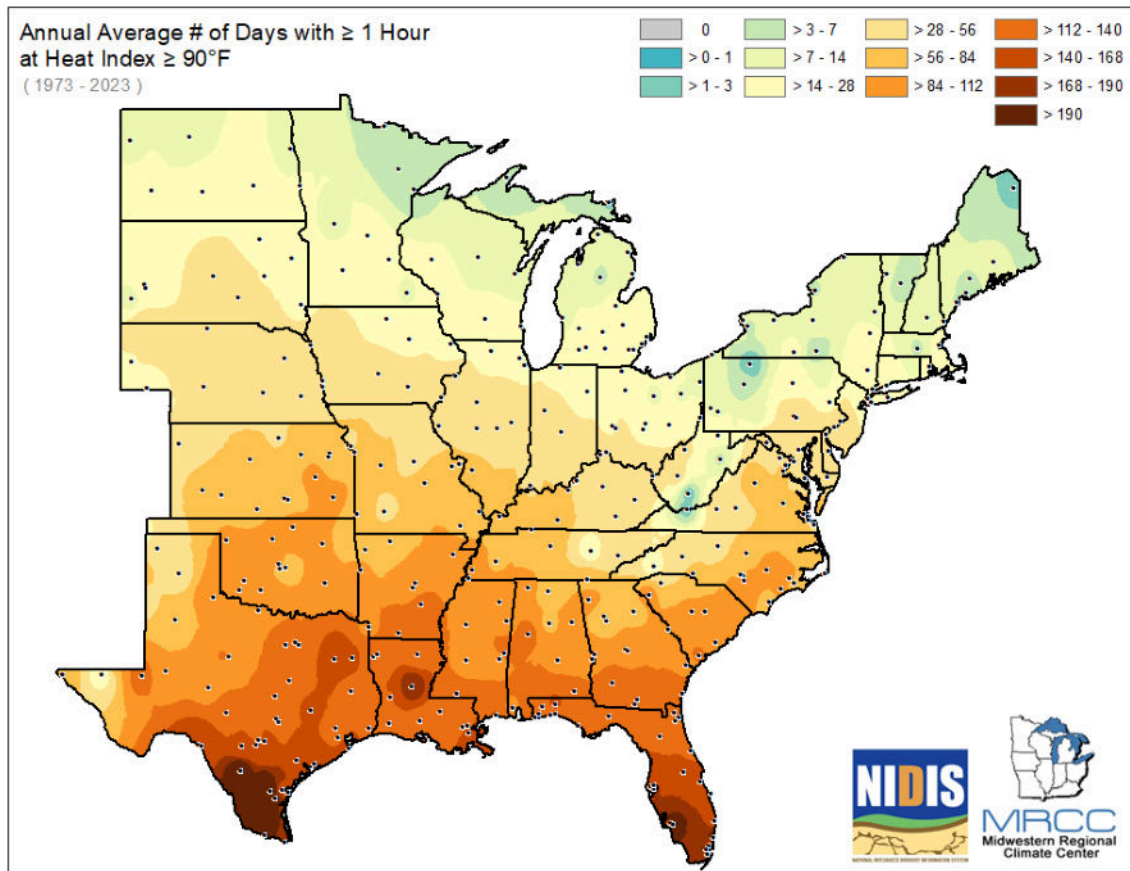


Figure 46. Annual Average # of Days with ≥ 1 Hour at Heat Index $\geq 90^{\circ}\text{F}$

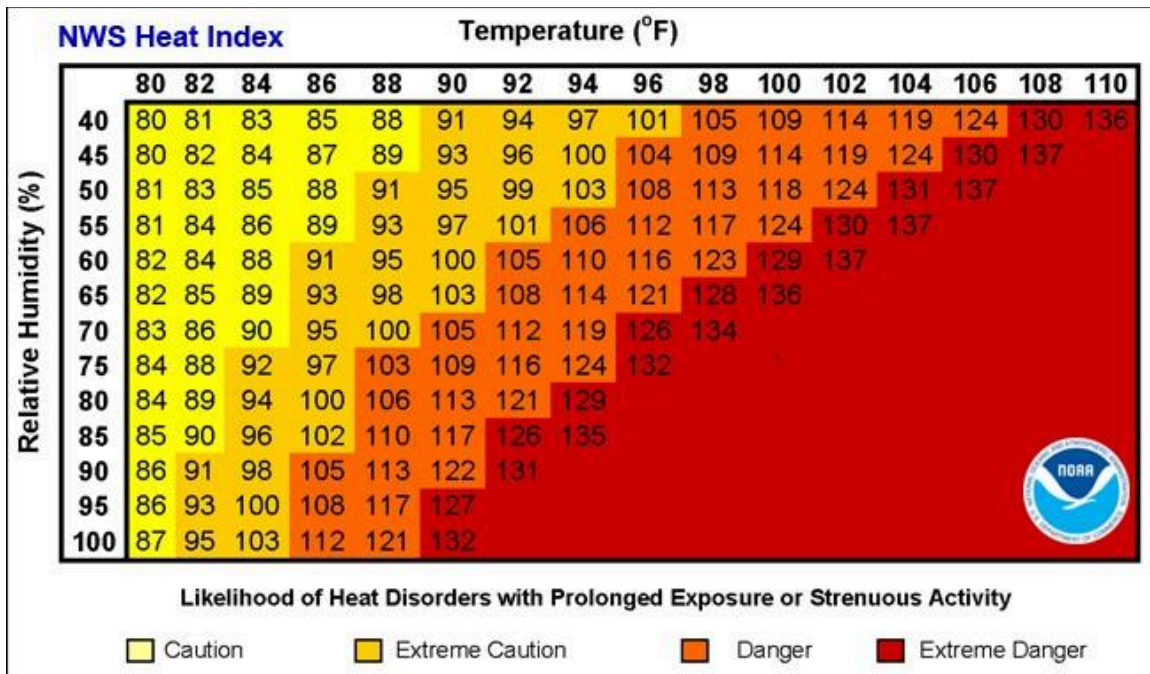


Figure 47. Heat Index Chart (NOAA, NWS)

7.4 Emerging Infectious Disease

A new health risk facing communities is the rise of emerging infectious diseases. The CDC describes infectious diseases as illnesses caused by germs (bacteria, viruses, and fungi) that enter the body, multiply, and can cause an infection. Some of these can be contagious/communicable and can be spread from person to person. Others can spread by germs carried in the air, water, food, or soil and by vectors (biting insects) or animals to humans. Furthermore, the CDC defines emerging infectious diseases as infections that have increased recently or threaten to increase in the near future.

These emerging infectious diseases currently pose an active threat to the citizens of Greenville County or are foreseen to pose a potential threat in the future. Urban areas are considered more vulnerable to diseases transmitted from human to human than rural areas. As the County continues to grow, the risk of emerging infectious diseases will also continue to grow. Older generations and lower income populations may lack proper health care, due to accessibility to proper medical attention and are considered to be at a higher risk.

In 2020, the COVID-19 pandemic was an example of how an infectious disease can affect the economy, health, and all aspects of life, community, and government. According to the South Carolina Hazard Mitigation Plan of 2023, Greenville County reported some of the highest numbers of cases of COVID-19 in the state of South Carolina during 2020 – 2021, with a total of 128,738 reported cases. COVID-19 (SARS-CoV-2) continues to be an emerging infectious disease, but countermeasures and preventative measures have allowed the risk to be managed.

Other emerging infectious diseases that are a current concern are: Pathogenic Avian Influenza (HPAI), Monkeypox, Low Pathogenic Avian Influenza (LPAI), Malaria, West Nile virus and Lyme disease. The state of South Carolina continues to monitor these in collaboration with the County. This plan encourages the County to continue to monitor potential emerging infectious disease outbreaks and propagation. As new developments occur in the control of such diseases, the County should review and incorporate those controls into the plan and planning process, as appropriate.

7.5 Risk Assessment & Social Vulnerability

7.5.1 Risk Assessment

Risk is comprised of two components: 1) the probability of an event occurring and 2) the consequences of that event. That is, if a hazard event occurs frequently, and has very high consequences, then that hazard is considered to pose a very high risk to the affected communities. In comparison, if a hazard event is not expected to occur frequently, and even if it did, the consequences would be minimal, then that hazard is considered to pose a very low risk. The estimation of risk is based on the judgment of the planners regarding both the likelihood of occurrence and its probable consequences.

The relationship between frequency of occurrence and the consequences of an event can be illustrated by the graph in Figure 48. This graph illustrates that some hazards can be defined as “low risk,” for they do not occur often and/or do not result in significant impacts when they do. In comparison, other hazards may occur more frequently and/or have severe consequences when they do, which puts them in the “high risk” category. The hazards addressed in Section 7.1 are a threat to Greenville County and are assessed for their probability of occurrence and their likely consequences.

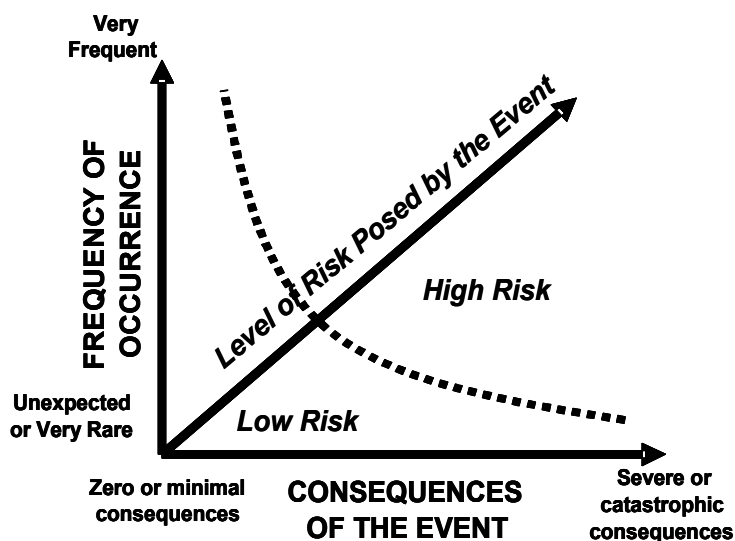


Figure 48. Estimation of Risk

By considering the relative risk of the hazards that threaten Greenville County, greater priority can be given to the “higher” risk hazards to most effectively utilize the time and resources available for the mitigation planning process. In this way, the planning approach used for Greenville County supports what can be termed “risk-based planning” because it facilitates the participants’ capabilities to focus on the highest risk hazards.

In earlier HMPs, the DMC derived a “relative risk score” using a qualitative process in which planners recorded, on a numeric scale, the likely frequency of occurrence, the extent of the community that would be impacted, and the likely consequences in terms of public safety, property damage, economic impact and harm to valuable environmental resources. The numeric total of the assessments of each of these is considered to constitute the “relative risk score.” The risk estimation numeric factors used in the planning process are listed in Table 22. In the table below, green represents low risk, yellow represents medium risk, and red represents high risk.

Table 22. Risk Estimation Factors

RISK FACTOR	EVALUATION CRITERION	ASSIGNED VALUE
Probability of Occurrence	Unknown but rare occurrence	1
	Unknown but anticipate an occurrence	2
	Unknown, but rare occurrence	1
	Unknown, but occasional occurrence	2
	100 years or less occurrence	3
	25 years or less occurrence	4
	Once a year or more occurrence	5
Area Impacted	No developed area impacted	0
	Less than 25% of developed area impacted	1
	Less than 50% of developed area impacted	2
	Less than 75% of developed area impacted	3
	Over 75% of developed area impacted	4
Health and Safety Consequences	No health or safety impact	0
	Few injuries/illnesses	1
	Few fatalities or many injuries/illnesses	2
	Numerous fatalities	3
Consequences to Property	No property damage	0
	Few properties destroyed or damaged	1
	Few destroyed – many damaged	2
	Few damaged – many destroyed	2
	Many properties damaged and destroyed	3
Consequences to Environmental Resources	Little or no environmental damage	0
	Resources damaged with short term recovery practical	1
	Resources damaged with long term recovery feasible	2
	Resources destroyed beyond recovery	3
Economic Consequences	No economic impact	0
	Low direct and / or low indirect costs	1
	Low direct and high indirect costs	2
	High direct and low indirect costs	2
	High direct and high indirect costs	3

A single, numerical value is selected from each of the five risk factors. The five values are then used to derive a total relative risk value for a particular hazard that is “weighted” for the probability of its occurrence.

The total relative risk for a particular hazard is calculated by adding the selected numeric values for each of the “Area Impacted,” “Health and Safety Consequences,” “Consequences to Property,” “Consequences to Environmental Resources” and “Economic Consequences” and multiplying this total by the numeric value selected for the “Probability of Occurrence,” as illustrated in this formula:

$$\left[\text{Area Impacted} + \text{Health and Safety Consequences} + \text{Consequences to Property} + \text{Consequences to Environmental Resources} + \text{Economic Consequences} \right] \times \text{Probability of Occurrence} = \text{Relative Risk}$$

Figure 49. Relative Risk Calculation

The resulting numeric value for relative risk can vary from zero, meaning the identified hazard poses no estimated risk at all to the jurisdiction, up to a maximum of 80, which means that the hazard poses a very substantial risk to the jurisdiction. Pursuant to the requirements of the Disaster Mitigation Act of 2000, Greenville County was required to evaluate a prescribed list of natural hazards. These hazards were: flood, winter storms, high winds/tornados, wildfires, earthquakes, drought, landslides, and hail. While many of these hazards are relevant to Greenville County, some are much less relevant due to the geographic location and characteristics of the planning area.

To derive the estimates of risk for each hazard, available information regarding the geographic areas that may be impacted, as well as population, infrastructure, and facilities within those impacted areas was utilized. The Probability of Occurrence was based on the potential of an event occurring that causes loss of life or measurable structural or environmental damage. This analysis included available inventories of valuable environmental resources, as well as factors that are influential to the economic well-being of the community. For much of the County, this information was available in a geographic information system (GIS) database or was accessed from internet websites and existing databases available from state and federal agencies.

For the Greenville County planning area, the results of the hazard identification and risk estimation process are shown in Table 23. The numeric criteria used for this analysis are defined above. Risk is relative, therefore for the table below green represents low risk (score = 0 – 20), yellow represents medium risk (score = 21 – 40), and red represents high risk (score > 41).

Table 23. Risk Estimation

Hazard	Probability of Occurrence	Consequence of Occurrence					Risk Rating
		Area of Impact	Health & Safety	Property	Environment	Economic	
Flood	5	2	1	2	1	3	45
Winter Storms	5	3	2	1	1	2	45
High Winds/ Tornados	4	2	2	2	2	3	44
Wildfires	5	3	1	1	2	2	45
Earthquakes	1	4	2	2	3	3	14
Drought	4	4	1	0	2	2	36
Landslides	1	1	1	1	1	1	5
Hail	4	3	1	1	2	2	36

The highest risk hazards throughout the planning area, in descending order based on the relative risk ratings, are:

1. Flood, Winter Storms, and Wildfires
2. High Winds / Tornados
3. Drought and Hail
4. Earthquakes
5. Landslides

Table 24 below was compiled from the 2023 South Carolina State Hazard Mitigation Plan. This table quantifies past events and provides insight into what can be expected in the future in terms of damage and risk to life. When looking at recent impacts, high winds, winter storms, and tornados have the highest annualized damage costs. No deaths or injuries were reported from 2015-2020. Over the period of record, winter storms have the highest cost and the largest death toll. It is important to note that unlikely events can still result in devastating effects.

Table 24. Summary of Historical and Recent Hazard Events

Hazard	Historical Events (1960-2020)			Recent Impact (2015-2020)		
	Annualized Losses	Deaths	Injuries	Annualized Losses	Deaths	Injuries
Flood	\$472,036	4	9	\$378,526	0	0
Winter Storms	\$1,758,480	14	2	\$8,757,183	0	0
Tornados	\$172,645	0	24	\$980,264	0	0
High Winds	\$944,527	1	17	\$8,812,019	0	0
Wildfires	\$0	0	0	\$0	0	0
Earthquakes	\$0	0	0	\$0	0	0
Landslides	\$0	0	0	\$0	0	0
Hail	\$29,095	1	3	\$0	0	0

FEMA's National Risk Index also computes a risk index score to determine a community's potential for negative impacts as a result of a natural hazard. The risk equation behind the Risk Index includes three components: a natural hazards component (Expected Annual Loss), a consequence enhancing component (Social Vulnerability), and a consequence reduction component (Community Resilience). The dataset supporting the natural hazards component provides estimates measured in 2022 U.S. dollars. The datasets supporting the consequence enhancing and consequence reduction component have been standardized using a minimum-maximum normalization approach prior to being incorporated into the National Risk Index risk calculation. Using these three components, composite Risk Index values and hazard type Risk Index values are calculated for each community (county and Census tract) included in the Index. Risk Index values form an absolute basis for measuring Risk within the National Risk Index, and they are used to generate Risk Index percentiles and ratings across communities.

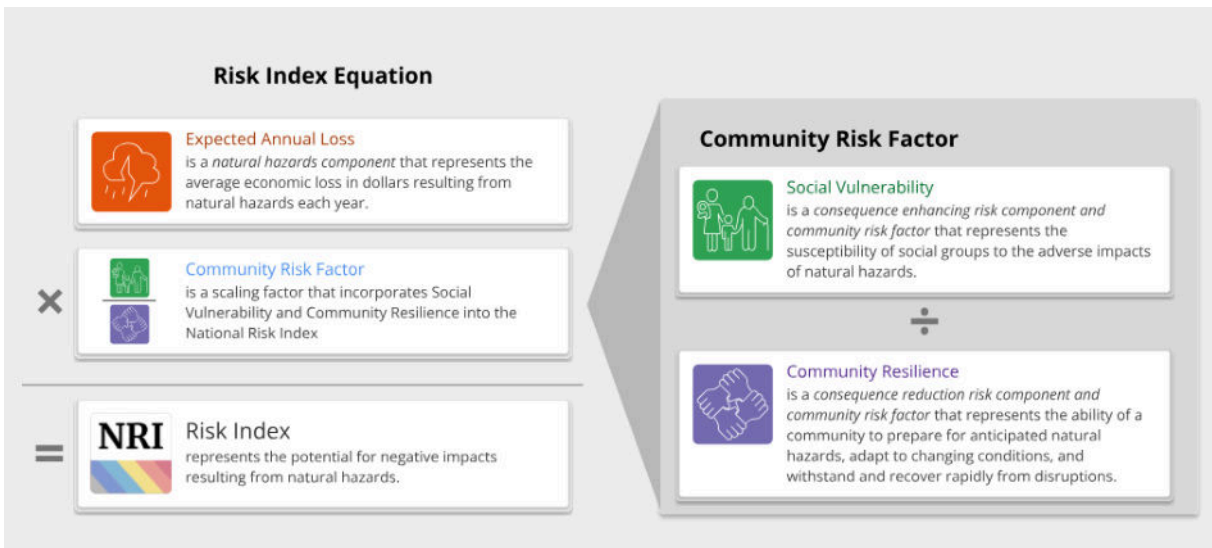


Figure 50. Risk Index Equation

Each community has a composite Risk Index score and up to 18 hazard type Risk Index scores (e.g., Tornado Risk Index score). A composite Risk Index percentile measures the relative risk of a community based on all 18 natural hazards included in the Index by comparing its composite Risk Index value with other communities at the same level.

A hazard type Risk Index percentile measures the relative risk of a community for a specific hazard type by comparing its hazard type Risk Index value with other communities at the same level. Figure 51 below shows the composite risk index score for all census tracts within Greenville County. The composite risk index score for all natural hazards across the County ranges from very low to relatively moderate when compared to all US Census tracts. The majority of the northern and southern portions of the County are very low risk, whereas the central portion of the County is relatively very low risk with relatively moderate risk around Mauldin, Fountain Inn, and Greer. Figure 52 below shows the composite risk index score by census tract with the flood zones overlayed for the 30 planning areas in Greenville County. Figure 53 through Figure 56 below show the three planning areas with the highest overall risk score in Greenville County (relatively moderate). These maps also show the flood zones as well as critical facilities in these areas of high risk. The final set of maps shows the future land use for Greenville County, the 30 planning areas, and the three areas with relatively moderate risk. Figure 57 through Figure 59 are zoomed in figures of the three planning areas with relatively moderate risk (Greer City, Mauldin City, and Golden Strip East).

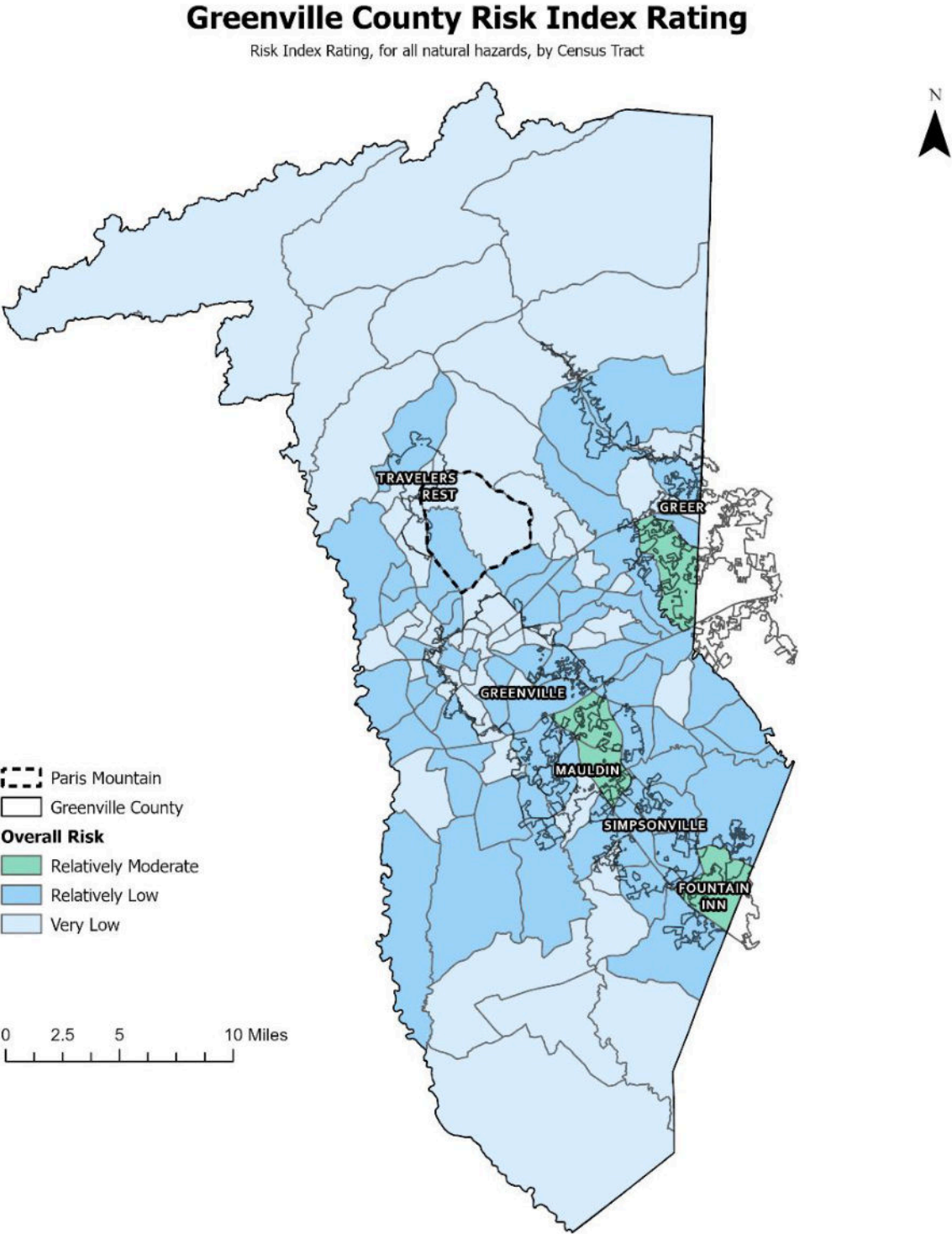


Figure 51. Greenville County Risk Index Rating

Greenville County Risk Index Rating

Risk Index Rating, for all natural hazards, by Census Tract

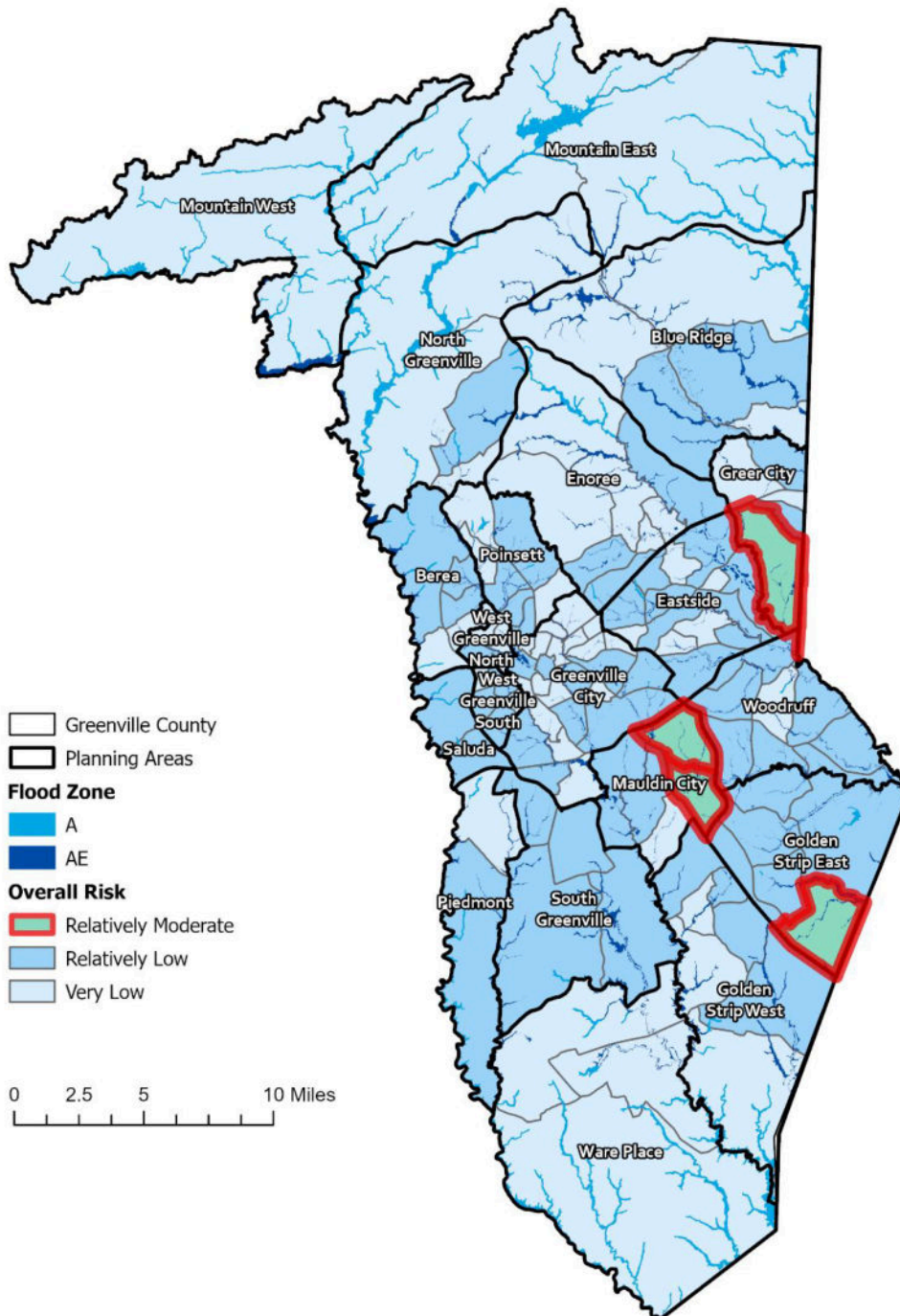


Figure 52. Greenville County Risk Index Rating with Planning Areas

Greenville County Risk Index Rating and Critical Facilities

Risk Index Rating, for all natural hazards, by Census Tract

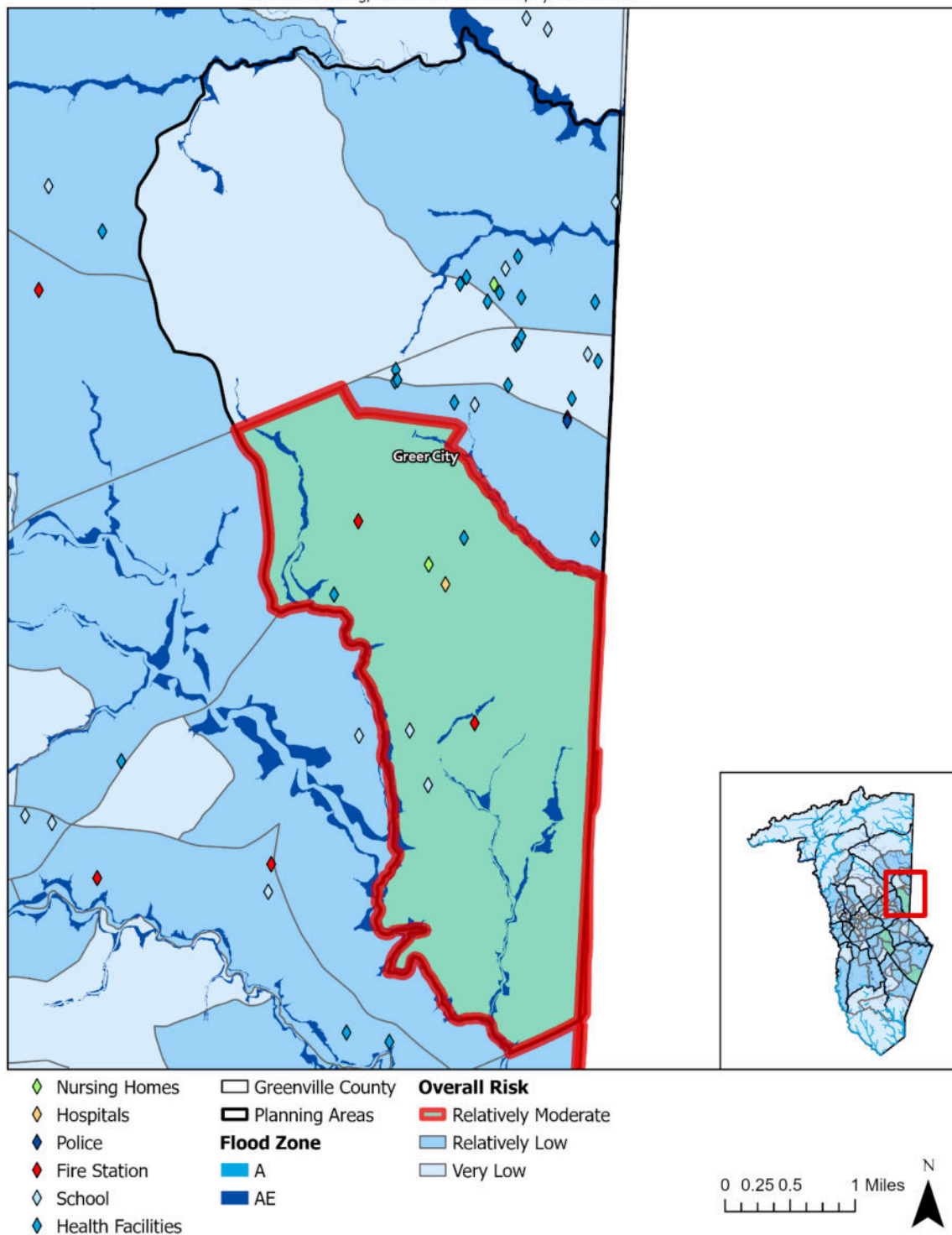


Figure 53. Greer City Planning Area – Risk, Flood Zone, and Critical Facilities

Greenville County Risk Index Rating and Critical Facilities

Risk Index Rating, for all natural hazards, by Census Tract

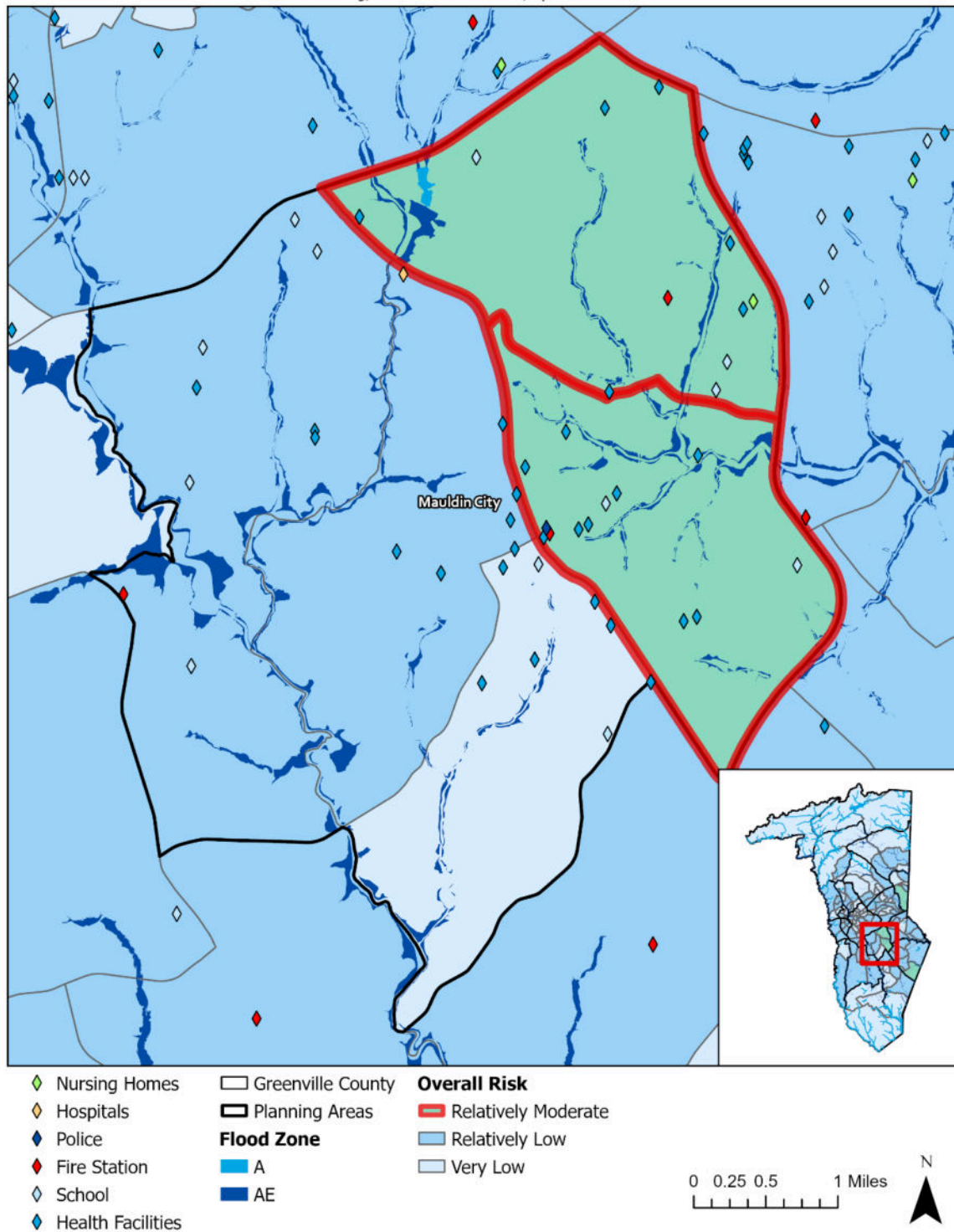


Figure 54. Mauldin City Planning Area – Risk, Flood Zone, and Critical Facilities

Greenville County Risk Index Rating and Critical Facilities

Risk Index Rating, for all natural hazards, by Census Tract

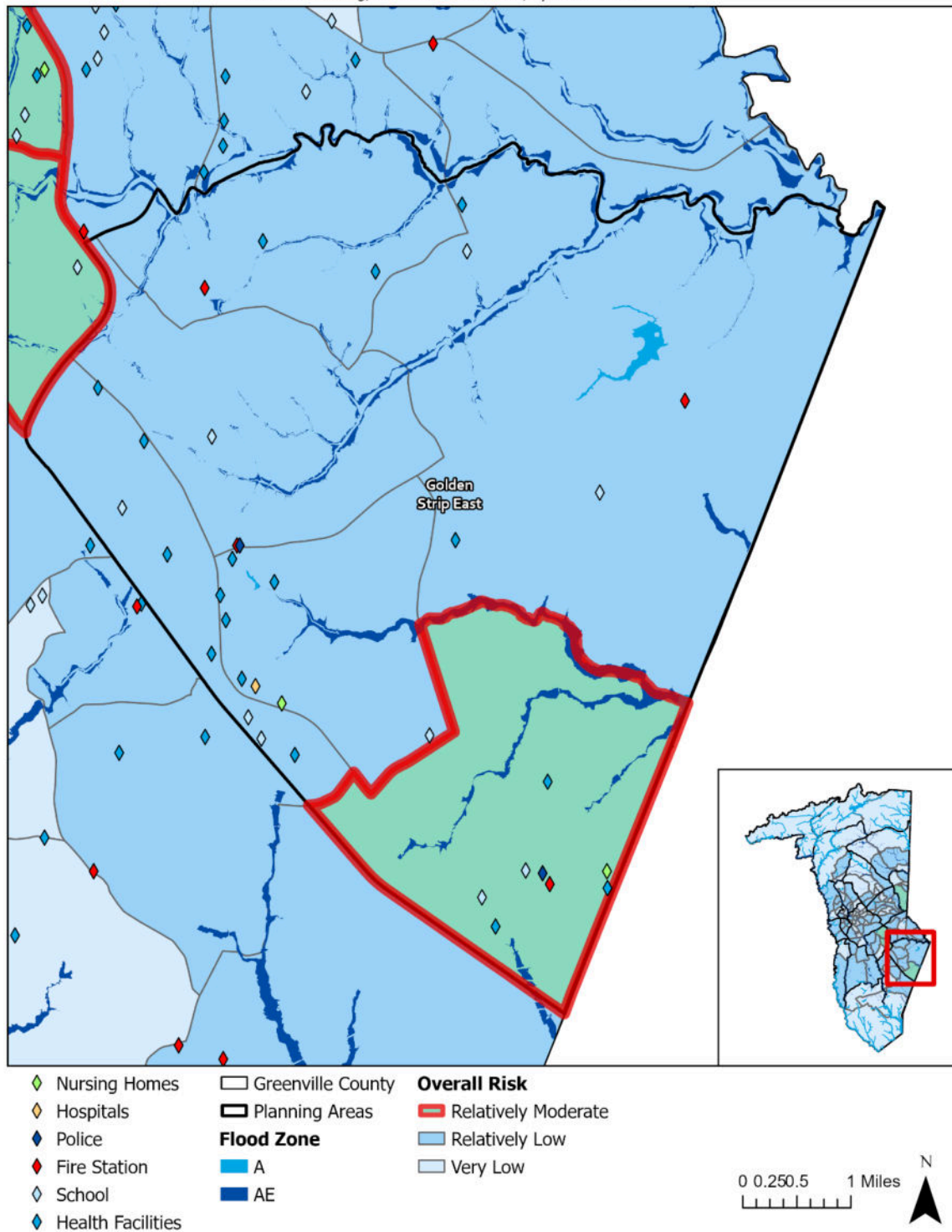


Figure 55. Golden Strip East Planning Area – Risk, Flood Zone, and Critical Facilities

Greenville County Risk Index Rating and Future Land Use

Risk Index Rating, for all natural hazards, by Census Tract

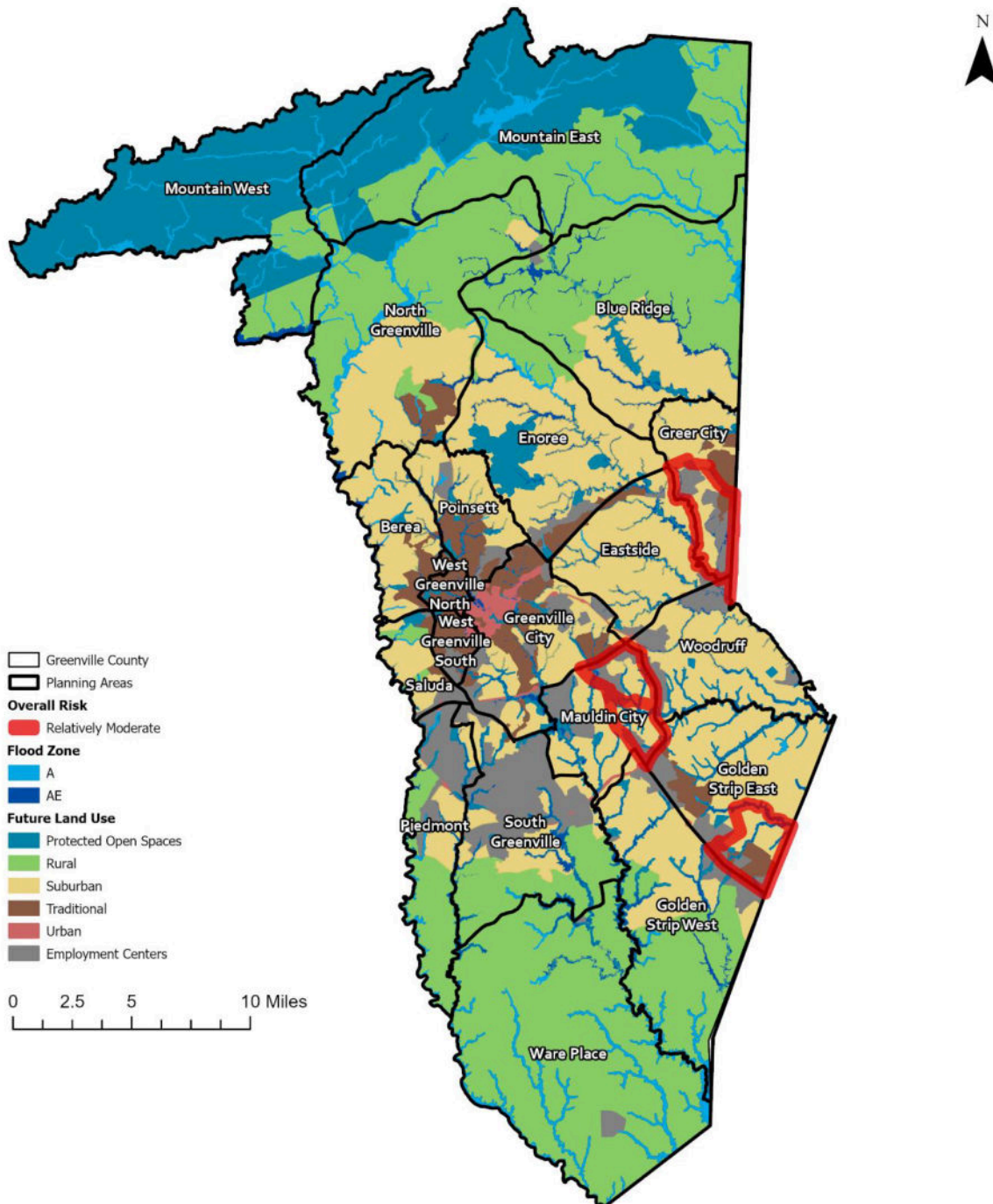


Figure 56. Greenville County Risk Index Rating (Relatively Moderate) with Future Land Use

Greenville County Risk Index Rating and Future Land Use

Risk Index Rating, for all natural hazards, by Census Tract

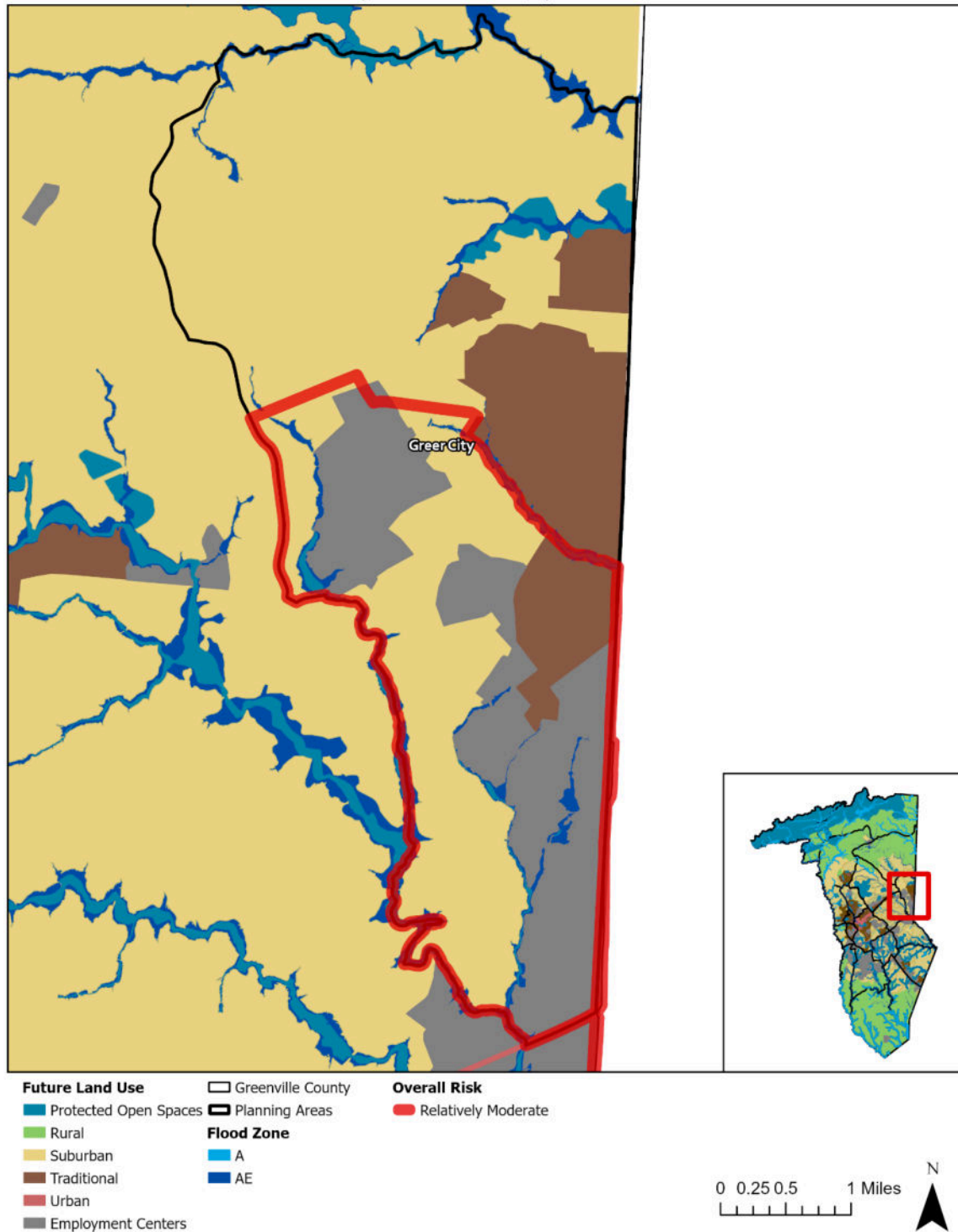


Figure 57. Greer City Planning Area – Risk with Future Land Use

Greenville County Risk Index Rating and Future Land Use

Risk Index Rating, for all natural hazards, by Census Tract

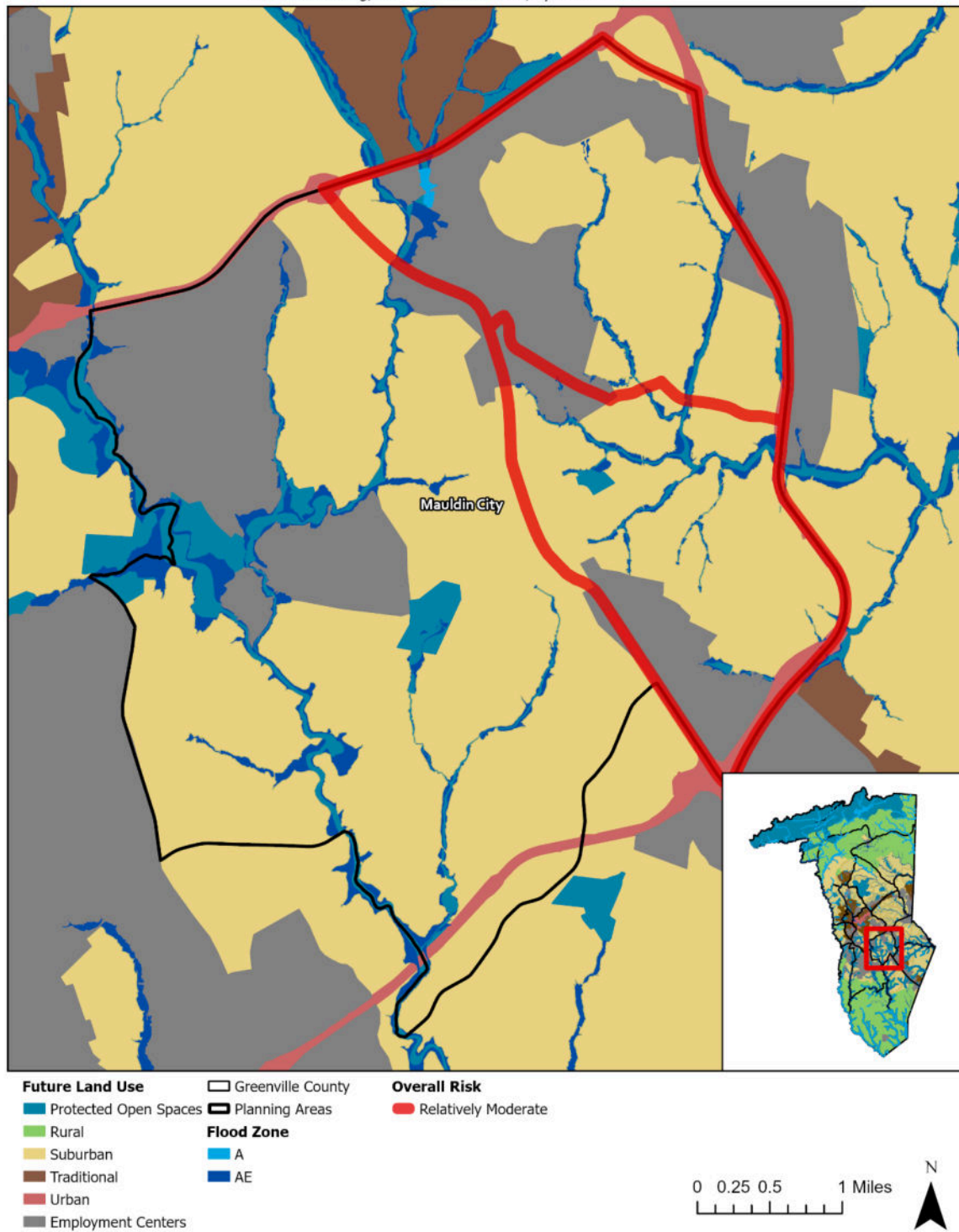


Figure 58. Mauldin City Planning Area – Risk with Future Land Use

Greenville County Risk Index Rating and Future Land Use

Risk Index Rating, for all natural hazards, by Census Tract

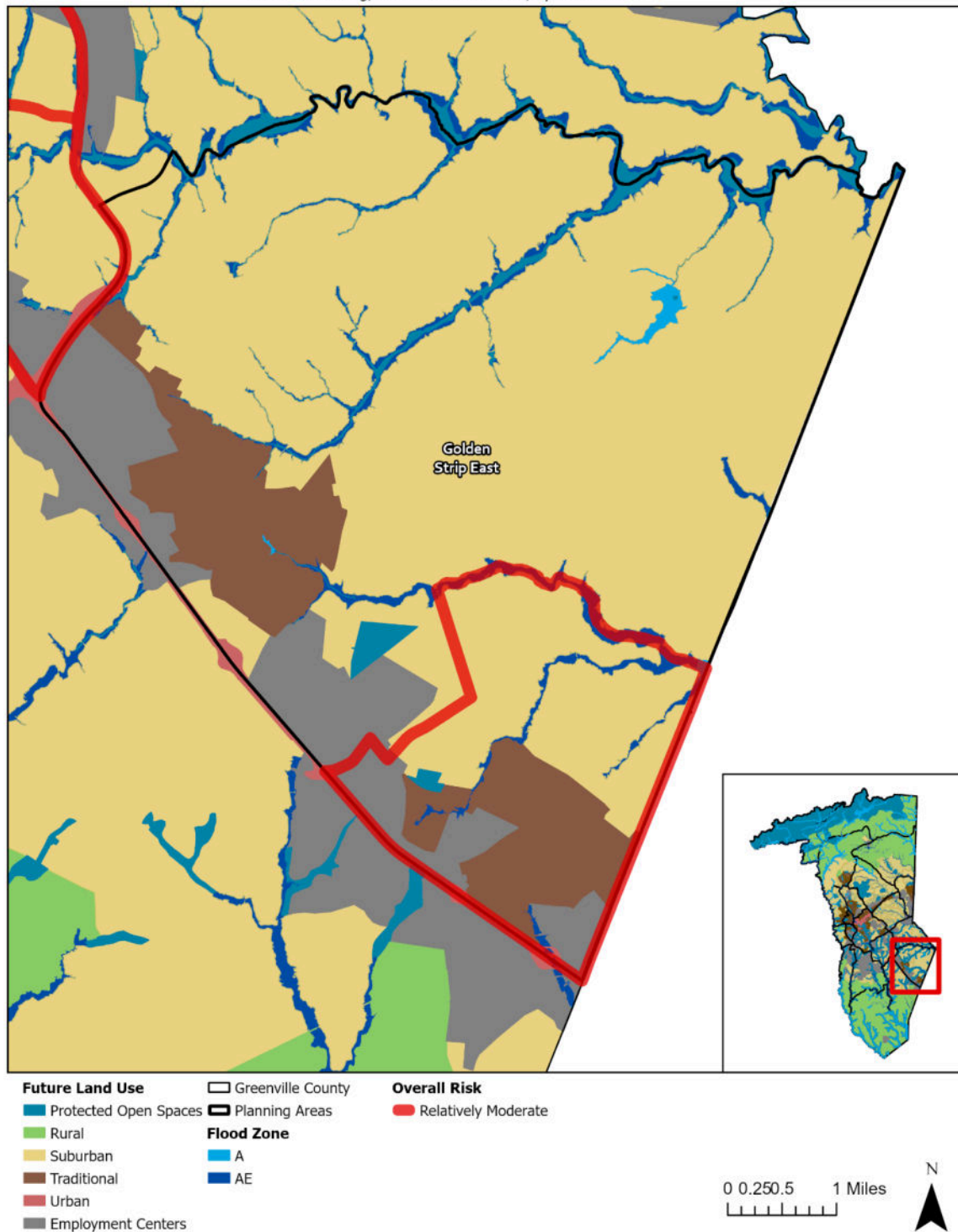


Figure 59 Golden Strip East Planning Area – Risk with Future Land Use

7.5.2 Social Vulnerability

Social vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. Every community must prepare for and respond to hazardous events, whether a natural disaster like a tornado or a disease outbreak, or an anthropogenic event such as a harmful chemical spill. The degree to which a community exhibits certain social conditions, including high poverty, low percentage of vehicle access, or crowded households, may affect that community's ability to prevent human suffering and financial loss in the event of disaster. These factors describe a community's social vulnerability. Social vulnerability and factors that may influence a citizen's inability to adequately prepare for and recover from natural disasters were given special consideration in the development of this plan and when determining appropriate mitigation measures. Multilingual messages, food islands, heating and cooling, and other social equity issues were discussed and considered in developing mitigation measures. While some measures are targeted to help specific groups, all selected measures are to be applied equally across the County.

As a consequence, enhancing risk component of the National Risk Index, a Social Vulnerability score and rating represent the relative level of a community's social vulnerability compared to all other communities at the same level. A community's Social Vulnerability score measures its national rank or percentile. A higher Social Vulnerability score results in a higher Risk Index score. There are multiple census derived factors contained within four (4) themes that are generally taken into consideration to determine the SVI for a community which are shown in Figure 60 below.

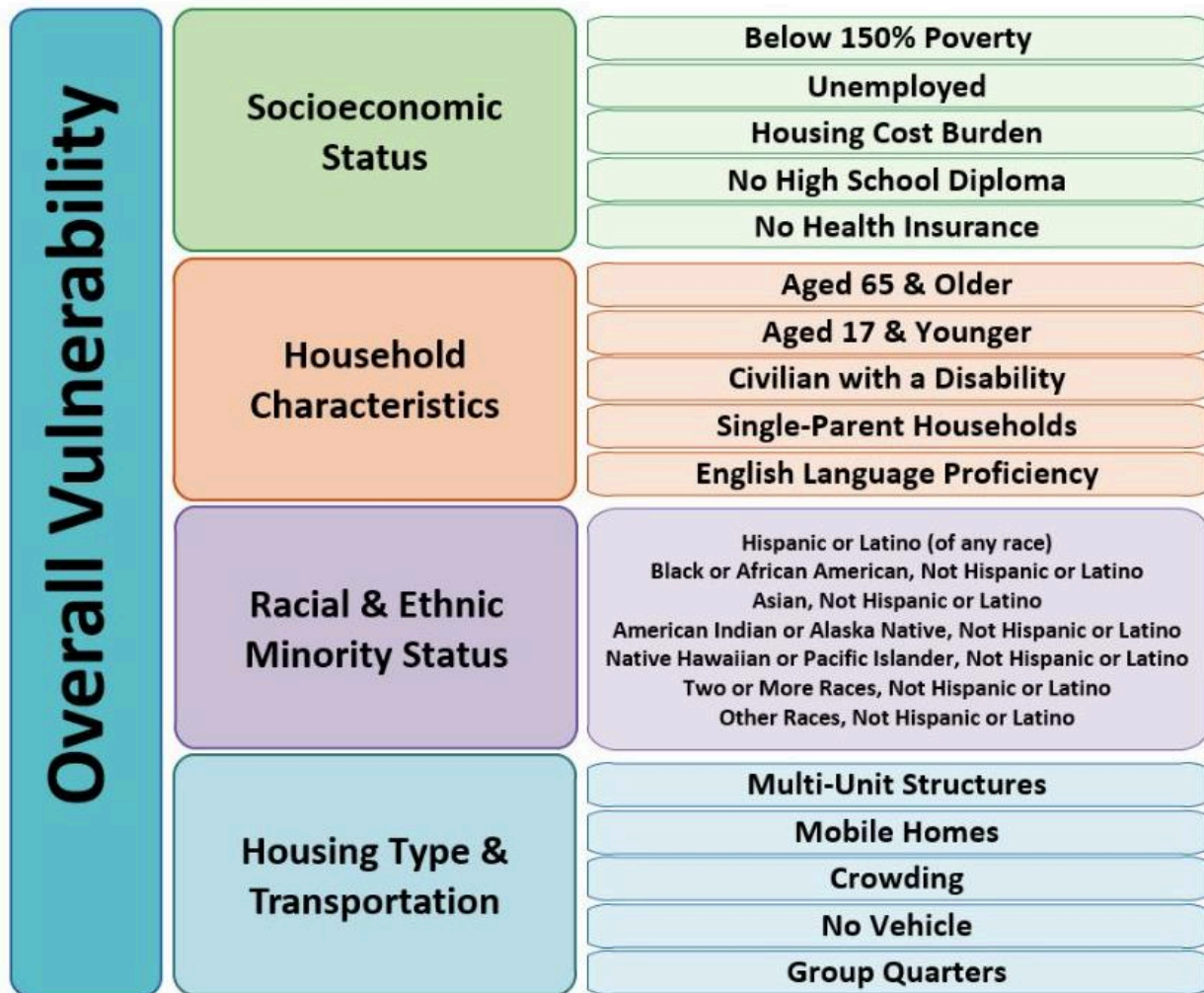


Figure 60. Social Vulnerability Index Themes

By combining these factors, a social vulnerability index rating is determined that provides a comprehensive assessment of the community's susceptibility to negative impacts from a natural disaster. The individual social vulnerability themes, by Census Tract, for Greenville County, is shown in Figure 61.

Greenville County Social Vulnerability Themes

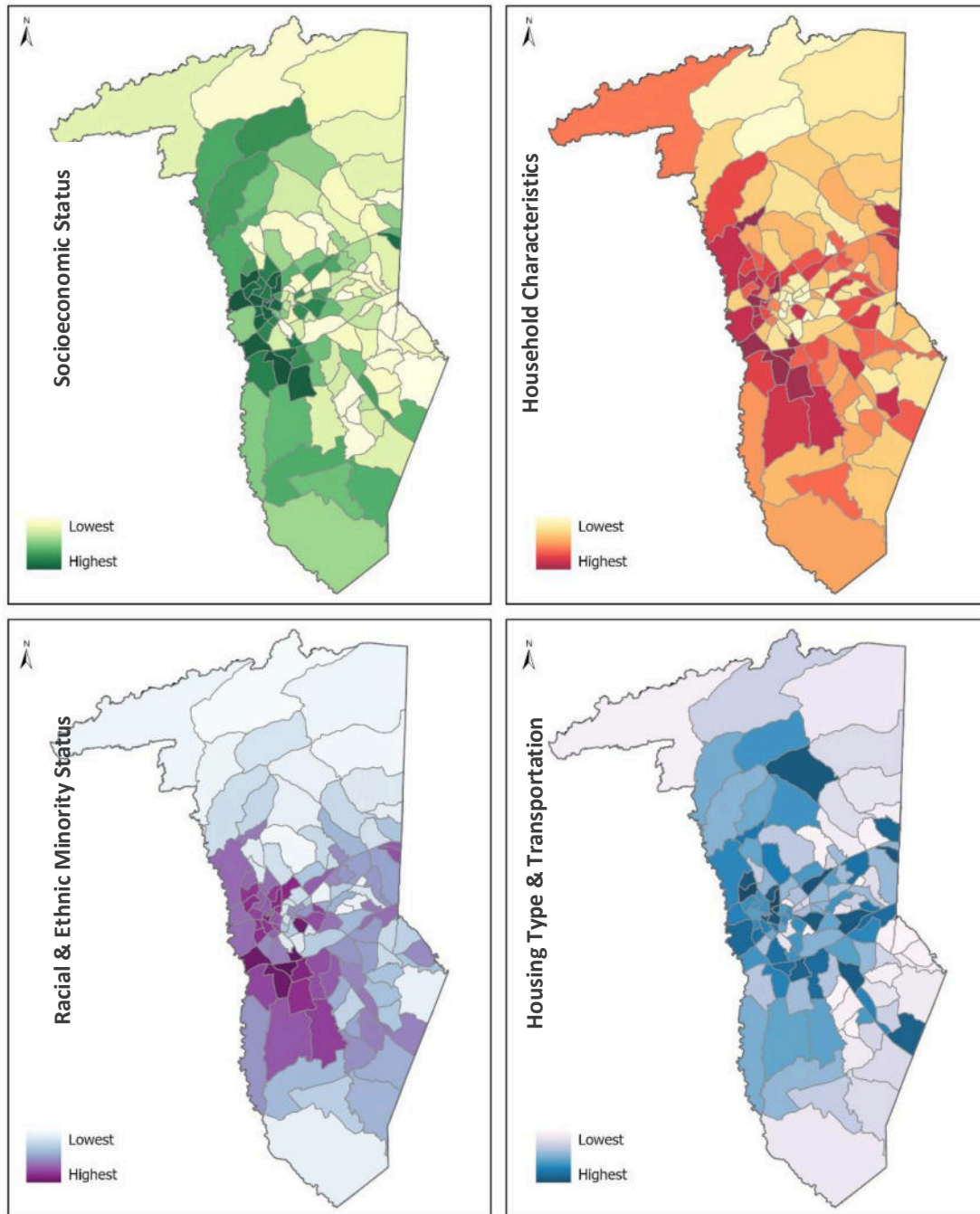


Figure 61. Greenville County Social Vulnerability Index Themes

The SVI obtained from FEMA's National Risk Index indicates that Greenville County's Social Vulnerability is relatively high, meaning that the community's susceptibility to adverse impacts of natural disasters is relatively high when compared to the rest of the U.S. Within South Carolina, Greenville County is in the 20th percentile which means its

social vulnerability is lower than approximately 80% of the other counties in South Carolina. By identifying the more vulnerable parts of the community, those areas can be targeted for additional support from first responders, public health officials, and others who can provide support before, during, and after hazardous events.

Furthermore, Greenville County's overall social vulnerability (combination of all four themes), was analyzed, per Census Tract, and is shown in Figure 62. The social vulnerability ratings for the City of Greenville's census tracts range from very low to very high with the highest social vulnerability ratings in the central eastern portion of the County, south of the City of Greenville, and around Mauldin, Fountain Inn, and Greer.

Greenville County Social Vulnerability Index Rating

Social Vulnerability Index Rating by Census Tract

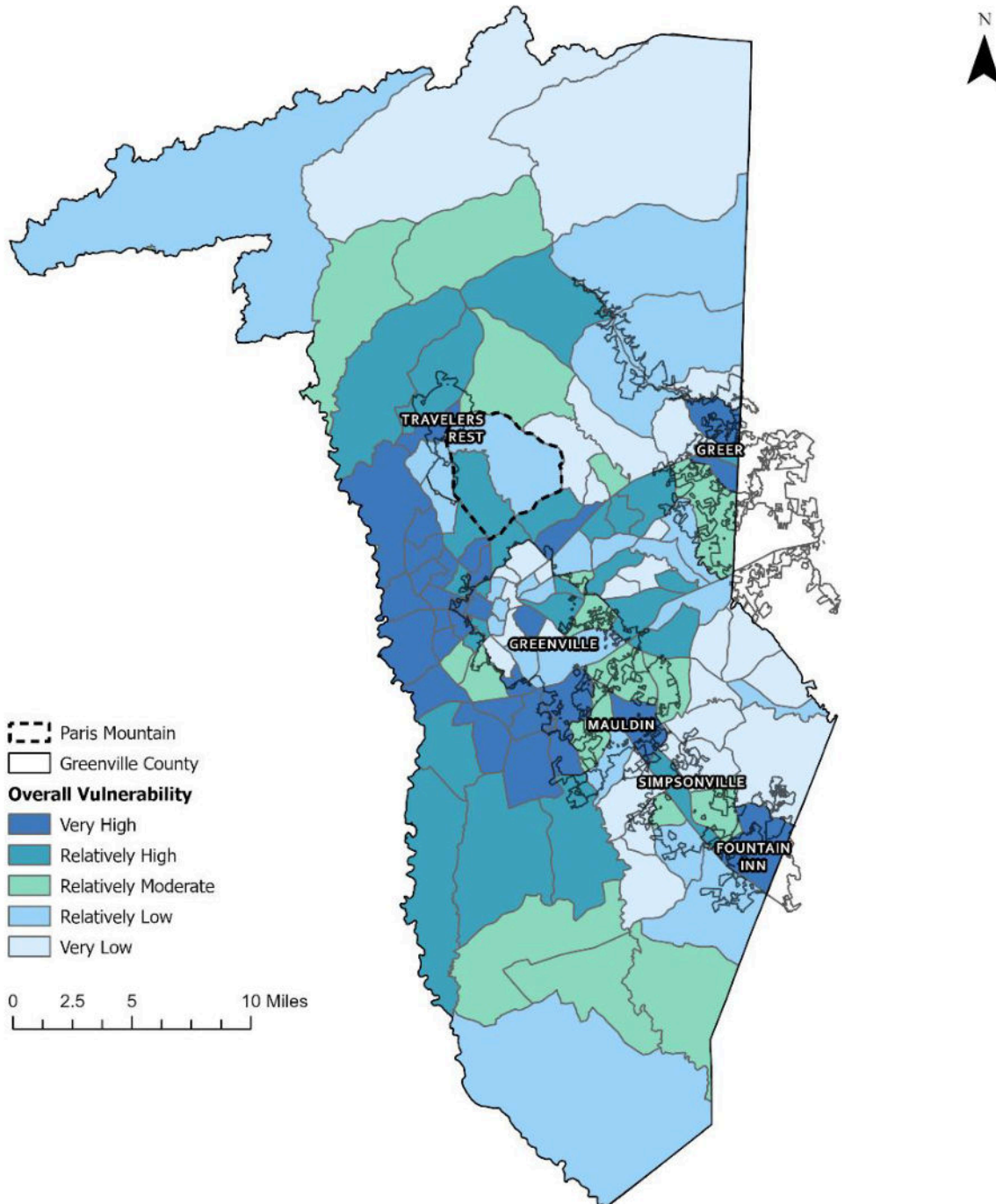


Figure 62. Overall Social Vulnerability Index

Additional information such as total property values, NFIP Repetitive Loss data, land use trends, and critical facilities also contributed to the assessment of the County's overall vulnerability to natural disasters. Table 25 below provides general demographics for Greenville County as reported by the US Census Bureau 2020 report.

Table 25. General Demographics

General Demographics	
Population	525,534
Ethnicity (Population of One Race)	
White	72.35%
Black or African American	18.06%
American Indian or Alaska Native	0.50%
Asian	2.66%
Native Hawaiian and Other Pacific Islander	0.09%
Other	6.34%
Age	
0-19 Years	24.9%
Over 65 Years	17.1%
Education	
Bachelor's Degree or Higher	42%
Median Household Income	\$76,334
People in Poverty	11.3%
Housing Units	226,215
Median Value	\$326,100

A spatial population reference, per Census Tract, for the County can be seen Figure 63.

Greenville County Total Population

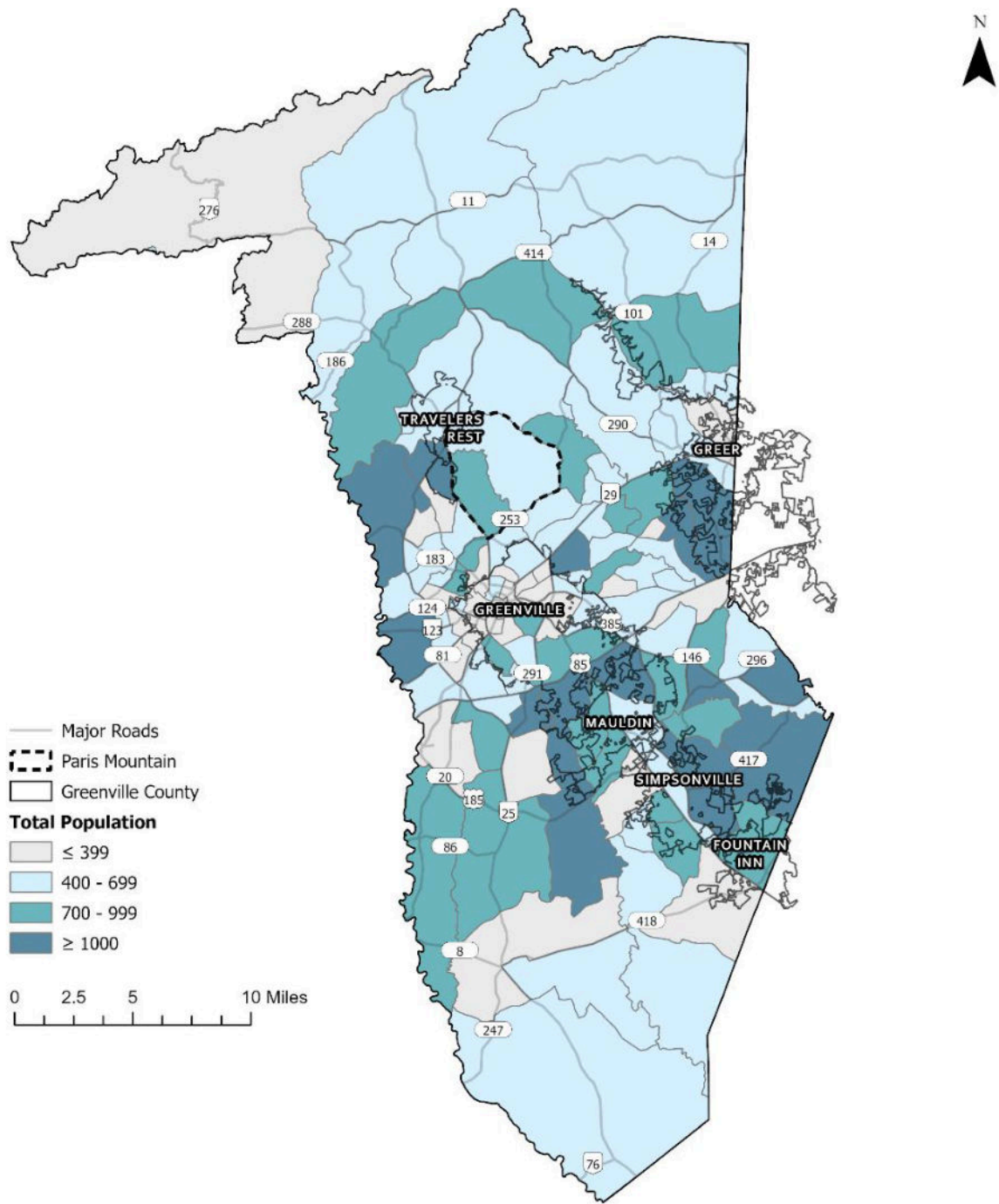


Figure 63. Total Population by Census Tract

Repetitive Loss Properties/Repetitive Loss Area Plan

Repetitive Loss (RL) properties are another indicator of the vulnerability to flood hazards. RL properties are those that have filed two or more flood insurance claims over the previous ten (10) years, exceeding \$1,000. Greenville County has been diligent in reducing the number of repetitive loss properties through the County's structure acquisition program. As of January 2025, Greenville County has 18 repetitive loss properties. The properties are residential properties spread across the County and are not part of a single watershed or flooding area. Owners of these properties have been approached by the County as part of the County's ongoing acquisition program but have not accepted the invitation to be purchased. As part of the County's continual effort to address the remaining repetitive loss properties, the County provides annual public outreach to the impacted homeowners and is open to potential purchase of the remaining properties. An example of the letter sent to the County's repetitive loss areas is contained in Appendix E. The County is also attentive to creating, implementing, and enforcing floodplain management policies to prevent additional structures from becoming repetitive loss properties.

The City of Greenville has 3 repetitive loss properties. Appendix E includes the repetitive loss area maps for the three properties within the City of Greenville. The City of Greer, Travelers Rest, and Fountain Inn reported that there are no repetitive loss properties within their jurisdictions. The City of Mauldin has participated in the FEMA home buyout program to remove homes at risk of flooding. There are no active acquisitions on-going, but Mauldin continues to monitor other homes at risk for program eligibility. The City of Simpsonville has one (1) property that has suffered repetitive flooding, but it is not listed on FEMA's repetitive loss list. This structure has been identified, however, as a potential acquisition project.

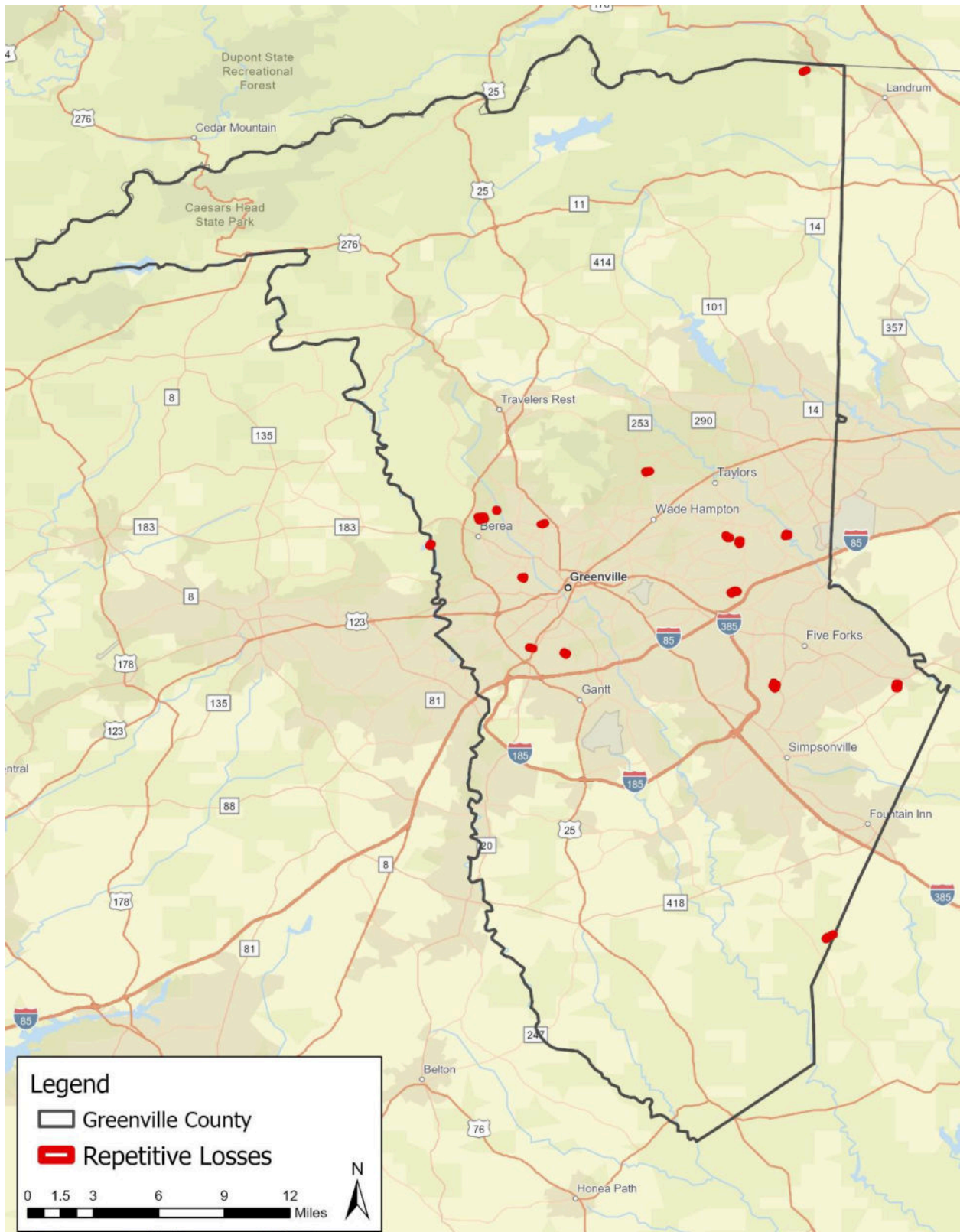


Figure 64. Repetitive Loss Areas

Land Use Trends

The DMC recognizes that land use, especially land within known hazard-prone areas, is a key measure of a community's vulnerability. It is recognized that hazard-prone areas, such as floodplains, may be more appropriately used for recreation and natural areas than for development. The DMC recognizes that its efforts, particularly to identify the areas at risk from various hazards, are a key factor in guiding the careful use of land to minimize future vulnerabilities to disaster. "Plan Greenville County" goals and objectives are an integral part of this plan and, likewise, this plan will become a part of the comprehensive plan. To further lessen its vulnerability to flood hazards, the County is an active participant in the CRS and is ranked a class 7. The County has also adopted the International Building Code Standards as amended by the State of South Carolina.

Critical Facilities

Critical facilities such as government operations and emergency services, healthcare, education, utilities, and shelters have been given special consideration in the planning process. These facilities have been mapped and reviewed for vulnerability to hazards. Continuation of service is essential to response and recovery operations and are included in the County's emergency operations planning.

7.5.3 Community Lifelines

Per FEMA, Community Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. The integrated network of assets, services, and capabilities that provide community lifeline services are used day to day to support recurring needs. Lifelines enable the continuous operation of critical government and business functions and are essential to human health and safety or economic security. Community Lifelines include the following:

- Safety and Security
- Food, Water, and Shelter
- Health and Medical
- Energy
- Communications
- Transportation
- Hazardous Materials

In Greenville County, each of these lifelines has the potential to be impacted by numerous natural hazards. The primary hazards of concern impacting the Community Lifelines are Winter Storms, Flood, High Winds/Tornados, and Wildfires. The other hazards included in the plan have lower risk ratings and will not drive mitigation measures associated with the lifelines.

Safety and Security

Safety and security issues are addressed in the plan via Emergency Services mitigation measures. In previous plans, issues associated with County operated emergency services have been the focus. In this plan, two (2) new mitigation measures were introduced that seek to create a "disaster ready" response from citizens: 1) Voluntary Organizations Active in Disaster (VOAD) and 2) Community Emergency Response Team (CERT). Heat is also a relatively new concern to this plan and is being further addressed through the "Perform a Heat Vulnerability Assessment" measure.

Food, Water, and Shelter

Access to food, water, and shelter is paramount to disaster response. The County's Emergency Response Plan addresses these issues and there are multiple non-profit agencies and churches within the County that provide emergency services during disaster events. Development of educational materials stemming from the HMRP are intended to provide information to citizens regarding these issues.

Health and Medical

There are two primary hospital systems serving the County: 1) Bon Secours St. Francis and 2) Prisma Health Greenville Memorial. Each hospital maintains auxiliary power to maintain service during power outages. Hospitals also maintain Emergency Operations Plans to facilitate continuous operations during disasters. Additional medical services are provided by local Urgent Care and Emergency Care facilities. The healthcare industry is represented on the DMC.

Energy

Power is supplied predominantly by one energy company, Duke Power. Critical government facilities maintain backup power sources. Some portions of the County have underground power lines reducing the potential for localized outages. Duke Energy has an existing program to bury power lines in Greenville County.

Communications

Power and communication outages associated with hazard events pose a serious threat to the safety and security of citizens. Paris Mountain contains much of the communication towers for all of Greenville County and other jurisdictions. Greenville County recently completed the Paris Mountain Wildfire Mitigation Plan which, in part, was developed to protect those communication facilities. The County maintains an adequate radio network to maintain communications through all emergency services. The County Emergency Operations Plan contains a communications section.

Transportation

Interstate 85 bisects the County and Interstate 385 connects I-85 to I-26 in the southern portion of the County. Most of the road system in the County is State owned and maintained. The County and SCDOT have a cooperative agreement for maintaining clear roads during ice and flood events. The County also has an active Roads and Bridges Department that is responsible for maintaining county owned roads and bridges.

Hazardous Materials

Hazardous material disasters are beyond the scope of this plan, however, Greenville Emergency Services personnel are trained and equipped to deal with local hazardous material spills. In addition, SCDES is on-call to assist with hazardous material spill response. Finally, all County facilities storing or using hazardous materials have developed and maintain Spill Response Plans.

7.5.4 Community Capabilities

This section of the plan contains a description and review of the capabilities of the County to prepare for and respond to natural hazards. The review includes four capability types defined by FEMA: 1) Planning and Regulatory, 2) Administrative and Technical, 3) Financial, and 4) Education and Outreach. This analysis intends to identify any weaknesses in these areas where mitigation of the weakness may provide for a more resilient community.

Much like the County's capabilities described below, the municipal jurisdictions participating in this HMRP also have programs in place that help them prepare for and respond to natural hazards. The Cities of Greenville, Greer, Mauldin, Simpsonville, Fountain Inn, and Travelers Rest confirmed that they have and continue to implement policies and programs that reduce vulnerabilities to loss of life and property from natural hazards. Simpsonville applied for, received and successfully administered a FEMA Public Assistance grant following Tropical Storm Helene. These planning and regulatory programs include but are not limited to community specific comprehensive plans, floodplain management regulations, building codes, and capital improvement plans that help ensure sustainable growth while safeguarding public safety, infrastructure, and environmental resilience. Mauldin reports that in 2025 it also prepared a stormwater master plan and is actively addressing issues identified in that plan. Each participating jurisdiction has technical staff to help administer these programs and budgets and funding mechanisms to support them including general funding, enterprise funding, and grants. More information related to the City of Greenville's programs can be found in Appendix F.

7.5.4.1 Planning and Regulatory

Planning and regulatory capabilities are plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards.

Plans and Policies

To effectively prepare and implement a hazard mitigation plan, the plan must be coordinated with other community plans, policies, and programs. More information about the County plans and programs that support mitigation planning can be found in Section 5.2 and Table 6 as well as is included below.

Comprehensive Land Use Plan

The current adopted Greenville County Comprehensive Land Use Plan, “Plan Greenville County, October 2019” includes a Natural Resources Element that addresses floodplains within the County. This HMRP incorporates portions of Plan Greenville County and, likewise, the HMRP is being created to provide for the resiliency element now required in all South Carolina Comprehensive Land Use Plans. At the end of this planning process, the HMRP will be a part of Plan Greenville County. Because of the strength of the County’s flood damage prevention ordinance and Plan Greenville County’s recognition of the natural benefits of floodplains as noted on page 137 of the plan, “Floodplains provide critical habitat, protect the integrity and quality of our lakes and streams, and help distribute fertile soils.”, the rate of development of the floodplain is decreasing. Additionally, a strategy noted in Plan Greenville County will further strengthen this resolve. This strategy is found on page 138 of the Plan, “Make floodplains a part of a tree and habitat protection plan”.

Climate Change Adaptation Plan

The County does not have a separate Climate Adaptation Plan; however, climate change is included in this plan. In particular, increasing rainfall intensities and frequencies play an important role in the County’s future drainage and floodplain management activities. Data regarding new rainfall and drought projections were used in the hazard assessment process and accounted for in the identified mitigation measures.

Emergency Operations Plan

Greenville County maintains an Emergency Operations Plan (EOP) through its Emergency Management Division. This plan is currently being updated and addresses all hazards identified in the 2026 Hazard Mitigation and Resiliency Plan. Any obstacles or problems related to response and recovery identified in the plan have an associated mitigation action.

The purpose of the EOP is to minimize the harm caused by natural disasters, technological accidents, criminal activities, or hostile acts to the people and communities of Greenville County.

“This will be achieved by coordinating disaster operations and deploying resources in a timely and effective manner. The citizens and visitors of Greenville County will be kept informed about the situation and provided with information on how they can protect themselves. In cases where Greenville County’s resources are insufficient or inadequate, assistance can be requested from other counties or the State.”

This plan is built in accordance with FEMA’s Comprehensive Planning Guide 101, Version 3 (September 2021) and encompasses the Federal Emergency Management Agency’s Incident Command System (ICS), Emergency Support Functions (ESF), and includes Community Lifelines. These Lifelines, as defined by FEMA, represent critical government and business functions that are essential to human health and safety, as well as economic security. At the minimum, the plan describes the actions the local government will take when conducting emergency or disaster operations.

Details about different sections, branches, and units as well as hazard-specific plans are contained in annexes and appendices. (e.g., Greenville County Multi-Jurisdictional Hazard Mitigation Plan, Greenville County Continuity of Operations Plan, Greenville County Radiological Standard Operating Guide.)

Simpsonville is currently updating its Emergency Operations Plan. Elements from this plan will be incorporated into the revised Emergency Operations Plan.

Streambank Buffer Protection Program

Greenville County has a strong riparian buffer program codified in County Ordinance Article 8.22 – Riparian Buffers. This ordinance ensures that as development near stream corridors increases, protected buffer areas also increase. Buffer widths vary from 50 feet to 100 feet on each side of the streambank and are required depending on stream type and watershed size. Only minimal encroachments are allowed.

Other Plans and Policies

- The County is a member in good standing with the NFIP. The County's rating with the CRS is currently Class 7.
- The County is a regulated community under the National Pollutant Discharge Elimination System Program (NPDES) Stormwater Program and maintains an active Stormwater Management Plan.
- Brownfields Redevelopment Program
- Community Wildfire Protection Plan
- Continuity of Operations Plan
- Disaster Recovery Plan
- Economic Development Plan
- Land acquisition for open space and public recreation uses
- Transportation Plan

Codes and Ordinances

The following items are included in FEMA's Hazard Mitigation Guidance for assessing codes and ordinances.

Building Code

"The Code Compliance Division is dedicated to the enforcement of Building Safety, the Flood Damage Prevention Ordinance, Property Maintenance Regulations, the Greenville County Zoning Ordinance and other related regulations to safeguard the public health, safety and general welfare of the citizens and businesses and to provide competent, consistent, courteous and timely services." Any owner who intends to construct, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, the installation of which is regulated by the International Codes, is required to apply to the building official and obtain the appropriate permit(s).

Floodplain Management Ordinance / NFIP Compliance

Greenville County (Building Official or Designee)

The County is a member in good standing of the NFIP and has a flood damage prevention ordinance (Chapter 8, Article II) that contains standards higher than the minimum requirements of the NFIP including compensatory storage within the floodplain and a four (4) foot freeboard requirement. The County has also obtained a Class 7 ranking in the CRS.

Damage assessments are conducted by systematically driving every roadway throughout the County and documenting each structure exhibiting signs of damage. For every building identified as having potential damage, inspectors complete an individual damage report to ensure accurate and consistent tracking. Building and Code Enforcement Inspectors are equipped with the appropriate damage assessment forms for each structure. Using these forms, inspectors evaluate the condition of buildings and enter their findings into the Palmetto Emergency Operations Center (EOC) Application (App). The App then calculates the damage level for each structure based on the information submitted. When a structure is determined to be uninhabitable, inspectors marked it accordingly with the proper signage to ensure public safety. In addition to being logged into the Palmetto EOC App, every damaged structure is also entered into the County's eTrakIT system, which generates a permit number for follow-

up actions. Homeowners seeking building permits are notified as to whether they can proceed with repairs or improvements based on the assessment results. Any structures deemed substantially damaged are formally reported to FEMA in accordance with regulatory requirements.

Fountain Inn (Fire Chief)

Damage assessments are conducted by systematically driving every roadway throughout the City of Fountain Inn and documenting each structure exhibiting signs of damage. For every building identified as having potential damage, inspectors complete an individual damage report to ensure accurate and consistent tracking. The Fire Department along with Building and Code Enforcement Inspectors are equipped with the appropriate damage assessment forms for each structure. Using these forms, inspectors evaluate the condition of buildings and the Fire Chief will enter their findings into the Palmetto Emergency Operations Center (EOC) Application (App). The App then calculates the damage level for each structure based on the information submitted. When a structure is determined to be uninhabitable, inspectors marked it accordingly with the proper signage to ensure public safety. In addition to being logged into the Palmetto EOC App, every damaged structure is also entered into the City's permitting system (iWorQ), which generates a permit number for follow-up actions. Homeowners seeking building permits are notified as to whether they can proceed with repairs or improvements based on the assessment results. Any structures deemed substantially damaged are formally reported to FEMA in accordance with regulatory requirements.

City of Greenville (Fire Chief)

The City of Greenville approaches damage assessment with a thorough and systematic process designed to ensure both accuracy and public safety. City personnel methodically drive every roadway, carefully documenting any structures that show signs of damage. For each building identified as potentially affected, detailed information is recorded and tracked to maintain consistency and reliability in the assessment process. Once findings are collected, staff enter all data into the Palmetto Emergency Operations Center (EOC) Application. This specialized tool then analyzes the input to determine the extent of damage for each structure. If a building is found to be uninhabitable, it is promptly marked by authorized city officials—whether building or fire personnel—with appropriate signage to alert the public and prevent unsafe access. Additionally, before any repairs begin, property owners are required to apply for building permits, ensuring that all reconstruction efforts comply with established safety and code standards. For cases where substantial damage is identified, the City formally reports these incidents to FEMA, adhering to all regulatory requirements and supporting a coordinated response to community needs.

City of Greer (Building Official or Designee)

In the event of a natural disaster, City of Greer Building Inspectors and Community Compliance Officers conduct post-disaster evaluations to identify damaged structures within the city limits. For each structure with potential damage, an ATC-20 Form (Rapid Evaluation Safety Assessment Form) is completed, and the structure is posted as "Restricted Use" or "Unsafe". When necessary, a more detailed evaluation is conducted with ATC-20 procedures to further assess structural integrity and safety. Each case is entered in the city's eTrakit system to document damages and track any follow-up actions. Cases are considered complete once permits have been issued for the necessary repairs. In cases where structures are determined to be substantially damaged these are reported to Greenville County or Spartanburg County for further review and compliance with FEMA requirements.

Mauldin (City Administrator)

Damage assessments within the City of Mauldin are conducted by combined effort of the City's Business and Development Services staff and Public Works staff by traveling every roadway throughout the community and documenting, both in writing and with photographs, each structure and lot exhibiting signs of damage. For all structures identified as having damage, inspectors complete a damage assessment report to ensure accurate and consistent tracking, and for lots or other non-habitable spaces, assessment staff record their findings as appropriate. Staff then upload all documentation into a central database for retention and reporting purposes. When a structure is determined to be uninhabitable, inspectors mark it accordingly with proper signage to ensure public awareness and safety, and communicate with homeowners regarding next steps and remediation requirements. The Business and Development Services department will follow-up with the property owner to ensure damaged structures are

remediated or demolished. The City's Building Official is responsible for reporting substantially damaged structures to the County or other governmental entities as required.

Simpsonville (Fire Chief)

After a widespread disaster, the fire department conducts a damage assessment. Initial damage is reported and documented by crews responding to emergency calls for service. The Fire Marshal's office conducts a street-by-street assessment for structural damage. Any structure that appears to have significant damage and may be deemed uninhabitable is referred to the city's building code official. Any building deemed uninhabitable by the code official is marked as such with signage. All assessment information is sent to Greenville County Emergency Management once gathered. Planning is underway currently to enhance the department's capabilities and streamline the assessment process.

Travelers Rest (Director of Public Works)

The City of Travelers Rest conducts post-disaster damage assessments by deploying City staff to systematically drive every street within the City limits. Assessment teams consist of personnel from Police, Fire, Public Works, and Code Enforcement, who identify and document all structures showing signs of damage. Inspectors evaluate each property using standardized forms to determine and record damage levels, ensuring consistency across all assessments. Structures determined to be unsafe or uninhabitable are clearly marked to ensure public safety. All damaged properties are also recorded using the City's iCloud-based permitting system for tracking and follow-up, which generates permit records and helps guide homeowners on repair eligibility, while any substantially damaged structures are reported to FEMA in accordance with regulatory requirements.

Other Codes and Ordinances

- Individual County Fire Departments are responsible for fire-related inspections.
- Site plans for new development and redevelopment are regulated under the County's site development and zoning ordinances. Plan reviews and inspections are performed by the County Land Development and Planning Departments.
- International Property Maintenance Code
- Other hazard-specific ordinances (stormwater, steep slope, and wildfire)

7.5.4.2 Administrative and Technical

Administrative and technical capabilities include boards, commissions, departments, staff, and consulting services, along with the related skills and tools, which can be used for mitigation planning and the implementation of specific mitigation actions.

Administrative

The following items are included in FEMA's Hazard Mitigation Guidance for assessing administrative capabilities.

Public Works Department

Public Works is responsible for operation and maintenance of infrastructure related to County owned projects. Engineering is a Division within the County's Public Works Department. Engineering is responsible for planning, design, project scoping, and construction oversight. While this division is primarily focused on roads and drainage, they also have the responsibility for assisting with mitigation actions requiring construction.

Code Enforcement Department

All building codes related to hazard mitigation are enforced through the same department including the flood damage prevention ordinance. The Code Enforcement Department has appropriate authority and capabilities to perform plan review, site inspections, and code enforcement related to hazard mitigation. The floodplain manager is a code enforcement officer.

Greenville County Code Compliance Division enforces the 2018 I-Code Series, with State modifications. For Building Code Credit Points, the County Score is 50 and the BCEGS Classification is 3/3.

Other Departments

- Emergency Management is provided through the County Emergency Management Division
- The County formed a Disaster Mitigation Committee to guide the Hazard Mitigation and Resiliency Plan development. This committee is also tasked with meeting post disaster to review lessons learned and how well mitigation efforts performed.
- The County has entered into multiple Mutual Aid Agreements including surrounding jurisdictions and the South Carolina Department of Transportation.
- The County Board of Zoning Appeals (BZA) reviews land use issues, including proposed variances from the County's zoning ordinance; special uses that require review to determine compatibility with adjacent properties and appeals of decisions made by the zoning administrator.
- County procurement of equipment, materials, services, and supplies is managed by the Procurement Services Division. Their primary function is to procure supplies, equipment, materials, and services in a timely, efficient, and effective manner, and in compliance with applicable laws, regulations, and County policies.

Technical

The following officials and departments provide technical resources to build a more resilient City.

Chief Building Officer

Code enforcement is a division of the Community Development and Planning Department. The County Floodplain Manager reports directly to the Chief Building Official. There is also close communication with the Greenville County Emergency Management Division, especially during times of disaster. A representative of Codes Enforcement will be present in the Emergency Operations Center during times of disaster.

Civil Engineer – Construction Project Management

The Engineering and Maintenance Division of Public Works is where the County Engineer is located. Typically, the Floodplain Manager will have direct oversight of Hazard Mitigation Grant projects with assistance from the County Engineer as needed. Construction projects are generally completed on time and within budget.

Grant Administrator

Greenville County does not have a Grants Administrator position. Each department is responsible for the management of grants for that department. For larger, more complex grants departments may utilize consultants to assist with grant identification, application, and management. For instance, the Floodplain Manager has employed Jeff Ward & Associates and Woolpert, Inc. to assist with state and federal grants including FEMA Hazard Mitigation Grant Program funding. Watershed studies, structure acquisition, and stream protection projects have all been completed successfully within the last five years using multiple grant types.

Grant Writer

As discussed in the previous section, the County relies on each department to support its grant applications. Emergency Management and Floodplain Management have successfully applied for, been granted, and administered multiple FEMA and non-FEMA grant programs.

Other Technical Staff

- Business Administrator
- Chief Financial Officer
- Civil Engineer – Design
- Civil Engineer – Inspections
- Clerk

- Community Planner
- Emergency Manager
- Floodplain Administrator
- GIS Coordinator (hazard and community asset data and information management, Hazus)

7.5.4.3 Financial

Financial capabilities include access to or eligibility to use funding resources for hazard mitigation.

Capital Improvements Program

The County operates on a two (2) – year budgeting process running from July 1st to June 30th. Stormwater and Floodplain capital projects are identified and included in the budget development process, discussed during the approval workflow and funded once the budget is approved by County Council. Mid-term capital projects are held to the next budget cycle unless the project involves grant funding.

Funding Programs – Federal (Non-FEMA)

Greenville County has been remarkably successful in securing and implementing several non-FEMA grants. Stream restoration and stormwater projects are currently being constructed using South Carolina Rural Infrastructure Agency grants (SCIIP), and stream restoration and riparian reclamation projects are being funded through the South Carolina Office of Resiliency (SCOR) grants. The total award value in 2023 from these two sources alone was approximately \$11.5 million. These projects are being administered through the County’s Land Development Division and address both water quality and flooding issues.

Utility Fees for Stormwater, Water, Sewer, Gas, or Electric Services

Greenville County does not provide water, sewer, gas, or electric services. Those services are provided by others. The County does, however, operate a Stormwater Utility (Enterprise Fund). The billing rate is based on \$27 per year per Equivalent Residential Unit (ERU) and generates annual revenues of approximately \$8 million per year. Use of these funds is limited by ordinance to the following items.

- (a) Administrative Costs, including but not limited to the salaries of Program administrators and staff and the costs of general planning and development.
- (b) NPDES Permit Compliance Costs, including but not limited to the costs of complying with the provisions of Permit No. SCS 230001 and subsequent permits.
- (c) Quantity Project Costs, including but not limited to the costs of projects related to flooding or other drainage problems as approved by Council.
- (d) New Construction Costs, including but not limited to permitting and inspection of land on which new construction is occurring that results in a “land-disturbing activity” which (1) requires a permitted plan and (2) which changes the natural cover or topography and which may cause erosion or contribute sediment and alter the quantity or quality of Stormwater runoff. New Construction Costs will only be chargeable to those parcels of land on which New Construction is occurring which results in land-disturbing activities equal to or greater than 1 acre in size, regardless of the size of the parcel.

This funding has been used in support of the Floodplain Management Program, including the County’s “at-risk structure acquisition program”. To date, approximately 222 residential structures have been acquired and permanently removed from the floodplain.

Other Financial Capabilities utilized by the County on an as needed basis include:

- Community Development Block Grant
- FEMA – Hazard Mitigation Assistance
- FEMA – Public Assistance 406 Mitigation
- Funding programs – State

- Funding programs – Philanthropic
- General obligation bonds and/or special tax bonds
- Impact fees for new development
- Tax levies for specific purposes

7.5.4.4 Education and Outreach

StormReady Certification

Greenville County is a StormReady Certified community through January 2027. This is the County's sixth recognition as a StormReady community. The County conducts regular outreach projects including attendance at events such as CERT outreach, Farmers Market Senior Day and Kids Day, Fire Fest, County Health Fair, etc.

Seasonal Emergency Management and Mitigation Outreach

The County conducts regular outreach projects throughout the year including attendance at events such as those listed below (recent 2023 and 2024 events).

- 8-20-24 – Mitigation Public Meeting #2
- 8-24-24 – CERT Outreach at the Church of Jesus Christ of Latter-day Saints
- 6-1-24 – Travelers Rest Farm Market Senior Citizens Day
- 6-11-24 – Park Hop
- 5-11-24 – Travelers Rest Farm Market Kids Day
- 4-18-24 – Mitigation Plan Public Input #1
- 4-09-24 – Citizens Academy EOC Tour
- 12-5-23 – Senior PREP
- 10-27-23 – South Greenville Open House
- 10-21-23 – Slater Marietta Fire Fest
- 10-14-23 Piedmont Park Open House
- 10-11-23 – County Health Fair
- 09-03-23 – Get Ready Greenville County

Other Education and Outreach Efforts

- Firewise USA certification
- Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.
- Natural disaster or safety related school programs
- Ongoing public education or information program (e.g., Environmental Education, Fire Safety, Household Preparedness, Responsible Water Use, etc.)
- Public-private partnership initiatives addressing disaster-related issues

8 Prioritized Mitigation Initiatives

Development of mitigation initiatives began with a review of initiatives contained in previous HMPs. Any initiative that was on the current list but that had not begun implementation remained in consideration for the 2026 HMRP. The DMC was also provided an opportunity to discuss additional mitigation measures with their sponsoring organization and submit those initiatives either in writing, at DMC Meeting #2, or again at Meeting #3.

8.1 Project Descriptions

The following projects were identified by the committee as potential mitigation initiatives and were scored according to the process defined in Section 8.2. All of the "Responsible Party" designations below refer to Greenville County Departments or Divisions, unless otherwise stated.

PREVENTION

Mitigation Initiative	Proactive Maintenance of Stormwater Infrastructure			
Description	- Maintain piped infrastructure, ditches, culverts, bridges, and Best Management Practices before hazardous conditions occur. - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering	County Budget	On-going More detailed analysis of localized flooding to be prepared as budget becomes available	Floods	Greenville County

Mitigation Initiative	Repetitive Loss Area Plan Implementation			
Description	- A Repetitive Area Loss Analysis was completed by the County per the Community Rating System (CRS) requirements. As a result, the Insurance Services Office (ISO) requires a repetitive loss plan. The County has created and is implementing the plan as required. - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	Floods	Greenville County

Mitigation Initiative	Update Existing Watershed Studies			
Description	- Determine new levels of service for each road crossing. - Identify at-risk infrastructure and mitigate as appropriate.			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County All Municipalities

Mitigation Initiative	Stormwater Utility Credit Manual Review			
Description	- Review and update the stormwater credit manual as appropriate - The credit manual has been reviewed and includes tree preservation, upgrade of existing detention or retention facilities, over detention/retention, and discharge elimination credits			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Land Development	County Budget	On-going	Floods	Greenville County

Mitigation Initiative	Stormwater Ordinance/Design Manual Review			
Description	Review stormwater ordinance and design manual as appropriate to address flooding. For example, look into increasing design storm requirements (currently 25-year), redevelopment requirements (requiring developers to restore existing streams), underground storage, and greywater reuse.			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Land Development	County Budget	On-going	Floods	Greenville County

Mitigation Initiative	Floodplain Ordinance/Mapping Review			
Description	- Review floodplain ordinance to confirm the ability to use local data/knowledge over FEMA maps when available - Review FEMA floodplain mapping – update maps as necessary to address growth			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	Floods	Greenville County

Mitigation Initiative	Grant Writer/Administrator			
Description	County to consider a grant writer/administrator position as an avenue for securing state/federal funding			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
County Administration	County Budget	As budget becomes available – pending position approval	Floods	Greenville County

Mitigation Initiative	Landslide Risk Study			
Description	Identify areas with landslide potential and develop plan to mitigate risk			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management Furman University	County Budget Grants	As budget/grant become available	Landslides	Greenville County All Municipalities

Mitigation Initiative	Wildfire Mitigation Planning/Wildfire Potential Study			
Description	- Evaluate risk assessment for wildfires county-wide and assess the need for additional wildfire planning (Glassy Mountain?) - Use LiDAR to identify areas where there is a high fuel load on the ground			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management Furman University	FEMA HMGP County Budget	As budget/grant become available	Wildfires Drought Climate Change	Greenville County

Mitigation Initiative	Implement Appropriate Sections of Paris Mountain Wildfire Plan County-wide			
Description	Implement the action plan outlined in the Paris Mountain Wildfire Plan County-wide (included as Appendix K to the County HMRP)			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
See Plan	See Plan	See Plan	Wildfires Drought Climate Change	Greenville County All Municipalities

Mitigation Initiative	Heat Vulnerability Assessment			
Description	Explore a potential partnership with Furman University to identify high heat areas/vulnerable communities throughout the county and potential mitigation measures (reflective pavement, tree planting, etc.)			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management Land Development Planning Furman University	Grants	As grants become available	Wildfires Drought Climate Change	Greenville County All Municipalities

PUBLIC EDUCATION & AWARENESS

Mitigation Initiative	Enhanced GIS Database			
Description	- Add hazard-related data to the County's GIS - Start collecting data on landslides			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Geographic Information Services Floodplain Administration Emergency Management Furman University	County Budget	On-going	All Hazards	Greenville County All Municipalities

Mitigation Initiative	Realtor Hazard Education			
Description	- Provide hazard data and training/resources to local realtors - Encourage the purchase of flood insurance/hazard insurance for homeowners and businesses - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration Emergency Management	County Budget FEMA Grant	On-going	All Hazards	Greenville County All Municipalities

Mitigation Initiative	Enhance Hazards Education			
Description	- Develop additional hazard education programs for County staff and the public, introducing Marty the Moose and educational literature - Distribute educational materials to schools - Develop hazard information for hazards (add hail and landslides)			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	All Hazards	Greenville County All Municipalities

Mitigation Initiative	Early Warning System Evaluation			
Description	- Review and evaluate the usage of an early warning system to alert the public about potential hazards. - Mobile messaging for water use restrictions related to drought and drought forecast data - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management Floodplain Administration Engineering	County Budget Grants	As budget/grant become available	Floods Winter Storms High Winds/Tornados Wildfires Drought Hail	Greenville County All Municipalities

Mitigation Initiative	Emergency Public Communication			
Description	Work with other agencies, departments, and media outlets to create a protocol for communication. This protocol should be written down and developed into an SOP to ensure consistent communication. Phone numbers used should be general in case of turnover in the department or agency. This will be included as part of the Emergency Operations Plan (EOP) that is in progress.			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management Public Information Officer	County Budget Public Service Ads	On-going	All Hazards	Greenville County All Municipalities

Mitigation Initiative	Protection Education			
Description	• Provide education for homeowners on how to properly prepare for hazardous conditions. This could include agencies to contact, websites to visit, and preventative measures the owner can perform such as boarding windows and putting away/securing outdoor items that may become hazardous. • Provide educational materials about sheltering in the home. • Provide education for homeowners on stream maintenance responsibilities and the impact a poorly maintained stream could have on their property. • Encourage the trimming of tree limbs around power lines on private property • Encourage zero scape or native landscaping that is less water intensive • Encourage the use of SC Emergency Manager App to build personal emergency plans			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Floodplain Management Soil & Water Conservation District	County Budget	On-going As budget becomes available	Floods Winter Storms High Winds/Tornados Earthquakes	Greenville County All Municipalities

Mitigation Initiative	Restoration Education Post Disaster Events			
Description	• Develop public education material - SOP for post disaster - Recovery Plan (utilize SCEMD information). Review annually after plan is in place. • Public education about the building permit process and how to select contractors post disaster event			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Public Information Officer	County Budget Grants	As budget becomes available	All Hazards	Greenville County All Municipalities

Mitigation Initiative	High Hazard Dam Proximity Awareness for New Development			
Description	• Consider updating the final plat process to require that a standard note be added to final plats indicating that the created lots are located in close proximity to a dam that has been designated as “High Risk” per the SC Department of Environmental Services. In the event of dam failure, these lots may be subject to significant flooding and other related hazards. This notification is provided solely as public advisory and does not constitute a warranty or an official risk assessment by the surveyor or the plat approval authority.			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Planning Department	County Budget	As budget becomes available	Flooding, High Hazard Potential Dams	Greenville County

NATURAL RESOURCES PROTECTION

Mitigation Initiative	Stream Crossing Debris Removal			
Description	The County owns and maintains over 1,800 miles of roadway. To the extent practical, provide for removal of debris built up in rivers and streams, especially at road crossings and in highly urbanized areas, dedicating additional resources to this program post disaster event. This activity is provided by the engineering department as part of their road maintenance program protocol. Greenville County also implements a beaver dam removal program.			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Roads and Drainage	County Budget FEMA Grant	On-going	Floods	Greenville County
Mitigation Initiative	Riparian Area Management Plans			
Description	- Create focused riparian buffer protection plans to target specific issues related to flooding. - Evaluate large areas of county-owned floodplain properties as well as identify properties that can be acquired by the county to restore and enhance current riparian areas. - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development Floodplain Management Planning	County Budget	On-going	Floods	Greenville County

Mitigation Initiative	Stream Restoration			
Description	- Identify areas to connect or reconnect streams to floodplains to improve flooding in problem areas - Implement stream restoration projects identified through watershed studies			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development Floodplain Management Planning	County Budget Grants	On-going As budget/grant become available	Floods	Greenville County

Mitigation Initiative	Evaluate Ordinance for Tree Canopy Improvement			
Description	Review/evaluate ordinance for tree planting/ways to increase tree canopy			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development Planning	County Budget	As budget becomes available	Climate Change	Greenville County

EMERGENCY SERVICES

Mitigation Initiative	Early Warning System Enhancement (See Early Warning System Evaluation)			
Description	- Install flood hazard signage and warning lights on frequently flooded roadways as well as hazard signage for steep roads, frequently icy bridges, and other known hazards on the road. - Install warning systems to notify travelers of road blocks due to fallen trees, ice, and other hazardous conditions.			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Floodplain Management Engineering	County Budget FEMA Grant	On-going As budget/grant become available	Floods, Winter Storms, High Winds/Tornados	Greenville County

Mitigation Initiative	Post Disaster Review Meetings			
Description	- DMC and emergency response agency post disaster debriefings to discuss “lessons learned” - Meet after declared disasters and at Floodplain Managers’ discretion after other storms			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement/Building Engineering	County Budget	As events occur	All Hazards	Greenville County All Municipalities

Mitigation Initiative	Evaluation of Emergency Routes			
Description	Review emergency routes and evacuation routes to ensure they are the safest, most appropriate routes			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Services Emergency Management Engineering	County Budget	On-going	All Hazards	Greenville County

Mitigation Initiative	Comprehensive Training			
Description	- Provide appropriate level of emergency response training for all County staff. - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Risk Management	County Budget FEMA Training Programs	On-going As budget becomes available	All Hazards	Greenville County

Mitigation Initiative	Coordinated Bridge De-Icing			
Description	Continue to coordinate with SCDOT to create a plan for de-icing bridges during winter weather conditions. Currently, “snow meetings” are held with the SCDOT in November and December to prepare for the snow season.			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering SCDOT	County Budget SCDOT	On-going	Winter Storms Hail	Greenville County

Mitigation Initiative	Heating and Cooling			
Description	- Continue to assist the Homeless Alliance and other non-governmental organizations (NGOs) in identifying vulnerable populations and creating plans to provide proper heating and cooling for those populations when conditions warrant. Engage with NGOs to find out what type of services they provide that could help with this task. - If required, the public will be notified where these services are provided.			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement	County Budget Grants	As budget / grant become available As events occur	Winter Storms Drought Hail	Greenville County

Mitigation Initiative	Voluntary Organizations Active in Disaster (VOAD)			
Description	- Develop a VOAD for the Upstate including Pickens, Oconee, and Anderson counties - Association of organizations (including national, state, and local volunteer organizations) that mitigate and reduce the impact of disasters. Members may provide local and emergency response and recovery services.			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management	County Budget Grants	As budget/grant become available	All Hazards	Greenville County All Municipalities

Mitigation Initiative	CERT Program			
Description	Encourage participation in County CERT Program			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management	County Budget	On-going	All Hazards	Greenville County All Municipalities

PROPERTY PROTECTION

Mitigation Initiative	Elevation Grant Program (On-going)			
Description	Continue providing elevation grants to eligible County residents.			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going Information can be found on Floodplain web page.	Floods	Greenville County

Mitigation Initiative	Flood Mitigation Acquisition Program (On-going)			
Description	- Continue acquiring appropriate, eligible properties to reduce buildings at high risk of flooding. - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going As grants become available	Floods	Greenville County

Mitigation Initiative	High Hazard Potential Dams			
Description	- Revise the HHPD section of the HMP to incorporate the results of the SCDES risk analysis for HHPDs and determine goals and actions for mitigating the risk posed by HHPDs. - Add the revised section as an annex to the 2026 HMP.			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Engineering SCDES	County Budget	Following SCDES dam risk analysis (September 2025)	Floods HHPDs	Greenville County

Mitigation Initiative	Financial Assistance Program for Mitigation Activities			
Description	Financial assistance programs to help homeowners with mitigation projects on their homes ahead of hazard events			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Floodplain Management	County Budget Grant	As budget/grant becomes available	All Hazards	Greenville County

STRUCTURAL PROJECTS

Mitigation Initiative	County-owned Critical Facilities			
Description	- Identify and evaluate County-owned critical facilities for risk and mitigate as appropriate. - Incorporate into County Continuation of Operations Plan (COOP) update			
Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Emergency Management Engineering	County Budget FEMA Grant	As budget/grant become available	All Hazards	Greenville County

Mitigation Initiative	Bridge/Culvert Replacement			
Description	- Replace and upgrade stream crossings to improve channel flow characteristics as needed. - Progress made since the 2020 plan update can be found in Section 5.4			
Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration Engineering	County Budget	On-going Each crossing is analyzed during the basin study process and programmed for upgrade in subsequent budget	Floods	Greenville County

The mitigation initiatives outlined above include actions that address all hazards for the participating communities. Additional actions specific to the City of Greenville and the City of Greer are included in Appendix F.

Table 26. Number of Projects Addressing Hazards by Communities

Community	Floods	Winter Storms	High Winds / Tornadoes	Wildfires	Earth-quakes	Drought	Landslides	Hail	Climate Change
Greenville County	29	17	15	16	13	17	13	14	15
City of Greenville	11	10	10	11	9	11	9	9	10
City of Greer	11	10	10	11	9	11	9	9	10
City of Mauldin	11	10	10	11	9	11	9	9	10
City of Simpsonville	11	10	10	11	9	11	9	9	10
City of Fountain Inn	11	10	10	11	9	11	9	9	10
City of Travelers Rest	11	10	10	11	9	11	9	9	10

8.2 Scoring

To facilitate orderly and meaningful implementation of mitigation initiatives, the 2005 DMC created an Initiative Priority Scoring System. This system has been used in all subsequent planning cycles for prioritizing mitigation initiatives. For the sake of consistency between plans and because of the effectiveness of previous prioritization efforts, the DMC opted to use this same system for the 2026 HMRP.

The scoring criteria is contained in Table 27 and the final prioritization is contained in Table 28.

Table 27. Initiative Scoring Criteria

Priority Criterion	Numeric Score
Strategy Effectiveness	
No effect on Risk or Hazard	0
Affects several structures within the County	1
Affects many structures within the County	2
Affects most structures within the County	3
Percentage of Population Benefited	
Less than 10% benefited	0
10% to 50% benefited	1
51% to 75% benefited	2
Greater than 75% benefited	3
Time to Implement	
Cannot be implemented	0
Longer than one year	1
Within one year	2
Immediate	3
Time to Impact	
Cannot be implemented	0
Longer than one year	1
Within one year	2
Immediate	3
Cost to County	
Completely Unaffordable	0
Expensive, but manageable	1
Cost is easily managed	2
Little to no cost	3
Cost to Others	
Completely Unaffordable	0
Expensive, but manageable	1
Cost is easily managed	2
Little to no cost	3
Funding Source	
No known funding source available	0
Requires outside funding	1
Requires budget consideration	2
Within existing county budget	3
Community Support	
Opposed by the entire community	0
Acceptable only to those affected by the project	1
Some community opposition	2
Acceptable community wide	3
Project Feasibility	
Not possible	0
Accomplished with extensive design and planning	1
Accomplished with some design and planning	2
Easily accomplished	3

Table 28. Prioritized Initiatives

Proposed Mitigation Activities	Strategy Effectiveness	Population Benefited	Time to Implement	Time to Impact	Cost to County	Cost to Others	Funding Source	Community Support	Project Feasibility	Total Score
Prevention										
Stormwater Utility Credit Manual Review	2.0	2.5	2.0	1.5	2.5	2.5	3.0	2.5	2.5	21.0
Floodplain Ordinance/Mapping Review	2.0	2.5	1.5	1.5	2.5	3.0	3.0	2.5	2.5	21.0
Grant Writer/Administrator	3.0	3.0	1.5	1.5	1.5	3.0	2.0	2.5	2.5	20.5
Repetitive Loss Area Plan Implementation	1.0	0.0	3.0	1.0	3.0	3.0	3.0	3.0	3.0	20.0
Stormwater Ordinance/Design Manual Review	2.5	2.5	1.5	1.5	2.5	2.5	2.5	2.0	2.5	20.0
Proactive Maintenance of Stormwater Infrastructure	2.5	2.5	2.0	2.5	1.5	1.5	2.0	2.0	2.0	18.5
Heat Vulnerability Assessment	2.0	3.0	1.5	1.5	1.5	2.5	2.0	2.5	1.5	18.0
Implement Appropriate Sections of Paris Mountain Wildfire Plan County-wide	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.5	17.0
Update Existing Watershed Studies	1.5	0.5	1.5	1.0	2.0	2.5	2.5	2.5	2.0	16.0
Wildfire Mitigation Planning/Wildfire Potential Study	2.0	1.5	1.5	1.0	1.5	2.0	1.5	2.5	1.5	15.0
Landslide Risk Study	1.5	1.5	1.5	1.0	1.0	2.5	1.5	1.5	1.5	13.5
Public Education and Awareness										
Restoration Education Post Disaster Events	2.5	2.5	2.0	2.5	2.5	3.0	2.5	3.0	3.0	23.5
Protection Education	2.0	1.5	2.0	3.0	2.5	3.0	3.0	3.0	3.0	23.0
Realtor Hazard Education	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	2.0	21.0
Enhance Hazards Education	3.0	2.0	2.0	1.0	2.0	3.0	3.0	3.0	2.0	21.0
Emergency Public Communication	1.5	1.5	2.0	2.5	2.5	2.5	3.0	2.5	2.5	20.5
Early Warning System Evaluation	1.5	1.5	2.0	2.0	2.0	3.0	3.0	3.0	2.5	20.5
High Hazard Dam Proximity Awareness for New Development	1.0	0.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	18.0
Enhanced GIS Database	2.0	1.0	1.0	2.0	1.0	1.5	3.0	2.0	2.0	15.5
Natural Resource Protection										
Stream Crossing Debris Removal	1.5	1.0	2.0	3.0	1.5	2.0	3.0	3.0	3.0	20.0
Evaluate Tree Ordinance for Canopy Improvement	2.5	2.5	1.5	1.5	2.0	2.5	2.5	2.0	2.5	19.5
Riparian Area Management Plans	1.5	2.0	2.0	1.5	2.0	3.0	2.5	2.0	2.0	18.5
Stream Restoration	2.0	1.5	1.0	1.0	1.0	1.5	1.5	2.5	1.5	13.5
Emergency Services										
Post Disaster Review Meetings	1.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	24.0
County CERT Program	3.0	3.0	2.5	1.5	2.5	3.0	3.0	3.0	2.5	24.0
Comprehensive Training	2.0	2.5	1.5	3.0	3.0	3.0	3.0	3.0	2.0	23.0
Coordinated Bridge De-Icing	1.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	2.0	22.0
Voluntary Organizations Active in Disaster (VOAD)	2.5	2.5	1.5	1.5	2.5	3.0	2.5	3.0	1.5	20.5
Evaluation of Emergency Routes	1.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0	2.0	20.0
Early Warning System Enhancement	1.5	1.5	1.0	3.0	2.0	2.5	2.0	3.0	2.0	18.5
Heating and Cooling	1.0	0.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	13.0
Property Protection										

Proposed Mitigation Activities	Strategy Effectiveness	Population Benefited	Time to Implement	Time to Impact	Cost to County	Cost to Others	Funding Source	Community Support	Project Feasibility	Total Score
Elevation Grant Program (On-going)	2.0	2.0	2.0	3.0	1.0	1.0	2.0	3.0	2.0	18.0
Flood Mitigation Acquisition Program (On-going)	2.0	2.0	2.0	3.0	1.0	1.0	1.0	3.0	2.0	17.0
High Hazard Potential Dams	2.0	1.5	1.5	1.5	1.0	2.5	1.5	2.5	1.5	15.5
Financial Assistance Program for Mitigation Activities	2.0	2.0	1.0	1.0	1.0	2.0	1.0	2.5	1.5	14.0
Structural Projects										
County-owned Critical Facilities	1.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	2.0	17.0
Bridge/Culvert Replacement	2.0	1.0	1.0	1.0	1.0	1.5	1.0	2.0	1.0	11.5

9 Plan Adoption and Update Process

Section 9 discusses how the County HMRP will be adopted, implemented, and maintained over time. “Plan adoption” means review and approval by the County’s governing body, County Council. “Plan implementation” refers to the action of completing proposed mitigation initiatives included in the plan. “Plan maintenance” is the process by which the DMC will continue to update, improve, and expand the mitigation planning process. It also includes the technical analyses needed to propose more mitigation initiatives for incorporation into the plan. “Plan maintenance” further includes the group’s activities to monitor implementation of the plan, to evaluate the effectiveness of implemented mitigation initiatives, and to continually strive to engage the community in the planning process. The basic elements of the DMC’s actions to implement and maintain the plan are also described in the DMC’s operating procedures, provided in Section 4.2.

9.1 Plan Adoption

Approval and adoption of the plan is a key step in assuring its implementation. Each previous plan has been adopted through County Council Resolution.

- 2005 HMP, Resolution No. 1118 on December 13, 2004
- 2010 HMP, Resolution No. 1365 on January 5, 2010
- 2015 HMP, Resolutions No. 1538 on June 02, 2015
- 2020 HMP, Resolution No. 1752 on June 16, 2020

Upon FEMA approval of this 2026 HMRP, Greenville County will formally adopt the plan in a public meeting. The resolution for that adoption will follow the same format as previous resolutions and will be placed in Appendix G of this document.

Annually, the DMC will seek input from both the public and participating organizations. Further, approximately once every five years, the DMC will again seek the approval of the plan by the County Council. This interval will provide a sufficient period for the DMC to assess HMRP effectiveness. Further, this time frame will coincide generally with the review of the County’s Community Rating System program.

9.2 Plan Implementation

The individual departments, divisions, agencies, and organizations that have been assigned primary responsibility for the mitigation initiatives incorporated into the plan are responsible for their implementation when the resources and/or opportunity to do so become available. As a practical matter, in most cases, this means that the responsible parties identify the most feasible funding source (e.g., a state or federal grant program, the agency’s budgetary process, etc.), make application to the funding source or otherwise allocate funds, and, upon receipt of funding, take the necessary steps to implement the project. In other cases, this may mean that should a unique opportunity for implementation of an initiative arise, e.g., upon receipt of unexpected funds, immediately after a disaster event, etc., the agency can proceed with implementation of the initiative regardless of its priority assignment.

The DMC encourages the party responsible for a proposed initiative to associate it with one or more potential funding sources. The purpose of this is to facilitate implementation of a proposed initiative by the sponsoring agency by indicating the starting point for seeking funding for implementation.

While the ultimate responsibility for implementation of a mitigation initiative lies with the County, the DMC as a cooperative organization has substantial involvement in plan implementation and can assist with the coordination and scheduling of the implementation of approved mitigation initiatives.

9.3 Plan Maintenance

Mitigation planning is a dynamic process that must be continually adjusted to account for changes in the community and to further refine the information, judgments, and proposals documented in the local mitigation plan. The process used by the Greenville County DMC to maintain the plan consists primarily of four functions.

The first is to continue to expand and improve the mitigation plan by accomplishing additional technical analyses, such as vulnerability assessments and post event analysis of disasters, etc. The second is to continue to expand participation in the planning process by implementing public information programs and expand participation by inviting the private sector. The third is to routinely monitor the implementation of initiatives in the plan until each is completed and in-place. Additionally, it is important to assess their actual effectiveness following the next relevant disaster event. The fourth is to issue an updated plan document for use by the participating organizations, to inform the community, and when appropriate for submittal to state and federal agencies for approval under the Disaster Mitigation Act of 2000. This portion of Section 9 describes how these four activities are carried out by the DMC to maintain the Greenville County HMRP.

The technical analyses conducted by the County are an ongoing effort to continually assess the hazards threatening the community, the vulnerabilities to those hazards, and the program framework to control those vulnerabilities. When indicated, the technical analysis also includes formulating proposed mitigation initiatives to eliminate or minimize the identified vulnerabilities. The County has completed the vulnerability assessment based on the best available information. As this process continues and additional data is gathered, the DMC will be better equipped to provide for more detailed analyses. In the next planning cycles, the DMC will continue to assess the vulnerabilities of facilities and planning areas. Vulnerability assessments are fundamental to identifying needed mitigation initiatives to propose for incorporation into the plan and as this process is continued, additional mitigation initiatives will be proposed for incorporation into the plan. Another technical analysis important to maintaining the plan is the expanded and refined evaluation of the policy and program framework of the County and the adequacy of this framework to control the vulnerabilities of the community.

The second type of activity to continue to maintain the County HMRP will be to continue to expand participation in the DMC and the mitigation planning process. The current participants in the planning and the level of their participation are addressed in Section 4 of the plan. Gaining additional participation in the planning is also part of the public information and community outreach component of the plan.

The third category of plan maintenance activities that will be undertaken by the DMC will be to monitor the implementation of mitigation initiatives. The DMC documents the efforts to fund the initiative, conduct required studies, and obtain any needed permits, as well as to estimate the time remaining to complete necessary design, studies, and purchasing/construction activities. When an initiative is completed, it is documented in Table 7 of the plan.

As a part of monitoring the implementation of mitigation initiatives, following a disaster and as a part of the post event analysis that the DMC will conduct, the effectiveness of completed mitigation initiatives, or any pre-existing mitigation initiatives, in reducing the human and economic impacts of the event can be estimated. As time passes and disaster events occur, this will enable the DMC to accumulate a database of “mitigation success stories” with regard to the value of the property losses avoided and the number of fatalities, injuries, or illnesses prevented.

Monitoring the effectiveness of plan implementation and maintenance also involves assessing the effectiveness of the mitigation goals and objectives established during the planning process. As noted above, the DMC established general goals and specific objectives to guide the participants in the mitigation planning process (included in Section 3.1). The DMC’s attempts to address the established objectives, with the intent of achieving the associated mitigation goals for the community, is a key measure of the effectiveness of the continuing plan maintenance and plan implementation. Table 28 documents the prioritized mitigation initiatives; the DMC’s efforts to achieve the

established goals and objectives. As these initiatives are implemented, and monitored for their effectiveness in future disasters, the DMC will be able to determine the overall success of their mitigation planning effort. In future planning cycles, these goals will be reviewed and re-evaluated to ensure they are still relevant to the unique needs of the community and continue to address current and expected conditions.

The fourth category of plan maintenance activities is to incorporate the results of all technical analyses, including the development of new mitigation initiatives and to publish another updated edition of the Greenville County HMRP. The DMC will continue to engage the public in the planning process, expand direct participation in the planning, and increase representation on the DMC itself. To complete this category of plan maintenance activity, the participants will follow a planning cycle.

Below are the major aspects of the Planning Cycle beginning in 2025 and ending in 2030:

- The DMC will meet as necessary and after each major event
- Mitigation initiatives will be collected as they appear from various City organizations, neighborhood groups, and businesses
- Adoption and implementation of new initiatives will be reviewed, ranked, and approved annually and during the next plan update.

The planned date for the release of the next edition of the Greenville County HMRP is intended to be 2030. At that time, the entire planning process, along with the new data that will have been collected, will be reviewed and altered as necessary.

9.3.1 Annual Review

As a part of the planning process, the HMRP is reviewed annually by the DMC. Mitigation initiatives are reviewed for implementation status, effectiveness, and relevancy as the County moves forward with implementation. Annual updates from this planning period can be found in Appendix D. Minor adjustments may be made to the HMRP, however, major edits and new recommended initiatives must go through the County Council for adoption.

9.3.2 New Initiatives

As identified, new mitigation initiatives may be added to the plan. These may be identified through the normal course of business, requests from citizens or other agencies, as a part of a post disaster review of the plan, or other means. New initiatives should be submitted to the DMC for review, scoring, and approval by Council (during the Five-Year Renewal process). Immediately following any major disaster, the DMC should convene to evaluate the performance of those initiatives that have been implemented, re-evaluate the scoring of remaining initiatives, and identify additional initiatives that might be appropriate considering the “lessons learned”.

9.3.3 Five-Year Renewal

Every five years, the HMRP is reviewed, evaluated, and updated as appropriate. This major update requires re-submittal to FEMA/SCEMD for review and approval. A County council resolution adopting the revised HMRP is also required.

9.3.4 Public Input into Plan Revisions

The DMC will continue efforts to develop and implement a year-round program to engage the community in the mitigation planning process and to provide them with mitigation-related information and education. These efforts will be to continually invite public comments and recommendations regarding the mitigation goals for the community, the priorities for the planning, and the unique needs of each community for mitigation-related public information. All DMC meetings are open to the public as well as Council Meetings where the plan and plan revisions are adopted. The final plan is posted on the County’s website, and the public is invited to comment on the HMRP content.

Appendix A – DMC Meeting Minutes



Meeting Minutes

Date of Meeting:	March 27, 2024	Subject:	Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update Disaster Mitigation Committee Meeting #1
Location:	Greenville County Emergency Management McAlister Square Training Room 225 S Pleasantburg Drive	Time:	1:30PM – 3:00PM
In Attendance:	See table below and scanned sign-in sheet attached.		

ITEMS DISCUSSED:

The Greenville County Disaster Mitigation Committee (DMC) met for the first time on March 27, 2024, to initiate the next update to the Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan (HMRP). The meeting was open to the public and had 35 attendees, with representatives from Greenville County, the City of Greenville, the City of Travelers Rest, the City of Fountain Inn, the City of Greer, members of the community, and other upstate agencies. A sign-in sheet was passed at the beginning of the meeting. The table below includes the contact information for all attendees and the scanned sign-in sheet is attached for reference. After a brief introduction from Jessica Stumpf, Greenville County’s Director of Emergency Management, members of the DMC introduced themselves to the group. Hal Clarkson and Molly Davis then presented an overview of the HMRP development process. The presentation included but was not limited to an explanation of the role/expectations of the committee members, the purpose of the HMRP, and general discussion regarding possible hazards and associated mitigation techniques. The presentation ended with an assignment for all committee members to think about the hazards presented and come ready with potential mitigation measures to present to the group at the next meeting. Hal let the committee know that the ideas presented at the second meeting will be evaluated and ranked for inclusion in the 2025 HMRP. A copy of the presentation was sent to the committee following the meeting and is attached for reference.

Name	Title	Organization
Catrina Woodruff	Assistant City Administrator	City of Greer
Zach Dukes	Engineering Infrastructure Program Manager	ReWa
Shaun Brand	Emergency Management Specialist	Prisma Health
Jennifer Simmons	Asset and Sustainability Leader	ReWa
Toby R Louis	Director of Technology	ReWa
Macy Sinner	Local Mitigation Planner	SCEMD
David Jones	Mitigation GIS Planner	SCEMD
James Moore	Public Citizen	CQRL
Russell Alexander	Fire Chief	City of Fountain Inn
Frank Holleman	Senior Attorney, President	Southern Environmental Law Center, Naturaland Trust
Mason Smith	Operations Manager	Duke Energy
Travis Elmore	Citizen	Paris Mountain Safety Com
Karen Kent	Emergency Planning Coordinator	Greenville County Emergency Management
Michael Jankowski	Planning Coordinator	Greenville County Emergency Management
Suresh Muthukrishnan	Professor, GIS/Remote Sensing	Furman University
Gustavo Coelho	Assistant Professor, Water Resources/Natural Disasters	Furman University
Jose Reynoso	Community Planner	Greenville County Redevelopment Authority
Imma Nwobodu	Program Director	Greenville County Redevelopment Authority
Rashida Jeffers-Campbell	Greenville County Planning Director	Greenville County
Anna Stewart	Transportation Planner	Greenville County
Brandon Grooms	Senior ROW Inspector/At-large member SC State Emergency Response Commission (SERC)	Colonial Pipeline Co.

Don Shuman	Parks Director	Greenville County
Hunter Crumley	County Engineer	Greenville County
Scot Yarborough	Regional Emergency Manager	SCEMD
Robert Roux	Environmental Engineering Project Manager	City of Greenville
Shannon Herman	City Administrator	City of Travelers Rest
Brian Bishop	Floodplain Administrator	Greenville County
Judy Wortkoetter	Stormwater / Land Development	Greenville County
Bob Mihalic	Government Affairs	Greenville County
Bena Peek	Citizen	Mountainside Garden Club Altamont Club Friends of Paris Mountain
Mike Winiski	Director of Applied Research	Shi Institute for Sustainable Communities – Furman University
Jessica Stumpf	Emergency Management Director	Greenville County Emergency Management
Chris Waller	Fire Code Official	Greenville County
Molly Davis	Woolpert, Inc. - Project Manager	Woolpert, Inc.
Harold Clarkson	Woolpert, Inc. - Program Director	Woolpert, inc.

Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261

Greenville County Multi- Hazard Mitigation Plan Update - DMC Meeting #1

Meeting Location: McAlister Square Training Room

Time: 1:30 PM

Date: Wednesday, March 27th, 2024



Name	Title	Organization
Catrina Woodruff	Assistant City Administrator	City of Greer
ZACH DUKES	ENGINEERING INFRA. PROGRAM MANAGER	REWA
Shaun Brand	Emergency Management Specialist	Prisma Health
Jennifer Simmons	Asset & Sustainability Leader	Rewa
Toby R. Louis	Director Technology	Rewa

Name	Title	Organization
Macy Sinner	local mitigation planner	SCCMD
DAVID JONES	MITIGATION GIS PLANNER	SCCMD
James MOORE	Public Citizen	CGR
Russell Alexander	City of Fountain Inn Fire Chief	Fountain Inn
Franc Hollenau	Senior ATTORNEY, Southern Environmental Law Center President Natural	Southern Environmental Law Center Natural Land Trust
MASON Smith	operations manager	Duke Energy
Travis Elmore	Citizen	Park Mountain Safety Corp

Name	Title	Organization
Karen Kent	Greenville County EM Planning Coordinator	GCEM
MICHAEL JANKOWSKI	PLANNING COORDINATOR	GCEM
Suresh, Muthukrishnan @furman.edu	Professor, Furman University GIS / Remote Sensing	Furman University
Gustavo Coelho	Assistant Professor Water Resources/Natural Disasters	Furman University
Jose Reynoso	Community Planner PLANNING	GCRA
Imma Nwobodo	Program Director	GCRA
Rashida Campbell	Greenville County Planning Director	Greenville County

Name	Title	Organization
Anna Stewart	Transportation Planner	Greenville County
BRANDON GROOMS	SR R.O.W. INSPECTOR // AT-LARGE MEMBER S.C. S.E.R.C.	COLONIAL PIPELINE Co.
Don Shuman	Parks Director	Greenville County
Hunter Cumley	County Engineer	Greenville County
SCOT YARBOROUGH	SEEMO REU	SEEMO
Robert Roux	Engineering Proj. Mgr.	City of Greenville
Shannon Herman	City Administrator	City of Travelers Rest

Name	Title	Organization
Brian Bishop	Floodplain Administrator	Greenville County
Judy Wortkoetter	Stormwater/Land Development	Greenville County
Bob Mihalic	Gov. Affairs	Greenville County
Bena Peek	Citizen	MTNSIDE Garden Club NOR ALTAMONT CLUB Friends of Paris Mtn
Mike Winiski	Director Applied Research	Shi Institute for Sustainable Communities Furman University
Jessica Stumpf	Director	Greenville County Emergency Management
Molly Davis	Project Manager	Woolpert Inc.

Name	Title	Organization
Chris Nalley	Fire Code official	Greenville County
Harold Clarkson	Program Director - Technical Lead	Woolpert, Inc.

Greenville County 2025 Multi-Jurisdictional Hazard Mitigation and Resiliency Plan



Agenda – DMC#1

- Introductions
- DMC Role
- Plan Purpose
- Hazards of Concern
- Risk
- Global Mitigation Measures
- GC Examples
- Assignment



Introductions

Disaster Mitigation Committee (DMC)



Disaster Mitigation Committee Members

10 County members and 7 municipal members, for a total of 17 plan participant members.
There are 23 public members and 40 total members.

Greenville County Members	Brian Bishop	City of Greenville	Paul Dow
	Don Shuman		
	Tyler Stone	City of Mauldin	Brian McHone
	Bob Mihalic		Bryan Thorton
	Jessica Stumpf	City of Simpsonville	Dianna Gracely
	Hunter Crumley	City of Greer	Dorian Flowers
	Karen Kent		
	Judy Wortkoetter	City of Travelers Rest	Shannon Herman
	Rashida Jeffers-Campbell	City of Fountain Inn	Shawn Bell
	Thomas (Tee) Coker	Woolpert	Hal Clarkson
			Molly Davis

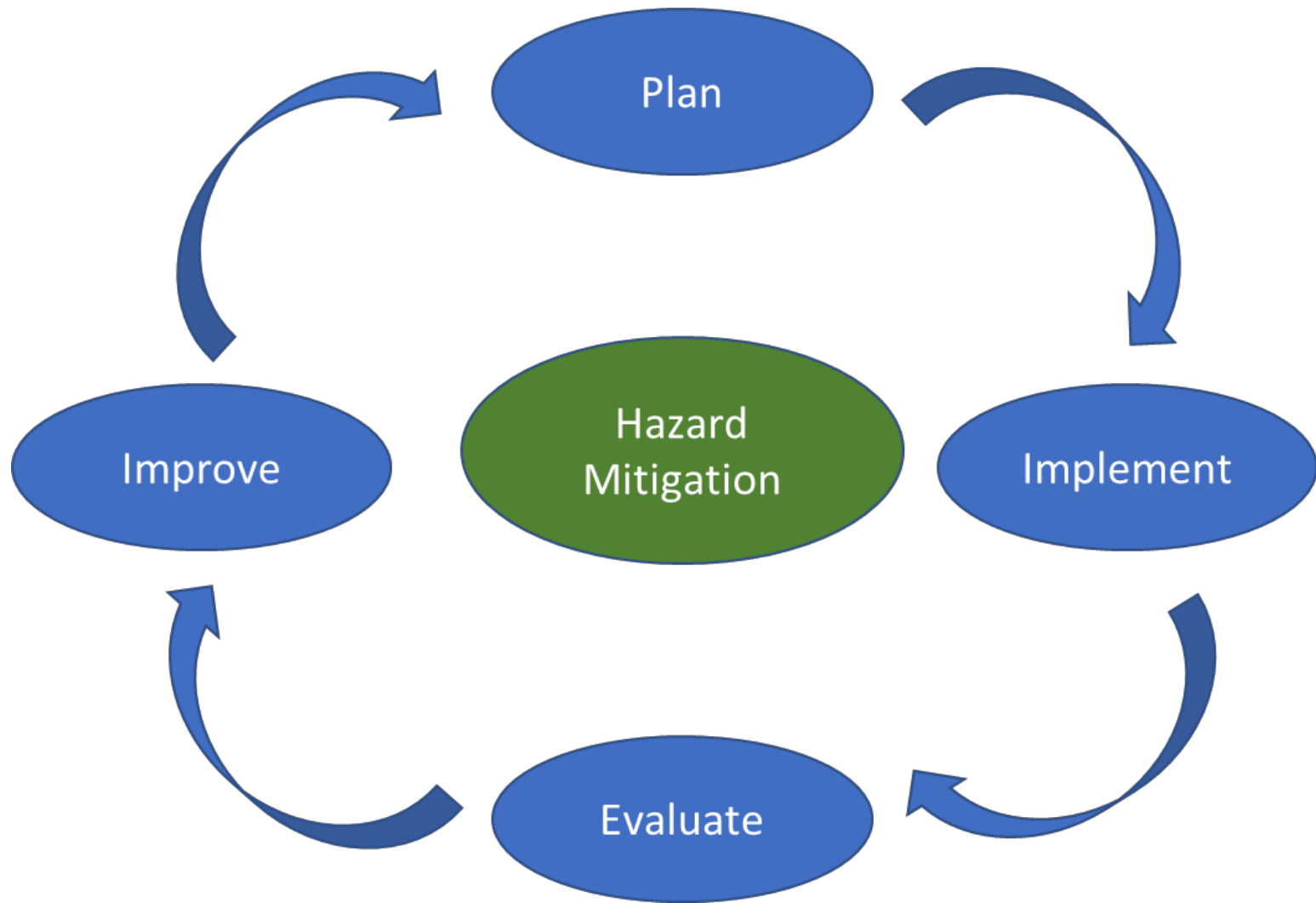


Disaster Mitigation Committee Members

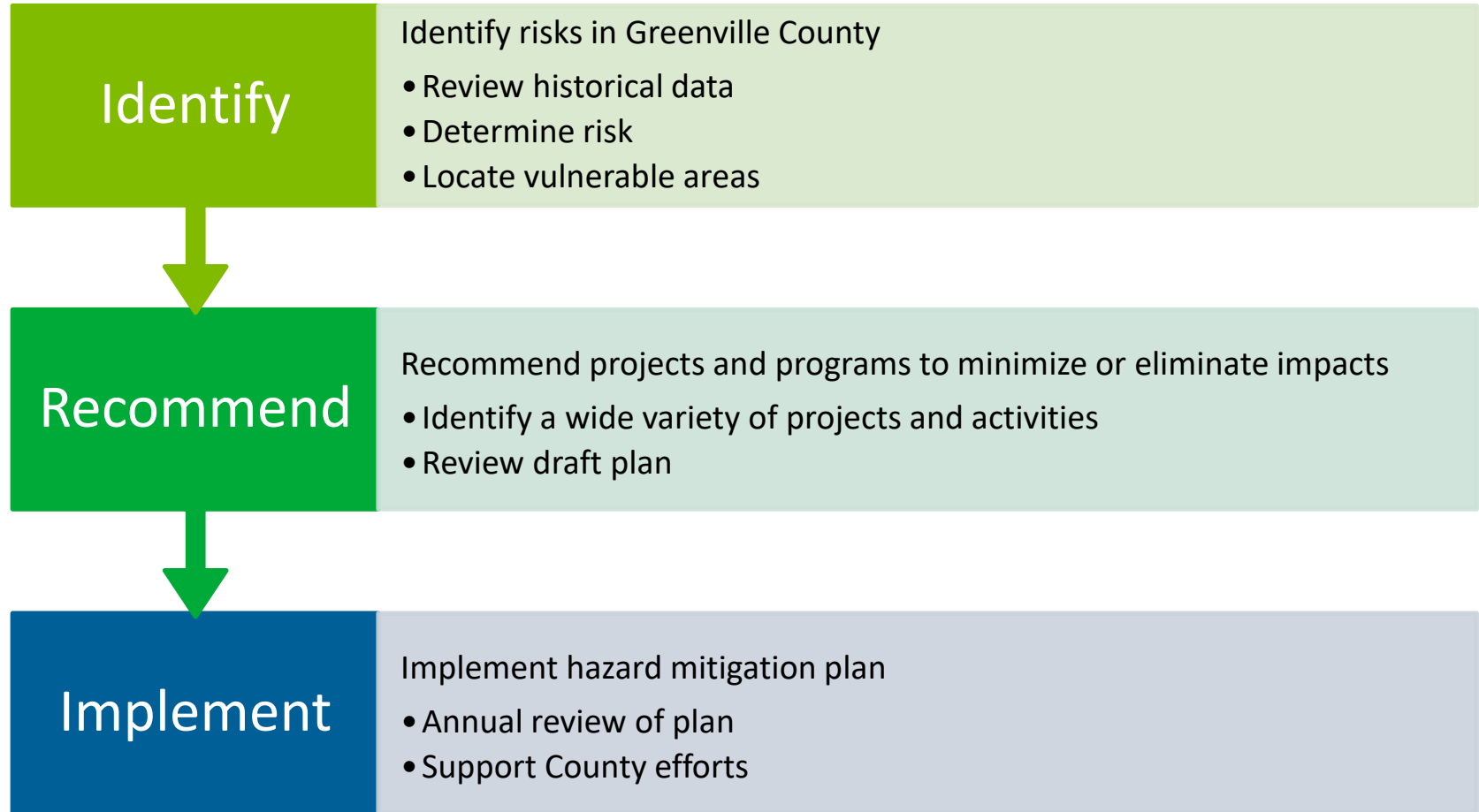
Greenville County Schools	Travis Forrester
NOAA	Brian Campbell
USDA	Lynne Newton
Furman University	Dr. Gustavo Coelho
	Andrew Predmore
ReWa	Zach Dukes
	Jennifer Simmons
	Toby Louris
Greenville County Redevelopment Authority	Imma Nwobodu
Upstate Forever	Drew Brittain
Home Builders Association	Taylor Lyles
Prisma Health	Jordan Bradway
Greengate Community Initiative	Meg Coffey

SCDOT	Joel Smith
Colonial Pipeline Company	Brandon Grooms
Duke Energy	Mason Smith
Greenville Water	Mark Hattendorf
Paris Mountain HOA	Bena Peek
	Travis Elmore
Save our Saluda & Easley Combined Utilities	Melanie Ruhlman
Southern Environmental Law Center	Frank S. Holleman III
Citizens for Quality Rural Living	Jim Moore
Sustainability Coursework	Anna Stewart

Planning Cycle



Role of the Committee



Plan Purpose

The Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan has been created **to make the population, neighborhoods, businesses, and institutions of the county more resistant to the impacts of future natural disasters.**

- **Provide a Methodical, Substantive Approach to Mitigation Planning**
- Enhance Public Awareness and Understanding
- Create a Decision Tool for Management
- Promote Compliance with State and Federal Program Requirements
- Enhance Local Policies for Hazard Mitigation Capability
- Integrate HMRP Requirements into Other County Plans

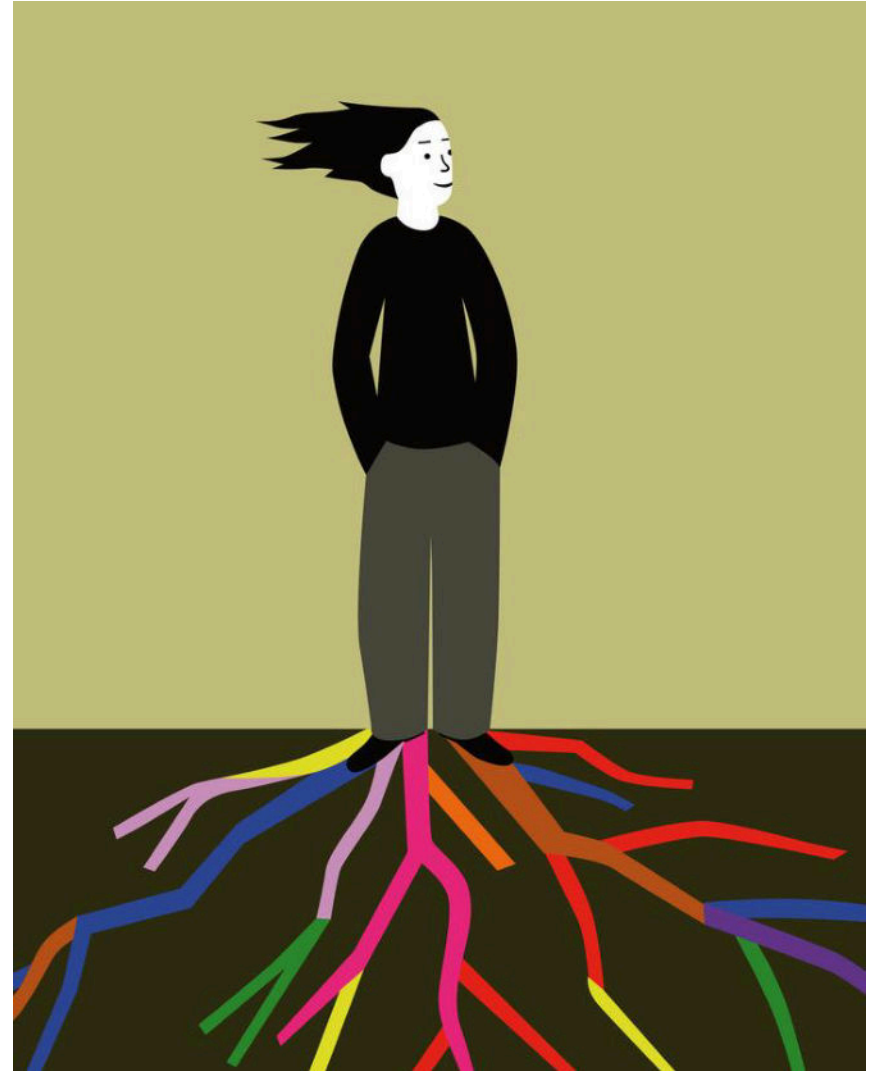


Plan Goals

1. Develop, maintain, and utilize hazard information
2. Initiate and sustain emergency response operations during and after a disaster
3. The continuity of operations will not be significantly disrupted by disasters
4. The policies and regulations will support effective hazard mitigation programming
5. Residents will have homes, institutions, and places of employment that are less vulnerable to disasters
6. The economic vitality will not be significantly threatened by a disaster
7. The availability and functioning of the infrastructure will not be significantly disrupted by a disaster
8. Employees will be trained to recognize hazards threatening local areas and the techniques to minimize vulnerability to hazards. Information on hazard mitigation will be disseminated to the public.
9. **Protect public safety and prevent loss of life and injury**

New Resiliency Components

- Notification of adjacent and relevant jurisdictions and agencies regarding the planning process and an opportunity to comment on the plan.
- Additional detail in hazard and risk analysis including additional mapping
- A review of the County's resources and capacity to implement the plan
- Strategies and goals for the following components:
 - population,
 - economic development
 - transportation
 - land use
 - natural resources
 - community facilities
 - cultural resources
 - priority investments

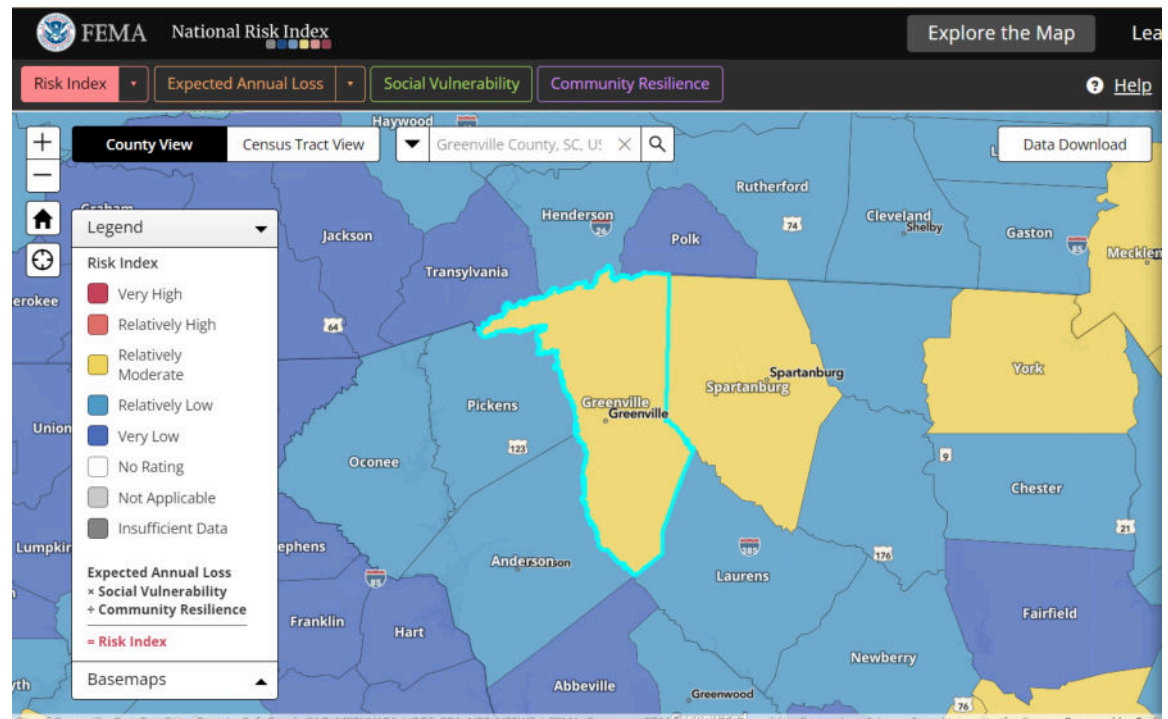


County Demographics

Population	529,297			
Projected Annual Growth Rate	1.5%			
Age	Under 18: 22.7%		Over 65: 17%	
Languages Spoken at Home	English: 88.6%	Spanish: 7.6%	Indo European and Asian: 3.3%	Other: 0.6%
Ethnicity	White: 73%	Black: 17.2%	Hispanic: 9.2%	Asian: 2.6%
Foreign Born	8%			
Education	High School Diploma or Higher: 89.9%		Bachelors Degree or higher: 35.9%	
Health	With a disability: 12.4%			
Income	Persons in poverty: 9.6%			

What's at risk?

- People
- Economy
- Infrastructure
 - Buildings
 - Roads
 - Utilities
- Critical Facilities
 - Hospitals
 - Schools
 - Utilities
 - Government Facilities
 - Eldercare & Childcare Facilities
- Natural Resources



Greenville County – National Risk Index

Risk Index:	Relatively Moderate
Expected Annual Loss:	Relatively Moderate
Social Vulnerability:	Relatively High
Community Resilience:	Relatively High

What's at risk?

- Safety and security
- Food, water, and shelter
- Health and medical services
- Energy
- Communications
- Transportation
- Hazardous materials management



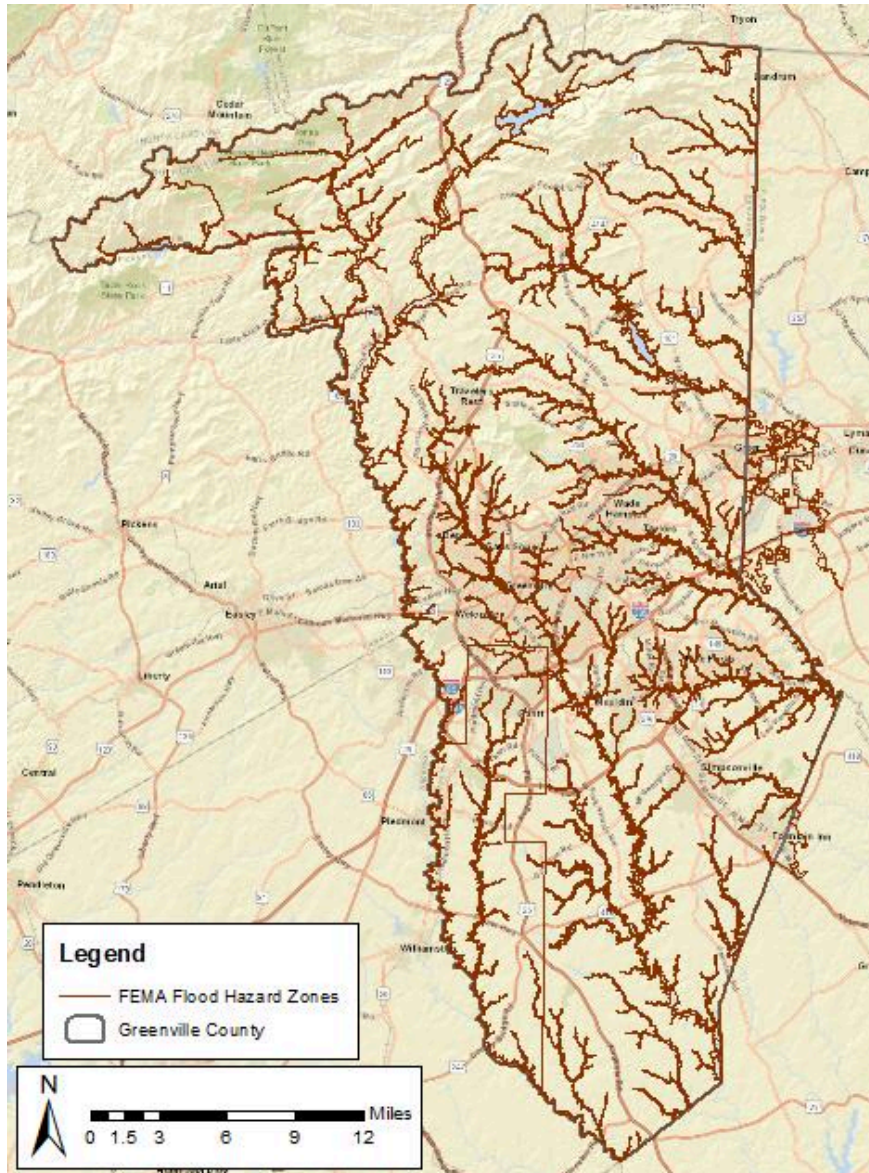


Hazards of Concern

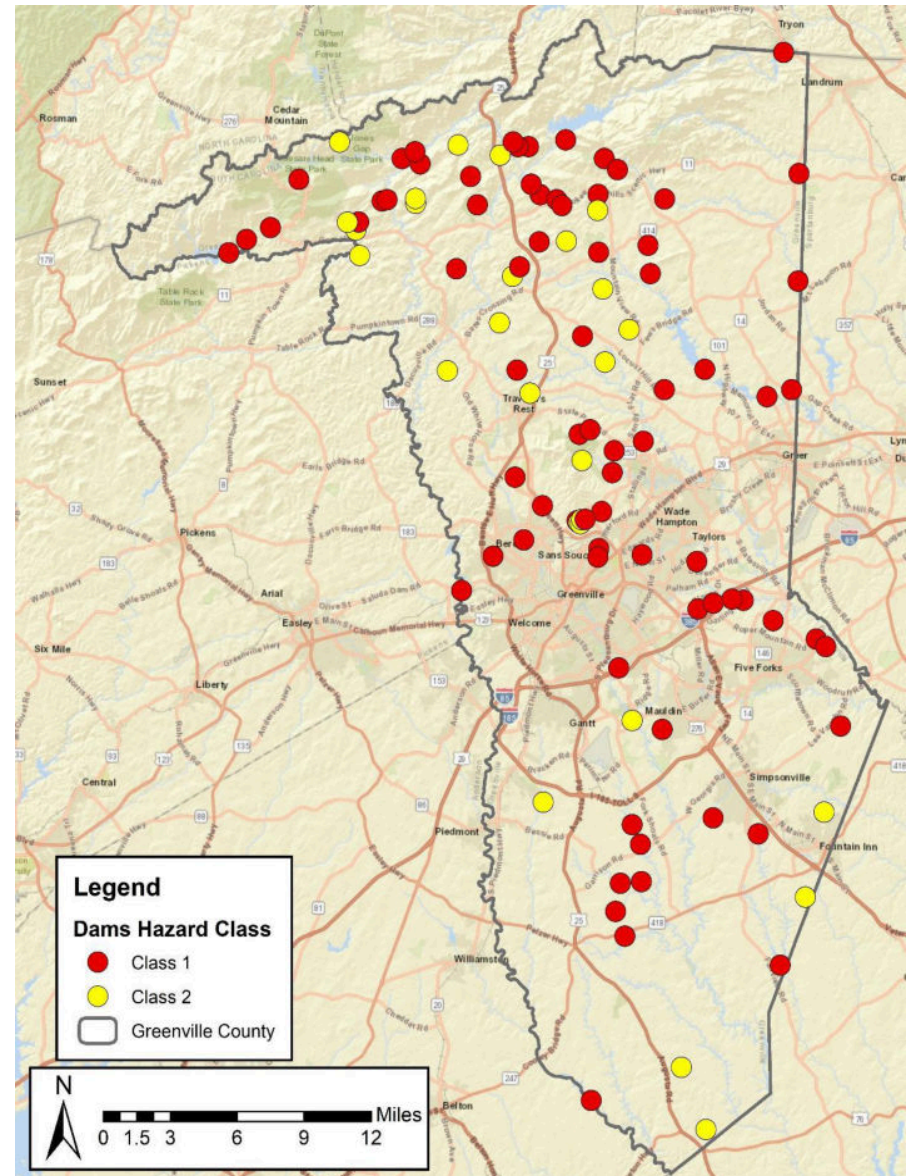
- Flooding
- Winter Storms
- High Winds / Tornadoes
- Wildfires
- Earthquakes
- Drought
- Landslides
- Sinkholes
- Hail
- Climate Change
- Emerging Infectious Diseases



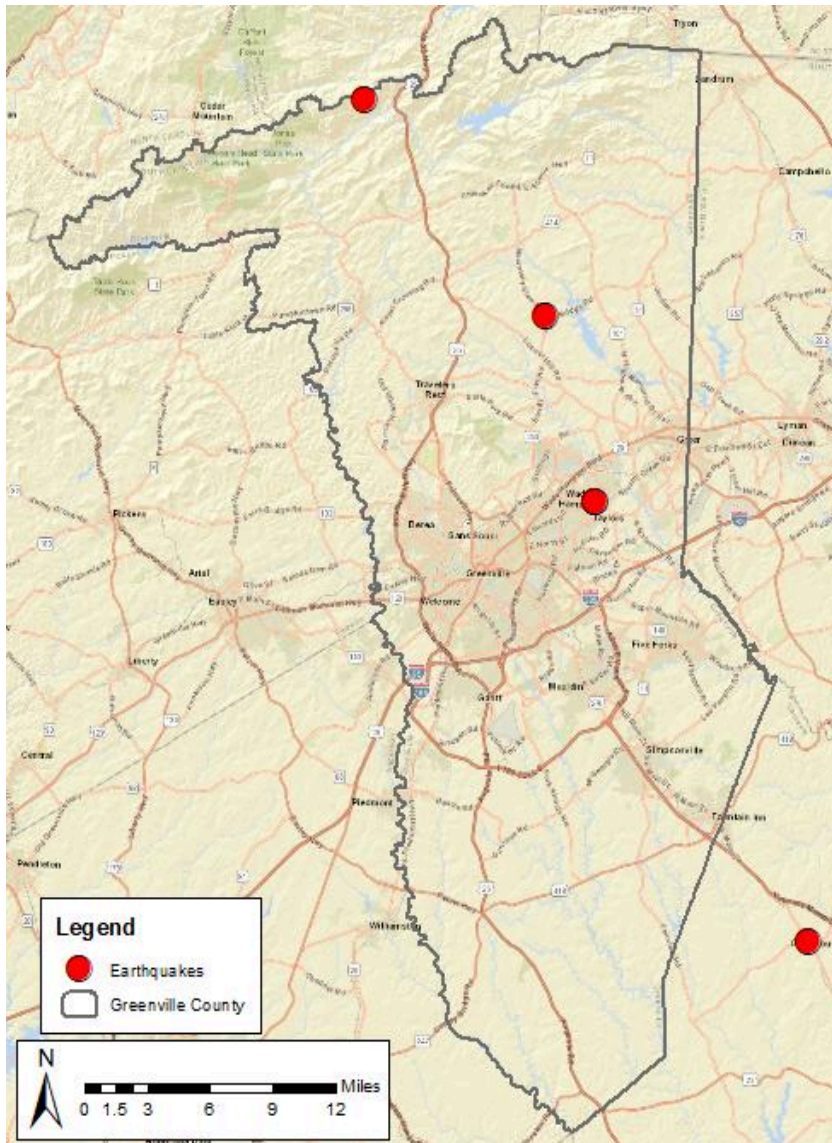
Flood Hazard



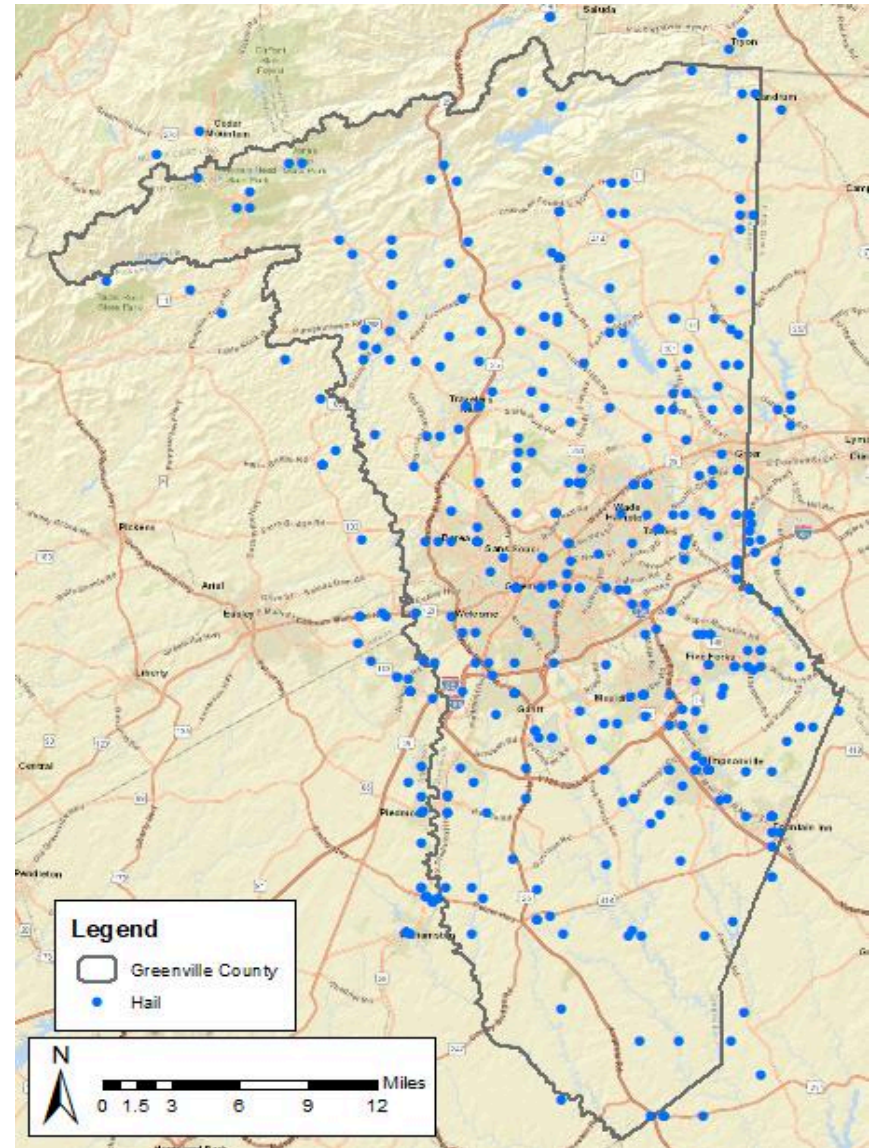
Dam Hazard



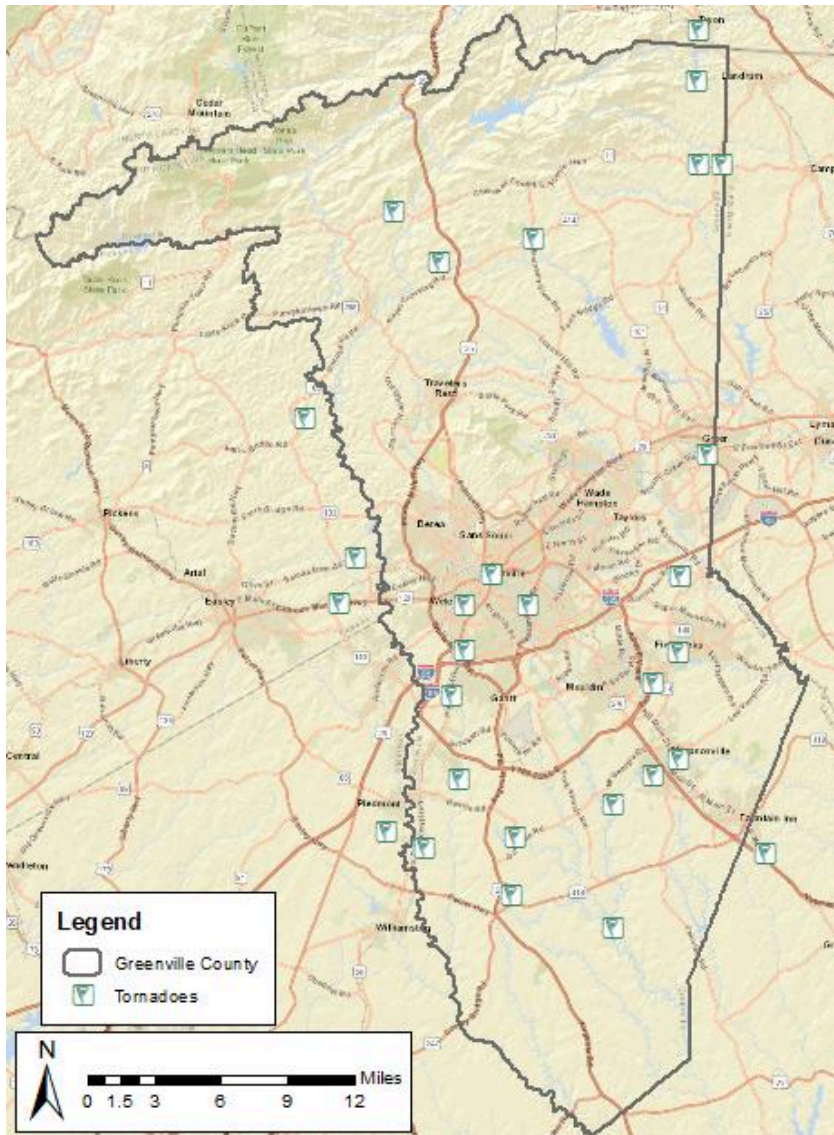
Earthquakes



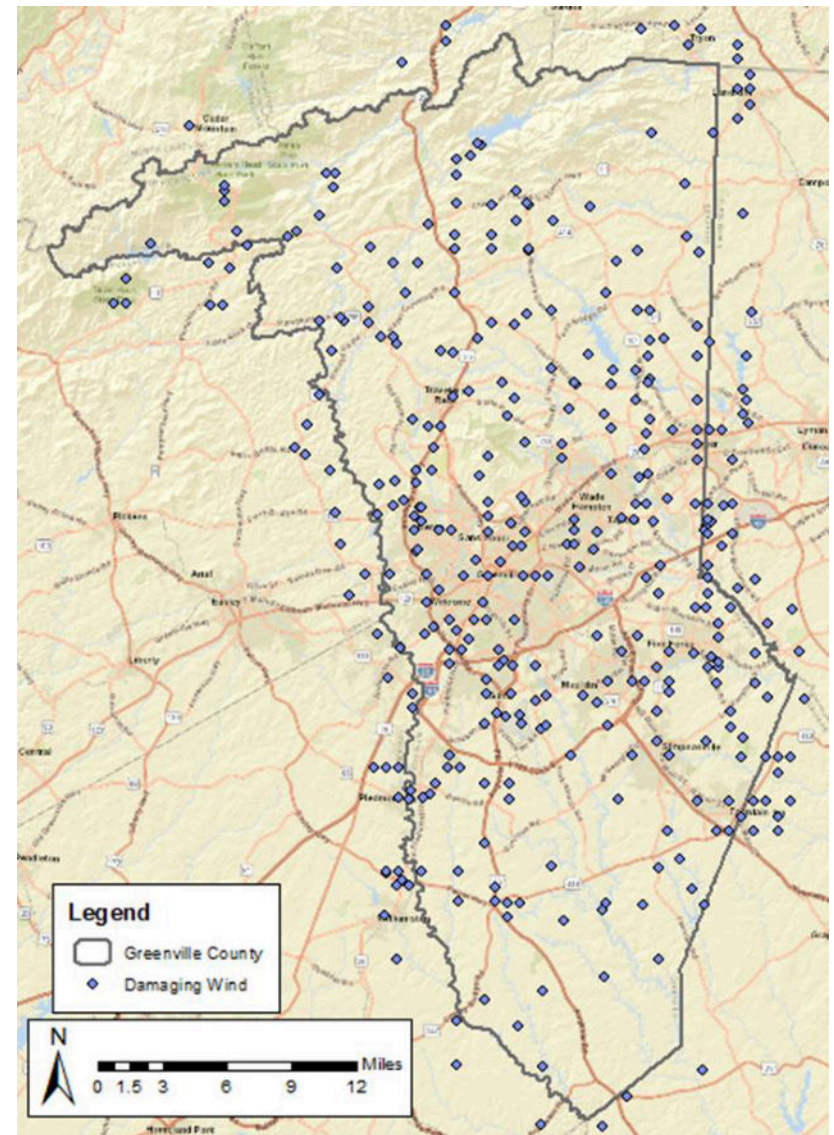
Hail



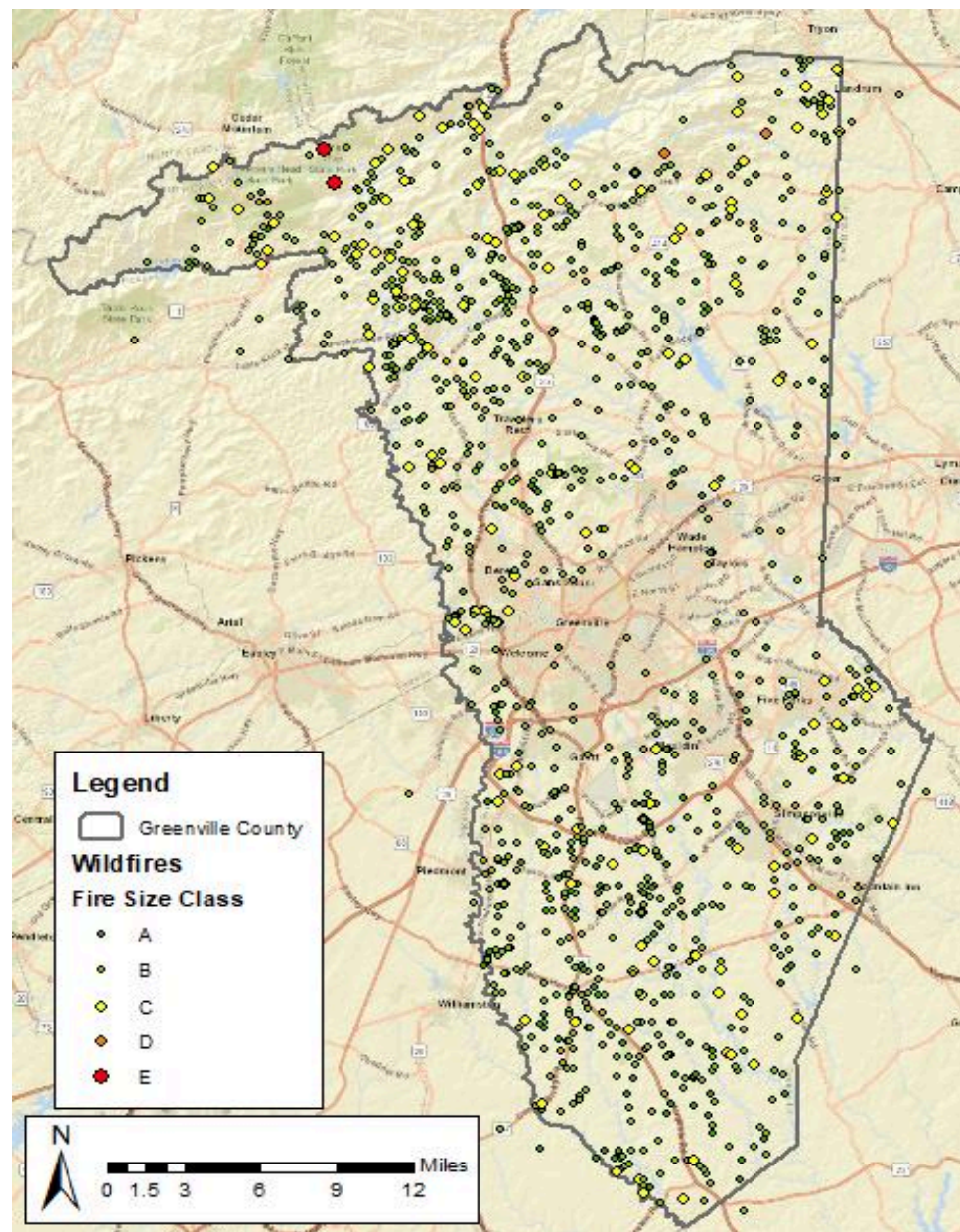
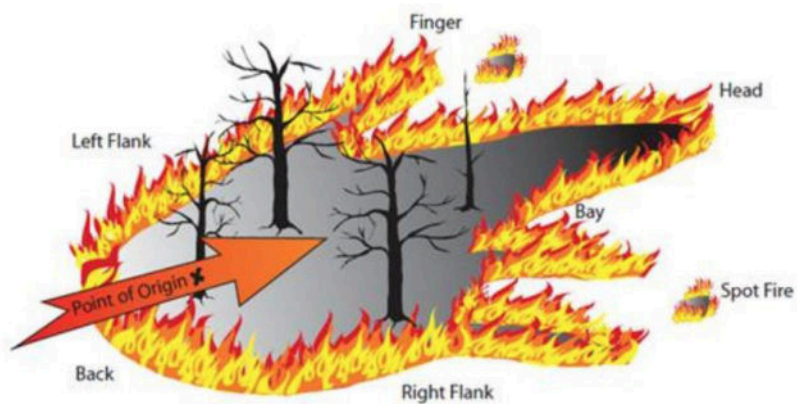
Tornados



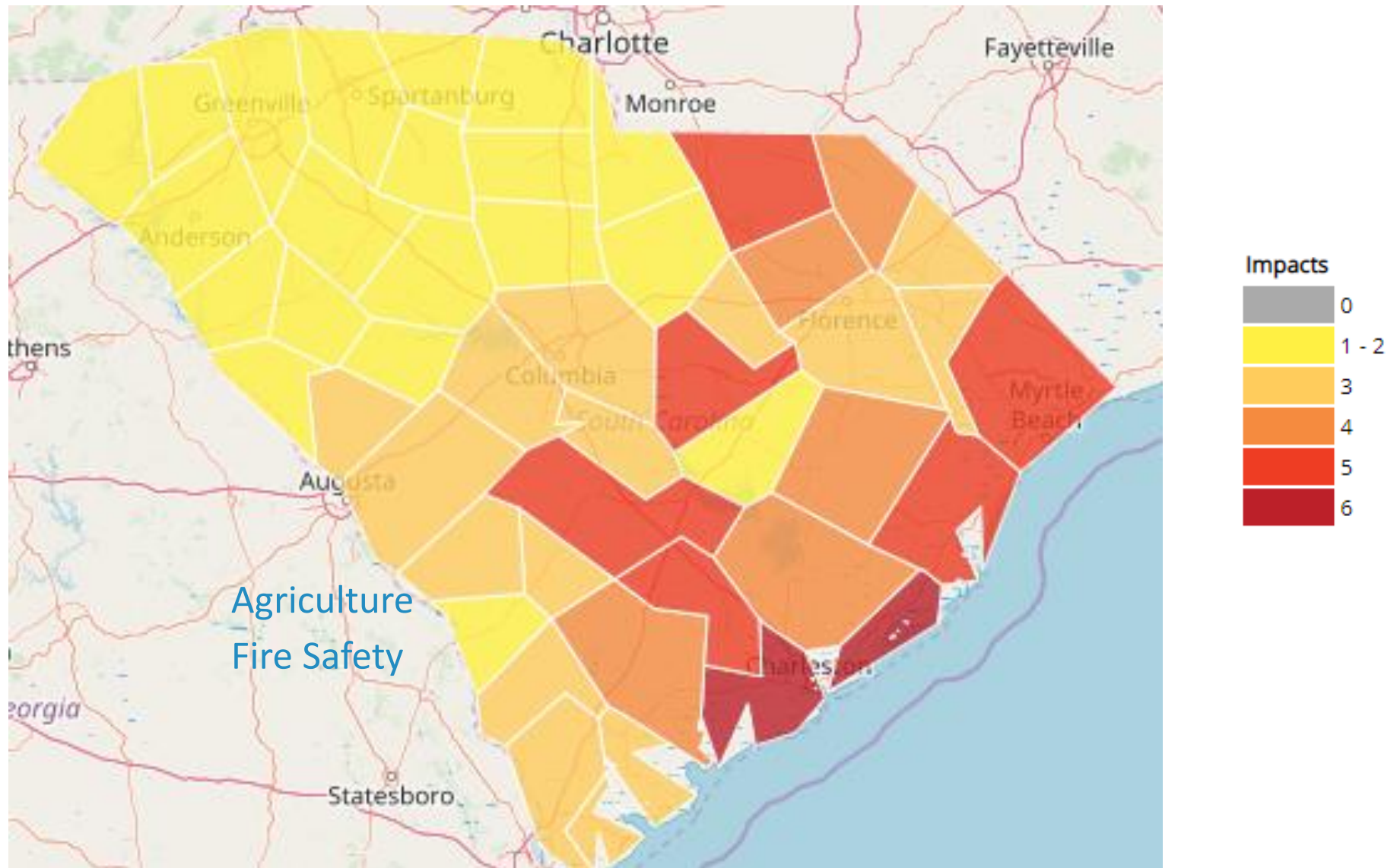
Wind



Wildfires

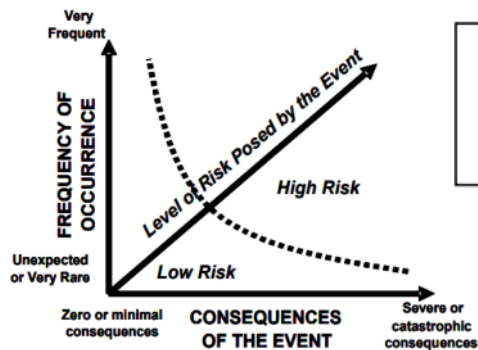


Drought



Hazard Matrix

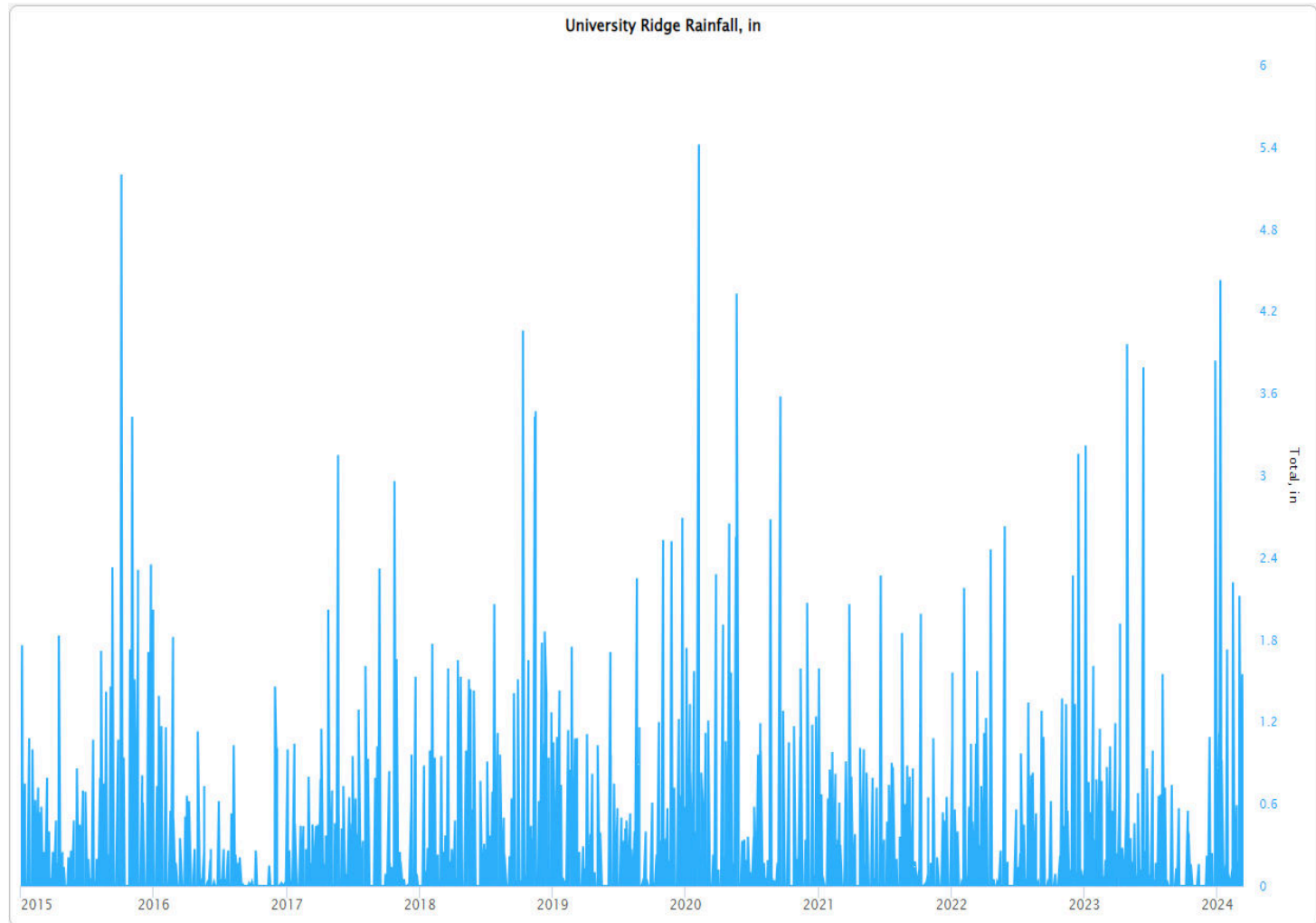
Hazard	Probability of Occurrence	Area of Impact	Consequence of Occurrence				Risk Rating
			Health & Safety	Property	Environment	Economic	
Flood	4	1	1	1	1	2	24
Winter Storms	5	4	1	1	0	2	40
High Winds/ Tornados	5	1	1	1	0	1	20
Wildfires	2	1	1	2	2	1	14
Earthquakes	1	4	1	1	0	1	7
Drought	3	3	1	0	1	1	18
Landslides	1	1	1	1	0	0	3
Sinkholes	1	1	1	1	0	0	3
Hail	4	1	1	1	1	1	20



$$\left[\text{Area Impacted} + \text{Health and Safety Consequences} + \text{Consequences to Property} + \text{Consequences to Environmental Resources} + \text{Economic Consequences} \right] \times \text{Probability of Occurrence} = \text{Relative Risk}$$

Climate Change

Storm total in inches data from the last 10 years. Rain Gauge from University Ridge.



Global Mitigation Techniques



Prevention

**Public Education
and Awareness**

**Natural Resource
Protection**

**Emergency
Services**

**Property Protection/
Acquisitions**

Structural Projects

Prevention

Processes and actions that influence the way property is developed

- Building codes
 - Flood damage prevention ordinance
 - Land planning
 - Open space preservation
 - Storm water management regulations
-
- Activities: Storm debris removal process plan, develop a plan for post-disaster nuclear power cleanup, severe rain event sewage study, create firebreaks around critical facilities, etc.



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Natural Resource Protection

Actions to preserve or restore the functions of natural systems

- Floodplain management
 - Stream restoration
 - Watershed and floodplain studies
 - Sediment and erosion control
 - Continued debris removal
-
- Activities: Update watershed studies and flood studies, address erosion control, develop riverine crews to assist with debris removal, sediment removal maintenance plan



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Property Protection/Acquisition

Modification of existing buildings or structures

- Acquisition
 - Relocation
 - Elevation
 - Floodproofing
 - Storm shutters
 - Safe Rooms
-
- Activities: Dwelling Elevation Program, cooperate with relocation of privately-owned utility facilities, stock piling debris locations, identify dam inundation zones



Public Education

Actions to inform citizens and elected officials about hazards and mitigation techniques

- Periodic meetings with neighborhood groups
- Distributed literature
- Public service announcements
- Hazard mitigation committee
- Real estate disclosures
- Utilize FEMA information



- Activities: Enhance GIS database, installation of rain gages, enhance hazards education

Emergency Services

Disaster response and recovery activities

- Warning systems
 - Emergency response services
 - Protection of critical facilities
-
- Activities: Reassessment of Reverse 911 System (Bilingual), provide backup generators for key intersections and critical facilities, correlate real time flood stages to areas of actual flooding, Identify more prevalent shelter locations, etc.



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Structural Projects

Construction of structures to reduce the impact of a hazard

- Dams
 - Levees
 - Floodwalls
-
- Activities: Dam restorations, Structural temporary roadblocks



High and Significant Hazard Regulated Dams

- High Hazard dams are those where failure or misoperation could result in a significant property damage, environmental harm and are pose an active threat as the risk of failure is very high.
- Typically located in areas where a failure would impact populated areas, critical infrastructure, or environmentally sensitive areas downstream.

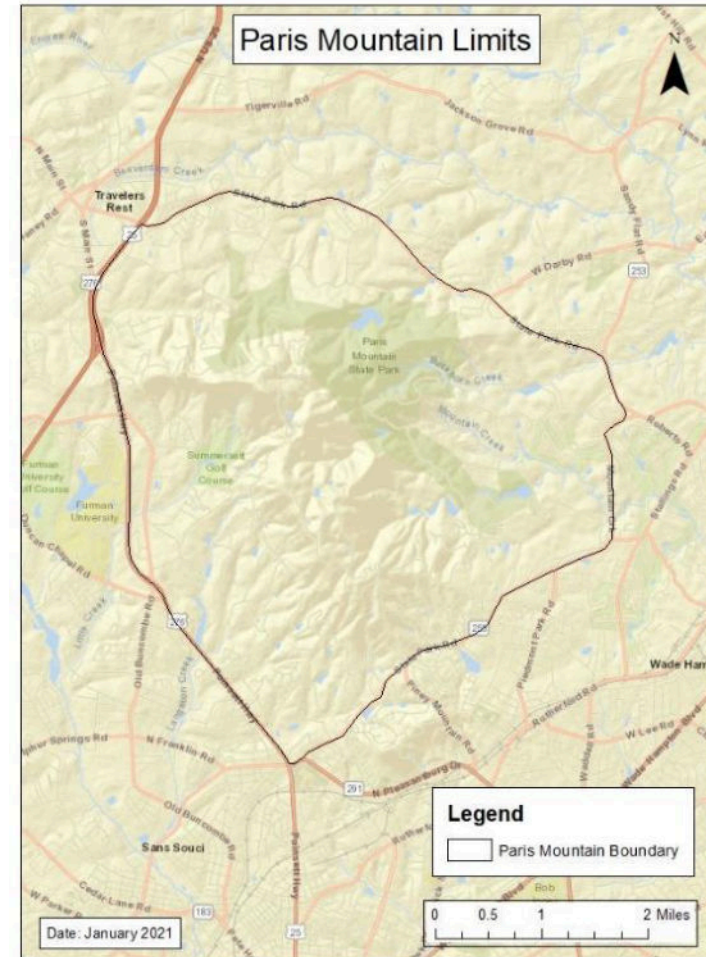


Hazard Potential Classification	Number of Dams
High – C1	65
Significant - C2	13
Low – C3	58
Total	136

<https://gis.dhec.sc.gov/scdams/>

Paris Mountain Wildfire Plan

- The Paris Mountain area is a valuable natural resource
- Assets :
 - Communications equipment
 - Paris Mountain State Park
 - Two waste treatment plants
 - residential and commercial structures
 - Home to approximately 8,827 people



Located: north of the City of Greenville and is bounded by State Park Road (County Road 22), South Carolina Highway 253, U.S. Route 276, and U.S. Route 25.

Next Steps



Data Needs

- Historical data
 - Locations
 - Event sizes
 - Damage costs
- Models and predictions
- Existing mitigation initiatives



Assignment:

Potential Mitigation Measures



Contact Information

Jessica Stumpf – Greenville County

- 864.467.3812
- jstumpf@greenvillecounty.org



Molly Davis– Woolpert, Inc.

- 803.214.5943
- molly.davis@woolpert.com

Meeting Minutes

Date of Meeting:	July 30, 2024	Subject:	Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update Disaster Mitigation Committee Meeting #2
Location:	Greenville County Emergency Management EOC 225 S Pleasantburg Drive	Time:	9:00 AM – 12:00PM
In Attendance:	See table below and scanned sign-in sheet attached.		

ITEMS DISCUSSED:

The Greenville County Disaster Mitigation Committee (DMC) held its second meeting on July 30, 2024. The main objective of the meeting was to brainstorm mitigation activities for the 2025 plan update. 27 people attended the meeting, with representatives from Greenville County, City of Greenville, City of Traveler’s Rest, City of Greer, City of Fountain Inn, members of the community, and other upstate agencies. Attendees names and titles/organizations are included in the table below. The scanned sign-in sheet is also attached for reference. The meeting was open to the public. The website posting with meeting details can be found in Figure 1 below.

Hal Clarkson started the meeting with a brief presentation covering the purpose/goals of the plan as well as a refresher on the hazards to be addressed and the mitigation activity types. The committee members were split into tables for small group discussions. Each table came up with mitigation activity ideas for each group of hazards. The hazard groupings are listed below.

- Flooding / High Hazard Potential Dams
- Winter Storms
- High Winds/Tornados/Hail
- Wildfires
- Heat/Drought
- Sinkholes, Landslides & Earthquakes

The groups were given 15 minutes to discuss each topic, and the group reconvened to share ideas for 10 minutes following each topic. The mitigation activity ideas that came out of the meeting are attached.

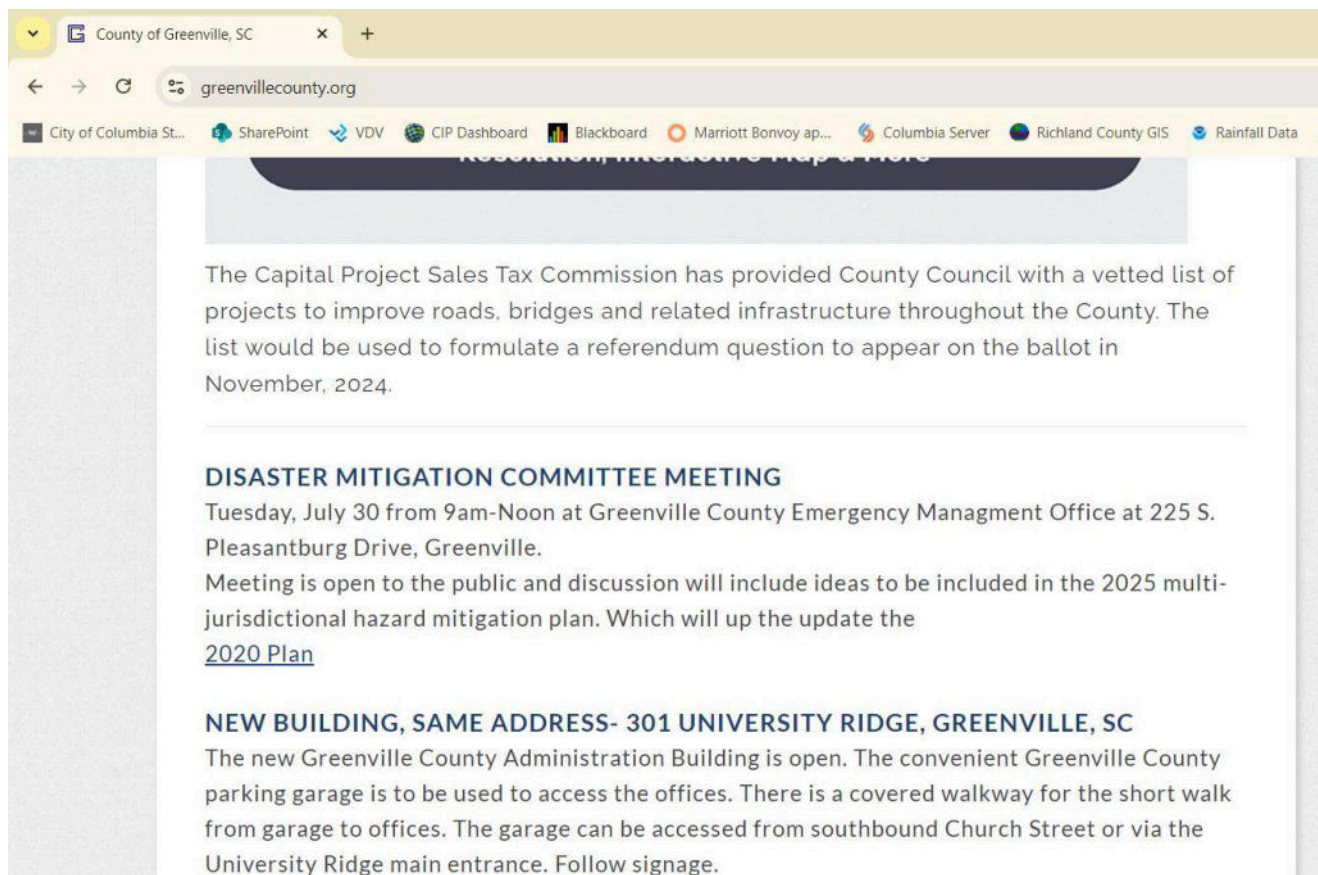


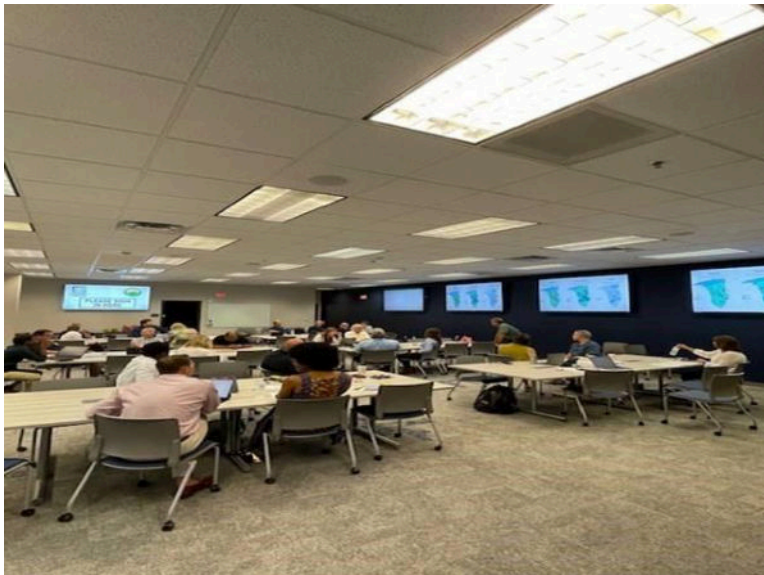
Figure 1 Public Posting with DMC #2 Meeting Details on the Greenville County website

Table 1 DMC Meeting #2 Attendees

Name	Title	Organization
Taylor Lyles	CEO	HBA of Greenville
James Woodward	ADME	SCDOT
Tee Coker	Assistant Administrator – Community Planning and Development	Greenville County
Melanie Ruhlman	President – Save Our Saluda Watershed Manager for Easley Combined Utilities	Save Our Saluda Easley Combined Utilities
Aubin Vertueux Dzossa Bontse	Climate Resilience Fellow	Shi Institute – Furman University
Joe Smith	Executive Director	Greenville County Redevelopment Authority
Catrina Woodruff	Assistant City Administrator	City of Greer
Phillip Tate	Public Works Director	City of Traveler’s Rest
Paul Dow	City Engineer	City of Greenville
David Garland	Public Works	City of Traveler’s Rest
Josh Almeida		City of Traveler’s Rest
Ben Roberts	Captain	Fountain Inn Fire
Shaun Brand	Emergency Management Specialist	Prisma Health
Jennifer Simmons	Asset and Sustainability Leader	ReWa
James “Jim” Moore	Public Citizen – President CQRL	CQRL
Michael Jankowski	Planning Coordinator	Greenville County Emergency Management
Suresh Muthukrishnan	Professor, GIS/Remote Sensing	Furman University

Jose Reynoso	Community Planner	Greenville County Redevelopment Authority
Rashida Jeffers-Campbell	Greenville County Planning Director	Greenville County
Anna Stewart	Transportation Planner	Greenville County
Brandon Grooms	Senior ROW Inspector/At-large member SC State Emergency Response Commission (SERC)	Colonial Pipeline Co.
Brian Bishop	Floodplain Administrator	Greenville County
Judy Wortkoetter	Stormwater / Land Development	Greenville County
Mike Winiski	Director of Applied Research	Shi Institute for Sustainable Communities – Furman University
Jessica Stumpf	Emergency Management Director	Greenville County Emergency Management
Molly Davis	Woolpert, Inc. - Project Manager	Woolpert, Inc.
Harold Clarkson	Woolpert, Inc. - Program Director	Woolpert, inc.

Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261



Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261

Greenville County Multi- Hazard Mitigation Plan Update - DMC Meeting #2

Meeting Location: Greenville County EOC

Time: 9:00 AM- 12:00 PM

Date: Tuesday, July 30, 2024



Name	Title	Organization	Email Address
Brian Bishop	Floodplain Administrator	Greenville County	jbishop@greenvillecounty.org
Josh Almeida		City of TR.	j.almeida@traversesst.com
Ben Rhea		St Inn Fire	Russell.Alexander.O. Fountain Inn .org
Jessica Stumpf	Director of Emergency Mgmt	Greenville County	jstumpf@greenvillecounty.org
MIKE JANOWSKI	PLANNING COORD.	Greenville County Sm	MJANOWSKI@GREENVILLECOUNTY.ORG

Name	Title	Organization	Email Address
Shawn Brand	E.M. Specialist	Prisma Health	shawn.brand@prismahealth.org
David Garland	Public Works	City of Travelers Rest	garland@travelersrestsc.com
Paul Dow	City Engineer	City of Greenville	pdow@greenville.sc.gov
Phillip TATE	Public works Dir	City of TR	tate@travelersrestsc.com
Catrina Woodruff	Assistant City Administrator	City of Greer	cwoodruff@cityofgreer.org
Joe Smith	E.D. GCRA	GCRA	JSmith@ GCRA-SC.ORG
Jose Reynoso	Community Planner GCRA	GCRA	jreynoso@gcra-sc.org

Name	Title	Organization	Email Address
Mike Winiski	Dir. Applied Research, shi, Furman	Furman University	mike.winiski@ furman.edu
Aubin Vertueux Dzossa Bontse	Climate Resilience Fellow, shi Institute, Furman.	Furman University	dzosau1@furman.edu
Melanie Ruhlman	President, Save Our Schule Watershed Manager Easley Combined Utilities →	→	info@saveourschule. org
Rashida Campbell	Planning Director	Greenville County	RJeffers-Campbell@ gmail.com
Anna Stewart	Transportation Planner	Greenville County / Sustainability coursework	Astewart@ greenvillecounty.org
Jennifer Simmons	Asset Sustainability Leader	ReWA	jennifers@re-wa.org
Judy Westkoetter	LDD	Gaillard County	

Name	Title	Organization	Email Address
TEE COREK	ASSASSANT ADMIN	GVL Co	TCOLKER@ GREENVILLECOUNTY .ORG
James Woodward	ADME	SCDOT	woodwardjw@ scdot.org
Taylor Lyles	CEO GREENVILLE	HBA of Greenville	Lyles @ Hbaofgreenville .com
BRANDON GROOMS	COLONIAL PIPELINE CO	↔ SR ROUTE INSPECTOR	bgrooms@colpipe.com
JIM MOORE	President	CQAL	comanche7093@aol.com
Suresh Muthukrishnan	Professor	Furman Univ.	Suresh.muthukrishnan @furman.edu
molly Davis	project manager	Woolpert, Inc	molly.davis@ woolpert.com

Name	Title	Organization	Email Address
Hal Clarkson	Program Director	Woolpert, Inc.	Hal.Clarkson@woolpert.com

Greenville County 2025 Multi-Jurisdictional Hazard Mitigation and Resiliency Plan



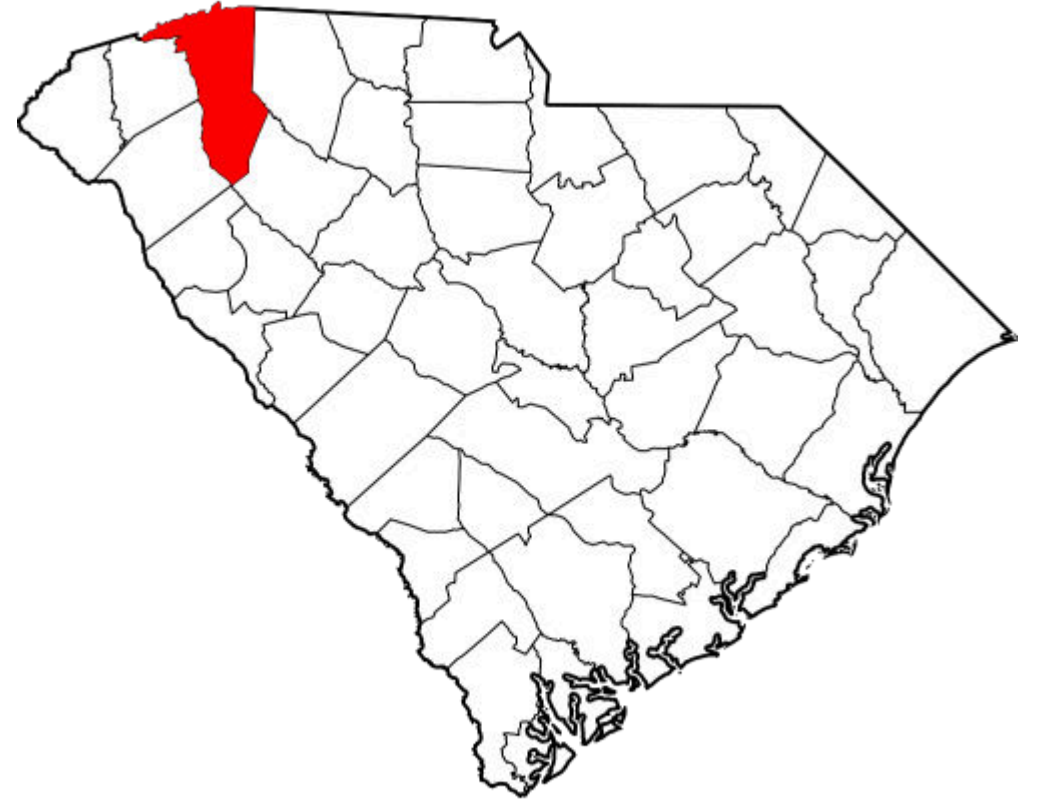
DMC Meeting #2



Plan Purpose

The Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan has been created **to make the population, neighborhoods, businesses, and institutions of the county more resistant to the impacts of future natural disasters.**

- **Provide a Methodical, Substantive Approach to Mitigation Planning**
- Enhance Public Awareness and Understanding
- Create a Decision Tool for Management
- Promote Compliance with State and Federal Program Requirements
- Enhance Local Policies for Hazard Mitigation Capability
- Integrate HMRP Requirements into Other County Plans



Role of the Committee



County Demographics

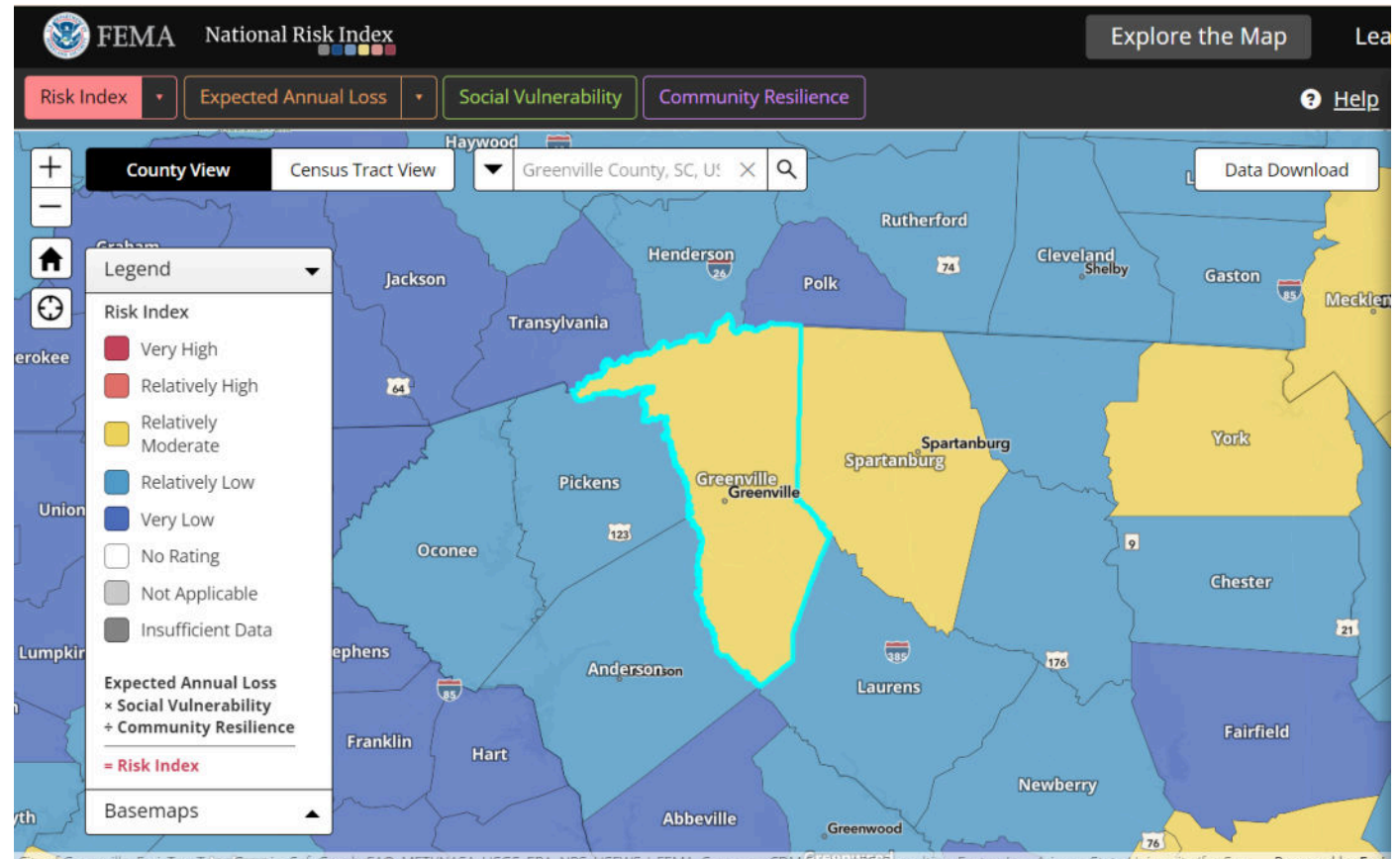
Population	529,297			
Projected Annual Growth Rate	1.5%			
Age	Under 18: 22.7%		Over 65: 17%	
Languages Spoken at Home	English: 88.6%	Spanish: 7.6%	Indo European and Asian: 3.3%	Other: 0.6%
Ethnicity	White: 73%	Black: 17.2%	Hispanic: 9.2%	Asian: 2.6%
Foreign Born	8%			
Education	High School Diploma or Higher: 89.9%		Bachelors Degree or higher: 35.9%	
Health	With a disability: 12.4%			
Income	Persons in poverty: 9.6%			

Source: https://data.census.gov/profile/Greenville_County,_South_Carolina?g=050XX00US45045



What's at risk?

- People
- Infrastructure
 - Buildings
 - Roads
 - Utilities
- Critical Facilities
 - Hospitals
 - Schools
 - Utilities
 - Government Facilities
 - Eldercare & Childcare Facilities
- Natural Resources
- Economy



Greenville County – National Risk Index

Risk Index: Relatively Moderate
Expected Annual Loss: Relatively Moderate
Social Vulnerability: Relatively High
Community Resilience: Relatively High

Source: <https://hazards.fema.gov/nri/map>

What's at risk?

- Safety and security
- Food, water, and shelter
- Health and medical services
- Energy
- Communications
- Transportation
- Hazardous materials management





Hazards of Concern

- Flooding / High Hazard Potential Dams
- Winter Storms
- High Winds / Tornadoes
- Hail
- Wildfires
- Earthquakes
- Drought
- Landslides
- Sinkholes

Global Mitigation Techniques

Prevention

**Public Education
and Awareness**

Natural Resource Protection

Emergency Services

**Property Protection/
Acquisitions**

Structural Projects

Things to Think About

- **What hazards have the most impact on Greenville County?**
 - In what way?
 - How frequently?
 - For how long?
- **What were the three most recent disaster events?**
 - What lessons were learned from events?
 - What changes have been made to address the lessons?
 - What changes still need to be made?
- **What mitigation techniques have been the most impactful?**
- **Are there different issues across the County?**
 - Of what nature?
 - Are there specific “trouble spots”?
- **What can we do to lessen the impact of future events?**

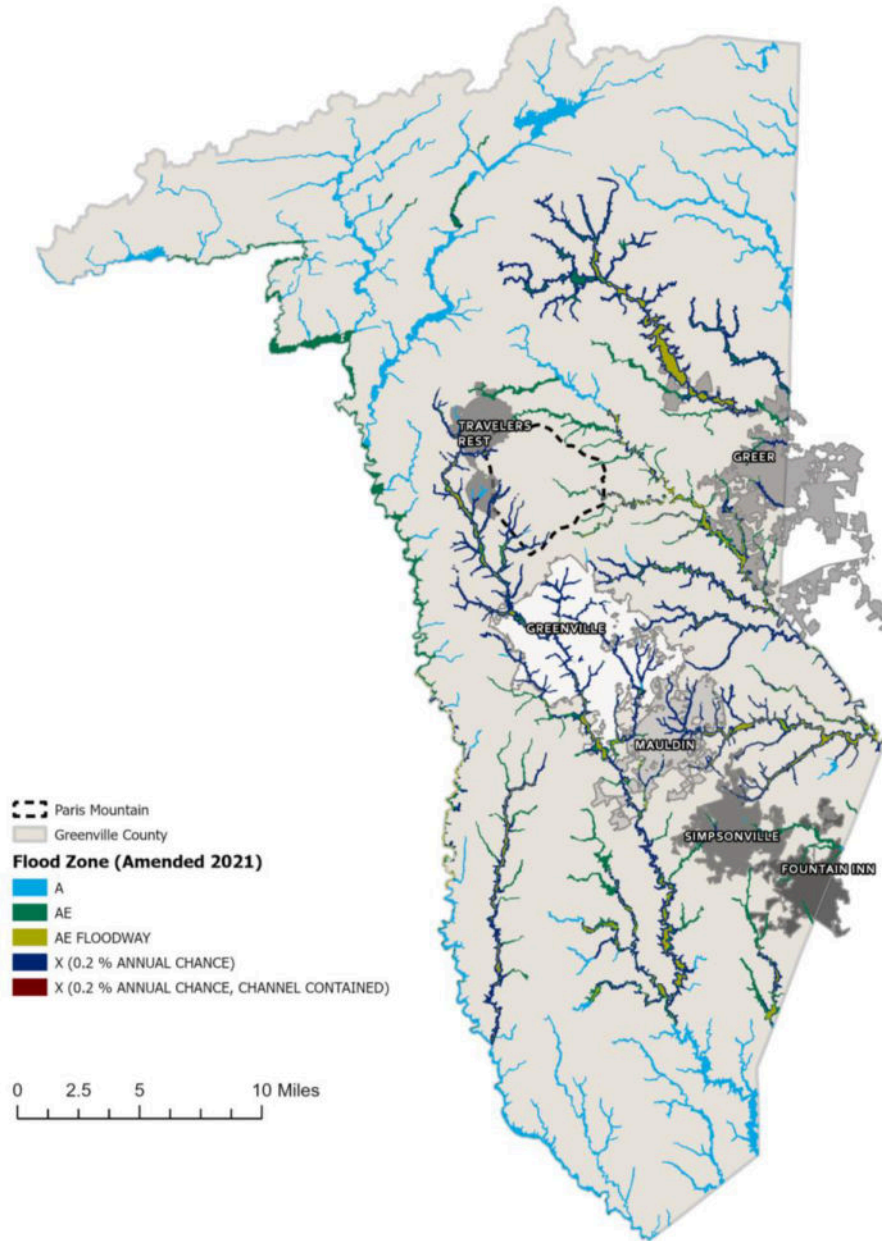
How This Will Work

- Brainstorm mitigation activities with your table
 - Will discuss mitigation activities by hazard
 - 6 groups of hazards
 1. Flooding / High Hazard Potential Dams
 2. Winter Storms
 3. High Winds/Tornados/Hail
 4. Wildfires
 5. Heat/Drought
 6. Sinkholes, Landslides & Earthquakes
 - 1 person at each table record / report ideas
- Reconvene and present ideas to the group

- Focus on pre-disaster mitigation activities
- Use 2020 plan activities list to help guide discussion
- No bad ideas

1. Flooding / High Hazard Potential Dams

Flooding

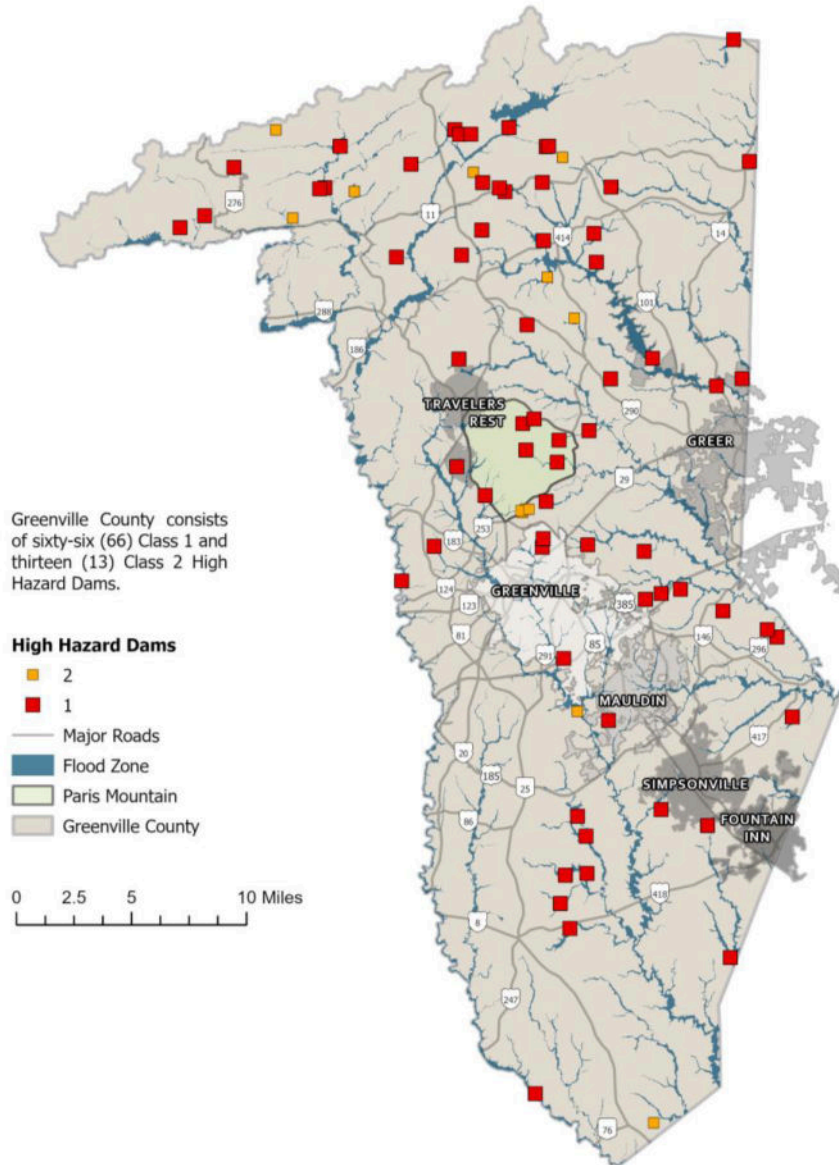


- Causes
 - Large and/or intense rainfall events
 - Hurricanes or tropical storms that have moved inland
- Problem Areas
 - densely populated areas that have inadequate drainage systems
 - buildings located in flood-prone areas
 - steeply sloped mountainous regions (flash flooding)
- Over the past several decades, the County has experienced severe flooding in urbanized areas.
- **While the County has addressed many of the flooding issues, flooding still remains a high priority for mitigation planning.**

High Hazard Potential Dams

Greenville County has:

- 66 Class I Dams
- 13 Class II Dams



- **High Hazard dams - failure or misoperation could result in significant property damage, environmental harm, and loss of life.**
- Typically located in areas where a failure would impact populated areas, critical infrastructure, or environmentally sensitive areas downstream.

Class I	Class II	Class III
High Hazard	Significant Hazard	Low Hazard
Dam failure would likely result in loss of life.	Dam failure wouldn't likely result in loss of life but property, roads, and other key infrastructure would be damaged.	Dams failure may cause minimal property damage to others. Loss of life is not expected.

Source: <https://gis.dhec.sc.gov/scdams>

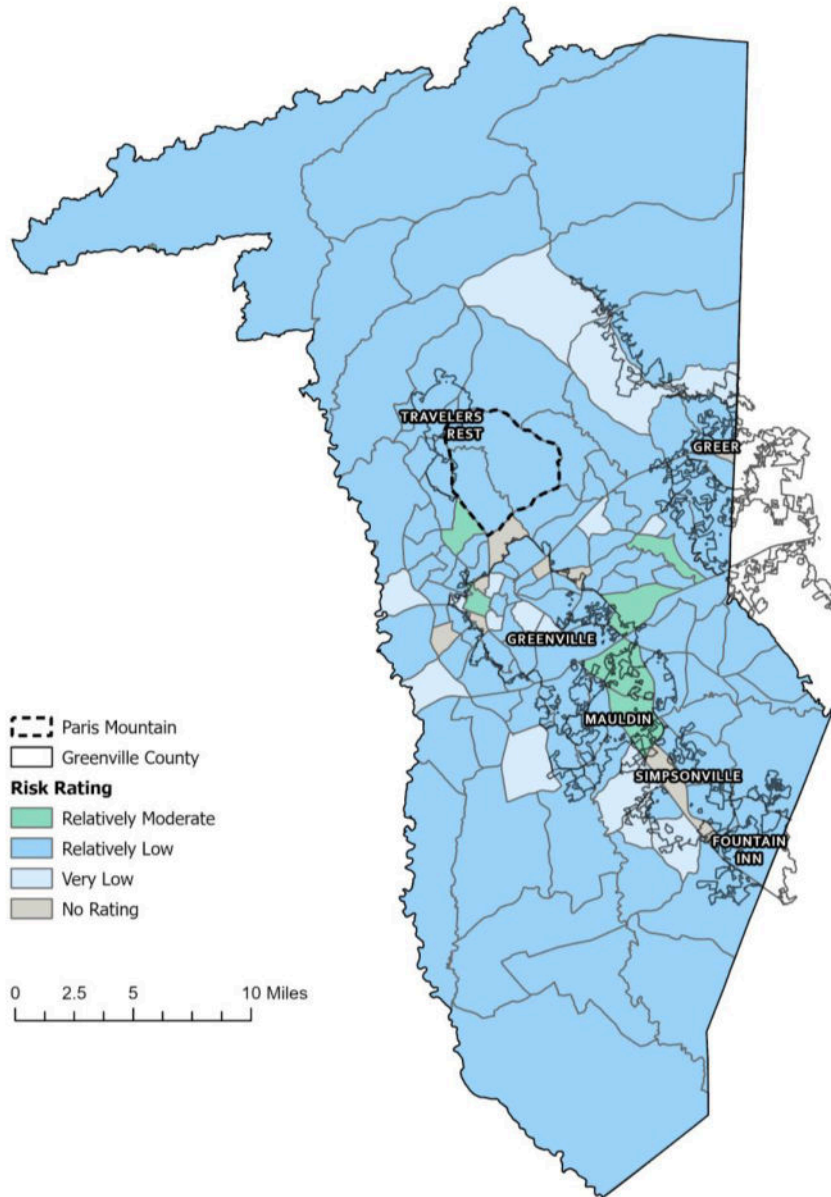


Flooding Risk

Greenville County Risk Index Rating: Floods

Risk Index Rating for Riverine Floods by Census Tract

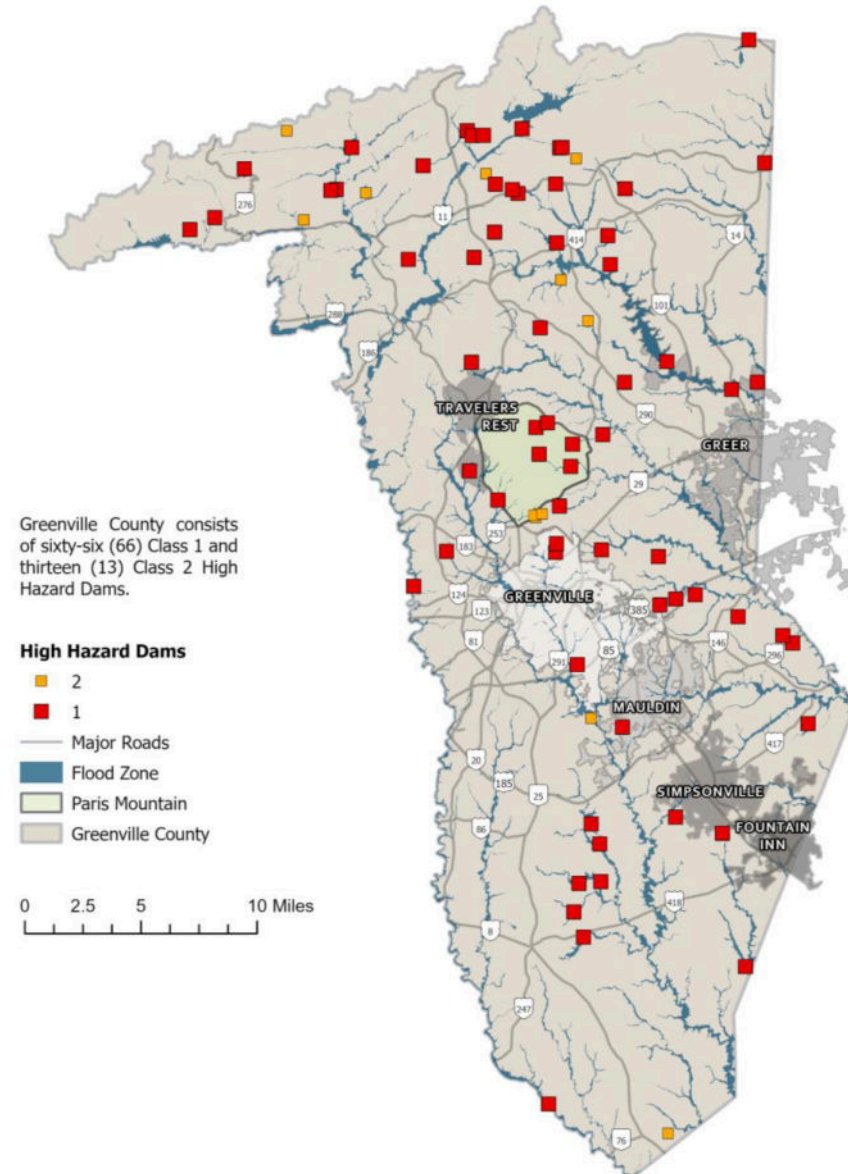
July 2024



HHPDs

Greenville County High Hazard Dams

July 2024



Flooding / High Hazard Potential Dams

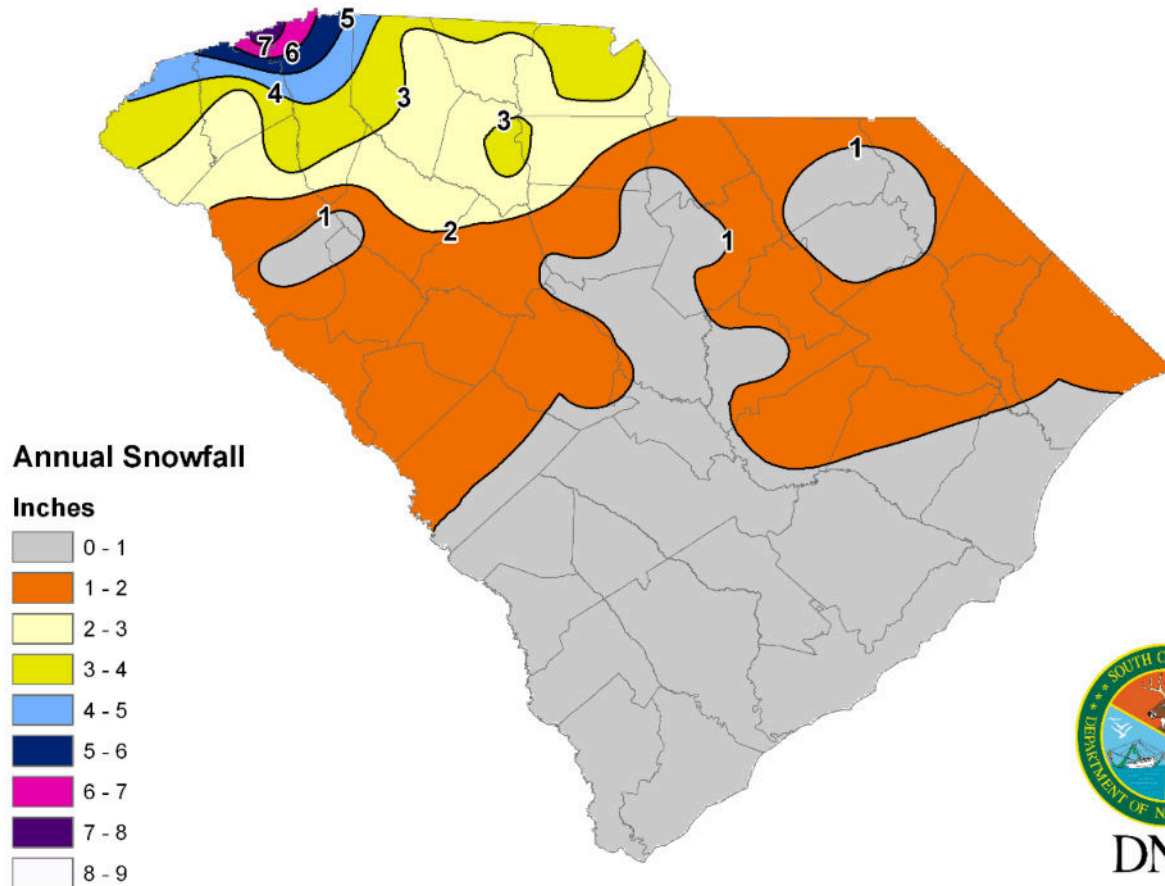
15 minute discussion
10 minute presentation

2. Winter Storms

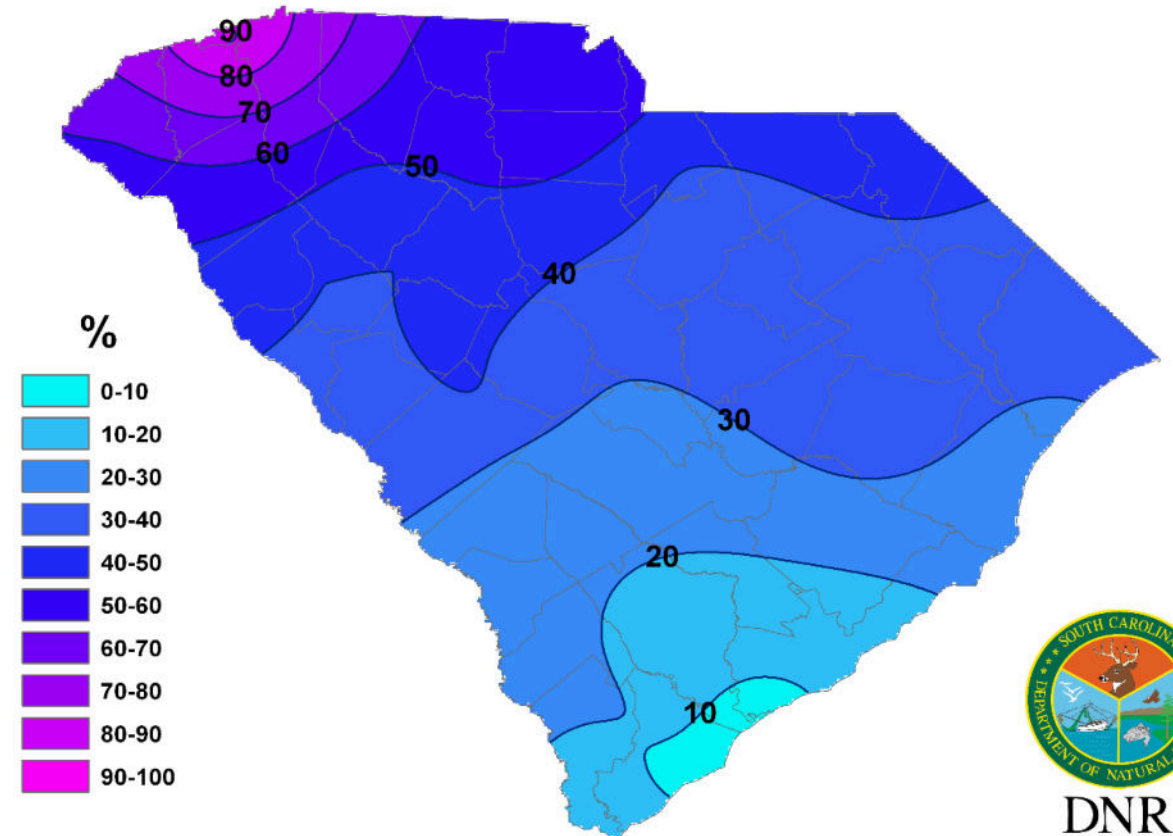
Winter Storms

- Greenville County experiences severe storms during the winter months.
- These events cause power outages, water line breaks, and reduced emergency services. Typically, as temperatures drop, house fires increase.

Station Period of Record Mean Annual Snowfall



South Carolina Snowfall Climatology
Percent Chance of Annual Snowfall



Source: SC DNR

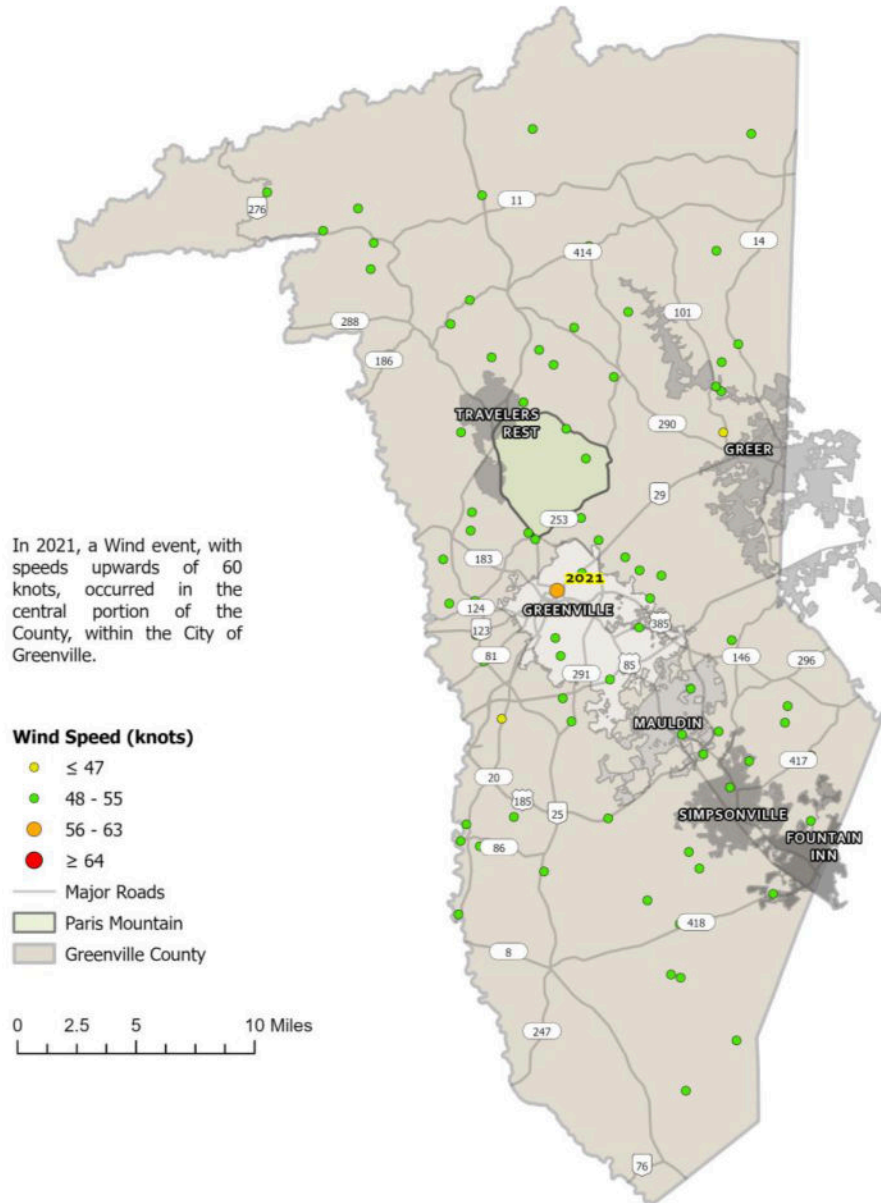
Winter Storms

15 minute discussion
10 minute presentation

3. High Winds, Tornadoes & Hail

Greenville County Historical Wind Events (2016-2022)

July 2024



Wind

- Tornados/high winds are commonly formed as part of larger thunderstorm systems or a spin off from hurricanes.
- The high winds associated with tornados or microbursts can cause major disruptions, similar to the effects of winter storms; blocked roads, downed trees and damaged electricity lines.
- In 2021, a wind event, with speeds upwards of 60 knots, occurred in the central portion of the County.

Force (Beaufort)	Wind Speed (Knots)	Description	Observed Conditions
10	≤55	Strong gale	Broken trees or uprooted
11	56 - 63	Violent Storm	Widespread damage
12	64 - 70	Hurricane	Violence

Source: NOAA

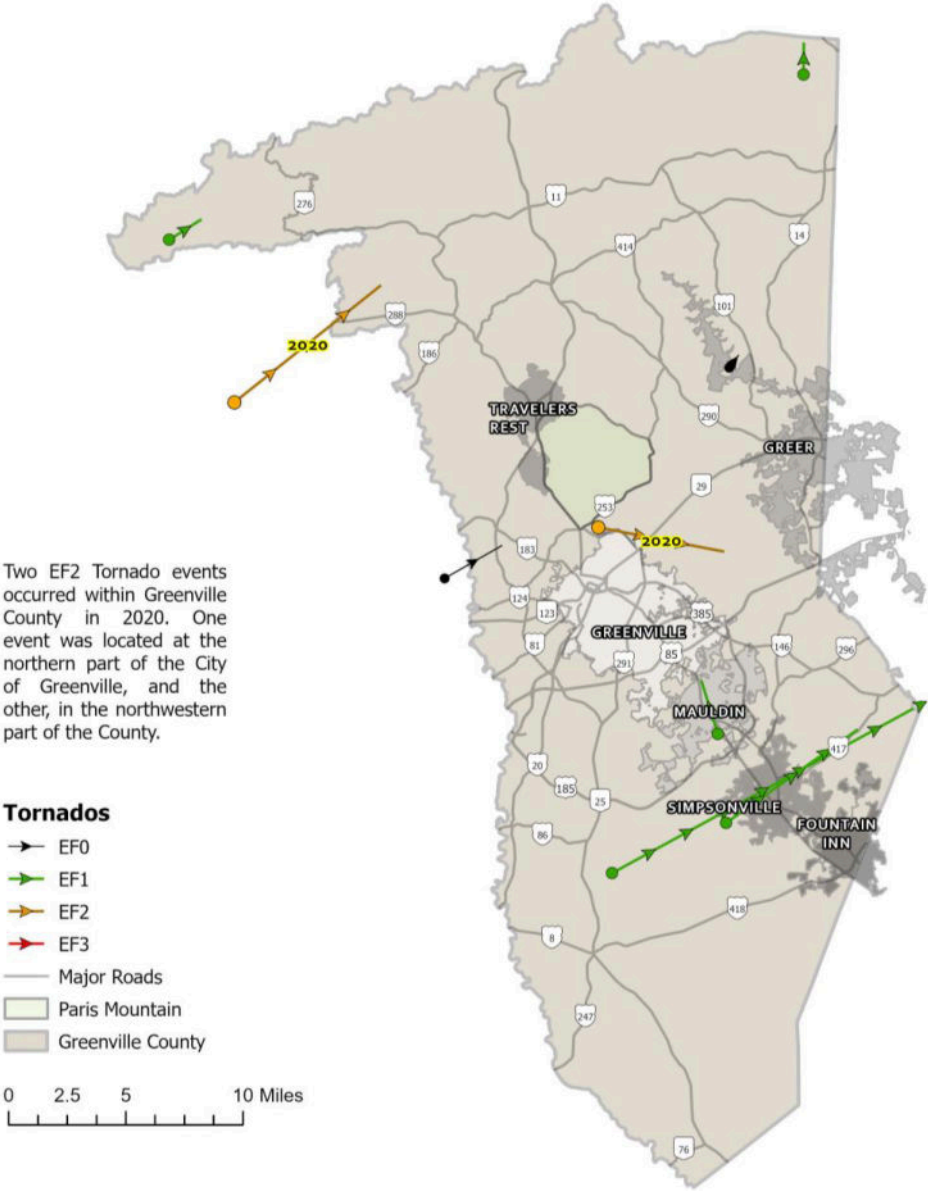


Greenville County Historical Tornado Events
(2016-2022)

July 2024

Tornados

- Two EF2 tornado events occurred within Greenville County in 2020

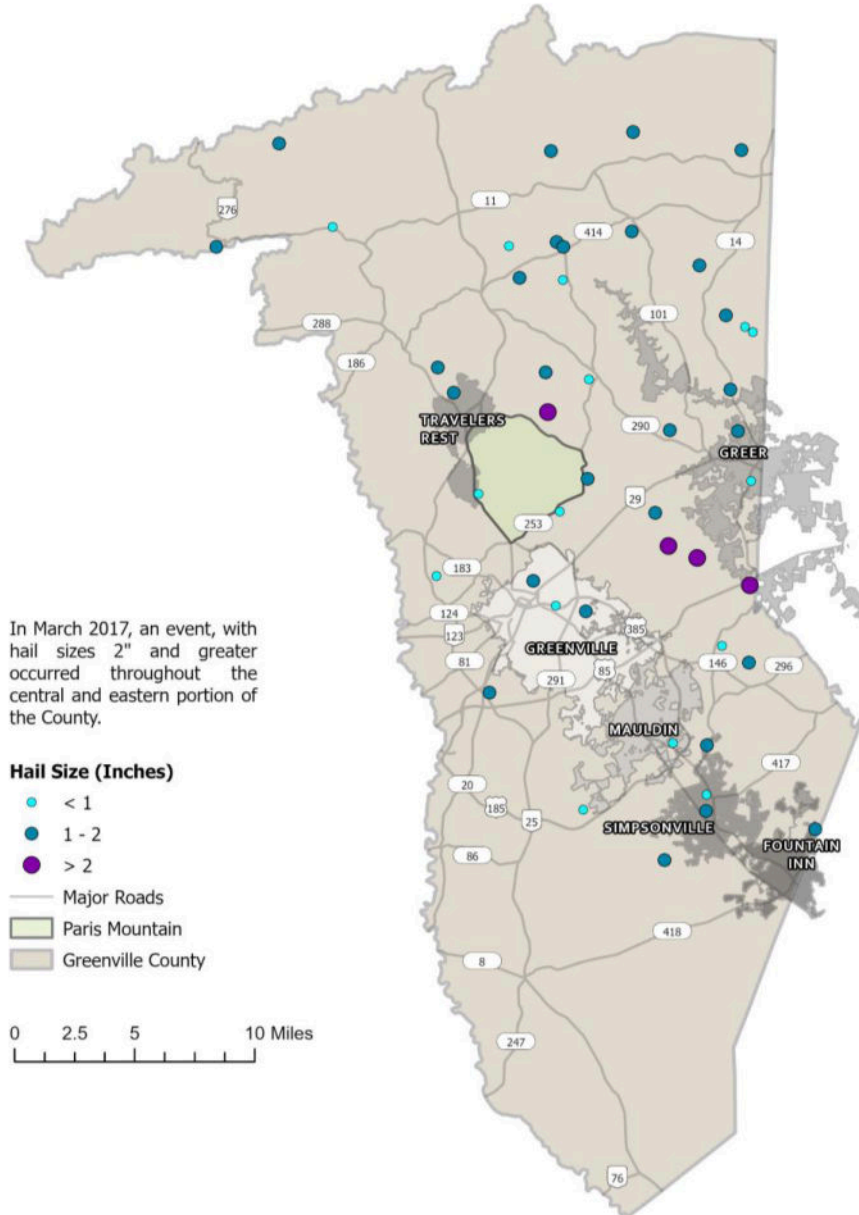


Enhanced Fujita Scale (EF-Scale)	
EF0	65 to 85 MPH
EF1	86 to 110 MPH
EF2	111 to 135 MPH
EF3	136 to 165 MPH
EF4	166 to 200 MPH
EF5	201+ MPH

Source: NOAA



Greenville County Historical Hail Events (2016-2022)



Hail

- In March 2017, an event with hail sizes 2 inches and great occurred throughout the central and eastern portion of the County

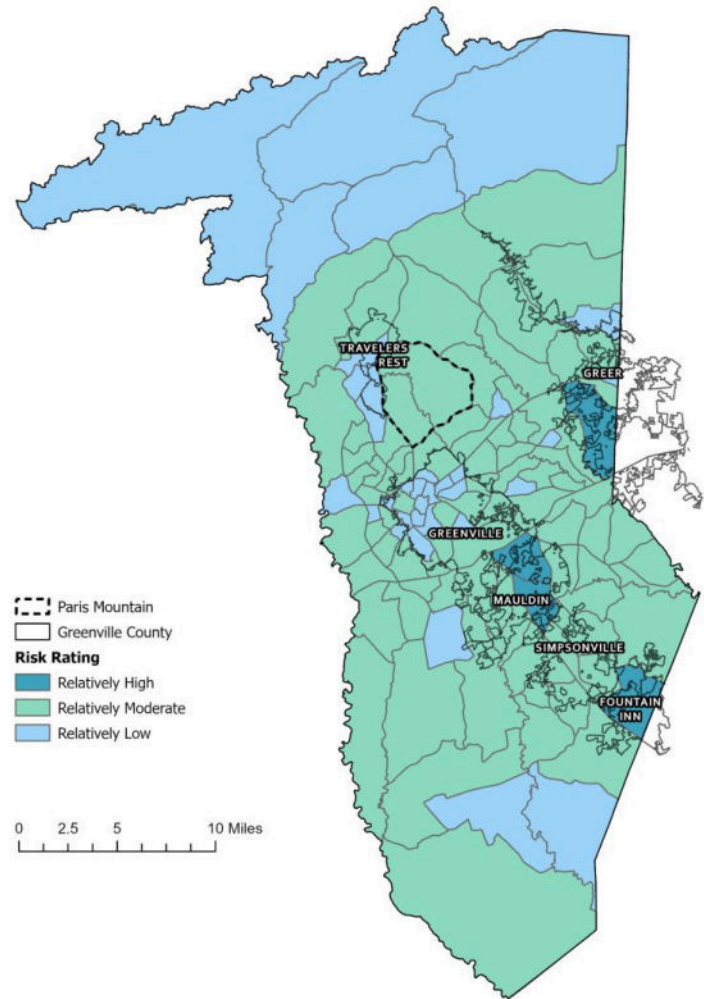
		Hailstone size	Measurement	
			Inches	Centimeters
H0	Hard Hail	bb	< ¼	<0.64
H1	Potentially Damaging	Pea	¼	0.64
H2	Significant	Dime	7/10	1.8
		Penny	¾	1.9
H3	Severe	Nickle	7/8	2.2
H4	Severe	Quarter	1	2.5
H5	Destructive	Half dollar	1 ¼	3.2
H6	Destructive	Golf ball	1 ¾	4.4
H7	Destructive	Billiard ball	2 1/8	5.4
H8	Destructive	Tennis ball	2 ½	6.4
H9	Super Hailstorm	Baseball	2 ¾	7.0
		Softball	3.8	9.7
H10	Super Hailstorm	Compact disk / DVD	4 ¾	12.1

Wind

Greenville County Risk Index Rating: Winds

Risk Index Rating for Strong Winds by Census Tract

July 2024

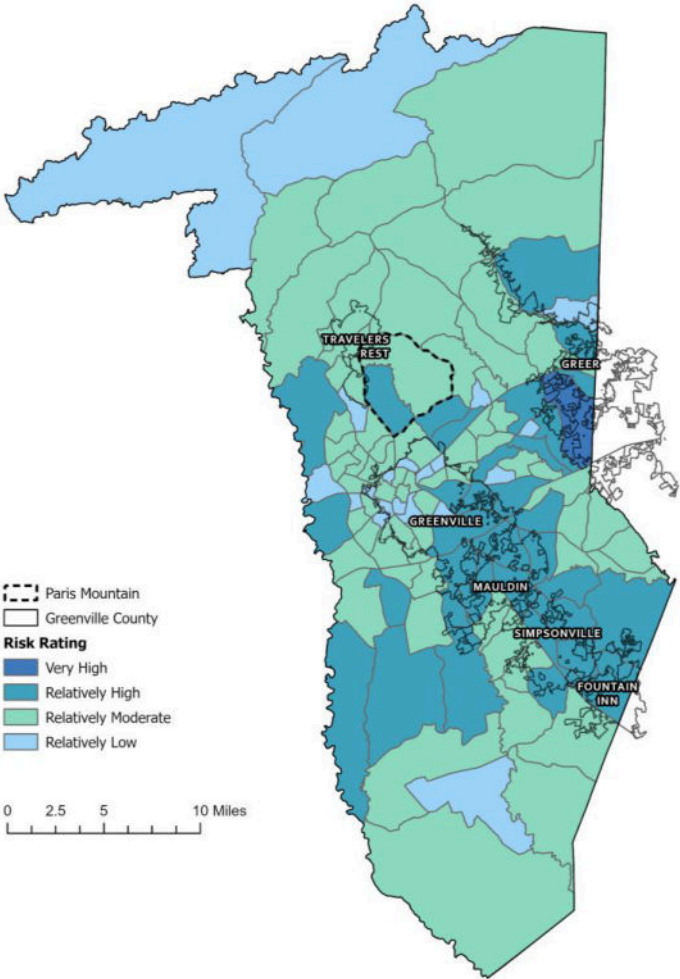


Tornados

Greenville County Risk Index Rating: Tornados

Risk Index Rating for Tornados by Census Tract

July 2024

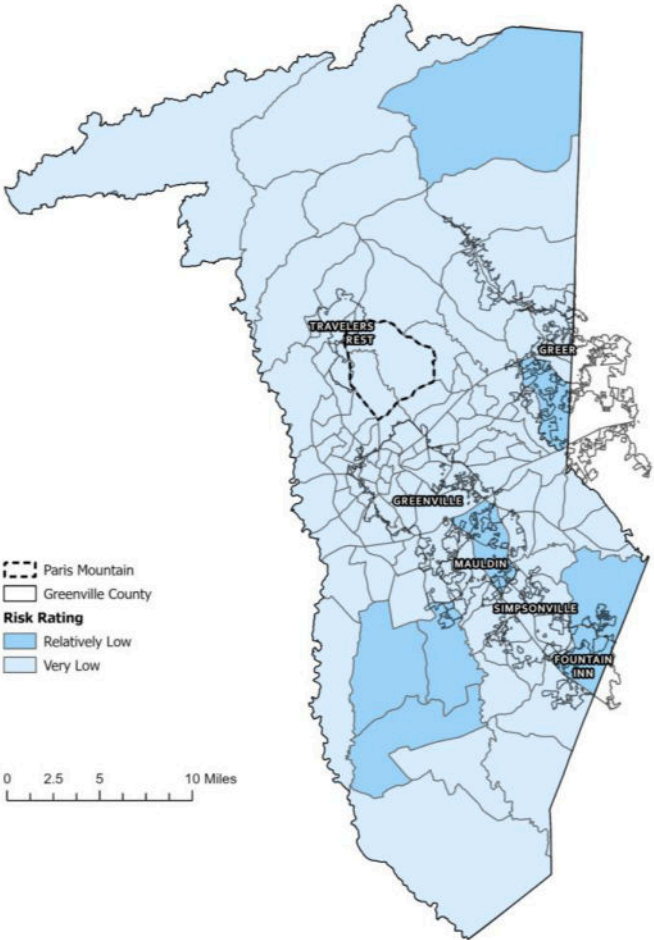


Hail

Greenville County Risk Index Rating: Hail

Risk Index Rating for Hail by Census Tract

July 2024

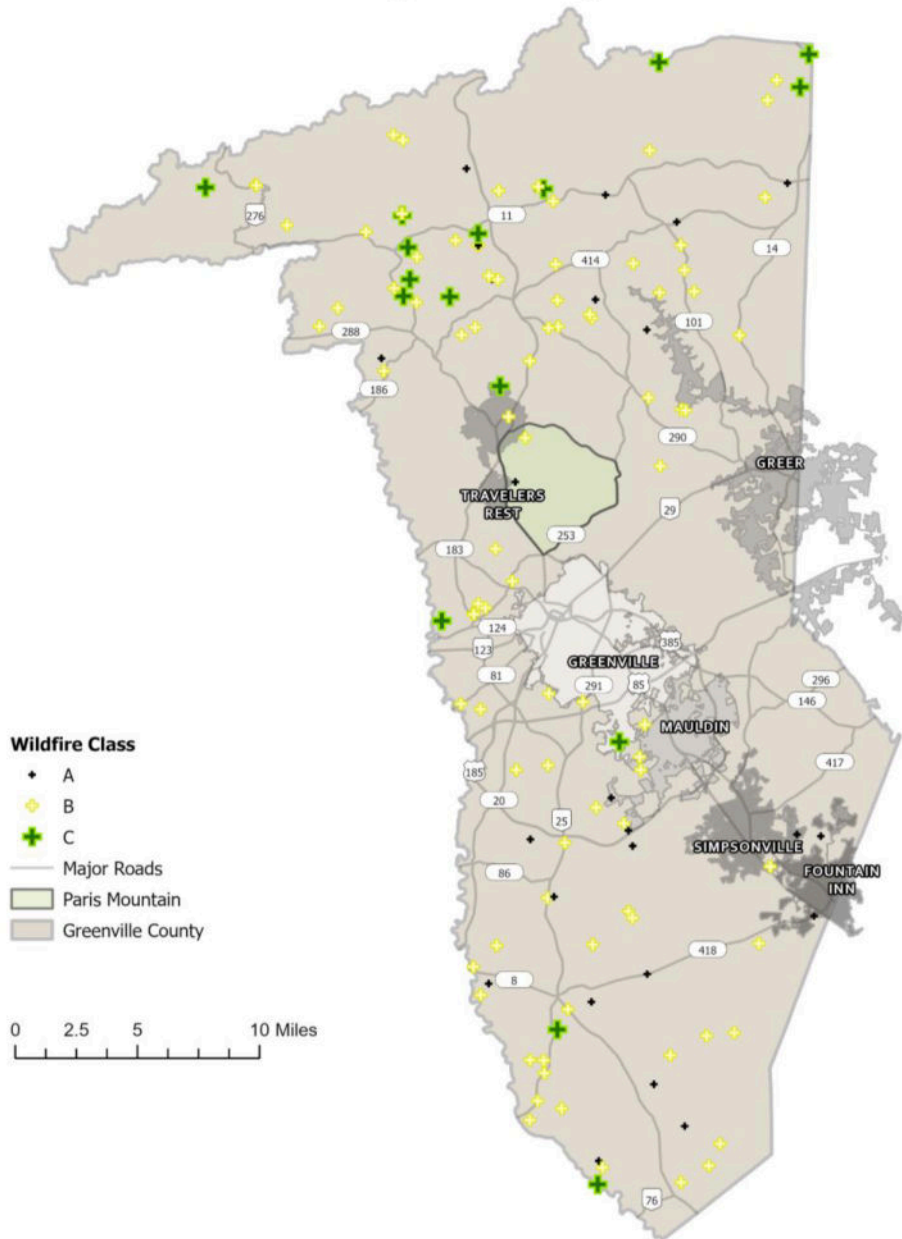


High Winds, Tornadoes & Hail

15 minute discussion
10 minute presentation

4. Wildfires

Greenville County Historical Wildfire Events (2016-2023)



Wildfires

- Paris Mountain Wildfire Plan completed in 2022
- Historically only small wildfires in Greenville County, but the threat continues to grow as the population increases and the wildland urban interface expands with it.

Class	Burn Area (Acres)	Year 2023 (qty.)
A	< 0.3	3
B	0.3 - 9.9	13
C	10 - 99.9	1
D	100 - 299.9	NA
E	300 - 999.9	NA

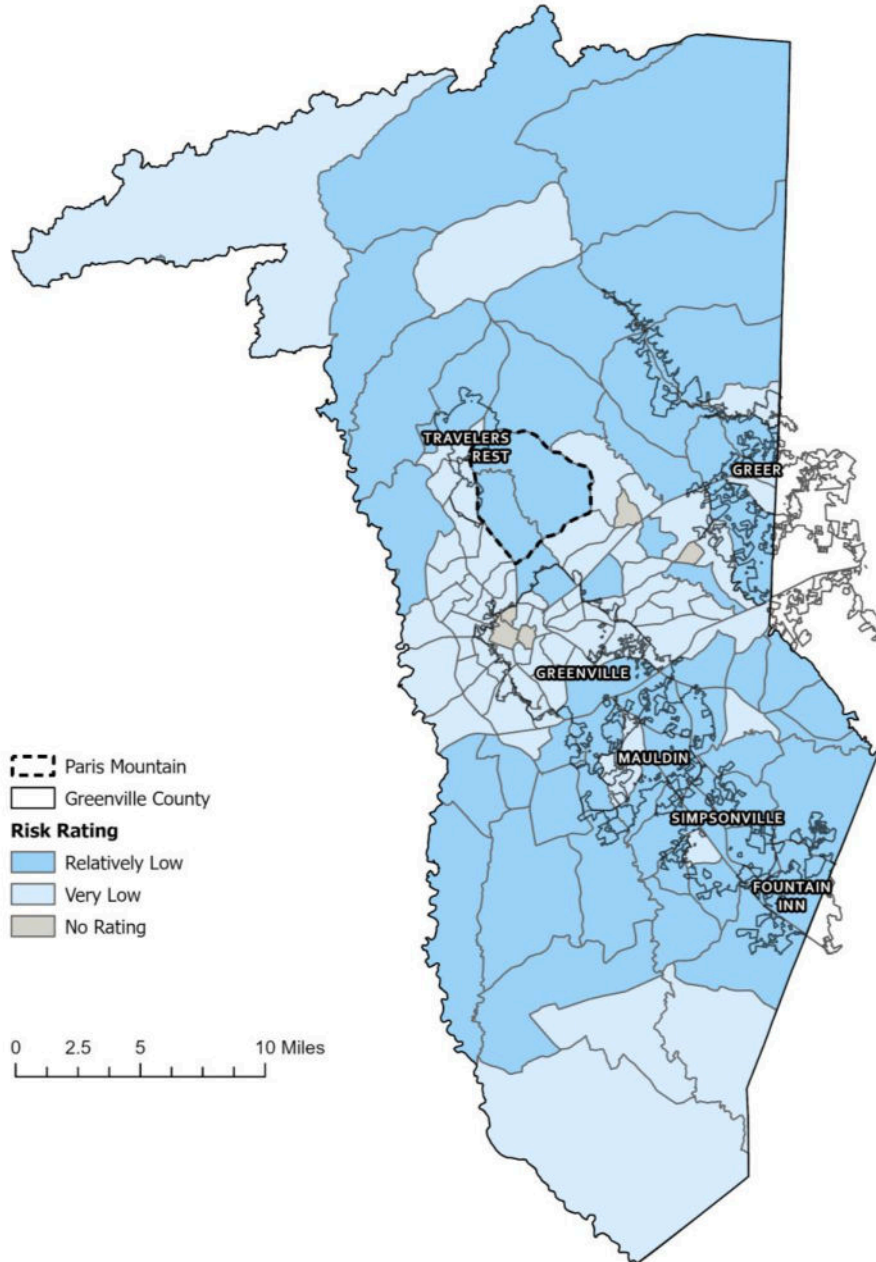
Source: South Carolina Forestry Commission



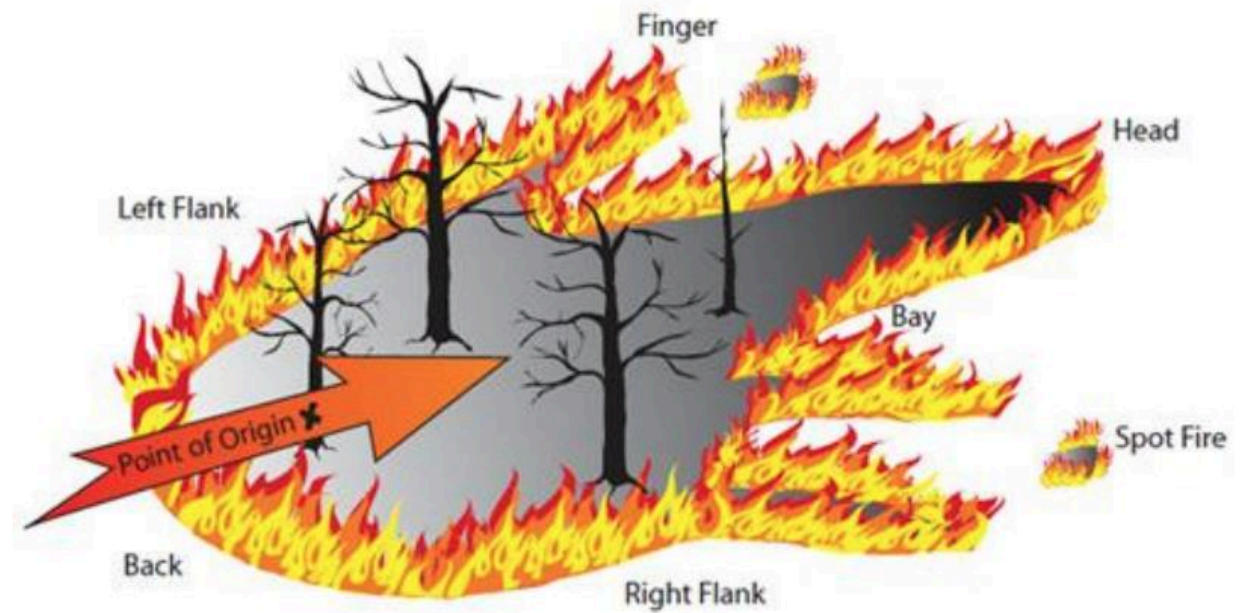
Greenville County Risk Index Rating: Wildfires

Risk Index Rating for Wildfires by Census Tract

July 2024



Wildfires



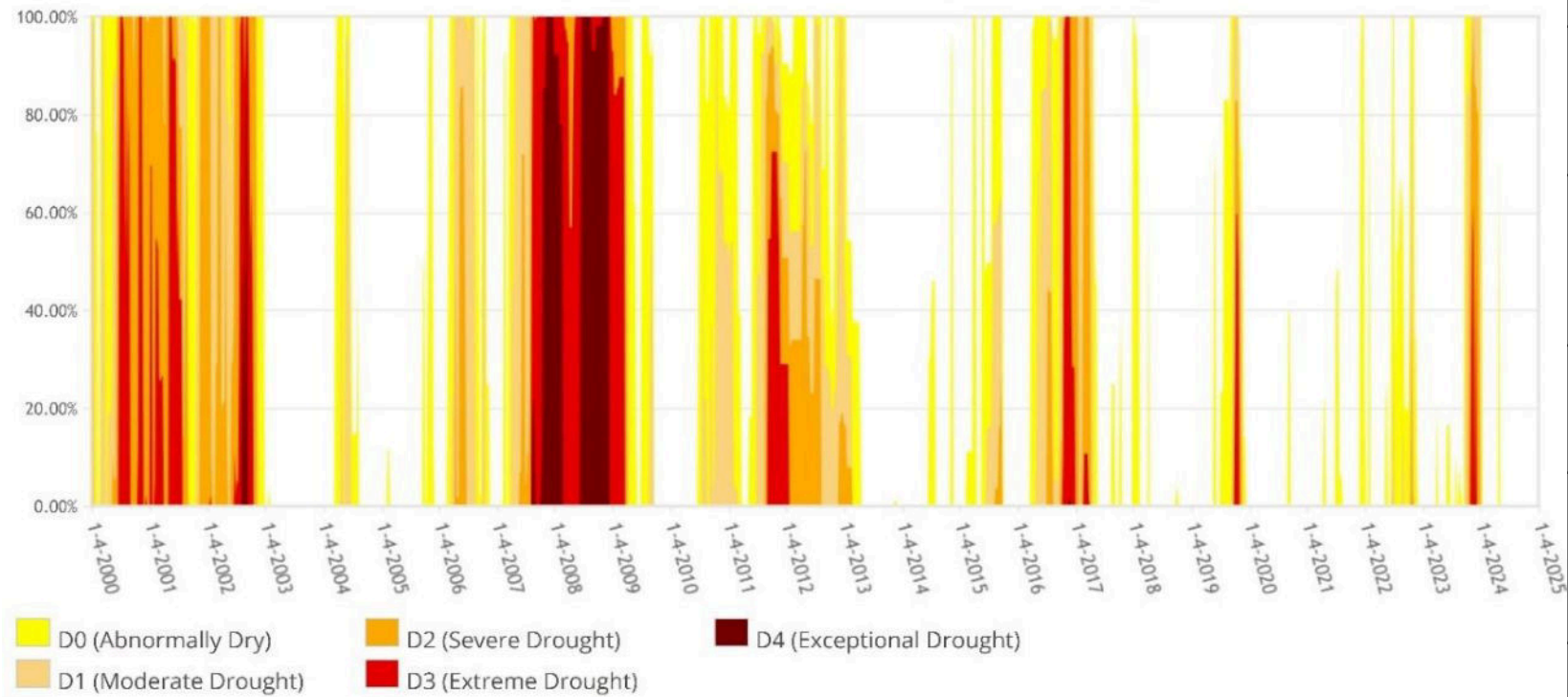
Wildfires

15 minute discussion
10 minute presentation

5. Heat / Drought

Drought

Greenville County (SC) Percent Area in U.S. Drought Monitor Categories



From the U.S. Drought Monitor website, <https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx>, 6-19-2024



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

Source: US Drought Monitor website

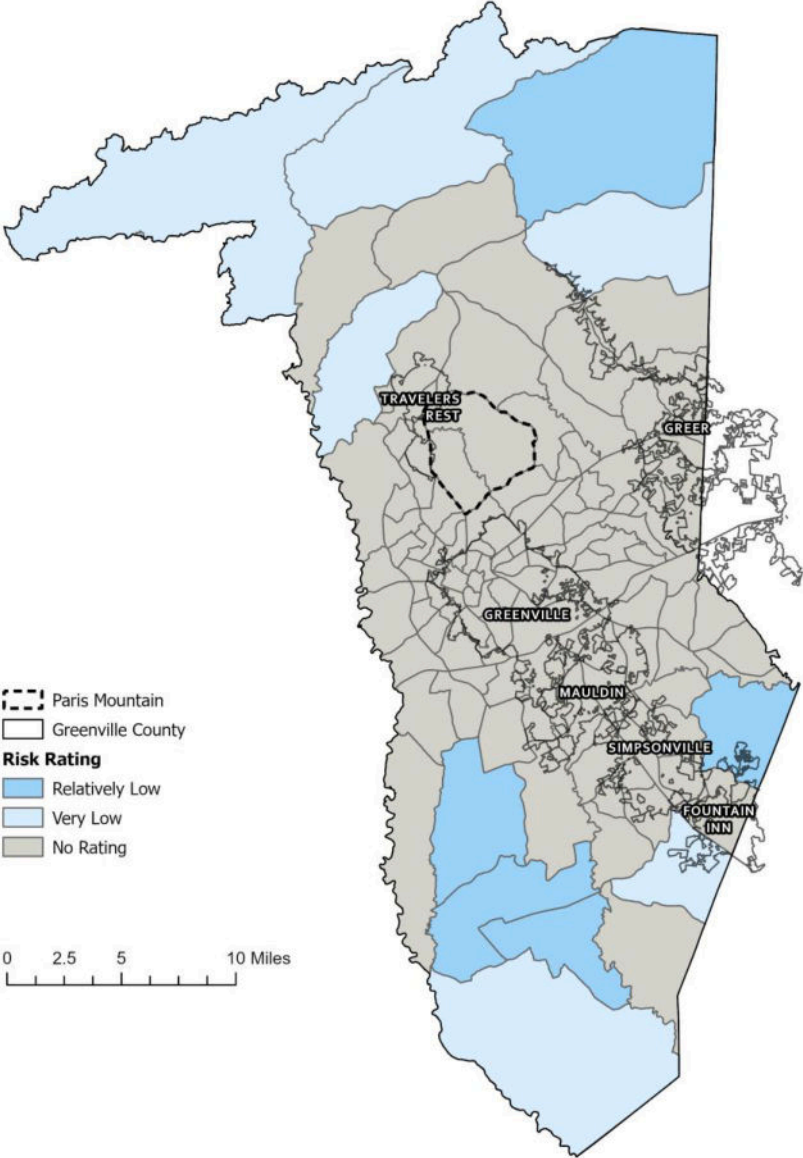


Drought

July 2024

Greenville County Risk Index Rating: Drought

Risk Index Rating for Drought by Census Tract

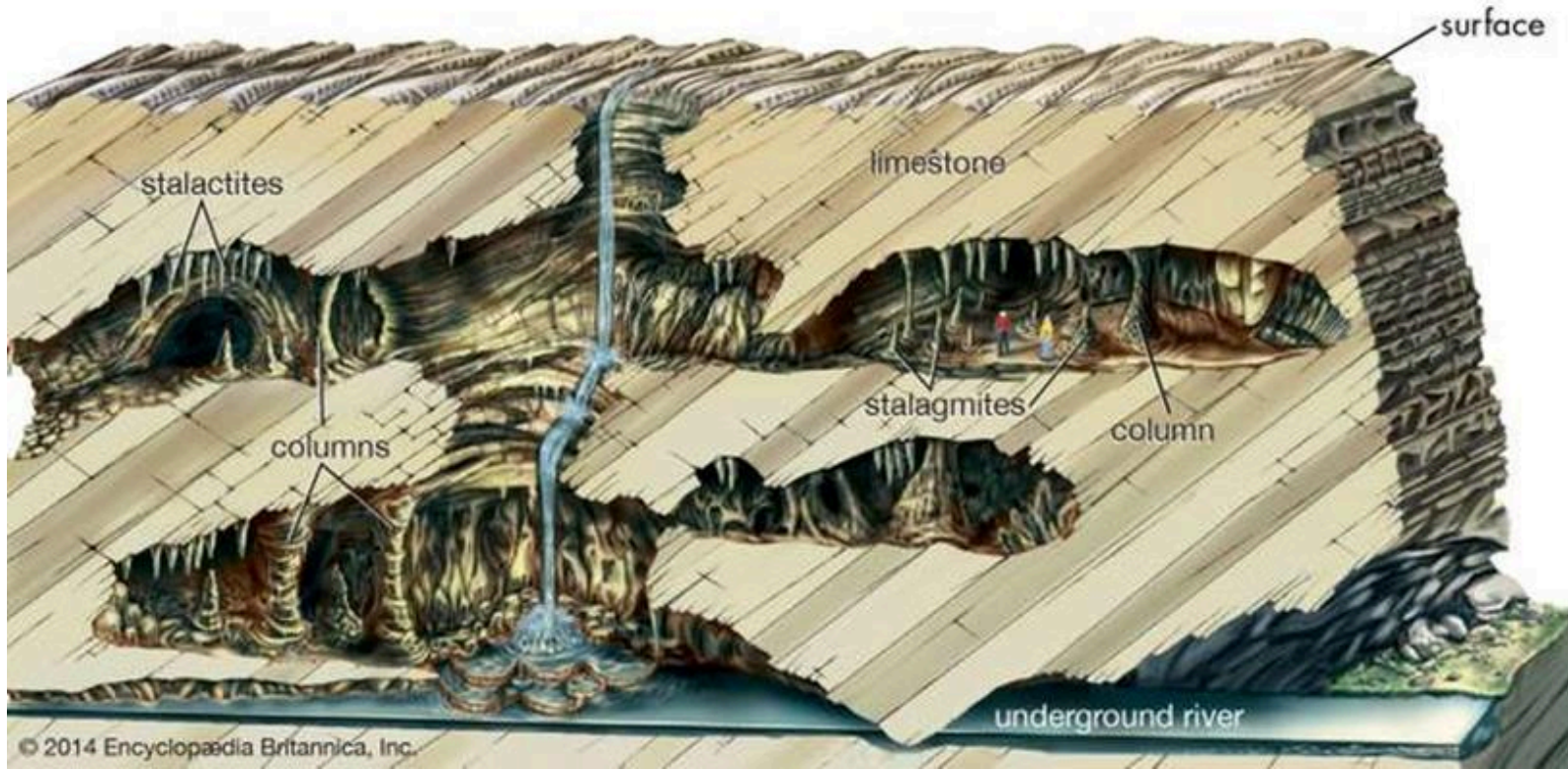


Heat / Drought

15 minute discussion
10 minute presentation

6. Sinkholes, Landslides & Earthquakes

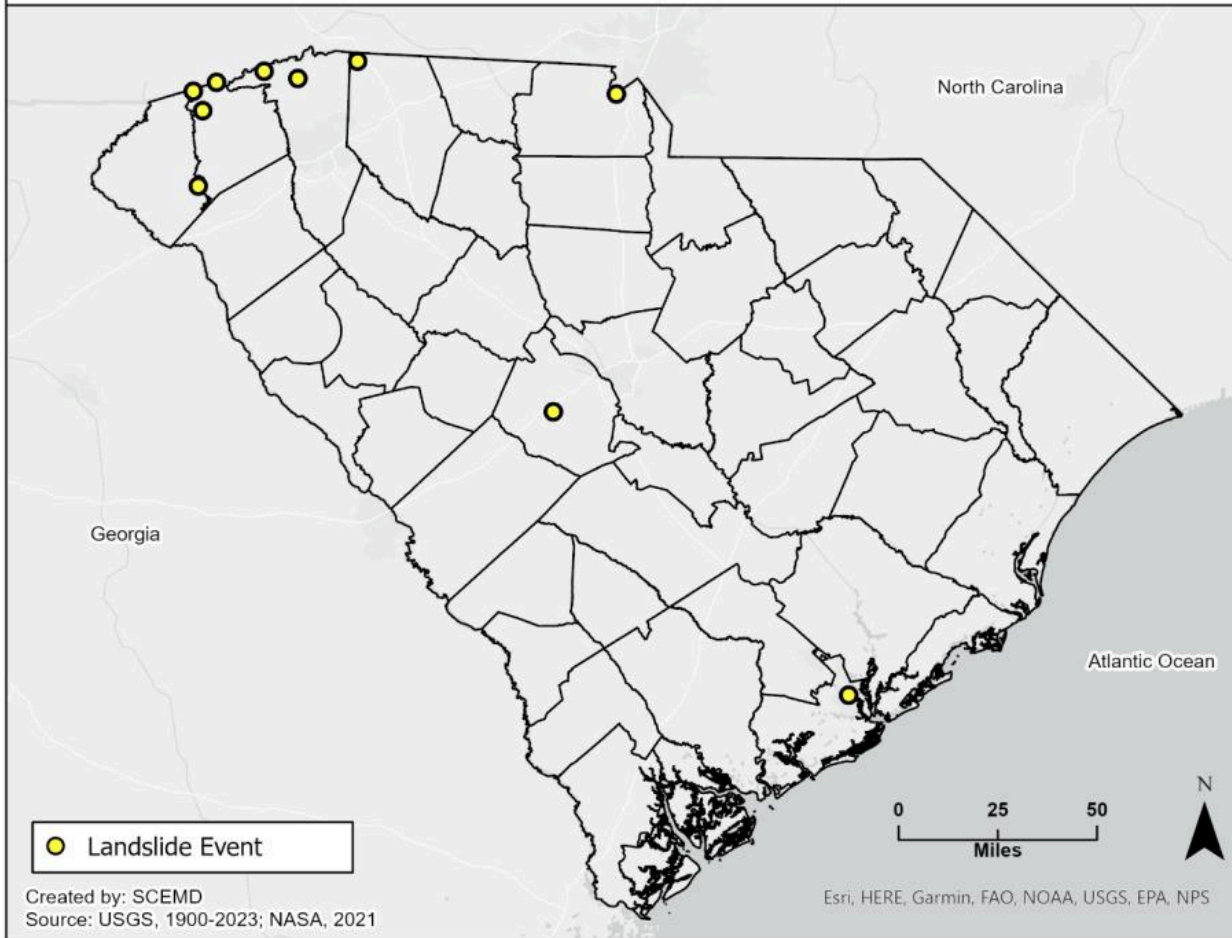
Sinkholes



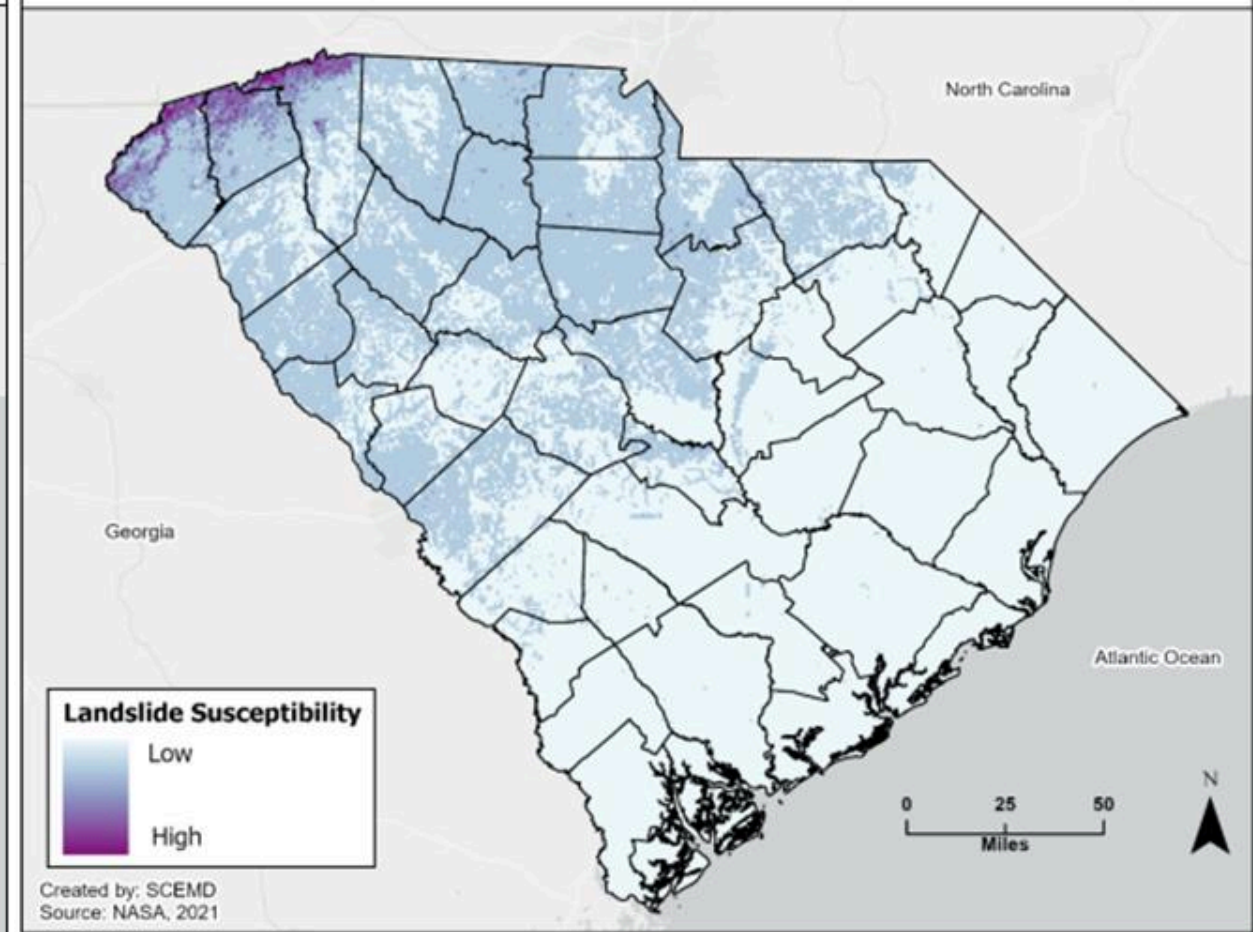
- Small sinkholes associated with poorly compacted soils (such as around buried utilities) are not an item considered in the HMP.
- Rather, this HMP deals with sinkholes generally associated with karst topography. Karst is a type of topography that occurs when soluble bedrocks such as limestone, dolomite, and gypsum dissolve. This dissolution creates a void under the ground such as a cave, and sinkholes can occur when such voids collapse.
- Greenville County does not have any current or potential karst topography, so it is unlikely that sinkholes will form

Landslides

Landslide Occurrences in South Carolina



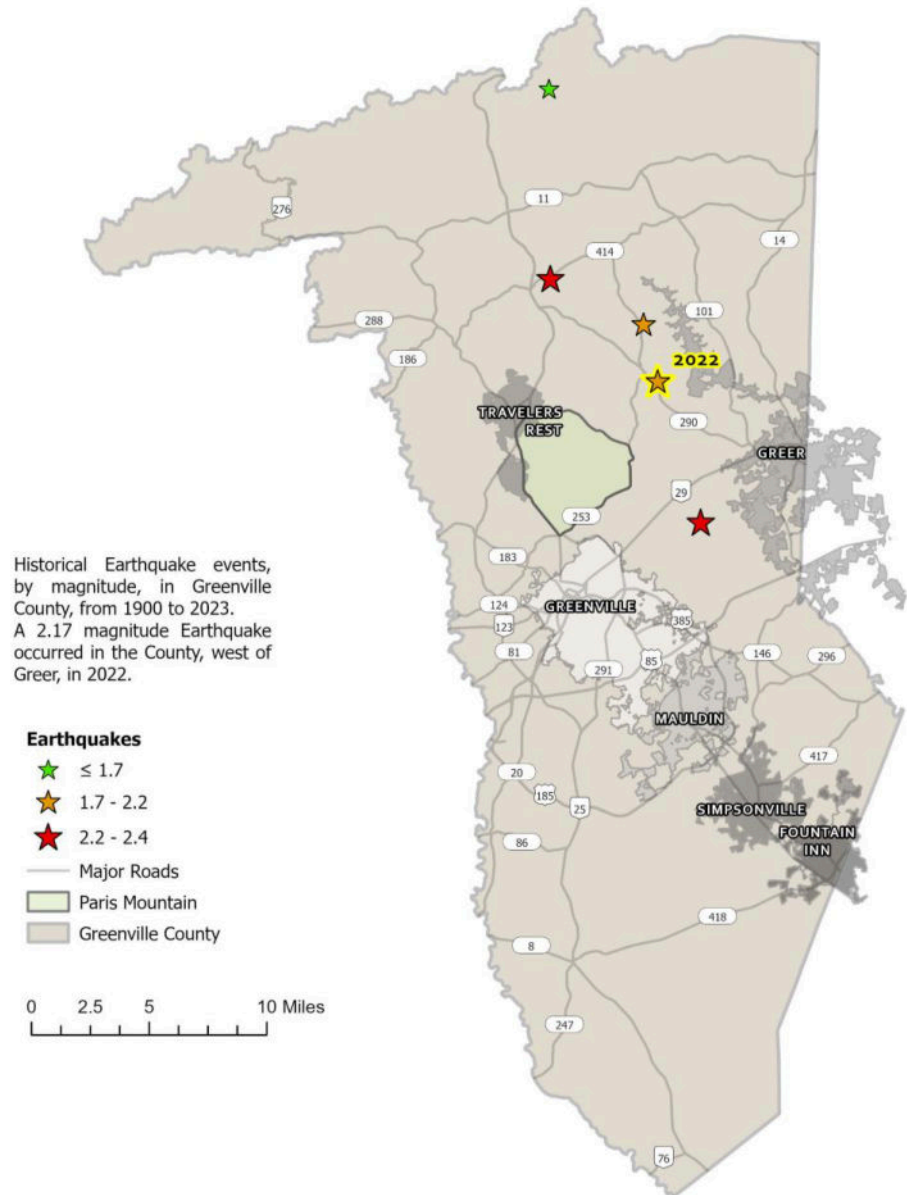
Landslide and Mass Wasting Susceptibility in South Carolina



Source: 2023 South Carolina Hazard Mitigation Plan



Greenville County Historical Earthquake Events (1900-2023)



Earthquakes

- A small number of relatively low magnitude earthquakes recorded across the County

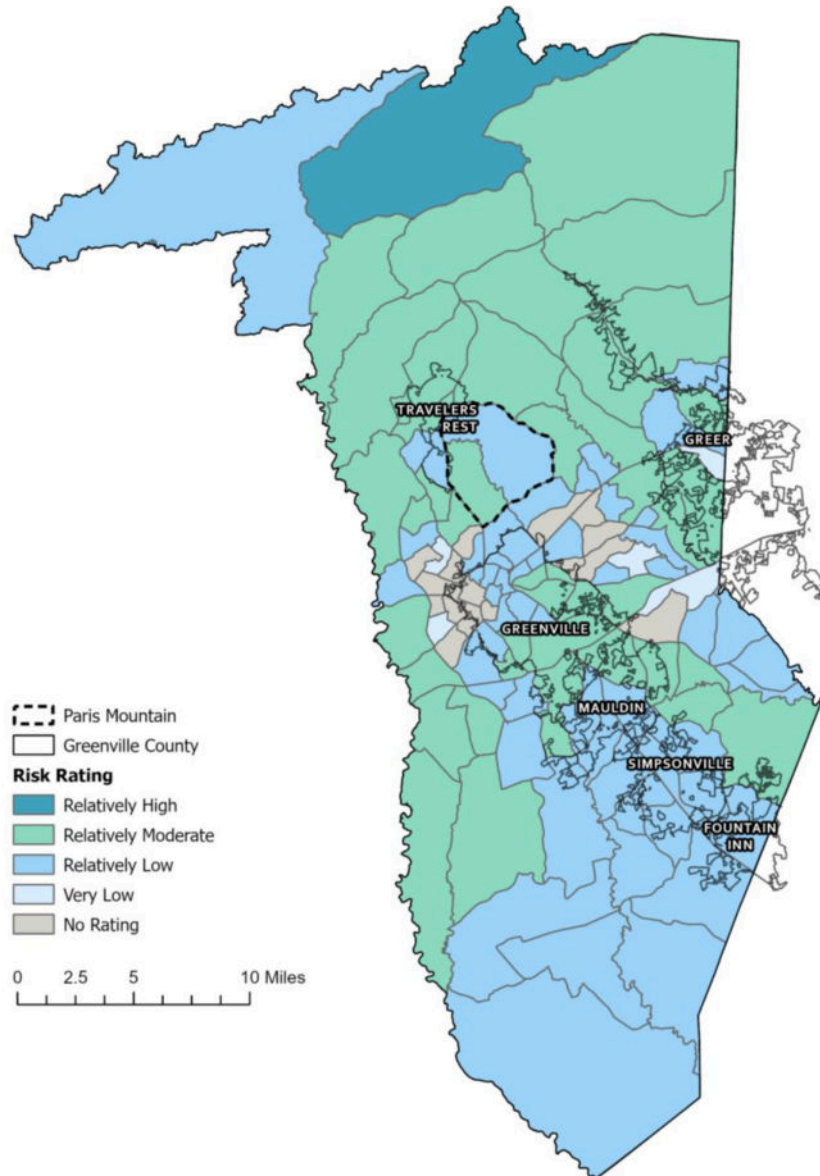
Richter magnitudes	Description	Earthquake effects	Frequency of occurrence
Less than 2.0	Micro	Microearthquakes, not felt.	About 8,000 per day
2.0-2.9	Minor	Generally not felt, but recorded.	About 1,000 per day
3.0-3.9		Often felt, but rarely causes damage.	49,000 per year (est.)
4.0-4.9	Light	Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.	6,200 per year (est.)
5.0-5.9	Moderate	Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings.	800 per year
6.0-6.9	Strong	Can be destructive in areas up to about 160 kilometers (100 mi) across in populated areas.	120 per year
7.0-7.9	Major	Can cause serious damage over larger areas.	18 per year
8.0-8.9	Great	Can cause serious damage in areas several hundred miles across.	1 per year
9.0-9.9		Devastating in areas several thousand miles across.	1 per 20 years
10.0+	Epic	Never recorded; see below for equivalent seismic energy yield.	Extremely rare (Unknown)

Landslides

July 2024

Greenville County Risk Index Rating: Landslides

Risk Index Rating for Landslides by Census Tract

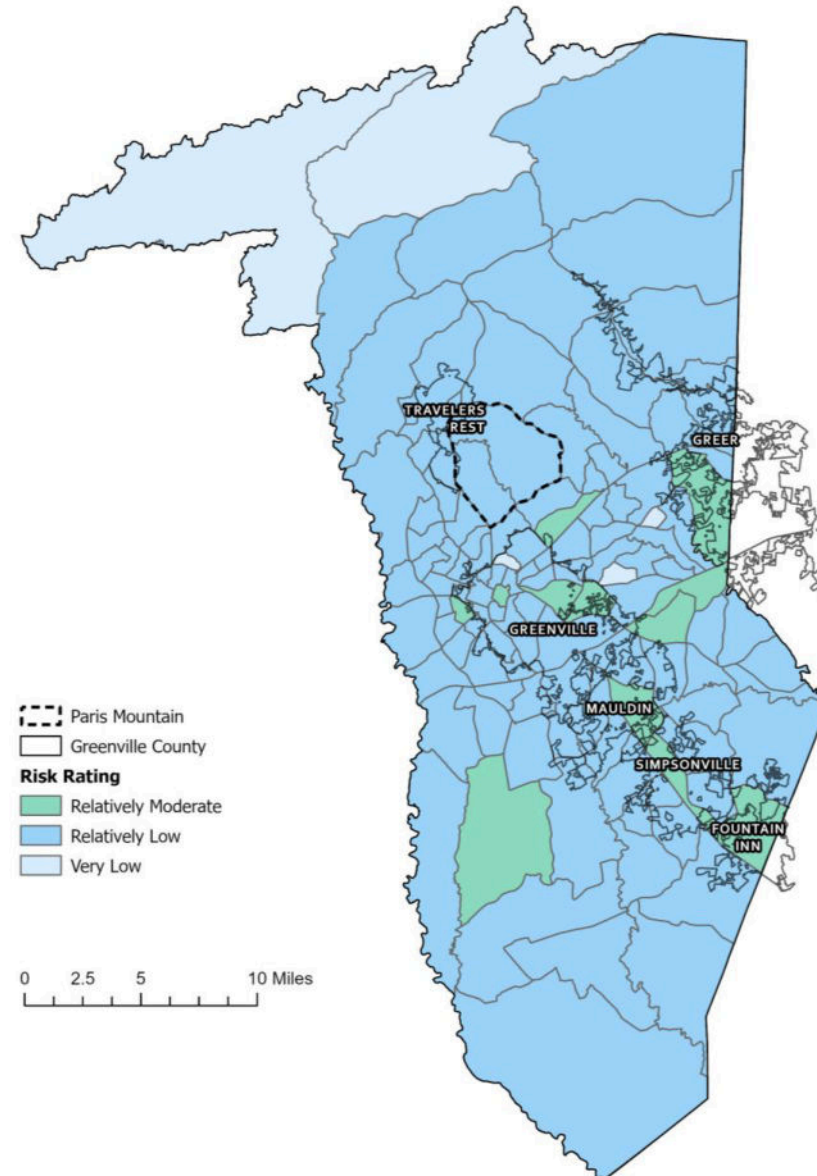


Earthquakes

July 2024

Greenville County Risk Index Rating: Earthquakes

Risk Index Rating for Earthquakes by Census Tract



Sinkholes, Landslides & Earthquakes

15 minute discussion

10 minute presentation

DMC Meeting #3



- Review prioritized mitigation activities

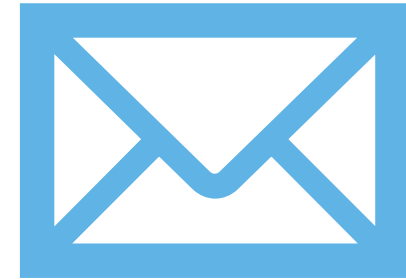
Contact Information

Jessica Stumpf – Greenville County

- 864.467.3812
- jstumpf@greenvillecounty.org

Molly Davis– Woolpert, Inc.

- 803.214.5943
- molly.davis@woolpert.com



Meeting Minutes

Date of Meeting:	January 27, 2025	Subject:	Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update Disaster Mitigation Committee Meeting #3
Location:	Greenville County Emergency Management EOC 225 S Pleasantburg Drive	Time:	10:00 AM – 11:30 AM
In Attendance:	See table below and scanned sign-in sheet attached.		

ITEMS DISCUSSED:

The Greenville County Disaster Mitigation Committee (DMC) met for the third time on January 27, 2025, to discuss the impacts of Hurricane Helene, review the prioritized mitigation initiatives, and allow the DMC to comment on the draft plan. The draft plan was provided to committee members before the meeting to give them time to review. Comments and feedback received were incorporated into the HMP update. The meeting included 18 attendees, with representatives from Greenville County, City of Greenville, City of Traveler’s Rest, City of Greer, City of Fountain Inn, Furman University, members of the community, and other upstate agencies. The table below lists all attendees that were present. The meeting was open to the public. The website posting with meeting details can be found in Figure 1 below.

The meeting began with a discussion about the impacts of Hurricane Helene and what could have been done before the storm to make response and recovery easier. The remaining time was spent reviewing the mitigation activities and scoring and addressing any comments/feedback from the committee’s review of the draft plan. Meeting notes are included below.

Hurricane Helene Discussion

Impacts

- Tree damage to structures and power/communication infrastructure
 - Idea to invite a representative from Spectrum to participate on the DMC during the next plan update
 - Provide areas where citizens can charge phones, get access to wifi, etc. Communicate these locations to citizens via radio in the event of power outages – research opportunities for resilience hubs
- Debris/erosion in areas with no riparian buffer
 - Evaluate debris at all bridges/road crossings post disaster
- Flooding – tailwater flooding at Laurel and Hardy Lakes
- Saluda Lake – drinking water source for Easley and surrounding areas, dam overtopped, lots of sediment and debris deposited into lake

- Idea to lower lake levels prior to storm events
- Structure Damage
 - 1,200-1,400 structures with significant damage
 - Develop standard operating procedures for completing post disaster damage assessments
- All communities faced similar challenges

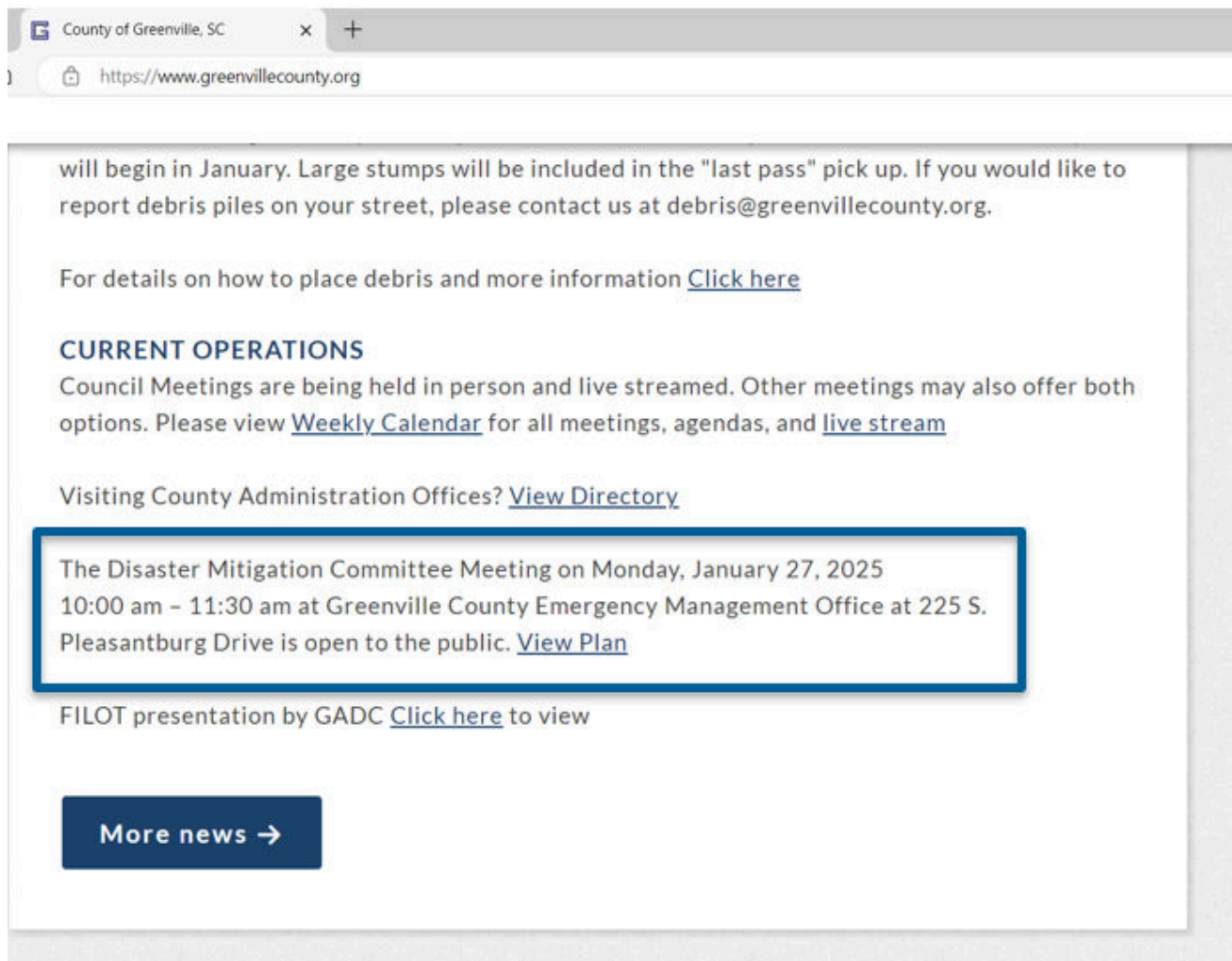


Figure 1 Public Posting with DMC #3 Meeting Details on the Greenville County website

Table 1 DMC Meeting #3 Attendees

Name	Company/Agency
Gustavo Coelho	Furman University
Zury Marroquin	Furman University
Rashida Jeffers-Campbell	Greenville County
Judith Wortkoetter	Greenville County Land Development
Bob Mihalic	Greenville County
Jack Buehner	Furman University
Paul Dow	City of Greenville
Phillip Tate	City of Travelers Rest Public Works
Mike Winiski	Furman University
Tee Coker	Greenville County Assistant Administrator
Brian Bishop	Greenville County
Kelli Hembree	Greenville County Floodplain Management
Rebecca Rodgers	E M Partners
Mike Jankowski	GCEM
Catrina Woodruff	City of Greer
Keith Choate	City of Greer
Russell Alexander	Fountain Inn



Woolpert, Inc.
807 Gervais Street, Suite 102
Columbia, SC 29201



Woolpert, Inc.
807 Gervais Street, Suite 102
Columbia, SC 29201

Appendix B – Call Log and Data Source Information

CALL LOG

United States Army Corps of Engineers (US ACE)

*US ACE
864-609-4326
CESAC-PAO@usace.army.mil
October 16, 2023 10:20 AM*

I called the US ACE Greenville office. The out of office message instructed me to call the Charleston office. Jean answered, took my number, and said she'd have someone call me back. I have not received a call back as of 12:00 PM on 10/20/23.

National Weather Service (NWS)

*NWS – Greenville/Spartanburg Office
(864) 848-3859
October 16, 2023 9:45 AM*

Called and spoke to Jeff Taylor (Meteorologist and Climate Program Leader – NWS Greenville/Spartanburg Forecast Office). He asked that I send an email with a summary of what is needed and specific parameters. Email sent after our phone call. Jeff called back on 10/17/23 and asked for more specific parameters, which have been provided to him. Link with data provided 11/3/23 - [National Weather Service List of NCEI Resources | National Centers for Environmental Information \(NCEI\) \(noaa.gov\)](#).

Natural Resources Conservation Service (NRCS)

*Soil and Water Conservation District
(864) 467-4996
Kirsten Robertson, Director
October 16, 2023 10:05 AM*

Called and left a voicemail explaining what we are looking for and asking to call back.

10:55 AM – Kirsten called back (I was on another call). She left a voicemail indicating that they don't have data and referred me to DNR and NWS.

Federal Emergency Management Agency (FEMA)

*FEMA
202-646-2500
October 16 2023, 10:10 AM*

I called the general number and the operator directed me to the mitigation office, where I got the voicemail. I left a message explaining what we are looking for and asking for a call back. I have not received a call back as of 12:00 PM on 10/20.

South Carolina Department of Transportation (SC DOT)

SC DOT
Chris Madden
864-241-1224
October 16, 2023 10:15 AM

Spoke to Olivia at the Greenville Maintenance office. She transferred me to Josh, an RME, who isn't sure what they have but would check around. Will generate problem areas and will email me. Did not receive problem areas from SCDOT.

South Carolina Department of Natural Resources (SC DNR)

SC DNR – Columbia Office
803-734-9568
mizzellh@dnr.sc.gov
Hope Mizzell
October 16, 2023 10:40 AM

Hope returned my call and indicated that most data we would need could be found online but she was going to pass my info to Melissa Griffin as this is her specialty area.

12:00 PM – Melissa called back and set up a meeting for 10/18 to go through data that may be helpful. In our meeting, she talked about standard language she wrote for plans like this concerning climate change and hazards as a result of climate change that she would get permission to share. She mentioned that NOAA/NWS flooding data doesn't distinguish pelluvial and alluvial flooding but that she had separate data for those and would pick some events to share. She wanted to make sure the plan included data from the 1995 drought, and was excited that this update would capture 2018 because it was the wettest on record for the upstate. The Pinnacle Mountain Fire was in early 2016 and the conditions that caused it likely weren't captured in the last update, so she has data to provide on that. She is aware of the timeline and expects to pull the data together by 10/30.

Data provided 10/23

South Carolina Disaster Recovery Office (SC DRO)

SC DRO
ContactSCDR@s cdr.sc.gov
October 12, 2023 – 9:15 AM

The SC DRO website does not have a phone number, so I sent an email to the address listed on the website. I explained the project and asked if they could please contact me. I included my office phone number for SC DRO to contact me. I received a response with links to data and other relevant information from Hope Warren at 3:00 10/12/2023.

South Carolina Emergency Management Division (SC EMD)

SC EMD
(803) 737-8500
October 16, 2023 11:00 AM

I spoke to the admin, who took my information and will have someone call me. David Jones called back 12:05 PM. Took my email and is emailing me state hazard mitigation plans. Received state plan as well as information on climate change and updates to the mitigation planning criteria on 10/16/23.

SC DES Dam Safety Program

*Chuck Owens
864-372-3273
owensc2@dhec.sc.gov
October 16, 2023 9:40 AM*

I spoke to Chuck about a list of dams within the City of Greenville. He was in the field but indicated he could pull this together. He gave me his email to send an email he could forward to the GIS department. Email sent after the phone call. Sam Johnson with DHEC requested the current city limits shapefile on 10/20/23, and I emailed it to him. List of dams in the city including those that would affect the city if they failed and associated shapefiles provided 11/3/23.

Friends of the Reedy River

*info@friendsofthereedyriver.org
864-255-8946
October 16, 2023 10:35*

Called but number has been disconnected. Emailed info@friendsofthereedyriver.org, the address listed on the Friends of the Reedy River website, for information and explained the project. No information received from Friends of the Reedy River.

Conestee Foundation

*info@conesteepreserve.org
October 16, 2023 10:45 AM
864-277-2004*

Spoke with Erin Knight, Operations director. She said they don't collect or track data of that kind because of the nonprofit nature but do exist entirely in a floodplain and would be happy to answer questions about that if they arose. She expressed interest in the project and offered to coordinate as needed.

Appalachian Council of Governments

*Appalachian Council of Governments
864 242-9733
October 16, 2023 10:55 AM*

I was directed to the voicemail of Chip Bentley (Deputy Director). I left a message briefly explaining the project and asked if they do any sort of planning for emergencies/hazards. I left my number and asked him to call back. No information received from Appalachian Council of Governments.

Representatives from NOAA, Upstate Forever, and Greenville County Floodplain Management are active members of the Disaster Mitigation Committee and have participated in all aspects of this plan update and are therefore not included in this call log. Additional data was obtained from various other agencies throughout the plan update.

<u>Source</u>	<u>Point of Contact (^)</u>	<u>Content</u>
ATSDR/CDC		<i>*US Census</i>
City of Greenville GIS Information		<i>*BlockGroups, Businesses, Critical Facilities, Land Use, Maps, Parcels, Traffic</i>
FEMA Flood Map Service Center		<i>*FIRMS/Floodplains</i>
FEMA National Risk Index		<i>*RI/SVI/CR Census, RI/SVI/CR Demographics, Reporting</i>
Greenville County Emergency Management		<i>Greenville County Suceptability to Hazards / Emergency Operations Plan</i>
Midwestern Regional Climate Center		<i>Climate Reporting</i>
National Inventory of Dams		<i>Dam Reporting</i>
NOAA (NWS SPC/NWPS/NCEI)	Brian Campbell (NOAA/NWS)	<i>*Climate, Flood, Hail, Tornados, Wind, Winter Weather</i>
	Matthew Elliot (NOAA Federal)	
	Scott Stephens (NOAA Federal)	
SCDOT		<i>*Highways, Other Roads</i>
SC State Climatology Office		<i>*Climate</i>
SC State Hazard Mitigation Plan		<i>*All Hazards</i>
SCDES		<i>*Critical Facilities</i>
SCDES Dam Safety Program		<i>*Dams</i>
SCDNR		<i>*Climate, Winter Weather</i>
South Carolina Forestry Commission	Kris Robbins (SCFC)	<i>*Wildfires</i>
State Climatology Office		<i>*Climate</i>
U.S. Drought Monitor	Brian Fuchs (National Drought Mitigation Center)	<i>*Drought</i>
USGS Earthquake Hazards Program		<i>*Earthquakes</i>
Woolpert		<i>*Boundaries, Municipalities</i>
SHELDUS Version 22.0		<i>*All Hazards</i>
2023 South Carolina Hazard Mitigation Plan		<i>All Hazards</i>

*GIS data retrieved and utilized in mapping for hazards, risk ,social vulnerability, and other aspects of the Hazard Mitigation and Resiliency Plan.

^ Point of Contact for additional data inquiries

Appendix C – Public Meeting Minutes

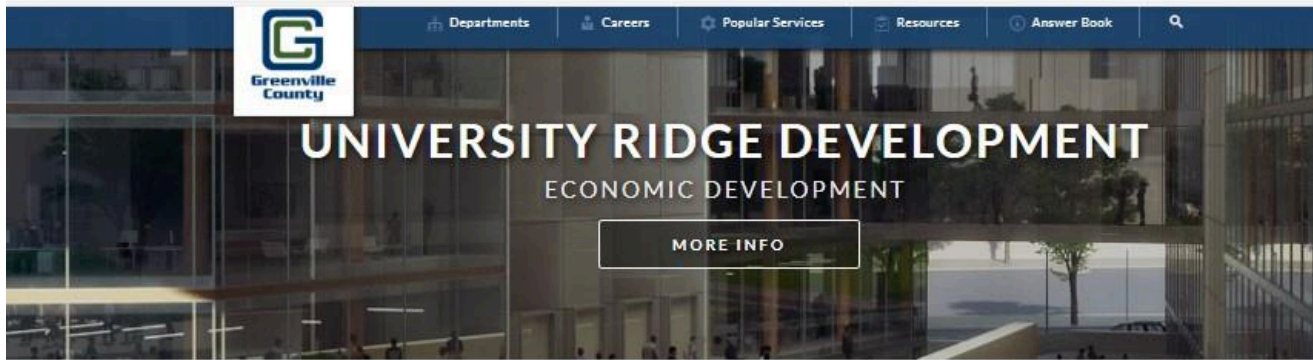


Meeting Minutes

Date of Meeting:	April 18, 2024	Subject:	Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update Public Meeting #1
Location:	The Pavilion 400 Scottswood Road, Taylors, SC, 29687	Time:	5:00 PM – 7:00 PM
In Attendance:	See table below and scanned sign-in sheet attached.		

ITEMS DISCUSSED:

The first public meeting for the 2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan update was held on April 18, 2024, from 5:00PM – 7:00PM at The Pavilion. Information about the meeting was posted publicly on the Greenville County website and LinkedIn (see screenshots below). The meeting was an open house format. The County and Woolpert set up tables at the entrance of the Pavilion and spoke to citizens as they entered the recreation center. Information was provided about the plan update, the hazards affecting Greenville County, emergency preparedness, and how the public can get involved and provide information to help with the plan update. One citizen voiced concern about flooding in her backyard, and another citizen expressed interest in being a part of the plan development and participating in the CERT program.



RESIDENTS

BUSINESSES

GOVERNMENT



The new Greenville County Administration Building is open. The convenient Greenville County parking garage is to be used to access the offices. There is a covered walkway for the short walk from garage to offices. The garage can be accessed from southbound Church Street or via the University Ridge main entrance.

[Traffic Pattern Map for Garage](#)

There is no parking in the former parking lots. The offices are accessible by foot with connection to the Swamp Rabbit Trail and a sidewalk system.

GREENVILLE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE

Date: April 18, 2024

Time: 5-7 PM

Location: The Pavilion - Greenville County Recreation Complex

Address: 400 Scottswood Road, Taylors, SC, 29687

You are invited to the public meeting to provide input and/or seek knowledge about the County's plan.

[Click here](#) for the 2020 Plan.

Quick Links

- Business Hours & Directions
- Boards & Commissions
- Benefits
- Calendars
- Ordinances & Minutes
- Elections / Voter Registration
- Financial Online Accountability
- Find Your Representatives
- Holiday Schedule
- Pay your taxes online
- GIS Information
- Greenville County
301 University Ridge
Greenville, SC 29601
864.467.7100
- County Property Sales
Foreclosure Sales
Surplus Property
Tax Sale and Date

Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261

Greenville County
**Multi-
Jurisdictional
Hazard
Mitigation and
Resiliency Plan**

Public Meeting #1



OPEN HOUSE FORMAT



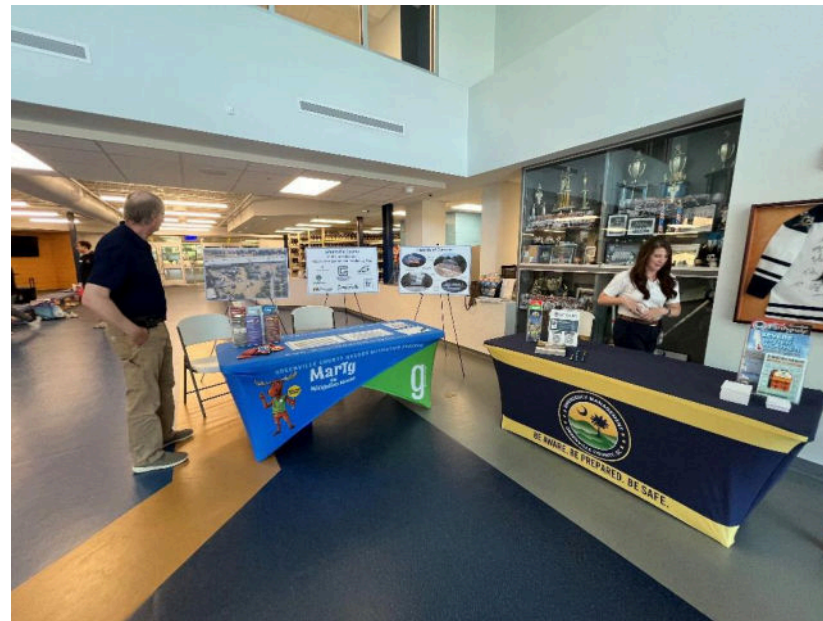
You're invited!

**THURSDAY
APRIL, 18TH**

at The Pavilion -
Greenville County
Recreation Complex
400 Scottswood Road
Taylors, SC, 29687

5:00PM - 7:00PM

We need your input!



Woolpert, Inc.
 807 Gervais Street, Suite 102
 Columbia, SC 29201

Name	Organization/Mailing Address	Phone	Email Address
Brian Bishop	Greenville County Floodplain	864-905-3501	jbishop@greenvillecounty.org
Jessica Stumpf	Greenville County Emergency Management	864-467-3812	jstumpf@greenvillecounty.org
Michael Jankowski	Greenville County Emergency Management	864-569-1148	mjankowski@greenvillecounty.org
Molly Davis	Woolpert, Inc.	803-214-5943	Molly.Davis@Woolpert.com
Harold Clarkson	Woolpert, Inc.	803-214-5881	Hal.Clarkson@Woolpert.com
Hannah Fisher	Greenville County Rec	864-612-0347	hanlfisher@outlook.com
Shaan Delport	Greenville County Rec	864-467-3592	sdelport@greenvillecounty.org
BC Christmas	510 Sweetbriar Way, Easley, SC, 29640	864-449-5885	adarksideboy@gmail.com
Jai Gilliland	Pavilion	864-467-3487	jgilliland@greenvillecounty.org
Kathy Nudak	105 Boulder Creek Way, Greer, SC, 29651	864-360-2777	Kanudak49@gmail.com
Lauren Rodriguez	11101 Pointe Grand Pl, Simpsonville, SC	910-650-0466	laurenschetler@gmail.com
Udhav Parate	8407 Old Spartanburg Road, 1700D, Taylors, SC, 29687	864-577-6773	udhavparate@gmail.com

Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261



Meeting Minutes

Date of Meeting:	August 20, 2024	Subject:	Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update Public Meeting #2
Location:	301 University Ridge North Tower Greenville, SC, 29601	Time:	4:00 PM – 6:00 PM
In Attendance:	See the table below and the scanned sign-in sheet attached.		

ITEMS DISCUSSED:

The second public meeting for the 2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan (HMRP) update was held on August 20, 2024, from 4:00PM – 6:00PM at the Greenville County offices. Information about the meeting was posted publicly on the Greenville County Emergency Management and Floodplain Management web pages. The meeting was an open house format. The County and Woolpert set up tables in the lobby of the North Tower at the County offices in front of County Council chambers. We provided information about the plan update, hazards affecting Greenville County, emergency preparedness, and how the public can get involved to help with the plan update. We had the opportunity to speak with an incoming Council member, the County Administrator, several members of the public, and County employees in different departments to tell them more about what we are doing to plan for/mitigate the risk of hazards that have the potential to affect Greenville County.

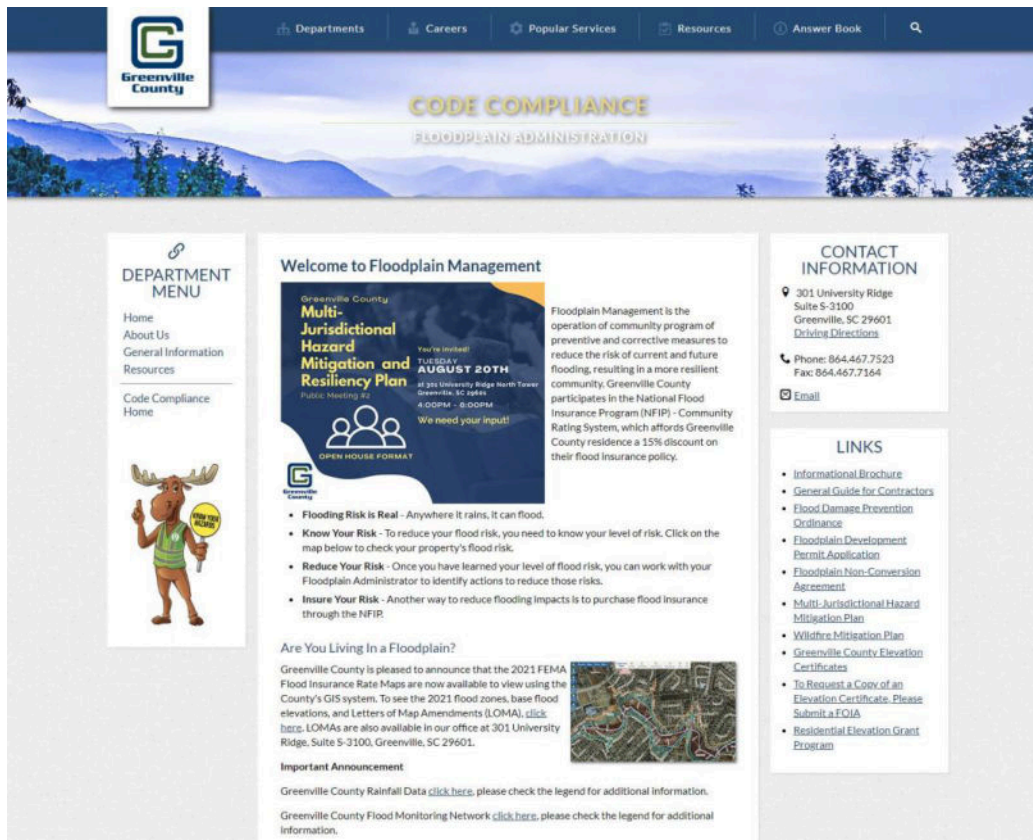


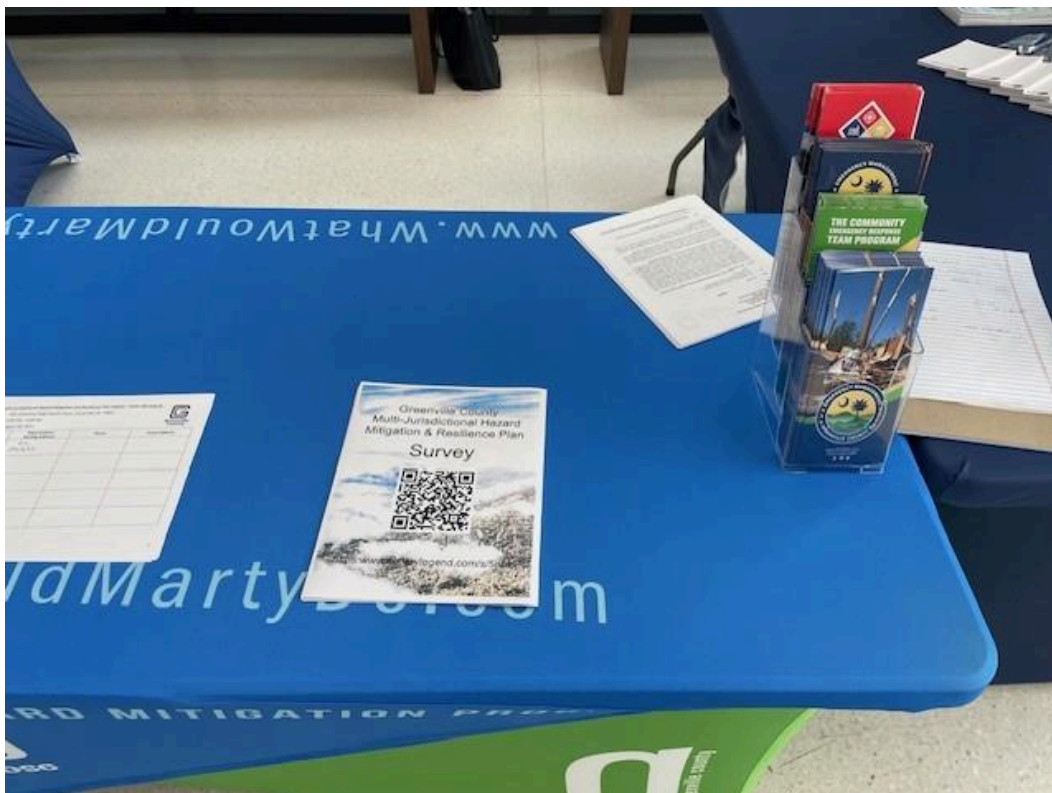
Figure 1 Public Meeting Announcement on Greenville County's Floodplain Management Website



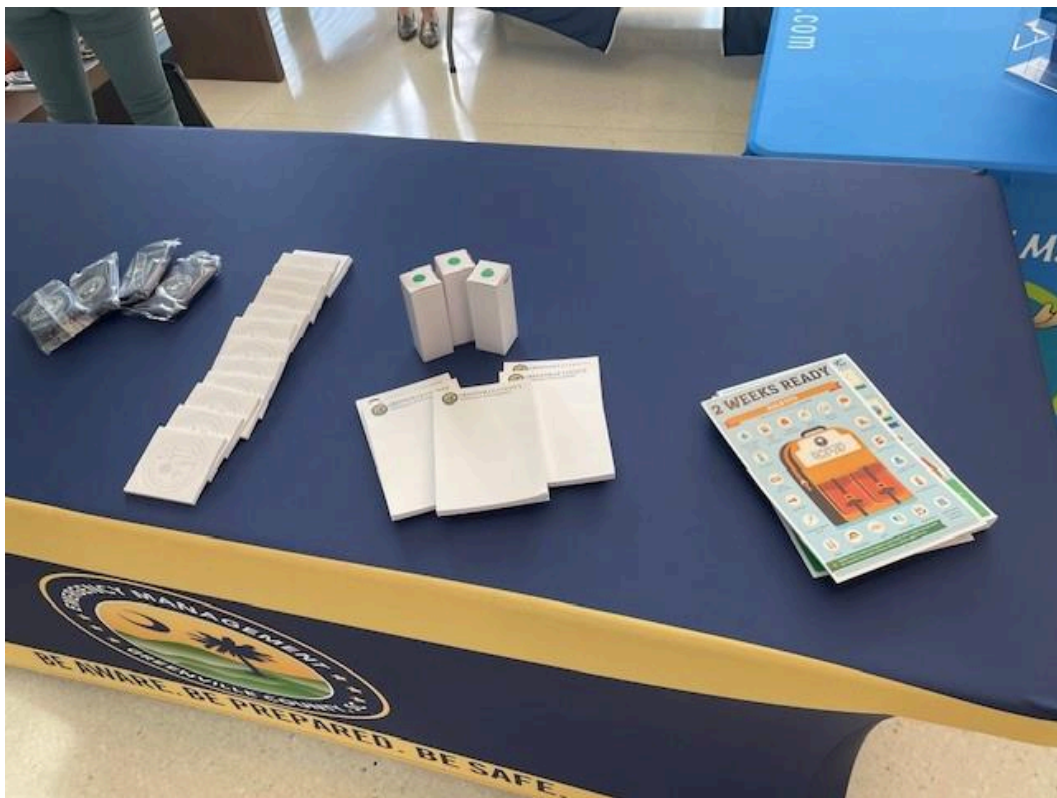
Figure 2 Public Meeting Announcement on Greenville County's Emergency Management Website

Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261

Photos



Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261



Woolpert, Inc.
 2000 Center Point Road, Suite 2200
 Columbia, SC 29210-5824
 803.731.0261



Woolpert, Inc.
2000 Center Point Road, Suite 2200
Columbia, SC 29210-5824
803.731.0261

Table 1 Public Meeting Attendees

Name	Organization/Mailing Address	Phone	Email Address
Brian Bishop	Greenville County Floodplain	864-905-3501	jbishop@greenvillecounty.org
Jessica Stumpf	Greenville County Emergency Management	864-467-3812	jstumpf@greenvillecounty.org
Michael Jankowski	Greenville County Emergency Management	864-569-1148	mjankowski@greenvillecounty.org
Molly Brown	Woolpert, Inc.	803-214-5943	Molly.Brown@Woolpert.com
Harold Clarkson	Woolpert, Inc.	803-214-5881	Hal.Clarkson@Woolpert.com
Curt McGahhey	Councilman Elect	864-714-9825	curt.mcgahhey@gmail.com
Jaimee Masters	134 Jarrard Drive, Marietta, SC 29661	864-526-2933	holcombjaimee@gmail.com
Dianne Vreeland	413 Heather Falls Lane, Simpsonville, SC 29681	702-210-4836	diannevreeland8@gmail.com
Bob Mihalic	Greenville County	864-467-7066	BMihalic@greenvillecounty.org
Janice Simpson		602-481-6456	jlsimpson@fastmail.com
Ed Hughes	Greenville County	864-467-7386	
Kyle Pfeifer			kylpfeifer@gmail.com
Nicole Wood	Greenville County	864-525-4251	
Joe Kernell	Greenville County	864-467-7106	
Bob S.	Greenville County	864-327-6088	

Woolpert, Inc.
807 Gervais Street, Suite 102
Columbia, SC 29201

Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update - Public Meeting #2

Meeting Location: 301 University Ridge North Tower, Greenville, SC, 29601

Time: 4:00 PM – 6:00 PM

Date: August 20, 2024



Name	Organization/ Mailing Address	Phone	Email Address
Brian Bishop	GC Floodplain	(864) 905-3501	bishop B greenvillecounty.org
Molly Brown	woolpert	803-214-5943	Molly.Davis@ woolpert.com
MIKE JANKOWSKI	GCZM	864- 569-1145	MIJANKOWSKI GreenvilleCounty.ORG
Hal CLARKSON	WOOLPERT	803 446.9459	Hal.Clarkson@ WOOLPERT.COM
Curt McGahhey	Councilman Elect	864 714-9835	Curt.mcgahey@ gmail.com

Name	Organization/ Mailing Address	Phone	Email Address
Jaimee Masters	134 Farrard Dr. Marietta SC 29661	864-524-2933	holcombjaimee@gmail.com
Dianne Vreeland	413 413 Heather Falls Ln Simpsonville	702-210-4836	diannevreeland8@gmail.com
Bob Mihalic		864-467-7066	
Jessica Stumpf	Greenville Co Emergency Mgmt	864-467-2680	jstumpf@greenville county.org
Janice Simpson	—	603 481 6456	jsimpson@fastmail.com
Ed Hughes	Greenville County	864-467-7386	N/A
Kyle Pfeifer			KylPfeifer@gmail.com

Name	Organization/ Mailing Address	Phone	Email Address
Anna Ward	County	5254251	
Joe Kernell	County	467-7106	
h.s. [Signature]	County	327-6088	



Meeting Minutes

Date of Meeting:	March 4, 2025	Subject:	Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update Public Meeting #3
Location:	301 University Ridge North Tower Greenville, SC, 29601	Time:	4:00 PM – 6:00 PM
In Attendance:	Scanned sign-in sheets attached.		

ITEMS DISCUSSED:

The third public meeting for the 2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan (HMRP) update was held on March 4, 2025, from 4:00PM – 6:00PM at the Greenville County offices. Information about the meeting was posted publicly on the Greenville County website and the County’s Emergency Management website. The meeting was an open house format. The County and Woolpert set up tables in the lobby of the North Tower at the County offices in front of County Council chambers. The draft plan update was presented. This meeting allowed for additional public review of and input into the HMRP.

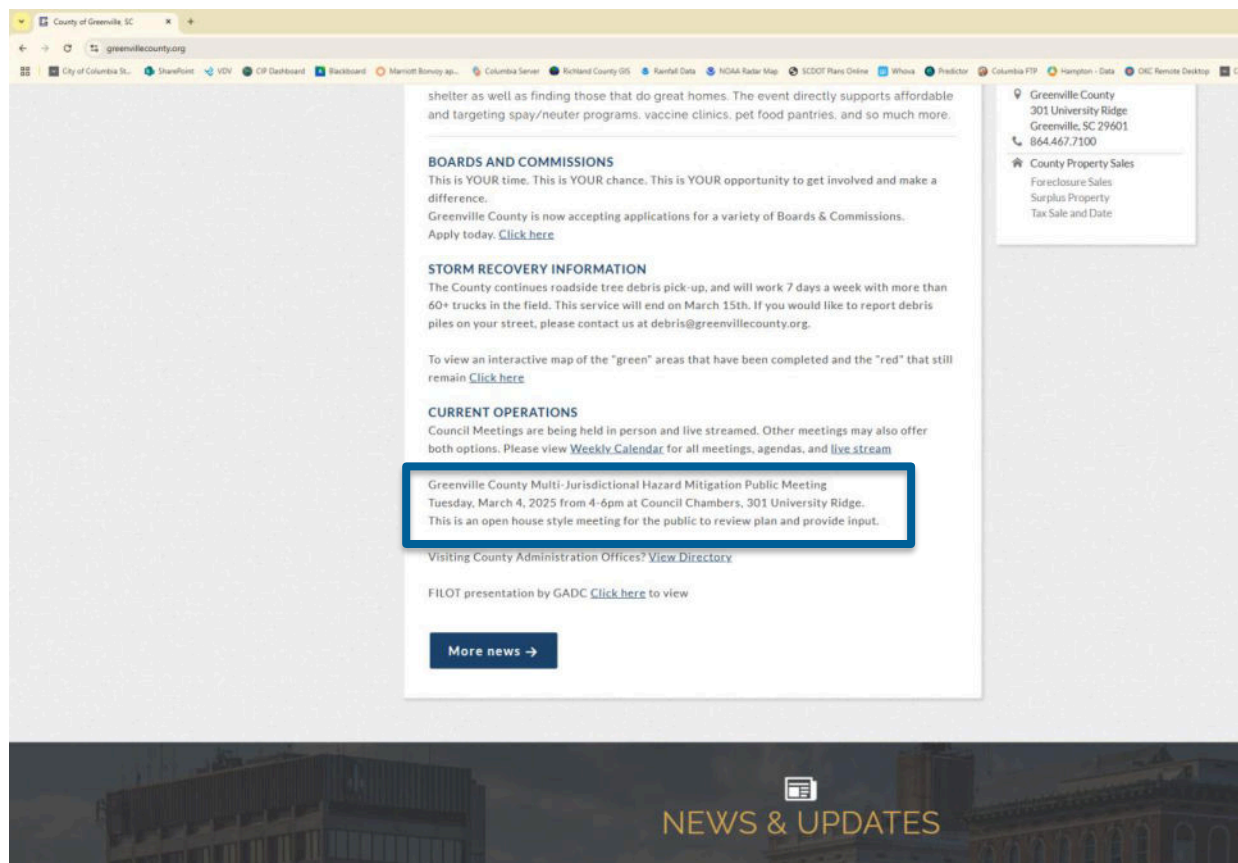
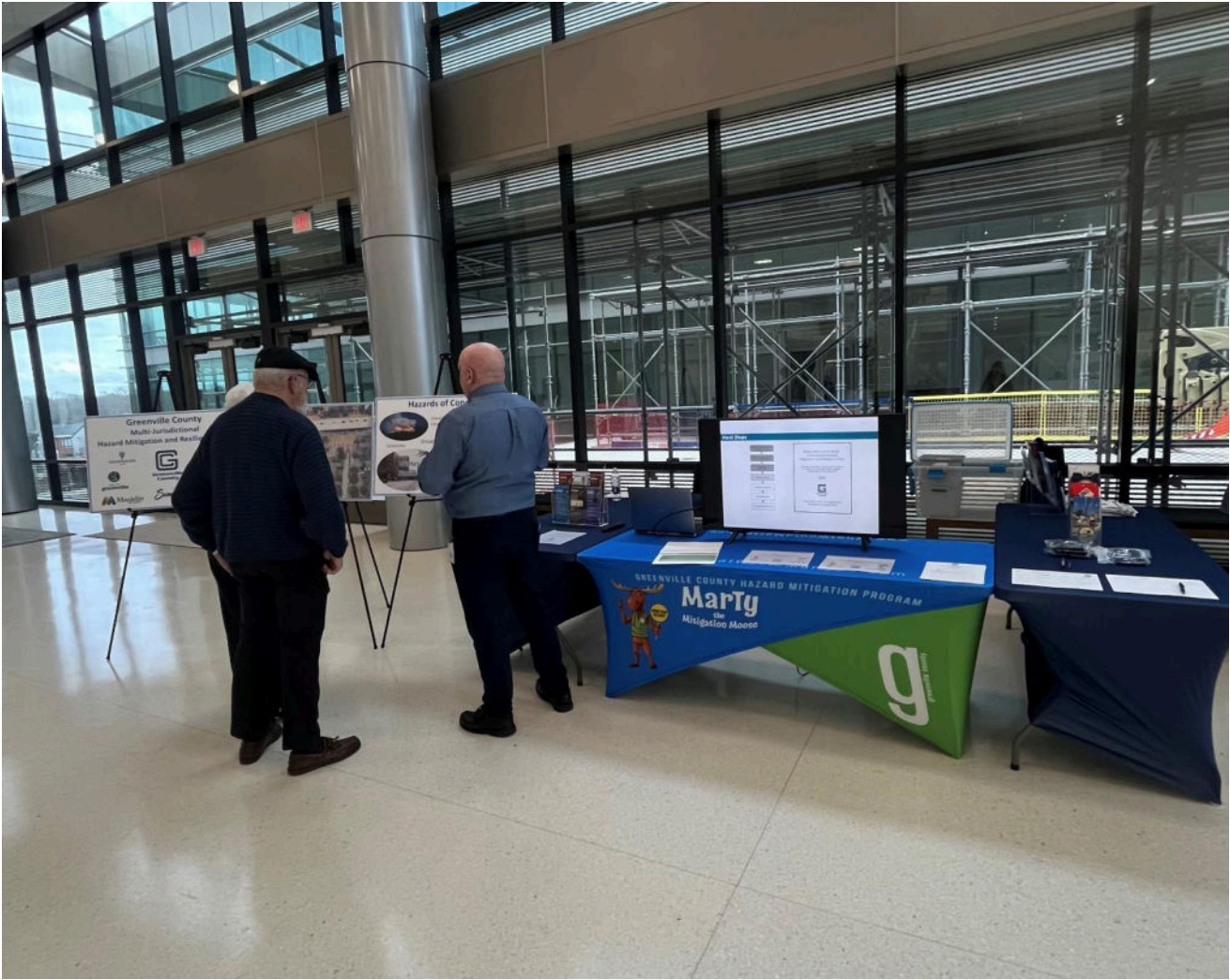


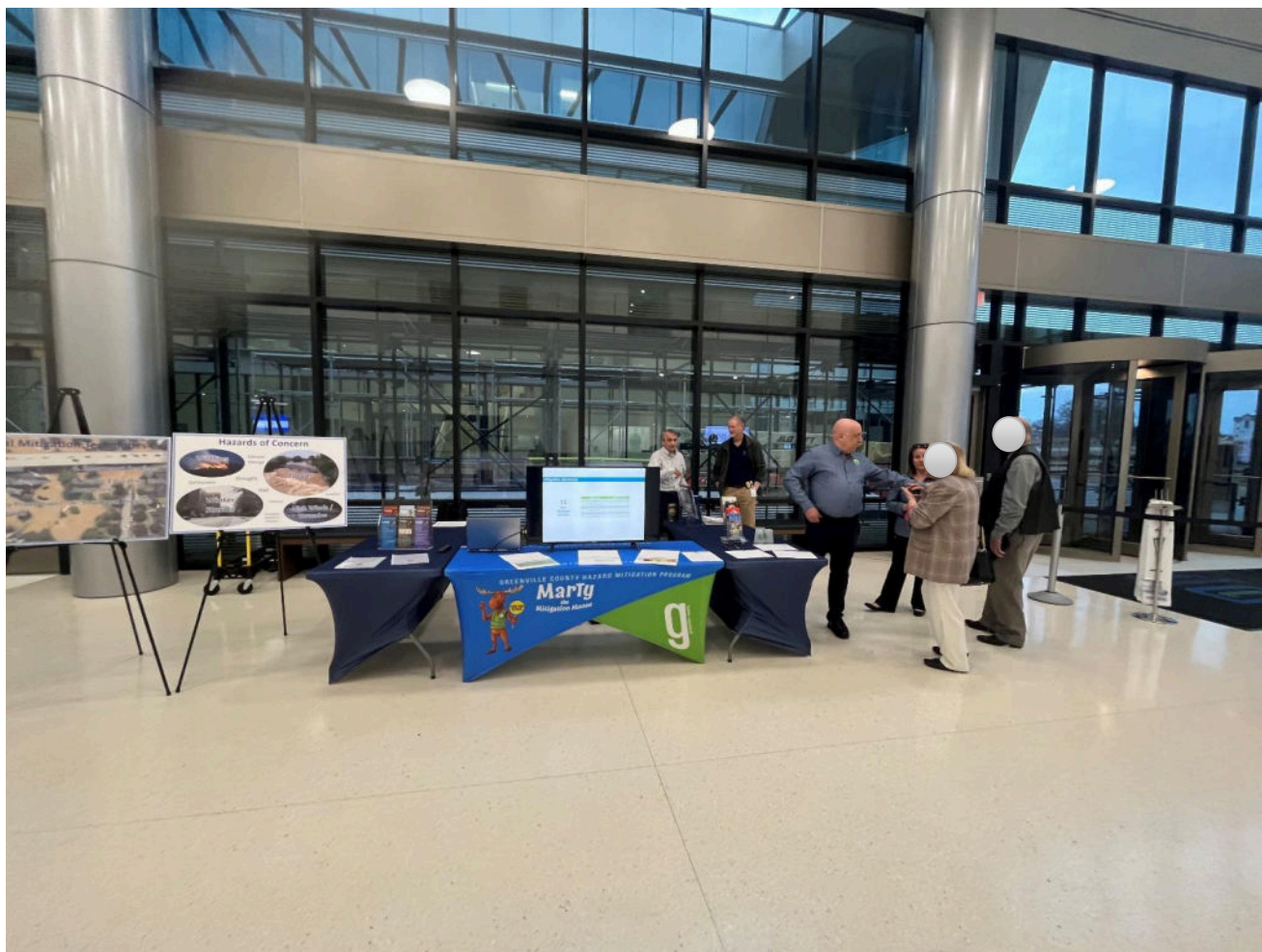
Figure 1 Public Meeting Announcement on Greenville County's Website



Figure 2 Public Meeting Announcement on Greenville County's Emergency Management Website

Photos







Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan Update - Public Meeting #3

Meeting Location: 301 University Ridge North Tower, Greenville, SC, 29601

Time: 4:00 PM – 6:00 PM

Date: March 4, 2025



Name	Organization/ Mailing Address	Phone	Email Address
HAL CLARKSON	Woolpert	803.446.9459	HAL.CLARKSON@WOOLPERT.COM
Brian Bishop	Greenville County Floodplain	467-7004	bbishop@greenvillecounty.org
MIKE JAN KOWSKI	GCSEM	864 569 1748	MIKANKOWSKI@GREENVILLECOUNTY.ORG
Molly Brown	Woolpert	803-214-5943	Molly.Brown@Woolpert.com
Sherrie Pueño	Community member	-	-

Name	Organization/ Mailing Address	Phone	Email Address
Angela Perry	GCEM	864-908-7682	anperry@greenville county.org
Kathy Opalacz	GCEM	864-436-4703	Kopalacz@greenville county.org
Hugh Means		864-505-8318	hmeans2012@gmail.com
Charles Means		864-505-4745	spearmusic2012@gmail.com
Jami Haman	G.C	(864) 982-7155	JHaman@ GreenvilleCounty-NC
Rob Mays	Treasurer	864-525-6739	rmays@greenvillecounty.org
Tami Elmore			

Name	Organization/ Mailing Address	Phone	Email Address
Hesha Gamble	Greenville Co Public Works	864-467-7016	
Nicole Wood	Greenville County Admin	467 7409	nwood@greenville county
Robert McRister	Greenville County	417. 2652	
* Lisa Bracewell			8 Civilair41@yahoo.com *
Paul Bracewell			pbracewell66@gmail.com
Gene Bishop			
* Corey Porham	Citizen taxpayer	864 419 9899	wporham@gmail.com

CERT

Name	Organization/ Mailing Address	Phone	Email Address
Deborah McLemore	132 Motor Boat Club Dr	864-534-3280	dmclemore@greenville County.org

Appendix D – Annual Updates

1 Prioritized Mitigation Initiatives

1.1 Introduction

Development of mitigation initiatives began with a review of initiatives contained in previous HMPs. Any initiative that was on the current list, but that had not begun implementation remained in consideration for the 2020 HMP. The DMC was also provided an opportunity to discuss potential mitigation measures with their sponsoring organization and submit those initiatives either in writing, at DMC meeting #2, or again at meeting #3.

1.2 Project Descriptions

The following projects were identified by the committee as potential mitigation initiatives and were scored according to the process defined in Section **Error! Reference source not found.** All of the “Responsible Party” designations below refer to Greenville County Departments or Divisions, unless otherwise stated.

PREVENTION

- Bridge/Culvert Analysis
 - Replace and upgrade stream crossings to improve channel flow characteristics as needed.
 - Total of 3 Bridge replacements for 2022/2023. Three additional bridges have been placed on order and to be completed in 2023.
 - Projected to replace 6 Bridges and 2 culverts in 2023/2024.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration, Engineering	County Budget	Each crossing is analyzed during the basin study process and programmed for upgrade in subsequent budget	Floods	Greenville County

- Proactive Maintenance of Stormwater Infrastructure
 - Maintain piped infrastructure, ditches, culverts, bridges, and Best Management Practices before hazardous conditions occur.
 - Upgraded 3 existing undersized and poorly functioning pipe drainage systems.
 - Rehabbed existing CMP pipe.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering	County Budget	On-going, more detailed analysis of localized flooding to be prepared as budget becomes available	Floods	Greenville County

- Underground Electricity Plan
 - Coordinate with utility companies to place powerlines underground to prevent hazards and outages associated with falling lines due to weather conditions.
 - Greenville County continually recommends to both developers and utility departments to install utilities underground. Ongoing outreach.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering, Land Development	County Budget	On-going	Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

- Paris Mountain Wildfire Mitigation Plan
 - A Hazard Mitigation Grant application has been submitted to FEMA for development of a plan for the Paris Mountain area.
 - Project completed. Currently preparing close out and final payment request from FEMA.
 - Requested FEMA to approve plan and incorporate into HMP.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	FEMA HMGP County Budget	Prepare upon award of grant application	Wildfires, Drought, Climate Change	Greenville County

- Repetitive Loss Area Plan
 - A Repetitive Area Loss Analysis was completed by the County per the Community Rating System (CRS) requirements. As a result, the Insurance Services Office (ISO) requires a repetitive loss plan. The County has created and is implementing the plan as required.
 - Repetitive Loss outreach letters were mailed. A total of 77 letters were sent to repetitive loss property owners and associated surrounding properties.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	Floods	Greenville County

- Update Existing Watershed Studies
 - Determine new levels of service for each road crossing.
 - Due to budget, Greenville County will delay updating the 5 existing watershed studies and focus on completing the Enoree river basin study (pending Grant approval funding).
 - Currently underway with the Middle Tyger Creek and Lower Reedy River watershed studies. Both projects are in the initial field surveying phase.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, All Municipalities

- Enoree River Basin Study
 - Prepare a watershed master plan for the Enoree River basin identifying potential flooding problems and solutions.
 - **Project will proceed once FEMA approved grant.**

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County

- Travelers Rest and Marietta Area Watershed Study
 - Prepare a watershed study in developing areas of Travelers Rest and Marietta.
 - **Portions of this watershed are incorporated into the Enoree River Basin Study. See above.**

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, Travelers Rest

PUBLIC EDUCATION & AWARENESS

- Enhanced GIS Database
 - Continue to update the County's GIS with hazard related data
 - **The County GIS is updated on a 6 month basis or sooner if needed.**

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Geographic Information Services, Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Realtor Flood Hazard Education
 - Provide hazard data and training to local realtors
 - **Information was mailed to the SC Realtors Association which reaches 3,000 members.**

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget FEMA Grant	On-going	Floods	Greenville County, All Municipalities

- Pre-Prepared Hazard Info Ads

- Prepare ads for hazard preparation to be released immediately before and during natural disasters to provide for a timely response including information on the health and safety risks associated with floodwaters
- Information Brochures on all HMP hazards have been developed. The materials are printed and ready for release as disasters occur.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	Public Service Ads County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Flood Signs
 - Develop signage denoting high flood risk areas and crossings
 - Signage is provided in known flood risk areas.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

- Enhance Hazards Education
 - Develop additional hazard education programs for County staff and the public, introducing Marty the Moose and educational literature
 - The County has a Facebook page and web site with hazard preparedness outreach via Marty the Mitigation Moose.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Early Warning System Evaluation
 - Review and evaluate the usage of an early warning system to alert the public about potential hazards.
 - Greenville County works alongside the National Weather Service and local news agencies.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Floodplain Administration, Engineering	County Budget Grants	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados, Wildfires, Drought, Hail	Greenville County, All Municipalities

- Social Media Public Communication
 - Leverage social media and cell phones by creating hashtags to keep the public engaged and informed.
 - Communicate emergency services available to the public on multiple platforms to reach a wider audience.
 - This information is provided through our emergency management division and supplemented with our website and Facebook page.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget	As budget becomes available	All Hazards	Greenville County, All Municipalities

- Emergency Public Communication
 - Determine the most efficient modes of communication for relaying emergency information to the public. This could vary depending on the population, so ensure vulnerable populations are able to be reached.
 - Include references to emergency management websites and social media in communications about hazards. For example, point the public to the EMD website for updates during a hurricane or a local police station Twitter that is providing continuous coverage of an emergency situation.
 - Work with other agencies and departments to create a protocol for communication. This protocol should be written down and developed into an SOP to ensure communication is consistent. Phone numbers used should be general in case of turnover in the department or agency.
 - Establish a protocol for media outlets during a hazardous event. For example, an agreement can be signed by the various media outlets, or a hotline can be established during emergencies for media outlets to contact for information.
 - This information is provided through our emergency management division and supplemented with our website and Facebook page.
 - Emergency Management manages the CodeRED Emergency notification system for the County with the ability to send out alerts via IPAW (integrated public alert and warning system).

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget Public Service Ads	As budget becomes available	All Hazards	Greenville County, All Municipalities

- Protection Education
 - Provide education for homeowners and business owners on how to properly prepare for hazardous conditions. This could include agencies to contact, websites to visit, and preventative measures the owner can perform such as boarding up windows.
 - Provide education for homeowners on stream maintenance responsibilities and the impact a poorly maintained stream could have on their property.
 - Both Floodplain Management and the Soil and Water Conservation District provide information at public meetings, trade events and outreach mailings.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Soil & Water Conservation District	County Budget	On-going As budget becomes available	Floods, Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

NATURAL RESOURCES PROTECTION

- Stream Crossing Debris Removal
 - The County owns and maintains over 1,800 miles of roadway. To the extent practical, provide for removal of debris build up in rivers and streams, especially at road crossings and in highly urbanized areas. This is part of the road maintenance program protocol. Greenville County also implements a beaver dam removal program.
 - This activity is provided by the engineering department as part of their road maintenance program.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Roads and Drainage	County Budget FEMA Grant	On-going	Floods	Greenville County

- Riparian Area Management Plans
 - Create focused riparian buffer protection plans to target specific issues related to flooding.
 - Identify properties that can be acquired by the county to restore and enhance current riparian areas.
 - Greenville County Planning Department is currently working on plans for several communities containing large areas of County owned floodplain properties.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development Floodplain Management Planning	County Budget	On-going	Floods	Greenville County

- Runoff Reduction
 - Enhance runoff reduction criteria by including creative practices such as Green Infrastructure and Low Impact Development.
 - The County's land development ordinance in conjunction with our comprehensive plan continues to evaluate our plans.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development	County Budget	On-going	Floods	Greenville County

EMERGENCY SERVICES

- Early Warning System Enhancement (See Evaluate Early Warning System)
 - Install flood hazard signage, warning lights, and gates on frequently flooded roadways as well as hazard signage for steep roads, frequently icy bridges, and other known hazards on the road.
 - Install warning systems to notify travelers of road blocks due to fallen trees, ice, and other hazardous conditions.
 - When an emergency is determined, the County's Emergency Management division in conjunction with our engineering department and local emergency services provide onsite warning/road closure notification.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Floodplain Management Engineering	County Budget FEMA Grant	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados	Greenville County

- Continue Improvements to Radio Communications
 - Radio communications are critical during disasters and the County currently operates multiple radio systems. Upgrade all radio systems to improve communications across divisions and agencies.
 - Funding has been provided and radio system has been upgraded.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Administration Emergency Management	County Budget Grant	On-going	All Hazards	Greenville County

- Communications Protocol
 - Review and continue to coordinate a communication protocol with the news media and to guide the media in disaster reporting
 - County Public Relations manager works with Emergency Management to provide information to the public prior to and during emergencies.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Public Information Officer	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Post-Disaster Review Meetings
 - DMC and emergency response agency post-disaster debriefings to discuss "lessons learned".
 - No declared emergencies during this reporting period.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement/Building Engineering	County Budget	As events occur	All Hazards	Greenville County, All Municipalities

- Evaluation of Emergency Routes
 - Review emergency routes and evacuation routes to ensure they are the safest, most appropriate routes
 - Ongoing evaluation through Emergency Management.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Services Emergency Management Engineering	County Budget	On-going	All Hazards	Greenville County

- Comprehensive Training
 - Provide appropriate level of emergency response training to all County staff.
 - Greenville County has 5 certified floodplain managers on staff and maintains their certification through webinars and conferences.
 - Emergency Management has 4 SC certified emergency managers on staff. Also has a dedicated training coordinator on staff.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Risk Management	County Budget FEMA Training Programs	As budget becomes available	All Hazards	Greenville County

- Coordinated Bridge De-Icing
 - Continue to coordinate with SCDOT to create a plan for de-icing bridges during winter weather conditions. Currently, “snow meetings” are held with the SCDOT in November and December to prepare for the snow season.
 - Ongoing activity. No issues/storm during this reporting period.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering SCDOT	County Budget SCDOT	On-going	Winter Storms, Hail	Greenville County

- Heating and Cooling

- Continue to provide assistance to the Homeless Alliance and other Non-governmental organizations (NGOs) identifying vulnerable populations and creating plans to provide proper heating and cooling for those populations. Engage with NGOs to find out what type of services they provide that could help with this task.
- If required, notification to the public will be notified where these services are provided.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement	County Budget Grants	As budget / grant become available	Winter Storms, Drought, Hail	Greenville County

- Backup Power
 - Identify critical places that may require backup power such as fueling stations, food sources, and vulnerable populations and, to the extent practical, work with NGOs and others to create a plan to provide this power in the event of an emergency. Critical County facilities already have emergency power plans in-place.
 - Evaluation of this activity will be addressed in the updated County Comprehensive/Resiliency plan.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management	County Budget Grants	On-going	Winter Storms, High Winds/Tornados, Earthquakes, Hail	Greenville County, All Municipalities

PROPERTY PROTECTION

- Elevation Grant Program
 - Continue providing elevation grants to eligible County residents.
 - This plan is still active and available. Information can be found on Floodplain web page.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going	Floods	Greenville County

- Flood Mitigation Acquisition Program
 - Continue acquiring appropriate, eligible properties to reduce buildings at high risk of flooding.
 - County continues to fund and promote our floodplain buyout program. To date the county has removed 219 structures from the special flood hazard areas representing 136.5 acres.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going, as grants become available	Floods	Greenville County

- Identify/Mitigate Infrastructure
 - Identify infrastructure at risk through basin studies and mitigate as appropriate.
 - County currently has two active basin studies and waiting on FEMA grant for third.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Floodplain Management	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

STRUCTURAL PROJECTS

- Critical Facility Retrofits/Relocations
 - Identify and evaluate critical facilities for risk and mitigate as appropriate.
 - No facilities have currently been identified.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Emergency Management Engineering	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County



Office of the Floodplain Administrator

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

MEMO

Date: May 2024

To: Mr. Darren Brock – Director of Code Compliance
Mr. Joseph M. Kernell, County Administrator
County Council

Subject: Re: Greenville County Flood Hazard Mitigation Plan Annual Progress Update

Greenville County participates in the Community Rating System (CRS) of the National Flood Insurance Program. This program commitment enhances public safety and property protection while providing our flood insurance policyholders with a premium discount. The County Flood Hazard Mitigation Plan is incorporated into the Multi-Jurisdictional Hazard Mitigation Plan (Plan) adopted by County Council on June 16, 2020. This Flood Hazard Mitigation Plan Update is an annual review that is transmitted to the local governing body; the State Flood Mitigation Program Administrator; and, the general public in accordance with CRS program requirements. The Plan and the activities summary update are available in the Floodplain Administrator's Office for public review and on the County's Floodplain Web page. This annual report is designed to document and evaluate progress toward implementing the flood hazard mitigation objectives of the Plan. The hazard mitigation committee met and a copy of the status of each mitigation initiative is attached. Updates are shown as green text. Additionally, an update to the Plan is currently being developed and is anticipated to be completed in the Spring of 2025.

Additionally, the floodplain management department completed their annual repetitive loss area analysis of insured structures that has had at least two paid flood losses of more than \$1000 each in any ten-year period since 1978. After our review, the county currently has 13 repetitive loss structures. A total of 92 notices were sent out which included the 13 repetitive loss properties and surrounding property owners with similar flooding risk. A copy of the letter is attached.

Greenville County staff is committed to achieving the flood hazard mitigation goals outlined in our Plan. We appreciate the support of Council, County Administration and our Disaster Mitigation Committee members as we work together to make Greenville County a more disaster resistant community.

Copy: South Carolina Department of Natural Resources, Flood Mitigation Programs
Mr. Bob Mihalic, Governmental Affairs Coordinator

h:\floodplain\CRS-ISO\2024\Memo HMP 2024



Office of the Floodplain Administrator

Brian Bishop
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

April 2024

To: Repetitive Loss Area Property Owners

**Re: Repetitive Loss Areas and Floodplain Management Information
National Flood Insurance Program (NFIP)**

Dear Sir or Madam:

You are receiving this letter because you own and/or reside in a home located in an area that is subject to flooding. In fact, one or more properties located in your area have experienced "repetitive losses" due to flooding. Repetitive loss properties are those properties for which two or more claims of more than \$1,000 have been paid by the NFIP within any 10-year period since 1978. Although repetitive loss properties represent only 1% of all the NFIP's insurance policies, they have accounted for nearly one-third of the claim payments.

Greenville County is concerned about repetitive flooding and has an ongoing program to address problem flooding areas. However, there are things that each property owner can do to protect themselves from damage caused by flooding events. The enclosed Brochure provides information on flooding issues and floodplain management such as:

Local Flood Hazards
County Flood Services
Flood Warnings
Property Protection Measures
Flood Safety

Permit Requirements
Flood Insurance
Natural and Beneficial Functions
Drainage System Maintenance

Greenville County also has a program to assist residents whose structures are located in floodplain areas and/or have experienced structural flood damage. The Residential Elevation Grant Program will provide up to \$7,500 to elevate flood prone homes which meet eligibility requirements. For more information on this program please visit our web site at www.greenvillecounty.org/floodplainadministration. Information related to flood insurance can be found at www.floodsmart.gov.

Please contact our office if you have questions regarding the enclosed information or floodplain management issues.

Sincerely,

Brian Bishop, P.E., CFM
Floodplain Administrator

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1 Prioritized Mitigation Initiatives 2023/2024

1.1 Introduction

Development of mitigation initiatives began with a review of initiatives contained in previous HMPs. Any initiative that was on the current list, but that had not begun implementation remained in consideration for the 2020 HMP. The DMC was also provided an opportunity to discuss potential mitigation measures with their sponsoring organization and submit those initiatives either in writing, at DMC meeting #2, or again at meeting #3.

1.2 Project Descriptions

The following projects were identified by the committee as potential mitigation initiatives and were scored according to the process defined in Section 10.3 All of the “Responsible Party” designations below refer to Greenville County Departments or Divisions, unless otherwise stated.

PREVENTION

- Bridge/Culvert Analysis
 - Replace and upgrade stream crossings to improve channel flow characteristics as needed.
 - Replaced/installed 7 Bridges and 6 Culverts 2023/2024.
 - Projected to replace 6 Bridges 2024/2025.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration, Engineering	County Budget	Each crossing is analyzed during the basin study process and programmed for upgrade in subsequent budget	Floods	Greenville County

- Proactive Maintenance of Stormwater Infrastructure
 - Maintain piped infrastructure, ditches, culverts, bridges, and Best Management Practices before hazardous conditions occur.
 - Upgraded 2 existing undersized and poorly functioning pipe drainage systems.
 - Rehabbed one pipe system and 2 large culverts.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering	County Budget	On-going, more detailed analysis of localized flooding to be prepared as budget becomes available	Floods	Greenville County

- Underground Electricity Plan
 - Coordinate with utility companies to place powerlines underground to prevent hazards and outages associated with falling lines due to weather conditions.
 - Greenville County continually recommends to both developers and utility departments to install utilities underground. Ongoing outreach.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering, Land Development	County Budget	On-going	Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

- Paris Mountain Wildfire Mitigation Plan
 - A Hazard Mitigation Grant application has been submitted to FEMA for development of a plan for the Paris Mountain area.
 - Project completed.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	FEMA HMGP County Budget	Prepare upon award of grant application	Wildfires, Drought, Climate Change	Greenville County

- Repetitive Loss Area Plan
 - A Repetitive Area Loss Analysis was completed by the County per the Community Rating System (CRS) requirements. As a result, the Insurance Services Office (ISO) requires a repetitive loss plan. The County has created and is implementing the plan as required.
 - Repetitive Loss outreach letters were mailed. A total of 92 letters were sent to repetitive loss property owners and associated surrounding properties.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	Floods	Greenville County

- Update Existing Watershed Studies
 - Determine new levels of service for each road crossing.
 - Due to budget, Greenville County will delay updating the 5 existing watershed studies and focus on completing the Enoree river basin study. Enoree Grant was awarded to the County on September 25, 2023. Contract to perform study was awarded in March 2025 and the study is underway.
 - Finalizing the Middle Tyger Creek and Lower Reedy River watershed studies.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, All Municipalities

- Enoree River Basin Study
 - Prepare a watershed master plan for the Enoree River basin identifying potential flooding problems and solutions.
 - Enoree Grant was awarded to the County on September 25, 2023. Contract to perform study was awarded in March 2025 and the study is underway.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County

- Travelers Rest and Marietta Area Watershed Study
 - Prepare a watershed study in developing areas of Travelers Rest and Marietta.
 - Portions of this watershed are incorporated into the Enoree River Basin Study. See above.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, Travelers Rest

PUBLIC EDUCATION & AWARENESS

- Enhanced GIS Database
 - Continue to update the County's GIS with hazard related data
 - The County GIS is updated on a 6 month basis or sooner if needed.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Geographic Information Services, Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Realtor Flood Hazard Education
 - Provide hazard data and training to local realtors
 - Information was mailed to the SC Realtors Association which reaches 3,000 members.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget FEMA Grant	On-going	Floods	Greenville County, All Municipalities

- Pre-Prepared Hazard Info Ads
 - Prepare ads for hazard preparation to be released immediately before and during natural disasters to provide for a timely response including information on the health and safety risks associated with floodwaters
 - Information Brochures on all HMP hazards have been developed. The materials are printed and ready for release as disasters occur.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	Public Service Ads County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Flood Signs
 - Develop signage denoting high flood risk areas and crossings
 - Signage is provided in known flood risk areas.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

- Enhance Hazards Education
 - Develop additional hazard education programs for County staff and the public, introducing Marty the Moose and educational literature
 - The County has a Facebook page and web site with hazard preparedness outreach via Marty the Mitigation Moose.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Early Warning System Evaluation
 - Review and evaluate the usage of an early warning system to alert the public about potential hazards.
 - Greenville County works alongside the National Weather Service and local news agencies.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Floodplain Administration, Engineering	County Budget Grants	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados, Wildfires, Drought, Hail	Greenville County, All Municipalities

- Social Media Public Communication
 - Leverage social media and cell phones by creating hashtags to keep the public engaged and informed.
 - Communicate emergency services available to the public on multiple platforms to reach a wider audience.
 - This information is provided through our emergency management division and supplemented with our website and Facebook page.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget	As budget becomes available	All Hazards	Greenville County, All Municipalities

- Emergency Public Communication
 - Determine the most efficient modes of communication for relaying emergency information to the public. This could vary depending on the population, so ensure vulnerable populations are able to be reached.
 - Include references to emergency management websites and social media in communications about hazards. For example, point the public to the EMD website for updates during a hurricane or a local police station Twitter that is providing continuous coverage of an emergency situation.
 - Work with other agencies and departments to create a protocol for communication. This protocol should be written down and developed into an SOP to ensure communication is consistent. Phone numbers used should be general in case of turnover in the department or agency.
 - Establish a protocol for media outlets during a hazardous event. For example, an agreement can be signed by the various media outlets, or a hotline can be established during emergencies for media outlets to contact for information.
 - This information is provided through our emergency management division and supplemented with our website and Facebook page.
 - Emergency Management manages the CodeRED Emergency notification system for the County with the ability to send out alerts via IPAW (integrated public alert and warning system).

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget Public Service Ads	As budget becomes available	All Hazards	Greenville County, All Municipalities

- Protection Education
 - Provide education for homeowners and business owners on how to properly prepare for hazardous conditions. This could include agencies to contact, websites to visit, and preventative measures the owner can perform such as boarding up windows.
 - Provide education for homeowners on stream maintenance responsibilities and the impact a poorly maintained stream could have on their property.
 - Both Floodplain Management and the Soil and Water Conservation District provide information at public meetings, trade events and outreach mailings.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Soil & Water Conservation District	County Budget	On-going As budget becomes available	Floods, Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

NATURAL RESOURCES PROTECTION

- Stream Crossing Debris Removal
 - The County owns and maintains over 1,800 miles of roadway. To the extent practical, provide for removal of debris build up in rivers and streams, especially at road crossings and in highly urbanized areas. This is part of the road maintenance program protocol. Greenville County also implements a beaver dam removal program.
 - This activity is provided by the engineering department as part of their road maintenance program.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Roads and Drainage	County Budget FEMA Grant	On-going	Floods	Greenville County

- Riparian Area Management Plans
 - Create focused riparian buffer protection plans to target specific issues related to flooding.
 - Identify properties that can be acquired by the county to restore and enhance current riparian areas.
 - Greenville County Planning Department is currently working on plans for several communities containing large areas of County owned floodplain properties.
 - County was awarded two grants for stream restoration projects.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development Floodplain Management Planning	County Budget	On-going	Floods	Greenville County

- Runoff Reduction
 - Enhance runoff reduction criteria by including creative practices such as Green Infrastructure and Low Impact Development.
 - The County's land development ordinance in conjunction with our comprehensive plan continues to evaluate our plans.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development	County Budget	On-going	Floods	Greenville County

EMERGENCY SERVICES

- Early Warning System Enhancement (See Evaluate Early Warning System)
 - Install flood hazard signage, warning lights, and gates on frequently flooded roadways as well as hazard signage for steep roads, frequently icy bridges, and other known hazards on the road.
 - Install warning systems to notify travelers of road blocks due to fallen trees, ice, and other hazardous conditions.
 - When an emergency is determined, the County's Emergency Management division in conjunction with our engineering department and local emergency services provide onsite warning/road closure notification.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Floodplain Management Engineering	County Budget FEMA Grant	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados	Greenville County

- Continue Improvements to Radio Communications
 - Radio communications are critical during disasters and the County currently operates multiple radio systems. Upgrade all radio systems to improve communications across divisions and agencies.
 - Funding has been provided and radio system has been upgraded.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Administration Emergency Management	County Budget Grant	On-going	All Hazards	Greenville County

- Communications Protocol
 - Review and continue to coordinate a communication protocol with the news media and to guide the media in disaster reporting
 - County Public Relations manager works with Emergency Management to provide information to the public prior to and during emergencies.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Public Information Officer	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Post-Disaster Review Meetings
 - DMC and emergency response agency post-disaster debriefings to discuss "lessons learned".
 - No declared emergencies during this reporting period.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement/Building Engineering	County Budget	As events occur	All Hazards	Greenville County, All Municipalities

- Evaluation of Emergency Routes
 - Review emergency routes and evacuation routes to ensure they are the safest, most appropriate routes
 - Ongoing evaluation through Emergency Management.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Services Emergency Management Engineering	County Budget	On-going	All Hazards	Greenville County

- Comprehensive Training
 - Provide appropriate level of emergency response training to all County staff.
 - Greenville County has 2 certified floodplain managers on staff and maintains their certification through webinars and conferences.
 - Emergency Management has 4 SC certified emergency managers on staff. Also has a dedicated training coordinator on staff.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Risk Management	County Budget FEMA Training Programs	As budget becomes available	All Hazards	Greenville County

- Coordinated Bridge De-Icing
 - Continue to coordinate with SCDOT to create a plan for de-icing bridges during winter weather conditions. Currently, “snow meetings” are held with the SCDOT in November and December to prepare for the snow season.
 - Ongoing activity. No issues/storm during this reporting period.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering SCDOT	County Budget SCDOT	On-going	Winter Storms, Hail	Greenville County

- Heating and Cooling
 - Continue to provide assistance to the Homeless Alliance and other Non-governmental organizations (NGOs) identifying vulnerable populations and creating plans to provide proper

heating and cooling for those populations. Engage with NGOs to find out what type of services they provide that could help with this task.

- If required, notification to the public will be notified where these services are provided.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement	County Budget Grants	As budget / grant become available	Winter Storms, Drought, Hail	Greenville County

- Backup Power
 - Identify critical places that may require backup power such as fueling stations, food sources, and vulnerable populations and, to the extent practical, work with NGOs and others to create a plan to provide this power in the event of an emergency. Critical County facilities already have emergency power plans in-place.
 - Evaluation of this activity will be addressed in the updated County Comprehensive/Resiliency plan. Updated plan currently in progress.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management	County Budget Grants	On-going	Winter Storms, High Winds/Tornados, Earthquakes, Hail	Greenville County, All Municipalities

PROPERTY PROTECTION

- Elevation Grant Program
 - Continue providing elevation grants to eligible County residents.
 - This plan is still active and available. Information can be found on Floodplain web page.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going	Floods	Greenville County

- Flood Mitigation Acquisition Program
 - Continue acquiring appropriate, eligible properties to reduce buildings at high risk of flooding.
 - County continues to fund and promote our floodplain buyout program. To date the county has removed 221 structures from the special flood hazard areas representing 140.53 acres.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going, as grants become available	Floods	Greenville County

- Identify/Mitigate Infrastructure
 - Identify infrastructure at risk through basin studies and mitigate as appropriate.
 - County currently has three active basin studies.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Floodplain Management	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

STRUCTURAL PROJECTS

- Critical Facility Retrofits/Relocations
 - Identify and evaluate critical facilities for risk and mitigate as appropriate.
 - No facilities have currently been identified.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Emergency Management Engineering	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County



Greenville County Multi-Jurisdictional Hazard Mitigation Plan

2021 ANNUAL UPDATE

Plan History

- Original Plan Date: 2005
 - Updates: 2010, 2015, 2020
- Approval Date:
 - FEMA approval: May 20, 2020
 - Greenville County Resolution: June 16, 2020
- Expiration Date: May 2025
- Plan Participants
 - Greenville County
 - Cities
 - Fountain Inn
 - Greenville
 - Greer
 - Mauldin
 - Simpsonville
 - Travelers Rest



Disaster Mitigation Committee Membership

- Organizations and Agencies
 - Greenville County
 - City of Greenville
 - City of Greer
 - City of Travelers Rest
 - City of Simpsonville
 - City of Fountain Inn
 - City of Mauldin
 - NOAA
 - USDA
 - Furman University
 - ReWA
 - Greenville Redevelopment Authority
 - Upstate Forever
 - Home Builders Association
 - Prisma Health
 - Greengate Community Initiative
 - Colonial Pipeline Company
 - Woolpert, Inc.

Organization / Agency	Participating Member	Member's Title	Contact Information
Greenville County	Brian Bishop	Floodplain Administrator	jbishop@greenvillecounty.org
	Patty Wright	Principal Engineering Technician	pwright@greenvillecounty.org
	Don Shuman	Parks Director	dshuman@greenvillecounty.org
	Hunter Crumley	Civil Engineer	hcrumley@greenvillecounty.org
	Tyler Stone	Planning Manager	astone@greenvillecounty.org
	Bob Mihalic	Governmental Affairs Coordinator	bmihalic@greenvillecounty.org
	Wade Shealy	Director of School Safety and Emergency Preparedness	wshealy@greenville.k12.sc.us
	Jessica Stumpf	Deputy Director of Emergency Management	jstumpf@greenvillecounty.org
	Jay Maret	Director of Emergency Management	jmarett@greenvillecounty.org
City of Greenville	Paul Dow	Assistant City Engineer	pdow@greenvillesc.gov
City of Greer	Dorian Flowers	Fire Chief	dflowers@cityofgreer.org
City of Travelers Rest	Eric Vinson	City Administrator	eric@travelersrestsc.com
City of Simpsonville	Dianna Gracely	City Administrator	dianna@simpsonville.com
City of Fountain Inn	Shawn Bell	City Administrator	shawn.bell@fountaininn.org
City of Mauldin	Bill Stewart	Fire Chief	bthornton@mauldincitysc.com
	Bryan Thornton	Streets Supervisor	bstewart@mauldinfire.com
NOAA	Brian Campbell	Regional Maintenance Specialist	Brian.Campbell@noaa.gov
USDA	Lynne Newton	Supervisory District Conservationist	Lynne.Newton@sc.usda.gov
Furman University	Geoffrey Habron	Professor of Sustainability Sciences	Geoffrey.Habron@furman.edu
ReWa	Gabrielle Soled		gabrielles@re-wa.org
	Glen McManus	Director of Business Continuity Services	glenm@re-wa.org
Greenville County Redevelopment Authority	Briney Bischof	Associate Community Development Planner	bbischof@gcra-sc.org
Upstate Forever	Drew Brittain	Land Conservation Specialist	dbrittain@upstateforever.org
Home Builders Association	Michael Dey	Chief Executive Officer	mdey@hbaofgreenville.com
Prisma Health	Jordan Bradway	Senior Program Manager	Jordan.Bradway@prismahealth.org
Greengate Community Initiative	Meg Coffey		megcoffey@yahoo.com
Colonial Pipeline Company	Brandon Grooms	Senior Right-of-Way Inspector	
Woolpert, Inc.	Hal Clarkson	Program Director	Hal.Clarkson@woolpert.com

Hazards of Concern

- Flooding
- Winter Storms/Ice Events
- High Winds/Tornados
- Wildfires
- Earthquakes
- Drought
- Mudslides
- Sinkholes
- Hail
- Climate Change

Hazard	Probability of Occurrence	Area of Impact	Consequence of Occurrence				Risk Rating
			Health & Safety	Property	Environment	Economic	
Flood	4	1	1	1	1	2	24
Winter Storms	5	4	1	1	0	2	40
High Winds/Tornados	5	1	1	1	0	1	20
Wildfires	2	1	1	2	2	1	14
Earthquakes	1	4	1	1	0	1	7
Drought	3	3	1	0	1	1	18
Landslides	1	1	1	1	0	0	3
Sinkholes	1	1	1	1	0	0	3
Hail	4	1	1	1	1	1	20

Table 7-2: Risk Estimation



Plan Update Process



1. Update status of identified mitigation initiatives
 1. Implementation
 2. Appropriateness
 3. Funding
 4. Priority ranking
2. Identify and rank new initiatives

Global Mitigation Strategies





TIME FOR REVIEW

Communications Protocol

Review and continue to coordinate a communication protocol with the news media and to guide to media in disaster reporting.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Public Information Officer	County Budget	On-going	All Hazards	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going Verify with Emergency Preparedness.	26	1	Yes

Social Media Public Communication

Leverage social media and cell phones by creating hashtags to keep the public engaged and informed.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget	As budget becomes available	Floods	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
Not started Verify with Emergency Preparedness. Consider wider use of QR codes.	24	2 T2	No

Post-Disaster Review Meetings

DMC and emergency response agency post-disaster debriefings to discuss “lessons learned.”

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Codes Enforcement/Building, Engineering	County Budget	As events occur	All Hazards	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going Need to refine definition of which storm, meet after declared disasters and at Floodplain Managers’ discretion after other storms.	24	2 T2	Yes

Protection Education

Provide education for homeowners and business owners on how to prepare for hazardous conditions.

Provide education for homeowners on stream maintenance responsibilities and the impact a poorly maintained stream could have on their property.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Management, Soil & Water Conservation District	County Budget	On-going, As budget becomes available	Floods, Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going	23	3 T2	Yes

Comprehensive Training

Provide appropriate level of emergency response training to all County staff.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Risk Management	County Budget, FEMA Training Programs	As budget becomes available	All Hazards	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going Damage Assessment training recently completed for Codes Enforcement and Floodplain Management staff.	23	3 T2	Yes

Pre-Prepared Hazard Info Ads

Prepare ads for hazard preparation to be released immediately before and during natural disasters to provide for a timely response including information on the health and safety risks associated with floodwaters.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	Public Service Ads, County Budget	On-going	All Hazards	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going Verify with Emergency Preparedness. The County Floodplain Management Program provides information via a Facebook page and Website “What would Marty do.com”.	22.5	4	Yes

Coordinated Bridge De-Icing

Continue to coordinate with SCDOT to create a plan for de-icing bridges during winter weather conditions. Currently, “snow meetings” are held with the SCDOT in November and December to prepare for the snow season.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering SCDOT	County Budget, SCDOT	On-going	Winter Storms, Hail	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going	22	5	Yes

Enhance Hazards Education

Develop additional hazard education programs for County staff and the public, introducing Marty the Moose and educational literature.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going	21	6 T2	Yes

Realtor Flood Hazard Education

Provide hazard data and training to local realtors.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget, FEMA Grant	On-going	Floods	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going The County sends contact information and resources to the Realtors Association annually to include in their newsletter	21	6 T2	Yes

Emergency Public Communication

Determine the most efficient modes of communication for relaying emergency information to the public.
Include references to emergency management websites and social media in communications about hazards.
Work with other agencies and departments to create a protocol for communication.
Establish a protocol for media outlets during a hazardous event.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget, Public Service Ads	As budget becomes available	All Hazards	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
Not started Verify with Emergency Preparedness	20.5	7 T2	No

Early Warning System Evaluation

Review and evaluate the usage of an early warning system to alert the public about potential hazards.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Floodplain Administration, Engineering	County Budget, Grants	As budget / grant become available	All Hazards	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
Not started	20.5	7 T2	No

Identify/Mitigate Infrastructure

Identify infrastructure at risk through basin studies and mitigate as appropriate.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering, Floodplain Management	County Budget, FEMA Grant	As budget / grant become available	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
Not started Dependent upon basin studies.	20	8 T4	No

Evaluation of Emergency Routes

Review emergency routes and evacuation routes to ensure they are the safest, most appropriate routes.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Services, Emergency Management, Engineering	County Budget	On-going	All Hazards	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going Verify with Emergency Preparedness.	20	8 T4	Yes

Stream Crossing Debris Removal

The County owns and maintains over 1,800 miles of roadway. To the extent practical, provide for removal of debris build up in rivers and streams, especially at road crossings and in highly urbanized areas. This is part of the road maintenance program protocol. Greenville County also implements a beaver dam removal program.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering, Roads and Drainage	County Budget, FEMA Grant	On-going	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going	20	8 T4	Yes

Repetitive Loss Area Plan

A Repetitive Area Loss Analysis was completed by the County per the Community Rating System (CRS) requirements. As a Result, the Insurance Services Office (ISO) requires a repetitive loss plan. The County has created and is implementing the plan as required.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
Completed County is down from 53 RL structures to 14 RL structures over the last 6 years. Plan is complete, implementation is on-going.	20	8 T4	Yes

Runoff Reduction

Enhance runoff reduction criteria by including creative practices such as Green Infrastructure and Low Impact Development.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Land Development	County Budget	On-going	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going Verify with Land Development. Check on new homeowner guidance for LID practices.	19	9 T2	Yes

Paris Mountain Wildfire Mitigation Plan

A Hazard Mitigation Grant application has been submitted to FEMA for development of a plan for the Paris Mountain area.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	FEMA HMGP, County Budget	Prepare upon award of grant application	Wildfires, Drought, Climate Change	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going	19	9 T2	Yes

Early Warning System Enhancement

Install flood hazard signage, warning lights, and gates on frequently flooded roadways as well as hazard signage for steep roads, frequently icy bridges, and other known hazards on the road.

Install warning systems to notify travelers of road blocks due to hazardous conditions.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Floodplain Management, Engineering	County Budget, FEMA Grant	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados	Greenville County

Status	Prioritization Score	Ranking	Funded?
Not started	18.5	10 T3	No

Proactive Maintenance of Stormwater Infrastructure

Maintain piped infrastructure, ditches, culverts, bridges, and Best Management Practices before hazardous conditions occur.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering	County Budget	On-going, more detailed analysis of localized flooding to be prepared as budget becomes available	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going Verify with Roads and Drainage.	18.5	10 T3	No

Riparian Area Management Plans

Create focused riparian buffer protection plans to target specific issues related to flooding.
Identify properties that can be acquired by the county to restore and enhance current riparian areas.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Land Development, Floodplain Management, Planning	County Budget	On-going	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going Verify with Land Development. Check on how to tie flooding issues with water quality standards (e.g. buffers, homeowner low impact development (LID) guidance, stream restoration, etc.)	18.5	10 T3	Yes

Elevation Grant Program

Continue providing elevation grants to eligible County residents.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Management	County Budget, FEMA HMGP	On-going	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going	18	11	Yes

Underground Electricity Plan

Coordinate with utility companies to place powerlines underground to prevent hazards and outages associated with falling lines due to weather conditions.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering, Land Development	County Budget	On-going	Winter Storms, High Winds/Tornadoes, Earthquakes	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
Not started Assign someone to call / check-in with Duke Energy.	17.5	12	Yes

Flood Mitigation Acquisition Program

Continue acquiring appropriate, eligible properties to reduce buildings at high risk of flooding.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Management	County Budget, FEMA HMGP	On-going, as grants become available	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going. Finished last \$1.5M home acquisitions (11 structures) and applied for BRIC \$1.5M and FMA \$0.8M funding for an additional acquisition of 8 homes.	17	13 T2	Yes

Critical Facility Retrofits/Relocations

Identify and evaluate critical facilities for risk and mitigate as appropriate.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered	
Floodplain Management, Emergency Management, Engineering	County Budget, FEMA Grant	As budget / grant become available	Floods	Greenville County	
Status			Prioritization Score	Ranking	Funded?
Not started			17	13 T2	No

Update Existing Watershed Studies

Determine new levels of service for each road crossing.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
Not started	16	14 T4	No

Enoree River Basin Study

Prepare a watershed master plan for the Enoree River Basin identifying potential flooding problems and solutions.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
Not started The County is monitoring stage and flow at Aiken Chappell Road in preparation of study.	16	14 T4	No

Travelers Rest and Marietta Area Watershed Study

- Prepare a watershed study in developing areas of Travelers Rest and Marietta.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, Travelers Rest

Status	Prioritization Score	Ranking	Funded?
Not started Consider stage and flow monitoring in the watershed.	16	14 T4	No

Flood Signs

Develop signage denoting high flood risk areas and crossings.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget, FEMA Grant	As budget / grant become available	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
Not started Consider new technology for signage, gates, etc.	16	14 T4	No

Enhanced GIS Database

Continue to update the County's GIS with hazard-related data.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Geographic Information Services, Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going	15.5	15	Yes

Backup Power

Identify critical places that may require backup power such as fueling stations, food sources, and vulnerable populations and, to the extent practical, work with NGOs and others to create a plan to provide this power in the event of an emergency. Critical County facilities already have emergency power plans in-place.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget, Grants	On-going	Winter Storms, High Winds/Tornados, Earthquakes, Hail	Greenville County, All Municipalities

Status	Prioritization Score	Ranking	Funded?
On-going	14	16	Yes

Continue Improvements to Radio Communications

Radio communications are critical during disasters and the County currently operates multiple radio systems. Upgrade all radio systems to improve communications across divisions and agencies.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Administration, Emergency Management	County Budget, Grant	On-going	All Hazards	Greenville County

Status	Prioritization Score	Ranking	Funded?
On-going	13.5	17	Yes

Heating and Cooling

Continue to provide assistance to the Homeless Alliance and other Non-governmental organizations (NGOs) identifying vulnerable populations and creating plans to provide proper heating and cooling for those populations. Engage with NGOs to find out what type of services they provide that could help with this task.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Codes Enforcement	County Budget, Grants	As budget / grant become available	Winter Storms, Drought, Hail	Greenville County

Status	Prioritization Score	Ranking	Funded?
Not started	13	18	No

Bridge / Culvert Analysis

Replace and upgrade stream crossings to improve channel flow characteristics as needed.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration, Engineering	County Budget	Each crossing is analyzed during the basin study process and programmed for upgrade in subsequent budget	Floods	Greenville County

Status	Prioritization Score	Ranking	Funded?
Not started Bridges and Culverts needs an analysis and project prioritization. Consider moving up mitigation prioritization.	11.5	19	No

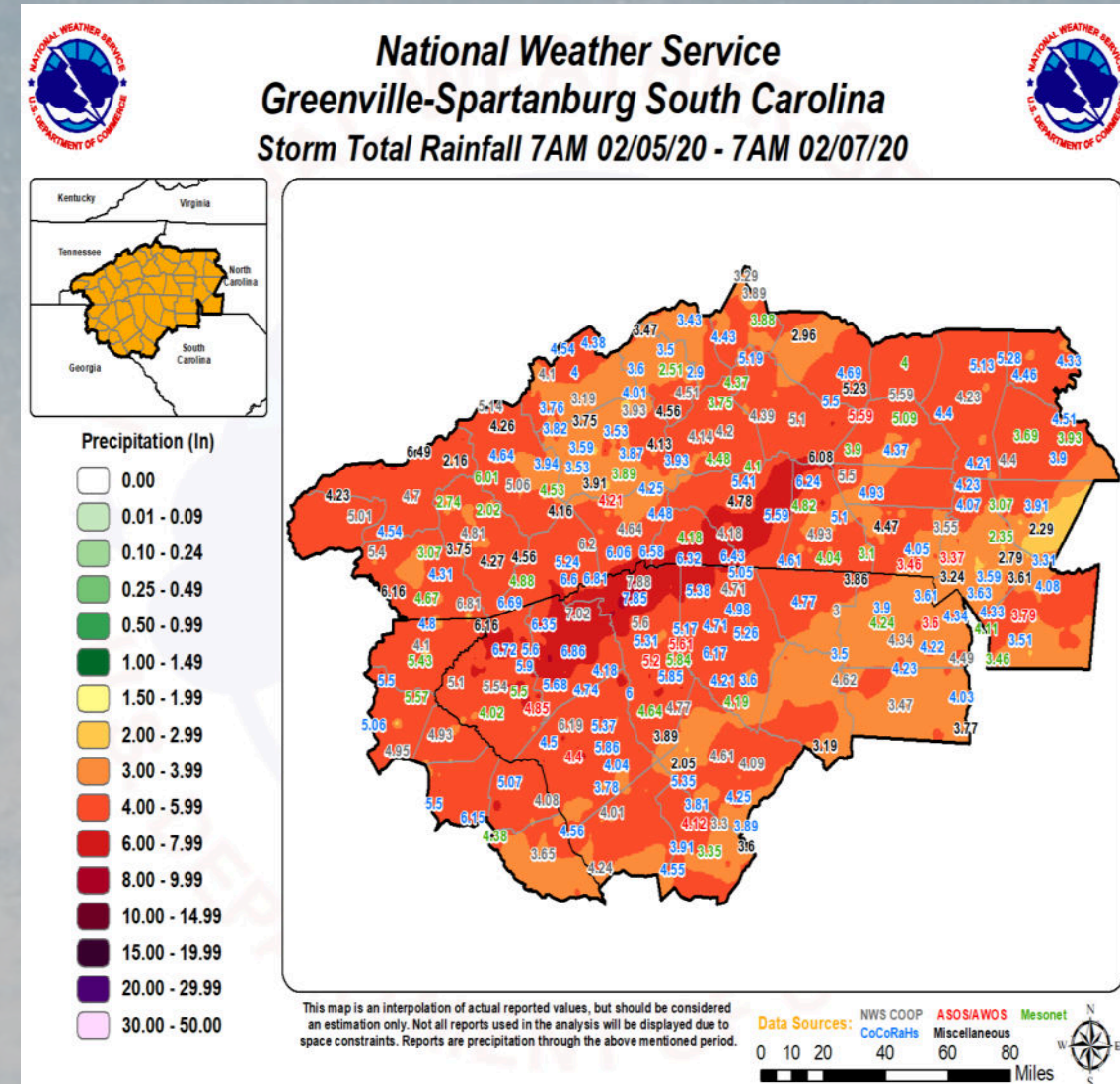
Discussion of Existing Mitigation Initiatives



Events Since July 2020

February 2020 – Flash floods countywide

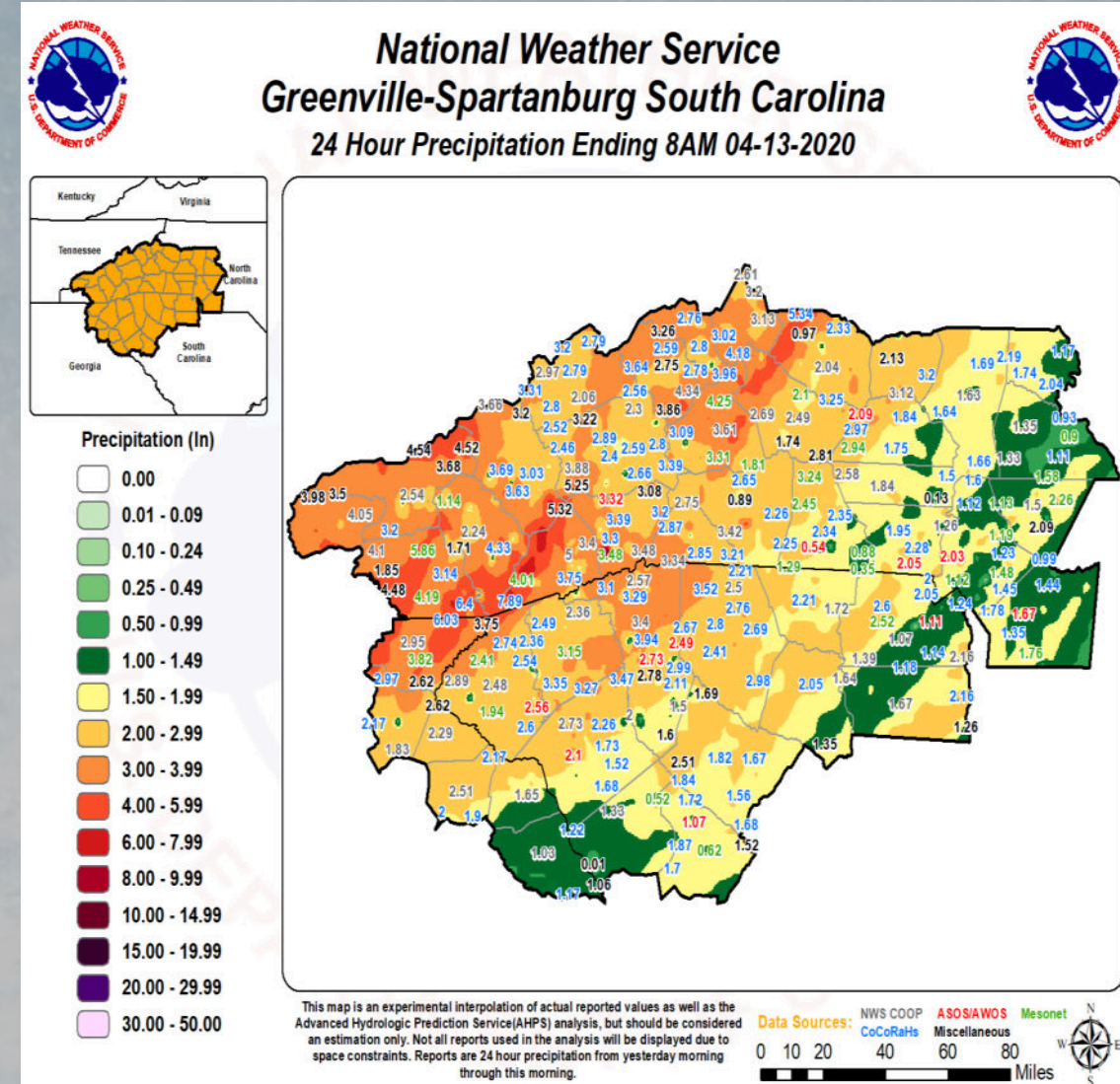
- Flash flood emergency issued for City of Greenville
- National Weather Service issued Tornado Watch warning for all SC counties
- Power lines and trees downed, flooding, structural damage due to heavy rain and strong winds
- Flooding caused multiple road failures, but initial results indicate that there was little, if any, damage to residential or commercial buildings.
- Up to 8 inches of rain recorded
 - Wettest single day in over 24 years



Events Since July 2020

April 2020 – Severe storms due to cold front from Tennessee Valley

- Flash floods, tornados, and strong winds in the week leading up
- Power lines and trees downed, saturated soils
- Up to 4 inches of rain recorded, average rainfall in April is usually 2.77 inches
 - 28.67 inches since January 1, 2020



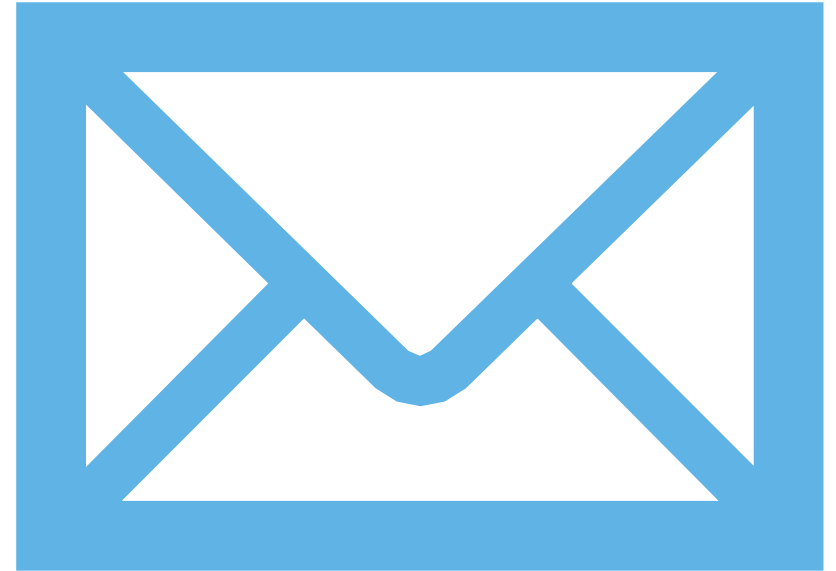
Contact Information

Brian Bishop – Greenville County

Address: 301 University Ridge, Suite 4100
Greenville, SC 29601

Phone number: 864 - 467 - 7004

Email: jbishop@greenvillecounty.org



Scoring Criteria

Priority Criterion	Numeric Score
Strategy Effectiveness	
No affect on risk or hazard	0
Affects several structures within the County	1
Affects many structures within the County	2
Affects most structures within the County	3
Percentage of Population Benefited	
Less than 10% benefited	0
10% to 50% benefited	1
51% to 75% benefited	2
Greater than 75% benefited	3
Time to Implement	
Cannot be implemented	0
Long term	1
Within one year	2
Immediate	3

Priority Criterion	Numeric Score
Time to Impact	
Cannot be implemented	0
Long term	1
Within one year	2
Immediate	3
Cost to County	
Completely unaffordable	0
Expensive	1
Inexpensive	2
Little to no cost	3
Funding Source	
No known funding source available	0
Requires outside funding	1
Requires budget consideration	2
Within existing county budget	3

Priority Criterion	Numeric Score
Cost to Others	
Cost to others is unacceptable	0
Expensive, but manageable	1
Cost is easily managed by others	2
No cost to others	3
Community Support	
Opposed by the entire community	0
Some community opposition	1
Acceptable only to those affected by the project	2
Acceptable community-wide	3
Project Feasibility	
Not possible	0
Accomplished with extensive design and planning	1
Accomplished with some design and planning	2
Easily accomplished	3



Office of the Floodplain Administrator

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

MEMO

Date: June 2022

To: Mr. Joseph M. Kernell, County Administrator
County Council
Mr. Tee Coker, Assistant Administrator - Community Planning & Development

Subject: Re: Greenville County Flood Hazard Mitigation Plan Annual Progress Update

Greenville County participates in the Community Rating System (CRS) of the National Flood Insurance Program. This program commitment enhances public safety and property protection while providing our flood insurance policyholders with a premium discount. The County Flood Hazard Mitigation Plan is incorporated into the Multi-Jurisdictional Hazard Mitigation Plan (Plan) adopted by County Council on June 16, 2020. This Flood Hazard Mitigation Plan Update is an annual review that is transmitted to the local governing body; the State Flood Mitigation Program Administrator; and, the general public in accordance with CRS program requirements. The Plan and the activities summary update are available in the Floodplain Administrator's Office for public review and on the County's Floodplain Web page. This annual report is designed to document and evaluate progress toward implementing the flood hazard mitigation objectives of the Plan. The hazard mitigation committee met on multiple occasions and a copy of the status of each mitigation initiative is attached.

Additionally the floodplain management department completed their annual repetitive loss area analysis of insured structures that has had at least two paid flood losses of more than \$1000 each in any ten year period since 1978. After our review, the county currently has 13 repetitive loss structures. A total of 91 notices were sent out which included the 13 repetitive loss properties and surrounding property owners with similar flooding risk. A copy of the letter is attached.

Greenville County staff is committed to achieving the flood hazard mitigation goals outlined in our Plan. We appreciate the support of Council, County Administration and our Disaster Mitigation Committee members as we work together to make Greenville County a more disaster resistant community.

Copy: South Carolina Department of Natural Resources, Flood Mitigation Programs
Mr. Bob Mihalic, Governmental Affairs Coordinator

h:\floodplain\haz mit general \2022 progress report\memo

1 Prioritized Mitigation Initiatives Update 2022

1.1 Introduction

Development of mitigation initiatives began with a review of initiatives contained in previous HMPs. Any initiative that was on the current list, but that had not begun implementation remained in consideration for the 2020 HMP. The DMC was also provided an opportunity to discuss potential mitigation measures with their sponsoring organization and submit those initiatives either in writing, at DMC meeting #2, or again at meeting #3.

1.2 Project Descriptions

The following projects were identified by the committee as potential mitigation initiatives and were scored according to the process defined in Section Error! Reference source not found.. All of the "Responsible Party" designations below refer to Greenville County Departments or Divisions, unless otherwise stated.

PREVENTION

- Bridge/Culvert Analysis
 - Replace and upgrade stream crossings to improve channel flow characteristics as needed.
 - Total of 7 Bridge/Culvert replacements for 2021/2022. These were completed on Phillips Lane, Jenkins Bridge Rd, Craigo Rd, McKittrich Bridge Rd Ext, Oliver Scotts Mill Rd and Jenkins Bridge Rd.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration, Engineering	County Budget	Each crossing is analyzed during the basin study process and programmed for upgrade in subsequent budget	Floods	Greenville County

- Proactive Maintenance of Stormwater Infrastructure
 - Maintain piped infrastructure, ditches, culverts, bridges, and Best Management Practices before hazardous conditions occur.
 - Ongoing for 2022 (limited flooding during this reporting period).

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering	County Budget	On-going, more detailed analysis of localized flooding to be prepared as budget becomes available	Floods	Greenville County

- Grant was applied for this project 2022.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County

- Travelers Rest and Marietta Area Watershed Study
 - Prepare a watershed study in developing areas of Travelers Rest and Marietta.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, Travelers Rest

PUBLIC EDUCATION & AWARENESS

- Enhanced GIS Database
 - Continue to update the County's GIS with hazard related data
 - Ongoing activity

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Geographic Information Services, Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Realtor Flood Hazard Education
 - Provide hazard data and training to local realtors
 - Information was mailed to Realtors Association with 3,000 members.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget FEMA Grant	On-going	Floods	Greenville County, All Municipalities

- Pre-Prepared Hazard Info Ads
 - Prepare ads for hazard preparation to be released immediately before and during natural disasters to provide for a timely response including information on the health and safety risks associated with floodwaters
 - Information Brochures have been developed for each hazard.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	Public Service Ads County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Emergency Public Communication
 - Determine the most efficient modes of communication for relaying emergency information to the public. This could vary depending on the population, so ensure vulnerable populations are able to be reached.
 - Include references to emergency management websites and social media in communications about hazards. For example, point the public to the EMD website for updates during a hurricane or a local police station Twitter that is providing continuous coverage of an emergency situation.
 - Work with other agencies and departments to create a protocol for communication. This protocol should be written down and developed into an SOP to ensure communication is consistent. Phone numbers used should be general in case of turnover in the department or agency.
 - Establish a protocol for media outlets during a hazardous event. For example, an agreement can be signed by the various media outlets, or a hotline can be established during emergencies for media outlets to contact for information.
 - Ongoing Activity

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget Public Service Ads	As budget becomes available	All Hazards	Greenville County, All Municipalities

- Protection Education
 - Provide education for homeowners and business owners on how to properly prepare for hazardous conditions. This could include agencies to contact, websites to visit, and preventative measures the owner can perform such as boarding up windows.
 - Provide education for homeowners on stream maintenance responsibilities and the impact a poorly maintained stream could have on their property.
 - Letters were provided to Realtors, Lending Institutions and Repetitive Loss properties. Brochures are also displayed in building permitting office, Land Disturbance Division and Offices of Cities located in Greenville County.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Soil & Water Conservation District	County Budget	On-going As budget becomes available	Floods, Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

NATURAL RESOURCES PROTECTION

- Stream Crossing Debris Removal
 - The County owns and maintains over 1,800 miles of roadway. To the extent practical, provide for removal of debris build up in rivers and streams, especially at road crossings and in highly urbanized areas. This is part of the road maintenance program protocol. Greenville County also implements a beaver dam removal program.
 - This activity is ongoing

- Radio communications are critical during disasters and the County currently operates multiple radio systems. Upgrade all radio systems to improve communications across divisions and agencies.
- Ongoing Activity

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Administration Emergency Management	County Budget Grant	On-going	All Hazards	Greenville County

- Communications Protocol
 - Review and continue to coordinate a communication protocol with the news media and to guide the media in disaster reporting
 - County Public Relations manager works with Emergency Management to provide information prior to and during emergencies.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Public Information Officer	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Post-Disaster Review Meetings
 - DMC and emergency response agency post-disaster debriefings to discuss “lessons learned”.
 - No declared emergencies during the period

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement/Building Engineering	County Budget	As events occur	All Hazards	Greenville County, All Municipalities

- Evaluation of Emergency Routes
 - Review emergency routes and evacuation routes to ensure they are the safest, most appropriate routes
 - Ongoing evaluation through Emergency Management

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Services Emergency Management Engineering	County Budget	On-going	All Hazards	Greenville County

PROPERTY PROTECTION

- Elevation Grant Program
 - Continue providing elevation grants to eligible County residents.
 - This program is still active and available

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going	Floods	Greenville County

- Flood Mitigation Acquisition Program
 - Continue acquiring appropriate, eligible properties to reduce buildings at high risk of flooding.
 - County continues to fund and promote our floodplain buyout program. Four homes were purchased 2021/2022.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going, as grants become available	Floods	Greenville County

- Identify/Mitigate Infrastructure
 - Identify infrastructure at risk through basin studies and mitigate as appropriate.
 - Ongoing

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Floodplain Management	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

STRUCTURAL PROJECTS

- Critical Facility Retrofits/Relocations
 - Identify and evaluate critical facilities for risk and mitigate as appropriate.
 - Ongoing

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Emergency Management Engineering	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County



Office of the Floodplain Administrator

Brian Bishop
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

May 2022

To: Repetitive Loss Area Property Owners

Re: **Repetitive Loss Areas and Floodplain Management Information**
National Flood Insurance Program (NFIP)

Dear Sir or Madam:

You are receiving this letter because you own and/or reside in a home located in an area that is subject to flooding. In fact, one or more properties located in your area have experienced "repetitive losses" due to flooding. Repetitive loss properties are those properties for which two or more claims of more than \$1,000 have been paid by the NFIP within any 10-year period since 1978. Although repetitive loss properties represent only 1% of all the NFIP's insurance policies, they have accounted for nearly one-third of the claim payments.

Greenville County is concerned about repetitive flooding and has an ongoing program to address problem flooding areas. However, there are things that each property owner can do to protect themselves from damage caused by flooding events. The enclosed Brochure provides information on flooding issues and floodplain management such as:

Local Flood Hazards
County Flood Services
Flood Warnings
Property Protection Measures
Flood Safety

Permit Requirements
Flood Insurance
Natural and Beneficial Functions
Drainage System Maintenance

Greenville County also has a program to assist residents whose structures are located in floodplain areas and/or have experienced structural flood damage. The Residential Elevation Grant Program will provide up to \$7,500 to elevate flood prone homes which meet eligibility requirements. For more information on this program please visit our web site at www.greenvillecounty.org/floodplainadministration. Information related to flood insurance can be found at www.floodsmart.gov.

Please contact our office if you have questions regarding the enclosed information or floodplain management issues.

Sincerely,

Brian Bishop, P.E., CFM
Floodplain Administrator
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1 Prioritized Mitigation Initiatives Update 2022

1.1 Introduction

Development of mitigation initiatives began with a review of initiatives contained in previous HMPs. Any initiative that was on the current list, but that had not begun implementation remained in consideration for the 2020 HMP. The DMC was also provided an opportunity to discuss potential mitigation measures with their sponsoring organization and submit those initiatives either in writing, at DMC meeting #2, or again at meeting #3.

1.2 Project Descriptions

The following projects were identified by the committee as potential mitigation initiatives and were scored according to the process defined in Section **Error! Reference source not found.** All of the "Responsible Party" designations below refer to Greenville County Departments or Divisions, unless otherwise stated.

PREVENTION

- Bridge/Culvert Analysis
 - Replace and upgrade stream crossings to improve channel flow characteristics as needed.
 - Total of 7 Bridge/Culvert replacements for 2021/2022. These were completed on Phillips Lane, Jenkins Bridge Rd, Craigo Rd, McKittrich Bridge Rd Ext, Oliver Scotts Mill Rd and Jenkins Bridge Rd.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration, Engineering	County Budget	Each crossing is analyzed during the basin study process and programmed for upgrade in subsequent budget	Floods	Greenville County

- Proactive Maintenance of Stormwater Infrastructure
 - Maintain piped infrastructure, ditches, culverts, bridges, and Best Management Practices before hazardous conditions occur.
 - Ongoing for 2022 (limited flooding during this reporting period).

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering	County Budget	On-going, more detailed analysis of localized flooding to be prepared as budget becomes available	Floods	Greenville County

- Underground Electricity Plan
 - Coordinate with utility companies to place powerlines underground to prevent hazards and outages associated with falling lines due to weather conditions.
 - This practice is being promoted

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Engineering, Land Development	County Budget	On-going	Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

- Paris Mountain Wildfire Mitigation Plan
 - A Hazard Mitigation Grant application has been submitted to FEMA for development of a plan for the Paris Mountain area.
 - The plan has been completed and adopted by the Committee. Copy can be found on County Floodplain Web site.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	FEMA HMGP County Budget	Completed	Wildfires, Drought, Climate Change	Greenville County

- Repetitive Loss Area Plan
 - A Repetitive Area Loss Analysis was completed by the County per the Community Rating System (CRS) requirements. As a result, the Insurance Services Office (ISO) requires a repetitive loss plan. The County has created and is implementing the plan as required.
 - Update was provided in 2022 Memo to Council.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	Floods	Greenville County

- Update Existing Watershed Studies
 - Determine new levels of service for each road crossing.
 - This will be Focus for 2022/2023 budget year. Currently obtaining proposals

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, All Municipalities

- Enoree River Basin Study
 - Prepare a watershed master plan for the Enoree River basin identifying potential flooding problems and solutions.

- Grant was applied for this project 2022.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County

- Travelers Rest and Marietta Area Watershed Study
 - Prepare a watershed study in developing areas of Travelers Rest and Marietta.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	As budget becomes available	Floods	Greenville County, Travelers Rest

PUBLIC EDUCATION & AWARENESS

- Enhanced GIS Database
 - Continue to update the County's GIS with hazard related data
 - Ongoing activity

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Geographic Information Services, Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Realtor Flood Hazard Education
 - Provide hazard data and training to local realtors
 - Information was mailed to Realtors Association with 3,000 members.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget FEMA Grant	On-going	Floods	Greenville County, All Municipalities

- Pre-Prepared Hazard Info Ads
 - Prepare ads for hazard preparation to be released immediately before and during natural disasters to provide for a timely response including information on the health and safety risks associated with floodwaters
 - Information Brochures have been developed for each hazard.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	Public Service Ads County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Flood Signs
 - Develop signage denoting high flood risk areas and crossings
 - Continue to maintain Signage.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

- Enhance Hazards Education
 - Develop additional hazard education programs for County staff and the public, introducing Marty the Moose and educational literature
 - Developed web site WWW.whatwouldmartydo.com – Provide updates on Facebook.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Floodplain Administration	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Early Warning System Evaluation
 - Review and evaluate the usage of an early warning system to alert the public about potential hazards.
 - Promoting Code Red for early warning notices.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management, Floodplain Administration, Engineering	County Budget Grants	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados, Wildfires, Drought, Hail	Greenville County, All Municipalities

- Social Media Public Communication
 - Leverage social media and cell phones by creating hashtags to keep the public engaged and informed.
 - Communicate emergency services available to the public on multiple platforms to reach a wider audience.
 - Utilizing web site, Facebook and county floodplain site.

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget	As budget becomes available	All Hazards	Greenville County, All Municipalities

- Emergency Public Communication
 - Determine the most efficient modes of communication for relaying emergency information to the public. This could vary depending on the population, so ensure vulnerable populations are able to be reached.
 - Include references to emergency management websites and social media in communications about hazards. For example, point the public to the EMD website for updates during a hurricane or a local police station Twitter that is providing continuous coverage of an emergency situation.
 - Work with other agencies and departments to create a protocol for communication. This protocol should be written down and developed into an SOP to ensure communication is consistent. Phone numbers used should be general in case of turnover in the department or agency.
 - Establish a protocol for media outlets during a hazardous event. For example, an agreement can be signed by the various media outlets, or a hotline can be established during emergencies for media outlets to contact for information.
 - Ongoing Activity

Responsible Party	Funding Source(s)	Timeline	Hazard Addressed	Jurisdictions Covered
Emergency Management	County Budget Public Service Ads	As budget becomes available	All Hazards	Greenville County, All Municipalities

- Protection Education
 - Provide education for homeowners and business owners on how to properly prepare for hazardous conditions. This could include agencies to contact, websites to visit, and preventative measures the owner can perform such as boarding up windows.
 - Provide education for homeowners on stream maintenance responsibilities and the impact a poorly maintained stream could have on their property.
 - Letters were provided to Realtors, Lending Institutions and Repetitive Loss properties. Brochures are also displayed in building permitting office, Land Disturbance Division and Offices of Cities located in Greenville County.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Soil & Water Conservation District	County Budget	On-going As budget becomes available	Floods, Winter Storms, High Winds/Tornados, Earthquakes	Greenville County, All Municipalities

NATURAL RESOURCES PROTECTION

- Stream Crossing Debris Removal
 - The County owns and maintains over 1,800 miles of roadway. To the extent practical, provide for removal of debris build up in rivers and streams, especially at road crossings and in highly urbanized areas. This is part of the road maintenance program protocol. Greenville County also implements a beaver dam removal program.
 - This activity is ongoing

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Roads and Drainage	County Budget FEMA Grant	On-going	Floods	Greenville County

- Riparian Area Management Plans
 - Create focused riparian buffer protection plans to target specific issues related to flooding.
 - Identify properties that can be acquired by the county to restore and enhance current riparian areas.
 - County is currently working with the planning department, Clemson Extension, Soil and Water and Land Development to evaluate existing floodplain properties to enhance these areas.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development Floodplain Management Planning	County Budget	On-going	Floods	Greenville County

- Runoff Reduction
 - Enhance runoff reduction criteria by including creative practices such as Green Infrastructure and Low Impact Development.
 - Land Development and Zoning continues to promote this practice.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Land Development	County Budget	On-going	Floods	Greenville County

EMERGENCY SERVICES

- Early Warning System Enhancement (See Evaluate Early Warning System)
 - Install flood hazard signage, warning lights, and gates on frequently flooded roadways as well as hazard signage for steep roads, frequently icy bridges, and other known hazards on the road.
 - Install warning systems to notify travelers of road blocks due to fallen trees, ice, and other hazardous conditions.
 - Hazard signage are maintained and emergency management implements notice during weather events

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Floodplain Management Engineering	County Budget FEMA Grant	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados	Greenville County

- Continue Improvements to Radio Communications

- Radio communications are critical during disasters and the County currently operates multiple radio systems. Upgrade all radio systems to improve communications across divisions and agencies.
- The County has adopted the Interoperable Communications Plan and is in the final phase of implementation. Currently all of the County communications, particularly first response and emergency management are on the PAL-800 system.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Administration Emergency Management	County Budget Grant	Completed	All Hazards	Greenville County

- Communications Protocol
 - Review and continue to coordinate a communication protocol with the news media and to guide the media in disaster reporting
 - County Public Relations manager works with Emergency Management to provide information prior to and during emergencies.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Public Information Officer	County Budget	On-going	All Hazards	Greenville County, All Municipalities

- Post-Disaster Review Meetings
 - DMC and emergency response agency post-disaster debriefings to discuss “lessons learned”.
 - No declared emergencies during the period

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement/Building Engineering	County Budget	As events occur	All Hazards	Greenville County, All Municipalities

- Evaluation of Emergency Routes
 - Review emergency routes and evacuation routes to ensure they are the safest, most appropriate routes
 - Ongoing evaluation through Emergency Management

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Services Emergency Management Engineering	County Budget	On-going	All Hazards	Greenville County

- Comprehensive Training
 - Provide appropriate level of emergency response training to all County staff.
 - **Mock Damage Assessment Field Activity was conducted during this period.**

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Risk Management	County Budget FEMA Training Programs	As budget becomes available	All Hazards	Greenville County

- Coordinated Bridge De-Icing
 - Continue to coordinate with SCDOT to create a plan for de-icing bridges during winter weather conditions. Currently, “snow meetings” are held with the SCDOT in November and December to prepare for the snow season.
 - **Ongoing Activity**

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering SCDOT	County Budget SCDOT	On-going	Winter Storms, Hail	Greenville County

- Heating and Cooling
 - Continue to provide assistance to the Homeless Alliance and other Non-governmental organizations (NGOs) identifying vulnerable populations and creating plans to provide proper heating and cooling for those populations. Engage with NGOs to find out what type of services they provide that could help with this task.
 - **Continue to Evaluate this Activity**

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement	County Budget Grants	As budget / grant become available	Winter Storms, Drought, Hail	Greenville County

- Backup Power
 - Identify critical places that may require backup power such as fueling stations, food sources, and vulnerable populations and, to the extent practical, work with NGOs and others to create a plan to provide this power in the event of an emergency. Critical County facilities already have emergency power plans in-place.
 - **Continue to Evaluate this Activity**

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Emergency Management	County Budget Grants	On-going	Winter Storms, High Winds/Tornados, Earthquakes, Hail	Greenville County, All Municipalities

PROPERTY PROTECTION

- Elevation Grant Program
 - Continue providing elevation grants to eligible County residents.
 - This program is still active and available

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going	Floods	Greenville County

- Flood Mitigation Acquisition Program
 - Continue acquiring appropriate, eligible properties to reduce buildings at high risk of flooding.
 - County continues to fund and promote our floodplain buyout program. Four homes were purchased 2021/2022.

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management	County Budget FEMA HMGP	On-going, as grants become available	Floods	Greenville County

- Identify/Mitigate Infrastructure
 - Identify infrastructure at risk through basin studies and mitigate as appropriate.
 - Ongoing

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Engineering Floodplain Management	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

STRUCTURAL PROJECTS

- Critical Facility Retrofits/Relocations
 - Identify and evaluate critical facilities for risk and mitigate as appropriate.
 - Ongoing

Responsible Party	Funding Source(s)	Timeline	Hazards Addressed	Jurisdictions Covered
Floodplain Management Emergency Management Engineering	County Budget FEMA Grant	As budget / grant become available	Floods	Greenville County

Appendix E – Repetitive Loss Information



Office of the Floodplain Administrator

Brian Bishop
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

April 2024

To: Repetitive Loss Area Property Owners

**Re: Repetitive Loss Areas and Floodplain Management Information
National Flood Insurance Program (NFIP)**

Dear Sir or Madam:

You are receiving this letter because you own and/or reside in a home located in an area that is subject to flooding. In fact, one or more properties located in your area have experienced "repetitive losses" due to flooding. Repetitive loss properties are those properties for which two or more claims of more than \$1,000 have been paid by the NFIP within any 10-year period since 1978. Although repetitive loss properties represent only 1% of all the NFIP's insurance policies, they have accounted for nearly one-third of the claim payments.

Greenville County is concerned about repetitive flooding and has an ongoing program to address problem flooding areas. However, there are things that each property owner can do to protect themselves from damage caused by flooding events. The enclosed Brochure provides information on flooding issues and floodplain management such as:

Local Flood Hazards
County Flood Services
Flood Warnings
Property Protection Measures
Flood Safety

Permit Requirements
Flood Insurance
Natural and Beneficial Functions
Drainage System Maintenance

Greenville County also has a program to assist residents whose structures are located in floodplain areas and/or have experienced structural flood damage. The Residential Elevation Grant Program will provide up to \$7,500 to elevate flood prone homes which meet eligibility requirements. For more information on this program please visit our web site at www.greenvillecounty.org/floodplainadministration. Information related to flood insurance can be found at www.floodsmart.gov.

Please contact our office if you have questions regarding the enclosed information or floodplain management issues.

Sincerely,

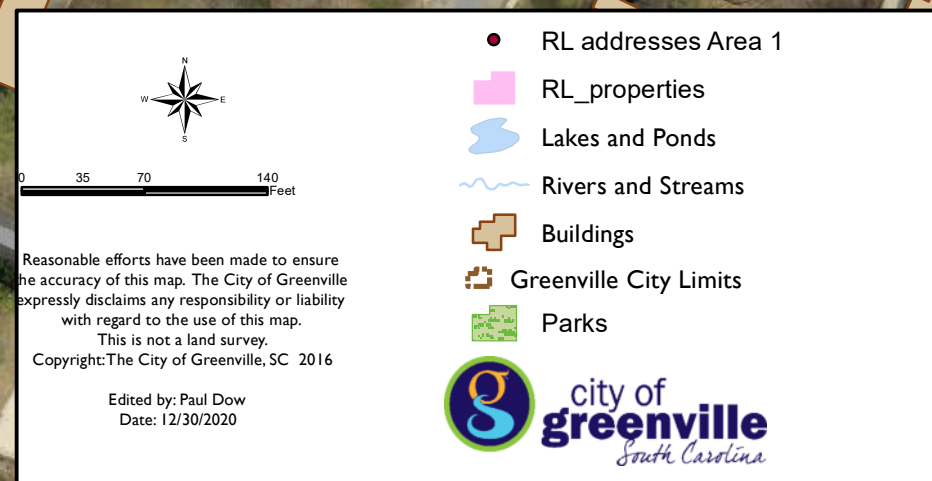
Brian Bishop, P.E., CFM
Floodplain Administrator

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City of Greenville Repetitive Loss Info

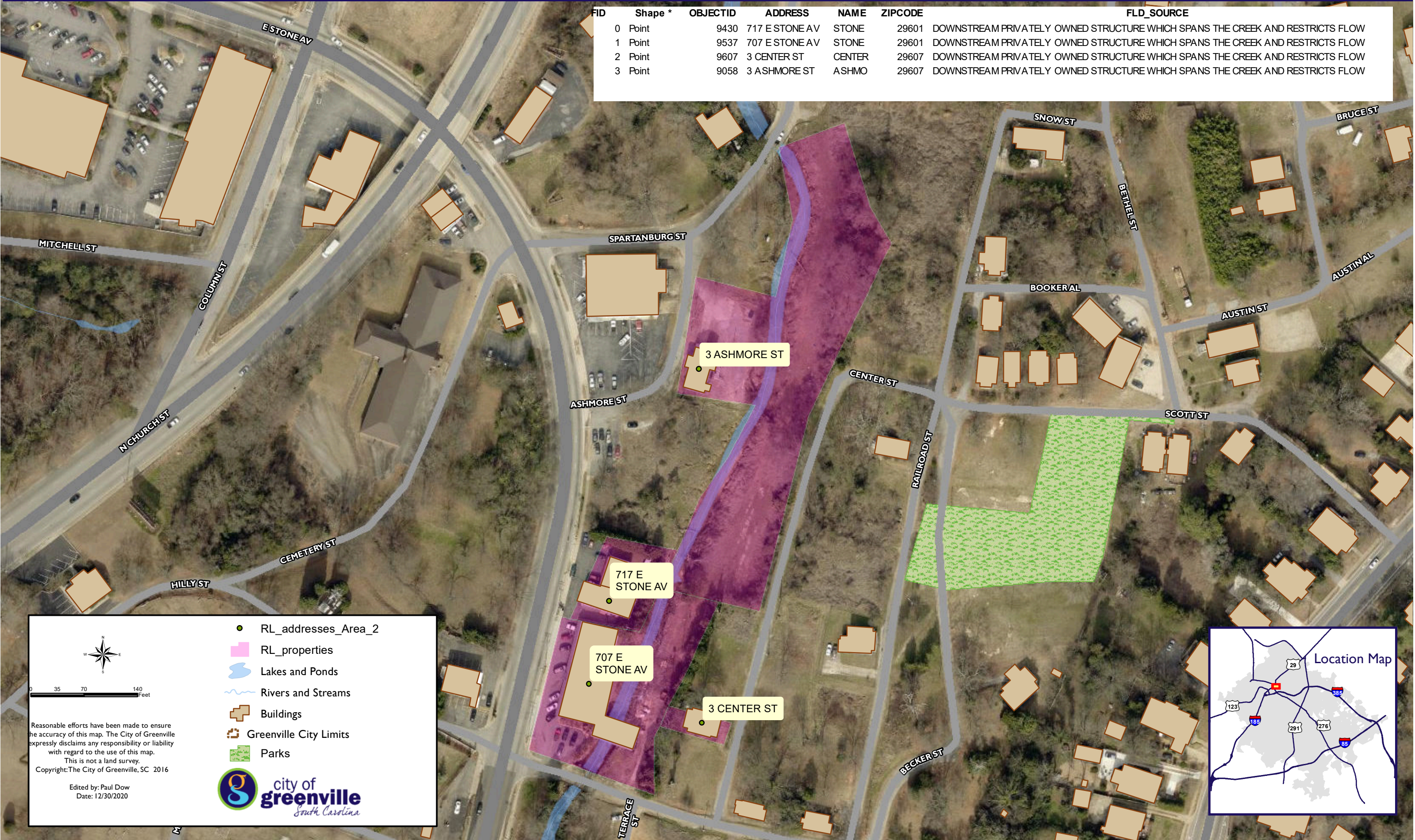
Repetitive Loss Area I

FID	Shape *	OBJECTID	ADDRESS	NAME	ZIPCODE	FLD_SOURCE
0	Point	2359	425 MOHAWK DR	MOHAWK	29609	UNDERSIZED CULVERT - CULVERT REPLACED IN 2010
	Point	2289	211 CHICK SPRINGS RD	CHICK SPRINGS	29609	UNDERSIZED CULVERT - CULVERT REPLACED IN 2010
	Point	2152	420 MOHAWK DR	MOHAWK	29609	UNDERSIZED CULVERT - CULVERT REPLACED IN 2010
	Point	2330	209 CHICK SPRINGS RD	CHICK SPRINGS	29609	UNDERSIZED CULVERT - CULVERT REPLACED IN 2010
	Point	2564	215 E MONTCLAIR AV	MONTCLAIR	29609	UNDERSIZED CULVERT - CULVERT REPLACED IN 2010
	Point	2669	413 MOHAWK DR	MOHAWK	29609	UNDERSIZED CULVERT - CULVERT REPLACED IN 2010
	Point	2120	200 SUMMIT DR	SUMMIT	29609	UNDERSIZED CULVERT - CULVERT REPLACED IN 2010



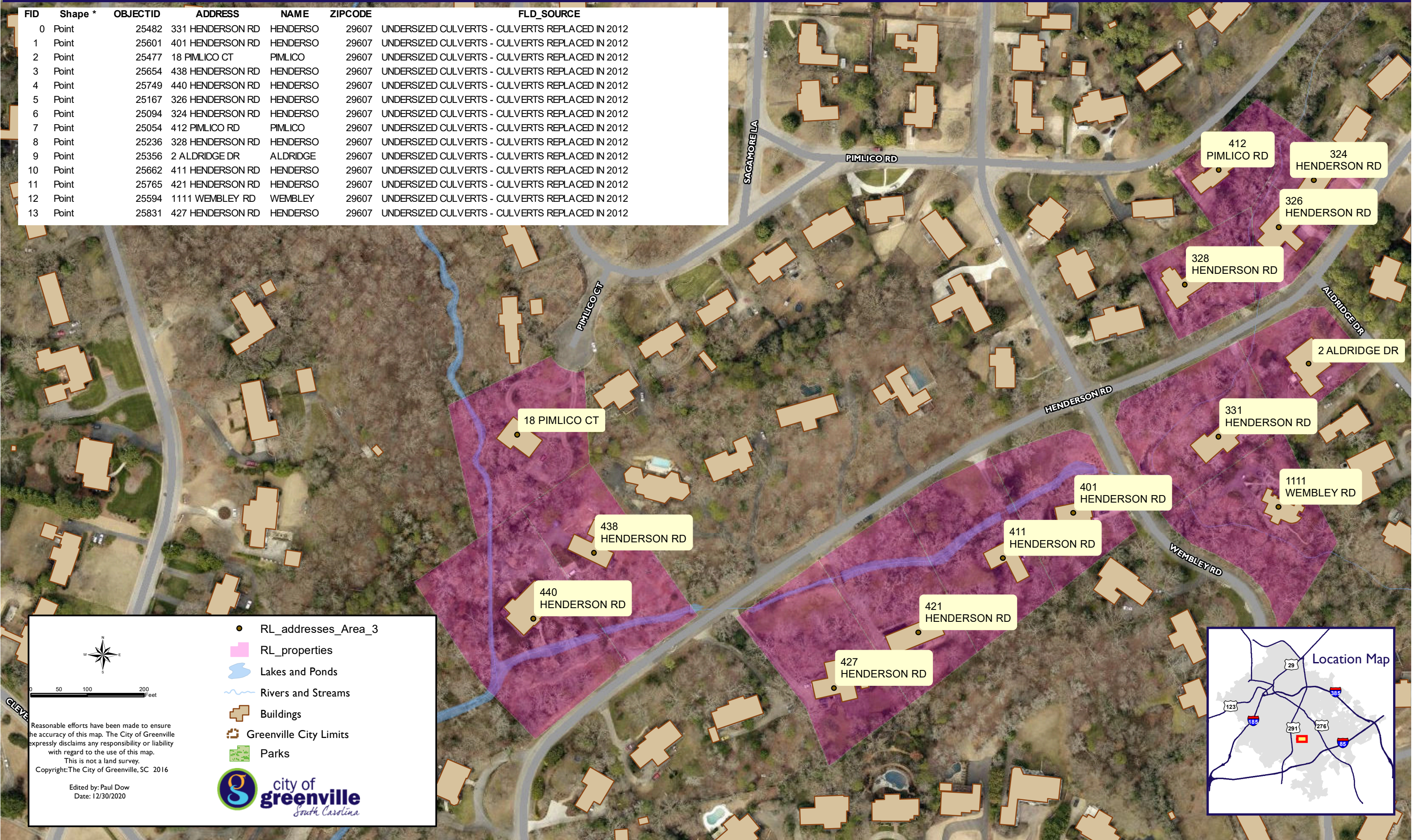
Repetitive Loss Area 2

FID	Shape *	OBJECTID	ADDRESS	NAME	ZIPCODE	FLD_SOURCE
0	Point	9430	717 E STONE AV	STONE	29601	DOWNSTREAM PRIVATELY OWNED STRUCTURE WHICH SPANS THE CREEK AND RESTRICTS FLOW
1	Point	9537	707 E STONE AV	STONE	29601	DOWNSTREAM PRIVATELY OWNED STRUCTURE WHICH SPANS THE CREEK AND RESTRICTS FLOW
2	Point	9607	3 CENTER ST	CENTER	29607	DOWNSTREAM PRIVATELY OWNED STRUCTURE WHICH SPANS THE CREEK AND RESTRICTS FLOW
3	Point	9058	3 ASHMORE ST	ASHMO	29607	DOWNSTREAM PRIVATELY OWNED STRUCTURE WHICH SPANS THE CREEK AND RESTRICTS FLOW



Repetitive Loss Area 3

FID	Shape *	OBJECTID	ADDRESS	NAME	ZIPCODE	FLD_SOURCE
0	Point	25482	331 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
1	Point	25601	401 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
2	Point	25477	18 PIMLICO CT	PIMLICO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
3	Point	25654	438 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
4	Point	25749	440 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
5	Point	25167	326 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
6	Point	25094	324 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
7	Point	25054	412 PIMLICO RD	PIMLICO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
8	Point	25236	328 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
9	Point	25356	2 ALDRIDGE DR	ALDRIDGE	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
10	Point	25662	411 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
11	Point	25765	421 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
12	Point	25594	1111 WEMBLEY RD	WEMBLEY	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012
13	Point	25831	427 HENDERSON RD	HENDERSO	29607	UNDERSIZED CULVERTS - CULVERTS REPLACED IN 2012



Appendix F – Participating Communities MOUs and HMPs

City of Greenville

**Office of the Floodplain Administrator**

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

February 13, 2024

Dear Shannon Lavrin:

Greenville County is in the process of updating its 2020 Multi-jurisdictional Hazard Mitigation Plan. This update will also include requisites from the South Carolina Planning Enabling Act of 1994 requiring a resiliency element with a community's comprehensive plan. Participation in the planning process and adoption of the plan will help ensure your community is eligible for certain federal disaster assistance grants, will meet certain requirements of the Planning Enabling Act, and may provide additional points in the flood insurance programs Community Rating System (CRS), lowering flood insurance premiums for your residents.

The *City of Greenville* has been a participant in this plan in the past. Greenville County has provided this service to participating communities at free of charge to the community. Your community is invited to again participate in this plan update; "2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan" (HMRP). This Memo of Understanding (MOU) also serves as notification of the County's resiliency planning process and your request to participate and comment on the plan.

To be a participant, the County is requesting that the *City of Greenville* acknowledge its responsibilities as a participating community by agreeing to the following.

The *City of Greenville* will:

1. Provide one person to serve as a Disaster Mitigation Committee (DMC) member.
2. The appointed DMC member agrees to participate fully in the planning process and to provide a substitute to meetings should he / she not be able to attend DMC meetings (approximately three, two-hour meetings).
3. Provide the County's consultant with data related to recent disasters, community demographics, current disaster mitigation and resiliency planning, and other pertinent information, as requested.
4. Provide the County with any additional mitigation actions the community would like to include in the plan. Note that FEMA / CRS requires participating communities to adopt mitigation actions specific to their community. This may require additional planning effort by each community.
5. Additionally, the community recognizes that adoption of the final HMRP by the community's council is a requisite to receiving the full benefits of the plan.

Greenville County will:

1. Provide timely notice of DMC and Public meetings to the community contact.
2. Provide copies of the final HMRP to the community for use and adoption.

Please acknowledge receipt and acceptance of this agreement by signing and providing the community contact information below.

Community Contact:

Name: Shannon Lavrin

Phone: 8644673861

Email: slavrin@greenvillesc.gov

Address: 206 S Main St., Greenville, SC 29601

Authorized Signature:

Name: Shannon Lavrin

Title: City Manager

DocuSigned by:
Shannon Lavrin
B6D12FA1F89A405...

City of Fountain Inn



Office of the Floodplain Administrator

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

February 13, 2024

Dear Shawn Bell:

Greenville County is in the process of updating its 2020 Multi-jurisdictional Hazard Mitigation Plan. This update will also include requisites from the South Carolina Planning Enabling Act of 1994 requiring a resiliency element with a community's comprehensive plan. Participation in the planning process and adoption of the plan will help ensure your community is eligible for certain federal disaster assistance grants, will meet certain requirements of the Planning Enabling Act, and may provide additional points in the flood insurance programs Community Rating System (CRS), lowering flood insurance premiums for your residents.

The *City of Fountain Inn* has been a participant in this plan in the past. Greenville County has provided this service to participating communities at free of charge to the community. Your community is invited to again participate in this plan update; "2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan" (HMRP). This Memo of Understanding (MOU) also serves as notification of the County's resiliency planning process and your request to participate and comment on the plan.

To be a participant, the County is requesting that the *City of Fountain Inn* acknowledge its responsibilities as a participating community by agreeing to the following.

The *City of Fountain Inn* will:

1. Provide one person to serve as a Disaster Mitigation Committee (DMC) member.
2. The appointed DMC member agrees to participate fully in the planning process and to provide a substitute to meetings should he / she not be able to attend DMC meetings (approximately three, two-hour meetings).
3. Provide the County's consultant with data related to recent disasters, community demographics, current disaster mitigation and resiliency planning, and other pertinent information, as requested.
4. Provide the County with any additional mitigation actions the community would like to include in the plan. Note that FEMA / CRS requires participating communities to adopt mitigation actions specific to their community. This may require additional planning effort by each community.
5. Additionally, the community recognizes that adoption of the final HMRP by the community's council is a requisite to receiving the full benefits of the plan.

Greenville County will:

1. Provide timely notice of DMC and Public meetings to the community contact.
2. Provide copies of the final HMRP to the community for use and adoption.

Please acknowledge receipt and acceptance of this agreement by signing and providing the community contact information below.

Community Contact:

Name: Shawn M. Bell

Phone: 864-423-2506

Email: shawn.bell@fountaininn.org

Address: 200 N. Main Street
Fountain Inn, SC 29644

Authorized Signature:

Name: Shawn M. Bell

Title: City Administrator

City of Greer



Office of the Floodplain Administrator

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

February 13, 2024

Dear Andy Merriman:

Greenville County is in the process of updating its 2020 Multi-jurisdictional Hazard Mitigation Plan. This update will also include requisites from the South Carolina Planning Enabling Act of 1994 requiring a resiliency element with a community's comprehensive plan. Participation in the planning process and adoption of the plan will help ensure your community is eligible for certain federal disaster assistance grants, will meet certain requirements of the Planning Enabling Act, and may provide additional points in the flood insurance programs Community Rating System (CRS), lowering flood insurance premiums for your residents.

The *City of Greer* has been a participant in this plan in the past. Greenville County has provided this service to participating communities at free of charge to the community. Your community is invited to again participate in this plan update; "2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan" (HMRP). This Memo of Understanding (MOU) also serves as notification of the County's resiliency planning process and your request to participate and comment on the plan.

To be a participant, the County is requesting that the *City of Greer* acknowledge its responsibilities as a participating community by agreeing to the following.

The *City of Greer* will:

1. Provide one person to serve as a Disaster Mitigation Committee (DMC) member.
2. The appointed DMC member agrees to participate fully in the planning process and to provide a substitute to meetings should he / she not be able to attend DMC meetings (approximately three, two-hour meetings).
3. Provide the County's consultant with data related to recent disasters, community demographics, current disaster mitigation and resiliency planning, and other pertinent information, as requested.
4. Provide the County with any additional mitigation actions the community would like to include in the plan. Note that FEMA / CRS requires participating communities to adopt mitigation actions specific to their community. This may require additional planning effort by each community.
5. Additionally, the community recognizes that adoption of the final HMRP by the community's council is a requisite to receiving the full benefits of the plan.

Greenville County will:

1. Provide timely notice of DMC and Public meetings to the community contact.
2. Provide copies of the final HMRP to the community for use and adoption.

Please acknowledge receipt and acceptance of this agreement by signing and providing the community contact information below.

Community Contact:

Name: Keith A. Choate

Phone: (864) 848-5386

Email: Kchoate@cityofgreer.org

Address: 301 E. Poinsett Greer, SC 29651

Authorized Signature:

Name: 

Title: City Administrator

City of Mauldin



Office of the Floodplain Administrator

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

February 13, 2024

Dear Seth Duncan:

Greenville County is in the process of updating its 2020 Multi-jurisdictional Hazard Mitigation Plan. This update will also include requisites from the South Carolina Planning Enabling Act of 1994 requiring a resiliency element with a community's comprehensive plan. Participation in the planning process and adoption of the plan will help ensure your community is eligible for certain federal disaster assistance grants, will meet certain requirements of the Planning Enabling Act, and may provide additional points in the flood insurance programs Community Rating System (CRS), lowering flood insurance premiums for your residents.

The *City of Mauldin* has been a participant in this plan in the past. Greenville County has provided this service to participating communities at free of charge to the community. Your community is invited to again participate in this plan update; "2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan" (HMRP). This Memo of Understanding (MOU) also serves as notification of the County's resiliency planning process and your request to participate and comment on the plan.

To be a participant, the County is requesting that the *City of Mauldin* acknowledge its responsibilities as a participating community by agreeing to the following.

The *City of Mauldin* will:

1. Provide one person to serve as a Disaster Mitigation Committee (DMC) member.
2. The appointed DMC member agrees to participate fully in the planning process and to provide a substitute to meetings should he / she not be able to attend DMC meetings (approximately three, two-hour meetings).
3. Provide the County's consultant with data related to recent disasters, community demographics, current disaster mitigation and resiliency planning, and other pertinent information, as requested.
4. Provide the County with any additional mitigation actions the community would like to include in the plan. Note that FEMA / CRS requires participating communities to adopt mitigation actions specific to their community. This may require additional planning effort by each community.
5. Additionally, the community recognizes that adoption of the final HMRP by the community's council is a requisite to receiving the full benefits of the plan.

Greenville County will:

1. Provide timely notice of DMC and Public meetings to the community contact.
2. Provide copies of the final HMRP to the community for use and adoption.

Please acknowledge receipt and acceptance of this agreement by signing and providing the community contact information below.

Community Contact:

Name: Brian McHone

Phone: 864-200-5803

Email: bmchone@mauldinfire.com

Address: 5 E. Butler Road, Mauldin, SC 29662

Authorized Signature:

Name: 

Title: City Administrator

City of Simpsonville



Office of the Floodplain Administrator

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

February 13, 2024

Dear Dianna Gracely:

Greenville County is in the process of updating its 2020 Multi-jurisdictional Hazard Mitigation Plan. This update will also include requisites from the South Carolina Planning Enabling Act of 1994 requiring a resiliency element with a community's comprehensive plan. Participation in the planning process and adoption of the plan will help ensure your community is eligible for certain federal disaster assistance grants, will meet certain requirements of the Planning Enabling Act, and may provide additional points in the flood insurance programs Community Rating System (CRS), lowering flood insurance premiums for your residents.

The *City of Simpsonville* has been a participant in this plan in the past. Greenville County has provided this service to participating communities at free of charge to the community. Your community is invited to again participate in this plan update; "2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan" (HMRP). This Memo of Understanding (MOU) also serves as notification of the County's resiliency planning process and your request to participate and comment on the plan.

To be a participant, the County is requesting that the *City of Simpsonville* acknowledge its responsibilities as a participating community by agreeing to the following.

The *City of Simpsonville* will:

1. Provide one person to serve as a Disaster Mitigation Committee (DMC) member.
2. The appointed DMC member agrees to participate fully in the planning process and to provide a substitute to meetings should he / she not be able to attend DMC meetings (approximately three, two-hour meetings).
3. Provide the County's consultant with data related to recent disasters, community demographics, current disaster mitigation and resiliency planning, and other pertinent information, as requested.
4. Provide the County with any additional mitigation actions the community would like to include in the plan. Note that FEMA / CRS requires participating communities to adopt mitigation actions specific to their community. This may require additional planning effort by each community.
5. Additionally, the community recognizes that adoption of the final HMRP by the community's council is a requisite to receiving the full benefits of the plan.

Greenville County will:

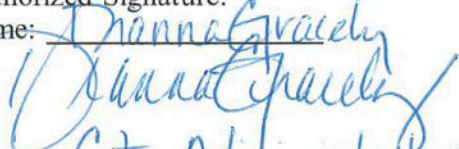
1. Provide timely notice of DMC and Public meetings to the community contact.
2. Provide copies of the final HMRP to the community for use and adoption.

Please acknowledge receipt and acceptance of this agreement by signing and providing the community contact information below.

Community Contact:

Name: Jon Derby
Phone: (864) 967-9526
Email: jderby@simpsonville.com
Address: 118 NE Main St
Simpsonville, SC 29681

Authorized Signature:

Name: Diana Grady

Title: City Administrator

City of Travelers Rest



Office of the Floodplain Administrator

Brian Bishop, PE, CFM
Floodplain Administrator
jbishop@greenvillecounty.org
(864) 467-7523
www.greenvillecounty.org

February 13, 2024

Dear Shannon Herman:

Greenville County is in the process of updating its 2020 Multi-jurisdictional Hazard Mitigation Plan. This update will also include requisites from the South Carolina Planning Enabling Act of 1994 requiring a resiliency element with a community's comprehensive plan. Participation in the planning process and adoption of the plan will help ensure your community is eligible for certain federal disaster assistance grants, will meet certain requirements of the Planning Enabling Act, and may provide additional points in the flood insurance programs Community Rating System (CRS), lowering flood insurance premiums for your residents.

The *City of Travelers Rest* has been a participant in this plan in the past. Greenville County has provided this service to participating communities at free of charge to the community. Your community is invited to again participate in this plan update; "2025 Greenville County Multi-Jurisdictional Hazard Mitigation and Resiliency Plan" (HMRP). This Memo of Understanding (MOU) also serves as notification of the County's resiliency planning process and your request to participate and comment on the plan.

To be a participant, the County is requesting that the *City of Travelers Rest* acknowledge its responsibilities as a participating community by agreeing to the following.

The *City of Travelers Rest* will:

1. Provide one person to serve as a Disaster Mitigation Committee (DMC) member.
2. The appointed DMC member agrees to participate fully in the planning process and to provide a substitute to meetings should he / she not be able to attend DMC meetings (approximately three, two-hour meetings).
3. Provide the County's consultant with data related to recent disasters, community demographics, current disaster mitigation and resiliency planning, and other pertinent information, as requested.
4. Provide the County with any additional mitigation actions the community would like to include in the plan. Note that FEMA / CRS requires participating communities to adopt mitigation actions specific to their community. This may require additional planning effort by each community.
5. Additionally, the community recognizes that adoption of the final HMRP by the community's council is a requisite to receiving the full benefits of the plan.

Greenville County will:

1. Provide timely notice of DMC and Public meetings to the community contact.
2. Provide copies of the final HMRP to the community for use and adoption.

Please acknowledge receipt and acceptance of this agreement by signing and providing the community contact information below.

Community Contact:

Name: Shannon Herman

Phone: 864.834.8740

Email: ShannonC@travelersrestsc.com

Address: 125 Trailblazer Dr.
Travelers Rest SC 29690

Authorized Signature:

Name: [Signature]

Title: City Administrator

City of Greenville

Energy

Power is supplied predominantly by one energy company, Duke Power. Critical government facilities maintain backup power sources. Some portions of the City are supplied with underground power lines reducing the potential for localized outages. Ensuring continuous supply of power was a concern of the DMC.

Communications

Paris Mountain, just outside of the City is where many communication facilities are located. Greenville County recently completed the Paris Mountain Wildfire Mitigation Plan, which in part, was developed to protect those communication facilities. The City maintains an adequate radio network to maintain communications through City services. The Emergency Operations Plan contains a communications section.

Transportation

Interstate 85 is the single Interstate running through the southern portion of the City. The South Carolina Department of Transportation (SCDOT) is responsible for the majority of the road system serving the City. The City and SCDOT have a cooperative agreement for maintaining clear roads during ice and flood events.

Hazardous Materials

Hazardous material disasters are beyond the scope of this plan, however, the City of Greenville Emergency Services are trained and equipped to deal with local hazardous material spills. In addition, SCDES is also on-call to assist with hazardous material spill response. Finally, all City facilities storing or using hazardous materials have developed and maintain Spill Response Plans.

7.6 Community Capabilities

This section of the plan contains a description and review of the capabilities of the City to prepare for and respond to natural hazards. The review includes four capability types defined by FEMA: 1) Planning and Regulatory, 2) Administrative and Technical, 3) Financial, and 4) Education and Outreach. This analysis intends to identify any weaknesses in these areas where mitigation of the weakness may provide for a more resilient community.

7.6.1 Planning and Regulatory

Planning and regulatory capabilities are plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards.

Plans and Policies

One of the methods to more effectively implement the City of Greenville Multi-Hazard Mitigation Plan is to develop initiatives that can be incorporated into other community plans, policies, and programs. By including personnel from a variety of departments in the hazard mitigation planning process, concepts derived from the planning process will be spread throughout City departments such as public works, floodplain management, GIS, and planning/zoning. The following programs, plans, and policies provide the programmatic framework for a more resilient City.

Comprehensive land use plan (GVL 2040)

GVL 2040 is the City's comprehensive land use plan. This plan does not yet contain a resiliency element, however, State law will require this plan to incorporate resiliency into the overall plan. Currently, the plan does contain a Natural Resources Element that considers, among other things, floodplains and wetlands. Additionally, GVL 2040 was a source of data for this Hazard Mitigation Plan and coordination of the two planning efforts has been considered in the mitigation actions.

Climate Change Adaptation Plan

The City does not have a Climate Adaptation Plan, however, climate change is a significant part of this plan. In particular, increasing rainfall intensities and frequencies play an important role in the City's future drainage and floodplain management activities and are considered in this plan.

Emergency Operations Plan

The City of Greenville maintains an Emergency Operations Plan (EOP) to be used for emergency preparedness, operations, and recovery. This plan has been developed utilizing an all-hazards approach and is designed to integrate with Greenville County, the State of South Carolina, and Federal Emergency Management Agency plans. In addition to the natural hazards contained in the Hazard Mitigation Plan, the Emergency Operations Plan also addresses man-made disasters including hazardous materials incidents, conflagration, nuclear power plant incidents, major transportation incidents, acts of terrorism, use of weapons of mass destruction, and civil disorder. The EOP contains a list of mitigation activities and action items relevant to the plan's mission. Mitigation is categorized by preparedness, response, and recovery activities.

Streambank Buffer Protection Program

To protect the natural function of floodplains, the City requires that buffer zones be provided on commercial properties and subdivisions along streams and creeks. City Ordinance Article 19-7.7.4 requires buffers along all Waters of the United States or streams classified as Waters of the State. Buffers may include linear or water body buffers. Buffer widths vary depending on the water body and type of development.

Other Plans and Policies

- The City is a member in good standing with the NFIP. Its rating with the Community Rating System (CRS) is currently Class 5.
- The City is a regulated community under the National Pollutant Discharge Elimination System Program (NPDES) Stormwater Program and as such, maintains an active Stormwater Management Plan. Additionally, the City recently created Stormwater 2.0, a plan that directs and guides the City's stormwater program and hydrologic and hydraulic modeling efforts.
- Since 2000, the City of Greenville has received approximately \$1.8 million from the US Environmental Protection Agency (EPA) brownfield grants. The latest grant was awarded to the City in 2014 in the amount of \$400,000 to fund assessments and outreach for a three-year period. The City has completed this grant and was awarded an assessment grant for the 2018 - 2021 funding cycle for \$300,000.

- Because an efficient transportation system is a critical component of Greenville’s future, the City, in partnership with the Greenville-Pickens Area Transportation Study, is developing a Downtown Transportation Master Plan to identify strategies that will improve mobility, traffic circulation and safety. The master plan will incorporate alternate modes of transportation and will include both a short-term plan for improvements that can be made within two to five years and a long-term plan for the safe and efficient movement of traffic over the next 10 years and beyond.
- The City of Greenville has created an Economic Development Strategic Plan, identifying key opportunities for partnerships and recommending strategies to foster balanced growth. The plan identifies key target clusters for Greenville including Automotive, Production Technology, Advanced Materials and Life Sciences. It encourages City leaders to cultivate existing Foreign Direct Investment, enhance collaboration with nearby colleges and universities to attract talent and create a clear workforce pipeline.

Codes and Ordinances

The following codes and ordinances provide the regulatory framework for a more resilient City.

Building Code

The City of Greenville follows the 2021 International Building Code, Amended with an effective date of January 1, 2023. This code includes standards for those hazards impacting Greenville. The City’s Building Code Effectiveness Grading Schedule Score is 03 for residential and 01 for commercial and industrial.

Floodplain Management Ordinance / NFIP Compliance

The City is a member of the NFIP and has a flood damage prevention ordinance that contains standards higher than the minimum requirements of the NFIP. The City has also obtained a Class 5 ranking in the Community Rating System.

Other Codes and Ordinances

- The City of Greenville Fire Department is responsible for fire related inspections.
- Site plans for new development and redevelopment are regulated under the City’s site development and zoning ordinances. Plan reviews and inspections are performed by the City’s Engineering and Planning Departments.

7.6.2 Administrative and Technical

Administrative and technical capabilities include boards, commissions, departments, staff, and consulting services, along with the related skills and tools, that can be used for mitigation planning and the implementation of specific mitigation actions.

Administrative

The following departments are essential to building a resilient City.

Engineering Department

The City of Greenville Engineering Department includes civil, environmental, traffic, and construction services. Structural projects identified in the Hazard Mitigation Plan can be designed and managed in-house or procured through Engineering.

Public Works Department

The Public Works Department is responsible for the maintenance of the City's infrastructure and for the collection and disposal of residential solid waste. Public Works is comprised of the following divisions: Garbage/Recycling, Parking, Streets, Sidewalks, Stormwater, Sewers, Right of Way, Trees, and Fleet. Public Works is active in emergency preparations, response, and recovery.

Code Enforcement Department

Building codes are managed and tracked through the Building and Permit Center. The City enforces the South Carolina Building Code for both residential and commercial buildings. Flood Damage Prevention ordinance requirements are spread across multiple groups. Engineering has responsibility for subdivision plan review and Codes Enforcement inspects building construction for code compliance.

Other Departments

- Emergency Management is provided through the Greenville County Emergency Management Division
- The City formed a Disaster Mitigation Committee to guide the Hazard Mitigation Plan development. This committee is also tasked with meeting post-disaster to review lessons learned and how well mitigation efforts performed.
- The City's Fire Department has county-wide and state-wide mutual aid agreements, as well as automatic aid agreements with six neighboring agencies. The City's Police Department has mutual aid agreements as well.
- The City Zoning Board of Appeals (BZA) reviews land use issues, including proposed variations from the City's zoning ordinance; special uses that require review to determine compatibility with adjacent properties and appeals of decisions made by the zoning administrator.
- City procurement of equipment, materials, services, and supplies is managed by the Purchasing Division. Their primary function is to procure in a cost effective, timely, and efficient manner and in compliance with all applicable laws, regulations, and City policies.

Technical

The following officials and departments provide the technical resources to build a more resilient City.

Chief Building Officer

The City Building Official works closely with the City's floodplain manager(s) to ensure that both residential and commercial buildings are constructed in compliance with the flood damage prevention ordinance.

Civil Engineer – Construction Project Management

The City Engineer is responsible for overseeing all engineering and construction activities for the City. The City Engineer is supported by a staff of professional engineers and technicians. As needed, the City Engineer may procure the services of consultants and contractors to assist in meeting schedules and managing heavier workloads.

Grant Administrator

Grant administration is typically performed by the department or division receiving the grant. For instance, FEMA grants awarded to the City are overseen by one of the City's Certified Floodplain Managers. Engineering may provide grant administration for structural projects. The City has not administered any FEMA Hazard Mitigation Assistance grants during the previous planning period. Prior to this planning period, the City was awarded HMGP funding for an acquisition project.

Grant Writer

The City does have a Grants Coordinator, whose primary responsibility is to assist city departments and divisions with identifying and applying for federal (both FEMA and non-FEMA) and state grants. The Grants Coordinator is aware of policies and programs associated with mitigation and resiliency, but the City has had limited opportunity to apply for and use such grants.

Other Technical Staff

- The City's Chief Financial Officer manages the City budget, assists with program funding, and provides financial oversight to projects.
- Community Planning for the City comes under the purview of the Assistant City Manager and Planning Director. Planning and Development Services has multiple planners and a landscape architect to provide technical assistance to resiliency projects as needed.
- The City Engineering Department maintains multiple Certified Floodplain Managers (CFMs) with shared responsibility for effective floodplain management. Engineering has effectively addressed repetitive loss structures and enforces a floodplain management ordinance with higher than minimum standards.
- The City has a robust GIS Department with multiple GIS professionals. Infrastructure, utilities, government facilities, flood zones, and other pertinent hazard and risk data are mapped in the City's GIS and were utilized significantly in the development of this plan.

7.6.3 Financial

Financial capabilities include access to or eligibility to use funding resources for hazard mitigation. Funding mechanisms have been identified for all mitigation initiatives in Section 8.1 below. The City will utilize the FEMA Mitigation Assistance Resource Guide to help identify federal funding, technical assistance, and other resources to support hazard mitigation. Some existing programs and grants the City has experience with are included below.

FEMA Grants

The City's grant administrators have some experience with FEMA HMA grant applications and administration. A previous HMA grant, an HMGP grant awarded to the City of Greenville through the SC Emergency Division for demolishing a City-owned building in a floodway was completed successfully. The City's risk manager also administers funding falling under HMGP's Disaster Grants-Public Assistance for Presidentially Declared Disasters and has extensive experience with FEMA's Assistance to Firefighters Grants Programs and Homeland Security Grant Program.

Federal Funding Programs (Non-FEMA)

The City's grant administrators have experience with other Federal non-FEMA grant administrations used for mitigation purposes. Examples of these grants, each of which was completed successfully, include Community Forest Health Enrichment Program through Hazard Tree Mitigation and Canopy Tree Restoration (administered by the SC Forestry Commission with monies from the US Forest Service), SC Nonpoint Source Water Pollution Grant (administered by SCDHEC (now SCDES) with monies from the EPA Federal Clean Water Act, Section 319(h), and U.S. EPA Brownfields Assessment Grants (6 total grants).

Other federal grant programs administered by the City include HUD's Community Development Block Grant Program (Greenville is an entitlement community), HUD's Home Investment Partnership Program, HUD's Housing Opportunities for Persons with AIDS Program, Department of Justice's Edward Byrne Memorial Justice Assistance Grants, and the Department of the Treasury's State and Local Fiscal Recovery Funds through the American Rescue Plan Act. The City also has administered pass-through funds from the SC Department of Parks, Recreation and Tourism for the US Department of Interior's Land and Water Conservation Fund grant and the US Department of Transportation's Recreational Trails Program, and from the SC Rural Infrastructure Authority's SC Infrastructure Investment Program funded through the US Department of the Treasury's State and Local Fiscal Recovery Funds. The City also has soundly managed large federal grants from the Environmental Protection Agency and the Appalachian Regional Commission. Examples of projects funded by these federal awards include property acquisition and homeowner rehabilitation projects to strengthen city neighborhoods, purchasing equipment to improve public safety, and making infrastructure improvements to support open space and the sewer system. The City of Greenville expends more than \$750,000 in federal funds in any given fiscal year. As such, the City undergoes a yearly A-133 audit and is considered a low-risk auditee by its independent auditors for compliance reporting.

Funding programs – State

The City regularly pursues and receives funding from the state. Some examples of grants received from State agencies to help make the City of Greenville a more resilient community include the Department of Environmental Services-DES (SC Nonpoint Source Water Pollution Grant and Solid Waste, Used Oil and

Waste Tire Recycling Grants), the Rural Infrastructure Authority (two grants received since 2020 for sewer rehabilitation (in addition to the SCIIP grant listed above), and Palmetto Pride (litter related).

Funding programs – Philanthropic

The City occasionally receives funding from private philanthropic sources (though oftentimes private foundations exclude giving to local governments). Examples of grants from private funding sources to help make the City of Greenville a more resilient community include the TD Foundation for a tree planting grant and Greenville Water for sewer and infrastructure rehab/upgrades.

Capital Improvements Program

The City's Capital Improvements Program for infrastructure is developed in the Engineering Department. Projects are identified through multiple channels including citizen input, assessment of existing infrastructure, and planning for future growth. There is a defined prioritization system for projects and cost is considered during the City budgeting process. Grants and other outside funding source may accelerate project implementation.

Utility Fees for Stormwater, Water, Sewer, Gas, or Electric Services

The City operates a stormwater utility and a sewer collection system. The City does not operate a water or electric utility. Revenue generated from the stormwater utility can be used, in part, to fund flood mitigation projects identified in the HMP. The utility generates approximately \$7 million per year. Revenues generated through the wastewater collection system are used specifically for the collection of wastewater.

7.6.4 Education and Outreach

StormReady Certification

While the City of Greenville is not certified as a StormReady community, Greenville County is a StormReady Certified community through January 2027 (entering its sixth round of certification). The County conducts regular outreach projects including attendance at events such as CERT outreach, Farmers Market Senior Day and Kids Day, Fire Fest, County Health Fair, etc. in which the City of Greenville residents participate.

Other Education and Outreach Efforts

- Firewise USA certification
- Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.
- Natural disaster or safety related school programs
- Ongoing public education or information program (e.g., Environmental Education, Fire Safety, Household Preparedness, Responsible Water Use, etc.)
- Public-private partnership initiatives addressing disaster-related issues

Ability of the City to Expand and Improve Capabilities

The City of Greenville is a Council-Manager form of government. Therefore, significant changes to policy are required to be reviewed and approved by Council and authorized by the Manager. Likewise, major

shifts in funding must also be approved by this elected body. Historically, the City has been proactive in hazard management and the Council has been very supportive of appropriate changes in policy, funding, outreach, and administrative efforts. Overall, the City has the ability and means to expand and improve its mitigation efforts and capabilities. The City's vision, strategic plan, and leadership support regular review of City policies and resources.

8 Prioritized Mitigation Initiatives

The proposed mitigation initiatives in this section are the result of the DMC's planning efforts. Development of mitigation initiatives began with a review of initiatives contained in previous HMPs. Any initiative on the list that had not been implemented remained in consideration for the 2024 HMP. The DMC was also encouraged to discuss potential mitigation measures with their sponsoring organization and submit those initiatives in writing, at DMC Meeting #2, or again at DMC Meeting #3.

These mitigation initiatives form the fundamental mechanism for the implementation of the multi-hazard mitigation plan. When the resources and opportunity become available, the sponsoring organization will implement an initiative to address the vulnerabilities of the facilities, systems, and planning areas that have been identified through the mitigation planning process. These initiatives build upon the initiatives identified in the County plan. After each successful implementation of an initiative, the community will become more resistant to the impacts of future disasters.

8.1 Project Descriptions

The proposed initiatives discussed in this section are specific mitigation actions and projects being considered to reduce the effects of each hazard pursuant to §201.6(c)(3)(ii) of the federal regulations. As specified in the procedures given in Section 4 of the plan, each proposed mitigation initiative is reviewed by the DMC. The purpose of this review and analysis is to ensure that an initiative proposed by a participating organization or community group is based on an adequate level of technical analysis, that all needed information about the proposal is presented, that any assumptions utilized are reasonable and logical, that the proposal is consistent with the goals and objectives of the DMC, and that it is addressing identified vulnerabilities of the community or shortfalls in the communities' mitigation policy framework. More specifically, the DMC's review and analysis process is focused on ensuring the technical validity of the proposal, making a judgment whether the initiative would be technically effective and cost-beneficial, if it is duplicative or in conflict with other proposed initiatives, or if its implementation would have an adverse effect in another jurisdiction. If necessary, the proposal is returned to the sponsoring organization for revision. When the DMC reaches a favorable judgment regarding the proposal, the initiative is added to the City of Greenville Multi-Hazard Mitigation Plan. With this process in place, each mitigation initiative is only incorporated into the plan after satisfactorily undergoing a "peer review" process considering both technical validity and policy compliance.

The 2024 plan update reviewed the progress made for each of the initiatives identified in the 2015 plan. For those initiatives that had been completed or were near completion, no further action was taken. Those 2015 initiatives that were not yet started or were partially underway remained part of the 2024 plan update. Additional initiatives identified during the 2024 update process were added to the list of 2015 initiatives to develop a single list of initiatives for the 2024 plan update. Likewise, the initiatives

contained in the updated 2015 plan were subjected to the same review for this plan. Additional initiatives identified during the 2024 update process were added to the combined 2009/2015 list of initiatives. The following sections contain the initiatives by mitigation type for the 2024 City of Greenville Multi-Hazard Mitigation Plan update. For the previous initiatives, the description includes the progress made towards implementing that initiative at the time of the 2024 plan update.

Near the end of the planning period, a post-disaster review meeting was held to discuss the impacts as well as the successes and failures of the actions taken during Hurricane Helene which occurred on September 27, 2024. Several new mitigation initiative ideas were discussed. Additional information about the impacts and mitigation initiatives can be found in the Hurricane Helene Section of the Disaster Mitigation Meeting #3 Minutes which are included in Appendix A.

8.1.1 PREVENTION

Storm debris removal process plan

The City is proposing to develop a plan that would dedicate crews to debris removal at crossings and other problem areas after hazard events. This plan would also allow for contractors to be on standby to assist with debris removal following storm events. At the time of the 2024 plan update, no progress had been made towards this initiative.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods, Winter Weather	City of Greenville Public Works	City Budget	Long-term

Cooperate with Greenville Water and ReWa emergency planning

The City is proposing to cooperate with Greenville Water and ReWa emergency planning efforts. At the time of the 2024 plan update, the City continues to cooperate with Greenville Water and ReWA, but a formal agreement for emergency planning and management has not been developed.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville Engineering	City Budget, Greenville Water, ReWA	Short-term

Review City's Urban Forestry Program

Review the City's Urban Forestry Program to identify and address trees within the road rights of way with the potential of falling and creating power outages during high wind and ice events.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Winter Storms, High Winds/Tornados	City of Greenville Parks, Recreation, and Tourism - Urban Forestry	City Budget	Short-term

Develop structural inspection program for bridges and road crossings

In an attempt to prevent damage and failures, the City is proposing to develop an inspection program in which bridges and road crossings would be inspected both prior to and immediately after large storm events to identify areas needing additional pre-storm protection or post-storm repair. Inspection results could also be used to identify capital improvement projects. At the time of the 2024 plan update, the City is partnering with SCDOT for bridge inspections. SCDOT performs bridge inspections and sends the results to the City. City culverts are managed through the stormwater asset management program. An official program for inspections pre and post storm events has not been developed.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget, SCDOT	Short-term

Review and update standards for stormwater design

Review current stormwater standards and detention policies to address increasing rainfall intensities and runoff. Incorporate the detention gap analysis performed in 2018 as a part of Stormwater 2.0.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget	Short-term

Review and update design standards as well as operation and maintenance program for aerial utility crossings

Aerial utility crossings can cause debris backup. Review the current design standards for potential to reduce blockages and flooding. Review and update the current operation and maintenance program for aerial utility crossings.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget	On-going

Monitor impacts of climate change

Perform a regular review of climate change trends.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Climate Change	City of Greenville, USGS, NWS	City Budget, Possible Grant Opportunities	On-going

Update the City of Greenville's FEMA Flood Insurance Rate Maps

The City updated its watershed master plan in August 2018, and the FIRMs were updated in August 2014. This mitigation activity would include updating the 2014 FIRMs with current data and standards.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget, Grant Funding (BRIC)	Long-term

8.1.2 PUBLIC EDUCATION & AWARENESS

Pre-canned PSAs to use before events

The City plans to prepare PSAs for use before hazard events to provide storm preparation reminders to those potentially affected.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville Communications & Engagement	City Budget	Short-term

Develop a Public Education Campaign

This campaign should include consideration of multiple media types, a variety of demographic groups, and City leadership. Include public outreach about the City's urban forestry, Community Cares, and Code Red programs as part of this campaign.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville Communications & Engagement	City Budget	Short-term

Internal disaster training for City employees/officials

Create an internal training program for City employees and officials to educate them about hazard mitigation planning and teach them about programs in place to assist citizens during disaster.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville Communications & Engagement	City Budget	Short-term

8.1.3 NATURAL RESOURCES PROTECTION

Create a City-wide Streambank Stabilization Program (Riparian Area Management Plan)

This program would focus on identifying existing streambank failures and future problem areas and design and implement effective solutions to stabilize the streambanks and limit future erosion.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget	Short-term

ICAR and Woodruff Road flood studies

The City proposes to prepare flood studies and alternatives analysis for the Clemson University International Center for Automotive Research (ICAR) and the Woodruff Road area to identify potential projects to reduce the flood hazard. This initiative includes the implementation of the recommended projects. At the time of the 2024 update, this initiative had not been started.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget	Short-term

Update Haywood Road watershed study

The City proposes to update the watershed study for the Haywood Road area (Basin No. 4, Laurel Creek watershed). This initiative includes the implementation of the recommended projects. At the time of the 2024 update, this initiative had not been started.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget	Long-term

Update Richland Creek watershed study

The City proposes to update the Richland Creek watershed study for the area between I-385 and the Reedy River. This area has not been investigated in approximately 20 years, during which time many apartment complexes have been developed. This initiative includes the implementation of the recommended projects. At the time of the 2024 update, this initiative had not been started.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget	Long-term

8.1.4 EMERGENCY SERVICES

Coordinated Roads Plan between City, County, and State

Develop a coordinated plan for emergency services and evacuation routes during natural disasters.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville, Greenville County, SCEMD, SCDOT	City of Greenville, Greenville County, SCEMD, SCDOT	On-going

Early Warning System

In efforts to forewarn its citizens of approaching hazards, particularly tornadoes, the City is proposing to install an early warning system that would sound, allowing citizens to take the necessary precautions to remain safe. At the time of the 2024 plan update, the City has not implemented an early warning system.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Tornados/ High Winds, All Hazards	City of Greenville, USGS, NWS	City Budget	Long-term

Backup battery power on traffic signals

Ensure that all traffic signals within the City of Greenville have backup battery power so that traffic is able to flow as usual during/following natural disasters.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville Traffic Engineering	City Budget	Long-term

Increase number of City represented CERT program participants

The County sponsors a free Community Emergency Response Training (CERT) where the City would encourage resident participation. Once trained, the citizens will be able to help during emergency situations and provide relief for other emergency service workers.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	Greenville County Emergency Management	City Budget	On-going

Correlate real time flood stages to areas of actual flooding

Utilizing existing flood stage gauges, the City can correlate these real-time flood stages to actual flooding in the City based on both the stage and the time to peak. This effort would be coordinated with the County and the NWS.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget, NWS, NRCS	Long-term

Create hotline for room and restaurant openings

To assist citizens after emergencies, find available rooms (especially those that will accept pets), open restaurants and grocery stores, and other open businesses, the City can develop a hotline for this purpose. This information is often available online, but this may be inaccessible to people displaced and without internet access. At the time of the 2024 plan update, the hotline had not been created.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	NWS, Greenville County Emergency Management, City of Greenville Communications & Engagement	Possible Grant Funding	As grants become available

Transportation for At-Risk Groups

Greenlink to coordinate with Greenville County Emergency Management to assist with the transportation of at-risk groups to safer locations for emergency events.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	Greenlink	City Budget, Greenlink	Short-term

Generator Connections for City of Greenville Facilities

Ensure that all crucial City buildings are equipped with generator connections and generators so that they are able to operate during times of natural disaster.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville Public Works - Facilities Maintenance	City Budget, Possible Grant Funding	Short-term

Develop program to educate residents in high-rise apartments/condominiums about evacuation plans

Create evacuation plans for apartments/condominiums in the City of Greenville.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	City of Greenville Communications & Engagement	City Budget	Short-term

Partner with pet kennels and shelters

The City may coordinate with local shelters, boarding facilities, and animal groups to provide temporary housing for animals during emergencies. This would ease pet owner concerns and allow them to ensure their own safety at shelters that typically do not allow pets. At the time of the 2024 plan update, no progress has been made toward this initiative.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	Greenville County Emergency Management, Greenville County Animal Care Services	Greenville County Budget	Long-term

Develop a City drought plan

The plan will cover drought related issues and response activities specific to the City of Greenville. The South Carolina Drought Response Committee may be a good resource for developing a plan for the City of Greenville.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
All Hazards	Greenville Water	Greenville Water	On-going

Provide additional home heaters through existing programs

Purchase additional home heaters to provide to citizens following winter storms.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Winter Storms	City of Greenville Fire Department	Grant Funding	On-going

Cooling centers for heatwaves

Develop a program for providing cooling centers for citizens during heatwaves.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Climate Change	City of Greenville, Greenville County Emergency Management	Possible Grant Funding	As grants become available

8.1.5 PROPERTY PROTECTION

Property Review for Flood Buyouts

The City recommends investigating the potential to purchase properties that have a high risk of flooding or that are known to flood frequently but are not classified as severe repetitive loss properties.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget, Possible Grant Funding (BRIC)	Short-term

Additional Covered Parking to Protect Vehicles

This program would include a study to determine the amount of covered parking needed during hailstorms and other inclement weather and come up with solutions to add more covered parking around the City if needed.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Hail	City of Greenville Parking	City Budget	Long-term

Relocate City-owned utility facilities

The City plans to investigate the locations of City-owned facilities (i.e. fire stations) to determine if their location is in a high hazard area and the feasibility of relocating. The initial plan in 2009 included this initiative for the Public Works facility, and the 2015 update included an evaluation of all City-owned facilities. At the time of the 2024 plan, the Public Works facility has been relocated.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget	Short-term

Dwelling Elevation Program

The City would like to develop a Dwelling Elevation Program similar to the program used by the County. The program will help individuals in the flood plain elevate their finished floor elevation to prevent future flooding. This is a similar concept to the “buy-out” programs but may provide an alternative to complete removal of a property. At the time of the 2024 plan update, no progress had been made towards this initiative.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Engineering	City Budget, FEMA	As grants become available

8.1.6 STRUCTURAL PROJECTS

Structural temporary road blocks

The City proposes to put up gates or other structures along roads that flood frequently to temporarily block roads. At the time of the 2024 plan update, the City has permanent floodgates in some parks and deploys barricades to protect citizens during flood events. The City will continue to add floodgates as needed.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
Floods	City of Greenville Public Works, SCDOT, City Fire Department	City Budget, Possible Grant Funding	Long-term

Upgrade all traffic signals to mast arm signal poles

Upgrade all traffic signals in the City to mast arm signal poles.

Hazards Addressed	Responsible Party	Funding Source(s)	Timeline
High Winds/Tornados, Winter Storms	City of Greenville Traffic Engineering	City Budget, Possible Grant Funding	Long-term

8.2 Scoring

Project prioritization was conducted by the DMC. To facilitate orderly and meaningful implementation of mitigation initiatives, the 2009 DMC created an Initiative Priority Scoring System. This system has been used in all subsequent planning cycles to prioritize mitigation initiatives. For the sake of consistency between plans and because of the effectiveness of previous prioritization efforts, the DMC opted to use this same system for the 2024 HMP. The scoring criteria are contained in Table 18 below. The minimum score for a proposed initiative is zero (0) and the maximum is twenty-seven (27), with the maximum score indicating the most strategic initiative.

Table 18: Initiative Scoring Criteria

Priority Criterion	Numeric Score
Strategy Effectiveness	
No effect on Risk or Hazard	0
Affects several structures within the County	1
Affects many structures within the County	2
Affects most structures within the County	3
Percentage of Population Benefited	
Less than 10% benefited	0
10% to 50% benefited	1
51% to 75% benefited	2
Greater than 75% benefited	3
Time to Implement	
Cannot be implemented	0
Longer than one year	1
Within one year	2
Immediate	3
Time to Impact	
Cannot be implemented	0
Longer than one year	1
Within one year	2
Immediate	3
Cost to County	
Completely Unaffordable	0
Expensive, but manageable	1
Cost is easily managed	2
Little to no cost	3
Cost to Others	
Completely Unaffordable	0
Expensive, but manageable	1
Cost is easily managed	2
Little to no cost	3
Funding Source	
No known funding source available	0
Requires outside funding	1
Requires budget consideration	2
Within existing county budget	3
Community Support	
Opposed by the entire community	0
Acceptable only to those affected by the project	1
Some community opposition	2
Acceptable community wide	3
Project Feasibility	
Not possible	0
Accomplished with extensive design and planning	1
Accomplished with some design and planning	2
Easily accomplished	3

The final prioritization of the mitigation initiatives evaluated as part of the 2024 plan update is included in Table 19 below. The initiatives are grouped by mitigation type and listed from highest to lowest priority score. The priority score is intended to serve as a guideline for the DMC regarding the relative desirability for the implementation of a specific mitigation initiative in comparison to other proposed initiatives in the plan.

Table 19: Prioritized Initiatives

Proposed Mitigation Activities	Strategy Effectiveness	Population Benefited	Time to Implement	Time to Impact	Cost to City	Cost to Others	Funding Source	Community Support	Project Feasibility	Total Score
Prevention										
Storm Debris Removal Process Plan	2.0	2.0	2.0	3.0	2.5	3.0	3.0	3.0	2.0	22.5
Cooperate with Greenville Water and ReWa emergency planning	3.0	3.0	1.5	1.5	2.0	2.0	2.5	3.0	2.5	21.0
Review City's Urban Forestry Program	2.0	2.0	2.0	1.0	2.0	2.5	2.5	2.5	3.0	19.5
Develop structural inspection program for bridges and road crossings	2.5	2.0	2.0	2.0	1.5	2.5	2.0	3.0	2.0	19.5
Review and update standards for stormwater design	3.0	1.0	2.5	1.0	2.0	2.0	3.0	2.5	2.0	19.0
Review and update design standards as well as operation and maintenance program for aerial utility crossings	2.0	1.5	2.5	1.5	2.0	1.5	3.0	2.0	2.5	18.5
Monitor impacts of climate change	3.0	2.5	1.0	1.5	2.0	2.5	2.0	2.5	1.5	18.5
Update the City of Greenville's FEMA Flood Insurance Rate Maps	1.5	0.5	1.5	1.0	1.0	2.5	2.0	2.5	1.0	13.5
Public Education & Awareness										
Pre-canned PSAs to use before events	2.0	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	24.0
Develop a Public Education Campaign	3.0	2.5	2.0	2.5	2.0	3.0	3.0	3.0	2.5	23.5
Internal disaster training for City employees/officials	1.0	1.0	2.0	2.5	2.0	3.0	3.0	3.0	2.5	20.0
Natural Resources Protection										
Create a City-wide Streambank Stabilization Program (Riparian Area Management Plan)	1.5	1.0	1.0	1.5	2.0	2.5	2.0	2.5	1.5	15.5
ICAR and Woodruff Road flood studies	1.5	1.5	1.0	1.5	1.0	3.0	2.0	2.0	1.0	14.5
Update Haywood Road watershed study	1.5	1.5	1.0	1.5	1.0	3.0	2.0	2.0	1.0	14.5
Update Richland Creek watershed study	1.5	1.5	1.0	1.5	1.0	3.0	2.0	2.0	1.0	14.5
Emergency Services										
Coordinated Roads Plan between City, County, and State	3.0	2.5	2.0	2.5	3.0	2.5	2.5	3.0	1.5	22.5
Early Warning System	3.0	3.0	1.5	3.0	1.5	1.5	2.0	2.5	2.0	20.0
Backup battery power on traffic signals	2.0	2.0	2.0	3.0	1.0	2.5	2.0	3.0	2.0	19.5
Increase number of City represented CERT program participants	2.0	2.0	1.0	3.0	1.5	2.5	2.0	2.5	2.0	18.5
Correlate real time flood stages to areas of actual flooding	1.0	2.0	1.5	2.0	2.5	2.5	2.0	3.0	2.0	18.5
Create hotline for room and restaurant openings	1.0	1.5	2.0	2.5	2.5	2.5	1.0	3.0	2.5	18.5
Transportation for At-Risk Groups	0.5	1.5	2.0	2.5	2.5	2.5	1.0	3.0	2.5	18.0
Generator Connections for City of Greenville Facilities	1.0	1.5	2.0	2.5	1.0	2.5	2.5	3.0	1.5	17.5
Develop program to educate residents in high-rise apartments/condominiums about evacuation plans	1.5	0.5	2.0	3.0	2.5	2.5	2.0	1.5	2.0	17.5
Partner with pet kennels and shelters	0.5	1.5	2.0	2.5	2.5	2.5	1.0	2.5	2.5	17.5
Develop a City drought plan	1.0	1.0	1.5	1.5	2.5	2.5	2.0	3.0	2.0	17.0
Provide additional home heaters through existing programs	1.0	0.0	1.5	2.5	1.5	2.5	1.5	1.5	1.0	13.0
Cooling centers for heatwaves	1.0	0.5	1.0	1.5	1.0	2.5	0.5	1.5	1.0	10.5

Proposed Mitigation Activities	Strategy Effectiveness	Population Benefited	Time to Implement	Time to Impact	Cost to City	Cost to Others	Funding Source	Community Support	Project Feasibility	Total Score
Property Protection										
Property Review for Flood Buyouts	1.5	0.0	1.0	2.0	1.5	2.5	1.0	2.0	1.5	13.0
Additional Covered Parking to Protect Vehicles	1.0	0.5	1.0	2.5	0.5	2.5	1.5	2.0	1.5	13.0
Relocate City-owned utility facilities	1.5	2.0	1.0	1.5	1.5	1.5	0.5	2.0	1.0	12.5
Dwelling Elevation Program	1.0	0.5	1.0	2.5	0.5	1.0	1.0	2.0	1.0	10.5
Structural Projects										
Structural temporary road blocks	1.0	1.5	2.0	2.5	2.0	2.5	2.0	2.0	2.5	18.0
Upgrade all traffic signals to mast arm signal poles	1.0	1.5	1.0	3.0	1.0	2.5	2.0	3.0	2.0	17.0

City of Greer

City of Greer Mitigation Action Plan

	Description	Hazard(s) Addressed	Responsible Party	Funding Source(s)	Timeline	Jurisdictions Covered
Prevention						
P-1	Integrate new bikeway/greenway and public park improvements into comprehensive planning and capital improvements efforts.	Flooding	Primary: City of Greer Planning and Zoning Administration Secondary: City of Greer Recreation Director	Local Funds/ grants	As budget/grant become available	Greer
P-2	Update landscaping around city owned facilities (around city owned buildings and in park areas) and along roadways to include shade=providing and drought resistant vegetation, while maintain proper buffers against wildfire.	Drought, Wildfire, Extreme Heat	Primary: City Administrator - City of Greer Administration Secondary: City of Greer Engineering and Director - Public Services	Local Funds	As budget become available	Greer
P-3	Identify and map stormwater "hot spots" and develop prioritized capital improvement plan for upgrade of substandard storm drainage components.	Flooding	Primary: City Engineer Secondary: Storm Water Program Director	Local Funds	As budget become available	Greer
P-4	Increase number of active traffic control devices at railway-roadway intersections.	Hazardous Materials, Transportation Incident	Greer Engineering Secondary: Chief- City of Greer Police	Local Funds	As budget become available	Greer

SECTION 8: MITIGATION ACTION PLAN

	Description	Hazard(s) Addressed	Responsible Party	Funding Source(s)	Timeline	Jurisdictions Covered
Property Protection						
PP-1	Work with SCDOT and the local counties to review all bridge construction plans to determine seismic susceptibility and strengthen bridges most at risk.	Earthquake	Primary: City Engineer Secondary: Director - Public Services	Local Funds Grants	As budget/grant become available	Greer
PP-2	Elevate, retrofit, or acquire flood prone structures based on a priority list based on cost/benefit analysis and overall feasibility.	Flooding	Primary: City of Greer Engineering Secondary: City of Greer Engineering	Federal, State, Local Funds	As budget/grant become available	Greer
PP-3	Map and inventory all structures along the railroad corridor and develop a priority list for code enforcement, relocation, or acquisition based on potential risk.	Transportation Incident	Primary: City of Greer Planning and Zoning Administration Secondary: City of Greer GIS Coordinator	Local Funds	As budget/grant become available	Greer

SECTION 8: MITIGATION ACTION PLAN

	Description	Hazard(s) Addressed	Responsible Party	Funding Source(s)	Timeline	Jurisdictions Covered
Emergency Services						
ES-1	Identify and evaluate potential new city run shelter facilities (not sponsored by ARC), with emphasis on building local volunteer capability and creating locally staffed shelters for small magnitude disaster events.	All	Primary: Fire Chief - City of Greer Fire Department Secondary: Chief - City of Greer Police Department	Local Funds	As budget become available	Greer
ES-2	Develop specific annual disaster response training plans for city fire/EMS and police departments and improve capability of city to respond indecently to small-scale and large-scale disaster events and to improve the integration of city staff/equipment into response parameters required by county EOP's.	All	Primary: Fire Chief - City of Greer Fire Department Secondary: Chief - City of Greer Police Department, Greenville County Emergency Management, Spartanburg County Emergency Management	Local Funds	As budget become available	Greer
ES-3	Improve generator response capabilities at high-risk traffic intersections.	Hazardous Materials Incident, Transportation Incident	Primary: Chief - City of Greer Police Department Secondary: Fire Chief - City of Greer Fire Department	Local Funds	As budget become available	Greer
ES-4	Purchase NOAA Weather Radios for all city owned facilities and other critical facilities (schools, nursing homes, other facilities housing vulnerable populations) and provide training on use of radios.	All	Primary: Fire Chief - City of Greer Fire Department Secondary: Chief - City of Greer Police Department and City Administration	Local Funds Grants	As budget/grant become available	Greer

SECTION 8: MITIGATION ACTION PLAN

	Description	Hazard(s) Addressed	Responsible Party	Funding Source(s)	Timeline	Jurisdictions Covered
Public Education and Awareness						
PEA-1	Incorporate risk mapping (natural and manmade hazard identification) into city website.	All	Primary: City of Greer Planning and Zoning Administration Secondary: City of Greer Communications Director and GIS Coordinator	Local Funds	As budget become available	Greer
PEA-2	Provide public education regarding water conservation efforts for homeowners (rain barrels, drought resistant landscaping, low-flow faucets, toilets, showerheads, etc.) in an effort to mitigate against the threat of drought.	Drought	Primary: City of Greer Engineering Secondary: City of Greer Communications Director	Local Funds	As budget become available	Greer
PEA-3	Educate homeowners and business owners about flood proofing homes and other buildings.	Flooding	Primary: City Engineering Department-Flood Plain Manager Secondary: City of Greer Building Development Standards Department	Local Funds	As budget become available	Greer

Appendix G – Resolutions

Appendix H – NAFSMA and FEMA Documents



Floodplain Management

A locally funded and supported
robust program with a vision “
Let the Floodplains Flood”

Paula Gucker

Assistant County Administrator for
Community Planning,
Development, and Public Works

- Greenville County, SC

Hal Clarkson, PE, CFM

Project Director

- Woolpert, Inc.

INTRODUCTIONS

“You are going to make a difference. A lot of times it won’t be huge, it won’t be visible even, but it will matter just the same.”

- Batman

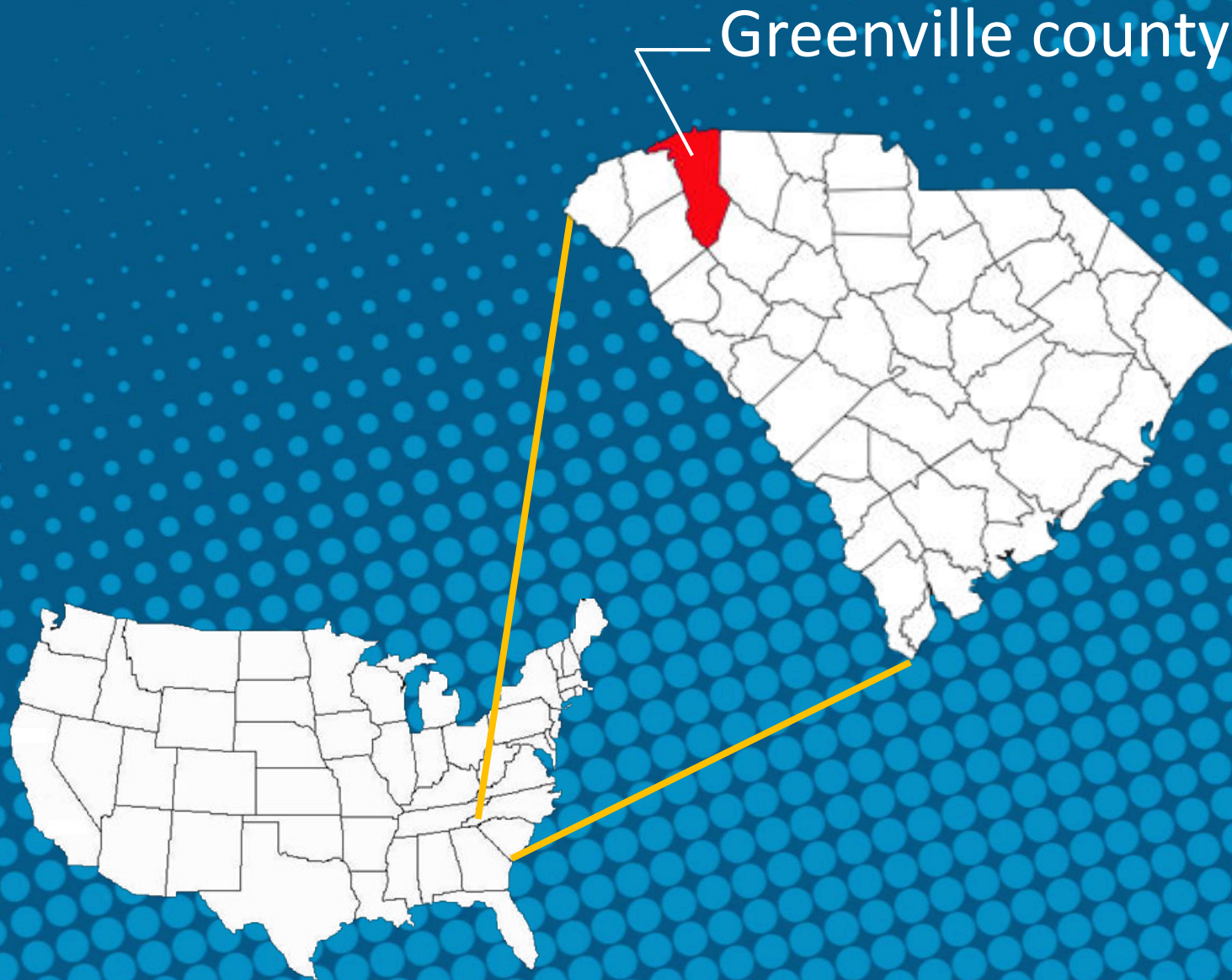


Gotham city (Greenville county, sc)...



“Son, we are the Gotham
City ~~Police Department~~
Public Works Department.
What do we do when we
come face-to-face with hell
on Earth? We get to work.”
— James Gordon

Location...

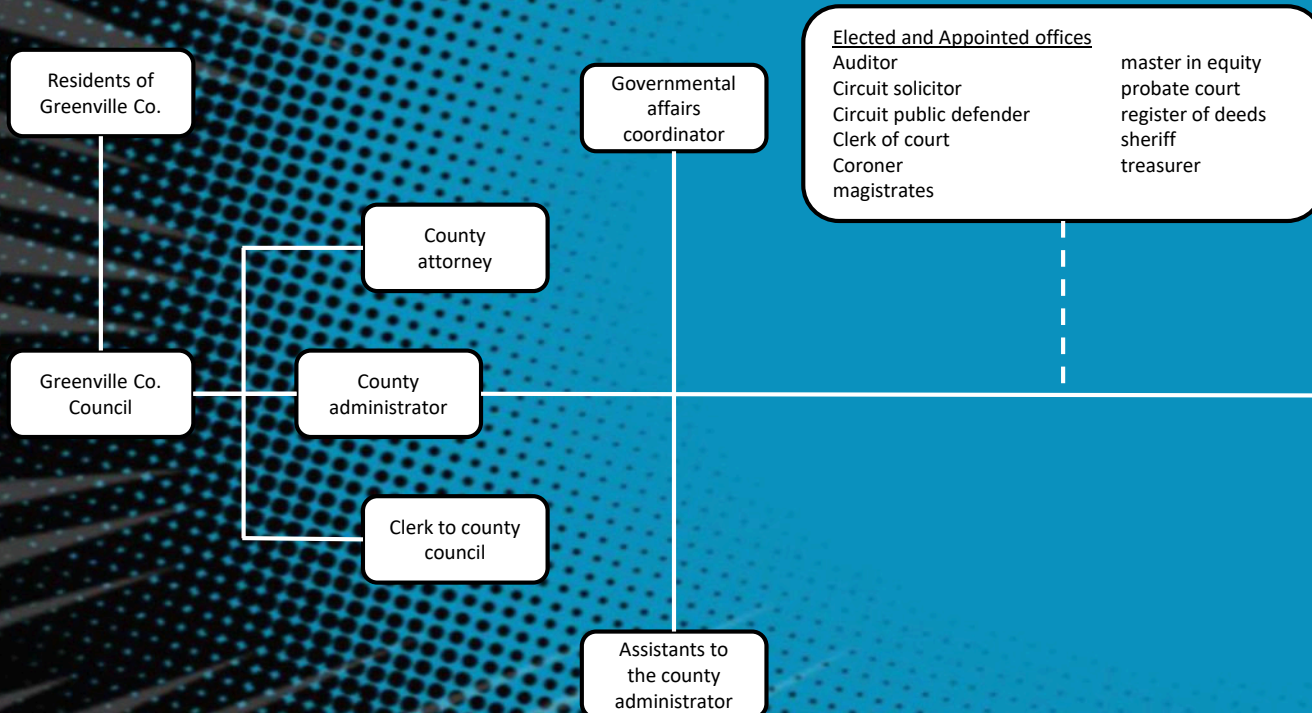


Greenville county

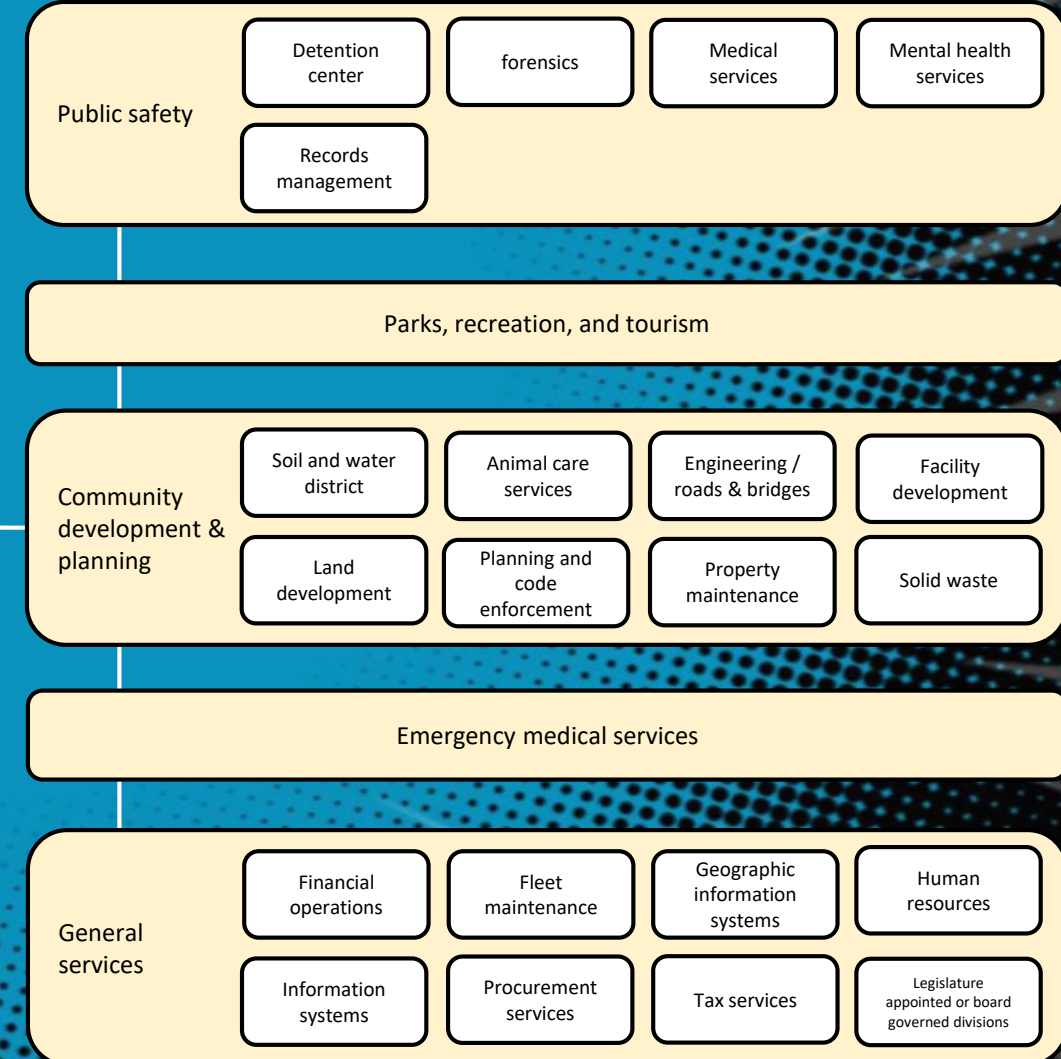
- Located in foothills of Appalachian Mountains
- Approximately 800 square miles
- Current Population $\approx$ 474,266
- Annual Rainfall $\approx$ 50 inches

Org chart...

- Where do floodplain management responsibilities reside?



Greenville county
organizational chart



Doctor doom (flood events)

- Tropical storm jerry (august 1995)
- West Side Storm (july 2004)
- Latest event in August 2014



“No matter how bad things get, sometimes good is out there, just over the horizon.”
– Green Lantern



League of Extraordinary Men and women



↑ County Council ↑



Role: protect the interest of the emPire

Wonder woman (Paula Gucker)

Role: Agent of SHIELD (County Council)

- Visible and accessible
- Love / hate relationship with council and citizens
 - Takes the “heat” for Council
 - Tells citizens what they need to know, not what they want to hear
- Focused on “big picture”
- Quick response (Rocky Creek)

“I need a day when there aren’t twenty crises to deal with, but I don’t see that coming anytime soon.”
– Iron Man



Superman (Brian Bishop)

- Role: Floodplain Manager
Fights for truth, justice, and the American way
- Enforces ordinance
- Coordinates studies and planning



Aquaman (Hal Clarkson - Woolpert)

Role: Controls the water....

Provide technical support
Studies

Bridge / culvert analysis

Planning assistance

Looking for long term, sustainable
solutions



"Our ancestors called it magic, but you call it science. I come from a land where they are one and the same."

- Thor



Captain America (JSW & Associates,

inc.) Role: Assists with property buyouts

Rescues those in peril

Fair buyout process -
county totally removed
from negotiation
process

“Trust is what
makes an army,
not a bunch of
guys running
around shooting
guns.
- captain America

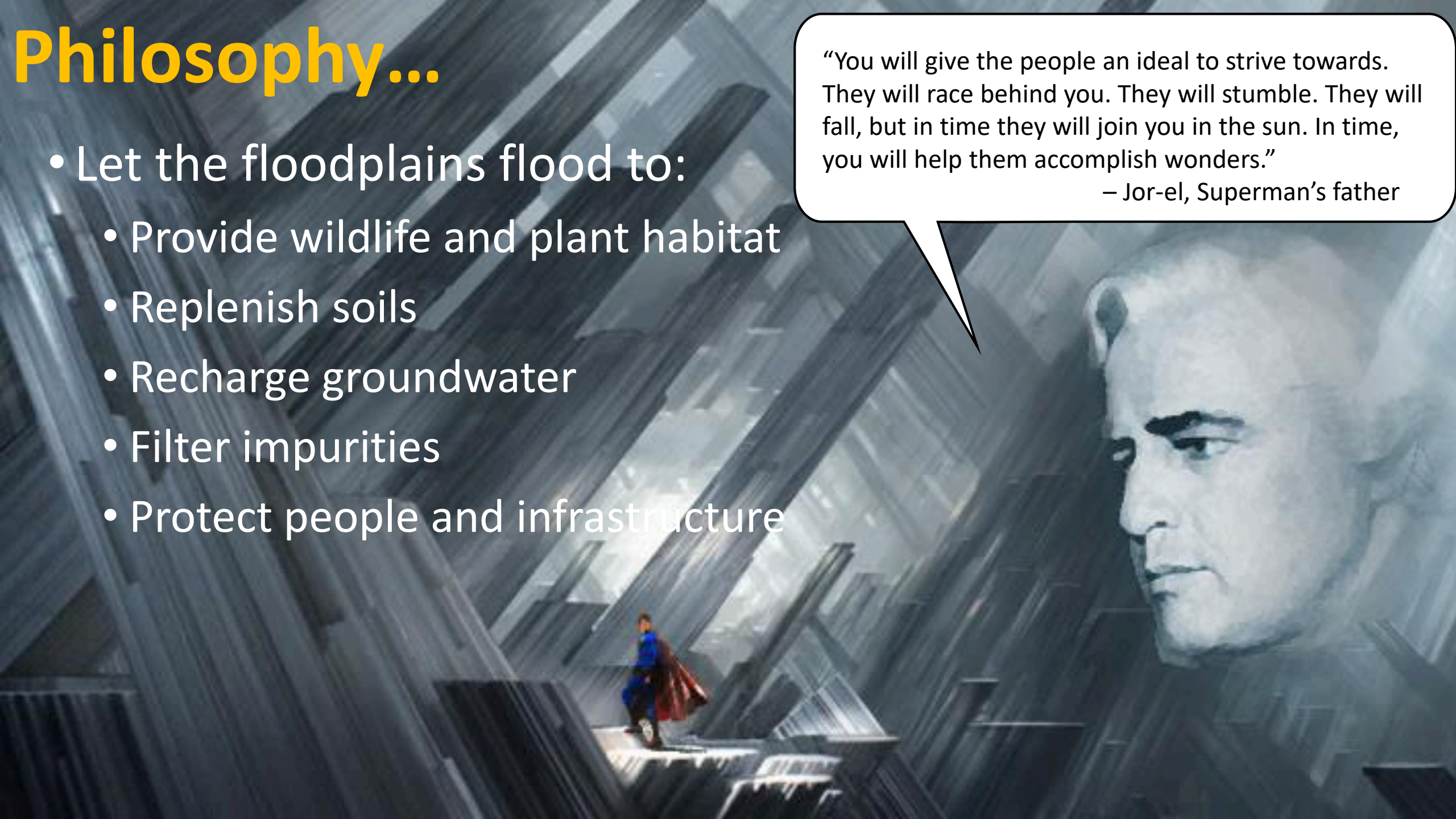


Philosophy...

- Let the floodplains flood to:
 - Provide wildlife and plant habitat
 - Replenish soils
 - Recharge groundwater
 - Filter impurities
 - Protect people and infrastructure

“You will give the people an ideal to strive towards. They will race behind you. They will stumble. They will fall, but in time they will join you in the sun. In time, you will help them accomplish wonders.”

– Jor-el, Superman’s father

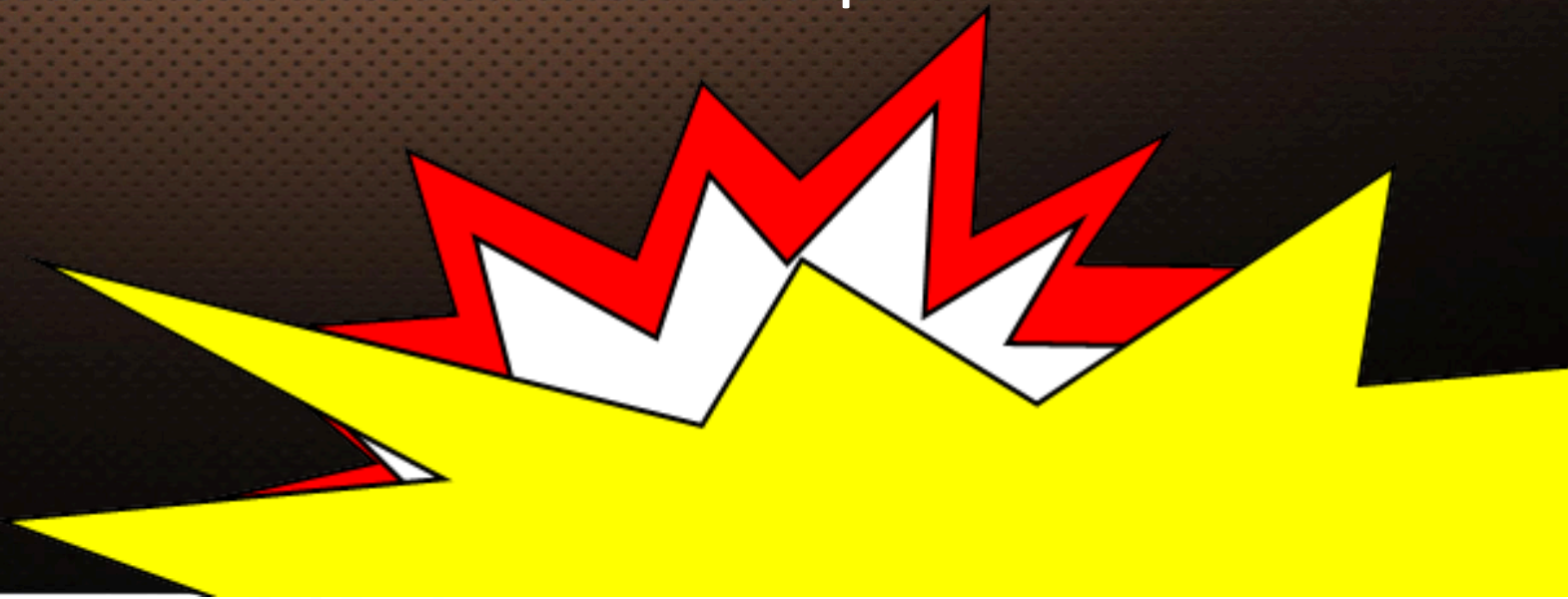


"The future is worth it. All the pain, all the tears. The future is worth the fight."

– Martian
Manhunter

Using the powers for good...

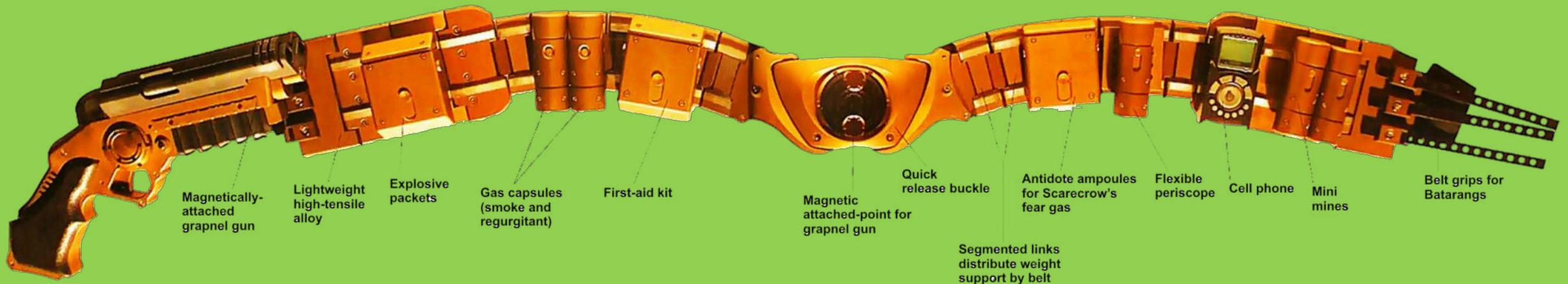
1. Reducing personal injury and loss of life
2. Reducing damage to private property and public infrastructure
3. Reducing cost of emergency response
4. Maintaining, enhancing, and restoring the natural functions of the floodplain



Superhero utility belt...

- Watershed prioritization and systematic study
 - Responded/adjusted to flood events (e.g., Rocky Creek watershed)
- Meaningful Hazard Mitigation Plan
- Progressive ordinance and active enforcement
- Systematic implementation of solutions
 - Infrastructure upgrades
 - Focused on channel capacity, road crossings, property protection
 - Elevation program
 - \$7,500 per elevation project – County funded
 - Buyouts
 - FEMA and County funded elements
- Partnerships

It doesn't matter who we are, what matters is our plan." - Bane



The battles...

- Watershed studies: Rocky creek, brushy creek, gilder creek, upper reedy, grove creek
- Hazard mitigation planning
- Mapping



Why this makes sense...

- The benefits
 - Bringing communities together
 - Benefiting the County's trail system

"Sometimes the truth isn't enough, sometimes people deserve more. Sometimes people deserve to have their faith rewarded."

- Batman



Evil defeated...

- 165 homes bought
- 24 RLS mitigated
- 6 homes elevated
- Over 75 culverts/bridges upgraded
- Average 9 neighborhood drainage projects each year
- 533 trees planted
- 2 community gardens established
- \$1.2M grant application awaiting fema approval
- 64.5 acres returned to the floodplain



"No matter how many times you save the world, it always manages to get back in jeopardy again."

"Sometimes I just want it to *stay* saved! You know?! For a little bit. I feel like the maid: "I just cleaned up this mess! Can we keep it clean for, for 10 minutes?! Please?!"

– Mr. Incredible

Neighborhoods/watersheds of implementation

- Brushy Creek

- Lake Fairfield
- Botany Woods
- Wellington Green Kingsgate
- Northside Heights
- Chestnut Hills
- Brookwood
- Heritage Hills
- Howell circle
- Del Norte

- Rocky Creek

- Mountain Brook
- Merrifield
- Foxcroft
- Rolling green

- Reedy River

- Buncombe Park Subdivision
- Berea Forest Subdivision
- Upper Reedy Watershed
- Mountain View Acres
- Western Hills
- Sharon Park
- Longforest Acres

- Gilder Creek

- Chandler Ridge
- Lee Vaughan

Brushy creek

Project name	Property Acquisitions	Repetitive loss structures	notes
Northside Heights	6		
Chesnut hills	1	1	
Brookwood	1		
Heritage hills	5		
Del norte	56	11	
Botany woods	4		
Lake Fairfield	15	1	– Vehicular Bridge and Roadway removed – New Cul-de-sacs – Elevated Pedestrian Bridge to maintain connectivity – Restoration of the Floodplain – Community Partnership with Lake Forest Garden
Howell circle	1		
Wellington green / Kingsgate	25	6	– Acquired a National Park Service Grant to design community garden, park and trails – Floodplain restoration program – wildflower and tree planting as well as stream bank restoration – Greengate Neighborhood leases and maintains the area

Rocky Creek

Project name	Property Acquisitions	Repetitive loss structures	notes
Mountain brook	1		– Culvert replaced
Merrifield			– undergoing drainage design project
Foxcroft	2		
Rolling green	3		

Reedy river

Project name	Property Acquisitions	Repetitive loss structures	notes
Buncombe park subdivision	13		
Berea forest subdivision	2	1	
Upper reedy watershed	10		
Mountain view acres	20		– 1 house, 19 mobile homes
Western hills	2		
Sharon park	3	1	
Longforest acres	12	3	– property stabilized with grass for parking lot for recreation – adjacent to the swamp rabbit trail

Gilder creek

Project name	Property Acquisitions	Repetitive loss structures	notes
Chandler ridge	1		
Lee Vaughan	1		

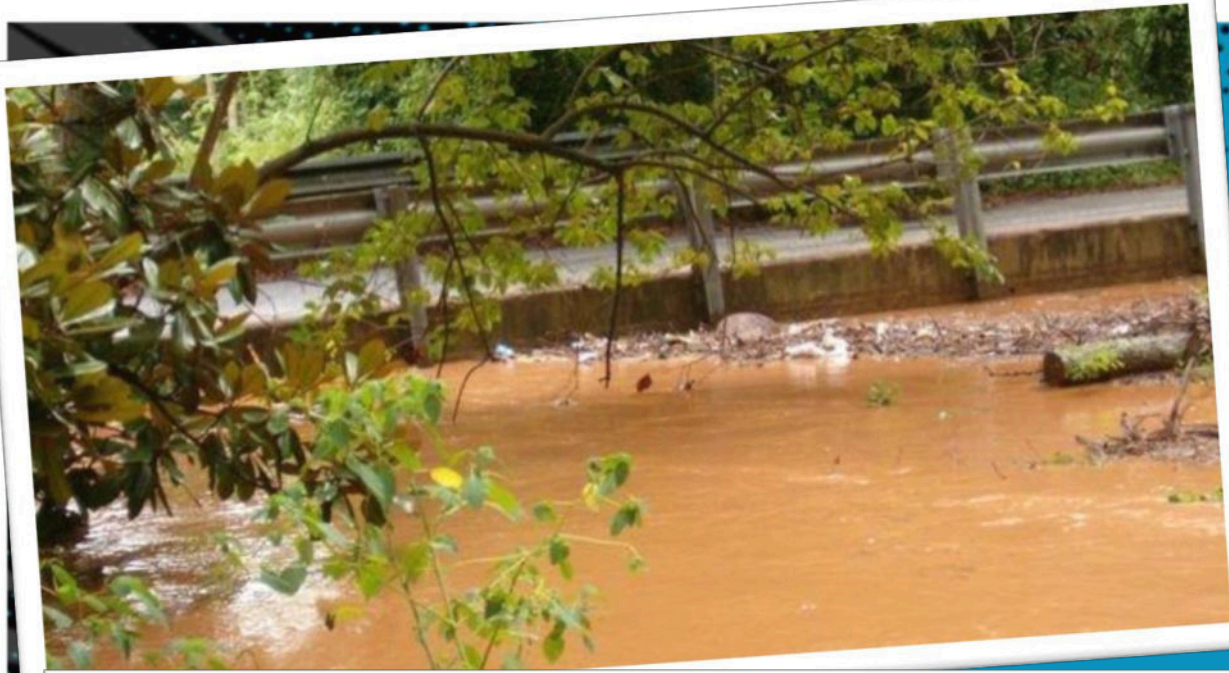
Before...



...After









Before...



...After

Before...



...After

The moral of the story...

“Everyday I wake up knowing that no matter how many lives I protect, no matter how many people call me a hero, someone even more powerful could change everything”.

– Spiderman



"Was that over
the top, I can
never tell."
- the riddler



Questions...

Hazard Mitigation Best Practice



SCEMD



FEMA

November, 2018



A resident enjoys the natural serenity of land that was cleared following a Greenville County land acquisition.

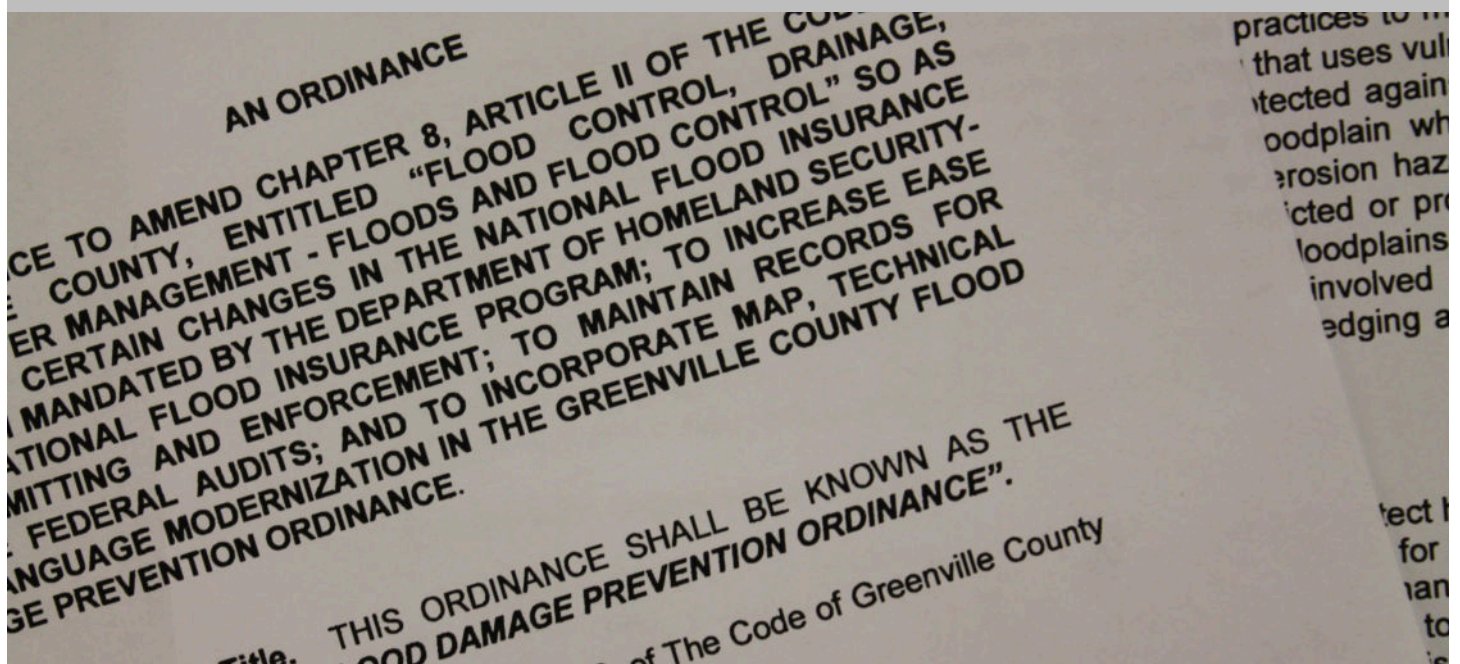
A Plan to Rise Above It All

One County's Comprehensive Plan to Combat Flood Risk

(Greenville County, SC) Surrounded by the scenic rolling foothills of the Blue Ridge Mountains, Greenville County South Carolina is the state's most populous county. It boasts that it is the "economic engine of South Carolina", and is also known for its rich culture and tradition

While Greenville County has numerous areas that are subject to flooding, the people of Greenville have a plan to rise above it all. "We don't want the same problem we had 20 years ago," said Brian Bishop, the county's floodplain administrator. "We are looking 20 years in the future."

The county has gone all in to create a comprehensive program to combat flood risk. "It started because we wanted to get people out of harm's way," said Paula Gucker, the Greenville County Assistant Administrator for Community Planning, Development and Public Works. "Not only are buildings staying dry, but there's a public safety benefit," she said. "There were times when you couldn't even get emergency services in."



Greenville County's Flood Damage Prevention Ordinance

One way the county is ensuring the health, safety and welfare of people in the county is through code enforcement. The Greenville County Flood Damage Prevention Ordinance greatly reduced the risk of future flood damage by encouraging responsible building and making sure that new or substantially improved homes are elevated or built to reduce their risk of flooding.

“We ended up with one of the strictest (ordinances) in the country,” said Gucker.

This progressive ordinance requires new, substantially damaged, or substantially improved residential structures to have its lowest floor (including utilities) elevated four feet above the Base Flood Elevation (BFE). Nonresidential structures have the option to floodproof in lieu of meeting the elevation requirement. Properties that have a ground elevation that is below the BFE are considered to be in a Special Flood Hazard Area (SFHA) which has a one percent chance of flooding in any given year.

According to Bishop, people are opting for higher ground rather than paying for the additional risk of building in a floodplain. In his four years with the county, he has only permitted a handful of houses to be built in the floodplain.

Greenville County participates in the Nation Flood Insurance Program (NFIP) Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Participation in this program allows the NFIP to offer discounted flood insurance to many of the county's residents and businesses.

“Rates are extremely good here (in Greenville County).” said Jerry Pilkington, an insurance broker and 27-year insurance industry veteran. He represents insurance firms in Greenville County, as well as other communities in several states. “If it rains, people need it (insurance). You don't need it until



An elevated home demonstrates Greenville County's ordinance requirements (Courtesy of Greenville County)

you need it,” Pilkington continued. “I am all about asset protection.”

The county also manages and protects their floodplains. Floodplains provide for recreation and a habitat for wildlife. When it rains heavily, these areas give the water a place to go. Bishop said it’s important to “let the floodplains do what they are supposed to do.”

Another part of Greenville County’s floodplain management strategy is a voluntary property acquisition program, where homeowners can sell homes located in areas of high flood risk to the county for a fair price. The county then clears the land, using it for things like parks and gardens, but a restricted deed is recorded stating that no structures can be placed on the property. Residents provide input for what goes into the newly created space.

“At first there was some opposition to the program. Property owners assumed the county was trying to take their property from them. Now that they understand the benefits, I don’t get much pushback. It’s a benefit to everyone,” said Bishop.

A resident who often walks in one of the areas said, “They had a problem here for a while. Now it’s a nice walking area.”

The acquisition program is mostly funded through county storm water and utility fees, with additional help from FEMA’s Hazard Mitigation Grant Program.

A lot of people contributed to making these programs work, including the Greenville County Depart-



A bench swing awaits visitors in one of the areas cleared by land acquisition

ment of Floodplain Management, Roads and Bridges, Parks and Recreation, Property Maintenance and Facilities. The State, FEMA and the National Park Service also assisted.

“It all works well together,” said Gucker. “The county is going to be in a really good place in the future,” she added.

***For more information about
flood insurance and other topics visit:***

www.scemd.org

or

www.fema.gov



SCEMD



FEMA

Greenville County “Buys Down the Risk” With Property Acquisition Program

Greenville County, SC: Creeks can be deceiving. The unassuming, meandering bodies of water convey a sense of calm to passersby, and sets scenes of solitude for the homeowner peering at its subtle wonder. Throughout history, communities have grown up around these bodies of water, resulting in thriving businesses and robust economies. But growth and development does not come without risks, and communities like Greenville County have learned to manage this risk in order to save lives and property, while ensuring future growth and prosperity for residents.

Greenville county Assistant Administrator, Paula Gucker, recalls the history behind the decision to build an increasingly aggressive property acquisitions program to minimize flood risk. “It started back in 1995 when Hurricane Jerry came through here,” said Gucker. “It dumped 18.9 inches of rain over a fairly large part of the county of Greenville. It was the Brushy Creek/Gilder Creek area, and it dumped enough rain in such a short amount of time that there were numerous floods.”

Although Gucker began working for the County in 2001, nearly six years after the massive flood event, she became a proponent of sound floodplain management practices and progressive approaches to dealing with flooding. The county commissioned a Flood Task Force that reviewed the county’s flood history, looking at where and why floods were occurring. One of the suggestions for dealing with flooding was to dredge Brushy Creek. However, property owners in the area were required to sign off on the plan. “We got about four houses down and people said they weren’t signing,” said Gucker. “They didn’t want us there so the whole project dropped.” The Flood Task Force was disbanded.

Between 2002 and 2004, Gucker and her staff reestablished the Flood Task Force, which recommended watershed studies, suggested different options for mitigating property in the floodplain, and different ways to strengthen the floodplain ordinance. “We looked at floodwalls, we looked at elevating homes, we looked at dredging the creeks, we looked at stream bank stabilizations,” recalled Gucker. “But we knew from the engineering modeling we had done, that some of the properties were so deep in the floodway* at that time, that there wasn’t much we could do. If we elevated them, we couldn’t get them up high enough to get them out of the water.

As a member of the Federal Emergency Management Agency’s (FEMA) National Flood Insurance Program (NFIP), Greenville County conducted detailed studies of the watershed and found that the amount of new development occurring upstream of Brushy and Gilder creeks was causing severe flooding during storm events. The new, detailed engineering studies conducted in coordination with FEMA and the South Carolina Department of Natural Resources determined the level of risk—low-to-moderate or high—for the entire county and identified floodways. The county then updated their flood damage prevention ordinance to eliminate building in the floodway. “It was a long process to do this,” said Gucker. “We started with Brushy, because that was the worst of it. It took us two years to do the watershed study for Brushy. We finished it in 2007, and the final study was adopted by council. They asked that we look at doing this in every watershed, and look at how we were going to make sure nobody ever built in the floodplain without doing due-diligence. Property owners have to build 4 feet above the base flood elevation (BFE*), and they can’t build in the floodway.”



Flooding in Del Norte



Open space in Del Norte post acquisition

The county then began discussions regarding the acquisitions. Public meetings were held to get input from residents and property owners. Initially, the public had many concerns. “There were concerns that we were going to disconnect neighborhoods. There were concerns that we weren’t going to pay property owners what their homes were really worth, that we were just going for a land-grab to get them out of there. In the meantime, we started researching who could help us with this,” recalled Gucker.

After responding to residents’ concerns, the county decided to move forward with property acquisitions. A request for proposals was released, and a contractor’s bid was accepted. The acquisitions firm that Greenville County selected implemented a detailed and thoughtful approach to handling property acquisitions. Initially, people were upset during the community planning meetings. “We got everybody in the room, and we sat up front and explained exactly how the process worked,” said Gucker. “After we went through that first round in the two neighborhoods that we started in, word got out that this wasn’t so bad, that it was a pretty good deal, the county was being really fair. Now when we have people come in to discuss buyouts, they’re very calm, cool and collected, and they’re like ‘what took you so long?’”

Greenville County sets aside an estimated \$1-1.2 million dollars per year for the annual acquisition of 10-12 homes. Some years they buy more, some years less. The buyouts are 100% county funded; the property owners pay nothing. “This is done through our storm water fee and our floodplain management program,” says Gucker. “Now we have a FEMA grant to take care of some repetitive losses.” To date, 166 homes have been acquired and 84.29 acres have returned to the floodplain as open space.

Opponents of property buyouts are often concerned about the impact on communities: dwindling tax base, change in neighborhood aesthetics, or loss of business growth opportunities. But the vast majority of Greenville County buyout participants remained within the unincorporated county and the area continues to thrive. “I only know of two people who moved out of the community,” said Gucker. “One moved to be with family on the coast and the other moved out of state. Everyone else has relocated within Greenville County.”

Greenville County serves as an example of a community that utilizes property acquisition and other tools in the floodplain management toolbox to protect its residents and property owners from the devastating effects of flooding. While some would shout from the rooftops about this tremendous level of success, county administrators remain humble. “We’re very quiet,” said Gucker. “We just don’t toot our own horn. We probably should more,” she adds.



*Floodways are the area in a high risk flood zone where water is deepest and runs fastest.

*BFE is the anticipated height floodwaters are expected to reach during the 1-percent-annual-chance flood (commonly referred to as the 100-year flood).

For more information about the National Flood Insurance Program and to see if your property is located in a designated floodplain, visit: <http://www.floodsmart.gov/floodsmart/>.

Appendix I – SHELXDUS Data

2022 SHEL DUS Data - Hazards 1960-2022 (Released January 14, 2024)
Greenville County, South Carolina

Hazard	Event Name	Year	StartDate	EndDate	Location	Remarks	Injuries	Fatalities	Crop Damage (2022 USD)	Property Damage (2022 USD)
Coastal/ Flooding/ Severe Storm/Thunder Storm/ Wind		1983	3/17/1983	3/17/1983	Statewide	Wind/ Rain/ Flooding/ Beach Erosion	0	0	\$3,088	\$30,876
Drought		1994	5/1/1994	5/31/1994	Statewide SC01>50	DROUGHT	0	0	\$2,075,077	\$0
Drought		1995	5/1/1995	5/31/1995	SCZ001>050	DROUGHT	0	0	\$807,156	\$0
Drought		1978	4/1/1978	4/13/1978	Statewide	Dry Weather	0	0	\$4,717	\$47
Drought		1984	6/1/1984	6/20/1984	Statewide	Drought	0	0	\$2,960	\$0
Drought	Drought/Heatwave 1988	1988	2/1/1988	2/28/1988	Statewide	Drought	0	0	\$2,600	\$26
Drought	Drought/Heatwave 1988	1988	6/1/1988	6/30/1988	Statewide	Drought	0	0	\$25,995	\$2,600
Drought	Drought/Heatwave 1988	1988	7/1/1988	7/31/1988	Statewide	Drought	0	0	\$2,600	\$260
Drought		1986	4/1/1986	4/30/1986	SCZ001-002-003-004-005-006-007	Drought	0	0	\$331	\$0
Drought	Drought/Heatwave 1986	1986	6/1/1986	6/30/1986	Statewide	Drought	0	0	\$28,059	\$2,806
Drought	Drought/Heatwave 1986	1986	7/1/1986	7/31/1986	SCZ001-002-003-004-005-006-007/ Statewide	Drought	0	0	\$2,805,897	\$280,590
Drought		1986	5/1/1986	5/31/1986	SCZAll: Statewide	Drought	0	0	\$2,806	\$0
Drought		1988	8/1/1988	8/31/1988	SCZ001-002-003-004-006-008 NW/ WC/ C/ S SC	Drought	0	0	\$3,517	\$4
Drought/ Heat	Drought/Heatwave 1993 Southeast	1993	7/1/1993	7/31/1993	SCZ001>007 ALL SC	Drought/ Hot Weather	0	0	\$0	\$11,236,950
Drought/ Heat		1977	7/1/1977	7/31/1977	Statewide	Drought/ Heat	0	0	\$507,469	\$5,075
Drought/ Heat		1978	10/1/1978	10/31/1978	Statewide	Drought/ Dry Weather	0	0	\$4,717	\$472
Drought/ Heat	Drought/Heatwave 1993 Southeast	1993	8/1/1993	8/31/1993	STATEWIDE	Dry/ Hot Weather	0	0	\$11,236,950	\$0
Flooding		1997	7/24/1997	7/24/1997	GREENVILLE	FLOODS	0	0	\$0	\$176,277
Flooding	Drought/Heatwave 1993 Southeast	1993	7/19/1993	7/19/1993	Greenville	Flash Flood	0	0	\$0	\$97,898
Flooding		1994	8/17/1994	8/17/1994	N Portion	Flood/Flash Flood	0	0	\$954,535	\$95,454
Flooding		1995	2/16/1995	2/16/1995	Greenville & Berea/ San Souci	Flash Flood	0	0	\$0	\$27,847
Flooding		1995	8/26/1995	8/26/1995	Greenville/ Taylors/ Greer	FLOODS	5	1	\$0	\$9,282,292
Flooding		1995	8/27/1995	8/27/1995	Greenville	FLOODS	0	0	\$0	\$928,229
Flooding		1998	1/7/1998	1/8/1998		FLOOD	0	0	\$0	\$86,787
Flooding		1966	3/1/1966	3/5/1966	STATEWIDE	FLOODING	0	0	\$9,492	\$9,492
Flooding		1973	2/3/1973	2/3/1973	STATEWIDE	FLOODING	0	0	\$7	\$6,926
Flooding		1976	5/28/1976	5/29/1976	Oconee/ Pickens/ Greenville Counties	Flash Flood	2	1	\$8,287	\$828,718
Flooding		1976	10/9/1976	10/19/1976	Statewide	Flood	0	0	\$54,047	\$54,047
Flooding		1991	7/30/1991	7/30/1991	Greenville	Flash Flood	0	0	\$0	\$103,864
Flooding		1980	3/15/1980	3/31/1980	Statewide	Flood	0	0	\$3,732	\$3,732
Flooding		1990	3/17/1990	3/17/1990	Greenville	Flash Flood	0	0	\$0	\$108,234

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Flooding		1964	3/1/1964	3/31/1964	South Carolina	Flooding	0	0	\$992	\$992
Flooding		1973	12/31/1973	12/31/1973	Foothills/ SC	Flash Flooding	0	0	\$0	\$531
		1977	10/25/1977	10/26/1977	Northern Walhalla/ Pickens/ Greenville/ and Spartanburg Counties	Flash Flood	0	0	\$778	\$7,781
Flooding		1978	1/26/1978	1/31/1978	Statewide	Flooding	0	0	\$0	\$4,717
Flooding		1979	11/2/1979	11/2/1979	Greenville/ Oconee/ and Pickens Counties	Flash Flooding	0	0	\$650	\$650
		1982	1/1/1982	1/14/1982	Along Saluda/ Broad/ Congaree/ Wateree/ Lynches/ and PeeDee Rivers	Flooding	0	0	\$67	\$666
Flooding		1984	7/13/1984	7/14/1984	Greenville	Flooding	0	0	\$0	\$13,615
Flooding		1989	7/15/1989	7/15/1989	Ware Place	Flash Flood	0	0	\$0	\$11,408
Flooding		1989	8/1/1989	8/1/1989	Mauldin	Flash Flood	0	0	\$0	\$11,408
Flooding		1989	10/1/1989	10/1/1989	Greenville	Flash Flooding	0	0	\$0	\$1,141
Flooding	Drought/Heatwave 1986	1986	6/10/1986	6/11/1986	Greenville County	Flash Flooding	0	0	\$0	\$12,907
Flooding		1993	1/1/1993	1/31/1993	Statewide	Flooding	0	0	\$425,654	\$21,282
Flooding		1991	5/18/1991	5/18/1991	Greenville	Flash Flood	0	0	\$0	\$10,386
Flooding		1991	6/18/1991	6/18/1991	Greenville	Flash Flood	0	0	\$0	\$1,039
Flooding		1995	8/27/1995	8/27/1995	7 E Simpsonville and Pelham- Batesville	Flash Flood	0	0	\$0	\$3,712,917
Flooding		1994	7/28/1994	7/28/1994	Berea	Flash Flood	0	0	\$0	\$9,545
Flooding		2013	7/8/2013	7/8/2013		NCDC_Flash Flood	0	0	\$0	\$607,246
Flooding		2010	6/1/2010	6/1/2010		NCDC_Flash Flood	0	0	\$0	\$25,950
Flooding		2014	7/31/2014	7/31/2014		NCDC_Flash Flood	0	0	\$0	\$5,976
Flooding		2014	8/10/2014	8/10/2014		NCDC_Flood	0	0	\$0	\$59,755
Flooding		2014	8/10/2014	8/10/2014		NCDC_Flood	0	0	\$0	\$23,902
Flooding		2014	8/9/2014	8/10/2014		NCDC_Flash Flood	0	2	\$0	\$1,792,657
Flooding		2014	8/9/2014	8/10/2014		NCDC_Flash Flood	0	0	\$0	\$239,021
Flooding		2014	7/31/2014	7/31/2014		NCDC_Flash Flood	0	0	\$0	\$11,951
Flooding	Flooding 2015 East/SC	2015	10/4/2015	10/4/2015		NCDC_Flood	0	0	\$0	\$1,194
Flooding		2015	12/24/2015	12/24/2015		NCDC_Flood	0	0	\$0	\$597
Flooding		2015	11/2/2015	11/2/2015		NCDC_Flood	0	0	\$0	\$1,194
Flooding		2015	12/30/2015	12/30/2015		NCDC_Flash Flood	0	0	\$0	\$1,194
Flooding		2016	6/27/2016	6/28/2016		NCDC_Flash Flood	0	0	\$0	\$57,888
Flooding		2017	8/11/2017	8/11/2017		NCDC_Flash Flood	0	0	\$0	\$567
Flooding		2018	11/12/2018	11/13/2018		NCDC_Flood	0	0	\$0	\$1,127
Flooding		2018	11/15/2018	11/16/2018		NCDC_Flood	0	0	\$0	\$2,253
Flooding		2002	6/30/2002	6/30/2002		NCDC_Flash Flood	0	0	\$0	\$78,634
Flooding		2003	3/20/2003	3/20/2003		NCDC_Flood	0	0	\$0	\$1,537,632
Flooding		2003	8/7/2003	8/7/2003		NCDC_Flash Flood	0	0	\$0	\$15,376
Flooding		2004	9/7/2004	9/8/2004		NCDC_Flood	0	0	\$0	\$22,466
Flooding		2004	7/29/2004	7/29/2004		NCDC_Flash Flood	0	0	\$0	\$5,242,112

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Flooding	Hurricane 2004 Frances	2004	9/7/2004	9/7/2004		NCDC_Flash Flood	0	0	\$0	\$11,982
Flooding	Hurricane 2004 Jeanne	2004	9/27/2004	9/27/2004		NCDC_Flash Flood	0	0	\$0	\$29,955
Flooding		2005	7/7/2005	7/7/2005		NCDC_Flash Flood	0	0	\$0	\$434,599
Flooding		2009	12/2/2009	12/2/2009		NCDC_Flash Flood	0	0	\$0	\$1,319
Flooding		2020	2/6/2020	2/6/2020		NCDC_Flash Flood	0	0	\$0	\$863,497
Flooding		2020	2/6/2020	2/7/2020		NCDC_Flood	0	0	\$0	\$1,079,371
Flooding		2020	5/20/2020	5/20/2020		NCDC_Flash Flood	0	0	\$0	\$215,874
Flooding		2020	5/20/2020	5/21/2020		NCDC_Flood	0	0	\$0	\$10,794
Flooding		2020	2/6/2020	2/6/2020		NCDC_Flash Flood	0	0	\$0	\$215,874
Flooding		2021	10/8/2021	10/8/2021		NCDC_Flash Flood	0	0	\$0	\$1,075
Flooding/ Hail		1984	5/6/1984	5/6/1984	Greenville	Hail/ Flooding	0	0	\$13,615	\$1,362
Flooding/ Hail/ Wind		1985	5/12/1985	5/12/1985	Greenville	Wind/ Hail/ Flash Flooding	0	0	\$0	\$13,147
Flooding/ Lightning		1991	5/18/1991	5/18/1991	Mauldin	Flash Flood/ Lightning	0	0	\$0	\$10,386
Flooding/ Lightning/ Severe Storm/Thunder Storm		1975	9/18/1975	9/18/1975	Greenville and Anderson Counties	HEAVY RAINS AND FLASH FLOODING/ LIGHTNING	2	1	\$13,147	\$1,314,704
Flooding/ Lightning/ Wind		1984	7/12/1984	7/12/1984	Greer	Lightning/Wind/Flood	2	0	\$0	\$136,152
Flooding/ Severe Storm/Thunder Storm		1976	10/7/1976	10/7/1976	Greenville	Heavy Rains/ Flash Flooding	0	0	\$2,486	\$248,615
Flooding/ Severe Storm/Thunder Storm		1976	10/8/1976	10/9/1976	Northwest	Heavy Rains/ Flash Flooding	0	0	\$41,436	\$414,359
Flooding/ Severe Storm/Thunder Storm		1977	11/5/1977	11/6/1977	Northern Greenville and Spartanburg Counties	Heavy Rain/ Flash Flood	0	0	\$0	\$116,718
Flooding/ Severe Storm/Thunder Storm		1978	8/6/1978	8/7/1978	Oconee/ Pickens/ Greenville/ and Spartanburg Counties	Heavy Rain/ Flood	0	0	\$5,424	\$542,416
Flooding/ Severe Storm/Thunder Storm		1985	8/16/1985	8/18/1985	Oconee/ Pickens/ Greenville/ Spartanburg/ Cherokee/ Union/ York/ Chester Counties	Flood/Rain	0	0	\$16,434	\$16,434
Flooding/ Severe Storm/Thunder Storm		1979	6/2/1979	6/2/1979	Berea/ Greenville County	Thunderstorm/ Heavy Rain	0	0	\$1,949	\$194,851
Flooding/ Severe Storm/Thunder Storm		1975	3/12/1975	3/18/1975	Statewide	Heavy Rains/ Flooding	0	0	\$572	\$5,716
Flooding/ Severe Storm/Thunder Storm		1973	6/16/1973	6/22/1973	Central Nothern and Eastern	Heavy Rain/ Flash Flooding	0	0	\$110	\$1,099
Flooding/ Severe Storm/Thunder Storm		1972	12/14/1972	12/17/1972	Northern two-thirds	Heavy rains/ flooding	0	0	\$1,538	\$1,538
Flooding/ Severe Storm/Thunder Storm		1975	10/17/1975	10/17/1975	NWSC	Rain and flash flooding	0	0	\$0	\$2,023
Flooding/ Severe Storm/Thunder Storm		1984	1/10/1984	1/10/1984	Anderson Co. Greenville Co. Greenwood Co. Chester Co. Union Co. Lancaster Co. York Co.	Heavy Rains/ Flash Flooding	0	0	\$195	\$1,945
Flooding/ Severe Storm/Thunder Storm		1984	2/13/1984	2/14/1984	Northwestern SC	Heavy Rains/ Flooding	0	0	\$227	\$2,269
Flooding/ Severe Storm/Thunder Storm		1982	5/26/1982	5/26/1982	Berea Section	Heavy Rains/ Flash Flooding	0	0	\$0	\$1,466

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Flooding/ Severe Storm/Thunder Storm		1984	6/29/1984	6/29/1984	Greeville	Rain/ Flooding	0	0	\$1,362	\$13,615
Flooding/ Severe Storm/Thunder Storm		1984	7/15/1984	7/15/1984	Northern and Central Greenville County	Heavy Rains/ Flash Flooding	0	0	\$0	\$13,615
Flooding/ Severe Storm/Thunder Storm		1985	2/1/1985	2/1/1985	Greenville	Heavy Rain/ Flash Flood	0	0	\$0	\$1,315
Flooding/ Severe Storm/Thunder Storm/ Wind		1984	2/27/1984	2/27/1984	State Wide	Rain/Wind/Flood	0	0	\$30	\$2,960
Flooding/ Severe Storm/Thunder Storm/ Wind		1984	7/26/1984	7/26/1984	Statewide	Wind/Rain/Flood	0	0	\$30	\$2,960
Flooding/ Severe Storm/Thunder Storm/ Wind		1977	9/16/1977	9/16/1977	Anderson and Greenville Counties	Thunderstorm/ flooding/ and wind	0	0	\$0	\$1,167
Flooding/ Wind		1978	1/25/1978	1/26/1978	Statewdie	Wind/ Flash Flood	0	0	\$5	\$47,167
Flooding/ Wind		1980	8/8/1980	8/8/1980	Statewide	wind/ flood	0	0	\$373	\$3,732
Flooding/ Wind		1983	12/6/1983	12/6/1983	Western/ Northern & Central	Flood/ Wind	0	0	\$36	\$3,642
Hail		1999	6/10/1999	6/10/1999	SIMPSONVILLE	HAIL	0	0	\$0	\$8,491
Hail		1992	3/19/1992	3/19/1992	Greenville	Hail	0	0	\$0	\$100,828
Hail		1963	6/11/1963	6/11/1963	SOUTH CAROLINA	HAILSTORMS	0	0	\$100,499	\$0
Hail	Drought/Heatwave 1986	1986	6/24/1986	6/24/1986	Greenville County	Hail	0	0	\$129,071	\$12,907
Hail		1965	4/7/1965	4/7/1965	Owensville/ Greenville County to St. Matthews/ Calhoun County	Hail	0	0	\$0	\$4,990
Hail		1960	10/5/1960	10/5/1960	Donaldson Air Force Base	Hail	0	0	\$0	\$478
Hail		1965	11/21/1965	11/21/1965	Western half of South Carolina	Hail	0	0	\$0	\$449
Hail		1964	4/24/1964	4/24/1964	Taylors/ Pelham/ and Greer areas/ Greenville County	Hail	0	0	\$45,633	\$4,563
Hail		1968	5/17/1968	5/17/1968	Western	Hail	0	0	\$407	\$0
Hail		1978	4/18/1978	4/18/1978	Northeast S.C.	Hail	0	0	\$15,498	\$1,550
Hail		1982	4/24/1982	4/24/1982	Gownsville	Hail	0	0	\$1,466	\$147
Hail		1986	5/26/1986	5/26/1986	Greer	Hail	0	0	\$0	\$129
Hail	Drought/Heatwave 1986	1986	6/8/1986	6/8/1986	Greenville County	Hail	0	0	\$0	\$129
Hail	Drought/Heatwave 1986	1986	6/24/1986	6/24/1986	Tigerville	Hail	0	0	\$12,907	\$12,907
Hail	Drought/Heatwave 1986	1986	7/26/1986	7/26/1986	Tigerville	Hail	0	0	\$129	\$0
Hail		1987	5/1/1987	5/1/1987	Greenville County	Hail	0	0	\$1,245	\$12,453
Hail		1987	5/4/1987	5/4/1987	Greenville County	Hail	0	0	\$0	\$12,453
Hail		1987	6/24/1987	6/24/1987	Mauldin	Hail	0	0	\$125	\$12,453
Hail		1987	6/24/1987	6/24/1987	Marietta and Paris Mountain State Park	Hail	0	0	\$125	\$1,245
Hail		1988	5/4/1988	5/4/1988	Eastern Greenville	Hail	0	0	\$0	\$120
Hail	Drought/Heatwave 1993 Southeast	1993	6/12/1993	6/12/1993	Hail (1.75)	W Greenville	0	0	\$0	\$979

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Hail		2003	5/2/2003	5/2/2003		NCDC_Hail	1	0	\$0	\$0
Hail		2003	5/3/2003	5/3/2003		NCDC_Hail	0	0	\$0	\$1,538
Hail/ Lightning		1973	12/13/1973	12/13/1973	Northern and Western SC	Hail/ Lightning	0	0	\$118	\$12
Hail/ Lightning		1994	7/21/1994	7/21/1994	Greenville	Hail (0.75)/ Lightning	1	0	\$0	\$0
Hail/ Lightning/ Severe Storm/Thunder Storm		1966	6/29/1966	6/29/1966	Greenville and Spartanburg Counties	Thunderstorm/ hail and lightning	0	1	\$2,183	\$21,831
Hail/ Lightning/ Severe Storm/Thunder Storm		1966	8/26/1966	8/26/1966	Greenville County	Hail/ lightning/ rain	0	0	\$0	\$437
Hail/ Lightning/ Severe Storm/Thunder Storm/ Wind		1994	7/19/1994	7/19/1994	Tigerville	Thunderstorm Winds/ Hail	0	0	\$0	\$95,454
Hail/ Lightning/ Severe Storm/Thunder Storm/ Wind		1973	5/20/1973	5/20/1973	NORTHERN & NORTHEAST SC	HAIL/ WIND/ RAIN/ ELECTRICAL	0	0	\$15,172	\$1,517
Hail/ Lightning/ Severe Storm/Thunder Storm/ Wind		1984	6/20/1984	6/20/1984	Statewide	Rain/Hail/Lighting/Wind	0	0	\$296	\$2,960
Hail/ Lightning/ Severe Storm/Thunder Storm/ Wind		1982	6/10/1982	6/10/1982	Western/ Northern/ Central/ & Eastern SC	Hail/Lightning/Rain/Wind	0	0	\$357,544	\$357,544
Hail/ Lightning/ Severe Storm/Thunder Storm/ Wind		1969	6/8/1969	6/8/1969	Greenville and Lancaster Counties	Thunderstorms/ wind/ hail/ and lightning	0	0	\$1,927	\$19,273
Hail/ Lightning/ Severe Storm/Thunder Storm/ Wind		1982	4/26/1982	4/27/1982	Statewide	Thunderstorm/ Wind/ Lightning/ Hail	0	0	\$32	\$32
Hail/ Lightning/ Wind		1974	3/29/1974	3/29/1974	NORTHERN/ EASTERN/ CENTRAL SC	WIND/ HAIL/ ELECTRICAL	0	0	\$6,832	\$6,832
Hail/ Lightning/ Wind		1976	5/11/1976	5/11/1976	Near Camden/ Pickens/ Mullins/ Latta/ Greenville/ Orangeburg/ Bamberg/ Darlington/ Florence/ North/ and Marion	Hail/ High Winds/ Lightning	0	0	\$27,624	\$2,762
Hail/ Lightning/ Wind		1977	6/19/1977	6/19/1977	Mt. Lebanon/ Woodruff/ Cross Anchor	Hail Storm/ Lightning/ Wind	0	0	\$116,718	\$11,672
Hail/ Lightning/ Wind		1975	3/24/1975	3/24/1975	Statewide	Wind/ Lightning/ Hail	0	0	\$57	\$5,716
Hail/ Lightning/ Wind		1975	5/10/1975	5/10/1975	York to Bamberg and Spatanburg to Oconee and Anderson	Hail/ Wind/ Lightning	0	0	\$146,078	\$14,608
Hail/ Lightning/ Wind		1975	6/18/1975	6/18/1975	Statewide	Wind/ Lightning/ Hail	0	0	\$5,716	\$57
Hail/ Lightning/ Wind		1975	7/4/1975	7/4/1975	NORTHERN AND CENTRAL	WIND/ HAIL/ LIGHTNING	0	0	\$75,126	\$7,513
Hail/ Lightning/ Wind		1965	7/19/1965	7/19/1965	South Carolina	Hail/ lightning/ wind	0	0	\$98	\$976
Hail/ Lightning/ Wind		1973	5/28/1973	5/29/1973	Western and Northern	Hail/ wind/ electrical	0	0	\$1,180	\$1,180
Hail/ Lightning/ Wind		1975	3/7/1975	3/7/1975	Northwest/ central and northeast SC	wind/ lightning/ and hail	0	0	\$0	\$751
Hail/ Lightning/ Wind		1975	6/15/1975	6/15/1975	Northern and Central SC	Lightning/ wind/ hail	0	0	\$773	\$773
Hail/ Lightning/ Wind		1975	6/19/1975	6/19/1975	Northern and Western SC	Lightning/ wind/ hail	0	0	\$974	\$974
Hail/ Lightning/ Wind		1977	6/6/1977	6/6/1977	Statewide	Wind/ lightning/ hail	0	0	\$5,075	\$507
Hail/ Severe Storm/Thunder Storm		1979	5/22/1979	5/22/1979	Western SC	Hail/ Heavy Rain/ Thundersotrms	0	0	\$194,851	\$1,949
Hail/ Severe Storm/Thunder Storm		1960	6/5/1960	6/5/1960	Anderson and Greenville Counties	Thunderstorm and Hail	2	0	\$0	\$2,390

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Hail/ Severe Storm/Thunder Storm		1965	5/20/1965	5/20/1965	Travelers Rest/ Greenville County	Thunderstorm/ Hail	0	0	\$0	\$44,909
Hail/ Severe Storm/Thunder Storm		1978	5/24/1978	5/24/1978	Northwest and Northeast	Thunderstorm Hail	0	0	\$1,550	\$15
Hail/ Severe Storm/Thunder Storm		1982	5/16/1982	5/16/1982	Northern and Eastern	Heavy Rain/ Hail/ Thunderstorms	0	0	\$59	\$586
Hail/ Severe Storm/Thunder Storm/ Wind	Drought/Heatwave 1993 Southeast	1993	7/8/1993	7/8/1993	DONALDSON CENTER AIR PARK TO SIMPSONVILLE-MAULDIN	Thunderstorm Winds/ Hail	0	0	\$0	\$391,591
Hail/ Severe Storm/Thunder Storm/ Wind		1991	6/1/1991	6/1/1991	NW Greenville	Thunderstorm Winds/ Hail	0	1	\$0	\$207,727
Hail/ Severe Storm/Thunder Storm/ Wind		1989	4/4/1989	4/4/1989	Greenville	Thunderstorm Winds/ Hail	0	0	\$0	\$114,082
Hail/ Severe Storm/Thunder Storm/ Wind		1989	4/4/1989	4/4/1989	Mauldin and Simpsonville	Thunderstorm Winds/ Hail	0	0	\$0	\$1,140,824
Hail/ Severe Storm/Thunder Storm/ Wind		1990	7/1/1990	7/1/1990	7ENE Simpsonville	Hail/ Thunderstorm Winds	0	0	\$108,234	\$108,234
Hail/ Severe Storm/Thunder Storm/ Wind		1965	7/1/1965	7/31/1965	South Carolina	Wind/ heavy rain/ hail	0	0	\$0	\$976
Hail/ Severe Storm/Thunder Storm/ Wind		1975	9/5/1975	9/5/1975	Northwest and Central	Thunderstorm/ wind/ hail	0	0	\$2,390	\$2,390
Hail/ Severe Storm/Thunder Storm/ Wind		1982	5/17/1982	5/17/1982	North/ Central/ Southern	Thunderstorms/ High Winds/ hail	0	0	\$407	\$41
Hail/ Severe Storm/Thunder Storm/ Wind		1989	4/4/1989	4/4/1989	Greenville	Thunderstorm Wind	0	0	\$0	\$1,141
Hail/ Severe Storm/Thunder Storm/ Wind		1989	6/5/1989	6/5/1989	Mauldin	Thunderstorm Winds/ Hail	0	0	\$0	\$11,408
Hail/ Severe Storm/Thunder Storm/ Wind		1993	2/21/1993	2/21/1993	Possom Kingdom/ 6 to 8 E Belton	Thunderstorm winds/ hail	0	0	\$0	\$98
Hail/ Severe Storm/Thunder Storm/ Wind		1990	7/1/1990	7/1/1990	2N Pelham	Thunderstorm Wind/ Hail	0	0	\$0	\$1,082
Hail/ Severe Storm/Thunder Storm/ Wind		1990	9/10/1990	9/10/1990	Simpsonville	Thunderstorm Wind/ Hail	0	0	\$0	\$10,823
Hail/ Severe Storm/Thunder Storm/ Wind	Drought/Heatwave 1993 Southeast	1993	7/10/1993	7/10/1993	NORTH GREENVILLE	THUNDERSTORM WINDS/ HAIL	0	0	\$0	\$98
Hail/ Severe Storm/Thunder Storm/ Wind		1994	9/25/1994	9/25/1994	Northern part of Greenville	Thunderstorm Winds and Hail (1.75)	0	0	\$0	\$9,545
Hail/ Severe Storm/Thunder Storm/ Wind		1994	8/19/1994	8/19/1994	Mauldin	Hail (0.75)/ Thunderstorm Winds	0	0	\$0	\$9,545
Hail/ Severe Storm/Thunder Storm/ Wind/ Winter Weather		1985	2/11/1985	2/12/1985	Statewide	Wind/Snow/Hail/ThunderStorms	0	0	\$3	\$2,858
Hail/ Wind		1960	2/18/1960	2/18/1960	CENTRAL/ NORTHERN SOUTH CAROLINA	WINDSTORMS/ HAIL	0	0	\$0	\$1,365
Hail/ Wind		1963	5/16/1963	5/16/1963	NORTHERN SOUTH CAROLINA	HAIL AND WINDSTORM	0	0	\$25,683	\$0

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Hail/ Wind		1974	4/3/1974	4/3/1974	NORTHWEST SC	HAIL/ WIND	1	0	\$4,782	\$47,824
Hail/ Wind		1984	3/28/1984	3/28/1984	Greenville	Hail/Wind	0	0	\$136,152	\$136,152
Hail/ Wind		1985	6/2/1985	6/2/1985	Northwest South Carolina	Hail/Wind	0	0	\$21,912	\$21,912
Hail/ Wind		1985	6/7/1985	6/7/1985	Statewide	Hail/Wind	0	0	\$286	\$2,858
Hail/ Wind		1974	3/30/1974	3/30/1974	Northwestern SC	High winds and hail	0	0	\$221	\$0
Hail/ Wind		1975	6/5/1975	6/5/1975	Northwest SC	Wind/ hail	0	0	\$202	\$2,023
Hail/ Wind		1984	4/14/1984	4/14/1984	Northern and Central SC	Hail/ Wind	0	0	\$486	\$486
Hail/ Wind		1984	4/30/1984	4/30/1984	Berea	Hail/ Wind	0	0	\$1,362	\$13,615
Hail/ Wind		1994	9/25/1994	9/25/1994	Greer	Hail (1.75) and Funnel Cloud	0	0	\$0	\$955
Heat	Drought/Heatwave 1999	1999	7/26/1999	7/31/1999	SCZ006-10>12-19	EXCESSIVE HEAT M46OU/ M42OU/ M59PH/ M44OU/ M60PH/ F81PH/ M51OU	0	1	\$0	\$0
Heat	Drought/Heatwave 1993 Southeast	1993	6/1/1993	6/30/1993	Entire State	Dry Hot Weather	0	0	\$2,128,210	\$0
Heat		1995	8/16/1995	8/16/1995	Greer	HEAT	0	1	\$0	\$0
Heat		1985	6/1/1985	6/7/1985	Statewide	Hot/ Dry	0	0	\$285,805	\$0
Heat		1987	7/22/1987	7/22/1987	Taylor	heat (M69P)	0	1	\$0	\$0
Heat		1989	7/8/1989	7/8/1989	Greenville	Heat	0	1	\$0	\$0
Heat		1976	2/1/1976	2/29/1976	Statewide	Dry weather	0	0	\$5,405	\$540
Heat		1995	8/16/1995	8/16/1995	Greenville	Heat	0	1	\$0	\$0
Heat		2000	7/10/2000	7/10/2000	CZone: SC006-Greater Greenville	Heat	0	1	\$0	\$0
Hurricane/Tropical Storm		1964	8/29/1964	8/31/1964	STATEWIDE	TROPICAL STORM	0	0	\$9,920	\$9,920
Hurricane/Tropical Storm	Hurricane 1972 Agnes	1972	6/20/1972	6/21/1972	STATEWIDE	TROPICAL DEPRESSION AGNES	0	0	\$7,357	\$736
Hurricane/Tropical Storm		1968	6/7/1968	6/8/1968	Statewide	Tropical Storm	0	0	\$88	\$884
Hurricane/Tropical Storm		1964	9/12/1964	9/13/1964	South Carolina	Tropical Storm Dora	0	0	\$992	\$992
Hurricane/Tropical Storm	Hurricane 1989 Hugo	1989	9/22/1989	9/22/1989	Greenville County	Hurricane Hugo	0	0	\$11,408	\$11,408
Hurricane/Tropical Storm		1995	8/24/1995	8/29/1995	SCZ001-SCZ051/ Statewide	Tropical Storm Jerry	0	0	\$4,036	\$403,578
Hurricane/Tropical Storm	Hurricane 2020 Zeta	2020	10/29/2020	10/29/2020		NCDC_Tropical Storm	0	0	\$0	\$161,906
Lightning		1999	5/18/1999	5/18/1999	GREER	LIGHTNING	0	0	\$0	\$33,965
Lightning		1994	8/19/1994	8/19/1994	Mauldin	Lightning	0	0	\$0	\$95,454
Lightning		1995	1/29/1995	1/29/1995	Oconee/ Anderson and Greenville Counties	Lightning	0	0	\$0	\$3,094
Lightning		1998	8/11/1998	8/11/1998		LIGHTNING	0	0	\$0	\$8,679
Lightning		1976	6/29/1976	6/29/1976	Northwest and Northern S.C.	Lightning	0	0	\$14	\$13,812
Lightning		1984	7/13/1984	7/13/1984	Berea	Lightning	0	0	\$0	\$136,152
Lightning	Drought/Heatwave 1986	1986	7/25/1986	7/25/1986	Honea Path	Lightning	0	0	\$0	\$129,071
Lightning		1987	6/1/1987	6/1/1987	Greenville County	Lightning	0	0	\$0	\$124,527
Lightning		1988	4/12/1988	4/12/1988	Parker	Lightning	0	0	\$0	\$1,195,791
Lightning	Drought/Heatwave 1988	1988	7/13/1988	7/13/1988	Greenville	Lightning	0	0	\$0	\$191,327
Lightning		1991	9/18/1991	9/18/1991	Central and Southern Portions	Lightning	0	0	\$0	\$103,864
Lightning		1989	8/1/1989	8/1/1989	Southern Portions	Lightning	0	0	\$11,408	\$114,082
Lightning		1982	7/9/1982	7/9/1982	Greenville	Lightning	0	1	\$0	\$0

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Lightning		1965	7/14/1965	7/14/1965	Greenville/ Greenville County	Lightning	1	0	\$0	\$449
Lightning		1965	8/15/1965	8/15/1965	Piedmont/ Greenville county	Lightning	0	0	\$0	\$44,909
Lightning		1965	8/27/1965	8/27/1965	South Carolina	Severe Lightning	0	0	\$0	\$976
Lightning		1964	6/23/1964	6/23/1964	Greenville/ Greenville County	Electrical	0	0	\$0	\$45,633
Lightning		1964	7/15/1964	7/15/1964	Greer/ Greenville County	Electrical	0	0	\$0	\$45,633
Lightning		1975	7/24/1975	7/24/1975	Western central and northern SC	Lightning	0	0	\$0	\$751
Lightning		1984	8/9/1984	8/9/1984	Greenville	Lightning/ Wind	0	0	\$0	\$1,362
Lightning		1989	6/20/1989	6/20/1989	5E Simpsonville	Lightning	1	0	\$0	\$0
Lightning	Drought/Heatwave 1986	1986	7/27/1986	7/27/1986	Greenville	Lightning	0	0	\$0	\$12,907
Lightning	Drought/Heatwave 1988	1988	6/8/1988	6/8/1988	Greenville	Lightning	0	0	\$0	\$120
Lightning	Drought/Heatwave 1988	1988	6/18/1988	6/18/1988	Greenville	Lightning	0	0	\$0	\$120
Lightning		1990	7/1/1990	7/1/1990	5E Simpsonville	Lightning	1	0	\$0	\$1,082
Lightning		1993	3/23/1993	3/23/1993	Caesars Head	Lightning	0	0	\$0	\$979
Lightning		1994	4/27/1994	4/27/1994	Tigerville	Lightning	0	1	\$0	\$0
Lightning		1994	9/1/1994	9/1/1994	Mauldin	Lightning	1	0	\$0	\$0
Lightning		1994	7/10/1994	7/10/1994	Simpsonville	Lightning	1	0	\$0	\$0
Lightning	Severe Weather 2014 May Rockies/Midwest/Easter n	2014	5/27/2014	5/27/2014		NCDC_Lightning	0	0	\$0	\$29,878
Lightning		2018	5/11/2018	5/11/2018		NCDC_Lightning	1	0	\$0	\$0
Lightning		2000	6/20/2000	6/20/2000		NCDC_Lightning	0	0	\$0	\$657,199
Lightning		2003	8/4/2003	8/4/2003		NCDC_Lightning	0	0	\$0	\$153,763
Lightning		2004	6/9/2004	6/9/2004		NCDC_Lightning	0	0	\$0	\$14,977
Lightning		2007	8/24/2007	8/24/2007		NCDC_Lightning	0	0	\$0	\$6,823
Lightning		2009	7/27/2009	7/27/2009		NCDC_Lightning	0	0	\$0	\$263,753
Lightning/ Severe Storm/Thunder Storm	Drought/Heatwave 1993 Southeast	1993	7/19/1993	7/19/1993	GREENVILLE TO MAULDIN TO SIMPSONVILLE	Lightning/ Rain	0	0	\$0	\$978,977
Lightning/ Severe Storm/Thunder Storm		1982	7/29/1982	7/29/1982	Greenville	rain/ lightning	0	1	\$0	\$14,659
Lightning/ Severe Storm/Thunder Storm		1969	6/24/1969	6/24/1969	Greenville County	Thunderstorms/ lightning	0	1	\$0	\$0
Lightning/ Severe Storm/Thunder Storm		1966	8/19/1966	8/19/1966	Greer/ Greenville County	Lightning/ rain	0	0	\$0	\$4,366
Lightning/ Severe Storm/Thunder Storm		1974	8/4/1974	8/4/1974	Northeast	Rain/ lightning	0	0	\$205	\$0
Lightning/ Severe Storm/Thunder Storm/ Wind		1972	8/7/1972	8/7/1972	GREEVILLE COUNTYYY	THUNDERSTORMS/ RAIN/ HIGH WINDS/ LIGHTNING	0	0	\$0	\$338,426
Lightning/ Severe Storm/Thunder Storm/ Wind		1975	8/27/1975	8/27/1975	NORTH/ NORTHEAST/ AND CENTRAL	Lightning/ HIGH WIND/ THUNDERSTROMS	0	0	\$69	\$6,920

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Lightning/ Severe Storm/Thunder Storm/ Wind		1973	8/29/1973	8/29/1973	Northwest and Midlands/ S.C.	Wind/ Rain/ Electrical	0	0	\$16	\$159
Lightning/ Severe Storm/Thunder Storm/ Wind		1976	7/26/1976	7/27/1976	NW South Carolina	Lightning/ wind/ rain	0	0	\$191	\$1,912
Lightning/ Severe Storm/Thunder Storm/ Wind		1976	7/29/1976	7/29/1976	NW South Carolina	Lightning/ wind/ rain	0	0	\$19	\$1,912
Lightning/ Severe Storm/Thunder Storm/ Wind		1989	7/30/1989	7/30/1989	Greer	Thunderstorm Wind and Lightning	0	0	\$0	\$1,141
Lightning/ Severe Storm/Thunder Storm/ Wind		1991	5/5/1991	5/5/1991	3N Greenwood	Thunderstorm Winds/ Lightning	0	0	\$0	\$10,386
Lightning/ Severe Storm/Thunder Storm/ Wind		1991	6/16/1991	6/16/1991	Simpsonville	Thunderstorm Winds/ Lightning	0	0	\$0	\$10,386
Lightning/ Severe Storm/Thunder Storm/ Wind	Drought/Heatwave 1993 Southeast	1993	7/22/1993	7/22/1993	GREENWOOD AND VICINITY	THUNDERSTORM WINDS/ LIGHTNING	0	0	\$0	\$9,790
Lightning/ Severe Storm/Thunder Storm/ Wind	Drought/Heatwave 1993 Southeast	1993	7/22/1993	7/22/1993	WARE PLACE	THUNDERSTORM WINDS/ LIGHTNING	0	0	\$0	\$98
Lightning/ Severe Storm/Thunder Storm/ Wind	Drought/Heatwave 1993 Southeast	1993	7/25/1993	7/25/1993	DONALDSON CENTER AIR PARK	THUNDERSTORM WINDS/ LIGHTNING	1	0	\$0	\$979
Lightning/ Wind		1974	3/21/1974	3/21/1974	ENTIRE STATE	HIGH WINDS & ELECTRICAL	0	0	\$624	\$6,238
Lightning/ Wind		1974	4/2/1974	4/2/1974	NORTHWEST SC	WIND/ LIGHTNING	1	0	\$478	\$4,782
Lightning/ Wind		1974	4/8/1974	4/8/1974	CENTRAL/ WESTERN & NORTHERN SC	WIND/ ELECTRICAL	0	0	\$8	\$7,971
Lightning/ Wind		1977	7/14/1977	7/14/1977	Statewide	Wind/ Lightning	0	0	\$51	\$5,075
Lightning/ Wind		1980	7/10/1980	7/10/1980	Greenville/ Spartanburg/ Union/ and Cherokee Counties	wind/ lightning	0	0	\$4,292	\$42,919
Lightning/ Wind		1975	5/15/1975	5/15/1975	Statewide	Wind/ Lightning	0	0	\$57	\$5,716
Lightning/ Wind		1983	7/25/1983	7/25/1983	Statewide	Wind/ Lightning	0	0	\$31	\$3,088
Lightning/ Wind		1983	8/23/1983	8/23/1983	North and Central SC	Wind/ Lightning	0	0	\$0	\$4,058
Lightning/ Wind		1984	4/14/1984	4/14/1984	Greer	Wind/ Lightning	0	0	\$0	\$1,362
Lightning/ Wind		1980	7/4/1980	7/4/1980	Greenville/ Spartanburg/ Union Counties	Lightning and windstorm	1	0	\$572	\$5,723
Severe Storm/Thunder Storm		1992	6/9/1992	6/9/1992	Greenville	Heavy Rain	0	0	\$0	\$100,828
Severe Storm/Thunder Storm		1961	6/20/1961	6/21/1961	NORTHERN PARTS OF OCONEE/ PICKENS/ AND GREENVILLE COUNTIES	HEAVY RAIN	0	0	\$157,706	\$157,706
Severe Storm/Thunder Storm		1963	3/12/1963	3/13/1963	UPSTATE SC	RAINSTORM	0	0	\$0	\$77,049
Severe Storm/Thunder Storm		1963	3/5/1963	3/6/1963	UPSTATE SC	RAINSTORM	0	0	\$0	\$77,049
Severe Storm/Thunder Storm		1964	4/6/1964	4/8/1964	NORTHWESTERN SOUTH CAROLINA	HEAVY RAINS	0	0	\$760,549	\$760,549
Severe Storm/Thunder Storm		1964	10/15/1964	10/16/1964	STATEWIDE	RAINSTORM	0	0	\$9,920	\$0
Severe Storm/Thunder Storm		1964	10/4/1964	10/6/1964	STATEWIDE	RAINASTORM	0	0	\$99,202	\$99,202
Severe Storm/Thunder Storm		1967	8/20/1967	8/25/1967	Statewide	RAIN	0	0	\$921	\$92,074
Severe Storm/Thunder Storm		1969	9/19/1969	9/19/1969	Greenville	RAINSTORM	0	0	\$0	\$385,455
Severe Storm/Thunder Storm		1965	6/8/1965	6/16/1965	South Carolina	Locally heavy rains	0	0	\$97,627	\$0

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Severe Storm/Thunder Storm		1960	8/15/1960	8/15/1960	Greenville County	Thunderstorm	0	0	\$0	\$4,779
Severe Storm/Thunder Storm		1961	12/10/1961	12/13/1961	Northwest and Mountain Division	Heavy rains	0	0	\$0	\$7,885
Severe Storm/Thunder Storm		1963	8/13/1963	8/13/1963	Northwestern South Carolina	Thunderstorm	0	0	\$0	\$7,705
Severe Storm/Thunder Storm		1968	5/13/1968	5/13/1968	Greenville County	Thunderstorm	1	0	\$0	\$407
Severe Storm/Thunder Storm		1975	1/25/1975	1/25/1975	Across State	Squall line	0	0	\$0	\$572
Severe Storm/Thunder Storm		1975	9/23/1975	9/23/1975	Extreme Northwest	Heavy rains	0	0	\$0	\$6,574
Severe Storm/Thunder Storm		1977	10/1/1977	10/1/1977	Northwestern	Thunderstorm/ High Winds	0	0	\$0	\$180
Severe Storm/Thunder Storm		1977	12/5/1977	12/5/1977	Statewide South Carolina	thunderstorm	0	0	\$0	\$51
Severe Storm/Thunder Storm		1977	9/7/1977	9/7/1977	Mountains of North-west South Carolina	Heavy rain	0	0	\$19	\$1,945
Severe Storm/Thunder Storm		1978	4/13/1978	4/13/1978	Northeast S.C.	Severe Thunderstorm	0	0	\$0	\$1,550
Severe Storm/Thunder Storm		1979	3/23/1979	3/23/1979	Abbeville/ Anderson/ and Greenville Counties	Severe Thunderstorm	1	0	\$0	\$64,950
Severe Storm/Thunder Storm		1984	3/5/1984	3/6/1984	Northwestern SC	Heavy Rain/ Flooding	0	0	\$227	\$227
Severe Storm/Thunder Storm		1982	6/17/1982	6/17/1982	Table Rock Area	Rain	0	0	\$0	\$14,659
Severe Storm/Thunder Storm		1981	5/31/1981	5/31/1981	Piedmont	Thunderstorm	0	0	\$0	\$778
Severe Storm/Thunder Storm		1993	3/31/1993	3/31/1993	W Greenville	Thunderstorm winds/ funnel cloud/ hail	0	0	\$0	\$9,790
Severe Storm/Thunder Storm		1993	5/25/1993	5/25/1993	Fairview Community	Thunderstorm Winds	0	0	\$0	\$9,790
Severe Storm/Thunder Storm		1992	8/4/1992	8/4/1992	GREENVILLE	THUNDERSTORM WINDS	0	0	\$0	\$101
Severe Storm/Thunder Storm		1992	7/17/1992	7/17/1992	GREENVILLE	THUNDERSTORM WINDS	0	0	\$0	\$1,008
Severe Storm/Thunder Storm		1992	7/31/1992	7/31/1992	GREENVILLE	THUNDERSTORM WINDS	0	0	\$0	\$10,083
Severe Storm/Thunder Storm		1992	7/31/1992	7/31/1992	E GREENVILLE	THUNDERSTORM WINDS	0	0	\$0	\$10,083
Severe Storm/Thunder Storm		1994	6/2/1994	6/2/1994	Five/ Forks/ 6 ENE Simpsonville	Thunderstorm Winds	0	0	\$0	\$9,545
Severe Storm/Thunder Storm		1994	6/26/1994	6/26/1994	Marietta	Thunderstorm Winds	0	0	\$0	\$9,545
Severe Storm/Thunder Storm		1994	6/26/1994	6/26/1994	Simpsonville and East	Thunderstorm Winds	0	0	\$0	\$955
Severe Storm/Thunder Storm		1995	3/8/1995	3/8/1995	Taylors	Thunderstorm Winds	0	0	\$0	\$3,713
Severe Storm/Thunder Storm		1995	3/8/1995	3/8/1995	8N Greer	Thunderstorm Winds	0	0	\$0	\$1,856
Severe Storm/Thunder Storm		1995	6/9/1995	6/9/1995	Fountain Inn	Thunderstorm Winds	0	0	\$0	\$92,823
Severe Storm/Thunder Storm/ Wind		1999	6/10/1999	6/10/1999	PIEDMONT	TSTM WIND	0	0	\$0	\$8,491
Severe Storm/Thunder Storm/ Wind		1999	7/6/1999	7/6/1999	MAULDIN	TSTM WIND	0	0	\$0	\$16,982
Severe Storm/Thunder Storm/ Wind		1999	8/1/1999	8/1/1999	PIEDMONT	THUNDERSTORM WIND	0	0	\$0	\$110,385
Severe Storm/Thunder Storm/ Wind		1997	7/28/1997	7/28/1997	SIMPSONVILLE	THUNDERSTORM WIND	0	0	\$0	\$8,814
Severe Storm/Thunder Storm/ Wind		1997	7/24/1997	7/24/1997	TAYLORS	THUNDERSTORM WIND	0	0	\$0	\$44,069
Severe Storm/Thunder Storm/ Wind		1996	1/19/1996	1/19/1996	Greenville	Thunderstorm Wind (G50)	0	0	\$0	\$27,048
Severe Storm/Thunder Storm/ Wind		1996	3/15/1996	3/15/1996	Travelers Rest Wares Xrds	Thunderstorm Wind	0	0	\$0	\$721,286

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Severe Storm/Thunder Storm/ Wind		1996	3/16/1996	3/16/1996	White House	Thunderstorm Wind	0	0	\$0	\$27,048
Severe Storm/Thunder Storm/ Wind		1996	4/20/1996	4/20/1996	Simpsonville	Thunderstorm Wind	0	0	\$0	\$27,048
Severe Storm/Thunder Storm/ Wind		1996	4/26/1996	4/26/1996	Donaldson AFB	Thunderstorm Wind	0	0	\$0	\$18,032
Severe Storm/Thunder Storm/ Wind		1996	6/4/1996	6/4/1996	Marietta	Thunderstorm Wind (G50)	0	0	\$0	\$9,016
Severe Storm/Thunder Storm/ Wind		1996	7/14/1996	7/14/1996	Greenville	Thunderstorm Wind (G50)	0	0	\$0	\$27,048
Severe Storm/Thunder Storm/ Wind		1996	7/17/1996	7/17/1996	1 W Gsp Intl Airport	Thunderstorm Wind (G70)	0	0	\$0	\$36,064
Severe Storm/Thunder Storm/ Wind		1996	8/24/1996	8/24/1996	6 E Simpsonville	Thunderstorm Wind (G50)	0	0	\$0	\$18,032
Severe Storm/Thunder Storm/ Wind	Hurricane 1996 Fran	1996	9/7/1996	9/7/1996	Greenville	Thunderstorm Wind (G50)	0	0	\$0	\$36,064
Severe Storm/Thunder Storm/ Wind		1992	7/21/1992	7/21/1992	Greenville Downtown Airport	Thunderstorm Winds	0	0	\$0	\$100,828
Severe Storm/Thunder Storm/ Wind		1995	1/14/1995	1/14/1995	Simpsonville	Thunderstorm Winds	0	0	\$0	\$9,282
Severe Storm/Thunder Storm/ Wind		1995	5/28/1995	5/28/1995	TAYLORS	THUNDERSTORM WIND	0	0	\$0	\$3,713
Severe Storm/Thunder Storm/ Wind		1995	6/9/1995	6/9/1995	Travelers Rest	Thunderstorm Winds	0	0	\$0	\$3,713
Severe Storm/Thunder Storm/ Wind		1995	6/10/1995	6/10/1995	Piedmont	Thunderstorm Winds	0	0	\$0	\$46,411
Severe Storm/Thunder Storm/ Wind		1998	5/27/1998	5/27/1998		THUNDERSTORM WIND	3	0	\$0	\$0
Severe Storm/Thunder Storm/ Wind		1998	6/19/1998	6/19/1998		THUNDERSTORM WIND	0	0	\$0	\$34,715
Severe Storm/Thunder Storm/ Wind		1970	9/19/1970	9/19/1970	GREENVILLE COUNTY	THUNDERSTORM/ HIGH WINDS	0	0	\$0	\$364,593
Severe Storm/Thunder Storm/ Wind	Drought/Heatwave 1988	1988	7/16/1988	7/16/1988	Tigerville	Severe Storm-Wind	0	0	\$120	\$119,579
Severe Storm/Thunder Storm/ Wind		1983	12/3/1983	12/4/1983	Western & Central	Wind/ Heavy Rain	0	0	\$546	\$5,463
Severe Storm/Thunder Storm/ Wind		1989	6/5/1989	6/5/1989	Taylors	Thunderstorm Winds	0	0	\$0	\$114,082
Severe Storm/Thunder Storm/ Wind		1989	6/5/1989	6/5/1989	Greer	Thunderstorm Winds	0	0	\$0	\$114,082
Severe Storm/Thunder Storm/ Wind		1990	4/10/1990	4/10/1990	6NNW Greer	Thunderstorm Winds	4	0	\$0	\$108,234
Severe Storm/Thunder Storm/ Wind		1972	6/6/1972	6/6/1972	Greenville and Anderson Counties	Thunderstorms/ rain/ high winds	0	0	\$0	\$16,921

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Severe Storm/Thunder Storm/ Wind		1961	2/24/1961	2/24/1961	Western and Central	Wind and Rain	0	0	\$0	\$1,352
Severe Storm/Thunder Storm/ Wind		1966	2/13/1966	2/13/1966	statewide	wind and rain	0	0	\$0	\$949
Severe Storm/Thunder Storm/ Wind		1969	5/23/1969	5/23/1969	Anderson and Greenville Counties	High winds/ thunderstorms/ rain	0	0	\$0	\$19,273
Severe Storm/Thunder Storm/ Wind		1968	8/8/1968	8/8/1968	Greenville County	Thunderstorm/ windstorm	0	0	\$0	\$40,650
Severe Storm/Thunder Storm/ Wind		1971	3/15/1971	3/15/1971	Statewide	Thunderstorms/ high winds	0	0	\$0	\$759
Severe Storm/Thunder Storm/ Wind		1970	8/2/1970	8/2/1970	Greenville County	Thunderstorm/ high winds	0	0	\$0	\$36,459
Severe Storm/Thunder Storm/ Wind		1975	7/14/1975	7/14/1975	Central and Northern SC	Wind/ rain	0	0	\$8	\$77
Severe Storm/Thunder Storm/ Wind		1976	8/13/1976	8/13/1976	Greer	Thunderstorm/ high wind	0	0	\$0	\$24,862
Severe Storm/Thunder Storm/ Wind		1977	3/31/1977	3/31/1977	Statewide	High winds/ heavy rains	0	0	\$0	\$51
Severe Storm/Thunder Storm/ Wind		1977	9/7/1977	9/7/1977	Statewide	Thunderstorms/ high winds/ heavy rain	0	0	\$51	\$507
Severe Storm/Thunder Storm/ Wind		1977	9/27/1977	9/27/1977	Greenville County	Thunderstorms/ high winds/ heavy rain	0	0	\$0	\$2,334
Severe Storm/Thunder Storm/ Wind		1983	7/20/1983	7/20/1983	Taylors area	High Winds/ Thunderstorm	0	0	\$0	\$14,203
Severe Storm/Thunder Storm/ Wind		1983	7/21/1983	7/21/1983	Greeville	Thunderstorm Winds	0	0	\$0	\$1,420
Severe Storm/Thunder Storm/ Wind		1989	5/5/1989	5/5/1989	Paris Mountain	Thunderstorm Winds	0	0	\$0	\$11,408
Severe Storm/Thunder Storm/ Wind		1989	5/5/1989	5/5/1989	Fountain Inn	Thunderstorm Winds	0	0	\$0	\$1,141
Severe Storm/Thunder Storm/ Wind		1989	6/5/1989	6/5/1989	Simpsonville	Thunderstorm Winds	0	0	\$0	\$11,408
Severe Storm/Thunder Storm/ Wind		1989	6/5/1989	6/5/1989	1W Greenville	Thunderstorm Winds	0	0	\$0	\$11,408
Severe Storm/Thunder Storm/ Wind		1989	6/5/1989	6/5/1989	Greer Airport	Thunderstorm Winds	0	0	\$0	\$1,141
Severe Storm/Thunder Storm/ Wind		1989	6/15/1989	6/15/1989	West Greenville	Thunderstorm Winds	0	0	\$0	\$1,141
Severe Storm/Thunder Storm/ Wind		1989	6/20/1989	6/20/1989	Eastern Greenville County	Thunderstorm Winds	0	0	\$0	\$11,408
Severe Storm/Thunder Storm/ Wind		1989	8/1/1989	8/1/1989	Fountain Inn	Thunderstorm Wind	0	0	\$0	\$1,141
Severe Storm/Thunder Storm/ Wind		1989	11/15/1989	11/15/1989	near Tigerville	Thunderstorm Wind	0	0	\$0	\$11,408

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Severe Storm/Thunder Storm/ Wind		1986	2/6/1986	2/6/1986	Greenville County	Thunderstorm Winds	0	0	\$0	\$1,291
Severe Storm/Thunder Storm/ Wind		1987	5/1/1987	5/1/1987	Greenville County	Thunderstorm Wind	0	0	\$125	\$1,245
Severe Storm/Thunder Storm/ Wind		1987	5/4/1987	5/4/1987	Greenville County	Thunderstorm Wind	0	0	\$0	\$1,245
Severe Storm/Thunder Storm/ Wind		1987	5/28/1987	5/28/1987	Greenville County	Thunderstorm Wind	0	0	\$0	\$1,245
Severe Storm/Thunder Storm/ Wind		1987	6/1/1987	6/1/1987	Greenville County	Thunderstorm Wind	0	0	\$0	\$1,245
Severe Storm/Thunder Storm/ Wind		1987	6/24/1987	6/24/1987	Mauldin	Thunderstorm Wind	0	0	\$0	\$12,453
Severe Storm/Thunder Storm/ Wind		1987	6/24/1987	6/24/1987	Greenville	Thunderstorm Wind	0	0	\$0	\$125
Severe Storm/Thunder Storm/ Wind		1987	6/24/1987	6/24/1987	Marietta and Paris Mountain State Park	Thunderstorm Wind	0	0	\$0	\$1,245
Severe Storm/Thunder Storm/ Wind		1987	7/5/1987	7/5/1987	Moonville	Thunderstorm Wind	0	0	\$0	\$125
Severe Storm/Thunder Storm/ Wind		1987	7/30/1987	7/30/1987	Tigerville	Thunderstorm Wind	0	0	\$0	\$125
Severe Storm/Thunder Storm/ Wind		1988	8/1/1988	8/1/1988	Greenville	Thunderstorm Wind	0	0	\$0	\$120
Severe Storm/Thunder Storm/ Wind		1990	2/10/1990	2/10/1990	Greenville Downtown Aiport	Thunderstorm Wind	0	0	\$0	\$10,823
Severe Storm/Thunder Storm/ Wind		1990	2/10/1990	2/10/1990	8N Greer	Thunderstorm Wind	0	0	\$0	\$1,082
Severe Storm/Thunder Storm/ Wind		1990	4/10/1990	4/10/1990	Travelers Rest	Thunderstorm Winds	0	0	\$0	\$1,082
Severe Storm/Thunder Storm/ Wind	Drought/Heatwave 1988	1988	7/21/1988	7/21/1988	Greenville	Thunderstorm wind	0	0	\$0	\$1,196
Severe Storm/Thunder Storm/ Wind		1992	3/10/1992	3/10/1992	5 to 8 ENE Simpsonville	thunderstorm winds	0	0	\$0	\$1,008
Severe Storm/Thunder Storm/ Wind		1990	8/9/1990	8/9/1990	West Greenville	Thunderstorm Wind	0	0	\$0	\$1,082
Severe Storm/Thunder Storm/ Wind		1994	3/27/1994	3/27/1994	City-view and Berea	Thunderstorm Winds	0	0	\$0	\$9,545
Severe Storm/Thunder Storm/ Wind		1991	4/8/1991	4/8/1991	West Greenville	Thunderstorm Wind	0	0	\$0	\$104
Severe Storm/Thunder Storm/ Wind		1996	3/15/1996	3/15/1996	Greer Greenville Spartanbu	Thunderstorm Wind M31PH	3	1	\$0	\$180,321
Severe Storm/Thunder Storm/ Wind		1996	3/15/1996	3/15/1996	Donaldson Fountain Inn	Thunderstorm Wind	0	0	\$0	\$90,161

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Severe Storm/Thunder Storm/ Wind	Flooding/Severe Weather/Tornadoes 2011 Midwest/Ohio Valley/Southeast/Mississippi and Missouri Rivers	2011	6/21/2011	6/21/2011		NCDC_Thunderstorm Wind	1	0	\$0	\$0
Severe Storm/Thunder Storm/ Wind		2015	8/5/2015	8/5/2015		NCDC_Thunderstorm Wind	0	0	\$0	\$1,194
Severe Storm/Thunder Storm/ Wind	Flooding/Severe Weather 2015 TX; OK	2015	5/26/2015	5/26/2015		NCDC_Thunderstorm Wind	0	0	\$0	\$11,937
Severe Storm/Thunder Storm/ Wind		2015	9/4/2015	9/4/2015		NCDC_Thunderstorm Wind	0	0	\$0	\$119,369
Severe Storm/Thunder Storm/ Wind		2016	8/7/2016	8/7/2016		NCDC_Thunderstorm Wind	0	0	\$0	\$579
Severe Storm/Thunder Storm/ Wind	Flooding/Severe Weather 2017 April/May Midwest/Central/Southeast	2017	3/1/2017	3/1/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$22,685
Severe Storm/Thunder Storm/ Wind		2017	4/5/2017	4/5/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$567
Severe Storm/Thunder Storm/ Wind		2017	4/5/2017	4/5/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$11,343
Severe Storm/Thunder Storm/ Wind		2017	4/3/2017	4/3/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$11,343
Severe Storm/Thunder Storm/ Wind		2017	5/5/2017	5/5/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$56,713
Severe Storm/Thunder Storm/ Wind		2017	6/24/2017	6/24/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$11,343
Severe Storm/Thunder Storm/ Wind		2017	7/2/2017	7/2/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$11,343
Severe Storm/Thunder Storm/ Wind		2017	7/5/2017	7/5/2017		NCDC_Thunderstorm Wind	0	0	\$0	\$2,269
Severe Storm/Thunder Storm/ Wind		2018	6/25/2018	6/25/2018		NCDC_Thunderstorm Wind	0	0	\$0	\$5,634
Severe Storm/Thunder Storm/ Wind		2018	6/17/2018	6/17/2018		NCDC_Thunderstorm Wind	0	0	\$0	\$5,634
Severe Storm/Thunder Storm/ Wind		2000	4/3/2000	4/3/2000		NCDC_Thunderstorm Wind	0	0	\$0	\$1,643
Severe Storm/Thunder Storm/ Wind		2000	5/25/2000	5/25/2000		NCDC_Thunderstorm Wind	2	0	\$0	\$0
Severe Storm/Thunder Storm/ Wind		2000	7/22/2000	7/22/2000		NCDC_Thunderstorm Wind	0	0	\$0	\$213,590

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Severe Storm/Thunder Storm/ Wind		2000	11/9/2000	11/9/2000		NCDC_Thunderstorm Wind	0	0	\$0	\$1,643
Severe Storm/Thunder Storm/ Wind		2002	11/11/2002	11/11/2002		NCDC_Thunderstorm Wind	0	0	\$0	\$7,863
Severe Storm/Thunder Storm/ Wind		2002	6/30/2002	6/30/2002		NCDC_Thunderstorm Wind	0	0	\$0	\$15,727
Severe Storm/Thunder Storm/ Wind		2002	6/4/2002	6/4/2002		NCDC_Thunderstorm Wind	0	0	\$0	\$4,718
Severe Storm/Thunder Storm/ Wind		2002	8/17/2002	8/17/2002		NCDC_Thunderstorm Wind	0	0	\$0	\$39,317
Severe Storm/Thunder Storm/ Wind		2002	7/10/2002	7/10/2002		NCDC_Thunderstorm Wind	0	0	\$0	\$15,727
Severe Storm/Thunder Storm/ Wind		2002	7/1/2002	7/1/2002		NCDC_Thunderstorm Wind	0	0	\$0	\$15,727
Severe Storm/Thunder Storm/ Wind		2002	11/11/2002	11/11/2002		NCDC_Thunderstorm Wind	0	0	\$0	\$15,727
Severe Storm/Thunder Storm/ Wind		2003	7/29/2003	7/29/2003		NCDC_Thunderstorm Wind	0	0	\$0	\$1,538
Severe Storm/Thunder Storm/ Wind		2003	8/4/2003	8/4/2003		NCDC_Thunderstorm Wind	0	0	\$0	\$1,538
Severe Storm/Thunder Storm/ Wind		2003	2/4/2003	2/4/2003		NCDC_Thunderstorm Wind	0	0	\$0	\$1,538
Severe Storm/Thunder Storm/ Wind		2003	5/2/2003	5/2/2003		NCDC_Thunderstorm Wind	0	0	\$0	\$3,075
Severe Storm/Thunder Storm/ Wind		2003	5/16/2003	5/16/2003		NCDC_Thunderstorm Wind	0	0	\$0	\$1,538
Severe Storm/Thunder Storm/ Wind		2003	5/2/2003	5/2/2003		NCDC_Thunderstorm Wind	0	0	\$0	\$4,613
Severe Storm/Thunder Storm/ Wind		2003	8/16/2003	8/16/2003		NCDC_Thunderstorm Wind	0	0	\$0	\$461,290
Severe Storm/Thunder Storm/ Wind		2004	7/5/2004	7/5/2004		NCDC_Thunderstorm Wind	0	0	\$0	\$224,662
Severe Storm/Thunder Storm/ Wind		2004	8/20/2004	8/20/2004		NCDC_Thunderstorm Wind	0	0	\$0	\$2,995
Severe Storm/Thunder Storm/ Wind		2004	7/5/2004	7/5/2004		NCDC_Thunderstorm Wind	0	0	\$0	\$7,489
Severe Storm/Thunder Storm/ Wind		2005	4/22/2005	4/22/2005		NCDC_Thunderstorm Wind	0	0	\$0	\$7,243
Severe Storm/Thunder Storm/ Wind		2005	4/22/2005	4/22/2005		NCDC_Thunderstorm Wind	0	0	\$0	\$36,217
Severe Storm/Thunder Storm/ Wind		2005	6/6/2005	6/6/2005		NCDC_Thunderstorm Wind	0	0	\$0	\$1,449
Severe Storm/Thunder Storm/ Wind		2006	8/20/2006	8/20/2006		NCDC_Thunderstorm Wind	0	1	\$0	\$0

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Severe Storm/Thunder Storm/ Wind		2007	6/30/2007	6/30/2007		NCDC_Thunderstorm Wind	0	0	\$0	\$4,094
Severe Storm/Thunder Storm/ Wind		2007	6/25/2007	6/25/2007		NCDC_Thunderstorm Wind	0	0	\$0	\$13,645
Severe Storm/Thunder Storm/ Wind		2008	7/21/2008	7/21/2008		NCDC_Thunderstorm Wind	0	0	\$0	\$657,037
Severe Storm/Thunder Storm/ Wind		2008	7/29/2008	7/29/2008		NCDC_Thunderstorm Wind	0	0	\$0	\$13,141
Severe Storm/Thunder Storm/ Wind		2020	5/22/2020	5/22/2020		NCDC_Thunderstorm Wind	0	0	\$0	\$2,159
Severe Storm/Thunder Storm/ Wind	Severe Weather/Hail/Tornadoes 2020 North/Central	2020	4/9/2020	4/9/2020		NCDC_Thunderstorm Wind	0	0	\$0	\$10,794
Severe Storm/Thunder Storm/ Wind	Severe Weather/Tornadoes Southeast/East	2020	4/13/2020	4/13/2020		NCDC_Thunderstorm Wind	0	0	\$0	\$5,397
Severe Storm/Thunder Storm/ Wind		2020	6/21/2020	6/21/2020		NCDC_Thunderstorm Wind	0	0	\$0	\$269,843
Severe Storm/Thunder Storm/ Wind		2022	6/27/2022	6/27/2022		NCDC_Thunderstorm Wind	0	0	\$0	\$50,000
Severe Storm/Thunder Storm/ Wind/ Winter Weather		1971	12/3/1971	12/3/1971	SOUTH CAROLINA	SNOW/ SLEET/ FREEZIING RAIN/ RAIN/ WINDS	0	0	\$75,932	\$75,932
Severe Storm/Thunder Storm/ Winter Weather		1968	1/9/1968	1/13/1968	Northern 2/3 of state	rain/ sleet/ snow/ and freezing rain	0	0	\$13	\$127,031
Tornado		1973	5/27/1973	5/27/1973	Southeast of Greenville/ Northeastward through Northwest Cherokee County	Tornado	15	0	\$106,203	\$1,062,028
Tornado		1980	4/13/1980	4/13/1980	Ware's Place	Tornado	3	0	\$0	\$858,387
Tornado		1979	3/23/1979	3/23/1979	Greenville/ Greenville County	Tornado	2	0	\$0	\$1,948,514
Tornado		1975	3/24/1975	3/24/1975	Pickens and Greenville Counties	Tornado	4	0	\$0	\$131,470
Tornado		1995	10/5/1995	10/5/1995	3 SW Simpsonville	Tornado (F0)	0	0	\$0	\$139,234
Tornado		1996	9/16/1996	9/16/1996	2 S Piedmont to 2 E Piedmont	Tornado (F0)	0	0	\$0	\$27,048
Tornado		1990	2/10/1990	2/10/1990	Eastside Greenville	Tornado (F1)	0	0	\$0	\$108,234
Tornado		1967	5/2/1967	5/2/1967	Greenville County	Small Tornado	0	0	\$0	\$42,354
Tornado		1964	6/21/1964	6/21/1964	Simpsonville/ Greenville County	Tornado	0	0	\$0	\$45,633
Tornado		1967	7/12/1967	7/12/1967	Greenville County	Small Tornado	0	0	\$0	\$42,354
Tornado		1973	3/31/1973	3/31/1973	Pickens and Greenville Counties	Tornado	0	0	\$0	\$15,930
Tornado		1973	5/27/1973	5/27/1973	3 miles west of Pickens to 1 mile south of Tigerville	Tornado	0	0	\$1,593	\$15,930
Tornado		1973	5/28/1973	5/28/1973	Richmondhill	Tornado	0	0	\$0	\$3,186
Tornado		1994	3/28/1994	3/28/1994	Tigerville	Tornado (F0)	0	0	\$0	\$955
Tornado		1994	3/27/1994	3/27/1994	Gowensbille to Arrowwood Community	Tornado (F1)	0	0	\$0	\$477

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Tornado		2013	6/10/2013	6/10/2013		NCDC_Tornado	0	0	\$0	\$6,072
Tornado		2014	10/14/2014	10/14/2014		NCDC_Tornado	0	0	\$0	\$1,195
Tornado		2016	11/30/2016	11/30/2016		NCDC_Tornado	0	0	\$0	\$578,877
Tornado		2017	4/3/2017	4/3/2017		NCDC_Tornado	0	0	\$0	\$22,685
Tornado		2017	10/8/2017	10/8/2017		NCDC_Tornado	0	0	\$0	\$56,713
Tornado		2002	11/11/2002	11/11/2002		NCDC_Tornado	0	0	\$0	\$393,169
Tornado		2002	11/11/2002	11/11/2002		NCDC_Tornado	0	0	\$0	\$3,145
Tornado		2008	8/26/2008	8/26/2008		NCDC_Tornado	0	0	\$0	\$65,704
Tornado		2019	4/14/2019	4/14/2019		NCDC_Tornado	0	0	\$0	\$163,758
Tornado	Severe Weather/Tornadoes Southeast/East	2020	4/13/2020	4/13/2020		NCDC_Tornado	0	0	\$0	\$107,937
Tornado	Severe Weather/Tornadoes Southeast/East	2020	4/13/2020	4/13/2020		NCDC_Tornado	0	0	\$0	\$21,587
Tornado		2020	4/25/2020	4/25/2020		NCDC_Tornado	0	0	\$0	\$5,396,853
Tornado	Tropical Storm 2021 Fred	2021	8/17/2021	8/17/2021		NCDC_Tornado	0	0	\$0	\$107,480
Wildfire		1966	3/15/1966	3/31/1966	STATEWIDE	FOREST FIRES	0	0	\$0	\$94,916
Wildfire		1985	3/1/1985	3/21/1985	Statewide	Fire	0	0	\$285,805	\$28,581
Wildfire		1985	4/1/1985	4/30/1985	Statewide	Fire	0	0	\$28,581	\$286
Wind		1997	5/13/1997	5/13/1997	GREENVILLE; SCZ006	GUSTY WINDS	6	0	\$0	\$5,288
Wind		1995	3/8/1995	3/8/1995	N Greenville County	High Winds	0	0	\$0	\$18,565
Wind		1995	11/11/1995	11/11/1995	Mountains/ Foothills/ and Lower Piedmont	High Winds	0	0	\$0	\$66,302
Wind		1998	2/3/1998	2/3/1998	SCZ001>008-010>013-019	High Wind	0	0	\$0	\$17,357
Wind		1981	3/16/1981	3/16/1981	Statewide	High Winds	0	0	\$3	\$3,383
Wind		1980	2/25/1980	2/25/1980	Statewide	Windstorm	0	0	\$0	\$3,732
Wind		1961	11/23/1961	11/23/1961	South Carolina	Windstorm	0	0	\$0	\$1,029
Wind		1964	1/20/1964	1/20/1964	Most of South Carolina	Windstorm	0	0	\$0	\$992
Wind		1968	3/22/1968	3/22/1968	Greenville/ Anderson/ and Pickens Counties	Windstorm	0	0	\$0	\$13,550
Wind		1968	7/28/1968	7/28/1968	Greenville and Laurens counties	Windstorm	0	0	\$0	\$20,325
Wind		1961	2/25/1961	2/25/1961	South Carolina	High Winds	0	0	\$0	\$1,029
Wind		1976	2/18/1976	2/18/1976	Northwestern	Wind	0	0	\$191	\$1,912
Wind		1973	11/21/1973	11/21/1973	Western/ Central/ Northern/ and Eastern SC	Windstorm	0	0	\$0	\$937
Wind		1972	3/2/1972	3/2/1972	Greenville/ Aiken/ and Anderson Counties	Wind	0	0	\$0	\$11,281
Wind		1974	11/20/1974	11/20/1974	Western SC	Wind	0	0	\$0	\$1,366
Wind		1975	12/31/1975	12/31/1975	Statewide	Strong winds	0	0	\$0	\$572
Wind		1977	3/18/1977	3/18/1977	Statewide	High Winds	0	0	\$51	\$51
Wind		1977	4/4/1977	4/4/1977	Statewide	Strong Winds	0	0	\$51	\$507
Wind		1982	4/3/1982	4/3/1982	Greenville	High Winds	0	0	\$0	\$7,330

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Wind		1984	3/8/1984	3/8/1984	Statewide	High Winds	0	0	\$30	\$296
Wind		1984	11/10/1984	11/10/1984	Abbeville Co. Anderson Co. Greenville Co. Laurens Co. Oconee Co.	High Wind	0	0	\$0	\$272
Wind		1989	1/3/1989	1/3/1989	Greeville	High Wind	0	0	\$0	\$114
Wind	Drought/Heatwave 1986	1986	6/8/1986	6/8/1986	Greenville County	Wind	0	0	\$0	\$129
Wind	Drought/Heatwave 1986	1986	6/24/1986	6/24/1986	Cleveland	Wind	0	0	\$0	\$129
Wind	Drought/Heatwave 1986	1986	7/14/1986	7/14/1986	Simpsonville	Wind	0	0	\$0	\$1,291
Wind	Drought/Heatwave 1986	1986	7/15/1986	7/15/1986	5 Miles South of Greenville	Wind	0	0	\$0	\$129
Wind		1987	2/8/1987	2/8/1987	SCZ002 Northwest SC	High Winds	0	0	\$0	\$1,779
Wind	Drought/Heatwave 1988	1988	2/27/1988	2/27/1988	Statewide	Strong Wind	0	0	\$0	\$26
Wind		1988	11/5/1988	11/5/1988	Western/ Northern/ and Northeastern SC	High Wind	0	0	\$0	\$386
Wind		1988	11/5/1988	11/5/1988	Greenville	High Wind	0	0	\$0	\$120
Wind		1985	4/7/1985	4/7/1985	Greenville	Wind	0	0	\$0	\$13,147
Wind		1985	7/13/1985	7/13/1985	Greenville	Wind	0	0	\$0	\$13,147
Wind	Blizzard 1993 Storm of the Century	1993	3/13/1993	3/13/1993	SCZ001-002	High winds	0	0	\$122,372	\$122,372
Wind		1996	1/18/1996	1/18/1996		High Wind (G50)	0	0	\$0	\$3,005
Wind		1989	1/3/1989	1/3/1989	Statewide	High Wind	0	0	\$2	\$2,480
Wind		2012	4/5/2012	4/5/2012		NCDC_Strong Wind	0	0	\$0	\$24,646
Wind	Winter Storm 2015 Central/East	2015	2/14/2015	2/15/2015		NCDC_High Wind	0	0	\$0	\$23,874
Wind	Winter Storm 2015 Central/East	2015	2/14/2015	2/15/2015		NCDC_High Wind	0	0	\$0	\$5,968
Wind	Hurricane 2017 Irma	2017	9/11/2017	9/11/2017		NCDC_High Wind	0	0	\$0	\$11,343
Wind	Hurricane 2017 Irma	2017	9/11/2017	9/11/2017		NCDC_High Wind	0	0	\$0	\$11,343
Wind	Hurricane 2018 Florence	2018	9/15/2018	9/16/2018		NCDC_Strong Wind	0	0	\$0	\$22,534
Wind		2004	3/7/2004	3/7/2004		NCDC_High Wind	0	0	\$0	\$2,995
Wind		2004	3/7/2004	3/7/2004		NCDC_High Wind	0	0	\$0	\$14,977
Wind	Hurricane 2004 Frances	2004	9/7/2004	9/7/2004		NCDC_High Wind	0	0	\$0	\$7,489
Wind		2004	9/16/2004	9/17/2004		NCDC_High Wind	0	0	\$0	\$7,489
Wind		2004	9/16/2004	9/17/2004		NCDC_High Wind	0	0	\$0	\$7,489
Wind		2005	4/2/2005	4/2/2005		NCDC_High Wind	0	0	\$0	\$7,243
Wind		2006	7/3/2006	7/3/2006		NCDC_Strong Wind	0	0	\$0	\$1,403
Wind		2007	4/16/2007	4/16/2007		NCDC_High Wind	0	0	\$0	\$682,265
Wind		2008	4/15/2008	4/15/2008		NCDC_Dust Devil	0	0	\$0	\$2,628
Wind		2003	2/23/2003	2/23/2003	CZone: SC006-Greater Greenville	Strong Wind 45EG	2	0	\$0	\$76,882

2022 SHELDUS Data - Hazards 1960-2022 (Released January 14, 2024)

Greenville County, South Carolina

Wind		2002	3/10/2002	3/10/2002	CZone: SC003-Greenville Mountains	HIGH WIND	0	0	\$0	\$1,573
Wind/ Winter Weather		1983	3/24/1983	3/24/1983	Statewide	Winter Storm/ Wind/ Snow	0	0	\$3	\$309
Wind/ Winter Weather		2017	3/16/2017	3/16/2017		NCDC_Cold/Wind Chill	0	0	\$56,713,479	\$0
Wind/ Winter Weather		2017	3/16/2017	3/16/2017		NCDC_Cold/Wind Chill	0	0	\$56,713,479	\$0
Winter Weather	Winter Storm 1999	1999	1/2/1999	1/3/1999	SCZ001>8-10>13-19	ICE STORM	0	0	\$0	\$3,396,450
Winter Weather		1997	1/9/1997	1/9/1997	SCZ001>008	ICE STORM	0	0	\$0	\$70,511
Winter Weather	Blizzard/Flooding 1996	1996	1/12/1996	1/12/1996		Extreme Cold; M8IW/ M11IW	0	2	\$0	\$0
Winter Weather		1995	1/6/1995	1/6/1995	SCZ001>008-010>013-019	Freezing Rain	0	0	\$0	\$18,565
Winter Weather		1995	12/27/1995	12/27/1995	Greenville	Cold	0	1	\$0	\$0
Winter Weather		1960	3/9/1960	3/11/1960	NORTHERN AND CENTRAL SECTIONS OF SC	SNOW/ SLEET/ ICE	0	0	\$0	\$13,655
Winter Weather		1960	3/2/1960	3/2/1960	NORTHERN SOUTH CAROLINA	SNOW/ ICE	0	0	\$0	\$26,551
Winter Weather		1961	1/25/1961	1/26/1961	SOUTH CAROLINA	ICE STORM	0	0	\$1,029	\$10,285
Winter Weather		1963	12/31/1963	1/1/1964	SOUTH CAROLINA	ICE	1	0	\$10,050	\$100,499
Winter Weather		1966	1/26/1966	1/27/1966	CENTRAL AND NORTH SECTIONS OF STATE	ICE/ SNOW	0	0	\$0	\$124,746
Winter Weather		1966	1/29/1966	1/30/1966	STATEWIDE	SEVERE COLD-ICE AND SNOE	0	0	\$94,916	\$0
Winter Weather		1969	2/15/1969	2/17/1969	STATEWIDE	SNOW/ SLEET AND FREEZING RAIN	0	0	\$8,201,179	\$82,012
Winter Weather		1971	3/25/1971	3/25/1971	NORTHERN HALF OF STATE	SNOWSTORM	1	0	\$194	\$194,050
Winter Weather		1972	4/1/1972	4/30/1972	STATE	COLD SPELL	0	0	\$384,575	\$0
Winter Weather		1973	1/7/1973	1/8/1973	STATEWIDE	SNOW & ICE	0	0	\$692,627	\$69,263
Winter Weather		1973	2/9/1973	2/10/1973	STATEWIDE	SNOWSTORM	0	0	\$693	\$692,627
Winter Weather		1973	4/11/1973	4/12/1973	NORTHWEST & NORTHERN SC	FROST & FREEZE	0	0	\$177,005	\$0
Winter Weather		1974	3/18/1974	3/18/1974	NORTHWESTERN SC	FREEZE	0	0	\$4,782	\$0
Winter Weather		1974	10/3/1974	10/4/1974	WESTERN/ NORTHERN/ CENTRAL SC	FROST/ FREEZE	0	0	\$0	\$7,357
Winter Weather		1981	12/31/1981	12/31/1981	Northwest SC	Freezing Rain/ Sleet	0	0	\$0	\$25,937
Winter Weather		1984	1/13/1984	1/13/1984	Northern Half of SC	Freezing Rain/Glaze	0	0	\$486	\$4,863
Winter Weather	Winter Storm/Cold Wave 1985	1985	1/20/1985	1/24/1985	Statewide	Extreme Cold/Snow	0	0	\$2,858	\$28,581
Winter Weather		1985	3/19/1985	3/19/1985	Statewide	Frost/Freeze	0	0	\$2,858	\$0
Winter Weather		1985	4/10/1985	4/10/1985	Northwestern SC	Extreme Cold	0	0	\$219,117	\$0
Winter Weather		1988	1/7/1988	1/11/1988	Statewide	Snow/ Ice/Sleet	0	0	\$0	\$25,995
Winter Weather		1979	2/17/1979	2/18/1979	Entire State	snow/ sleet/ freezing rain	0	0	\$424	\$42,359
Winter Weather		1979	2/6/1979	2/6/1979	Northwest and Central	snow/ sleet/ ice	0	0	\$650	\$649,505
Winter Weather		1980	2/9/1980	2/9/1980	Northwestern	Snowstorm	0	0	\$286	\$28,613
Winter Weather		1980	2/5/1980	2/6/1980	All of SC except South Coastal	Snowstorm over most of State except Ice Storm near Beaches North Coastal Area	0	0	\$373	\$37,321
Winter Weather		1980	3/1/1980	3/2/1980	Statewide	snow/ freezing rain/ drizzle and sleet	0	0	\$3,732	\$3,732
Winter Weather		1975	2/3/1975	2/4/1975	Northwest and North	Ice Storm	0	0	\$1,461	\$14,608
Winter Weather		1975	3/2/1975	3/3/1975	Statewide	Low Temperatures	0	0	\$5,716	\$0

2022 SHELDUS Data - Hazards 1960-2022 (Released January 14, 2024)

Greenville County, South Carolina

Winter Weather		1982	1/12/1982	1/12/1982	all but coastal plain	Snow/sleet/freezing rain	0	0	\$516	\$5,236
Winter Weather		1982	2/26/1982	2/27/1982	statewide	snow/sleet/glaze	0	0	\$0	\$3,187
Winter Weather		1982	3/27/1982	3/27/1982	statewide	Extreme Cold	0	0	\$318,681	\$0
Winter Weather		1982	4/7/1982	4/7/1982	statewide/ except southern	frost/freeze	0	0	\$3,664,822	\$0
Winter Weather		1983	1/21/1983	1/21/1983	Statewide	Freezing Rain/ Sleet/ Snow	0	0	\$31	\$3,088
Winter Weather		1983	2/5/1983	2/6/1983	Northwestern SC	Snow/ Freezing Rain	0	0	\$0	\$23,672
Winter Weather		1983	4/17/1983	4/18/1983	Statewide	Extreme Cold	0	0	\$3,087,614	\$0
Winter Weather		1983	12/25/1983	12/25/1983	Statewide	Extreme Cold	0	1	\$30,876	\$30,876
Winter Weather		1983	12/30/1983	12/31/1983	Statewide	Extreme Cold	0	0	\$309	\$3,088
Winter Weather		1989	4/12/1989	4/12/1989	NORTHWEST SC (ZONES 1 THRU 4)	Freeze	0	0	\$0	\$6,004
Winter Weather		1989	5/8/1989	5/8/1989	Northwest (Zones 1-3	Frost	0	0	\$9,507	\$0
Winter Weather		1970	1/8/1970	1/9/1970	Statewide	Severe Freeze	0	2	\$8	\$793
Winter Weather		1970	11/24/1970	11/25/1970	Statewide	Severe freeze	0	0	\$8	\$8
Winter Weather		1982	1/11/1982	1/11/1982	Statewide	hard freeze	0	0	\$319	\$319
Winter Weather		1988	3/16/1988	3/16/1988	Greenville	hypothermia/ (M65P)	0	1	\$0	\$0
Winter Weather	Winter Storm 1989	1989	12/21/1989	12/21/1989	Greenville County	extreme cold	0	1	\$0	\$0
Winter Weather		1991	1/16/1991	1/16/1991	Greenville County	Cold M66?	0	1	\$0	\$0
Winter Weather		1961	2/3/1961	2/4/1961	Entire state	Glaze	0	0	\$0	\$1,029
Winter Weather		1962	1/1/1962	1/1/1962	Northern Counties from Anderson to York	Ice and Snow	0	0	\$0	\$2,602
Winter Weather		1964	1/12/1964	1/13/1964	Northern and Western South Carolina	Ice	1	0	\$0	\$2,173
Winter Weather		1967	3/17/1967	3/19/1967	Northern part of State	Cold wave	0	0	\$2,352,996	\$0
Winter Weather		1964	3/30/1964	3/31/1964	South Carolina	Killing freeze	0	0	\$992,021	\$0
Winter Weather		1969	12/25/1969	12/25/1969	Greenville/ Spartanburg/ Cherokee/ Union/ Chester/ and York Counties	Freezing rain	0	0	\$771	\$77
Winter Weather		1971	1/8/1971	1/9/1971	Northwest part of State	Freezing Rain	0	0	\$2,687	\$2,687
Winter Weather		1973	12/20/1973	12/20/1973	Northwestern SC	Freezing Rain	0	0	\$0	\$245
Winter Weather		1977	1/1/1977	1/31/1977	Statewide	Unusual Cold Weather	0	0	\$507	\$507
Winter Weather		1977	1/1/1977	1/31/1977	Statewide	Unusual cold weather	0	0	\$507	\$507
Winter Weather		1978	1/13/1978	1/13/1978	Northwestern	Snow/ Sleet/ Freezing Rain	0	0	\$0	\$1,808
Winter Weather		1978	3/2/1978	3/3/1978	Northwest SC	Snow/ Freezing Rain	0	0	\$0	\$1,669
Winter Weather		1980	1/4/1980	1/4/1980	Northwestern SC	Snowstorm	0	0	\$343	\$343
Winter Weather		1980	1/30/1980	1/31/1980	Northern half of State	Freezing Rain	0	0	\$904	\$904
Winter Weather		1980	12/23/1980	12/23/1980	Northwest and Central	Freezing Rain	0	0	\$0	\$78
Winter Weather		1981	2/1/1981	2/1/1981	Northern SC	Freezing rain and sleet	0	0	\$0	\$86
Winter Weather		1982	4/23/1982	4/24/1982	Statewide	Frost Freeze	0	0	\$32	\$0
Winter Weather		1983	12/22/1983	12/22/1983	Northwest and Northcentral SC	Freezing Rain	0	0	\$0	\$1,184
Winter Weather		1984	2/6/1984	2/6/1984	Northern SC	Snow	0	0	\$0	\$756
Winter Weather		1984	12/5/1984	12/6/1984	Northwest SC	Freezing Rain	0	0	\$0	\$227
Winter Weather		1989	1/14/1989	1/14/1989	SCZ001-002-003 Northwest SC	Freezing Drizzle	0	0	\$0	\$9
Winter Weather		1986	11/14/1986	11/14/1986	Mountains	Freezing Rain	0	0	\$0	\$129

2022 SHELDUS Data - Hazards 1960-2022 (Released January 14, 2024)
Greenville County, South Carolina

Winter Weather		1987	1/1/1987	1/1/1987	SCZ001-002 Mountains and Foothills	Heavy Snow	0	0	\$0	\$178
Winter Weather		1987	1/22/1987	1/22/1987	SCZ01-002-003-004 Northwest SC	Heavy Snow and Sleet	0	0	\$66	\$655
Winter Weather		1985	1/4/1985	1/4/1985	Mountains	Freezing rain	0	0	\$0	\$329
Winter Weather	Winter Storm/Cold Wave 1985	1985	1/17/1985	1/17/1985	Northern South Carolina	Freezing rain	0	0	\$0	\$73
Winter Weather		1985	1/28/1985	1/28/1985	Northern South Carolina	Snow/sleet	0	0	\$0	\$730
Winter Weather		1987	2/16/1987	2/16/1987	SCZ001-002-003-004-005-006-007/ Northwest/ North-Central/ and Northeast SC	Ice Storm	0	0	\$655	\$6,554
Winter Weather		1987	4/3/1987	4/3/1987	SCZ001 Northwest South Carolina	Heavy Snow	0	0	\$0	\$4,151
Winter Weather		1980	3/13/1980	3/13/1980	Northwest	Sleet and snow	0	0	\$2,861	\$2,861
Winter Weather		1987	10/1/1987	10/31/1987	Statewide	Cold Weather	0	0	\$271	\$0
Winter Weather		1985	2/5/1985	2/5/1985	Northwestern South Carolina	Freezing Rain/ Glaze	0	0	\$0	\$2,191
Winter Weather		1981	12/21/1981	12/21/1981	Northwest SC	Freezing Rain/ Sleet	0	0	\$0	\$2,594
Winter Weather		1982	12/19/1982	12/19/1982	Northwestern	Freezing Rain	0	0	\$0	\$244
Winter Weather		1988	3/14/1988	3/17/1988	Statewide	Low Temperature	0	0	\$0	\$260
Winter Weather		1988	4/20/1988	4/20/1988	SCZ002-003-004 Foothills/ East Piedmont/ Lower Piedmont	Frost	0	0	\$63	\$0
Winter Weather		1993	2/25/1993	2/26/1993	SCZ001/002/ Mountains and Foothills	Ice storm/ snow	0	0	\$0	\$1,224
Winter Weather		1990	12/27/1990	12/28/1990	SCZ001-002 Mountains and Foothills	Freezing Rain/ Sleet	0	0	\$0	\$135
Winter Weather	Blizzard 1993 Storm of the Century	1993	3/13/1993	3/13/1993	SCZ001-002-004	Heavy snow	0	0	\$69,927	\$69,927
Winter Weather	Blizzard/Flooding 1996	1996	1/6/1996	1/6/1996		Winter Storm	0	0	\$0	\$12,880
Winter Weather	Blizzard/Flooding 1996	1996	1/7/1996	1/7/1996		Winter Storm	0	0	\$0	\$12,880
Winter Weather	Ice Storm 1994 Southeast	1994	2/11/1994	2/11/1994	SCZ001>022	Ice Storm	0	0	\$0	\$50,239
Winter Weather		1985	12/26/1985	12/26/1985	Statewide	Cold	0	0	\$29	\$286
Winter Weather		1996	3/8/1996	3/8/1996	SCZ001>014-019	Extreme Cold	0	0	\$3,005,356	\$0
Winter Weather		1992	12/10/1992	12/10/1992	Foothills	Ice Storm	0	0	\$0	\$12,604
Winter Weather		1992	12/27/1992	12/28/1992	Foothills/ East and Lower Piedmont/ North Midlands	Ice Storm	0	0	\$36,010	\$36,010
Winter Weather		1990	3/21/1990	3/21/1990	Statewide	Freeze	0	0	\$235,292	\$0
Winter Weather		1989	2/17/1989	2/17/1989	SCZ001-002 Mountains/ Foothills	Ice Storm and Extreme Cold	0	0	\$0	\$142,603
Winter Weather	Winter Storm 1989	1989	12/22/1989	12/25/1989	SCZ001-002-003-004-005-006 Mountains/ Foothills/ Piedmont and Midlands	Extreme Cold	0	2	\$0	\$31,690
Winter Weather		1986	1/26/1986	1/27/1986	SCZ001-002-003-004-005-006-007-008 Statewide	Cold	0	0	\$28	\$2,806
Winter Weather		1986	2/14/1986	2/14/1986	SCZ001-002 Northwest South Carolina	Snow	0	0	\$0	\$18

2022 SHELDUS Data - Hazards 1960-2022 (Released January 14, 2024)
Greenville County, South Carolina

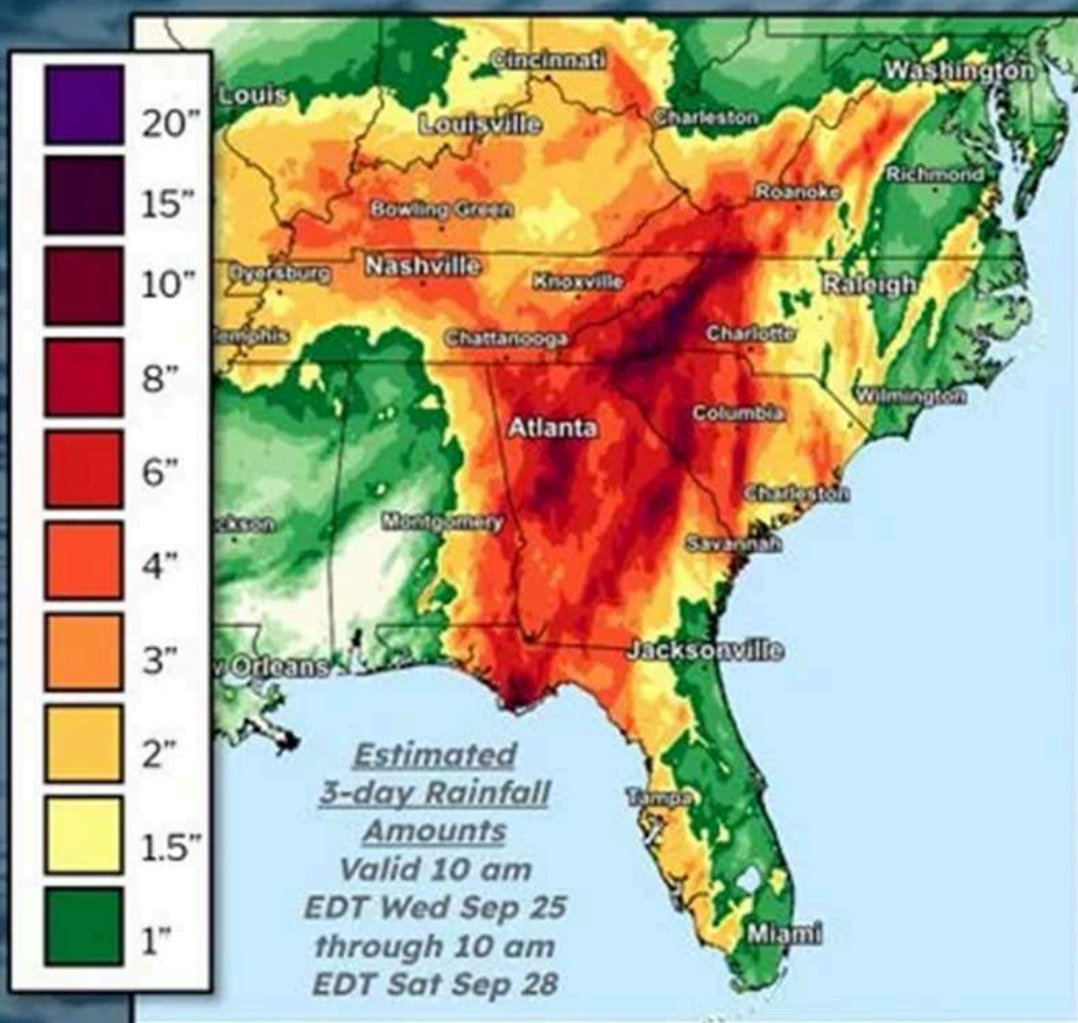
Winter Weather		1986	3/22/1986	3/23/1986	SCZ001-002-003-004-005-006-007-008 Statewide	Cold	0	0	\$2,806	\$0
Winter Weather		1986	4/23/1986	4/24/1986	SCZ001-002-003-004-005-006-007-008 Statewide	Frost/Freeze	0	0	\$2,806	\$0
Winter Weather		1987	1/25/1987	1/25/1987	SCZ001-002: Northwest South Carolina	Ice Storm	0	0	\$178	\$17,790
Winter Weather		1987	4/1/1987	4/1/1987	SCZ001-002-003-004-005-006-007 Statewide except the Immediate Coast	Freeze	0	0	\$3,193	\$0
Winter Weather		1989	2/17/1989	2/19/1989	SCZ001-002 Northwest South Carolina	Ice Storm	0	0	\$0	\$142,603
Winter Weather		1989	2/23/1989	2/23/1989	Statewide	Heavy Snow	0	0	\$0	\$2,480
Winter Weather		1996	12/25/1996	12/25/1996	SCZ006	Cold M83IW/ F88PH	0	2	\$0	\$0
Winter Weather		2002	12/4/2002	12/5/2002		NCDC_Ice Storm	0	0	\$0	\$18,872,102
Winter Weather		2004	2/26/2004	2/27/2004		NCDC_Heavy Snow	0	0	\$0	\$2,995
Winter Weather		2005	12/15/2005	12/15/2005		NCDC_Ice Storm	0	0	\$0	\$144,866
Winter Weather		2005	12/15/2005	12/15/2005		NCDC_Ice Storm	0	0	\$0	\$434,599
Winter Weather	Freeze 2007	2007	4/8/2007	4/8/2007		NCDC_Frost/Freeze	0	0	\$8,187,176	\$0
Winter Weather	Freeze 2007	2007	4/8/2007	4/8/2007		NCDC_Frost/Freeze	0	0	\$1,364,529	\$0
Flooding		2013	6/5/2013	6/5/2013		NCDC_Flash Flood	0	0	\$0	\$30,362

Appendix J – Hurricane Helene

Priming Storm – 9/24-25/2024

Station	Region	9/24-25/2024 Rainfall (inch)	Max Recurrence Interval	Peak 5-min Intensity (inch)
Darby Rd	North	2.49	2 yr – 30-min	0.33
Gateway	North	3.28	10 yr – 10-min	0.57
Greenville Tech	North	2.16	-	0.34
Heritage Ele	North	2.48	2 yr – 10-min	0.49
North Saluda	North	4.15	2 yr – 2-hr	0.27
Palmetto Bible Camp	North	3.02	-	0.22
Pleasant Ridge	North	3.62	2 yr – 6-hr	0.29
Bells Crossing	Central	0.00	-	0
Dry Pocket	Central	0.08	-	0.07
Hillcrest HS	Central	0	-	0
Landfill	Central	0.00	-	0
Mauldin HS	Central	0.00	-	0
Pavilion	Central	1.29	-	0.35
University Ridge	Central	1.78	100 yr – 10-min	0.76
Boyd's Mill Park	South	0.29	-	0.1
Dairy Rd	South	0.01	-	0.01
Dunklin FD	South	0.00	-	0
Grove Ele	South	0.00	-	0
Hwy 8	South	0.00	-	0
Log Shoals	South	0.00	-	0
S Greenville FD	South	0.00	-	0

Selected Preliminary Storm Total Rainfall Associated with **HURRICANE HELENE** (Valid Wed 9/25 - Sat 9/28)



FLORIDA

Sumatra	15.91"
Wilma	11.94"
Apalachicola	9.20"

GEORGIA

Tallulah	14.22"
Dillard 3.5 NE	14.06"
Atlanta International Arpt	11.13"

ALABAMA

Eufaula Municipal Arpt	9.42"
Pansy 1.6 NNE	8.50"
Auburn-Opelika Arpt	7.13"

KENTUCKY

Paducah	6.00"
Elizabethtown 6.5 N	5.98"
Fort Knox	4.58"

NORTH CAROLINA

Busick	30.78"
Mount Mitchell State Park	24.20"
Boone 3.8 ENE	20.12"

SOUTH CAROLINA

Table Rock	14.34"
Salem 1.8 NE	13.78"
Columbia 2.1 NNW	10.76"

TENNESSEE

Benton 2.3 ESE	9.92"
Sevierville 3.8 SE	7.22"
Bristol/Kingsport/Johnson City Arpt	5.79"

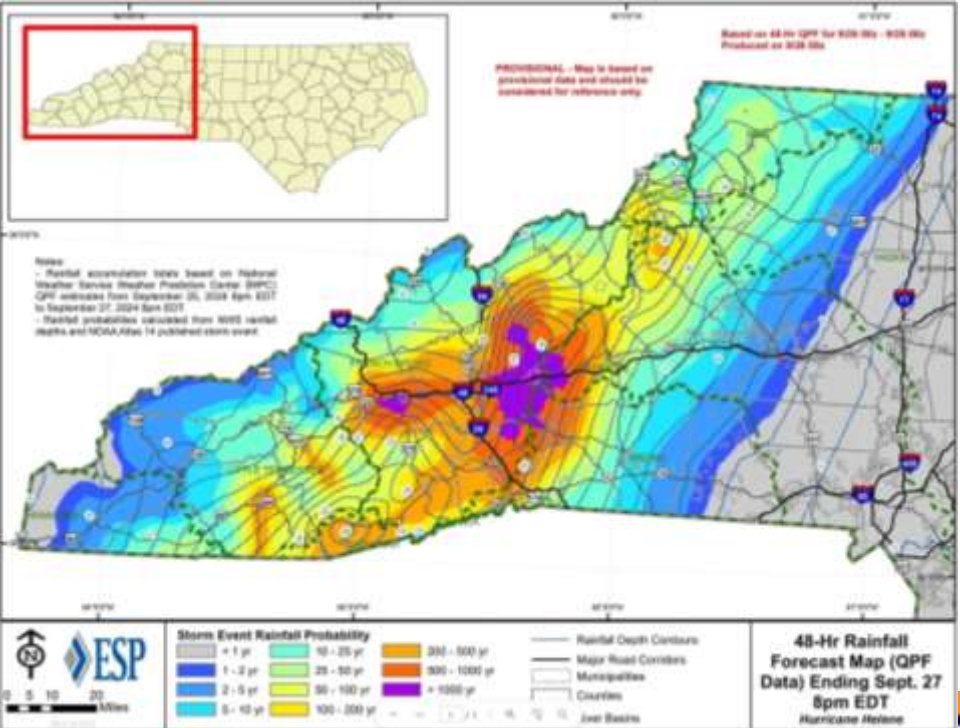
VIRGINIA

Independence 1.3 S	9.49"
Galax 5.3 SW	8.11"
Nora 4 SSE	7.55"

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NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
WEATHER PREDICTION CENTER



WEATHER COVERAGE YOU CAN COUNT ON



KATRINA

CAT 3
125 MAX WINDS
DIAMETER: 400 MILES
WIND FIELD: 230 MILES



HELENE

CAT 4
140 MAX WINDS
DIAMETER: 822 MILES
WIND FIELD: 370 MILES

Hurricane Helene-9/27/2024

Station	Region	Helene Rainfall (inch)	Max Recurrence Interval	Peak 5-min Intensity (inch)
Darby Rd*	North	8.07*	10 yr - 3 day*	0.04*
Gateway	North	11.11	100 yr - 3 day	0.28
Greenville Tech	North	7.97	10 yr - 24 hr.	0.17
Heritage Ele	North	10.21	50 yr - 3 day	0.28
North Saluda	North	11.47	100 yr - 3 day	0.24
Palmetto Bible Camp	North	13.07	100 yr - 3 day	0.45
Pleasant Ridge	North	11.88	100 yr - 3 day	0.26
Bells Crossing	Central	8.64	25 yr – 24 hr.	0.31
Dry Pocket	Central	8.98	25 yr – 12 hr.	0.32
Hillcrest HS	Central	8.03	25 yr - 3 day	0.23
Landfill	Central	8.05	10 yr - 6 hr.	0.23
Mauldin HS	Central	8.65	25 yr - 6 hr.	0.26
Pavilion	Central	7.93	10 yr - 6 hr.	0.25
University Ridge	Central	8.48	25 yr - 3 day	0.18
Boyd's Mill Park	South	7.46	25 yr – 24 hr.	0.24
Dairy Rd	South	7.69	25 yr - 24 hr.	0.2
Dunklin FD	South	7.57	10 yr - 12 hr.	0.22
Grove Ele	South	8.97	25 yr - 3 day	0.18
Hwy 8	South	7.50	10 yr - 6 hr.	0.19
Log Shoals	South	7.17	10 yr - 24 hr.	0.23
S Greenville FD	South	7.56	10 yr - 24 hr.	0.22
*Darby Road station was clogged by debris from the hurricane and rainfall values should not be considered valid, especially intensity.				

GSP Historical

TOP ONE DAY RAINFALL AT GSP

- 1- 9.32 26-Aug 1995
- 2- 8.20 8-May 1910
- 3- 7.24 16-Oct 1932
- 4- 7.10 26-Aug 1908
- 5- 6.52 30-Sep 1930

TOP TWO DAY RAINFALL AT GSP

- 1- 14.07 26-Aug 27-Aug 1995
- 2- 13.12 25-Aug 26-Aug 1908
- 3- 9.36 8-May 9-May 1910
- 4- 7.47 15-Oct 16-Oct 1932
- 5- 7.35 24-Oct 25-Oct 1918

TOP THREE DAY RAINFALL AT GSP

- 1- 14.47 25-Aug 27-Aug 1995
- 2- 14.14 24-Aug 26-Aug 1908
- 3- 9.36 7-May 9-May 1910
- 4- 7.79 24-Oct 26-Oct 1918
- 5- 7.70 15-Oct 17-Oct 1932

WETEST SEPTEMBER AT GSP

- **Palmetto Bible Camp 17.9"**
- **Hudson 13.2"**
- 1- 12.95 1925
- 2- 11.65 1975
- 3- 11.12 2004
- **4- 10.94 2024**
- 5- 10.34 1936

Stage Summary

Station	Watershed	Helene Rainfall (Inches)	Max Depth (Feet)	Max Stage (9/24/24)	Max Stage (Helene)	Helene Flood Return Year	Previous Max Stage (2020)
Aiken Chapel	Enoree	10.96	>16.4	838.5	>849.4	100 yr	848.6
Dry Pocket	Enoree (Brushy Ck N)	8.98	12.8	789.7	798.6	-	796.1
E. Georgia	Enoree (Gilder Ck)	8.64	>18.4	664.3	>682.5	500 yr	680.5
Mills Ave	Brushy Creek South (Reedy)	8.48	7.2	889.6	892.32	100 yr	890.9
Hudson	Reedy River	8.48	17.0	917.7	927.4	500 yr	926.9
Parkins	Reedy River	8.05	>14.2	813.7	>822.4	100 yr	820.3
Landfill	Reedy River	8.05	18.2	807.6	817.5	500 yr	815.3
Log Shoals	Reedy River	7.07	10.3	720.7	733.9	-	732.7
Hwy 418	Reedy River	7.50	19.0	661.7	677.2	-	676.4
Hwy 76	Reedy River	7.69	>8.8	548.7	>550.6	-	560.6
Holland Ford	Saluda River	8.9	14.6+ (about 15'-submerged radar cone)	No change, if any, timing lined up with Helene	>654.6	100 yr	n/a
Keeler	Saluda River	11.77	13.6	910.0	919.9	-	920.2
Tilly	Saluda River	13.0	13.8	971.7	981.3	100 yr	979.1

Note the > depths are because either the station was damaged and stopped reporting or the radar sensor became submerged and so we don't have an exact depth once that happened.

Hudson Street

- University Ridge – 8.48”
- Depth – 17’
- Stage – 927.4 – 0.5’ higher than previous
- 500 yr.
- Hudson Rd Bridge Closed



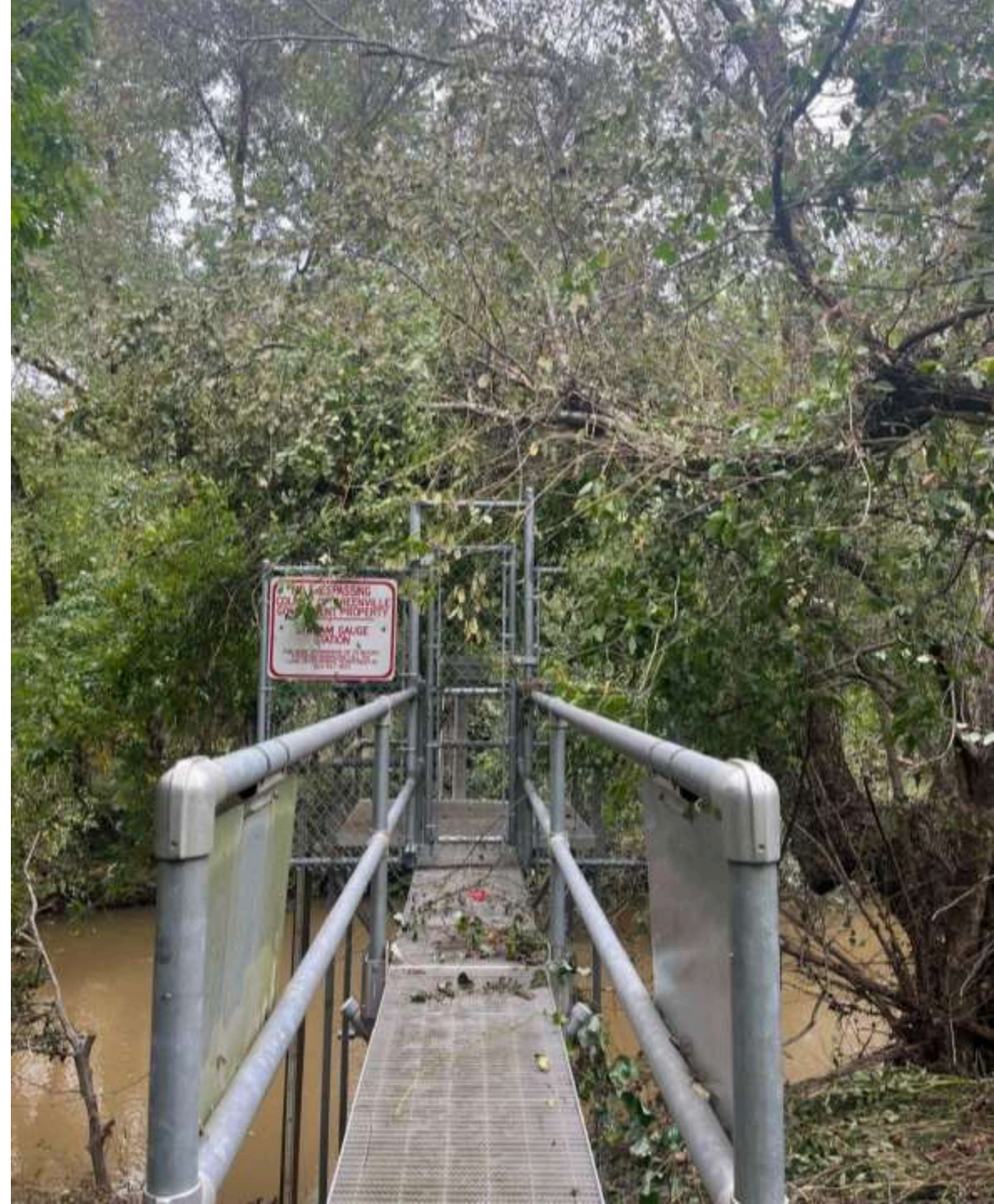
Mills Ave

- University Ridge – 8.48”
- Depth – 7.2’
- Stage – 889.3 – 890.6
previous highest
- 100 yr.



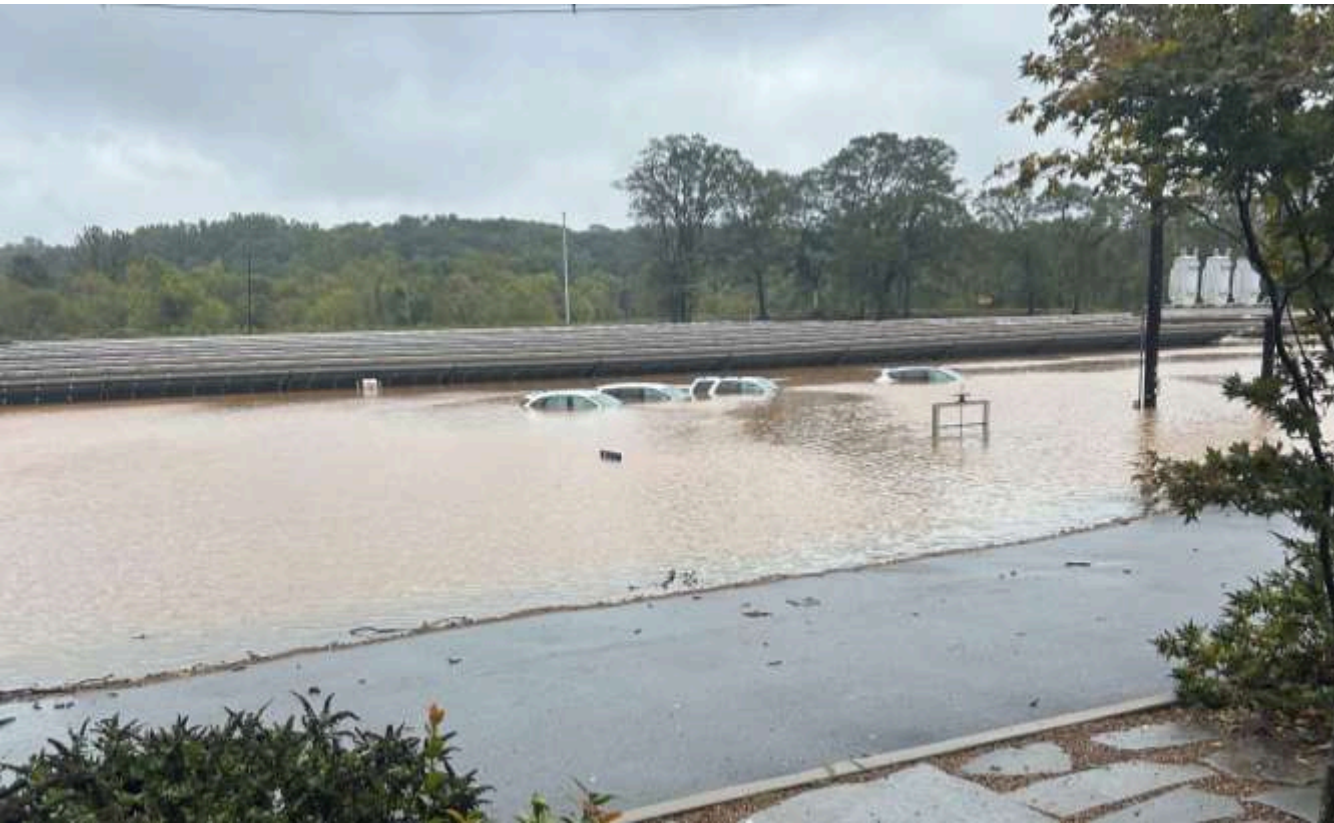
Parkins

- Landfill– 8.05”
- Depth – $>14.2'$ (lost power)
- Stage – $>822.4'$ approx. 2' higher than previous
- 100 yr.
- Other – Tree fell on station



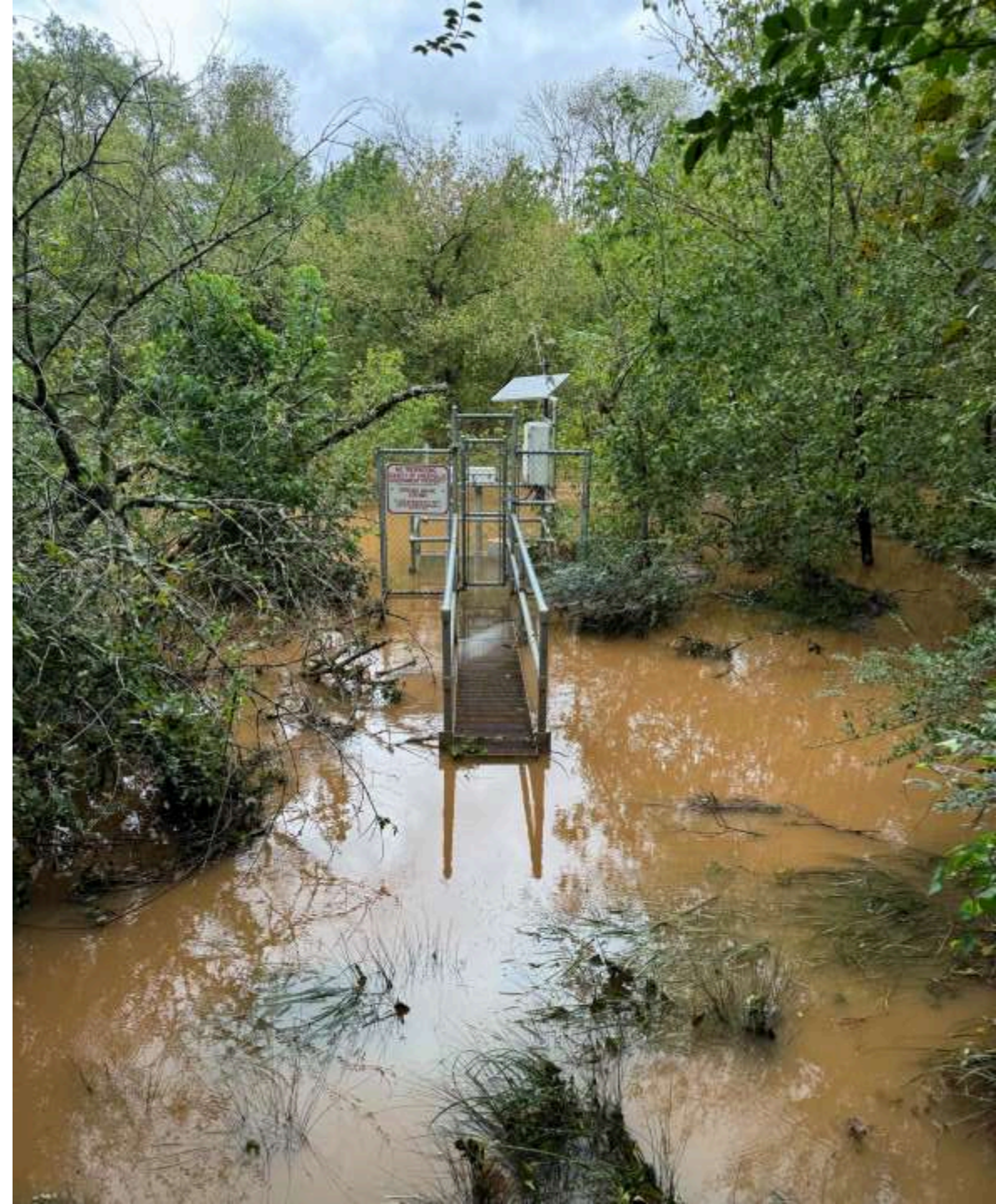
ReWa Mauldin Rd WRRF

- Plant was “nonfunctional” with flood damage until after 6pm on 9/27
- Lost approximately 14 vehicles



Landfill

- Landfill– 8.05”
- Depth – 18.2’
- Stage – 817.5 – 2.2’ higher than previous
- 500 yr.
- Other – Mauldin Rd WRRF operational issues



Log Shoals

- Log Shoals– 7.07”
- Depth – 10.3’
- Stage – 733.9– 1.2’ higher than previous
- Station Damage – broke staff gauge loose



Hwy 418

- Hwy 8– 7.5”
- Depth – 19’
- Stage – 677.2 – 0.8 higher than previous
- 500 yr.
- Station Damage – None



Hwy 76

- Dairy Rd.– 7.69”
- Depth – >8.8’
- Stage – >550.6 – tree fell and broke radar
- Damage – logger, modem, solar regulator and panel mounts, radar, fencing



Aiken Chapel

- Dairy Rd.– 7.69”
- Depth – >16.4’
- Stage – >849.4 (>0.8’ higher than previous)
- Damage – logger, modem, solar regulator, radar, sonde



Dry Pocket

- Dry Pocket– 8.98”
- Depth – 12.8’
- Stage – 798.6 (2.5’ higher than previous)
- Station Damage – minor support washout of walkway



East Georgia

- Bells Crossing – 8.64”
- Depth – >18.4’
- Stage – >682.5 (>2’ higher than previous)
- 500 yr.
- Road overtopped by approximately 4-5’ or more
- Damage – walkway shifted



Holland Ford

- Grove Elem.– 8.97”
- Depth – >14.6’
- Stage – >654.5
- 100 yr.



Keeler

- Pleasant Ridge– 11.88”
- Depth – 13.6’
- Stage – 919.9(previous high 920.2)



Tilly

- Palmetto Bible- 13.07”
- Depth – 13.8’
- Stage – 981.3 (2.2’ higher than previous)
- Road was damaged with overtopping

Pre-hurricane-9/25



Saluda Lake Buoy

- Buoy went over the dam
- Found 1 mile downstream
- Station Damage – logger, modem, solar regulator, battery, anchor and lines/chain



Boat – Before/After





Appendix K – Paris Mountain Wildfire Plan



Paris Mountain Wildfire Mitigation Plan

February 2022



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1.EXECUTIVE SUMMARY

The Paris Mountain area is a valuable natural resource in Greenville County as well as the site for several high value infrastructure assets. It is located in unincorporated Greenville County just north of the City of Greenville and is bounded approximately by State Park Road (County Road 22), South Carolina Highway 253, U.S. Route 276, and U.S. Route 25. Assets located within the boundaries of this area include, but not limited to; communications equipment including multiple television and radio transmission towers, Paris Mountain State Park, two (2) waste treatment plants, and a large number of residential and commercial structures. In addition to the physical assets, the area is home to approximately 8,827 people.

Complicating emergency services to this area is the fact that access to many of these assets and residents is limited. Altamont Road provides access from the west to the communications equipment and State Park Road provides park access from the south. Subdivision streets provide access to many of the residential structures located at the base of the mountain.

In November 2016, Pickens County suffered from the Pinnacle Mountain wildfire that burned approximately 10,560 acres and included portions of Greenville County. There have been additional recent wildfires across the nation that have increased awareness of wildfires and their associated risks and hazards. Greenville County recognizes that Paris Mountain is in the urban / forest interface and is susceptible to wildfire. Because of the high risk and number and types of assets located on the mountain, the County decided to enhance the existing Multi-Jurisdictional Hazard Mitigation Plan (HMP) with an annex addressing wildfire mitigation for the Paris Mountain area.

The development of this plan followed the same process used to develop the 2020 HMP. A Wildfire Mitigation Team was formed of stakeholders and wildfire experts to provide technical guidance and develop potential mitigation measures. Multiple public meetings were held to provide for input from residents into plan development. The South Carolina Forestry Commission proved to be an invaluable resource for development of the plan providing data and expert insight into the planning process.

The resulting plan contains twenty-two individual potential mitigation measures spread across each of seven broader mitigation categories including:

1. Community outreach and education
2. Fuel management
3. Fireproof structures
4. Fireproof landscapes
5. Improved fire response
6. Training
7. Research and risk assessment

Each of the initiatives has been prioritized for implementation with the understanding that available funding may drive implementation of lower ranked measures ahead of higher ranked measures. This plan is an annex of the 2022 HMP and should be reviewed annually and revisited in its entirety on the same schedule as the HMP.

2. INTRODUCTION

In 2019, Greenville County embarked on a revision process of the Greenville County Multi-Jurisdictional Hazard Mitigation Plan (HMP). The final plan was adopted in February 2020. This plan contains a mitigation action plan (Section 10, Prioritized Mitigation Initiatives) developed by a Disaster Mitigation Committee (DMC) to address multiple hazards including wildfire. Section 10.4, Paris Mountain Wildfire Plan defines the Paris Mountain wildfire planning area, provides a brief description of assets at risk, and recognition of the impact of the Pinnacle Mountain fire on the need to develop the Paris Mountain Wildfire Plan.

Hazard Mitigation Grant Program funding was subsequently obtained through the South Carolina Emergency Management Division (SCEMD) to develop the Paris Mountain Wildfire Plan and Woolpert, Inc was retained by Greenville County to assist in the preparation of the plan. The planning process began in the Fall of 2020, albeit slowly, due to the impacts of the Covid-19 pandemic. In-person public meetings during this time were problematic, therefore, the planning process continued with the hazard and risk assessment while waiting for a safer time to meet with the general public to seek input.

A Wildfire Mitigation Team (WMT) was created as a sub-committee of the Disaster Mitigation Committee (DMC). The WMT met on several occasions to provide guidance for development of the plan and to develop potential wildfire mitigation measures to be implemented. Because the Paris Mountain Wildfire plan is being included in the overall Greenville County Multi-Jurisdiction Hazard Mitigation Plan (HMP), mitigation measures identified in this planning process were evaluated and prioritized by the DMC.

Wildfire is the singular hazard being addressed in this plan. The plan includes descriptions of wildfire categories, types, components, behavior, causes, and potential. While this section of the report is not intended to be comprehensive, it is intended to provide a sufficient overview of the hazard to provide the WMT with a solid basis for identifying appropriate mitigation measures.

Risks considered in the plan include infrastructure, buildings, natural resources, and wildlife, and of course, human life. Seven (7) broad categories of mitigation were evaluated including 1) community outreach and education, 2) fuel management, 3) fireproof structures, 4) fireproof landscapes, 5) improved fire response, 6) training, and 7) research and risk assessment. Twenty-two individual mitigation measures were developed and included in the plan.

This plan could not have been developed without the assistance of the WMT and those with expertise in mitigating and fighting wildfires. In particular, the expertise and resources of the South Carolina Forestry Commission was invaluable in developing this plan.

Once reviewed and approved, this plan will be incorporated into the HMP as an appendix.

3.HISTORY OF WILDFIRE

While Greenville County is not historically known for large wildfires, the South Carolina Forestry Commission (SCFC) and local fire departments report several small wildfires each year (Figure 3-1). The threat of wildfire in Greenville County continues to grow as population increases and the wildland urban interface expands with it. The National Wildfire Coordinating Group defines the Wildland Urban Interface as “the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.” According to the SCFC, 98% of wildfires in South Carolina are caused by humans. Therefore, pockets of undeveloped natural areas across the County are areas of higher concern due to their potential to fuel wildfires, especially when they are intertwined with urban areas. These areas of concern in the County include Paris Mountain State Park, the Mountain Bridge Wilderness Area, and large privately owned undeveloped tracts that border areas experiencing urban sprawl.

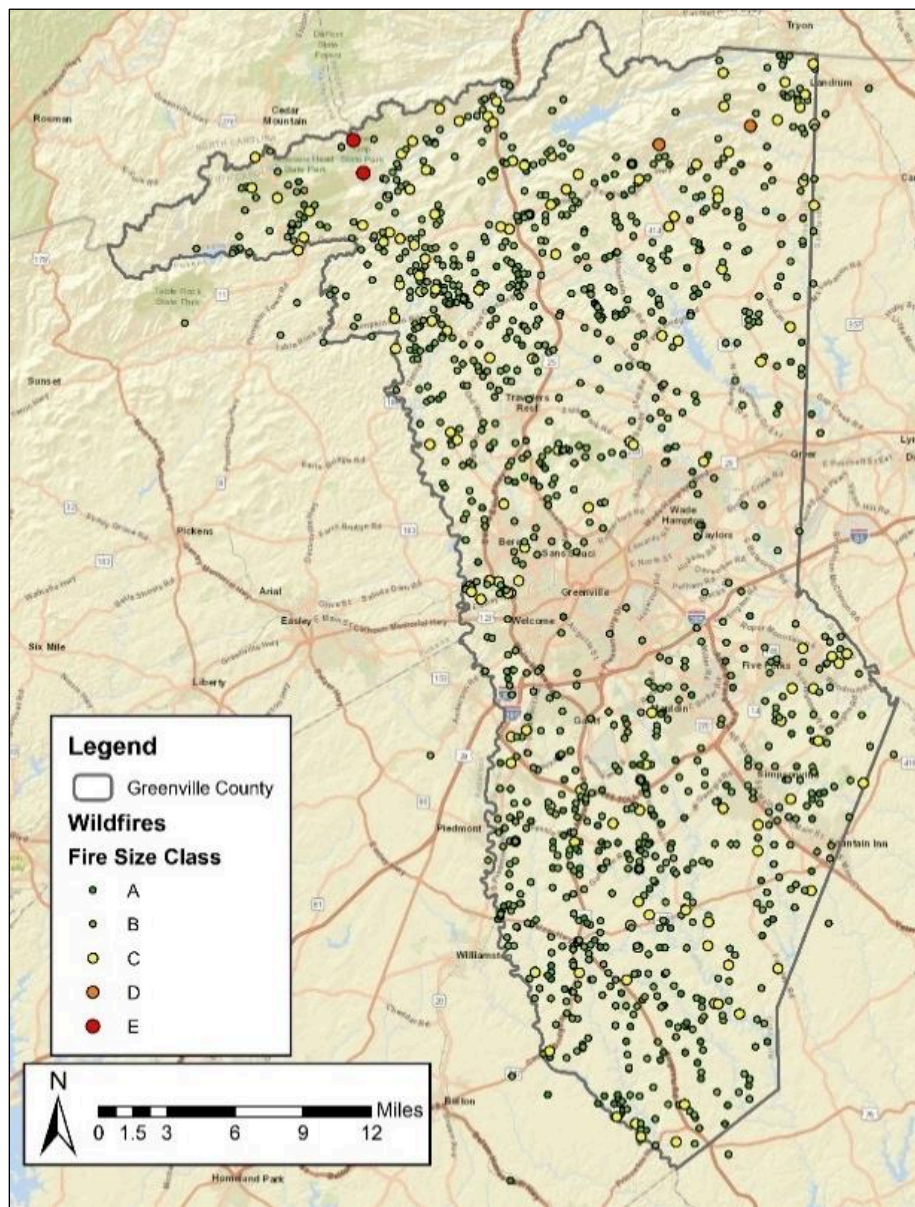


Figure 3-1: Wildfires recorded by size in Greenville County from July 1987 to August 2019

This Wildland Urban Interface has been the location of several wildfires that have occurred in Greenville County. The largest and most well-known was the Pinnacle Mountain Fire that occurred in November of 2016. An escaped campfire from Table Rock State Park quickly spread over 10,000 acres across northern Pickens and Greenville County that led firefighters from all over the country on a month-long chase to extinguish it. While no homes were damaged and no lives were lost, it was a stark reminder of the complexity of fighting a wildfire in the upstate during perfect wildfire conditions.

A growing concern and the focus of this plan is Paris Mountain, a monadnock (an isolated hill) located roughly 5 miles north of the City of Greenville. This unique area is a prime example of the wildland urban interface as it is home to many families, businesses, schools, and various infrastructure as well as a state park and various other protected forested areas. Historically, Paris Mountain has seen a few small-scale wildfires. In January of 2003, a wildfire burned 50 acres, destroying one home, and damaging another. In 2014, another fire broke out burning two acres and an abandoned building before it was suppressed. Due to the steep terrain and limited access, fighting these fires were a dangerous and difficult task requiring the assistance of bulldozers, helicopters, and many firefighters.

4. GENERAL DESCRIPTION OF AREA

Limits

For the purpose of this plan, Paris Mountain is the area within the boundaries of U.S. Route 276 to the southwest, U.S. Route 25 to the northwest, State Park Road (County Road 22) to the north & northeast, and South Carolina Highway 253 to the east & southeast.

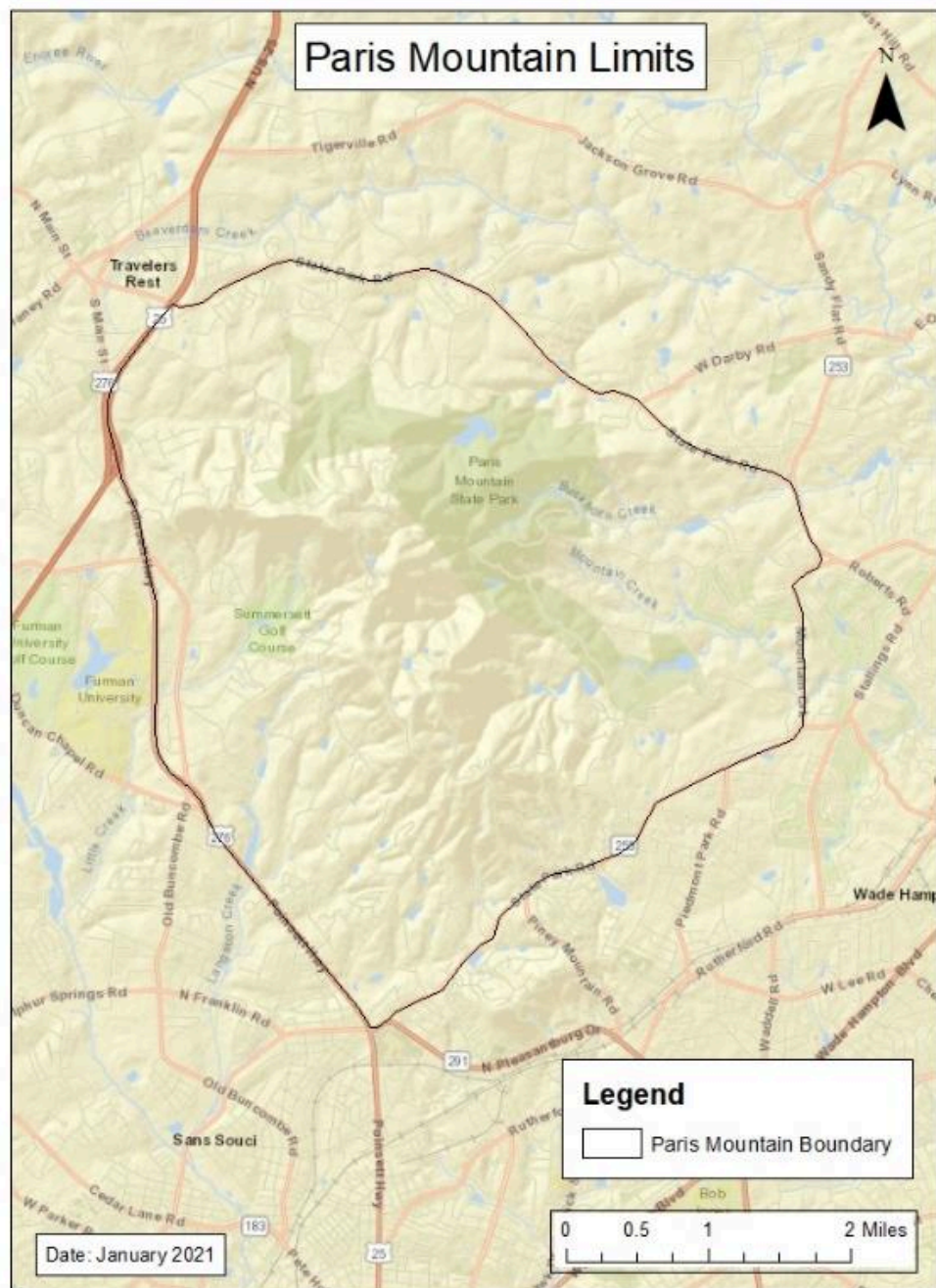


Figure 4-1: Paris Mountain Limits

Topography

Paris Mountain is a unique feature in Greenville County known as a monadnock: an isolated hill or mountain that stands above the surrounding landscape. The elevation ranges from approximately 1,000 feet to the summit measuring 2,053 feet. The ridge to the west of Altamont Road leading to the communication towers feature some of the steepest incline in the area gaining roughly 1000 feet in less than a quarter of a mile in places. The foot of the mountain begins the transition back into the low rolling plateau known as the piedmont region. The geography of the mountain provides many pathways for small streams leading to several dammed lakes that serve as drinking water supply and outdoor recreation.

Assets

Paris Mountain is home to almost 4,000 homes and over 150 businesses. Recreation opportunities consist of Paris Mountain State Park, Camp Buckhorn, and Paris Mountain Country Club. Emergency services are scattered across the foot of the mountain while the summit serves as the high point for several communication towers that service the greater Greenville area. Several utilities span across Paris Mountain such as water supply and wastewater treatment stations. The mountain has great historical significance and was the drinking supply for Greenville citizens from 1890 until the 1930's. Afterwards, the land was turned into a park using the workforce of the Civilian Conservation Corps, and many of the buildings and structures they built are still standing today.

5. WILDFIRE MITIGATION TEAM

Greenville County created the Wildfire Mitigation Team (WMT) to assist in the preparation of the Paris Mountain Wildfire Mitigation Plan. The WMT is a subset of the Disaster Mitigation Committee (DMC) created to assist in the development of the Greenville County 2020 Multi-jurisdictional Hazard Mitigation Plan (2020 HMP). The WMT includes homeowner(s), business owners, utility, and service providers from the Paris Mountain planning area. The WMT also includes members from local, state, and federal agencies to provide data and wildfire expertise. Multiple departments of Greenville County are also represented on the WMT. Many of the members of the WMT overlap with the DMC.

The table on the next page (Table 5-1) contains the full membership of the WMT. Individual committee representatives may change during the planning cycle; however, it is anticipated that all the listed agencies, departments, and jurisdictions will maintain at least one representative on the committee throughout the five (5) year planning cycle. In addition to members of the WMT, the list also contains names and agencies of people that could serve as information resources. Both "official" and support members of the WMT were provided regular updates of plan progress.

Table 5-1. Wildfire Mitigation Team Listing

Organization	Name	Title	Email	Member (M) or Resource (R)
Greenville County	Brian Bishop	Floodplain Coordinator	Jbishop@greenvillecounty.org	M
Greenville County	Jay Maret	Director of Emergency Management	Jmaret@greenvillecounty.org	M
Greenville County	Mackenzie Forgacs	Preparedness Coordinator	Mforgacs@greenvillecounty.org	M
Greenville County	Suzanne Terry	AICP Planner	sterry@greenvillecounty.org	M
Greenville County	Jessica Stumpf	Deputy Director of Emergency Management	Jstumpf@greenvillecounty.org	M
Greenville County	Ben Cotton	Principal Planner	BCotton@greenvillecounty.org	M
Greenville County	Paula Gucker	Assistant County Administrator	Pgucker@greenvillecounty.org	M
Greenville County	Mark Sutton	E911/Sheriff's Office	msutton@greenvillecounty.org	M
Greenville County	Stan Whitten	Sheriff's Office	swhitten@greenvillecounty.org	M
Woolpert	Hal Clarkson	Program Director	Hal.Clarkson@woolpert.com	R
Woolpert	James Riddle	Project Manager	James.Riddle@woolpert.com	R
Woolpert	Shady Agnew	Engineering Technician	shady.agnew@woolpert.com	R
SC Forestry Commission	Chris Revels	Upstate WUI Coordinator	crevels@scfc.gov	M
SC Forestry Commission	Mike Bozzo	Piedmont Regional Forester	MBozzo@scfc.gov	M
SC Forestry Commission	Ray Cassell	FMO / Greenville -Pickens	rcassell@scfc.gov	R

SC Forestry Commission	Michael Weeks	Unit Forester	mweeks@scfc.gov	R
SC Forestry Commission	Brad Bramlett	Piedmont Assistant Regional Forester	BBramlett@scfc.gov	M
Paris Mountain HOA	Alex Kiriakides	Altamont Club Contact	Akiriakides3@aol.com	M
Duncan Chapel Fire Department	Russell Watson	Chief	Watson823@duncanchapelfire.org	M
Piedmont Park Fire Department	Tom McCarty	Chief	tmccarty@piedmontparkfire.org	M
Piedmont Park Fire Department	Kevin Taylor	Rescue Coordinator	ktaylor@piedmontparkfire.org	M
SC State Fire	Chad Beam	Section Chief, SCERTF	Chad.Beam@llr.sc.gov	M
SC State Fire	Josh Fulbright	Section Chief, Community Risk Reduction	josh.fulbright@llr.sc.gov	M
SC Parks, Recreation & Tourism	Terry Hurley	Chief of Interpretation & Resource Management	thurley@scprt.com	M
SC Parks, Recreation & Tourism	Adin Fell	Regional Chief, Mountain Region	afell@scprt.com	M
SC Parks, Recreation & Tourism	Jason Hege	Paris Mountain Park Manager	jhege@scprt.com	R
SC Parks, Recreation & Tourism	Dan Neary	Paris Mountain Park Ranger	dneary@scprt.com	R
SC Parks, Recreation & Tourism	Stacy Scherman	State Parks Biologist	sscherman@scprt.com	R
SC Parks, Recreation & Tourism	Rachel Chism	State Parks Forester	rchism@scprt.com	R

Furman	Geoffrey Habron	Professor of Sustainability Sciences	Geoffrey.Habron@furman.edu	M
SC Emergency Management Division	Lindsey McCoy	Mitigation Planning Coordinator	lmccoy@emd.sc.gov	M
SC Emergency Management Division	Ryan Guerry	Mitigation Planning Specialist	rguerry@emd.sc.gov	R
National Weather Service (GSP)	Trisha Palmer	Warning Coordination Meteorologist	Trisha.Palmer@noaa.gov	M
National Oceanic & Atmospheric Administration	Brian Campbell	Regional Maintenance Specialist	Brian.Campbell@noaa.gov	M
ReWa	Gregory Wright	Engineering Director	gregoryw@re-wa.org	M
ReWa	Rebecca West	Resiliency Plan	rebeccaw@re-wa.org	R
ReWa	Jennifer Simmons	Emergency Response	jennifers@re-wa.org	R
Greenville Water	Mark Hattendorf	Director of Engineering	mhattendorf@greenvillewater.com	M
Greenville Water	Craig Sollman	Hydraulic Modeling Engineer	csollman@greenvillewater.com	M
Duke Energy	Linda Hannon	District Manager	linda.hannon@duke-energy.com	M
SCDOT	Tony Thompson	District Maintenance Engineer	ThompsonTN@scdot.org	M
SCDOT	Joel Smith	Greenville County Resident Maintenance Engineer	smithjj@scdot.org	R
N/A	Savannah Norvell	Resident	slnorvel@gmail.com	M

Sign-in sheets for all WMT meetings can be found in Appendix A.

As with the DMC, the WMT is intended to represent a partnership between the public and private sectors of the community, working together to create a wildfire resistant community. The proposed mitigation initiatives developed by the WMT and listed in this plan, when implemented, are intended to make the Paris Mountain planning area safer from the impacts of future wildfires for the benefit of every individual, neighborhood, business, and institution within the planning area.

The WMT is charged with meeting, at a minimum, on an annual basis to review mitigation initiatives that have been implemented, review lessons learned from disaster events that may have occurred since the last meeting of the WMT, and revise the Wildfire Mitigation Plan, as appropriate. Mitigation initiatives proposed for future implementation may also be reevaluated for consistency with the goals of the Wildfire Mitigation Plan and to incorporate lessons learned from ongoing or implemented initiatives. This annual meeting should be held prior to the annual meeting of the DMC so that any proposed changes to this plan can be reviewed by the DMC and incorporated in the overall 2020 HMP, as appropriate.

Wildfire Mitigation Team Operating Procedures

The WMT was organized as the guiding body for the creation of the Paris Mountain Wildfire Plan with Woolpert, Inc. assisting through data gathering and analysis, meeting facilitation, and plan preparation. The plan development process included two meetings with the WMT and two meetings with the DMC. (Full agendas and meeting minutes are contained in Appendix A).

WMT meeting #1 (October 15, 2020): The initial meeting of the WMT served primarily as an introductory meeting for the project and WMT members. A project overview including a review of the relationship of this plan to the 2020 HMP was provided. The WMT also reviewed the following:

- Wildfire Mitigation Plan purpose and goals
- WMT introductions and roles
- Planning process and schedule
- Wildfire hazard
- Overarching mitigation techniques
- Next steps

WMT meeting #2 (July 1, 2021): This was the second meeting of the WMT and the purpose was to begin identifying actionable items (mitigation initiatives) to reduce the risk of wildfire or wildfire damage in the Paris Mountain planning area. The identified mitigation initiatives will be presented to the public for comment, then revised as appropriate. After addressing comments from the public, the list of mitigation initiatives will be prioritized by the WMT for implementation. Approximately two dozen individual ideas were presented representing eight (8) different strategies.

DMC meeting #3 (November 12, 2021): Because this plan is a part of the larger HMP and the DMC is responsible for establishing plan priorities in that plan, the WMT submitted its list of potential mitigation measures to the DMC for scoring. The DMC met and reviewed the plan and began scoring of measures. Meeting time ran short, and the DMC requested that a second scoring meeting be established and that Woolpert offer an initial scoring for the remaining measures prior to the meeting.

DMC meeting #4 (December 9, 2021): Woolpert provided the DMC with an initial scoring prior to the meeting. During this meeting the DMC reviewed the suggested scores and made scoring revisions as appropriate. The DMC also recommended modifications to the “Provide incentives for residential sprinklers” measure to include all fireproofing techniques and requested that mitigation measures related to potential wildlife in the area be researched and included, as appropriate.

Woolpert performed the requested research and recommended adding wildlife considerations to the public outreach materials and development of wildlife surveys within the Paris Mountain planning area. Including additional material in the public outreach category required only a modification of the description and did not require rescoring. The wildlife survey was a new mitigation measure and was submitted to the DMC for review and scoring.

6. PLAN PURPOSE AND GOALS

Paris Mountain is in unincorporated Greenville County just north of the City of Greenville. In general, and for the purposes of this document, the Paris Mountain planning area is bounded by State Park Road (County Road 22), South Carolina Highway 253, U.S. Route 276, and U.S. Route 25 (See Figure 4-1). There are many valuable infrastructure and natural assets located within the boundaries of this area including, but not limited to; communications equipment including multiple television and radio transmission towers, Paris Mountain State Park, two (2) waste treatment plants, and a large number of residential and commercial structures.

Additionally, access to many of these assets is limited. Altamont Road provides access from the west to the communications equipment and State Park Road provides park access from the south. Subdivision streets provide access to many of the residential structures located at the base of the mountain.

In November 2016, Pickens County and portions of Greenville County suffered from the Pinnacle Mountain wildfire that burned over 10,000 acres. While this event was subject to unique weather conditions (high winds), it raised awareness of the potential for future wildfire events in Greenville County. There have been additional recent wildfires across the nation that have increased awareness of wildfires and their associated risks and hazards. Greenville County recognizes that Paris Mountain is in the wildland-urban interface and is susceptible to wildfire. Because of the high risk and number and types of assets located on the mountain, the County decided to enhance the existing 2020 HMP with an annex addressing wildfire mitigation for the Paris Mountain planning area.

The intent of this plan is to develop an understanding of the Paris Mountain community's susceptibility to wildfire, evaluate the assets at risk, and determine mitigation actions that can be taken to reduce the overall susceptibility to wildfire and potential risk to life, infrastructure, and natural resources.

Plan Goals

Hazard mitigation goals were established as part of the 2020 HMP process. Because this plan is an annex to that document, those same goals apply to this plan. The 2020 HMP contains nine (9) goals, each with multiple objectives.

Below are the goals and objectives listed in the 2020 HMP.

1. County government will have the capability to develop, maintain, and utilize hazard information
 - a. Data and information needed for defining hazards, risk areas, and vulnerabilities in the community will be obtained
 - b. The capability to effectively utilize available data and information related to mitigation planning and program development will be available
 - c. The effectiveness of mitigation initiatives implemented in the community will be reviewed and documented
 - d. There will be a program to derive mitigation "lessons learned" from significant disaster events occurring in or near the community
2. The County will have the capability to initiate and sustain emergency response operations during and after a disaster
 - a. Communications systems supporting emergency services operations will be available to provide for effective communication during times of disaster
 - b. Designated evacuation shelters will be capable of operating during and after disaster events
 - c. Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations
 - d. Local emergency services facilities will be assessed, and County-owned service facilities will be capable of operating during a disaster event

- e. Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts
- 3. The continuity of County government operations will not be significantly disrupted by disasters
 - a. Measures will be implemented to alert County personnel of impending disasters and corresponding action plans
 - b. County employees will be trained in disaster response and operations
- 4. The policies and regulations of County government will support effective hazard mitigation programming throughout the County
 - a. County government will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community
 - b. County government will protect high hazard natural areas from new or continuing development
 - c. Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk
 - d. Reconstruction and rehabilitation of structures and utilities in the County will incorporate appropriate hazard mitigation techniques
 - e. Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster
 - f. The County will continue participation in the National Flood Insurance Program and the associated Community Rating System
- 5. Residents of the County will have homes, institutions, and places of employment that are less vulnerable to disasters
 - a. Programs for removal, relocation or retrofitting of vulnerable utilities in high hazard areas will be established
 - b. The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized
- 6. The economic vitality of the County will not be significantly threatened by a disaster
 - a. County government emergency response and disaster recovery plans will appropriately consider the needs of key employers in the community
 - b. County government will encourage community businesses and industries to make their facilities and operations disaster resistant
 - c. County government will implement appropriate communications initiatives to address public concerns of community condition and functioning in the aftermath of a disaster
- 7. The availability and functioning of the County's infrastructure will not be significantly disrupted by a disaster
 - a. County government will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities
 - b. Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure due to a disaster
 - c. Transportation facilities and systems serving the County will be constructed and/or retrofitted to minimize the potential for disruption during a disaster
- 8. Key County employees will be trained to recognize hazards threatening local areas and the techniques to minimize vulnerability to those hazards. Information on hazard mitigation will be disseminated to the public.
 - a. Interested individuals will be encouraged to participate in hazard mitigation planning and training activities
 - b. Education programs in risk communication and hazard mitigation will be established and implemented
 - c. Managers of public facilities will be knowledgeable in hazard mitigation techniques and the components of the County's mitigation plan
 - d. Technical training in mitigation planning and programming will be given to appropriate local government employees
 - e. The public will have facilitated access to information needed to understand their vulnerability to disasters and effective mitigation techniques
- 9. The County will protect public safety and reduce loss of life and injury

- a. Mitigation initiatives will be prioritized with emphasis on the number of citizens impacted by the initiative
- b. Hazards with the highest potential to cause injury or risk to life will be given priority in the planning process
- c. This plan will support the efforts of those responsible for emergency response during and immediately following a natural disaster

While not all of these goals or objectives may be applicable to wildfire mitigation, it is the intent of this planning process to meet as many goals and objectives listed in the 2020 HMP as practical.

7. DESCRIPTION OF WILDFIRE HAZARD

Understanding the hazard posed by wildfire to the Paris Mountain planning area begins with a general understanding of the characteristics and forms of wildfire in general. The following sections provide some insight into the nature of wildfires, particularly in the urban wildland interface – the transition zone from urbanized area to natural area. Upon gaining an understanding of the basic behavior of wildfire, one can estimate the wildfire hazard for a given area.

The South Carolina Forestry Commission (SCFC) has prepared a wildfire risk assessment for the Paris Mountain planning area using the Southern Wildfire Risk Assessment tool (SouthWrap or SoWRAP) provided by the Southern Wildfire Risk Assessment Project. This assessment provides an initial indication of both the level of wildfire hazard and risk and is referenced extensively in this section (Section 7. Description of Wildfire Hazard and Section 8. Description of Risk).

Wildfire Categories

Wildfires are identified through various categories. The four most common categories are described below.

1. **Wildland:** The wildland is an area where development is essentially non-existent except for transportation ways and the occasional structure. A wildland fire is defined as any non-structure fire that occurs in vegetation or natural fuels.
2. **Interface:** The wildland urban interface is an area where man-made structures are in or adjacent to areas prone to wildfire.
3. **Intermix:** The wildland urban intermix is where multiple single or clustered man-made structures are scattered in a wildland area. These areas are often difficult to access and surrounded by highly flammable unmanaged vegetation.
4. **Prescribed:** A prescribed fire or controlled burn is the application of fire by a team of fire experts under specified weather conditions to help meet a management objective.

Wildfire Types

There are also three basic types of wildfires with distinct characteristics. These can act individually or in conjunction with each other creating complex firefighting challenges. Figure 7-1 below illustrates the three types of wildfires.

1. **Ground:** Ground fires occur in areas where there is deep accumulation of highly burnable peat, humus, and several layers of dead vegetation that has become dry enough to burn. These fires can move extremely slow but are very difficult to detect and control as they can burn under the surface for several months given the right conditions. Ground fires pose a risk to firefighting safety as well as increase the chance of re-ignition several days to several months after the main fire event.
2. **Surface:** Depending on weather conditions, surface fires may only burn the immediate surface litter and move more slowly with less intensity. Typically, these fires are relatively easy to control and cause the least amount of damage. However, under proper weather conditions and with the right kind of fuel on the ground, surface fires can burn more intensely, move faster, and cause significant damage.
3. **Crown:** Crown fires burn independently of ground fires moving from treetop to treetop. These fires spread very quickly through a forest with high intensity. These fires are very difficult to control and can cause the most extensive damage.



Figure 7-1: Wildland Fire Types

The SoWRAP analysis in Table 7-1 and Figure 7-2 concludes that the likely predominant fire type to impact the Paris Mountain planning area is surface fire (85.1%). Although surface fires are typically easier to control than ground or crown fires, they still require an immediate and coordinated emergency response.

Table 7-1: Percent Probability of Fire Types in Paris Mountain

Fire Type		Acres	Percent
	Non-Burnable	1,452	14.0 %
	Surface Fire	8,820	85.1 %
	Passive Canopy	93	0.9 %
	Active Canopy	0	0.0 %
Total		10,365	100.0 %

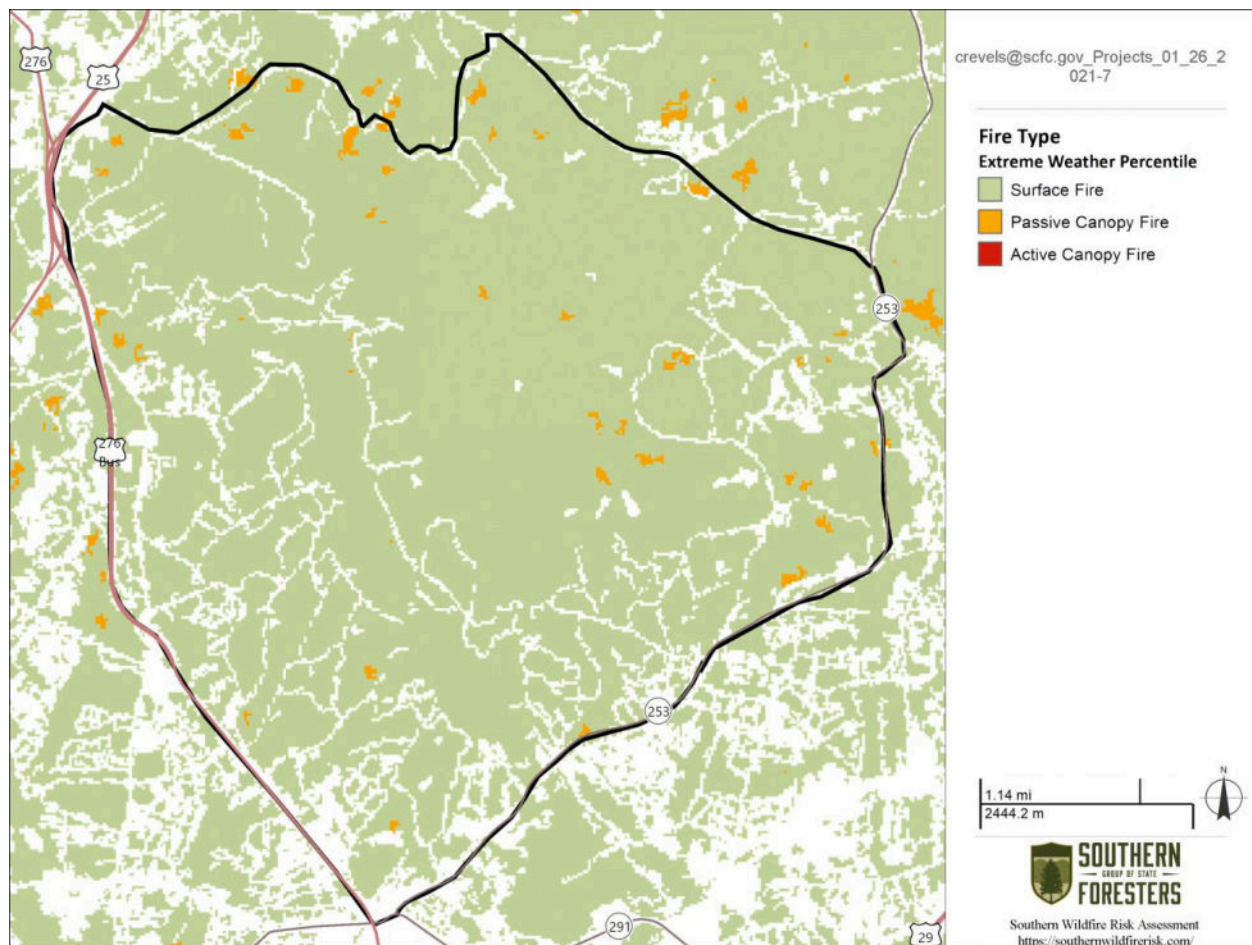


Figure 7-2: Fire Types in Paris Mountain

Wildfire Components

The following terms are frequently used in describing the components of a wildfire (<https://www.nwcg.gov/glossary/a-z>). Figure 7-3 below illustrates the various parts of a wildfire.

1. **Head:** The head of a wildfire is the fastest moving part of a fire. It is being carried by the wind into unburned fuel. The most intense fire behavior is usually found here.
2. **Flank (Left & Right):** The flanks are the edges of the fire burning parallel to the main direction of the fire. They do not move as fast and are not as intense; however, with a wind shift a flank fire can quickly turn into a head fire.
3. **Back:** The back of the fire is the line of fire opposite of the head. It is the slowest moving part of the fire with the least intense behavior. The back of the fire is moving into unburned vegetation against the wind direction.
4. **Point of Origin:** The point of origin is where ignition first occurred. Examples of this would be an escaped campfire, cigarette, or lightning strike.
5. **Pocket/Bay:** A pocket or bay is unburned indentions in the fire line. Usually, the vegetation in this area is slower burning and will become surrounded by the main fire.
6. **Fingers:** A finger is a long narrow extension of the fire the projects from the main body of the fire.

7. **Spot Fire:** A spot fire is an ignition outside the main fire body typically started from embers dropping into unburned vegetation. Spotting can occur miles away from the main fire front and can eventually merge creating larger and more dangerous fires.

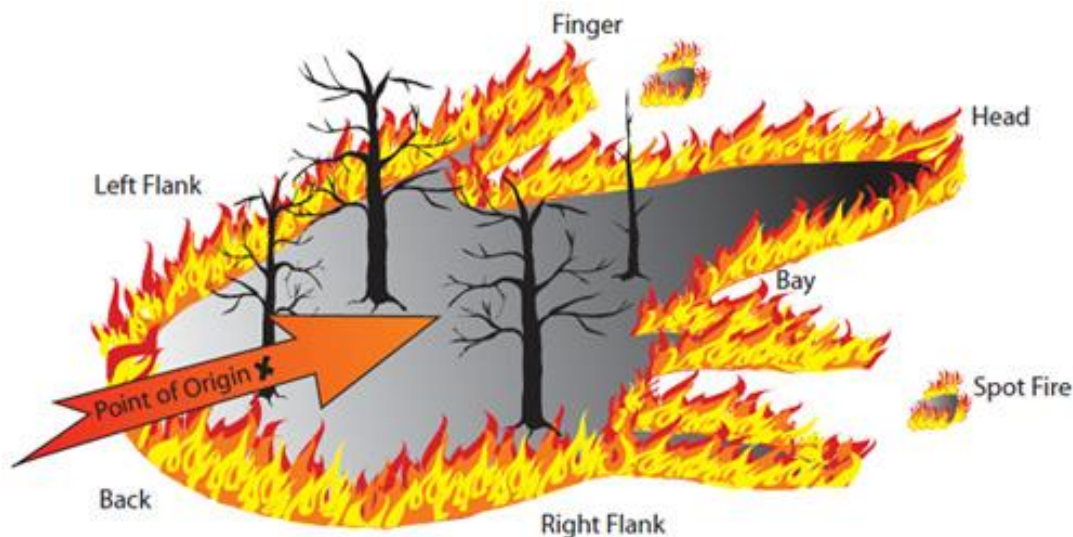


Figure 7-3: Wildfire Components

Wildfire Behavior

Multiple factors can influence the behavior of a wildfire including fuel, weather, and topography. These factors must be considered and managed to effectively mitigate any wildfire.

1. **Fuel:** Anything that can burn can be fuel for a wildfire. In a wildland area, all plant materials act as a fuel source. As these materials accumulate unmanaged over multiple seasons, the risk for a catastrophic and uncontrollable wildfire increase. Fuel, however, is the only fire behavior component that can be manipulated to decrease the risk of a wildfire.
2. **Weather:** Weather conditions can heavily influence the behavior of a fire, especially wind, temperature, and humidity.
 - a. **Relative humidity:** Relative humidity is a measure of the actual water vapor in the air compared to the total amount of vapor that can exist at a current temperature. This has a direct effect on the moisture level in fuels. At low humidity levels and especially after extended droughts, the fuels will become extremely dry and catch fire easily.
 - b. **Wind:** Wind is probably the most important factor in wildland fire behavior as it is the driving source behind a fire and provides the fire with a constant source of oxygen. High winds can contribute to a fast-moving head and a greater possibility for spot fires.
 - c. **Temperature:** Temperature is another important factor when considering the flammability of fuels. Fuels will ignite more readily at higher ambient temperatures as they are heated by solar radiation.
 - d. **Firestorms:** In extreme wildfire behavior it is not uncommon to see a firestorm. As hot air from the fire rapidly rises, a void of space is left behind which is quickly filled by air near the ground. This creates an extreme updraft that begins to spin when it meets crosswinds, creating a fire whirl or fire tornado. Firestorms are an indication of unstable atmospheric conditions.
3. **Topography:** Topography can have a direct impact on fire behavior. Fire moves uphill quickly as it heats the fuels above it, decreasing the ignition time. Areas downhill from fires can be just as dangerous as vegetation burning uphill releases and rolls down spreading the fire or injuring those below it. Saddles and chimneys can

create dangerous fire behavior as air is shuttled through these areas. Steep slopes increase the difficulty of fire suppression and increase the chance of firefighters being caught in the fire.



Figure 7-4: Photo of a Firenado (Marvin Vetter, Oregon Department of Forestry)

According to the “Southern Wildfire Risk Assessment Summary Report”, rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains per hour (ch/hr) or feet per minute (ft/min). One chain = 66 feet. Rate of spread is a fire behavior output, which is influenced by the three previously discussed environmental factors - fuels, weather, and topography. Rate of Spread is the metric used to derive Community Protection Zones.

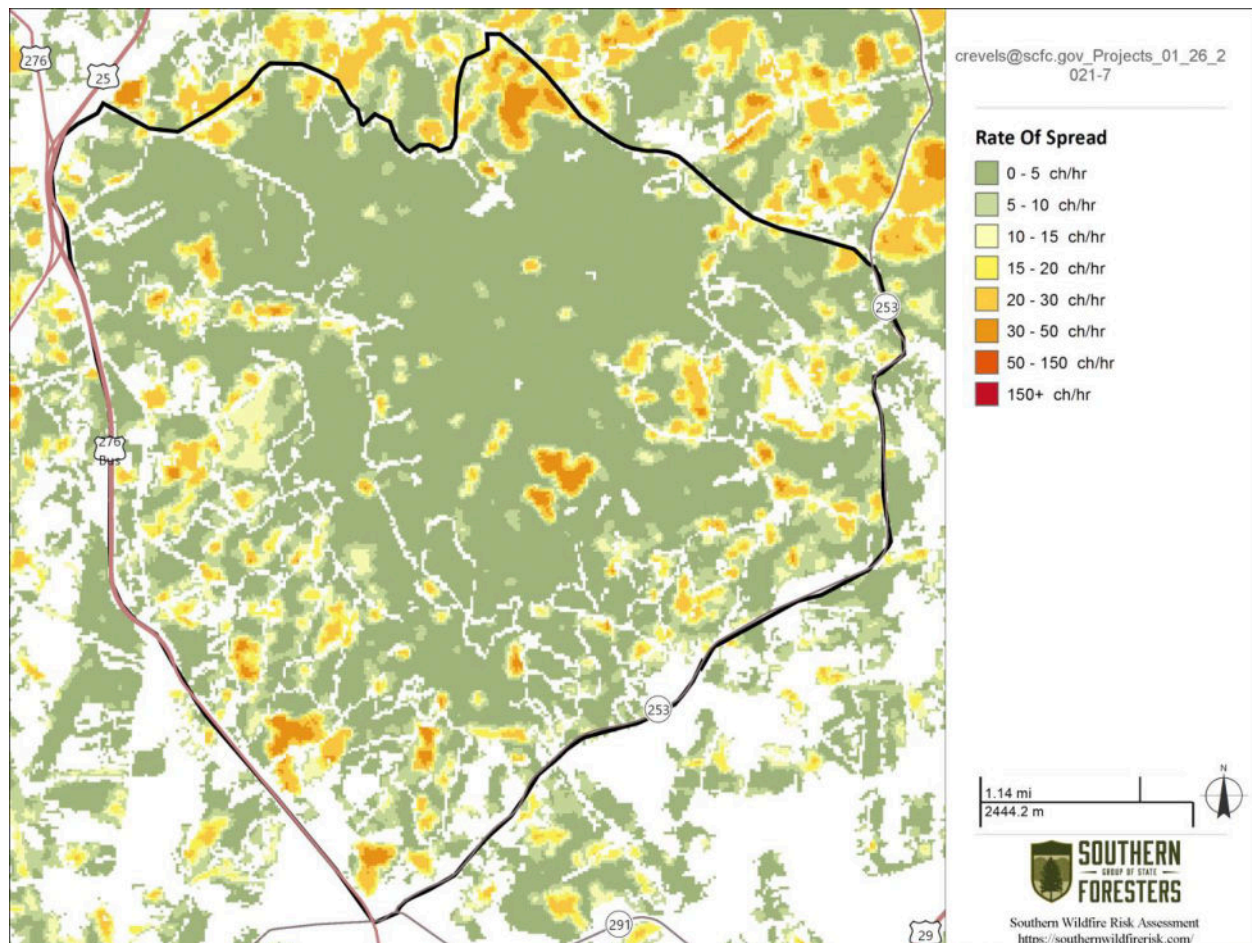


Figure 7-5: Wildfire Rate of Spread

Changes to Environment

Changes to the environment can also impact fire behavior. Changes in climate, pests and plant types, fuel types, and forest management can all play a key role in wildfire behavior. The principal issue that impacts wildfire, however, is human behavior.

1. **Climate:** Unlike day-to-day weather conditions, climate is the trending weather conditions in an area over a long period of time (typically 30 years). Climate has a direct effect on fire severity and behavior, so it is worth considering when planning long term management. An area that is warmer and drier will have more severe fires than an area that is cooler and wetter. Changing climate trends will influence fire behavior in that area.
2. **Invasive Pests/Plants:** Invasive pests and plants have been around for many years and can lead to an increased amount of fuel in the ecosystem. Pests such as the Hemlock Woolly Adelgid, Southern Pine Beetle, and Emerald Ash Borer can kill off large swaths of trees, leaving a large amount of dead and highly flammable fuel behind. Invasive plants such as Cogongrass and Kudzu can be extremely flammable or act as ladder fuels allowing fire to reach the canopy of the tree to begin a crown fire.
3. **Fuel Types:** Fuel types can change throughout the years for a multitude of reasons. Management by way of planting or mismanagement can lead to an influx of species that are fire susceptible or carry fire extremely well. As forests mature and drop leaves and needles, these accumulate to create thick loads of fuel that when dried out are extreme fire hazards.

4. **Forest Management:** Forest management in general has changed greatly over the past century. Since the Wildland Fire Control Program was initiated in 1885, fire suppression was common across America. In 1911 forest managers experimented with using fire to fight fire and research began to see if prescribed fire would increase viability and overall land health. In the 1960's forest management began to take a turn from passive management and fire suppression to a more proactive management. Even still, there are many legal/regulatory considerations when conducting any forest management technique and forest management can sometimes take an entire lifetime to achieve desired results.
5. **Human Intervention:** Human behavior has also greatly changed development patterns over the last century. As utilities became more available and desire for open space grew, people began to wander away from cities and into these "wild" areas. That trend has continued, but not many people are educated on the ecosystems they are moving into. Many wildland areas are fire dependent to ensure a thriving ecosystem. When man-made structures encroach these areas, it can add danger and complexity to prescribing or fighting these fires. Human causes also contribute to over 90% of all wildfires (90% nationwide & about 98% in South Carolina), increasing the chance of a fire breaking out during non-ideal or dangerous weather conditions.

Wildfire Causes

There are many potential causes of wildfire including those noted in Figure 7-6. This figure illustrates the percentage of wildfires nationwide due to each cause. The overwhelming majority of wildfires are due to either debris burning or woods arson. Overnight camping is allowed in the Paris Mountain State Park, and there are remote areas of the planning area where camping might occur, indicating that campfires might also be of elevated concern. Additionally, fireworks, powerlines, and structure fires should be considered as potential causes.

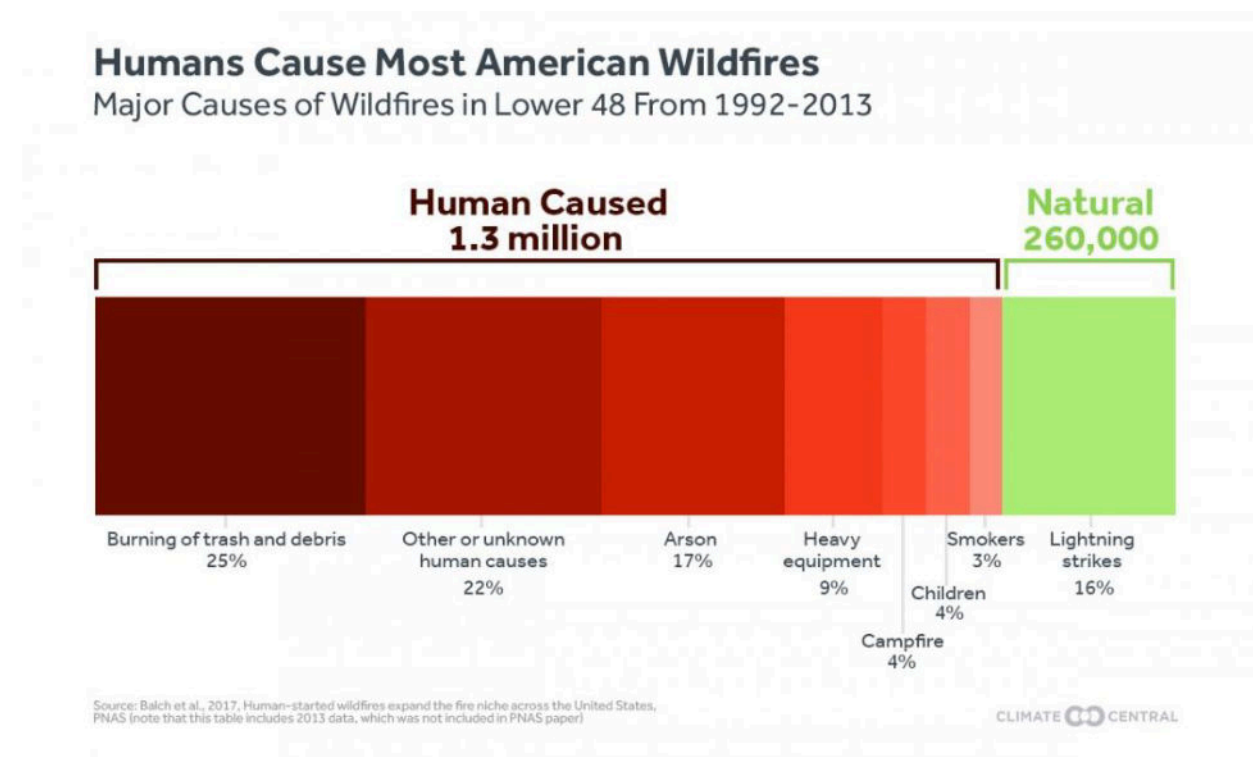


Figure 7-6: Causes of Wildfires Nationwide

Wildfire Potential

There are a variety of wildfire elements and tools available to measure the potential for wildfire hazard in a given area. As noted above, the SCFC utilized SouthWRAP to assess the risk of wildfire in the Paris Mountain planning area. This tool allowed the SCFC to define a specific planning area and summarize wildfire related information for that area. A draft detailed risk summary report was then generated using map products developed by the Southern Wildfire Risk Assessment project. Per the Southern Wildfire Risk Assessment Project, “SouthWRAP provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in the South.”

The SCFC performed a SouthWRAP analysis using the tool located at www.southernwildfirerisk.com and prepared a draft report of its findings. A summary of the analysis is contained below. It should be noted that the planning area for this plan and the planning area for the SCFC are slightly different.

See Appendix B for a complete copy of the analysis and report by the SCFC.

“Within the South WRAP tool, the Burn Probability (BP) layer depicts the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts. It is the tendency of any given “pixel” to burn, given the static landscape conditions depicted by the LANDFIRE Refresh 2008 dataset (as resampled by FPA), contemporary weather and ignition patterns, as well as contemporary fire management policies (entailing considerable fire prevention and suppression efforts).”

The BP data does not, and is not intended to, depict fire-return intervals of any vintage, nor do they indicate likely fire footprints or routes of travel. Nothing about the expected shape or size of any actual fire incident can be interpreted from the burn probabilities. Instead, the BP data, in conjunction with the Fire Program Analysts FIL layers, are intended to support an actuarial approach to quantitative wildfire risk analysis (e.g., see Thompson et al. 2011).

Values in the Burn Probability (BP) data layer indicate, for each pixel, the number of times that cell was burned by an FSim-modeled fire, divided by the total number of annual weather scenarios simulated. Burn probability raster data was generated using the large fire simulator - FSim - developed for use in the Fire Program Analysis (FPA) project. FSim uses historical weather data and current landcover data for discrete geographical areas (Fire Planning Units - FPU) and simulates fires in these FPU. Using these simulated fires, an overall burn probability and marginal burn probabilities at four fire intensities (flame lengths) are returned by FSim for each 270m pixel in the FPU.

The fire growth simulations, when run repeatedly with different ignition locations and weather streams, generate burn probabilities and fire behavior distributions at each landscape location (i.e., cell or pixel). Results are objectively evaluated through comparison with historical fire patterns and statistics, including the mean annual burn probability and fire size distribution, for each FPU. This evaluation is part of the FSim calibration process for each FPU, whereby simulation inputs are adjusted until the slopes of the historical and modeled fire size distributions are similar and the modeled average burn probability falls within an acceptable range of the historical reference value (i.e., the 95% confidence interval for the mean).

Table 7-2: Areas of Burn Probabilities in Paris Mountain

	Class	Acres	Percent
	1	4,359	57.6 %
	2	2,828	37.4 %
	3	378	5.0 %
	4	0	0.0 %
	5	0	0.0 %
	6	0	0.0 %
	7	0	0.0 %
	8	0	0.0 %
	9	0	0.0 %
	10	0	0.0 %
	Total	7,565	100.0 %

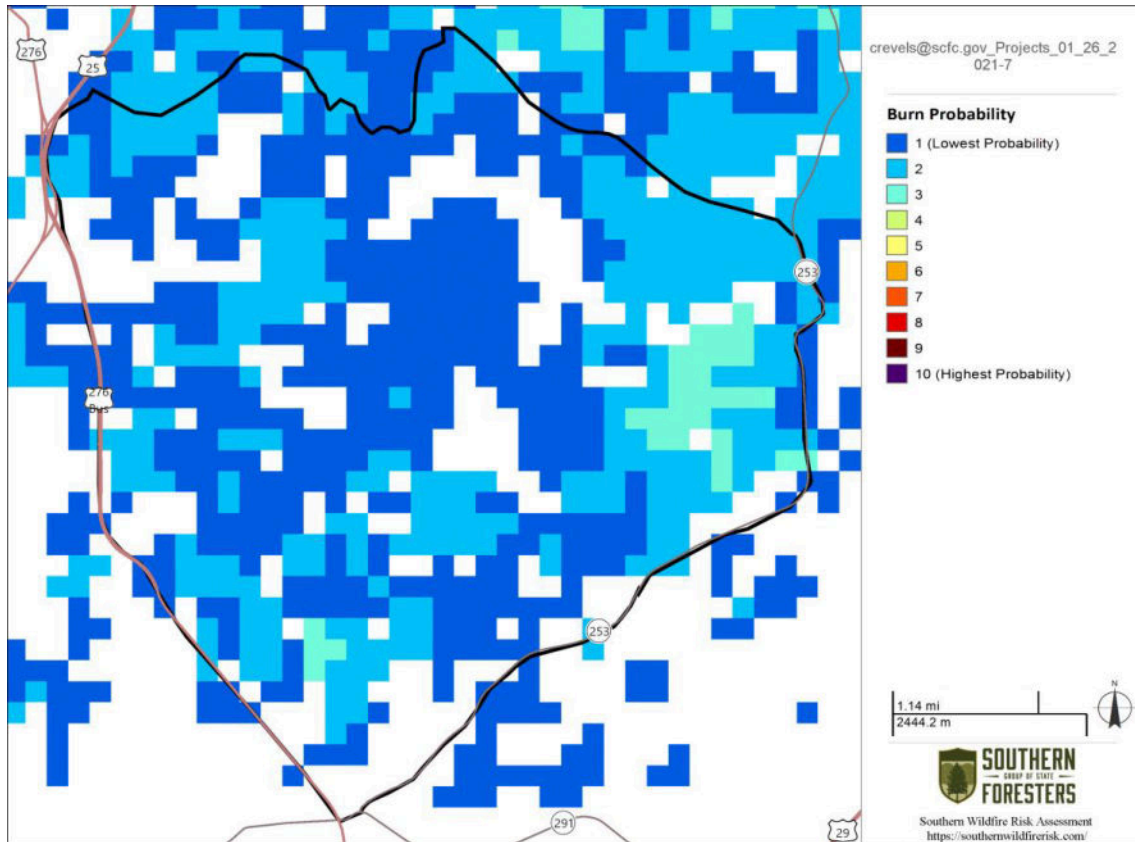


Figure 7-7: Burn Probability of Paris Mountain

8. DESCRIPTION OF WILDFIRE RISKS

General Risk

Section 7, Hazard and Risk Assessment, of the 2020 HMP Greenville County 2020 Multi-Jurisdictional Hazard Mitigation Plan discusses the County's approach to evaluating relative risk for all hazards including wildfire. In general, risk is comprised of two components: 1) the probability of an event occurring and 2) the consequences of that event. That is, if a hazard event occurs frequently, and has very high consequences, then that hazard is considered to pose a very high risk to the affected communities. In comparison, if a hazard event is not expected to occur frequently, and even if it did, the consequences would be minimal, then that hazard is considered to pose a very low risk. Each of the hazards considered to be a threat to Greenville County were assessed in the 2020 HMP for their probability of occurrence and likely consequences.

In the 2020 HMP, the DMC utilized a "relative risk score" derived from a qualitative process in which planners recorded, on a numeric scale, the likely frequency of occurrence, the extent of the community that would be impacted, and the likely consequences in terms of public safety, property damage, economic impact, and harm to valuable environmental resources. The numeric total of the assessments of each of these constituted the "relative risk score." For a more detailed explanation of the Risk Estimation Factors, please refer to Section 7 of the 2020 HMP.

The results of this process are listed in Table 8-1 below (green represents low risk (score = 0 – 10), yellow represents medium risk (score = 11 – 20), and red represents high risk (score = 21 – 40)). Wildfire hazard scored 14 points, classifying it as a medium risk relative to other hazards potentially impacting the County.

Table 8-1: Hazard Risk Scores

Rank	Hazard	Risk Score and Relative Risk Category
1.	Winter storms	40
2.	Flood	24
3.	High winds / Tornados	20
4.	Hail	20
5.	Drought	18
6.	Wildfire	14
7.	Earthquakes	7
8.	Sinkholes	3
9.	Landslides	3

The following data, also contained in the 2020 HMP, represents the impact county-wide from wildfire and was compiled from data supplied by the South Carolina Emergency Management Division, the South Carolina Hazard

Mitigation Plan, and the risk assessment described above. This data quantifies past events and provides insight into what can be expected in the future.

Table 8-2: Summary of Past Hazard Events and Future Risk

Hazard	Annualized Losses	Total Losses	Deaths	Injuries	Current Relative Level of Risk
Wildfires	\$6,674	\$367,071	0	0	Medium

Paris Mountain Area Risk

Risk can be assigned to people, infrastructure, and natural resources. The following data for the Paris Mountain planning area was taken from U.S. Census Bureau.

People at Risk: There is a substantial number of people residing in the Paris Mountain planning area. The population is generally congregated in the southwest and northwest quadrants of the planning area with additional residential properties scattered around the remaining base of the mountain. The population as a whole is relatively well educated. With a Hispanic population around 1%, the need for communications in Spanish is less critical than in some areas. See Figure 8-1 for a map of residential buildings in Paris Mountain.

- Population = 8,827
- Median Income = ~\$60,000
- At poverty level = 12%
- Education = 94% with some college
- Hispanic population = ~1%

Infrastructure at Risk: With over 3,900 structures valued at more than \$770 million, there is potential for considerable structural damage should a wildfire go unchecked in the planning area. This estimate does not include the number and value of other major assets such as communications equipment, non-profit institutions, medical, education, and public facilities. See Figure 8-1 for a map of the commercial and residential buildings at risk.

- Residential Buildings
 - 3,870 structures
 - ~\$687 million
- Commercial Buildings
 - 153 structures
 - ~\$82.5 million
- Other Infrastructure Types
 - Communications Equipment
 - Paris Mountain State Park
 - Medical Facilities
 - Education Institutions
 - Water Supply / Wastewater Treatment

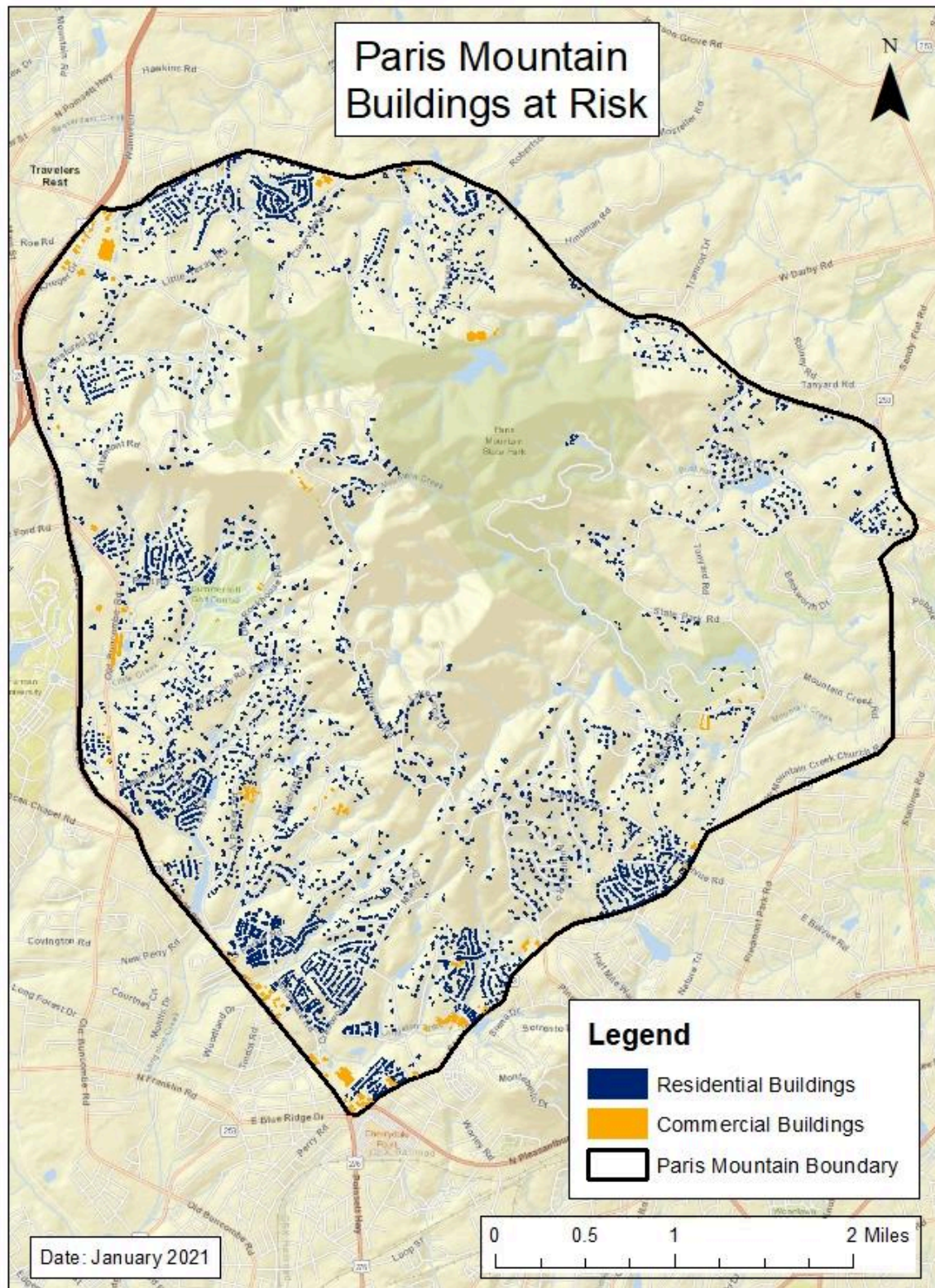


Figure 8-1: Paris Mountain Buildings at Risk

The SouthWrap analysis performed by the SCFC provides additional data on the density of housing in the planning area. See Table 8-3 and Figure 8-2 below. Residential housing is concentrated on the Southern, Western, and Eastern edges of Paris Mountain, with scattered housing throughout the central area. It should be noted that there are slight differences in population and structure numbers between this report and the SouthWrap analysis due to slightly different planning areas.

Table 8-3: Housing Density of Paris Mountain

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	16	0.2 %	1,119	13.6 %
	1hs/40ac to 1hs/20ac	32	0.4 %	694	8.5 %
	1hs/20ac to 1hs/10ac	149	1.9 %	1,096	13.4 %
	1hs/10ac to 1hs/5ac	311	4.0 %	1,153	14.1 %
	1hs/5ac to 1hs/2ac	1,349	17.5 %	2,034	24.8 %
	1hs/2ac to 3hs/1ac	5,050	65.5 %	2,021	24.6 %
	GT 3hs/1ac	800	10.4 %	87	1.1 %
	Total	7,707	100.0 %	8,204	100.0 %

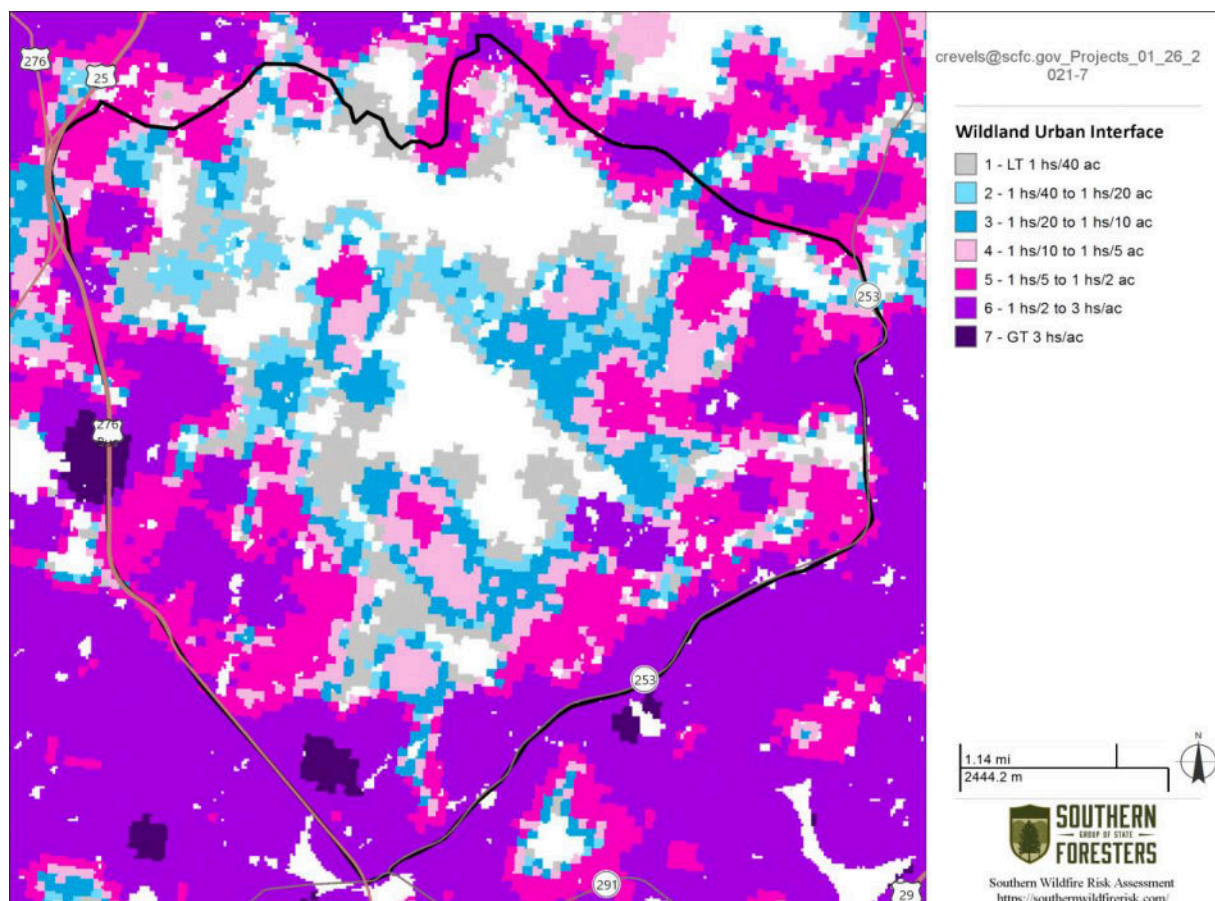


Figure 8-2: Housing Density of Paris Mountain

Natural Resources at Risk: In addition to people and hard infrastructure, the Paris Mountain planning area is home to several valued natural resources. These natural resources include Paris Mountain State Park, a designated National Register listed Historic District (contained within the State Park), and three (3) separate Naturaland Trust protected properties.

As of the writing of this report, the Naturaland Trust website indicates the Trust has purchased and protected key parcels around the state park, shown in Figure 8-3. The first parcel was 33 acres situated on Brissy Ridge, a beautiful hardwood forest. This property was transferred to the State Park for long-term management. An additional purchase was the Furman Face, which occupies approximately 58 acres of the wooded western face of the mountain. This property can be seen from Greenville, Poinsett Highway, downtown Travelers Rest, Furman University, and the Swamp Rabbit Trail.

Paris Mountain State Park Expansion

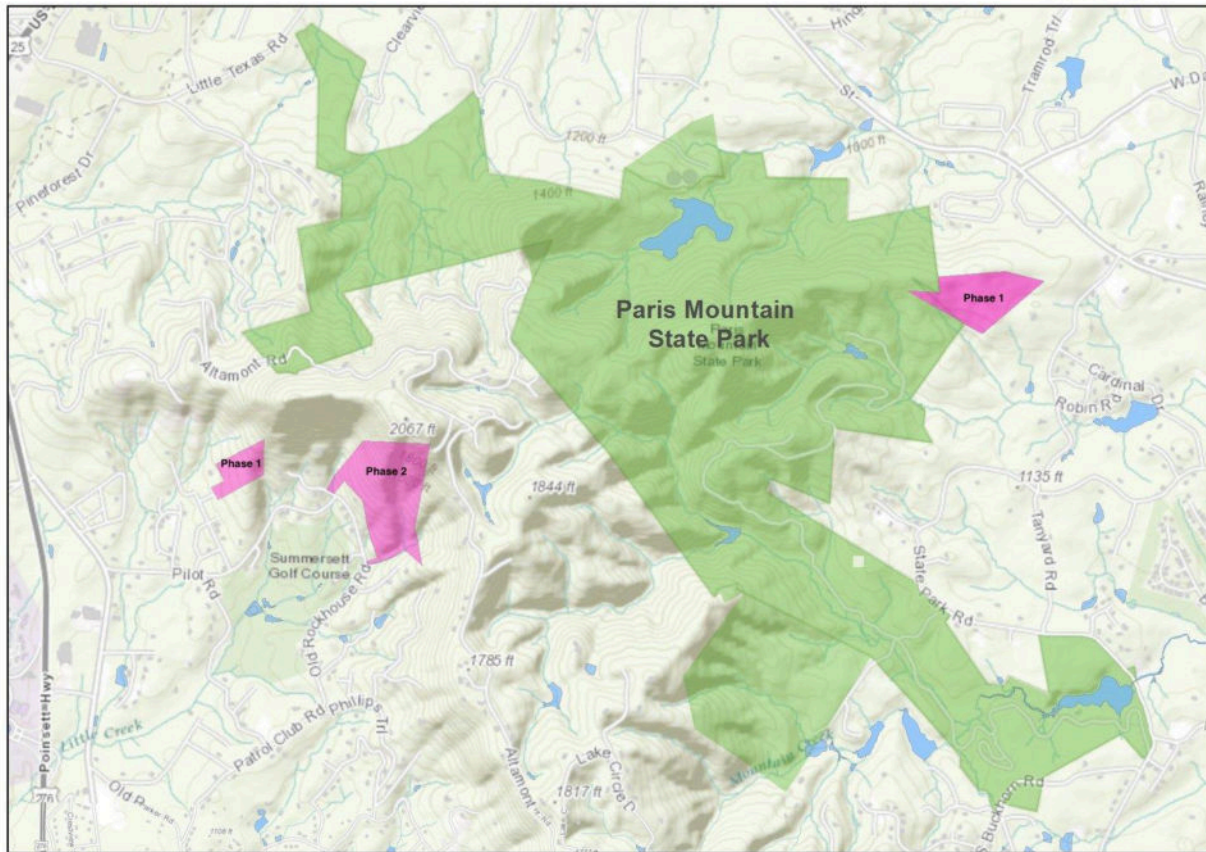


Figure 8-3: Paris Mountain State Park and Naturaland Trust Properties

Source: <http://www.naturalandtrust.org/paris-mountain>

"Paris Mountain State Park is located six miles north of downtown Greenville. It encompasses 1,700 acres of forest, streams, and lakes, including Lake Placid, which was created in 1898 to provide drinking water for the City of Greenville. Most Park structures were created in the 1930s by the Civilian Conservation Corps.

The Park is designated as a Discover Carolina site, making education a top priority, and recognizing that the park's location in the City of Greenville makes it an ideal destination where students can learn about our natural world. The efforts of the Paris Mountain State Park Friends make much of this possible."

Source: <https://southcarolinaparks.com/discover-nature-paris-mountain>

"Paris Mountain is significant for its association with the establishment and development of a system of state parks in South Carolina. As one of sixteen state parks constructed in the state by the Civilian Conservation Corps (CCC), Paris Mountain is expressive of the conservation, recreation, and design ethic of the early twentieth century state parks movement. Specifically, Paris Mountain is significant for its association with early utilitarian conservation efforts in South Carolina before the 1930s, and the establishment of local recreational parks during the Great Depression. Paris Mountain also reflects the

rustic style of park architecture and landscape design. Buildings and structures in the park were built using local materials, such as rubble stone and roughhewn logs, in a manner that harmonized with the natural environment. The CCC structures are grouped into three main areas, all surrounding or close to lakes. The most concentrated development occurs along the south side of Lake Placid. This section of the park includes picnic spots, the bathhouse, swimming area, amphitheater, athletic field, and park administrative buildings. The area around Sulphur Springs and Mountain Lake includes trails, picnic areas, and the archery range. Hidden deep within the park is the Buckhorn organized group camp, which consists of a lodge and camper cabins. All of these areas are joined by park roads, which serve to unify the overall park design. Listed in the National Register April 30, 1998.”

Source: <http://www.nationalregister.sc.gov/greenville/S10817723049/index.htm>

All of the Paris Mountain planning area resources combined, constitute substantial value to the community that should be protected from wildfire hazard. This plan considers mitigation measures to protect people, infrastructure, and natural resources to the extent practical.

SouthWRAP Risk Assessment

The SouthWRAP analysis prepared by the SCFC provides additional insight into the potential risk of wildfire in the Paris Mountain planning area. The sections below are taken substantially from the “Southern Wildfire Risk Assessment Summary Report”.

Wildland Urban Interface (WUI) Risk Index: “The Wildland Urban Interface (WUI) Risk Index is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre). The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes.

To calculate the WUI Risk Rating, the WUI housing density data was combined with Flame Length data and response functions were defined to represent potential impacts. By combining flame length with the WUI housing density data, the location where there is the greatest potential impact to homes and people was determined. Figure 8.4 illustrate the results of the WUI Risk Interface model.”

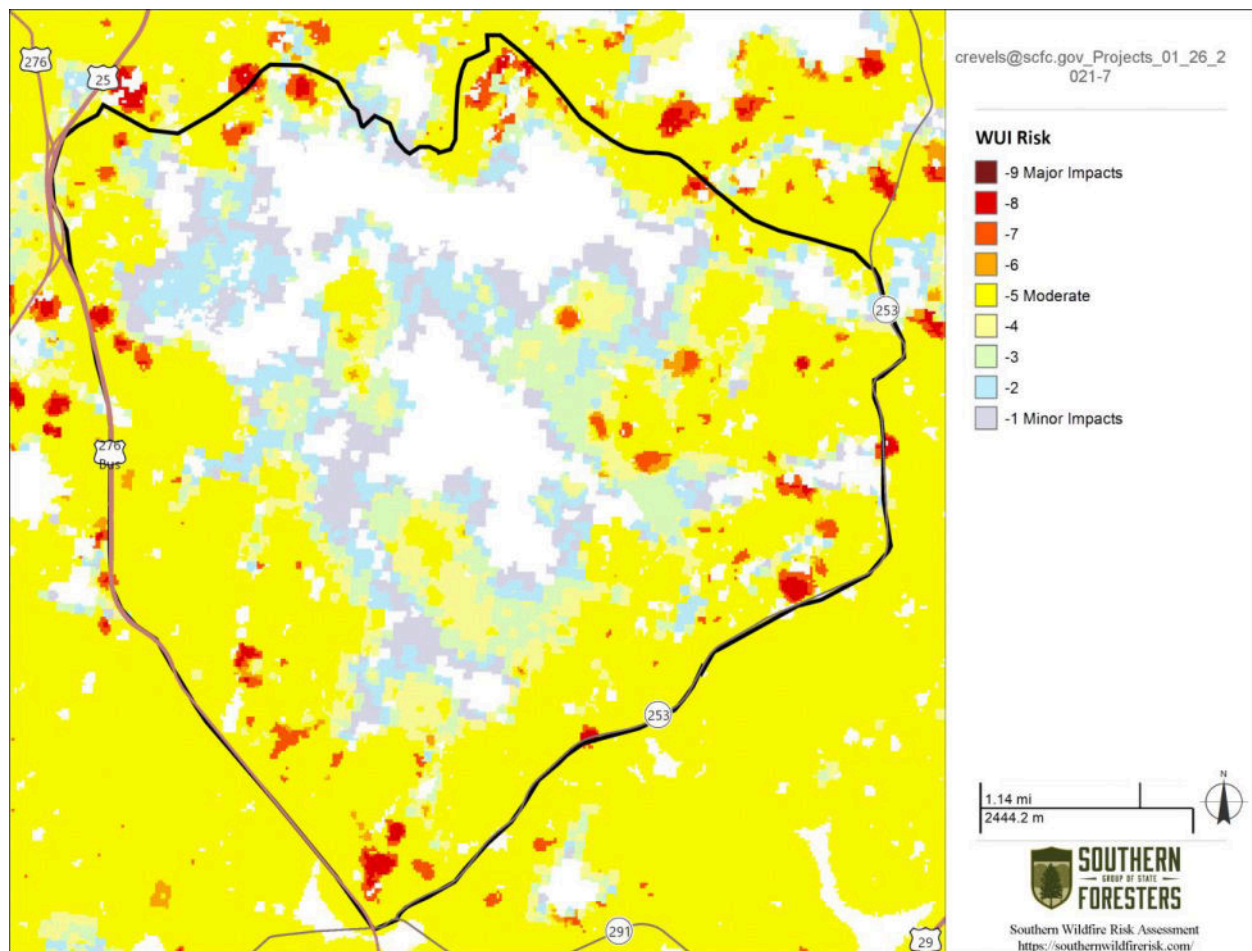


Figure 8-4: Paris Mountain Wildlands Urban Interface Risk

Community Protection Zones (CPZ): Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the “Where People Live” housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.

General consensus among fire planners is that for fuel mitigation treatments to be effective in reducing wildfire hazard, they must be conducted within a close distance of a community. The WUI housing density has been used to reflect populated areas in place of community boundaries (Primary CPZ). This ensures that CPZs reflect where people are living in the wildland, not jurisdictional boundaries.

Secondary CPZs represent a variable width buffer around populated areas that are within a 2-hour fire spread distance. Accordingly, CPZs will extend farther in areas where rates of spread are greater and less in areas where minimal rate of spread potential exists. Secondary CPZ boundaries inherently incorporate fire behavior conditions.

Primary CPZs reflect areas with a predefined housing density, such as greater than 1 house per 20 acres. Secondary CPZs are the areas around Primary CPZs within a 2-hour fire spread distance.

Figure 8.5 illustrates the results of the CPZ analysis.



Figure 8-5: Paris Mountain Community Protection Zones

This data combined with local understanding of the wildfire hazard and potential risks will help inform Section 9, Potential Damages /Cost Assessment and Section 10, Mitigation Initiatives.

9.POTENTIAL DAMAGES/COST ASSESSMENT

Estimating damages from a potential wildfire incident is a difficult task. There are many variables that impact costs including location of the fire within the planning area (i.e., inhabited vs. uninhabited area), size, duration, and level of preparedness of the impacted community. There are initial attack costs, damages to infrastructure, and social costs. The following paragraphs provide some general information regarding costs of wildfires across the nation and a generalized estimate of potential damages associated with a potential wildfire in the Paris Mountain planning area.

Wildfires are associated with two major types of cost: damage cost and suppression cost. The damage cost of a wildfire is estimated from loss and damage caused to property values, building values, natural resources and human life. According to the National Institute of Standards and Technology (NIST) report, “The Costs and Losses of Wildfires”, annual damage costs in the U.S are estimated to range from \$63.5 billion to \$285 billion. Wildfire suppression costs are the costs spent to control and put out fires. This includes the costs to pay for equipment and federal and state firefighting crews. Wildfire suppression costs in the U.S. have increased from an annual average of about \$425 million from 1985 to 1999 to \$1.6 billion from 2000 to 2019, according to data from the National Interagency Fire Center. This increase in wildfire suppression costs is in part due to an increase in frequency of wildfires, but also due to the growing urban wildland interface that places more development in danger of wildfires, forcing firefighters to protect human developments at any cost. The NIST report estimates that the true annual fire suppression costs range from \$7.6 billion to \$62.8 billion. While suppressing wildfires is expensive, the estimated suppression costs remain much less than the estimated damage costs from wildfires. Investing in a well-prepared firefighting response can limit wildfire damage, which ultimately saves money by reducing the damage costs of wildfires.

The Southeast U.S. sees about 45,000 wildfires and more than one million acres burned per year, according to Wildland Fire in the Southeast. While the Western U.S. is often in the national spotlight because of the region’s frequent large wildfires, the Southeast remains at significant risk to wildfires. The Southeast has a higher percentage of population living in the wildland urban interface than any other region in the U.S., increasing the risk of wildfire damage costs for the area. The population of the Southeast is expected to continue to grow, thereby increasing urban sprawl and the wildland urban interface area, which ultimately will increase the damage risk of wildfires to the Southeast.

Greenville County’s most recent large wildfire was the Pinnacle Mountain fire. The fire was met with a fast-acting and aggressive firefighting response, with suppression costs estimated to total \$5 million. Due to that well-prepared response, no homes were damaged, and no lives were lost, so the damages cost associated with the fire was minimal. Compare that to the Chimney Tops 2 fire in Tennessee that began in similar conditions but was met with a slower firefighting response and greater complexity with the increased wildland urban interface. More than 2,400 homes were destroyed, 14 people were killed, and it cost an estimated \$2 billion in damages. The estimated suppression costs were \$8.8 million, almost twice as much as the Pinnacle Mountain fire suppression costs. The Chimney Tops 2 Fire Report, performed by the National Park Service, determined that the lack of fire preparedness caused the response to be overwhelmed by the wildfire, and they therefore recommended enhancing the regions preparedness and fire planning for the future. The difference in damage and suppression costs between the two wildfires illustrates how a well-prepared firefighting response can be the difference in saving billions of dollars’ worth of damage and human lives.

The Paris Mountain area contains great value at risk of wildfire damage. It includes approximately 3,968 residential buildings valued at \$747 million and 153 commercial buildings valued at \$82.5 million. The total tax value of the Paris Mountain area is about \$890.5 million, and the population of Paris Mountain is 8,827. Based on data from the SCFC, it is estimated that a response to even a small wildfire in the Paris Mountain area could cost from \$65,000 to \$200,000. This number could increase depending on the variables mentioned at the beginning of this section. However, the cost of response could save up to \$890.5 million in damages in addition to saving thousands of lives.

10. MITIGATION INITIATIVES

Introduction

The following sections describe overall strategies that are commonly employed to mitigate potential damage from a wildfire, specific mitigation actions identified by the WMT to be implemented in the Paris Mountain planning area, and the methodology employed to prioritize and include these initiatives in the 2020 HMP. The WMT was provided with the hazard and risk assessment results and an overview of mitigation strategies. The group then used workshop settings to identify specific initiatives. The DMC, established by in 2020 HMP, was responsible for prioritizing the mitigation measures identified by the WMT.

Wildfire hazards and risks are unique to each planning area and require unique solutions to reducing the potential for wildfire and the ensuing damage. The Paris Mountain planning area also presents unique challenges as noted below.

- While most structures are located at or near the base of Paris Mountain in relatively flat terrain, there is large accumulation of communications equipment at the top of the mountain and a State Park located on the opposite side of the mountain from the higher density residential area. This creates multiple areas of concern located in “opposite corners” of the planning area.
- The approximately 4,000 total residential and commercial structures are also spread across the planning area encircling the majority of the base of the mountain. Additionally, to go from one populated area to another, the perimeter roads must be utilized (i.e., there is limited access from one neighborhood directly to another).
- Related to the issues of limited access and the spread of areas needing protection, the SCFC SoWRAP analysis indicated that the WUI index areas of “major impact” are also spread across the planning area rather than being congregated in a more singular location.
- The planning area contains both a State Park and protected land trust area. These areas provide access for individuals living outside of the planning area and, further, Paris Mountain State Park offers overnight camping potentially increasing the possibility of human caused wildfire.
- Paris Mountain has areas of very steep terrain limiting the operation of heavy equipment.
- There are three Fire Departments tasked with providing service to the planning area.

Even though the Paris Mountain planning area presents certain challenges to mitigating wildfire losses, it also has several benefits that should be leveraged in devising a mitigation plan.

- An active home-owners association
- Firewise planning effort led by the SCFC
- Multiple responding fire departments (While this can create complications, it also provides firefighting resources from multiple directions)

Overarching strategies and individual initiatives should consider both the unique challenges for the planning area as well as the available resources. The next section discusses overall strategies that may be applicable to the Paris Mountain planning area.

Overview of Mitigation Strategies

As with any hazard mitigation planning effort, multiple layers of defense are best. Approaching mitigation from a wholistic viewpoint provides redundancy and, generally, a more effective strategy. The following paragraphs describe common wildfire mitigation strategies and their application to the Paris Mountain planning area. To the extent practical, multiple individual mitigation initiatives from each of these strategies should be represented in the final plan.

Community Outreach and Education

With over 90% of all wildfires being started by humans, it makes sense that educating the public should be a major component of wildfire mitigation. Helping residents better understand wildfire causes, response, and self-protection measures can significantly reduce not only the likelihood of wildfire, but also the damages incurred should a fire occur. Because there are many visitors to the planning area (Paris Mountain State Park), there is also a need to educate non-residents, especially on the dangers of campfires.

Education can be achieved effectively through several activities including informative signs, learning trails, seasonal mailers, homeowner workshops, State Park educational events, and programs such as Firewise. Because there are active homeowner's associations in the planning area, a Firewise planning effort underway, and an established education program at the State Park, these groups should be a key element in developing a robust public education campaign.

Fuel management

Obviously, fuel is a key ingredient to any wildfire. Effectively managing the type and quantity of fuel within the planning area is fundamental to reducing the potential / intensity / duration of any fire. There are several means of managing fuel including prescribed burning, mechanical thinning, and snag removal. For the most part, these specific efforts should be undertaken only by professionals; however, there are several things a property owner can do to help mitigate the risk. Examples of this would include clearing small debris around the property, choosing fire resistant vegetation and landscape design, and refrain from any outdoor burning on dry windy days. A strong working relationship between landowners, Greenville County, fire departments, the SC Department of Parks, Recreation and Tourism (SCPRT), and the SCFC may be necessary to facilitate this strategy.

Fireproof Structures

Decreasing the vulnerability to fire of individual structures is dependent upon each home / business owner taking some responsibility to protect themselves. Although the Greenville County building codes offer some level of protection for new structures, there are additional measures builders and owners can employ to make their structure more resilient. Likewise, existing structures can be retrofitted to provide greater levels of protection. Examples of fire protection techniques are located below. Finally, performing a critical facility risk assessment would identify the more critical structures within the planning area, determine each structure's vulnerability to fire, and prepare individual retrofitting plans.

Common Structure Fireproofing Techniques

- Site Layout
- Ignition Resistant Roofs
- Ember Resistant Exterior
- Window Protection
- Fire Rated Doors
- Louvers and Vents with fire dampers
- Sprinkler Systems

Fireproof the landscape

The probability of a structure surviving a wildfire greatly increase with the creation of a defensible space around the structure. States more susceptible to wildfire, like California, require a defensible space around homes. These requirements range in width and number of zones, but all are intended to add further protection to individual structures.

Defensible spaces are created using fire retardant materials, plants, and mulches, clear and visible street signs and house numbers, regular removal of debris and trash, trimming of trees, etc. Each zone has a distinct strategy and becomes more specific the closer to the structure the zone becomes.

Sprinkler systems, fire breaks and fuel breaks can also add levels of protection to individual structures. Below is a brief description of each of these techniques.

- Defensible space: A defensible space is a natural and/or landscaped area around a structure that has been maintained and designed to reduce fire danger. The practice is sometimes called “Firescaping”.
- Sprinkler systems: Sprinkler systems provide the ability to keep the space around the home wet during a wildfire event.
- Fire breaks: Firebreaks are fuel-managed areas meant to stop fire propagation. They are areas without any fuel, so there is nothing available for the fire to spread to. Examples include roads, trenches, and streams. See Figure 10-1.
- Fuel breaks: Fuel breaks are fuel-managed areas meant to hamper fire propagation. They are areas with reduced amounts of fuel available for fires to burn. Examples include thinned vegetation and Firewise landscaping. See Figure 10-1.

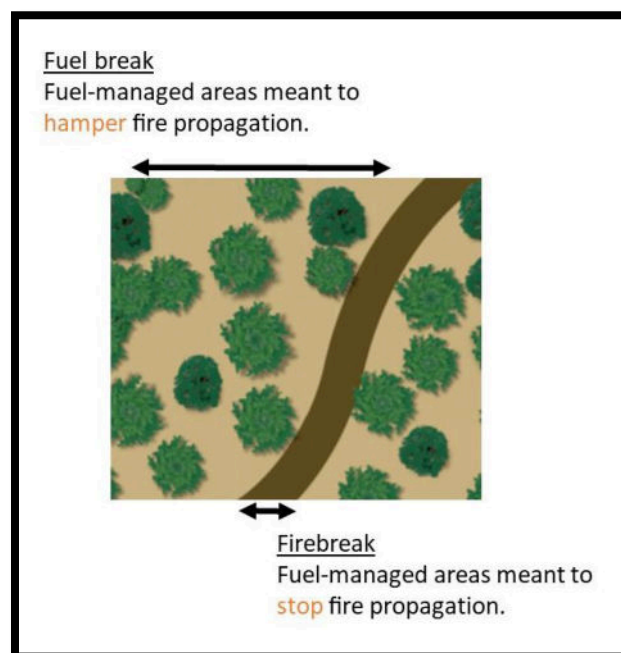


Figure 10-1: Comparison of a fuel break and a fire break

Improve fire response

Should a wildfire event occur, a quick and appropriate response can mean the difference in it being a very minor event or a major disaster. There are currently two separate fire departments that have responsibility for responding to a wildfire in the Paris Mountain planning area including: Piedmont Park Fire Department and Duncan Chapel Fire Department. These departments are well equipped and properly trained. Communication channels between the departments and the SCFC have been established, however, identifying and supplying additional needs to support these departments is paramount. The Sheriff's Office Air Support Unit and the Travelers Rest Fire Department were also mentioned as possible resources to aid in firefighting.

Appropriate access to all areas is another key element to a proper response. Mitigating areas with limited access, ensuring that roads are sufficient for firefighting equipment to maneuver, identifying and maintaining landing areas for helicopter support, locating evacuation routes, and other access issues should be identified and addressed.

Training

Like public outreach for citizens, training for both firefighters and citizens alike regarding proper wildfire fighting techniques and fire safety is essential. It is becoming well-known that landowners taking appropriate measures towards protecting their homes along with quick and effective fire-fighting response can keep costs and damages to a minimum. Fire departments are constantly training and preparing for all firefighting situations, so supporting local fire departments with the financial resources to maintain relevant training is an appropriate mitigation measure.

Techniques, equipment, and preparedness are all areas of focus that require financial support and appropriate training. While local fire departments might be the first to respond to a wildfire on Paris Mountain, the SCFC is a needed resource as they have specialized training and equipment to deal with wildfires. In addition, the SCFC has developed training devices such as an interactive tabletop exercises that can be used to simulate a wildfire given chosen conditions. These exercises demonstrate fire behavior and allow the agency to develop strategies to prevent and respond if a situation were to occur.

The landowner should also maintain a level of education on wildfire risk in their area along with strategies to minimize the risk of a wildfire damaging their property. Community support such as the Firewise program offer educational materials and strategies to assist with this. Maintaining communication with local support efforts such as emergency responders can help identify and resolve potential obstacles before an emergency occurs.

Research and risk assessment

Fire response plans are built from multiple pools of research gathered on risk, infrastructure, landscape, fuel, etc. Understanding which areas are at the highest risk of wildfire is key to developing a fire response plan that adequately addresses that risk. Proper evacuation and emergency response routes must be developed from accurate infrastructure information. Research on fuel loads across the landscape can inform which areas need a reduction in fuel to reduce the risk of fire, and where fire breaks would be most effectively placed. Research and risk assessments should be performed periodically to ensure that fire response plans are developed from accurate and up-to-date information.

- Fuel management / Fire studies
- Weather Monitoring

Individual Mitigation Initiatives

Development of wildfire mitigation initiatives began with a review of the overall mitigation strategies defined in the previous section by the WMT. A workshop was then held to discuss individual initiatives relevant to each strategy. Approximately 21 individual mitigation measures were initially identified. One additional mitigation measure was created by the DMC during their review of the proposed WMT measures to make a total of 21 scored mitigation measures.

Initiative Descriptions

The WMT met on July 1, 2021, to identify potential mitigation measures for incorporation into the plan. Each of the initiatives has been categorized by strategy type and is briefly described below.

Category 1: Community Outreach and Education

The WMT identified a variety of outreach and education activities (listed below). It is believed that many of these activities can be funded through the existing HMGP Public Outreach Funding.

- a. Send postcards or mailers to residents and businesses in the planning area
- b. Present at Homeowners Association meetings
- c. Provide information to local Realtors regarding wildfire risk and mitigation within the planning area
- d. Provide information to local builders regarding fire resistant buildings
- e. Support Fire Department door to door “blitz” to distribute wildfire mitigation information and residential smoke alarms
- f. Organize a “Touch a Truck” event to educate residents on wildfire mitigation and response
- g. Coordinate with Paris Mountain State Park regarding education events (incorporate wildfire mitigation into State Park education activities)
- h. Identify potential venues to provide information to such as local churches, schools, and other public organizations

It is recommended that these activities be organized into a comprehensive community outreach and education program. During the prioritization process, the DMC recommended adding information into the public education material related to wildlife. Topics should include items such as being aware of additional wildlife on roadways during an event, avoiding fleeing and injured wildlife, not allowing domestic animals to interfere with fleeing wildlife, being aware of a larger presence of wildlife in urbanized areas during and immediately after an event.

Category 2: Fuel management

Proper fuel management is significant in reducing the likelihood of a wildfire starting. It is recommended that Greenville County support community fuel reduction efforts by:

- a. Providing roll-off containers / fuel reduction trailers to collect and dispose of natural debris
- b. Organizing fuel reduction workdays / chipping and disposal days
- c. Providing economic incentives for creation of defensible spaces

Category 3: Fireproof Structures

The County should encourage the use and installation of fireproof structures to help decrease fire risk and damage, since those structures help to slow and prevent the spread of fire. Detailed information for fireproofing of structures can be found through the Firewise program and CWPP (Community Wildfire Protection Plan).

- a. Greenville County should provide information and incentives for building structures using fireproof materials and techniques.

NOTE: The WMT suggested incentives for residential sprinkler systems. There was discussion by the DMC during the scoring process regarding this measure and it was decided to broaden the scope of the measure to include support for use of additional fireproof materials and techniques.

CWPP: <https://www.forestsandrangelands.gov/documents/resources/communities/cwpphandbook.pdf>

Firewise: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA>

Category 4: Fireproof the landscape

The County will fireproof the landscape by creating fire breaks and fuel breaks to slow and stop the spread of fires. These fire breaks and fuel breaks may include methods like thinning vegetation and incorporating Firewise landscapes. Detailed information for fireproofing the landscape can be found through the Firewise program and CWPP (Community Wildfire Protection Plan).

- a. Create Fire Breaks and Fuel Breaks
 - i. Naturaland Trust
 - ii. Paris Mountain State Park
 - iii. Individual landowners

CWPP: <https://www.forestsandrangelands.gov/documents/resources/communities/cwpphandbook.pdf>

Firewise: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA>

Category 5: Improve fire response

To improve fire response, the County will enhance communications within the planning area. Enhanced communication can speed up the response time to fires which is a critical component to reducing and preventing fire risk. Greenville County's fire response encompasses the emergency communications in place to respond to fires.

- a. Utilize the Nextdoor app or similar social platforms
- b. Identify a fireplug (Community leader) for each community or HOA
- c. Enhance emergency responder communications
- d. Engage communication tower operators

Category 6: Training

It is important for community members to be educated and trained on fire risks and procedures to follow when a fire starts in the area. Firewise and Fire Adapted communities not only prepare plans for fire prevention and damage reduction, but also increase awareness and understanding of wildfire mitigation.

- a. Develop Firewise and / or Fire Adapted communities

Category 7: Research and risk assessment

Research and risk assessments should be performed periodically to ensure that fire response plans are developed from accurate and up-to-date information. The planning area's existing infrastructure should be evaluated to determine possible improvements.

- a. Incorporate "Wildfire Overlay Districts" into County land planning activities (See [Land use planning can reduce wildfire risk to homes and communities - Headwaters Economics](#))
- b. Prepare an assessment of ingress / egress issues with prioritized action plan
 - i. Consider reversible lanes, alternative routes, emergency access roads
 - ii. Identify "Safe Zones" within the planning area
 - iii. Identify evacuation routes out of and emergency routes into the planning area
- c. Prepare Wildlife Assessment
 - i. Contact DNR to develop an assessment on wildlife activity in the planning area and any appropriate action steps.

Mitigation Initiative Scoring and Prioritization

For the sake of consistency between plans and because of the effectiveness of previous prioritization efforts, the DMC opted to use the same system as used in the 2020 HMP.

It was noted, however, that for future scoring both the criteria and process should be revisited and modified as appropriate. Submitting an initial scoring to the DMC by the consultant appeared to speed up the process without significantly influencing the results.

The scoring criteria is contained in Table 10-1 and the final prioritization is contained in Table 10-2

Table 10-1: Initiative Scoring Criteria

Priority Criterion	Numeric Score
Strategy Effectiveness	
No effect on Risk or Hazard	0
Affects several structures within the County	1
Affects many structures within the County	2
Affects most structures within the County	3
Percentage of Population Benefited	
Less than 10% benefited	0
10% to 50% benefited	1
51% to 75% benefited	2
Greater than 75% benefited	3

Time to Implement	
Cannot be implemented	0
Longer than one year	1
Within one year	2
Immediate	3
Time to Impact	
Cannot be implemented	0
Longer than one year	1
Within one year	2
Immediate	3
Cost to County	
Completely Unaffordable	0
Expensive, but manageable	1
Cost is easily managed	2
Little to no cost	3
Cost to Others	
Completely Unaffordable	0
Expensive, but manageable	1
Cost is easily managed	2
Little to no cost	3
Funding Source	
No known funding source available	0
Requires outside funding	1
Requires budget consideration	2
Within existing county budget	3

Community Support	
Opposed by the entire community	0
Acceptable only to those affected by the project	1
Some community opposition	2
Acceptable community wide	3
Project Feasibility	
Not possible	0
Accomplished with extensive design and planning	1
Accomplished with some design and planning	2
Easily accomplished	3

Table 10-2: Prioritized Initiatives

Proposed Mitigation Activities	Strategy Effectiveness	Population Benefited	Time to Implement	Time to Impact	Cost to County	Cost to Others	Funding Source	Community Support	Project Feasibility	Total Score	Overall Rank
Category 1: Community Outreach and Education											
<i>a</i> Post cards	1	1	3	1	3	3	3	3	3	21	2
<i>b</i> HOA meetings	1	1	3	1	3	3	3	3	3	21	2
<i>c</i> Realtor info	2	2	3	1	3	3	3	3	3	23	1
<i>d</i> Builder info	2	2	3	1	3	3	3	3	3	23	1
<i>e</i> Door blitz	1	1	3	1	3	3	3	3	3	21	2
<i>f</i> Touch a Truck	1	1	2	1	3	3	3	3	3	20	4
<i>g</i> Paris Mtn. State Park Education	2	2	2	1	3	2	3	3	3	21	2
<i>h</i> Venue info centers	1	1	2	1	3	3	3	3	3	20	4
Category 2: Fuel Management											
<i>a</i> Roll-off containers	1	0.5	2	3	2	3	3	3	3	20.5	3
<i>b</i> Fuel reduction workdays (Chip & Disposal)	1	0.5	2	3	2	3	2	3	3	19.5	5
<i>c</i> Defensible space incentives	1	0.5	1	2	2	3	3	3	2	17.5	7
Category 3: Fireproof Structures											
Information / Incentives regarding Fireproof Construction Techniques	1	0.5	2	2	3	1.5	3	3	2	18.0	6
Residential sprinkler incentives										0	
Category 4: Fireproof the Landscape											
<i>a</i> Create fire breaks and fuel breaks	1	3	1	3	0.5	0.5	1	2	1	13	10
Category 5: Improve Fire Response											
<i>a</i> Nextdoor app	1	3	1	3	0.5	0.5	1	2	1	13	10
<i>b</i> Fireplug	1	3	1	3	0.5	0.5	1	2	1	13	10
<i>c</i> Emergency Response Communications	2	1	1	3	1	1	1	3	1	14	9
<i>d</i> Engage Communication Tower Operators	1	3	3	1	3	3	1	1	1.5	17.5	7
Category 6: Training											
<i>a</i> Firewise / Fire Adapted communities	1	0.5	1	1	3	3	2	3	1.5	16	8
Category 7: Research and Risk Assessment											
<i>a</i> Wildfire Overlay Districts	1	1	1	1	2	2	3	1	2	14	9
<i>b</i> Ingress / Egress Assessment	1	1	1	1	2	3	2	3	2	16	8
<i>c</i> Prepare Wildlife Assessment	1	1	1	1	2	3	2	3	2	16	8

Incorporation into 2020 Multi-Jurisdictional Hazard Mitigation Plan

Development of the Paris Mountain Wildfire Mitigation Plan was identified as a mitigation measure in the 2020 HMP. The development of this Plan followed the same process as that of the 2020 HMP (e.g., public input, stakeholder involvement, hazard and risk assessment, etc.). After review by County staff, the draft plan was

submitted to the Wildfire Mitigation Team for additional review. A copy of the Plan was submitted to the South Carolina Emergency Management Division as a courtesy.

The Paris Mountain Wildfire Mitigation Plan is now an annex to the Greenville County Multi-Jurisdiction Hazard Mitigation Plan and will be reviewed and updated using the same protocols as the HMP

11. ACTION PLAN

Mitigation Category	Activity	Relevant Sub-tasks	Responsible Party	Funding Source	Priority Score	Priority Ranking
Community Outreach & Education (Category 1)	Provide Information to Realtors Regarding Wildfire Risk and Mitigation (Activity C)	1. Determine method of information distribution to realtors (brochures, pamphlets, presentations, online resources). 2. Develop a list of realtors who serve the planning area. 3. Distribute the information to the realtors.	Greenville County EMD	HMGP	23	1
Community Outreach & Education (Category 1)	Provide Information to Local Builders Regarding Fire Resistant Buildings (Activity D)	1. Determine method of information distribution to local builders (brochures, pamphlets, presentations, online resources). 2. Develop a list of local builders to target. 3. Distribute the information to the local builders.	Greenville County EMD / Codes Enforcement	HMGP	23	1
Community Outreach & Education (Category 1)	Send Postcards/Mailers to Residents and Businesses in the Planning Area (Activity A)	1. Design postcards/mailers with wildfire safety information. 2. Develop a mailing list of residences and business.	Greenville County EMD	HMGP	21	2
Community Outreach & Education (Category 1)	Present at HOA Meetings (Activity B)	1. Identify HOAs willing to have the County present at their meetings. 2. Design the presentation. 3. Schedule the meetings.	Greenville County EMD	Budget	21	2
Community Outreach & Education (Category 1)	Support Fire Department "Blitz" to distribute wildfire and smoke alarm information (Activity E)	1. Determine staff and resources to help distribute information from the Fire Departments. 2. Contact each Fire Department to coordinate schedule of events.	Greenville County EMD/ Participating Fire Departments	Budget	21	2

Mitigation Category	Activity	Relevant Sub-tasks	Responsible Party	Funding Source	Priority Score	Priority Ranking
Community Outreach & Education (Category 1)	Coordinate with Paris Mountain State Park on Education Events (Activity G)	1. Identify coordinating partner at Paris Mountain State Park. 2. Determine appropriate topics 3. Develop educational materials & resources that can be incorporated into their education events.	Greenville County EMD, Paris Mountain State Park	Budget	21	2
Fuel Management (Category 2)	Provide Roll-off Containers / Fuel Reduction Trailers (Activity A)	1. Identify areas that require fuel reduction containers and the number of containers required to service them. 2. Notify residents of schedule for when containers will be dropped off and picked up. 3. Distribute the containers as scheduled.	Greenville County Solid Waste	Budget	20.5	3
Community Outreach & Education (Category 1)	Organize a "Touch a Truck" Event (Activity F)	1. Determine the location(s) and schedule of the event. 2. Communicate with the fire department(s) to have a truck and staff available for the event. 3. Distribute advertisements for the event on social media, through mailers, etc. 4. Hold the event.	Greenville County EMD / Fire Department(s)	Budget	20	4

Mitigation Category	Activity	Relevant Sub-tasks	Responsible Party	Funding Source	Priority Score	Priority Ranking
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Community Outreach & Education (Category 1)	Provide Information to Realtors Regarding Wildfire Risk and Mitigation (Activity C)	1. Determine method of information distribution to realtors (brochures, pamphlets, presentations, online resources). 2. Develop a list of realtors who serve the planning area. 3. Distribute the information to the realtors.	Greenville County EMD	HMGP	23	1
Community Outreach & Education (Category 1)	Provide Information to Local Builders Regarding Fire Resistant Buildings (Activity D)	1. Determine method of information distribution to local builders (brochures, pamphlets, presentations, online resources). 2. Develop a list of local builders to target. 3. Distribute the information to the local builders.	Greenville County EMD / Codes Enforcement	HMGP	23	1
Community Outreach & Education (Category 1)	Send Postcards/Mailers to Residents and Businesses in the Planning Area (Activity A)	1. Design postcards/mailers with wildfire safety information. 2. Develop a mailing list of residences and business.	Greenville County EMD	HMGP	21	2
Community Outreach & Education (Category 1)	Present at HOA Meetings (Activity B)	1. Identify HOAs willing to have the County present at their meetings. 2. Design the presentation. 3. Schedule the meetings.	Greenville County EMD	Budget	21	2
Community Outreach & Education (Category 1)	Support Fire Department "Blitz" to distribute wildfire and smoke alarm information (Activity E)	1. Determine staff and resources to help distribute information from the Fire Departments. 2. Contact each Fire Department to coordinate schedule of events.	Greenville County EMD/ Participating Fire Departments	Budget	21	2

Mitigation Category	Activity	Relevant Sub-tasks	Responsible Party	Funding Source	Priority Score	Priority Ranking
Community Outreach & Education (Category 1)	Identify Potential Venues to Provide Information (Activity H)	1. Contact potential participating public organization and venues. 2. Distribute information for display. 3. Periodically refresh brochures and pamphlets.	Greenville County EMD	HMGP	20	4
Fuel Management (Category 2)	Organize Fuel Reduction Workdays (Activity B)	1. Identify staff or contractors to perform work. 2. Determine the frequency and schedule of fuel reduction workdays. 3. Notify community of work status.	Greenville County EMD / Public Works / SCFC	Budget	19.5	5
Fireproof Structures (Category 3)	Provide Information / Incentives Regarding Fireproof Construction Techniques. (Activity A)	1. Develop information packets. 2. Determine appropriate incentives, if any. 3. Make information readily available through website, brochure racks, presentations to Home Builders Assoc.	Greenville County EMD / Codes Enforcement	Budget	18	6
Fuel Management (Category 2)	Provide Incentives for Creating Defensible Spaces (Activity C)	1. Research the cost and techniques for creating defensible space. 2. Determine appropriate incentives to be given for creating defensible space. 3. Make information readily available through website, brochure racks, presentations to HOAs.	Greenville County EMD / Fire Departments / SCFC	Budget	17.5	7

Mitigation Category	Activity	Relevant Sub-tasks	Responsible Party	Funding Source	Priority Score	Priority Ranking
Improve Fire Response (Category 5)	Engage Communication Tower Operators in Planning Process (Activity D)	None identified	Greenville County EMD	Budget	17.5	7
Training (Category 6)	Develop Firewise and/or Fire Adapted Communities (Activity A)	None identified	SCFC	SCFC	16	8
Research and Risk Assessment (Category 7)	Prepare an assessment of ingress/egress issues with prioritized action plan (Activity B)	1. Evaluate the use of reversible lanes, alternative routes, and emergency access roads. 2. Identify safe zones within the planning area. 3. Identify evacuation routes out and emergency routes in.	Greenville County	Budget	16	8
Research and Risk Assessment (Category 7)	Prepare Wildlife Assessment (Activity C)	1. Identify consultant Or DNR to assist with assessment. 2. Conduct assessment. 3. Provide results to appropriate agencies and homeowner groups.	Greenville County EMD / SCDNR	Budget	16	8
Improve Fire Response (Category 5)	Enhance Emergency Response Communications (Activity C)	None identified	Greenville County Fire Department(s)	Budget	14	9
Research and Risk Assessment (Category 7)	Incorporate Wildfire Overlay Districts into County Land Planning Activities (Activity A)	1. Determine the characteristics of the overlay district. 2. Present findings to the planning commission.	Greenville County Planning	Budget	14	9

Mitigation Category	Activity	Relevant Sub-tasks	Responsible Party	Funding Source	Priority Score	Priority Ranking
Fireproof the Landscape (Category 4)	Create Fire Breaks and Fuel Breaks (Activity A)	1. Identify areas to create fire breaks and fuel breaks in, based on the risk of fire and the feasibility of installation. 2. Obtain permission from landowners to perform work. 3. Determine staff or contractor to perform work.	Greenville County EMD / Fire Departments / SCFC	Budget	13	10
Improve Fire Response (Category 5)	Nextdoor App (Activity A)	None identified	Greenville County EMD	Budget	13	10
Improve Fire Response (Category 5)	Develop a “fire plug” (Activity B)	None identified	Greenville County EMD	Budget	13	10

Appendix A

Agendas, Meeting minutes, Sign-in sheets, & Presentations from
WMT/DMC/Public Meetings

Meeting Minutes

Date of Meeting: August 27, 2020

Re: Fire Mitigation Plan

Location: Teams Call

Issue Date: August 27, 2020

Submitted By: Riddle, James

Conference Call:

In Attendance:

Hal Clarkson
James Riddle
Shady Agnew
Brian Bishop
Jay Merritt
Mackenzie Forgacs
Suzanne Terry
Ben Cotton
Paula Gucker

ITEMS DISCUSSED:

- Jessica Stumpf is currently responding to emergency needs associated with Hurricane Laura and unavailable today. Jessica will be out for 1-2 weeks, so include Jay on interim communication.
- Various approaches will be considered for public input due to the avoidance of in-person meetings associated with Covid.
- This mitigation plan targets pre-fire planning and will be a stand-alone document, but also will be included as an appendix to the County hazard mitigation plan.
- This work is grant funded, but funding provided from separate grant award than that for the development of the County hazard mitigation plan.
- Hal discussed the project schedule and indicated that dates were general targets only. The draft plan for adoption should be delivered in March 2020.
- Brian asked about how the schedule/deadlines aligned with the grant requirements. **Hal stated that we did not have a copy of the grant but will need to coordinate with Jessica regarding such deadlines.** If the deadline for the final draft is after the current target date, Woolpert will move forward with the draft schedule as planned. Paula and Jay confirmed that the final plan is not due until 2022.
- Brian stated that REWA should be included on the wildfire team due to the Altamont treatment plant located on Paris Mountain
- Paula stated that Greenville Water has storage tanks located off of Altamont Road that we need to add to the map of critical assets. The group discussed inclusion of Mark Hattendorf to the wildfire team. Shady knows Mark from her prior work experience at Greenville Water.
- Paula mentioned several radio towers that are located on the mountain.

- Paula stated to add SCDOT to the wildfire team as they own roads on the mountain. The group mentioned the addition of representatives from Piedmont Park, Duncan Chapel fire departments, and Paris Mountain state parks.
- Hal mentioned possible inclusion of state EMD, USGS, or NOAA. Brian mentioned inclusion of Duke Power since they provide power on the mountain. Paula suggested that Linda Hannon with Duke Energy is their governmental representative. Brian mentioned that Furman might have graduate students that may have interest in being involved and other benefits of including representation from the university. Gregory Habron, Department of Sustainability.
- Ben asked about identifying a representative from the HOA on the mountain to include on the wildfire team. Paula indicated that she would provide contact information for Alex Kiriakides.
- Paula said that SCETV would be a good organization to include on the team. Mention of Mark Sutton. Another communications group has “doomsday” setup on top of mountain, but Jay could not remember the contact’s name.
- Hal and Shady have connections with the forestry commission and Hal mentioned recent sand table desktop simulations.
- Shady discussed the Firewise program which provides nationwide guidance for communities and individual homes for mitigation, which could be leveraged as part of this planning effort. Much of the forest on the mountain is considered “ladder fuels” and really difficult for fire personnel to deal with. Program participation does not imply removal of all shrubbery or trees around a home but evaluates and provides guidance on reductions in forms of available fuel and educating residents. Representatives from the forestry commission (Chris Revels) just did an initial assessment for homeowner risk on the mountain just prior to Covid and this person may be added to the fire team. The road up the mountain is very curvy and not very manageable for a fire truck.
- Hal stated that he would send out meeting minutes and the other items that were shared on the call today.



Agenda

Meeting Location: Virtual Kickoff Meeting

Time: 10:00am - 11:30am

Date: Thursday, 08/27/20

Attendees: Greenville County
Woolpert

Subject: Paris Mountain Wildfire Mitigation Plan

ITEMS TO DISCUSS:

1. Team Introductions
 - a. Greenville County
 - b. Woolpert
2. Project Overview
 - a. County concerns and project goals
 - b. Primary focus is pre-fire mitigation, secondary is response and post-fire recovery efforts
3. Scope Review
 - a. Overview of individual tasks
 - b. Review of project area
 - c. Plan development process
 - i. Initial hazard and risk assessment and mapping
 - ii. Wildfire Mitigation Team (WMT) development and meetings
 - iii. Public meetings
 - iv. Project prioritization
 - v. Plan development and approval
 1. Greenville County
 2. WMT
 3. State
 - d. Plan format (HMP Amendment)
4. Project Schedule
 - a. Overall
 - b. Tentative meeting dates

5. WMT Composition
 - a. County Departments
 - i. Fire Departments
 - ii. Emergency Preparedness
 - iii. Public Works
 - iv. Planning
 - v. Floodplain management
 - b. State stakeholders
 - i. Paris Mountain State Park
 - ii. Forestry Commission
 - c. Other stakeholders
 - i. Homeowner
 - ii. Television or Radio Company
6. Existing Data Review
 - a. GIS data
 - b. Records of previous incidents
 - c. State Forestry Commission Paris Mountain Desktop Exercise
 - d. Property values
 - e. Related ordinances (e.g., open burning) and building codes
7. South Carolina Firewise USA Program Opportunities

Presentation Materials:

Information not available

Meeting Minutes

Date of Meeting: October 15, 2020 **Re:** Paris Mountain Wildfire Mitigation Plan

Location: Teams Virtual Meeting **Issue Date:** October 15, 2020

Submitted By: S. Agnew

In Attendance: Greenville County Staff
Wildfire Mitigation Team (WMT)
Woolpert Staff

ITEMS DISCUSSED:

This was the first meeting of the WMT to introduce the team and present them with the objective of identifying various mitigation measures for the Paris Mountain Wildfire Hazard Mitigation plan.

General Comments:

- Forestry Commission has done Firewise workshops in the past. Homeowners seem hesitant to reduce vegetation around their homes due to their desire to keep the “nature feel”. Education may help this.
- Forestry Commission has worked with Piedmont Park to perform initial assessments around Altamont Drive. The assessment has been completed and they are currently working with fire departments on a community wide protection plan. Hope to make Paris Mountain a Firewise Community.
- Assessments have been done regarding trees over powerlines or roads that need to be removed
- DOT will start adding reflectors and vegetation in the spring of 2021

The meeting agenda, presentation material, and attendee list is attached following the list of initiatives. A recording of the meeting is also available.

Attendee List:

Meeting Summary: Total Number of Participants 23
Meeting Title: Paris Mountain Wildfire Mitigation Team Meeting
Full Name
Hal Clarkson
James Riddle
Shady Agnew
Paula Gucker
Jessica Stumpf
Brian Bishop
Jessica Jordon
Ben Cotton
Susan
Stan Whitten
Jay Marrett
Chris Revels
Dan Neary
Suzzanne Terry
Tom McCarty
Kevin Taylor
Kent Spencer
Trisha Palmer
Lindsey McCoy
Matthew Lawson
Brad Bramlett
Craig Solloman
Mark Hattendorf

Presentation Material:



Wildfire Mitigation Team Kick Off Meeting

October 15th, 2020

Agenda

- Plan purpose and goals
 - Mitigate potential damages from wildfire for Paris Mt
 - Relationship to HMP
- Introduce WMT
 - County / role
 - Woolpert / Role
 - WMT / Role
- Planning process
 - Create Wildfire Mitigation Team
 - Gather and Review Data
 - Perform Hazard & Risk Assessment
 - Determine potential mitigation measures
 - Prioritize
 - Plan adoption and inclusion in HMP
- Planning Schedule
- Hazard
 - Fire History
 - Common wildfire terminology
 - Common Causes
 - Infrastructure / people at risk
- Mitigation techniques (broad overview)
 - Other planning efforts
- Next steps

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Introductions

County: Paula Gucker, Assistant County Administrator
Jessica Stumpf, Deputy Director Emergency Management Division
Brian Bishop, Floodplain Administrator

Woolpert: Hal Clarkson, PE, CFM, IAM
James Riddle, PE
Shady Agnew

WMT:

Duke Energy	SC DOT	NOAA
ReWa	SC Forestry Commission	Duncan Chapel Fire Department
Paris Mountain HOA	SC Parks	Piedmont Park Fire Department
Greenville Water	SC EMD	
Furman University	SC ETV	

Agenda

- Plan purpose and goals
- Wildfire Mitigation Team
- Planning process
- Planning schedule
- Hazard & risk
- Mitigation techniques
- Next steps

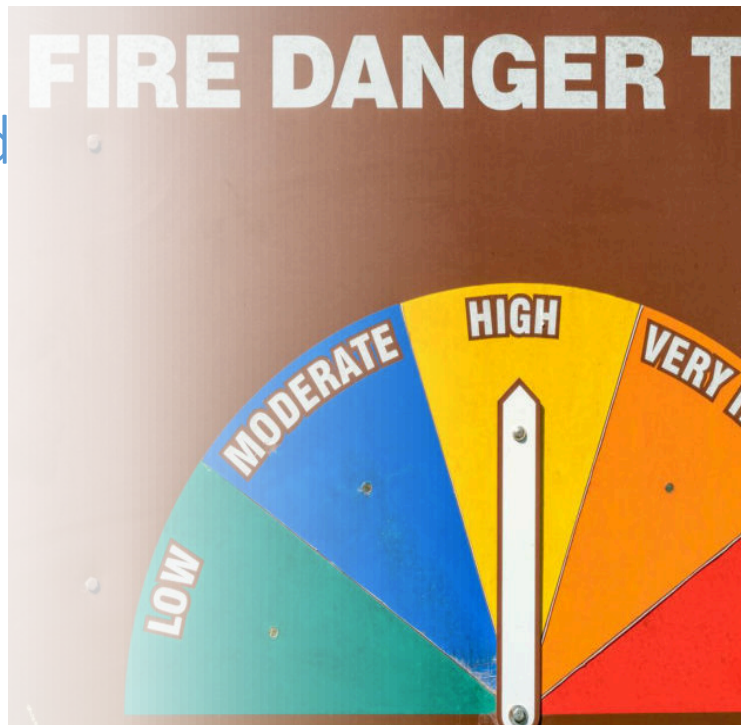


Plan Purpose and Goals

Mitigate potential damages from wildfire to Paris Mountain community and infrastructure

1. Quantify the wildfire hazard and risks
2. Identify potential measures to reduce the hazard and risk
3. Prioritize projects for funding

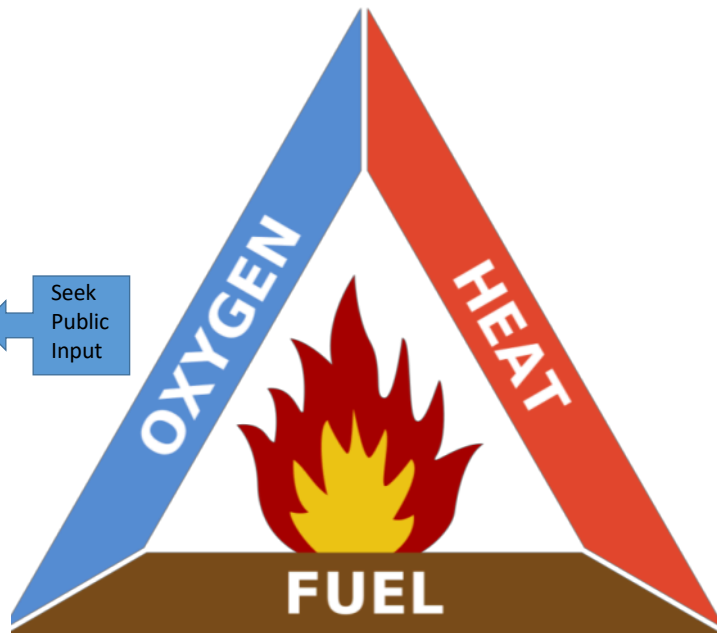
Create a Wildfire Mitigation Plan as an annex to the existing 2020 Hazard Mitigation Plan



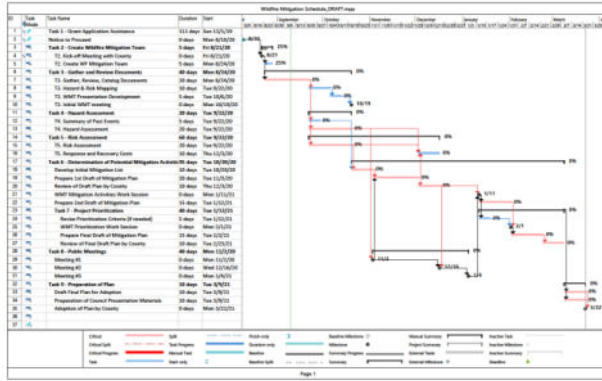
Planning Process

- Create the Wildfire Mitigation Team
- Gather and Review Data
- Perform Hazard and Risk Assessment
- Determine potential mitigation measures
- Prioritize Projects
- Develop and adopt plan for inclusion in HMP

Seek Public Input



Tentative Planning Schedule



- Oct 15, 2020 Initial WMT Meeting
- Early Nov 2020 Public Meeting # 1
- Mid Dec 2020 Hazard & Risk Assessment Complete
- Mid Dec 2020 Public Meeting # 2
- Early Jan 2021 Public Meeting # 3
- Mid Jan 2021 WMT Mitigation Activities Work Session
- Early Feb 2021 WMT Project Prioritization Work Session
- Late Feb 2021 Draft Mitigation Plan
- Late Mar 2021 Final Plan

Hazard and Risk



Fire History in South Carolina



Forestry Commission responds to an average of 3000 wildland fires per year.



Since 1954 there have been four wildland fires in South Carolina that led to a Fire Management Assistance Declaration; one of which was in Greenville County.



Greenville County saw 213 wildfires during 1946-47. Now the county sees anywhere from 5 -40 wildfires per year.



Clear Pond Fire
Conway, SC - April 1976

- SC's largest forest fire burning 30,000 acres
- Smoke column was visible to satellites while ashes were scattered up to 40 miles away
- Is now known as the most volatile area in SC after three additional wildfires.
- No injuries or loss of life
- Cause: Unattended Campfire



The Red Fox Road Fire Camden, SC - March 1985

- One of the worst extended wildfire seasons on record
- 40 MPH winds moved the fire front 5 ½ miles in 2 hours.
- 2000 acres burned and 8 homes destroyed in one day
- Cause: Downed powerline from tree fall

Paris Mountain – January 2003



- 50 acres burned
- 1 home destroyed, another damaged
- Residents along Altamont Drive were voluntarily evacuated
- Cause: Human



Highway 31 Fire Horry County, SC - April 2009

- SC's worst wildland urban interface fire
- Extreme fire behavior due to low humidity, high winds, and flammable vegetation
- \$50 million in damage
- 19,130 acres burned
- Destroyed 76 homes and damaged 97 others.
- No injuries or loss of life
- Cause: Escaped burning Debris

Pinnacle Mountain Fire November 2016



- Over 10,000 acres burned between Pickens county and Greenville County
- Longest and costliest fire in SC history
- No deaths or property loss
- Cause: Human

A big fire could happen at Paris Mountain...



The Camp Fire – Butte County California - November 2018

- The deadliest and most destructive wildfire in California's history, and the most expensive natural disaster in the world in 2018 in terms of insured losses.
- Fire moved at 80 Football fields a minute
- 85 dead
- 153,335 acres burned
- 18,800 structures destroyed
- Cause: Downed electrical lines

Wildland Urban Interface - The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.



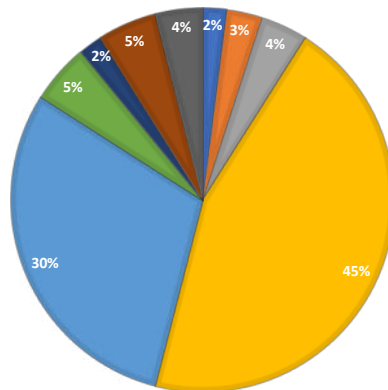


Wildland Intermix Interface

Single or clustered homes and other structures are scattered throughout a wildland area, e.g., summer homes, suburban homes on large tracts of land, and isolated recreation areas, such as cabins, mobile homes, and camping facilities. Many individual structures are often surrounded by woodland vegetation, and are served only by narrow roads, making it very difficult to reach these areas if fires occur.

Causes of Fire

~75% of wildfires are from debris burning & arson!



- Lightning
- Campfires
- Smoking
- Debris Burning
- Woods Arson
- Equipment Use
- Railroad
- Children
- Misc

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Wildland Fire Types



Ground

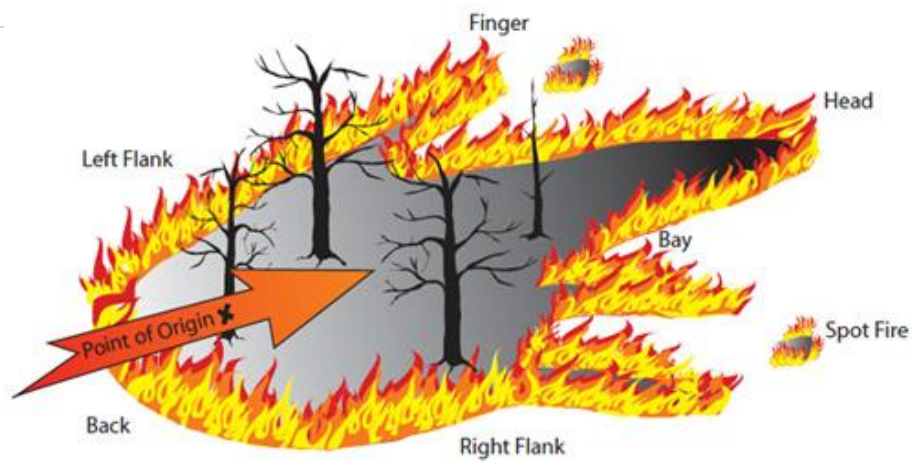


Surface

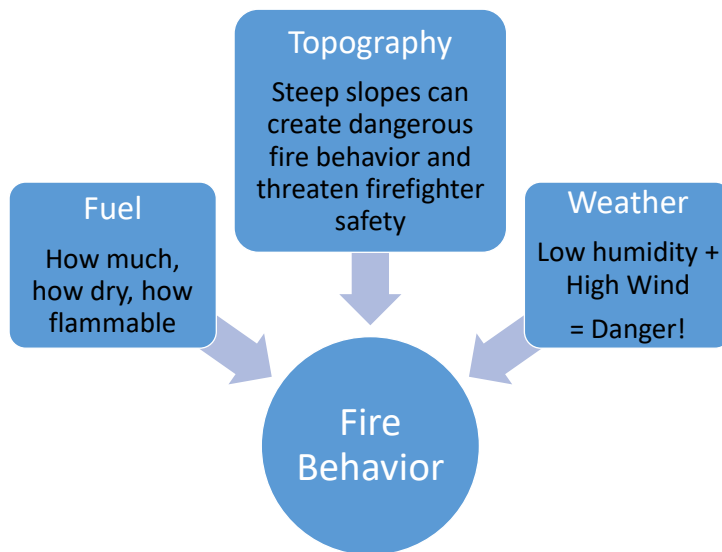


Crown

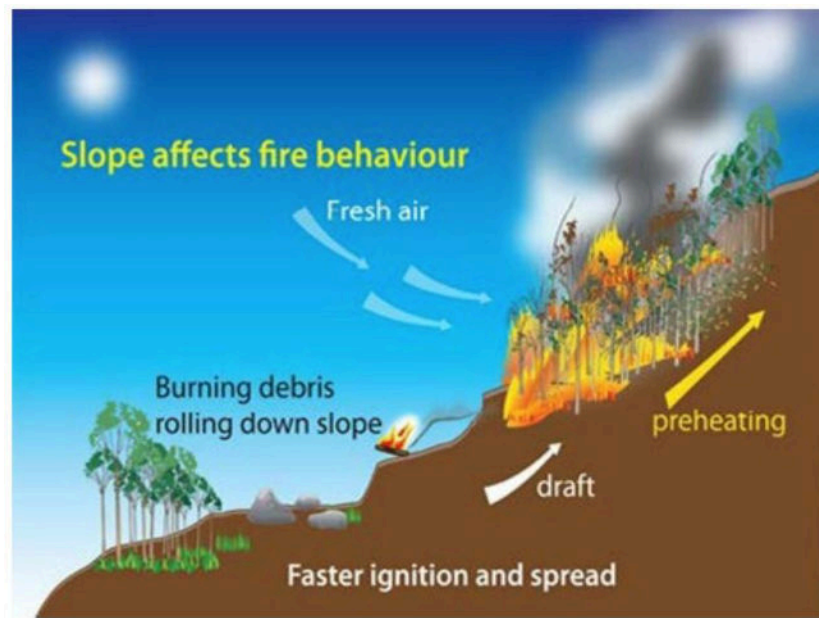
Parts of a Wildfire



Three Components That Determine Fire Behavior



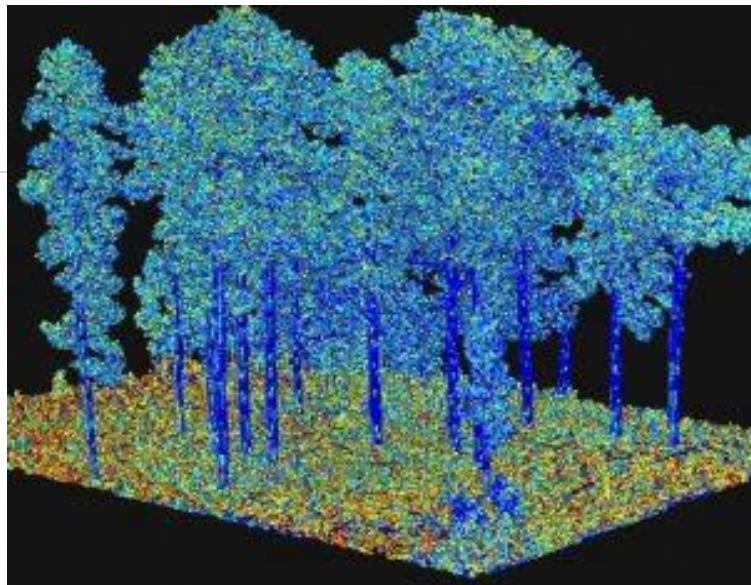
How Topography Affects Wildfire



How Weather Affects Wildfire



How Fuels Affect Wildfire





All it takes is a flame and
the right conditions

Main Concerns for Paris Mountain



Limited road access



No defensible spaces around homes



Lack of public knowledge concerning wildland urban interface



Topography and current fuel loads



Others?

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Infrastructure and People at Risk

People at Risk

Population: 8,827
 Demographics:
 Median Income = \$60,000
 94% with Some College
 12% at Poverty Level
 1% Hispanic

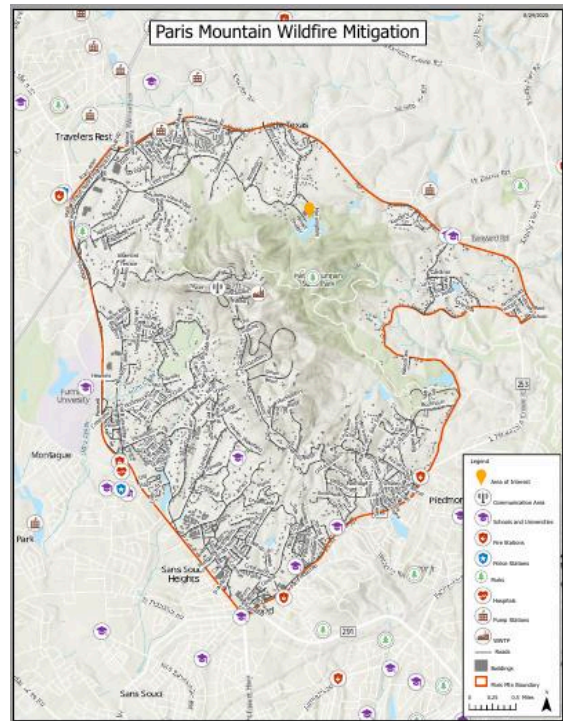
Value at Risk

Residential	Commercial
3,870 buildings	153 buildings
\$687 million	\$82.5 million

Total Value: \$769.5 million

Infrastructure

- Communications
- State Park
- Businesses
- Water Supply / Wastewater Treatment
- Medical Facilities
- Education Institutions
- Residential Properties
- Fire Stations



Mitigation Strategies Work

1. Community Outreach & Education
2. Fuel Management
3. Construction recommendations
4. Fireproof the landscape
5. Improve fire response
6. Training
7. Research & Risk Assessment

Education & Outreach

- Firewise communities
- Informational signs
- Fire learning trail for hikers



FIREWISE USA®
Residents reducing wildfire risks



Fuel Management

- Prescribed Burning (By professional only)
- Mechanical Thinning
- Snag Removals



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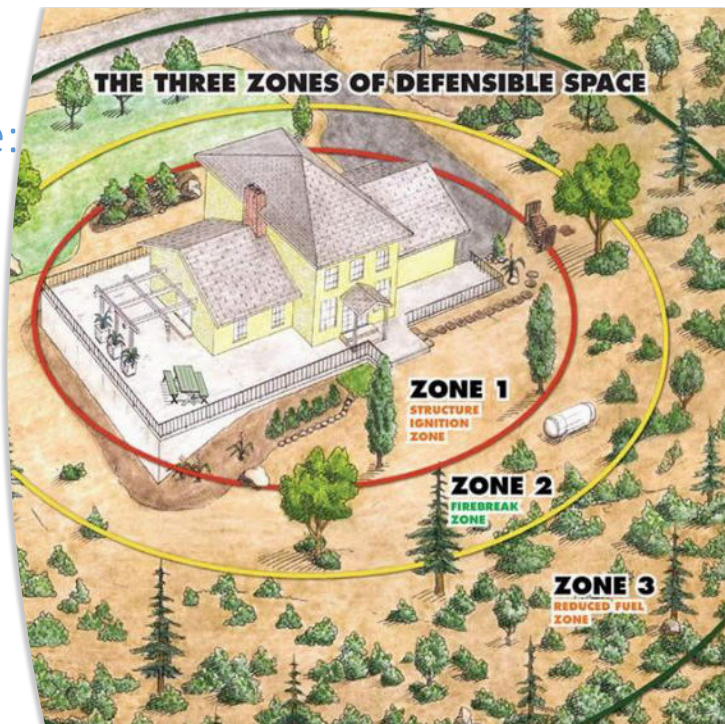
Fire-proof Structures

- Building regulations for new construction
- Updating old structures
- Community education on fire-proofing their home (Fire Wise)
- Identify priority structures?



Fire-Proof the Landscape: Defensible Space

- The area between a house and an oncoming wildfire where the vegetation has been modified to reduce the wildfire threat and to provide an opportunity for firefighters to effectively defend the house.
- “Firescape” - Replace flammable vegetation with fire-resistant species.
- Sprinkler systems



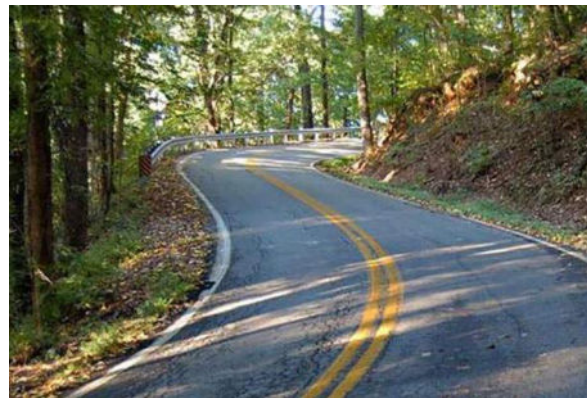
Fire-Proof the Landscape: Defensible Space

Firebreaks are strips of bare soil or fire retarding vegetation meant to stop or control fire.

- Hiking trails (Not always reliable depending on fire behavior)
- Roads
- Large streams
- Dozer blazed trails

Fuel Breaks are strips or blocks of vegetation that have been altered to slow or control a fire.

- Right of Way depending on utility
- Mowed yards
- Firewise landscaping



Improve Fire Response:
Access

Can a firetruck safely reach its designation?
Are structure signage clear?
Are water sources marked?



Improve Fire Response:
Resources

Designate and maintain safe places for fire response activities.

Training

- Interagency updates/communications
- Workshops for both professionals and homeowners/businesses
- Community visits to discover potential issues
- Fire Learning Network (The Nature Conservancy)



Research & Risk Assessment

- Fuel management and fire studies performed by students from local Universities
- Develop a Community Wildfire Protection Plan based of a completed risk assessment (SCFC)
- Weather monitoring stations on the mountain for fire danger estimates and firefighting measures.
 - Rainfall
 - Windspeed/direction
 - Relative Humidity



Other Planning Efforts



FIREWISE USA®
RESIDENTS REDUCING WILDFIRE RISKS

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864.252.3705



Contact Information and Next Steps

Project Contacts:

Jessica Stumpf, SC CEM | Deputy Director
Greenville County Emergency
Management
864-467-3056
JStumpf@greenvillecounty.org

Hal Clarkson, PE, CFM, IAM
Woolpert, Inc
803-214-5881
Hal.Clarkson@Woolpert.com

Next Steps:

Prepare Hazard & Risk Assessment	Woolpert
Develop Mitigation Measures	WMT
Public Input	Woolpert / County
Prioritize Mitigation Measures	WMT
Develop Draft Plan	Woolpert

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Greenville County Wildfire Mitigation Plan – Public Meeting #1

May 27, 2021

Attendees & Comments

Attendees:

Name	Affiliation
Jimmy Durham	Resident
Suzanne Terry	Resident
Charles Settoon	Resident
Forrest Long	Resident
Ben Cotton	Resident
Kirk Brown	Resident
Rachel Snuggs	SCPRT
John Lederer	Piedmont Park Fire District
Jess Greer	Resident
Bob Lanning	Resident
Robert Lanning	Resident
Kevin Taylor	Piedmont Park Fire District
Elizabeth Price	SCEMD
Jason Price	GHAPD
Hal Clarkson	Woolpert
Joanne Armstrong	Resident
Scott Etter	Resident
Jessica Stumpf	Greenville County EM
Ava Chitty	Resident
Terry Hurley	SCPRT
Alex Kuickilder	Resident
Laura & Jim Edge	Resident
Brian Bishop	Greenville County
James Riddle	Woolpert
Shady Agnew	Woolpert

Comments:

1. “This event has been a long time coming! I’m glad to see the effort for Paris Mountain! I own *[illegible]* subdivision on Paris Mountain and would love to help with the local effort toward protection of this rare feature in Greenville County”. Recommends house fire retardant spray and mentions Laurel Ridge HOA has no fire hydrants. -Jimmy D.
2. Concerns of a lot of trees & Limbs down after ice storms. Also, homeowners cutting down trees and leaving them on the ground. – Ava C.
3. “Fire mitigation is top priority in our neighborhood, we live on a private road with no fire hydrants. 2 homes have burned to the ground on our street. My home narrowly escaped burning to the ground due to a firebreak and water from Furman Lake. We need access to water on Altamont Rd. so water will flow downhill to our neighborhood. Our subdivision backs up to Altamont Rd properties. Thank you for this crucial work.” - Joanna A. (Laurel Ridge subdivision HOA president)

Presentations:

Paris Mountain Public Outreach Meeting #1

Station #1

Welcome and Please Sign In



Meeting Purpose

Answer questions and gather feedback on Greenville County's Wildfire Mitigation Plan for the Paris Mountain Area.

Station #2

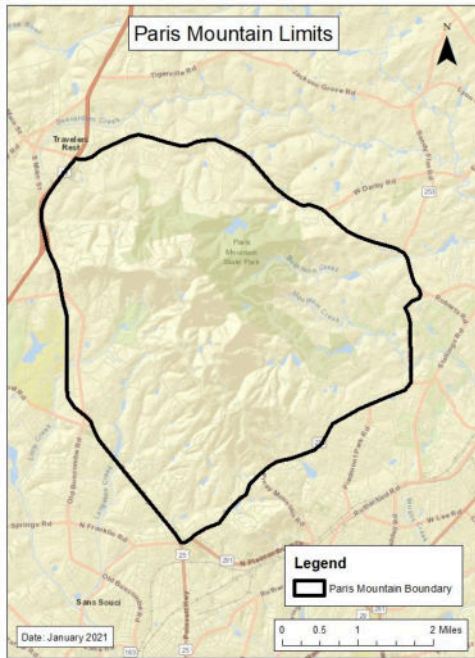


Wildfires
don't just
happen out
west

November 2016 – The Pinnacle Mountain Fire burned over 10,000 acres in Pickens and Greenville County.

Additional recent wildfires across the nation have increased awareness of wildfires and their associated risks and hazards.

Purpose: 1/6



Planning Area

In general, the Paris Mountain planning area is bounded by State Park Road (County Road 22), South Carolina Highway 253, U.S. Route 276, and U.S. Route 25.

The planning area includes approximately:

- 4,000 Residences
- 150 Businesses
- Paris Mountain State Park
- Communications Towers

Purpose: 2/6



Plan Purpose

Reduce the risk of wildfire for the Paris Mountain planning area.

Purpose: 3/6

Wildfire Mitigation Plan Goals

County government will have the capability to develop, maintain, and utilize hazard information.

The County will have the capability to initiate and sustain emergency response operations during and after a disaster.

The continuity of County government operations will not be significantly disrupted by disasters.

The policies and regulations of County government will support effective hazard mitigation programming throughout the County.

Residents of the County will have homes, institutions, and places of employment that are less vulnerable to disasters.



Purpose: 4/6

Wildfire Mitigation Plan Goals

The economic vitality of the County will not be significantly threatened by a disaster.

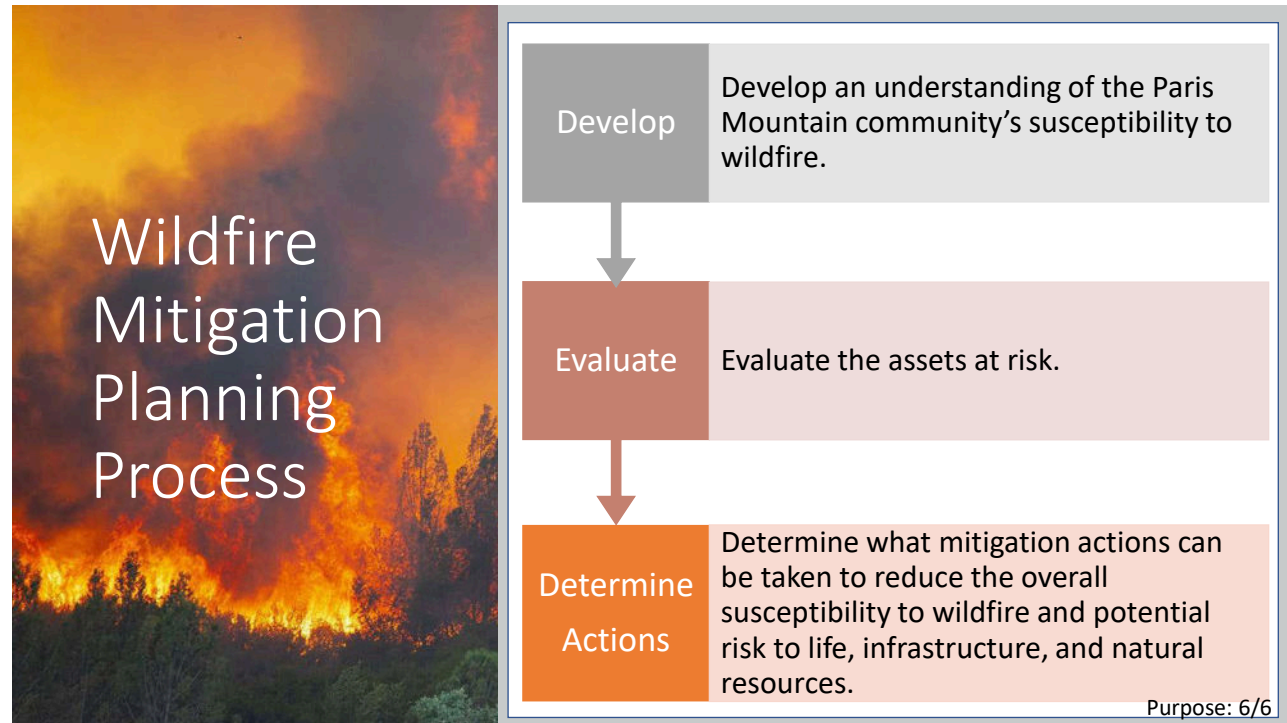
The availability and functioning of the County's infrastructure will not be significantly disrupted by a disaster.

Key County employees will be trained to recognize hazards threatening local areas and the techniques to minimize vulnerability to those hazards. Information on hazard mitigation will be disseminated to the public.

The County will protect public safety and reduce loss of life and injury.



Purpose: 5/6



Station #3

Wildland Urban Interface

The Wildland Urban Interface is the line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

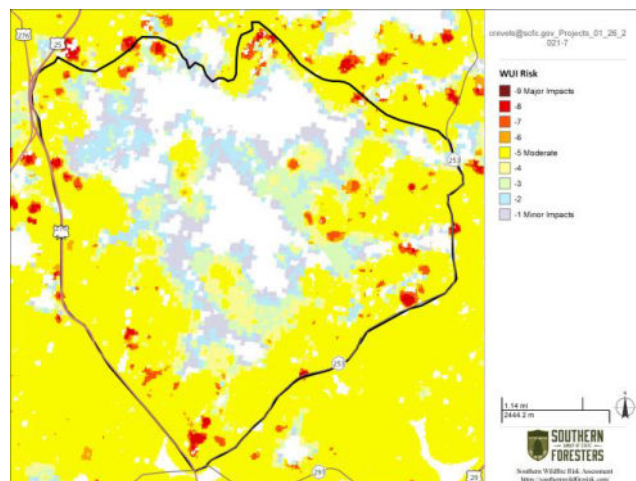
Paris Mountain is within the wildland urban interface which increases the risk of wildfire for the entire area.



Risk: 1/7

Wildfire Urban Interface Risk Index

The **Wildland Urban Interface (WUI) Risk Index** is a rating of the potential impact of a wildfire on people and their homes. The greater the **WUI**, the higher the risk of potential wildfire impacts.



Paris Mountain WUI Risk Map

Risk: 2/7

What is at Risk?

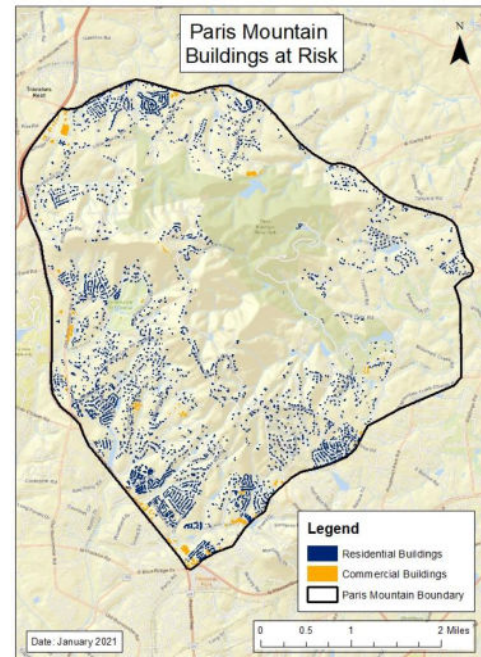
~8,827 People

~\$890 million of infrastructure

Natural Resources

Paris Mountain State Park

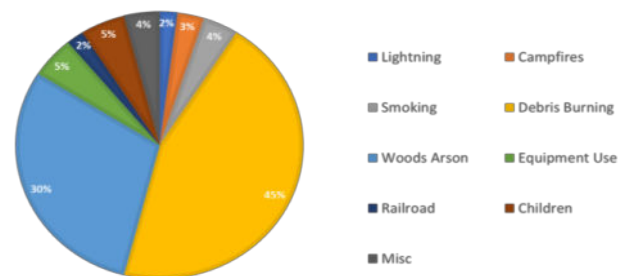
Three (3) Naturaland Trust Properties



Risk: 3/7

The Causes of Wildfire in South Carolina

Humans cause approximately 90% of all wildfires



Risk: 4/7

Wildfire Response

Each wildfire response must be tailored to the **wildfire type** and the fire's **fuel, topography, and weather conditions** to form an effective response.

Risk: 5/7

Wildland Fire Types



Ground



Surface



Crown

The Paris Mountain area is most likely to experience surface fires.

Risk: 6/7

Influences on Wildfire Behavior

- Fuel** The amount of trees, fallen leaves/needles, and other plant material available to burn.
- Topography** Fires on steeper slopes are more difficult to suppress than fires on flat lands.
- Weather** Rain helps suppress fires, while dry conditions and high winds can make fires burn hotter and faster.

Risk: 7/7

Station #4

Wildfire Mitigation Strategies

Mitigation: 1/10



What is Wildfire Mitigation?

Actions taken to prevent wildfires from occurring or to limit the damage caused by wildfires that do occur.

Mitigation: 2/10

Community Outreach and Education

Over 90% of all wildfires are started by humans.

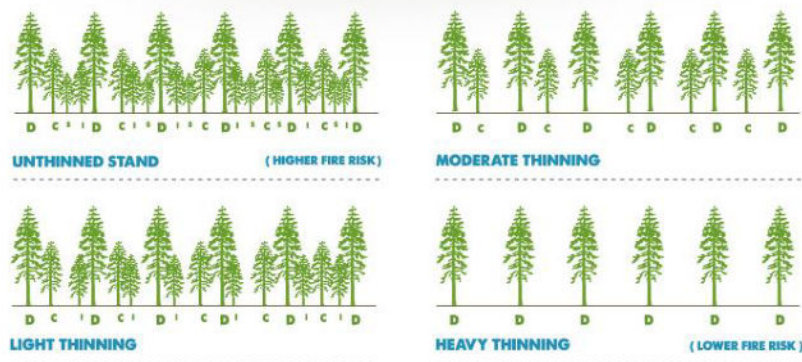
Helping residents and visitors understand **wildfire causes, response, and self-protection measures** can significantly reduce not only the likelihood of wildfire, but also the damages incurred should a fire occur.



Mitigation: 3/10

Fuel Management

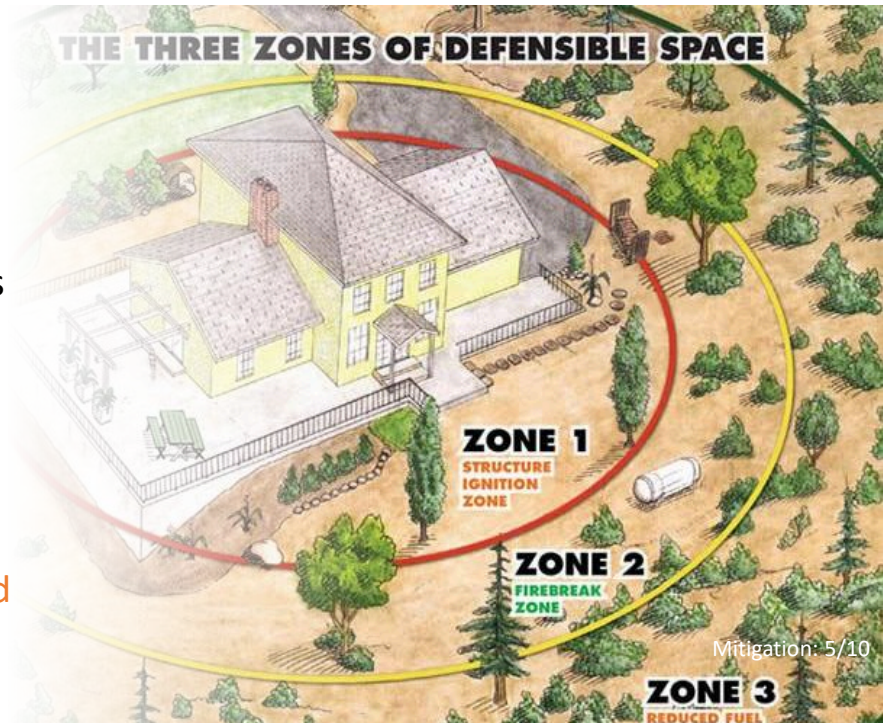
Effectively managing the type and quantity of fuel within the planning area is fundamental to reducing the potential/intensity/duration of any fire. There are several means of managing fuel including; prescribed burning, mechanical thinning, and snag removal.



Mitigation: 4/10

Fireproof Landscape

A **defensible space** is a natural and/or landscaped area around a structure that has been maintained and designed to reduce fire danger. The **practice is also called firescaping**.



Fireproof Landscape

Fuel break examples:

- Thinned vegetation
- Mowed yards
- Firewise landscaping

Fire break examples:

- Roads/trails
- Large streams

Fuel break

Fuel-managed areas meant to **hamper** fire propagation.



Firebreak

Fuel-managed areas meant to **stop** fire propagation.

Mitigation: 6/10

Fireproof Structures

Using the following elements in buildings and homes can reduce the potential for and spread of wildfires in communities.

- Fire rated doors
- Ignition resistant roofs
- Ember resistant exterior
- Window protection
- Sprinkler systems
- Louvers/vents with fire dampers
- Fire-safe site layout



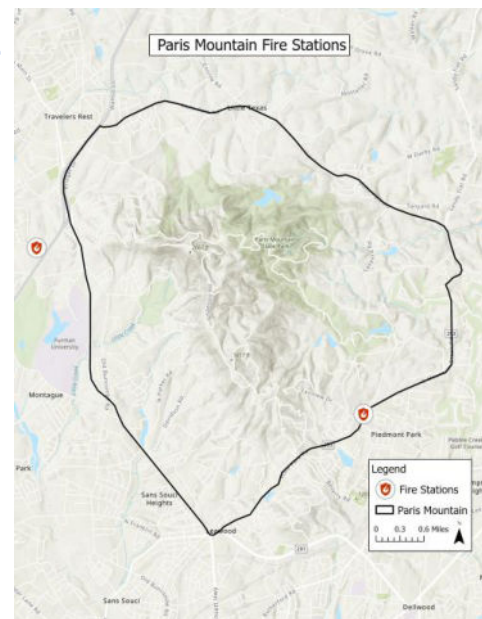
Mitigation: 7/10

Improved Fire Response

The Paris Mountain planning area has two fire departments responsible for responding to wildfires; Piedmont Park and Duncan Chapel Fire.

These departments are well equipped and properly trained. Communication channels between the departments and the South Carolina Forestry Commission (SCFC) are established.

Maintaining appropriate access to the area for all fire departments is key to ensuring quick wildfire response times.



Mitigation: 8/10

Training

Maintaining funding for training fire departments is essential for wildfire mitigation.

Fire departments must be prepared for all possible firefighting situations.

Firefighters and citizens should stay up-to-date on wildfire fighting techniques and fire safety.



Mitigation: 9/10

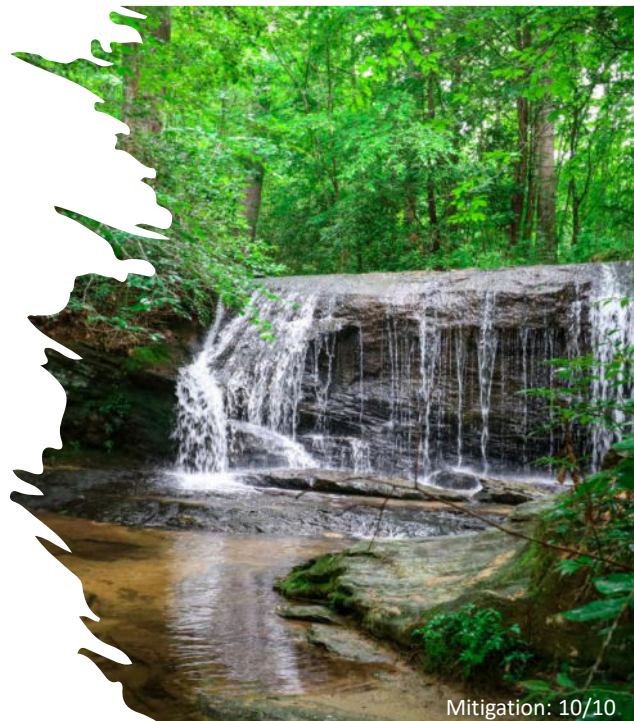
Research and Risk Assessment

Studies and assessments provide a better understanding of the risk and ways to reduce wildfire potential.

Examples include, fuel management and fire studies and risk assessments (SCFC) to develop a Community Wildfire Protection Plan.

Also, weather monitoring stations on the mountain inform fire danger estimates and firefighting measures.

- Rainfall
- Windspeed/direction
- Relative Humidity



Mitigation: 10/10

Station #5

Add a schedule!

The Wildfire Mitigation Team





Comments

Please write down and leave your comments
and suggestions for the Wildfire Mitigation Plan
at this station.

Meeting Minutes

Date of Meeting: July 1, 2021 **Re:** Paris Mountain Wildfire Mitigation Plan

Location: Teams Virtual Meeting **Issue Date:** July 1, 2021

Submitted By: H. Clarkson

In Attendance: Greenville County Staff
Wildfire Mitigation Team (WMT)
Woolpert Staff

ITEMS DISCUSSED:

This was the second meeting of the WMT and the purpose was to begin identifying actionable items (mitigation initiatives) to reduce the risk of wildfire or wildfire damage in the Paris Mountain planning area. The identified mitigation initiatives will be presented to the public for comment, then revised as appropriate. After addressing comments from the public, the list of mitigation initiatives will be prioritized by the WMT for implementation.

The following lists were developed from comments provided by the WMT during the meeting. Some comments and recommendations have been summarized and /or combined with other comments and recommendations for brevity and to avoid duplication.

General Comments:

- Greenville County has received additional Hazard Mitigation Grant Program (HMGP) funding to provide public outreach to the Paris Mountain planning area related to wildfire mitigation.
- The State Fire Marshall's office follows the 5 E's of fire mitigation: 1) Engineering, 2) Enforcement, 3) Education 4) Economic Incentives, and 5) Emergency Response. Suggest incorporating these global strategies into the plan.
- Tracking and coordination with Homeowners Associations (HOAs) within the planning area is difficult. There are several HOAs and leadership changes annually at a minimum.
- Both Piedmont Park and Duncan Chapel Fire Departments perform regular hydrant maintenance and annual inspections including verifying operations of the hydrant, weed control and painting. Any hydrant that is not capable of providing fire support is reported to Greenville Water for repair. Hydrant coverage of the planning area should be reviewed.
- Additional water sources for emergency response have also been identified including dip sites, ponds, and pools.
- Access in and out of the planning area is of major concern to the group. Roads can be narrow, winding, steep and often have narrow shoulders, if any. Trying to evacuate residents at the same time emergency responders are trying to gain access will be problematic.

- Certified Firewise communities are eligible for additional grant funding sources (e.g., Ready, Set, Go program; See <https://www.readyforwildfire.org/prepare-for-wildfire/ready-set-go/>)

Recommended Mitigation Measures:

1. *Perform public outreach activities* (Current Paris Mountain HMGP funding may be utilized)
 - a. Postcards or mailers
 - b. Presentations at Homeowners Association meetings
 - c. Provide information to local Realtors regarding wildfire risk and mitigation within the planning area
 - d. Provide information to local builders regarding fire resistant buildings
 - e. Support Fire Department door to door “blitz” to distribute wildfire mitigation information and residential smoke alarms
 - f. Organize a “Touch a Truck” event to educate residents on wildfire mitigation and response
 - g. Utilize Paris Mountain State Park for education events
 - h. Identify potential venues to provide information such as local churches, schools, and other public organizations
2. *Support community fuel reduction efforts*
 - a. Provide roll-off containers / “fuel reduction trailers” to collect and dispose of natural debris
 - b. Organize fuel reduction workdays / chipping and disposal days
 - c. Provide economic incentives for creation of “defensible spaces”
3. *Support installation of residential sprinkler systems*
4. *Enhance communications for stakeholders within the planning area*
 - a. Homeowners and businesses
 - i. Utilize “Nextdoor” app or similar social media outlet(s)
 - ii. Identify a “Fireplug” (community leader) for each community or HOA
 - b. Enhance emergency responder communications
 - c. Include communication tower owners in planning process
5. *Create Fire Breaks and Fuel Breaks*
 - a. Naturaland Trust
 - b. Paris Mountain State Park
 - c. Individual landowners
6. *Develop Firewise and / or Fire Adapted communities*
7. *Incorporate “Wildfire Overlay Districts” into County land planning activities* (See [Land use planning can reduce wildfire risk to homes and communities - Headwaters Economics](#))
8. *Prepare an assessment of ingress / egress issues with prioritized action plan*
 - a. Consider “reversible lanes”, alternative routes, emergency access roads
 - b. Identify “Safe Zones” within the planning area
 - c. Identify evacuation routes out and emergency routes in

Each of the concepts above will be further defined with individual steps to implementation. For instance, to create fire and fuel breaks, appropriate locations must be identified and vetted with the landowners, and the entity responsible for creating the fire or fuel break must also be identified and appropriately funded.

The meeting agenda, presentation material, and attendee list is attached following the list of initiatives. A recording of the meeting is also available.



Agenda

Meeting Location:	Virtual Meeting
Time:	10:00 am – 12:00 pm
Date:	Thursday, 07/01/21
Attendees:	Greenville County WMT Woolpert
Subject:	Paris Mountain Wildfire Mitigation Team, Meeting #2 – Hazards, Risk, Mitigation Measures

ITEMS TO DISCUSS:

1. Team Introductions
 - a. Greenville County
 - b. Woolpert
 - c. WMT
2. Project Overview
 - a. Plan purpose
 - b. Plan goals
 - c. Process
3. Overview of Draft Plan
4. Hazard Review
 - a. Human causes account for well over 90% of wildfires in SC
 - b. Wildfire influences relevant to Paris Mountain
 - i. Fuel
 - ii. Topography
 - iii. Access
5. Risk Review
 - a. ~8,827 people within planning area
 - b. ~\$890M of infrastructure
 - c. Natural Resources (State Park & Naturaland Trust)
 - d. Communications
6. Overarching Mitigation Strategies

- a. Community Outreach and Education
 - b. Fuel Management
 - c. Fireproof Landscape
 - d. Fire Resistant Structures
 - e. Fire Response
 - f. Training
 - g. Research and Risk Assessment
7. Mitigation Measures Identification (This will be an open discussion of specific activities that could be undertaken to reduce the risk of wildfire damage. We would like to identify several ideas underneath each of the overarching strategies.)
8. Next steps

Attendee List:

Meeting Summary: Total Number of Participants 23		
Meeting Title: Paris Mountain Wildfire Mitigation Team Meeting		
Meeting Start Time	7/1/2021, 9:51:29 AM	
Meeting End Time	7/1/2021, 11:15:43 AM	
Full Name	Join Time	Leave Time
Hal Clarkson	7/1/2021, 9:51:29 AM	7/1/2021, 11:12:45 AM
Kevin Taylor	7/1/2021, 9:51:59 AM	7/1/2021, 11:12:41 AM
Terry Hurley	7/1/2021, 9:53:11 AM	7/1/2021, 11:12:42 AM
Jessica Stumpf	7/1/2021, 9:55:30 AM	7/1/2021, 11:12:47 AM
Mike Bozzo	7/1/2021, 9:56:19 AM	7/1/2021, 11:12:49 AM
Chris Revels	7/1/2021, 9:56:20 AM	7/1/2021, 11:12:40 AM
Michael Weeks	7/1/2021, 9:56:37 AM	7/1/2021, 11:12:20 AM
Josh Fulbright	7/1/2021, 9:57:16 AM	7/1/2021, 11:12:39 AM
Paula Gucker	7/1/2021, 9:57:43 AM	7/1/2021, 10:28:54 AM
Shady Agnew	7/1/2021, 9:58:06 AM	7/1/2021, 11:12:49 AM
James Riddle	7/1/2021, 9:58:28 AM	7/1/2021, 11:12:46 AM
Ben Cotton	7/1/2021, 9:58:45 AM	7/1/2021, 11:12:57 AM
Craig Sollman	7/1/2021, 9:59:00 AM	7/1/2021, 11:12:45 AM
Brian Bishop	7/1/2021, 9:59:24 AM	7/1/2021, 11:15:43 AM
Linda Hannon	7/1/2021, 10:03:15 AM	7/1/2021, 10:25:15 AM

Geoffrey Habron	7/1/2021, 10:03:40 AM	7/1/2021, 10:55:48 AM
Ryan Guery	7/1/2021, 10:06:05 AM	7/1/2021, 11:12:47 AM
Unknown Guest	7/1/2021, 10:06:08 AM	7/1/2021, 11:12:42 AM
Unknown Guest	7/1/2021, 10:07:28 AM	7/1/2021, 10:21:50 AM
Jennifer Simmons	7/1/2021, 10:11:00 AM	7/1/2021, 11:00:18 AM
Rebecca West	7/1/2021, 10:11:47 AM	7/1/2021, 11:12:40 AM
Sharon Appell	7/1/2021, 10:18:35 AM	7/1/2021, 11:12:38 AM
Mark Sutton	7/1/2021, 10:21:09 AM	7/1/2021, 11:13:15 AM

Presentation Material:



Wildfire Mitigation Team Mitigation Identification Meeting

July 1st, 2021

Agenda

- Introductions
- Project Overview
- Overview of Draft Plan
- Hazard Review
- Risk Review
- Overarching Mitigation Strategies
 - Community Outreach and Education
 - Fuel Management
 - Fireproof Landscape
 - Fire Resistant Structures
 - Fire Response
 - Training
 - Research and Risk Assessment
- Mitigation Measures Identification
- Next steps

Introductions

County: Paula Gucker, Assistant County Administrator
Jessica Stumpf, Deputy Director Emergency Management Division
Brian Bishop, Floodplain Administrator

Woolpert: Hal Clarkson, PE, CFM, IAM
James Riddle, PE
Shady Agnew

WMT:

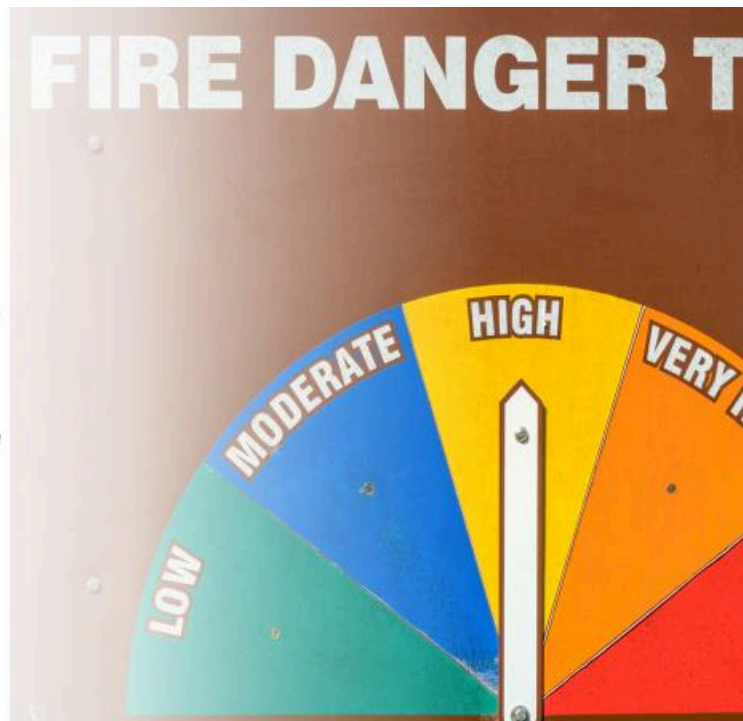
Duke Energy	SC DOT	NOAA
ReWa	SC Forestry Commission	Duncan Chapel Fire Department
Paris Mountain HOA	SC Parks	Piedmont Park Fire Department
Greenville Water	SC EMD	
Furman University	SC ETV	

Plan Purpose and Goals

Mitigate potential damages from wildfire to Paris Mountain community and infrastructure

1. Quantify the wildfire hazard and risks
2. Identify potential measures to reduce the hazard and risk
3. Prioritize projects for implementation

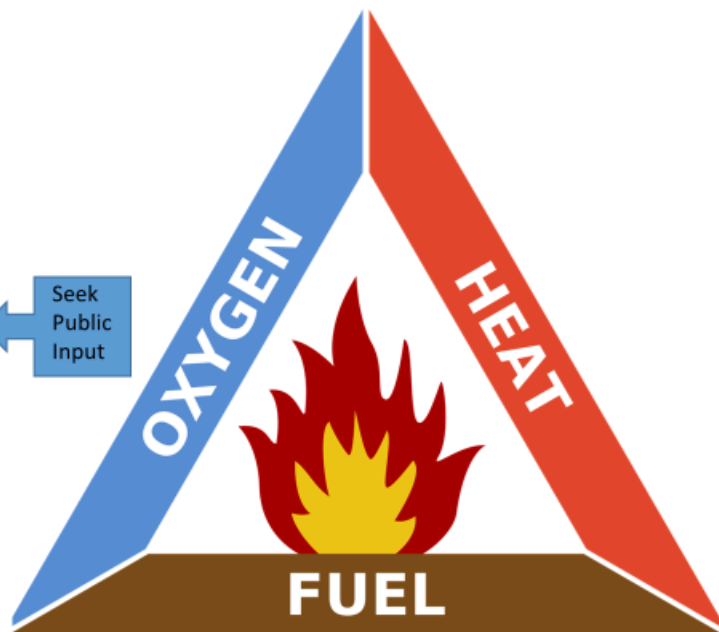
Create a Wildfire Mitigation Plan as an annex to the existing 2020 Hazard Mitigation Plan



Planning Process

- Create the Wildfire Mitigation Team
- Gather and Review Data
- Perform Hazard and Risk Assessment
- Determine potential mitigation measures
- Prioritize Projects
- Develop and adopt plan for inclusion in HMP

Seek
Public
Input



Paris Mountain Wildfire Mitigation Plan

1. Executive Summary

2. Introduction

3. History of Wildfire

4. General Description of Area

- Limits
- Topography
- Assets

5. Wildfire Mitigation Team

- Wildfire Mitigation Team Operating Procedures

6. Plan Purpose and Goals

- Plan Goals

7. Description of Wildfire hazard

- Wildfire Categories
- Wildfire Types
- Wildfire Components
- Wildfire Behavior
- Changes to Environment
- Wildfire Causes
- Wildfire Potential

8. Description of Wildfire Risks

- General Risk
- Paris Mountain Area Risk
- SouthWRAP Risk Assessment

9. Potential Damages/Cost Assessment

10. Mitigation Initiatives

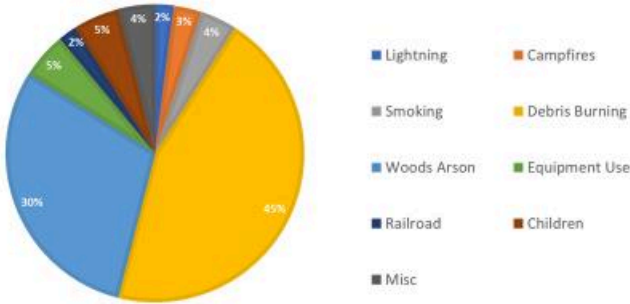
- Existing Measures
- Schedule
- Inspection
- Fuel Reduction

11. Action Plan



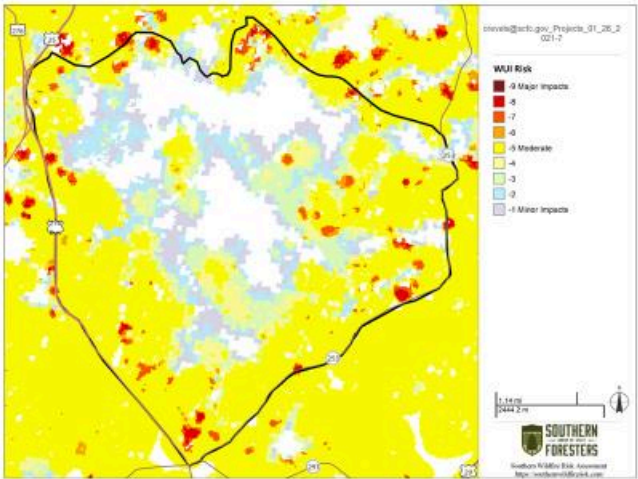
The Causes of Wildfire in South Carolina

Humans cause approximately 90% of all wildfires



Wildfire Urban Interface Risk Index

The **Wildland Urban Interface (WUI) Risk Index** is a rating of the potential impact of a wildfire on people and their homes. The greater the **WUI**, the higher the risk of potential wildfire impacts.



Paris Mountain WUI Risk Map

Risk: 2/7

Influences on Wildfire Behavior

Fuel

The amount of trees, fallen leaves/needles, and other plant material available to burn.

Topography

Fires on steeper slopes are more difficult to suppress than fires on flat lands.

Weather

Rain helps suppress fires, while dry conditions and high winds can make fires burn hotter and faster.

Risk: 7/7

Infrastructure and People at Risk

People at Risk

Population: 8,827
Demographics:
Median Income = \$60,000
94% with Some College
12% at Poverty Level
1% Hispanic

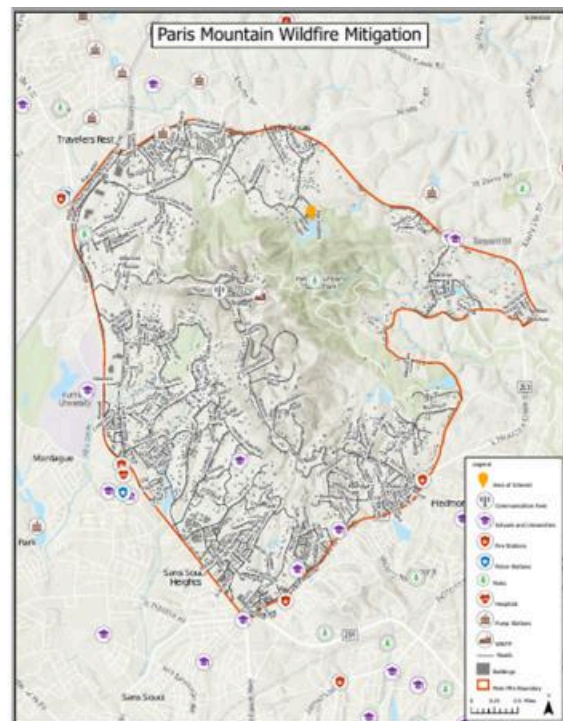
Value at Risk

Residential	Commercial
3,870 buildings	153 buildings
\$687 million	\$82.5 million

Total Value: \$769.5 million

Infrastructure

- Communications
- State Park
- Businesses
- Water Supply / Wastewater Treatment
- Medical Facilities
- Educational Institutions
- Residential Properties
- Fire Stations



Mitigation Strategies

- Community Outreach & Education
- Fuel Management
- Fire Resistant Construction
- Fire Resistant Landscape
- Fire Response
- Training
- Research & Risk Assessment



Community Outreach & Education

- Firewise communities
- Informational signs
- Fire learning trail for hikers



Fuel Management

- Prescribed Burning (By professional only)
- Mechanical Thinning
- Snag Removals

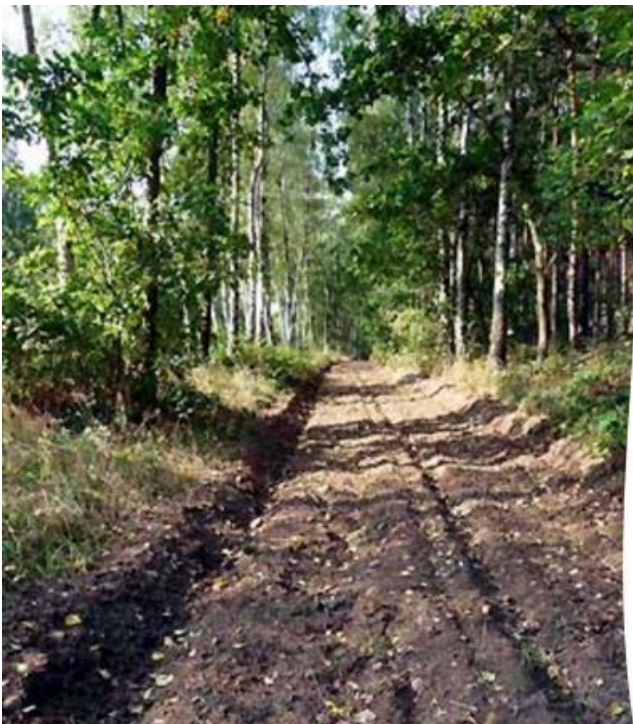
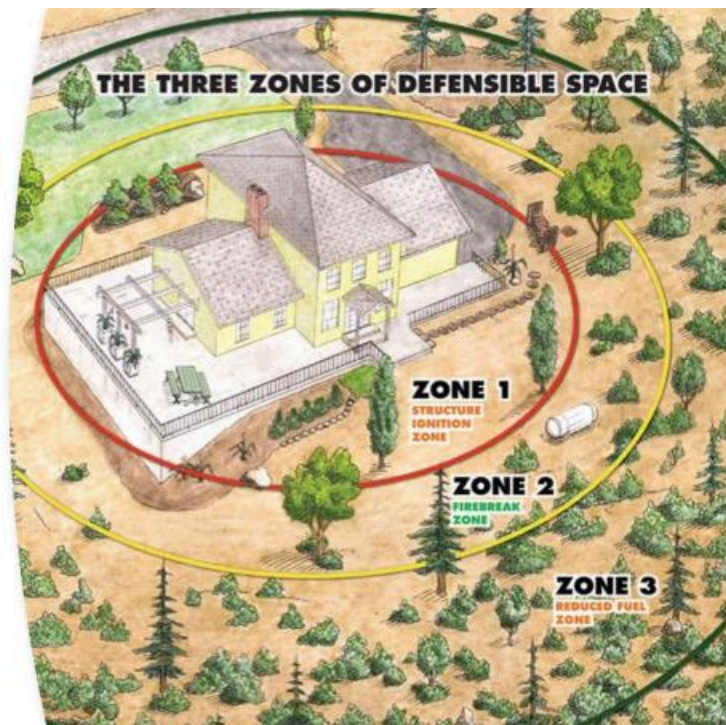


Fire Resistant Construction

- Building regulations for new construction
- Updating old structures
- Community education on fire-proofing their home (Fire Wise)
- Identify priority structures?

Fire Resistant Landscape

- The area between a house and an oncoming wildfire where the vegetation has been modified to reduce the wildfire threat and to provide an opportunity for firefighters to effectively defend the house.
- "Firescape" - Replace flammable vegetation with fire-resistant species.
- Sprinkler systems



Fire Resistant Landscape

- Firebreaks are strips of bare soil or fire retarding vegetation meant to stop or control fire.
 - Hiking trails (Not always reliable depending on fire behavior)
 - Roads
 - Large streams
 - Dozer blazed trails
- Fuel Breaks are strips or blocks of vegetation that have been altered to slow or control a fire.
 - Right of Way depending on utility
 - Mowed yards
 - Firewise landscaping



Fire Response

- Can a firetruck safely reach its designation?
- Are structure signage clear?
- Are water sources marked?

Fire Response

- Designate and maintain safe places for fire response activities.





Training

- Interagency updates/communications
- Workshops for both professionals and homeowners/businesses
- Community visits to discover potential issues
- Fire Learning Network (The Nature Conservancy)



Research & Risk Assessment

- Fuel management and fire studies performed by students from local Universities
- Develop a Community Wildfire Protection Plan based of a completed risk assessment (SCFC)
- Weather monitoring stations on the mountain for fire danger estimates and firefighting measures.
 - Rainfall
 - Windspeed/direction
 - Relative Humidity

Discussion of Mitigation Initiatives



Contact Information and Next Steps

Project Contacts:

Jessica Stumpf, SC CEM | Deputy Director
Greenville County Emergency
Management
864-467-3056
JStumpf@greenvillecounty.org

Hal Clarkson, PE, CFM, IAM
Woolpert, Inc
803-214-5881
Hal.Clarkson@Woolpert.com

Next Steps:

Public Input	Woolpert / County
Prioritize Mitigation Measures	WMT
Develop Draft Plan	Woolpert

Woolpert, Inc
514 Petigru Street
Greenville, SC 29601
864.252.3705

Greenville County Wildfire Mitigation Plan – Public Meeting #2

September 16, 2021

Attendees & Comments

No Attendees, No Comments

Greenville County Wildfire Mitigation Plan – Public Meeting #2

September 16, 2021

Attendees & Comments

Presentations:

Paris Mountain Public Outreach Meeting #2

*Piedmont Park Fire Department
2119 State Park Rd.
Greenville, SC 29609*

September 16th, 2021

Station #1

Welcome and Please Sign In

Meeting Purpose

1

Educate on the risks associated with wildfire in the Paris Mountain planning area.

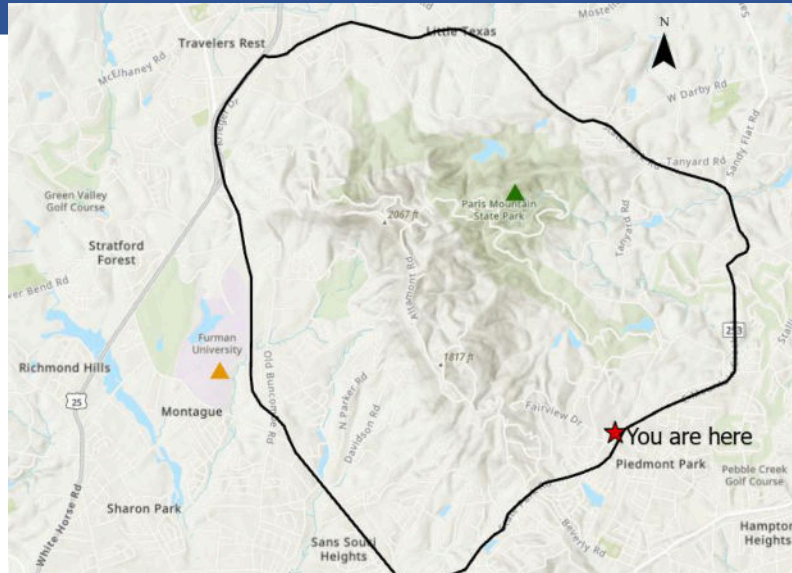
2

Present the Greenville County planning process.

3

Present wildfire mitigation strategies and actions identified to date.

The Paris Mountain Planning Area



Station #2

The Hazards and Risk of Wildfire

1/8

1/8



History of Wildfires

November 2016 – The Pinnacle Mountain Fire burned over 10,000 acres in Pickens and Greenville County.

So far this year, 5.1 million acres have burned in the United States. Currently, 1.9 million acres are burning across 10 states.

2/8

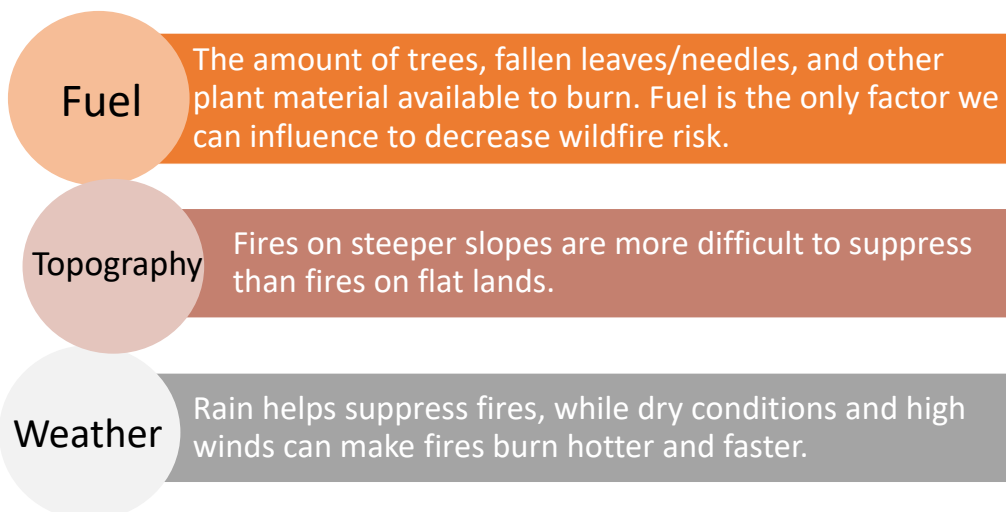
Wildland Fire Types



The Paris Mountain area is most likely to experience surface fires.

3/8

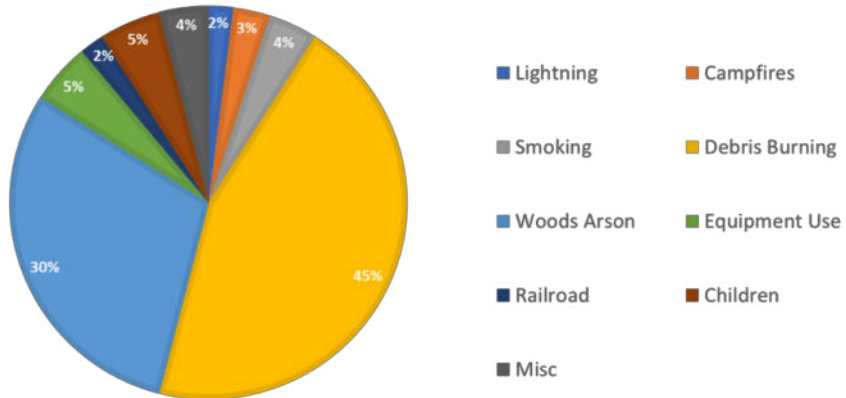
Influences on Wildfire Behavior



4/8

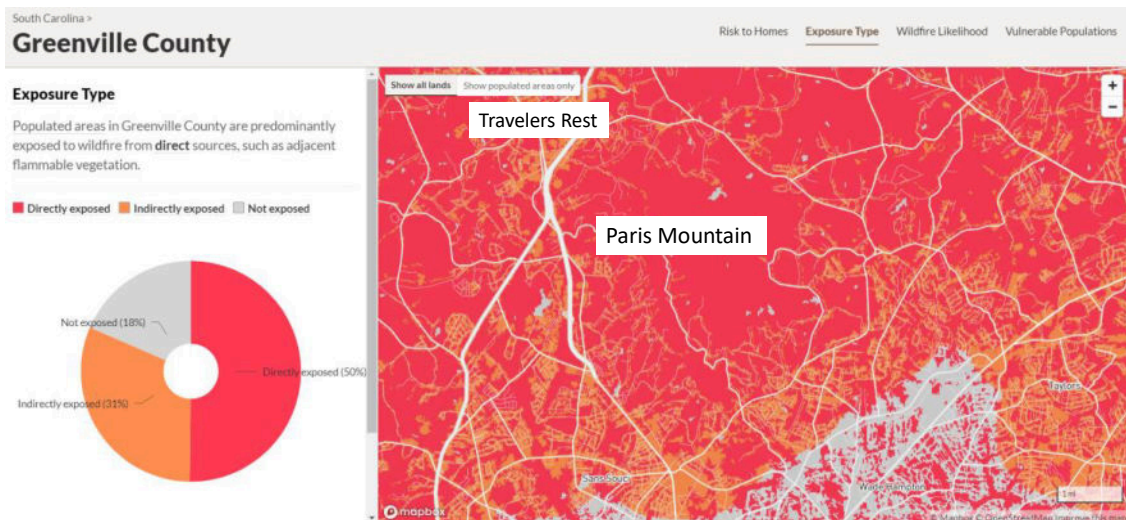
Wildfire Causes in South Carolina

Humans cause approximately 90% of all wildfires



5/8

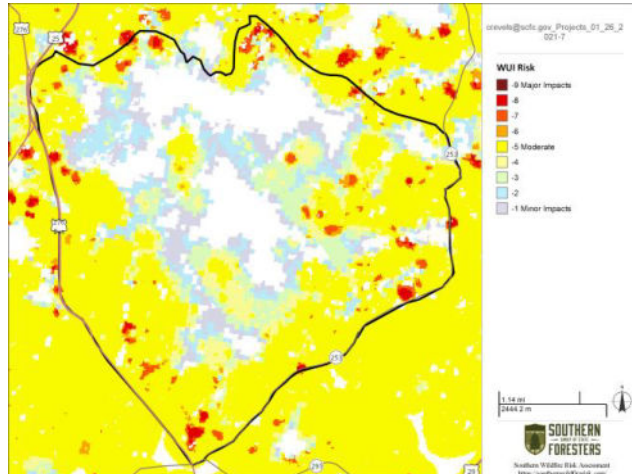
The Risks



7/8

Wildfire Urban Interface Risk Index

The **Wildland Urban Interface (WUI) Risk Index** is a rating of the potential impact of a wildfire on people and their homes. **WUI** reflects housing density (houses per acre). The greater the **WUI**, the higher the risk of potential wildfire impacts.



6/8

What is at Risk?

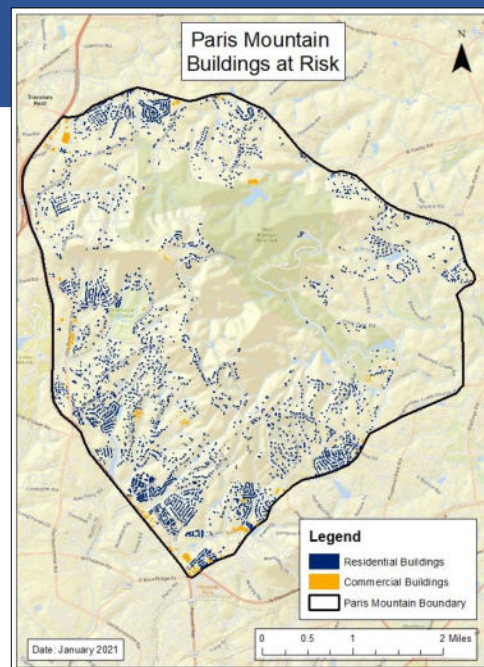
~8,827 People

~\$890 million infrastructure value

Natural Resources

Paris Mountain State Park

Three (3) Naturaland Trust Properties



8/8

Station #3



The Planning Process

Wildfire Mitigation Plan Purpose



Protect **life**,
infrastructure and
natural resources
from wildfires in the
Paris Mountain
planning area.

2/7

Planning Process – Established Goals

County government will have the capability to develop, maintain, and utilize hazard information.

The County will have the capability to initiate and sustain emergency response operations during and after a disaster.

The continuity of County government operations will not be significantly disrupted by disasters.

The policies and regulations of County government will support effective hazard mitigation programming throughout the County.

Residents of the County will have homes, institutions, and places of employment that are less vulnerable to disasters.

3/7

Planning Process – Established Goals

The economic vitality of the County will not be significantly threatened by a disaster.

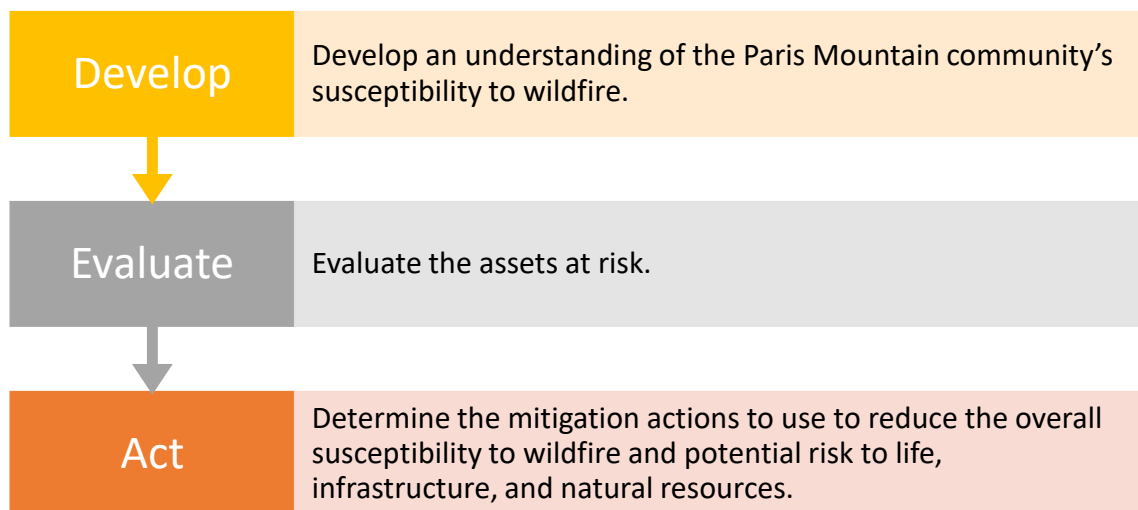
The availability and functioning of the County's infrastructure will not be significantly disrupted by a disaster.

Key County employees will be trained to recognize hazards threatening local areas and the techniques to minimize vulnerability to those hazards. Information of hazard mitigation will be disseminated to the public.

The County will protect public safety and reduce loss of life and injury.

4/7

The Planning Process



5/7

Next Steps

-  1. Prioritize the wildfire mitigation activities for implementation.
-  2. Prepare the final draft plan.
-  3. Plan reviewed by SCEMD and Greenville County Council.
-  4. Adopted by Greenville County Council and incorporated into the multi-hazard plan.
-  5. Implement the plan.

6/7

Thank You to the Wildfire Mitigation Planning Team



7/7

Station #4



Community Outreach and Education



Postcards or mailers to residents and businesses.



Wildfire safety information at HOA meetings.



Wildfire risk and mitigation information to local Realtors.



Fire resistant buildings information to local builders.

2/9

Community Outreach and Education



Support Fire Department distribution of wildfire information and residential smoke alarms.



“Touch a Truck” events to educate residents on wildfire mitigation and response.



Incorporate wildfire mitigation into State Park education activities.



Identify local public organizations to distribute wildfire information.

3/9

Fuel Management



Fuel reduction
workdays or
chipping and
disposal days.



Provide roll-off
containers to
collect and dispose
of natural debris.



Economic
incentives for the
creation of
defensible spaces.

4/9

Fireproof Structures



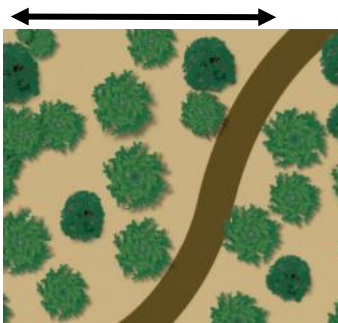
Voluntary installation of
residential sprinkler
systems.

4/9

Fireproof Landscape

Firebreak

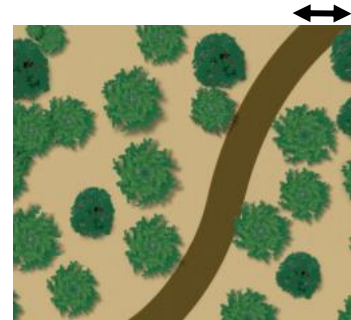
Fuel-managed areas meant to **stop** fire propagation.



Create fire
breaks and fuel
breaks.

Fuel break

Fuel-managed areas meant to **hamper** fire propagation.



4/9

Improve Fire Response



Utilize
“Nextdoor” app
or similar social
media
platform(s).



Identify a
community
leader for each
community or
HOA.



Enhance
emergency
responder
communications.



Include
communication
tower owners in
planning
process.

4/9

Planning & Training

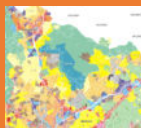
Develop Firewise
and/or Fire Adapted
communities.



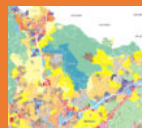
FIREWISE USA®
RESIDENTS REDUCING WILDFIRE RISKS

4/9

Research and Risk Assessment



Incorporate Wildfire Overlay
Districts into Greenville County land
planning activities.



Prepare an assessment of
ingress/egress issues with a
prioritized action plan.

- a. Consider
“reversible lanes”,
alternative routes,
emergency access
roads.
- b. Identify “Safe
Zones” within the
planning area.
- c. Identify
evacuation routes
out and
emergency routes
into the planning
area.

4/9

Station #5

Comments

Please write down and leave your comments
and suggestions for the Wildfire Mitigation Plan
at this station.

Meeting Minutes

Date of Meeting: November 12 & December 9, 2021 **Re:** Paris Mountain Wildfire Mitigation Plan

Location: Teams Virtual Meeting **Issue Date:** December 9 2021

Submitted By: S. Agnew

In Attendance: Greenville County Staff
Disaster Mitigation Committee (DMC)
Woolpert Staff

ITEMS DISCUSSED:

The purpose of this meeting was to score and prioritize the mitigation strategies developed by the Wildfire Mitigation Team (WMT). This meeting took part over two days due to time constraints during the first meeting. This document is a summary of both meetings.

General Comments:

Category 3 – Fireproofing structures (Residential sprinkler systems)

- The original category was heavily discussed and ultimately the DMT agreed to revise due to feasibility, cost, and effectiveness. The revised category focused on providing information/incentives to builders and homeowners regarding fireproof construction techniques.

Category 4 – Fireproofing the landscape

- Communication towers would be the main concern for this objective.
- Effective typically immediately but would need to be maintained.
- Implementation could be difficult; county could only maintain firebreaks on county land... homeowners may need to be responsible for their own properties.
- May be some mitigation grant funding for this objective.

Category 5 – Improve fire response

- Focusing on the State Park would have a bigger impact.
- Emergency management pays for Code Red; wildfire could be an add on.
- Accessibility a main concern, little room for large apparatuses.

Category 7 – Research & Risk

- A study on wildlife may be needed. Evacuation procedures may need to include a notice on wildlife fleeing.

*Note: During the scoring, the DMC decided to change the “0” score to a “.5” as to not mislead the public on importance.

The meeting agenda, presentation material, and attendee list is attached following the list of initiatives. Recordings of the meeting are also available.

Attendee List:

Meeting Title: Paris Mountain Wildfire Mitigation DMC scoring meetings		
	Attended?	
Full Name	11/12/2021	12/9/2021
Hal Clarkson	Yes	Yes
James Riddle	Yes	Yes
Shady Agnew	Yes	Yes
Brian Bishop	Yes	Yes
Jessica Stumpf	Yes	Yes
Mac McMakin	Yes	No
Michael Dey	Yes	No
Paul Dow	Yes	Yes
Paula Gucker	Yes	Yes
Wesley Williams	Yes	No
Dorian Flowers	Yes	Yes
Hesha Gamble	No	Yes

Presentation Material:



Greenville County Disaster Mitigation Committee Wildfire Mitigation Prioritization Meeting

November 12, 2021

Agenda

- 11:00 – 11:05 Introductions
- 11:05 – 11:20 Overview of the Paris Mountain Wildfire Mitigation Plan
- 11:20 – 11:25 Review of Scoring criteria
- 11:25 – 12:00 Scoring of mitigation measures
 - 1. Community outreach and education
 - 2. Fuel management
 - 3. Fireproof structures
 - 4. Fireproof the landscape
 - 5. Improve fire response
 - 6. Training
 - 7. Research and risk assessment

Introductions

County: Paula Gucker, Assistant County Administrator
Jessica Stumpf, Acting Director Emergency Management Division
Brian Bishop, Floodplain Administrator

Woolpert: Hal Clarkson, PE, CFM, IAM
James Riddle, PE
Shady Agnew

WMT:

Duke Energy	SC DOT	NOAA
ReWa	SC Forestry Commission	Duncan Chapel Fire Department
Paris Mountain HOA	SC Parks	Piedmont Park Fire Department
Greenville Water	SC EMD	
Furman University	SC ETV	

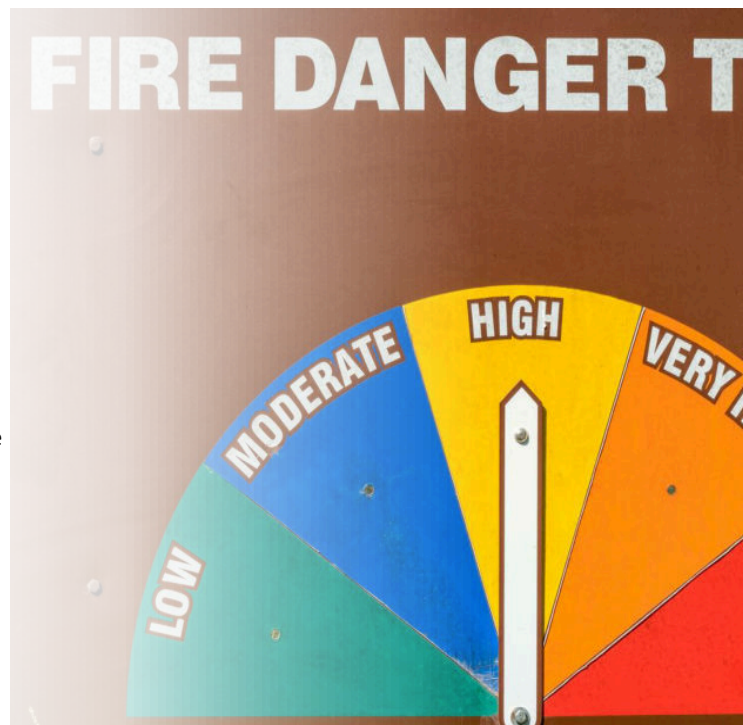
Paris Mountain Wildfire Mitigation Plan

Plan Purpose and Goals

Mitigate potential damages from wildfire to Paris Mountain community and infrastructure

1. Quantify the wildfire hazard and risks
2. Identify potential measures to reduce the hazard and risk
3. Prioritize projects for implementation

Create a Wildfire Mitigation Plan as an annex to the existing 2020 Hazard Mitigation Plan



Paris Mountain Wildfire Mitigation Plan

1. Executive Summary

2. Introduction

3. History of Wildfire

4. General Description of Area

- Limits
- Topography
- Assets

5. Wildfire Mitigation Team

- Wildfire Mitigation Team Operating Procedures

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- Plan Goals

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- Wildfire Types
- Wildfire Components
- Wildfire Behavior
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- Wildfire Potential

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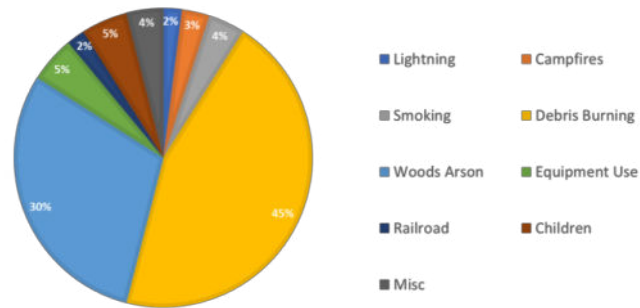
- Existing Measures
- Schedule
- Inspection
- Fuel Reduction

11. Action Plan



The Causes of Wildfire in South Carolina

Humans cause approximately 90% of all wildfires



Influences on Wildfire Behavior

Fuel

The amount of trees, fallen leaves/needles, and other plant material available to burn.

Topography

Fires on steeper slopes are more difficult to suppress than fires on flat lands.

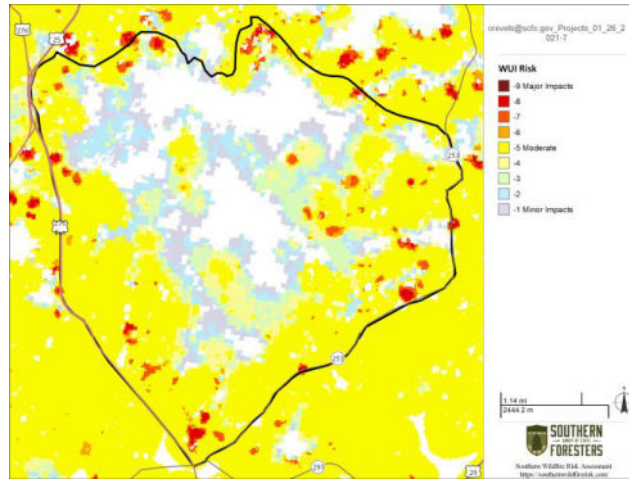
Weather

Rain helps suppress fires, while dry conditions and high winds can make fires burn hotter and faster.

Risk: 7/7

Wildfire Urban Interface Risk Index

The **Wildland Urban Interface (WUI) Risk Index** is a rating of the potential impact of a wildfire on people and their homes. The greater the **WUI**, the higher the risk of potential wildfire impacts.



Paris Mountain WUI Risk Map

Risk: 2/7

Infrastructure and People at Risk

People at Risk

Population: 8,827
Demographics:
Median Income = \$60,000
94% with Some College
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1% Hispanic

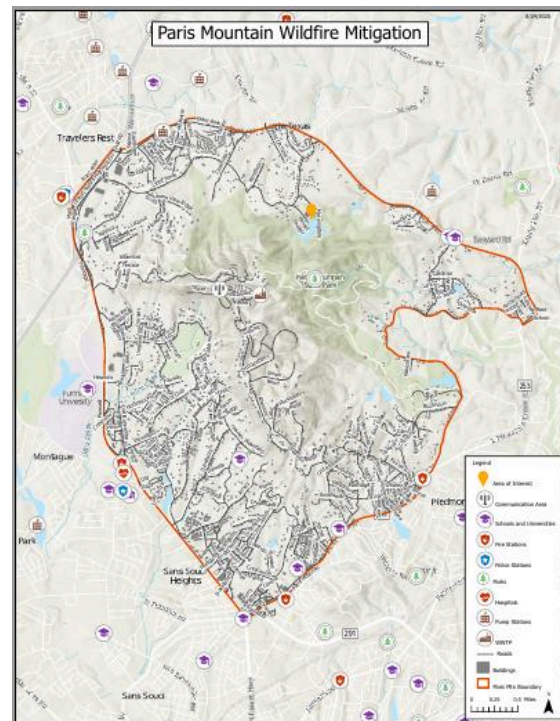
Value at Risk

Residential	Commercial
3,870 buildings	153 buildings
\$687 million	\$82.5 million

Total Value: \$769.5 million

Infrastructure

- Communications
- State Park
- Businesses
- Water Supply / Wastewater Treatment
- Medical Facilities
- Educational Institutions
- Residential Properties
- Fire Stations



Woolpert, Inc
514 Pettigru Street
Greenville, SC 29601
864.252.3705

Scoring Criteria

Priority Criterion	Numeric Score
Strategy Effectiveness	
No affect on risk or hazard	0
Affects several structures within the County	1
Affects many structures within the County	2
Affects most structures within the County	3
Percentage of Population Benefited	
Less than 10% benefited	0
10% to 50% benefited	1
51% to 75% benefited	2
Greater than 75% benefited	3
Time to Implement	
Cannot be implemented	0
Long term	1
Within one year	2
Immediate	3



Priority Criterion	Numeric Score
Time to Impact	
Cannot be implemented	0
Long term	1
Within one year	2
Immediate	3
Cost to County	
Completely unaffordable	0
Expensive	1
Inexpensive	2
Little to no cost	3
Funding Source	
No known funding source available	0
Requires outside funding	1
Requires budget consideration	2
Within existing county budget	3



Priority Criterion	Numeric Score
Cost to Others	
Cost to others is unacceptable	0
Expensive, but manageable	1
Cost is easily managed by others	2
No cost to others	3
Community Support	
Opposed by the entire community	0
Some community opposition	1
Acceptable only to those affected by the project	2
Acceptable community-wide	3
Project Feasibility	
Not possible	0
Accomplished with extensive design and planning	1
Accomplished with some design and planning	2
Easily accomplished	3



Discussion of Mitigation Initiatives



Woolpert, Inc
514 Pettigru Street
Greenville, SC 29601
864.252.3705

Mitigation Strategies

- Community Outreach & Education
- Fuel Management
- Fire Resistant Construction
- Fire Resistant Landscape
- Fire Response
- Training
- Research & Risk Assessment



Community Outreach and Education



Postcards or mailers to *residents and businesses.*



Wildfire safety information at *HOA meetings.*



Wildfire risk and mitigation information to *local Realtors.*



Fire resistant buildings information to *local builders.*

Community Outreach and Education



Support *Fire Department* distribution of wildfire information and residential smoke alarms.



“Touch a Truck” events to educate residents on wildfire mitigation and response.



Incorporate wildfire mitigation into *State Park* education activities.



Identify *local public organizations* to distribute wildfire information.

3/9

Fuel Management



Fuel reduction workdays or chipping and disposal days.



Provide roll-off containers to collect and dispose of *natural debris*.



Economic incentives for the creation of *defensible spaces*.

4/9

Fireproof Structures



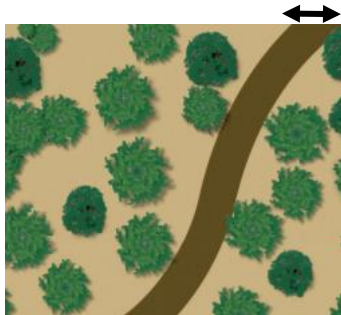
Voluntary installation of
*residential sprinkler
systems.*

5/9

Fireproof Landscape

Firebreak

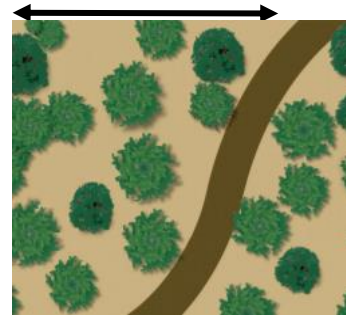
Fuel-managed areas meant to
stop fire propagation.



Create fire
breaks and fuel
breaks.

Fuel break

Fuel-managed areas meant to
hamper fire propagation.



6/9

Improve Fire Response



Utilize
"Nextdoor" app
or similar *social
media*
platform(s).



Identify a
*community
leader* for each
community or
HOA.



Enhance
*emergency
responder
communications.*



Include
*communication
tower owners* in
planning
process.

7/9

Planning & Training

Develop Firewise
and/or Fire Adapted
communities.



FIREWISE USA®
RESIDENTS REDUCING WILDFIRE RISKS

8/9

Research and Risk Assessment



Incorporate Wildfire Overlay Districts into Greenville County *land planning activities*.



Prepare an *assessment of ingress/egress* issues with a prioritized action plan.

- a. Consider “reversible lanes”, alternative routes, emergency access roads.
- b. Identify “Safe Zones” within the planning area.
- c. Identify evacuation routes out and emergency routes into the planning area.

9/9

Project Scoring



Scoring Process

- Proceed by project category
- Determine if mitigation measures within the category should be scored separately
- Review individual each project category for common understanding
- Proceed through each scoring criteria for that project category
- Nominate an initial score
- Hear alternative scores, discuss
- Take a vote, repeat as necessary
 - Assign one half point if not unanimous

See Project Scoring Spreadsheet





Contact Information and Next Steps

Project Contacts:

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Management
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Next Steps:

Present draft plan to County Council

Wildfire Mitigation Initiative Descriptions:

Because many of the mitigation measures are very similar in nature, they have been grouped into larger categories for scoring. Unless the DMC determines there are sufficient differences between individual mitigation measures within a category that warrants segregating them back to individual measures, we will score only the seven (7) overarching categories.

Category #1: Community Outreach and Education

The Wildfire Mitigation Team (WMT) identified a variety of outreach and education activities (listed below). It is believed that many of these activities can be funded through the existing Hazard Mitigation Grant Program (HMGP) Public Outreach Funding.

1. Send postcards or mailers to residents and businesses in the planning area
2. Present at Homeowners Association meetings
3. Provide information to local Realtors regarding wildfire risk and mitigation within the planning area
4. Provide information to local builders regarding fire resistant buildings
5. Support Fire Department door to door “blitz” to distribute wildfire mitigation information and residential smoke alarms
6. Organize a “Touch a Truck” event to educate residents on wildfire mitigation and response
7. Coordinate with Paris Mountain State Park regarding education events (incorporate wildfire mitigation into State Park education activities)
8. Identify potential venues to provide information to such as local churches, schools, and other public organizations

It is recommended that these activities be organized into a comprehensive community outreach and education program.

Category #2: Fuel management

Proper fuel management is significant in reducing the likelihood of a wildfire starting. It is recommended that Greenville County support community fuel reduction efforts by:

1. Providing roll-off containers / “fuel reduction trailers” to collect and dispose of natural debris
2. Organizing fuel reduction workdays / chipping and disposal days
3. Providing economic incentives for creation of “defensible spaces”

Category #3: Fireproof Structures

The County should encourage the use and installation of fireproof structures to help decrease fire risk and damage, since those structures help to slow and prevent the spread of fire.

1. While installation of residential sprinkler systems is not a requirement of the current building codes, Greenville County should support voluntary installation of residential sprinkler systems.
2. Provide information / incentives to builders and homeowners regarding fireproof construction techniques

Category #4: Fireproof the landscape

The County will fireproof the landscape by creating fire breaks and fuel breaks to slow and stop the spread of fires.

These fire breaks and fuel breaks may include methods like thinning vegetation and incorporating Firewise landscapes.

1. Create Fire Breaks and Fuel Breaks
 - a. Naturaland Trust
 - b. Paris Mountain State Park
 - c. Individual landowners

Category #5: Improve fire response

To improve fire response, the County will enhance communications within the planning area. Enhanced communication can speed up the response time to fires which is a critical component to reducing and preventing fire risk. Greenville County's fire response encompasses the emergency communications in place to respond to fires.

1. Enhance communications for stakeholders within the planning area
 - a. Homeowners and businesses
 - i. Utilize "Nextdoor" app or similar social media platform(s)
 - ii. Identify a "Fireplug" (community leader) for each community or HOA
 - b. Enhance emergency responder communications
 - c. Include communication tower owners in planning process

Category #6: Training

It is important for community members to be educated and trained on fire risks and procedures to follow when a fire starts in the area. Firewise and Fire Adapted communities not only prepare plans for fire prevention and damage reduction, but also increase awareness and understanding of wildfire mitigation.

1. Develop Firewise and / or Fire Adapted communities

Category #7: Research and risk assessment

Research and risk assessments should be performed periodically to ensure that fire response plans are developed from accurate and up-to-date information. The planning area's existing infrastructure should be evaluated to determine possible improvements.

1. *Incorporate "Wildfire Overlay Districts" into County land planning activities* (See [Land use planning can reduce wildfire risk to homes and communities - Headwaters Economics](#))
2. Prepare an assessment of ingress / egress issues with a prioritized action plan
 - a. Consider "reversible lanes", alternative routes, emergency access roads
 - b. Identify "Safe Zones" within the planning area
 - c. Identify evacuation routes out and emergency routes in

Proposed Mitigation Activities	Strategy Effectiveness	Population Benefited	Time to Implement	Time to Impact	Cost to County	Cost to Others	Funding Source	Community Support	Project Feasibility	Total Score
Category 1: Community Outreach and Education										
1 Post cards	1	1	3	1	3	3	3	3	3	21
2 HOA meetings	1	1	3	1	3	3	3	3	3	21
3 Realtor info	2	2	3	1	3	3	3	3	3	23
4 Builder info	2	2	3	1	3	3	3	3	3	23
5 Door blitz	1	1	3	1	3	3	3	3	3	21
6 Touch a Truck	1	1	2	1	3	3	3	3	3	20
7 Paris Mtn. State Park Education	2	2	2	1	3	2	3	3	3	21
8 Venue info centers	1	1	2	1	3	3	3	3	3	20
Category 2: Fuel Management										
1 Roll-off containers	1	0.5	2	3	2	3	3	3	3	20.5
2 Fuel reduction workdays (Chip & Disposal)	1	0.5	2	3	2	3	2	3	3	19.5
3 Defensible space incentives	1	0.5	1	2	2	3	3	3	2	17.5
Category 3: Fireproof Structures										
Information / Incentives regarding Fireproof Construction Techniques	1	0.5	2	2	3	1.5	3	3	2	18.0
Residential sprinkler incentives										0
Category 4: Fireproof the Landscape										
1 Create fire breaks and fuel breaks	1	3	1	3	0.5	0.5	1	2	1	13
Category 5: Improve Fire Response										
1a Nextdoor app	1	3	1	3	0.5	0.5	1	2	1	13
1b Fireplug	1	3	1	3	0.5	0.5	1	2	1	13
2 Emergency Response Communications	2	1	1	3	1	1	1	3	1	14
3 Engage Communication Tower Operators	1	3	3	1	3	3	1	1	1.5	17.5
Continued on next page...										

Proposed Mitigation Activities (Cont.)	Strategy Effectiveness	Population Benefited	Time to Implement	Time to Impact	Cost to County	Cost to Others	Funding Source	Community Support	Project Feasibility	Total Score
Category 6: Training										
1 Firewise / Fire Adapted communities	1	0.5	1	1	3	3	2	3	1.5	16
Category 7: Research and Risk Assessment										
1 Wildfire Overlay Districts	1	1	1	1	2	2	3	1	2	14
2 Ingress / Egress Assessment	1	1	1	1	2	3	2	3	2	16
3 Prepare Wildlife Assessment	1	1	1	1	2	3	2	3	2	16

Appendix B

SouthWrap Analysis courtesy of SCFC

Paris Mountain

Greenville, Greenville County, South Carolina



Community Wildfire Risk Assessment

Total Assessed Rating

170 - High

Suppression Rating

High Hazard

Surrounding Environment Rating

Extreme Hazard

Structures Rating

High Hazard

Fire Protection District

Piedmont Park Fire District

Community Information

Latitude	34° 55' 53"
Longitude	-82° 23' 51"
Dwelling Units	500
Size	10,380.04 acres
Residential Type	Fixed

Assessed By: Chris Revels

Assessment Date: 07-08-2020



Paris Mountain

Greenville, Greenville County, South Carolina



SUPPRESSION ASSESSMENT

Ingress and Egress

→ **2 or more roads in and out**

One road in and out (entrance and exit are the same)

Recommended Mitigation Strategies

- ☐ Keep community ingress/egress open and maintained (cleared of vegetation)
- ☐ Develop community plan for evacuation routes, safe zones, staging areas
- ☐ If community is gated, develop evacuation plan and ensure emergency responder access
- ☐ Ensure residents know their closest exit in case of emergency

Road Width

Road width is > 24 feet

Road width is > 20 feet and < 24 feet

→ **Road width is < 20 feet**

Recommended Mitigation Strategies

- ☐ Keep shoulders of road clear for emergency vehicle use whenever possible
- ☐ Consider providing pull-offs every 100 yards for emergency vehicle use
- ☐ Coordinate with fire department to ensure they are aware of road width limitations
- ☐ Be aware that road width could limit emergency vehicles to brush trucks only

Road Accessibility

→ **Surfaced road**

Non-surfaced road, grade less than or equal to 5%

Non-surfaced road, grade greater than 5%

Non-maintained dirt road

Recommended Mitigation Strategies

- ☐ Ensure that road maintenance plan is in place

Paris Mountain

Greenville, Greenville County, South Carolina



Secondary Road Terminus

Road ends in a cul-de-sac, diameter > 100 feet

Road ends in a cul-de-sac, diameter < 100 feet

Dead end road <200 feet long

→ **Dead end road >200 feet long**

Recommended Mitigation Strategies

- ☐ Ensure emergency responders are aware of dead-end roads
- ☐ If dead-end roads are narrow, restrict access during an emergency

Street Signs

→ **Present, lettering 4 inches high, non-flammable and reflective**

Present but wooden, non-reflective, or lettering less than 4"

Not present

Recommended Mitigation Strategies

- ☐ Keep street signs visible and clear of vegetation and fine fuels

Driveways

Average driveway allows access to homes

→ **Average driveway restricts access to homes**

Recommended Mitigation Strategies

- ☐ Improve driveway accessibility where possible
- ☐ Ensure emergency responders are aware of driveway restrictions

Water Supply

→ **Has pressurized hydrants**

Dry Hydrant(s) / Draft available within the community

Other accessible sources within community (pond, lake, etc.)

Water sources located within 4 miles of community (incl heli dip sites)

No water sources in or within 4 miles of the community

Recommended Mitigation Strategies

- ☐ Ensure hydrants and water sources are marked, accessible and properly maintained
- ☐ Keep hydrants clear of obstructions and vegetation

Paris Mountain

Greenville, Greenville County, South Carolina



Hazardous Features

No notable hazardous features present to hinder fire suppression

→ **Fire suppression hindered by hazardous features**

Recommended Mitigation Strategies

- ☐ Be aware of local hazardous features and plan appropriately in the event of a wildfire approaching your area
- ☐ Ensure emergency responders are aware of local hazardous features that can hinder fire suppression efforts

Local Response Resources

→ **5 miles or less from fire department**

More than 5 miles from fire department

Recommended Mitigation Strategies

- ☐ N/A

Homeowners Association

HOA has organizational structure for sustained fire prevention and mitigation

→ **HOA lacks organizational structure for sustained fire prevention and mitigation**

Recommended Mitigation Strategies

- ☐ Work with community to become more proactive towards protecting your life and property against wildfires

SURROUNDING ENVIRONMENT ASSESSMENT

Predominant Vegetation

Light
Medium
→ **Heavy**
Extreme / Slash

Recommended Mitigation Strategies

- ☐ Consider removal of ladder fuels that allow fire to climb from lower to higher vegetation
- ☐ Trim tree canopies regularly to keep their branches a minimum of 10' from structures and other trees
- ☐ Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees
- ☐ Prune trees 6'10 feet from the ground

Defensible Space

> 100 ft. of vegetation treatment from structure(s)
71 to 100 ft. of vegetation treatment from structure(s)
30 to 70 ft. of vegetation treatment from structure(s)
→ **< 30 ft. of vegetation treatment from structure(s)**

Recommended Mitigation Strategies

- ☐ Be aware of the risks from falling embers in relation to nearby fuels and defensible space
- ☐ Mow lawns regularly
- ☐ Water grass, plants, trees and mulch regularly
- ☐ Create a spacing of 30 feet between tree crowns
- ☐ Create a 'fire-free' area within 5 feet of your home, using non-flammable landscaping materials
- ☐ Remove dead vegetation from under the deck and within 10 feet of the house
- ☐ Consider xeriscaping if you are affected by water restrictions
- ☐ Plant a mixture of deciduous trees (e.g. oak and maple) and coniferous trees (e.g. pine)
- ☐ Create fuel breaks like driveways and gravel walkways
- ☐ Remove smaller conifers that are growing between taller trees
- ☐ Remove heavy accumulations of woody debris
- ☐ Reduce the density of tall trees so canopies do not touch

Structure to Structure Ignition

No Possible Structure to Structure Ignition
→ **Possible Structure to Structure Ignition**

Recommended Mitigation Strategies

- ☐ Work with neighbors to remove/prune vegetation between houses to mitigate structure-to-structure ignition risk
- ☐ Consider use of sprinkler systems to keep vegetation moisture levels up
- ☐ Replace flammable roofs, siding, soffits, etc. with nonflammable when possible

Paris Mountain

Greenville, Greenville County, South Carolina



Slope

Slope 0% - 5%

Slope 6 % - 10%

→ **Slope 11% - 30%**

Slope > 30%

Recommended Mitigation Strategies

- ☐ Increase defensible space in areas with steeper slopes

History of Wildfire

→ **No recent History of High Fire Occurrence**

Area with History of High Fire Occurrence

Recommended Mitigation Strategies

- ☐ N/A

Topographical Features

No topographical features that adversely affect wildland fire behavior

→ **Topographical features that adversely affect wildland fire behavior**

Recommended Mitigation Strategies

- ☐ Maintain situational awareness of fire danger in your area, as local topographical features can adversely affect wildland behavior

Adjacency to Wildlands

Not adjacent to wildlands with accumulated fuels and no program for fuel management

→ **Adjacent to wildlands with accumulated fuels and no program for fuel management**

Recommended Mitigation Strategies

- ☐ When possible, install firebreaks and reduce fuel loads around community boundary to reduce risk from adjacent wildlands

Severe Wind Exposure

→ **Not in an area with regular exposure to severe winds**

Regularly exposed to severe winds that adversely affect fire behavior

Recommended Mitigation Strategies

- ☐ N/A

Paris Mountain

Greenville, Greenville County, South Carolina



Undeveloped Lots with Restricted Access and/or Not Maintained

- Fewer than 10% of lots are undeveloped
- **10% to 50% of lots are undeveloped**
- 51% to 75% of lots are undeveloped
- Greater than 75% of lots are undeveloped

Recommended Mitigation Strategies

- ☐ Provide FIREWISE construction guidelines to developers / owners
- ☐ Consider developing covenant restrictions, if applicable

STRUCTURE ASSESSMENT

Roofing Materials

- **> 75% of homes have metal, tile or class A asphalt or fiberglass shingles**
 50 to 75% of homes have metal, tile or class A asphalt or fiberglass shingles
 < 50% of homes have metal, tile or class A asphalt or fiberglass shingles

Recommended Mitigation Strategies

- ☐ Use fire-resistant roofing material such as metal, tile or Class A shingles
- ☐ Inspect for and address gaps in roofing that can expose roof decking or supports
- ☐ Place angle flashing over openings between the roof decking and fascia board

Debris on Roof

- No
 → Yes

Recommended Mitigation Strategies

- ☐ Clear branch, leaf-litter and other debris from roof regularly
- ☐ Prune tree limbs away from roof

Ventilation and Soffits

- > 75% of homes have non-combustible ventilation soffits with mesh or screening
 → **50-74% of homes have non-combustible ventilation soffits with mesh or screening**
 < 50% of homes have non-combustible ventilation soffits with mesh or screening

Recommended Mitigation Strategies

- ☐ Clean vents to keep them free of debris, allowing them to keep embers out while allowing air flow for ventilation
- ☐ Enclose or box-in eaves with non-combustible materials such as metal, cement board or stucco
- ☐ Install a 1/8 inch metal screen behind roof vents

Siding

- > 75% of homes have non-combustible siding
 → **50-74% of homes have non-combustible siding**
 < 50% of homes have non-combustible siding

Recommended Mitigation Strategies

- ☐ Keep landscaping materials and vegetation away from combustible siding
- ☐ Increase defensible space from combustible siding
- ☐ Replace with noncombustible siding when possible

Paris Mountain

Greenville, Greenville County, South Carolina



Underskirting

> 75% of homes have skirting underneath raised floors/decks

→ **50-74% of homes have skirting underneath**

< 50% of homes have skirting underneath

Recommended Mitigation Strategies

- ☐ Remove combustible vegetation and leaf litter
- ☐ Spread gravel or other non-combustible material under the deck
- ☐ Screen in the bottom of the deck with metal 1/8-inch screening
- ☐ Separate wooden fences from the house with a stone or metal barrier

Wooden Attachments

> 75% of homes have NO Wooden Attachments

50-74% of homes have NO Wooden Attachments

→ **< 50% of homes have NO Wooden Attachments**

Recommended Mitigation Strategies

- ☐ Maintain debris-free decks (e.g. remove ignitable furniture, planters and covering propane grills, especially during high fire danger periods)
- ☐ Consider disconnecting fences from structures, or replacing materials directly attached to structures with fire resistant materials
- ☐ Be aware that wooden attachments can act as a fuse to the structure

Gutters

Noncombustible

→ **Combustible with leaf litter present**

Recommended Mitigation Strategies

- ☐ Keep gutters clear of fine fuels and debris

Building Setback

Not applicable

→ **Greater than or equal to 30 feet from slope**

Less than 30 feet from slope

Recommended Mitigation Strategies

- ☐ Review suggested defensible space and vegetation management as pertains to building setback

Paris Mountain

Greenville, Greenville County, South Carolina



Windows

→ **Not known**

Multi-paned

Single-paned

Recommended Mitigation Strategies

- ☐ Use metal framing or aluminum coverings for wood or vinyl
- ☐ Use a fiberglass or metal screen
- ☐ Use drapes and shutters that are fire resistant to help reduce the likelihood of fire spread

Gas Utilities

→ **Underground/clearly marked or Not applicable**

Above ground/clearly marked with a 30 foot cleared perimeter

Underground/not marked

Above ground/not marked

Recommended Mitigation Strategies

- ☐ Keep vegetation pruned to a minimal level near gas utilities
- ☐ When possible, place propane tanks 20' away from home and structures

Electric Utilities

Underground/clearly marked

→ **Overhead with a 20 foot wide maintained right of way**

Underground/not marked

Overhead with right of way not maintained

Recommended Mitigation Strategies

- ☐ Keep vegetation pruned and mowed around electric cabinets
- ☐ Place non-flammable mulch (rock, stone) around base of electrical cabinets
- ☐ Plant less flammable bushes and shrubs around electrical cabinets

COMMENTS

The Altamont Road/Paris Mountain Community is within the Paris Mountain Monadnock area. Slopes are steep and with heavy fuels that are not under any time of fuels management program. Paris Mountain State Park makes up a large percentage of the acreage within this assessment. The park has many developed areas including camps and other historic structures constructed by the CCC.

SOUTHERN WILDFIRE RISK ASSESSMENT SUMMARY REPORT



Paris Mountain – Altamont Road



Report was generated using
www.southernwildfirerisk.com

Report version: 4.0

Report generated: 1/28/2021

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Users should also note that property boundaries included in any product do not represent an on-the-ground survey suitable for legal, engineering, or surveying purposes. They represent only the approximate relative locations.

Introduction

Welcome to the Southern Wildfire Risk Assessment Summary Report.

This tool allows users of the Professional Viewer application of the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP) to define a specific project area and summarize wildfire related information for this area. A detailed risk summary report is generated using a set of predefined map products developed by the Southern Wildfire Risk Assessment project which have been summarized explicitly for the user defined project area. The report is generated in MS WORD format.

The report has been designed so that information from the report can easily be copied and pasted into other specific plans, reports, or documents depending on user needs. Examples include, but are not limited to, Community Wildfire Protection Plans, Local Fire Plans, Fuels Mitigation Plans, Hazard Mitigation Plans, Homeowner Association Risk Assessments, and Forest Management or Stewardship Plans. Formats and standards for these types of reports vary from state to state across the South, and accordingly SouthWRAP provides the SWRA information in a generic risk report format to facilitate use in any type of external document. The SouthWRAP Risk Summary Report also stands alone as a viable depiction of current wildfire risk conditions for the user defined project area.

SouthWRAP provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in the South.

Results of the assessment can be used to help prioritize areas in the state where mitigation treatments, community interaction and education, or tactical analyses might be necessary to reduce risk from wildfires.



The SouthWRAP products included in this report are designed to provide the information needed to support the following key priorities:

- Identify areas that are most prone to wildfire
- Identify areas that may require additional tactical planning, specifically related to mitigation projects and Community Wildfire Protection Planning
- Provide the information necessary to justify resource, budget and funding requests
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries
- Define wildland communities and identify the risk to those communities
- Increase communication and outreach with local residents and the public to create awareness and address community priorities and needs
- Plan for response and suppression resource needs
- Plan and prioritize hazardous fuel treatment programs

To learn more about the SWRA project or to create a custom summary report, go to www.southernwildfirerisk.com.

Products

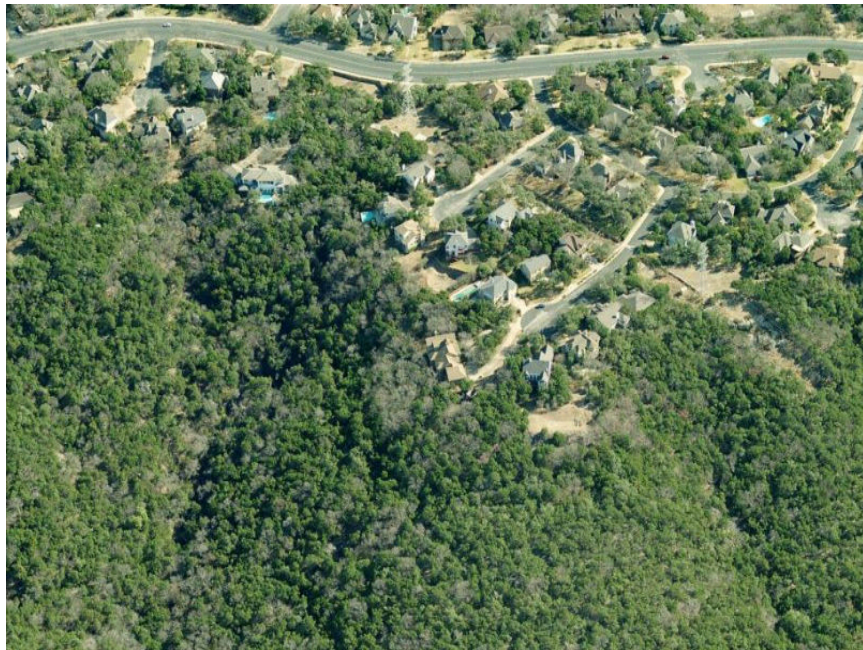
Each product in this report is accompanied by a general description, table, chart and/or map. A list of available SouthWRAP products in this report is provided in the following table.

SouthWRAP Product	Description
Wildland Urban Interface (WUI)	Depicts where humans and their structures meet or intermix with wildland fuel
WUI Risk Index	Represents a rating of the potential impact of a wildfire on people and their homes
Community Protection Zones	Represents those areas designated as primary and secondary priorities for community protection planning
Burn Probability	Probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts
Characteristic Rate of Spread	Represents the speed with which a fire moves in a horizontal direction across the landscape
Characteristic Flame Length	Represents the distance between the tip and base of the flame
Characteristic Fire Intensity Scale	Quantifies the potential fire intensity for an area by orders of magnitude
Fire Type - Extreme	Represents the potential fire type (surface or canopy) under extreme percentile weather conditions
Surface Fuels	Contains the parameters needed to compute surface fire behavior characteristics
Dozer Operability Rating	Level of difficulty to operate a dozer in an area based on limitations associated with slope and vegetation type

Wildland Urban Interface

Description

The South is one of the fastest growing regions in the nation, with an estimated population growth of 1.5 million people per year. The South also consistently has the highest number of wildfires per year. Population growth is pushing housing developments further into natural and forested areas where most of these wildfires occur. This situation puts many lives and communities at risk each year.



In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI).

The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the **Paris Mountain - Altamont Road** project area, it is estimated that **7,707** people or **97.6 % percent** of the total project area population (**7,896**) live within the WUI.



The Wildland Urban Interface (WUI) layer reflects housing density depicting where humans and their structures meet or intermix with wildland fuels.

WUI housing density is categorized based on the standard Federal Register and U.S. Forest Service SILVIS data set categories, long considered a de facto standard for depicting WUI. However, in the SWRA WUI data the number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements for fire protection planning activities. While units of the actual data set are in *houses per sq. km.*, the data is presented as the *number of houses per acre* to aid with interpretation and use by fire planners in the South.

In the past, conventional wildland urban interface data sets, such as USFS SILVIS, have been used to reflect these concerns. However, USFS SILVIS and other existing data sources do not provide the level of detail for defining population living in the wildland as needed by Southern state WUI specialists and local fire protection agencies.

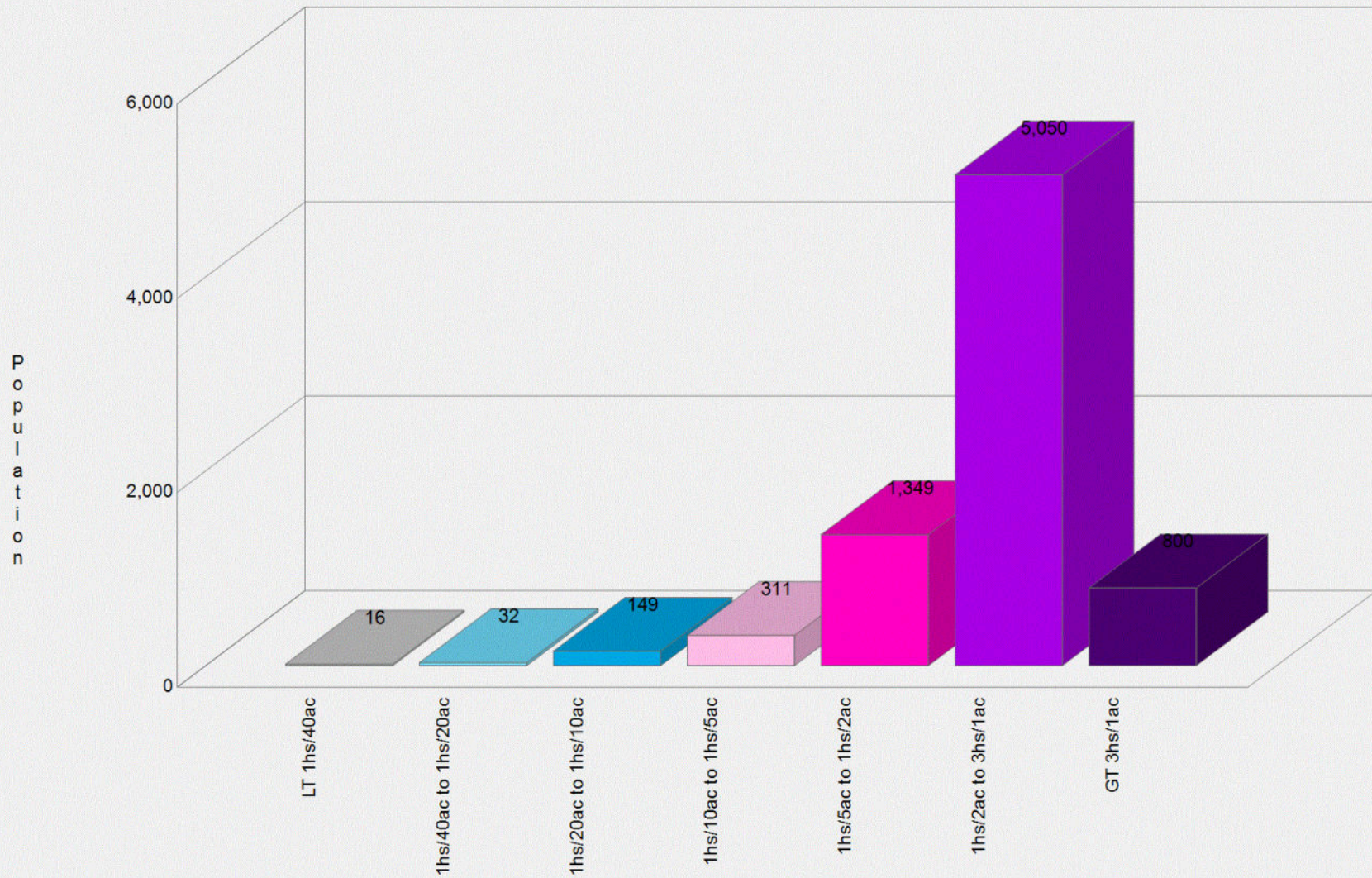
The new SWRA WUI 2012 dataset is derived using advanced modeling techniques based on the SWRA Where People Live (housing density) dataset and 2012 LandScan population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The primary difference between the WPL and WUI is that populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by a wildfire. Simply put, the SWRA WUI is the SWRA WPL data with the urban core areas removed.

Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers. The following table shows the total population for each WUI area within the project area.

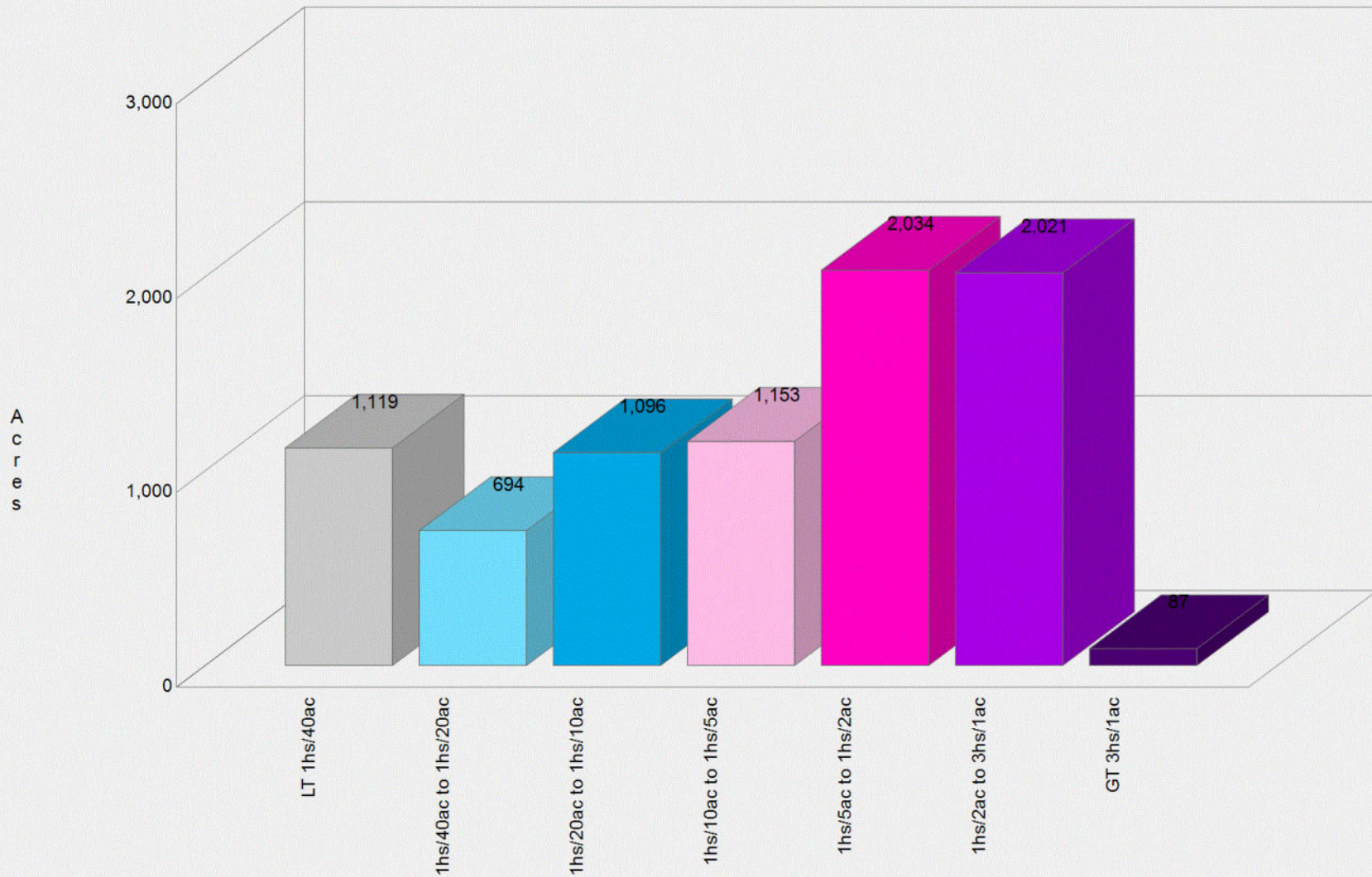
WUI – Population and Acres

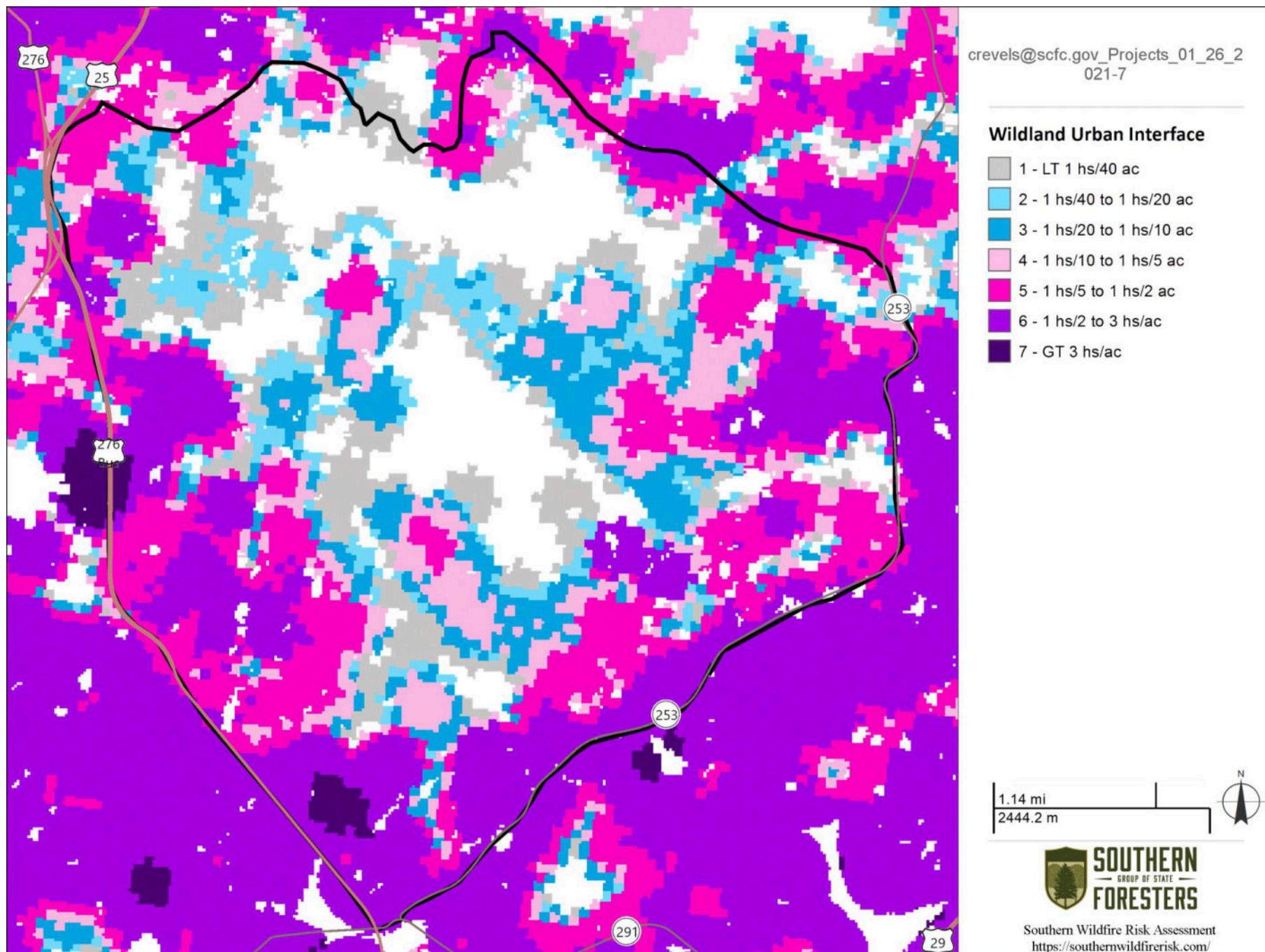
	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	16	0.2 %	1,119	13.6 %
	1hs/40ac to 1hs/20ac	32	0.4 %	694	8.5 %
	1hs/20ac to 1hs/10ac	149	1.9 %	1,096	13.4 %
	1hs/10ac to 1hs/5ac	311	4.0 %	1,153	14.1 %
	1hs/5ac to 1hs/2ac	1,349	17.5 %	2,034	24.8 %
	1hs/2ac to 3hs/1ac	5,050	65.5 %	2,021	24.6 %
	GT 3hs/1ac	800	10.4 %	87	1.1 %
	Total	7,707	100.0 %	8,204	100.0 %

Wildland Urban Interface



Wildland Urban Interface





WUI Risk Index

Description

The Wildland Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes.

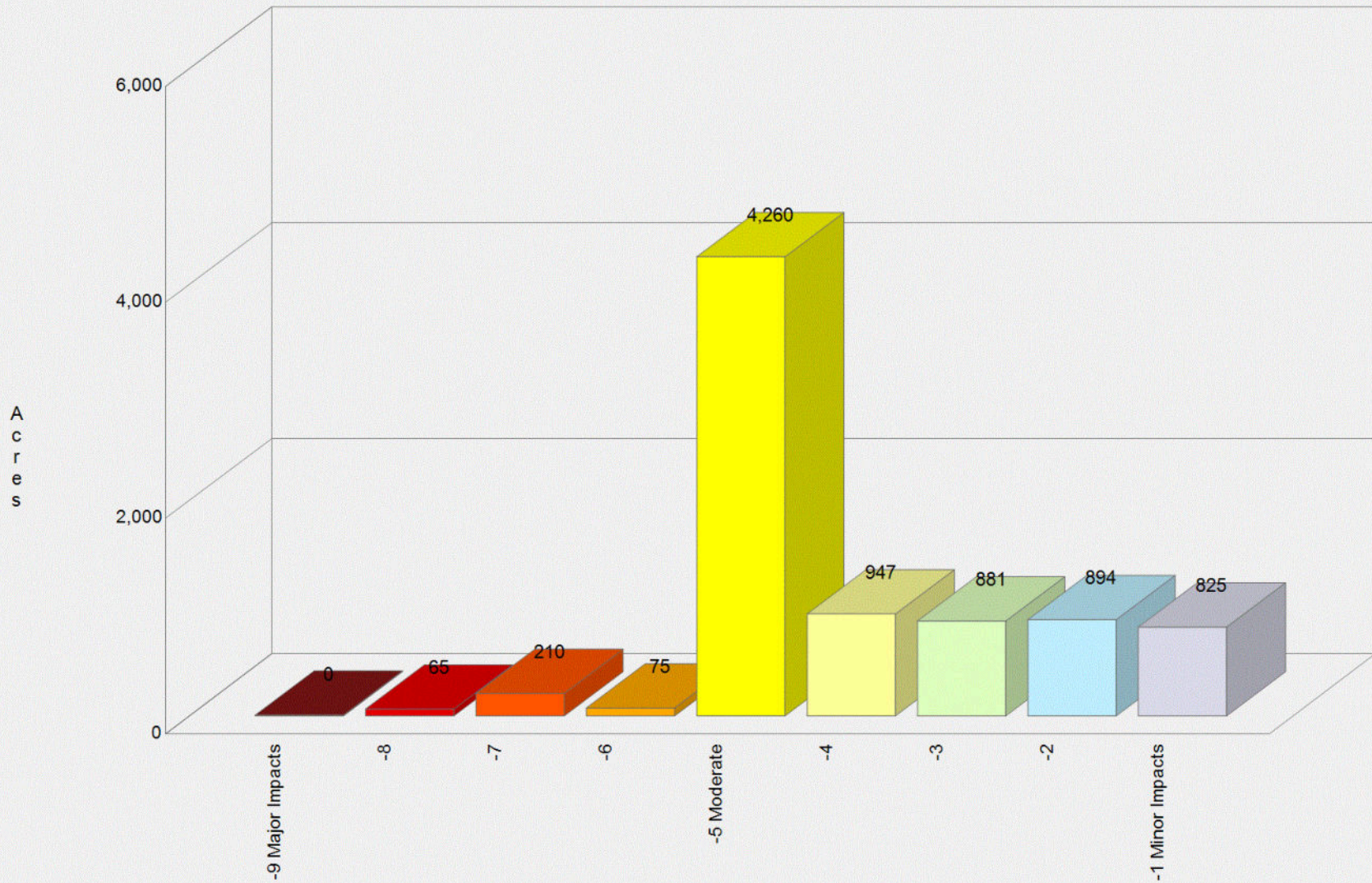
The WUI Risk Rating is derived using a Response Function modeling approach. Response functions are a method of assigning a net change in the value to a *resource* or *asset* based on susceptibility to fire at different intensity levels, such as flame length. The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9 while areas with low housing density and low flame lengths are rated -1.

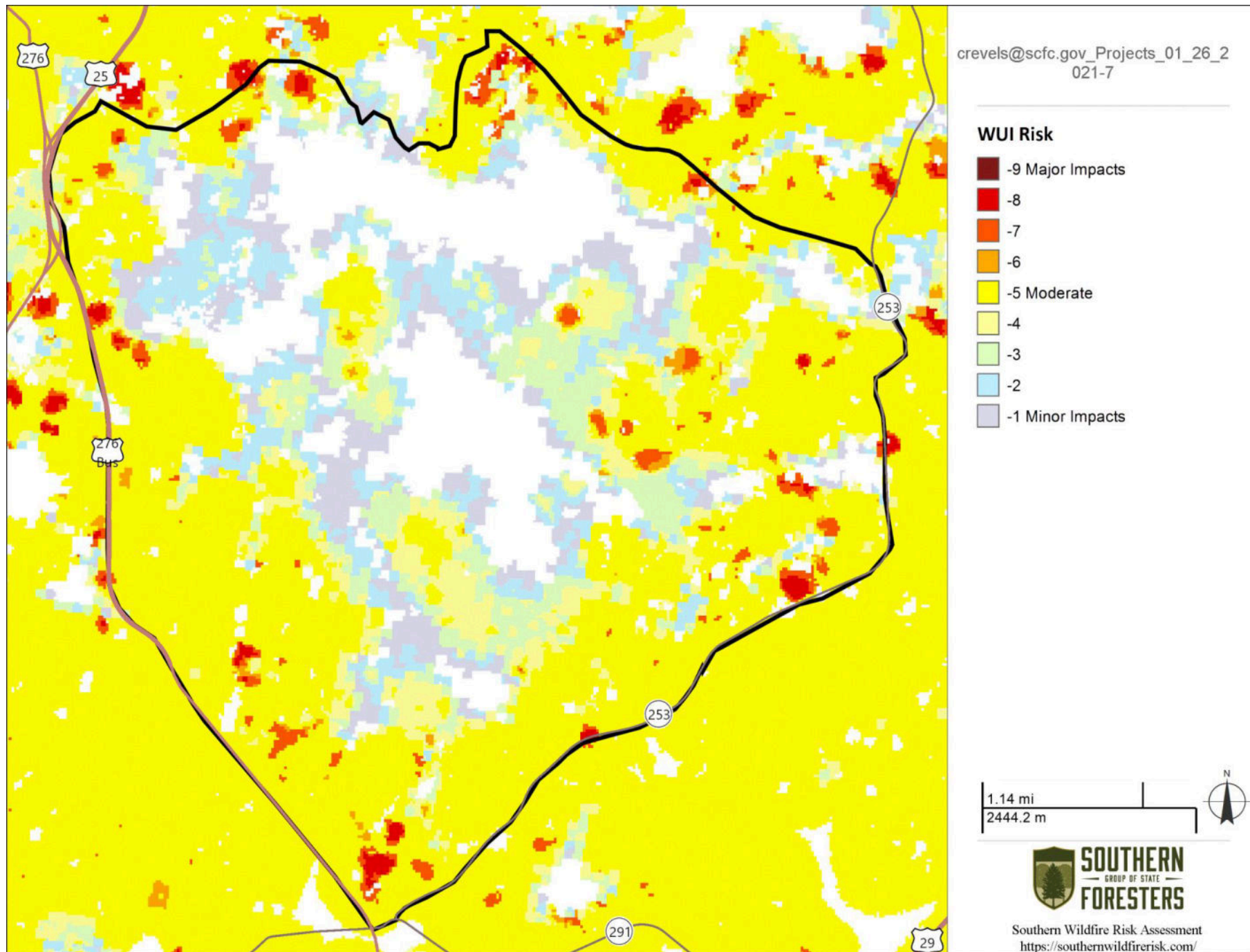
To calculate the WUI Risk Rating, the WUI housing density data was combined with Flame Length data and response functions were defined to represent potential impacts. The response functions were defined by a team of experts based on values defined by the SWRA Update Project technical team. By combining flame length with the WUI housing density data, you can determine where the greatest potential impact to homes and people is likely to occur.

Fire intensity data is modeled to incorporate penetration into urban fringe areas so that outputs better reflect real world conditions for fire spread and impact in fringe urban interface areas. With this enhancement, houses in urban areas adjacent to wildland fuels are incorporated into the WUI risk modeling. All areas in the South have the WUI Risk Index calculated consistently, which allows for comparison and ordination of areas across the entire region. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers.

	Class	Acres	Percent
	-9 Major Impacts	0	0.0 %
	-8	65	0.8 %
	-7	210	2.6 %
	-6	75	0.9 %
	-5 Moderate	4,260	52.2 %
	-4	947	11.6 %
	-3	881	10.8 %
	-2	894	11.0 %
	-1 Minor Impacts	825	10.1 %
	Total	8,157	100.0 %

WUI Response Index





Community Protection Zones

Description

Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.

General consensus among fire planners is that for fuel mitigation treatments to be effective in reducing wildfire hazard, they must be conducted within a close distance of a community. In the South, the WUI housing density has been used to reflect populated areas in place of community boundaries (Primary CPZ). This ensures that CPZs reflect where people are living in the wildland, not jurisdictional boundaries.

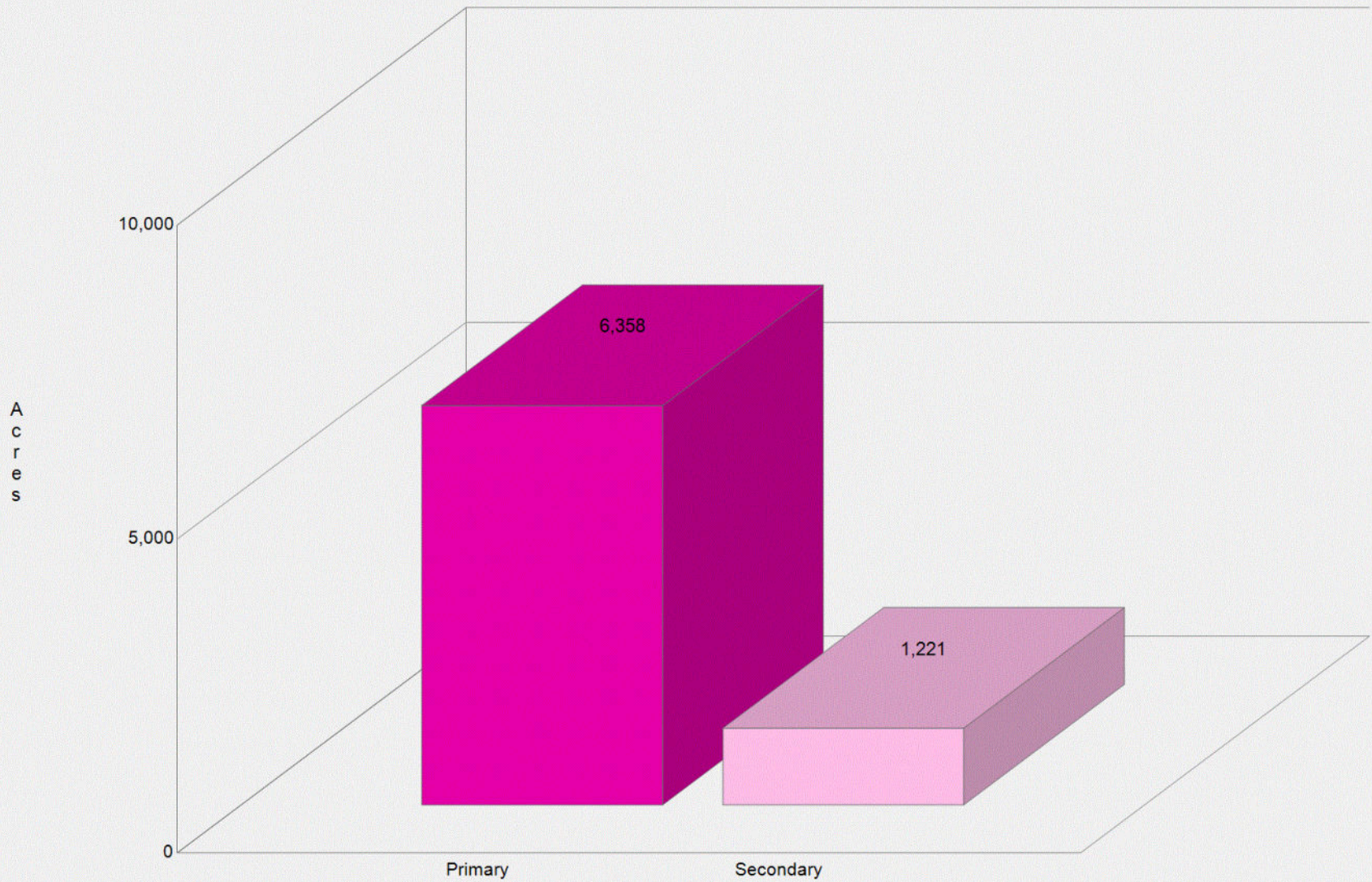
Secondary CPZs represent a variable width buffer around populated areas that are within a 2-hour fire spread distance. Accordingly, CPZs will extend farther in areas where rates of spread are greater and less in areas where minimal rate of spread potential exists. Secondary CPZ boundaries inherently incorporate fire behavior conditions.

Primary CPZs reflect areas with a predefined housing density, such as greater than 1 house per 20 acres. Secondary CPZs are the areas around Primary CPZs within a 2 hour fire spread distance.

All areas in the South have the CPZs calculated consistently, which allows for comparison and ordination of areas across the entire region. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers.

	Class	Acres	Percent
	Primary	6,358	83.9 %
	Secondary	1,221	16.1 %
	Total	7,579	100.0 %

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Community Protection Zones





Burn Probability

Description

The Burn Probability (BP) layer depicts the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts.

Describe in more detail, it is the tendency of any given pixel to burn, given the static landscape conditions depicted by the LANDFIRE Refresh 2008 dataset (as resampled by FPA), contemporary weather and ignition patterns, as well as contemporary fire management policies (entailing considerable fire prevention and suppression efforts).

The BP data does not, and is not intended to, depict fire-return intervals of any vintage, nor do they indicate likely fire footprints or routes of travel. Nothing about the expected shape or size of any actual fire incident can be interpreted from the burn probabilities. Instead, the BP data, in conjunction with the Fire Program Analysts FIL layers, are intended to support an actuarial approach to quantitative wildfire risk analysis (e.g., see Thompson et al. 2011).

Values in the Burn Probability (BP) data layer indicate, for each pixel, the number of times that cell was burned by an FSim-modeled fire, divided by the total number of annual weather scenarios simulated. Burn probability raster data was generated using the large fire simulator - FSim - developed for use in the Fire Program Analysis (FPA) project. FSim uses historical weather data and current landcover data for discrete geographical areas (Fire Planning Units - FPU) and simulates fires in these FPU. Using these simulated fires, an overall burn probability and marginal burn probabilities at four fire intensities (flame lengths) are returned by FSim for each 270m pixel in the FPU.

The fire growth simulations, when run repeatedly with different ignition locations and weather streams, generate burn probabilities and fire behavior distributions at each landscape location (i.e., cell or pixel). Results are objectively evaluated through comparison with historical fire patterns and statistics, including the mean annual burn probability and fire size distribution, for each FPU. This evaluation is part of the FSim calibration process for each FPU, whereby simulation inputs are adjusted until the slopes of the historical and modeled fire size distributions are similar and the modeled average burn probability falls within an acceptable range of the historical reference value (i.e., the 95% confidence interval for the mean).

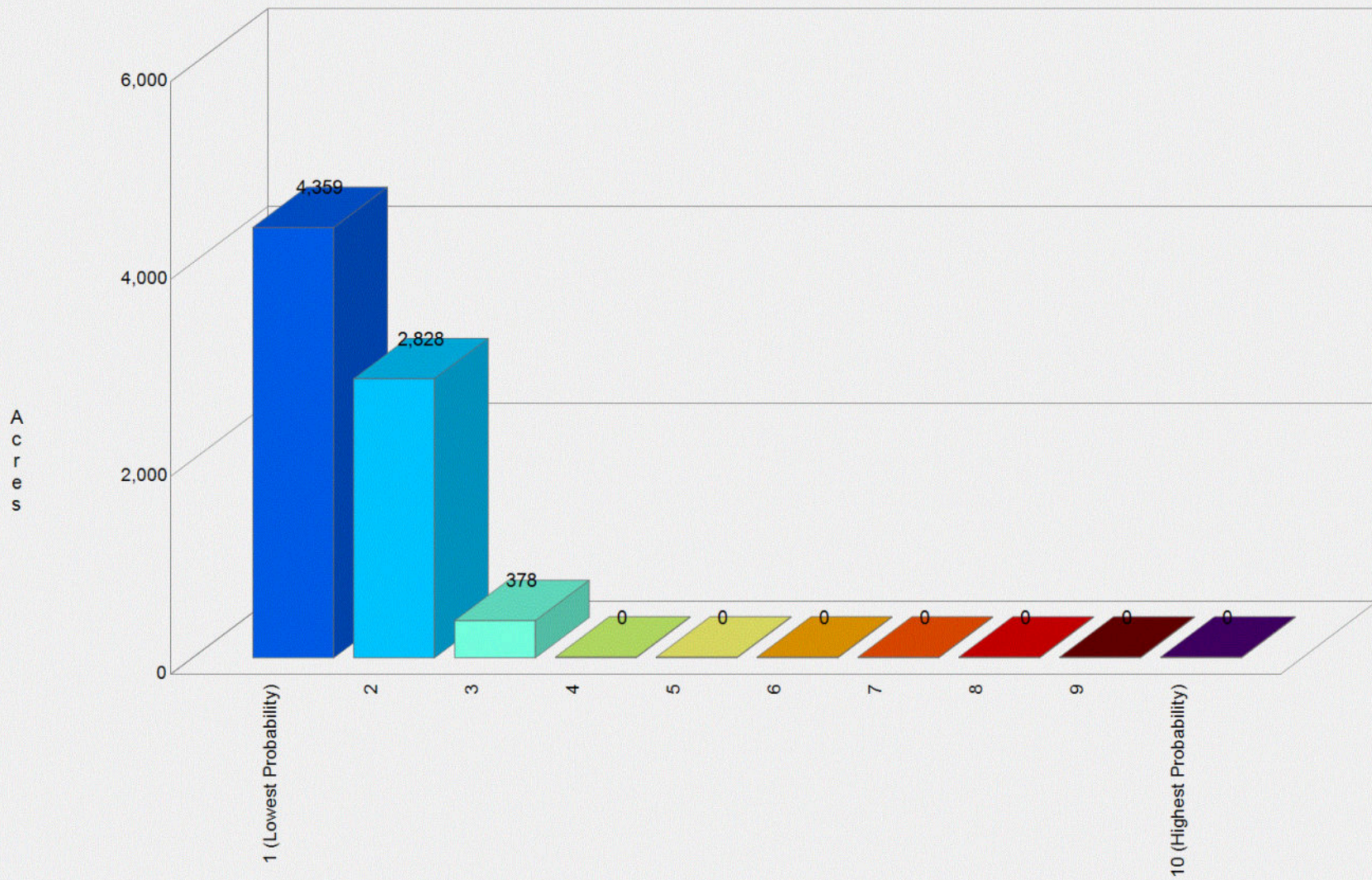
Please refer to the metadata available for this dataset for a detailed description of the data processing methods, assumptions and references that pertain to the development of this data. This information is available from the USFS Missoula Fire Sciences Laboratory.

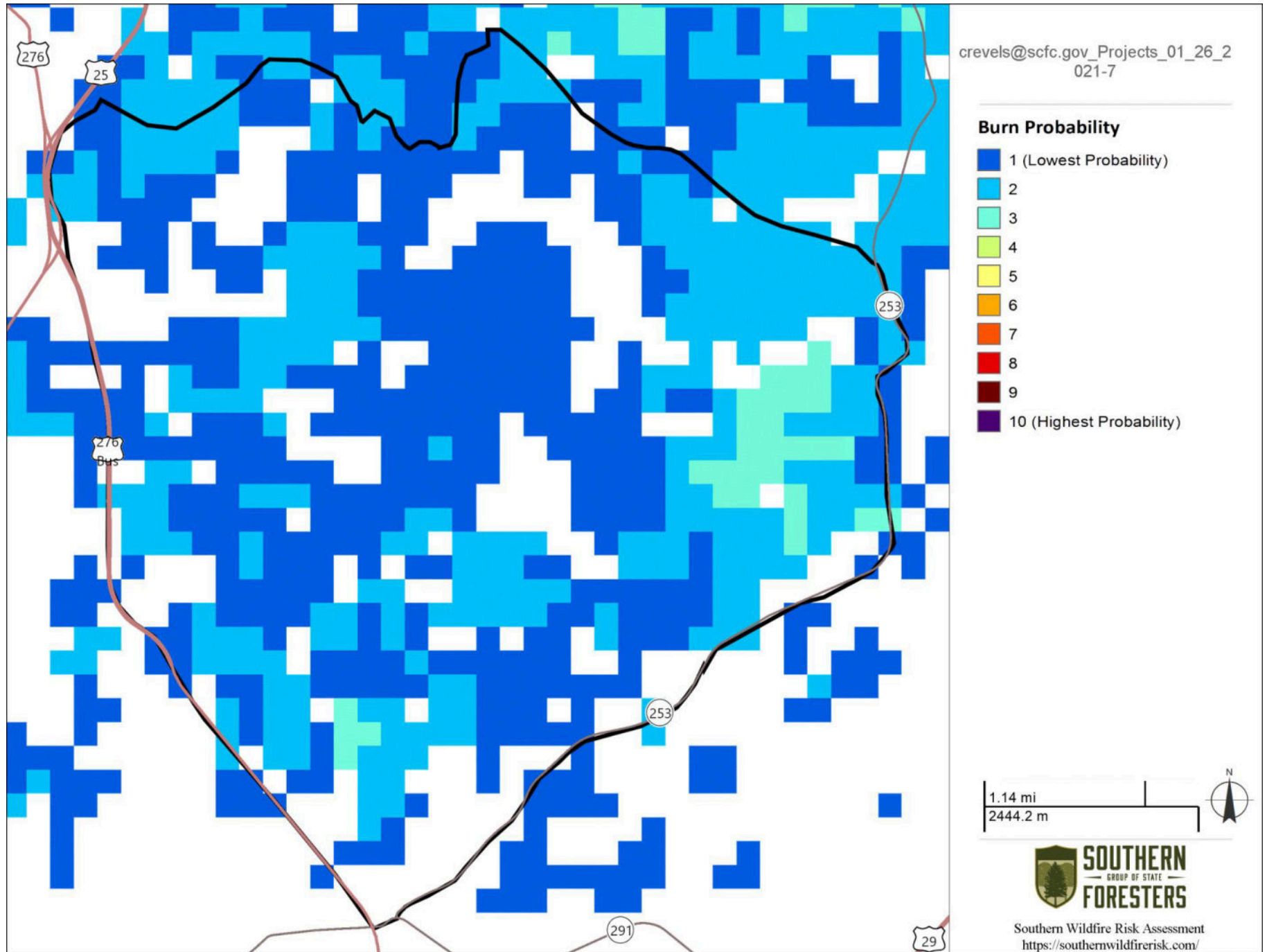
Please refer to the web site link in the report References to obtain more detailed descriptions of FPA and the related data products such as Burn Probability.

Burn Probability replaces the Wildland Fire Susceptibility Index (WFSI) layer developed in the original SWRA project completed in 2005.

	Class	Acres	Percent
	1	4,359	57.6 %
	2	2,828	37.4 %
	3	378	5.0 %
	4	0	0.0 %
	5	0	0.0 %
	6	0	0.0 %
	7	0	0.0 %
	8	0	0.0 %
	9	0	0.0 %
	10	0	0.0 %
	Total	7,565	100.0 %

Burn Probability





Fire Behavior

Description

Fire behavior is the manner in which a fire reacts to the following environmental influences:

1. **Fuels**
2. **Weather**
3. **Topography**



Fire behavior characteristics are attributes of wildland fire that pertain to its spread, intensity, and growth. Fire behavior characteristics utilized in the Southern Wildfire Risk Assessment (SWRA) include fire type, rate of spread, flame length and fire intensity scale. These metrics are used to determine the potential fire behavior under different weather scenarios. Areas that exhibit moderate to high fire behavior potential can be identified for mitigation treatments, especially if these areas are in close proximity to homes, business, or other assets.

Fuels

The SWRA includes composition and characteristics for both surface fuels and canopy fuels. Significant increases in fire behavior will be captured if the fire has the potential to transition from a surface fire to a canopy fire.

Fuel datasets required to compute both surface and canopy fire potential include:

- **Surface Fuels**, generally referred to as fire behavior fuel models, provide the input parameters needed to compute surface fire behavior.
- **Canopy Cover** is the horizontal percentage of the ground surface that is covered by tree crowns. It is used to compute wind reduction factors and shading.
- **Canopy Ceiling Height/Stand Height** is the height above the ground of the highest canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. A good estimate of canopy ceiling height would be the average height of the dominant and co-dominant trees in a stand. It is used for computing wind reduction to midflame height and spotting distances from torching trees (Fire Program Solutions, L.L.C, 2005).
- **Canopy Base Height** is the lowest height above the ground above which there is sufficient canopy fuel to propagate fire vertically (Scott & Reinhardt, 2001). Canopy base height is a property of a plot, stand, or group of trees, not of an individual tree. For fire modeling, canopy base height is an effective value that incorporates ladder fuel, such as tall shrubs and small trees. Canopy base height is used to determine if a surface fire will transition to a canopy fire.
- **Canopy Bulk Density** is the mass of available canopy fuel per unit canopy volume (Scott & Reinhardt, 2001). Canopy bulk density is a bulk property of a stand, plot, or group of trees, not of an individual tree. Canopy bulk density is used to predict whether an active crown fire is possible.

Weather

Environmental weather parameters needed to compute fire behavior characteristics include 1-hour, 10-hour, and 100-hour timelag fuel moistures, herbaceous fuel moisture, woody fuel moisture, and the 20-foot 10 minute average wind speed. To collect this information, weather influence zones were established across the region. A weather influence zone is an area where for analysis purposes the weather on any given day is considered uniform. Within each weather influence zone, historical daily weather is gathered to compile a weather dataset from which four percentile weather categories are created. The percentile weather categories are intended to represent low, moderate, high, and extreme fire weather days. Fire behavior outputs are computed for each percentile weather category to determine fire potential under different weather scenarios.

The four percentile weather categories include:

- Low Weather Percentile (0 – 15%)
- Moderate Weather Percentile (16 – 90%)
- High Weather Percentile (91 – 97%)
- Extreme Weather Percentile (98 – 100%)

Topography

Topography datasets required to compute fire behavior characteristics are elevation, slope and aspect.

FIRE BEHAVIOR CHARACTERISTICS

Fire behavior characteristics provided in this report include:

- **Characteristic Rate of Spread**
- **Characteristic Flame Length**
- **Characteristic Fire Intensity Scale**
- **Fire Type - Extreme**

Characteristic Rate of Spread

Description

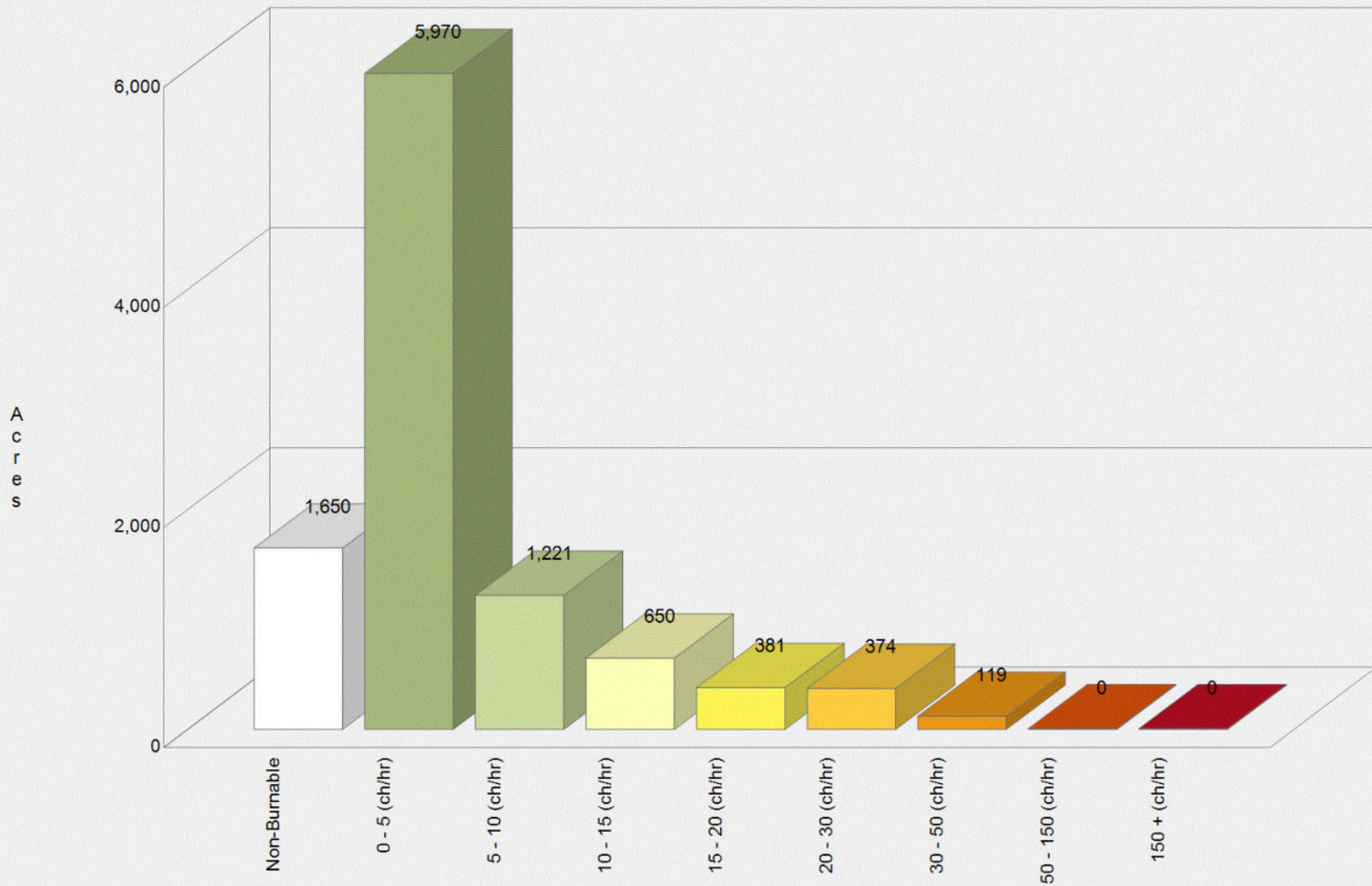
Characteristic Rate of Spread is the typical or representative rate of spread of a potential fire based on a weighted average of four percentile weather categories. Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains per hour (ch/hr) or feet per minute (ft/min). For purposes of the Southern Wildfire Risk Assessment, this measurement represents the maximum rate of spread of the fire front. Rate of Spread is the metric used to derive the Community Protection Zones.

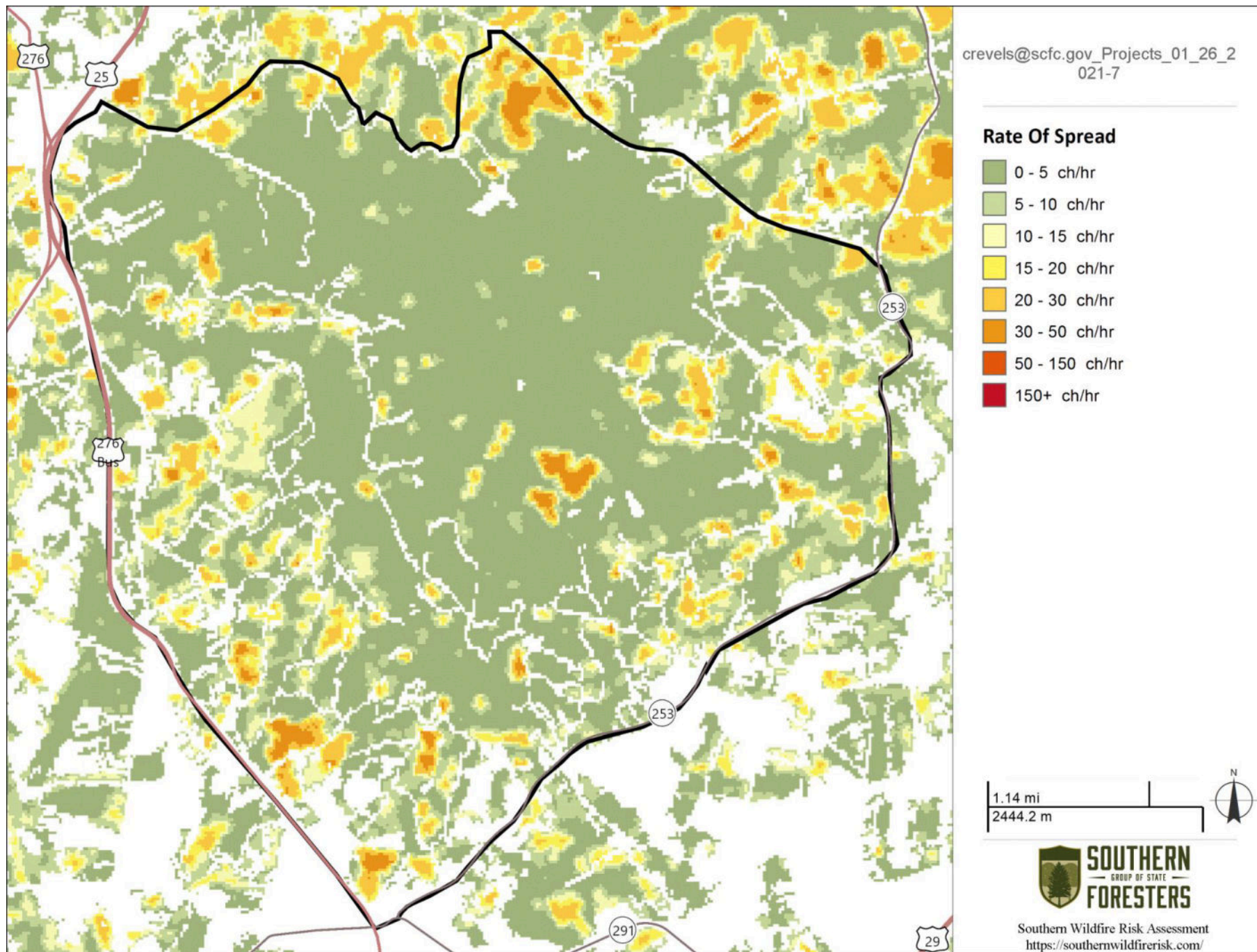
Rate of spread is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

Rate of Spread		Acres	Percent
	Non-Burnable	1,650	15.9 %
	0 - 5 (ch/hr)	5,970	57.6 %
	5 - 10 (ch/hr)	1,221	11.8 %
	10 - 15 (ch/hr)	650	6.3 %
	15 - 20 (ch/hr)	381	3.7 %
	20 - 30 (ch/hr)	374	3.6 %
	30 - 50 (ch/hr)	119	1.1 %
	50 - 150 (ch/hr)	0	0.0 %
	150 + (ch/hr)	0	0.0 %
Total		10,365	100.0 %

Characteristic Rate of Spread





Characteristic Flame Length

Description

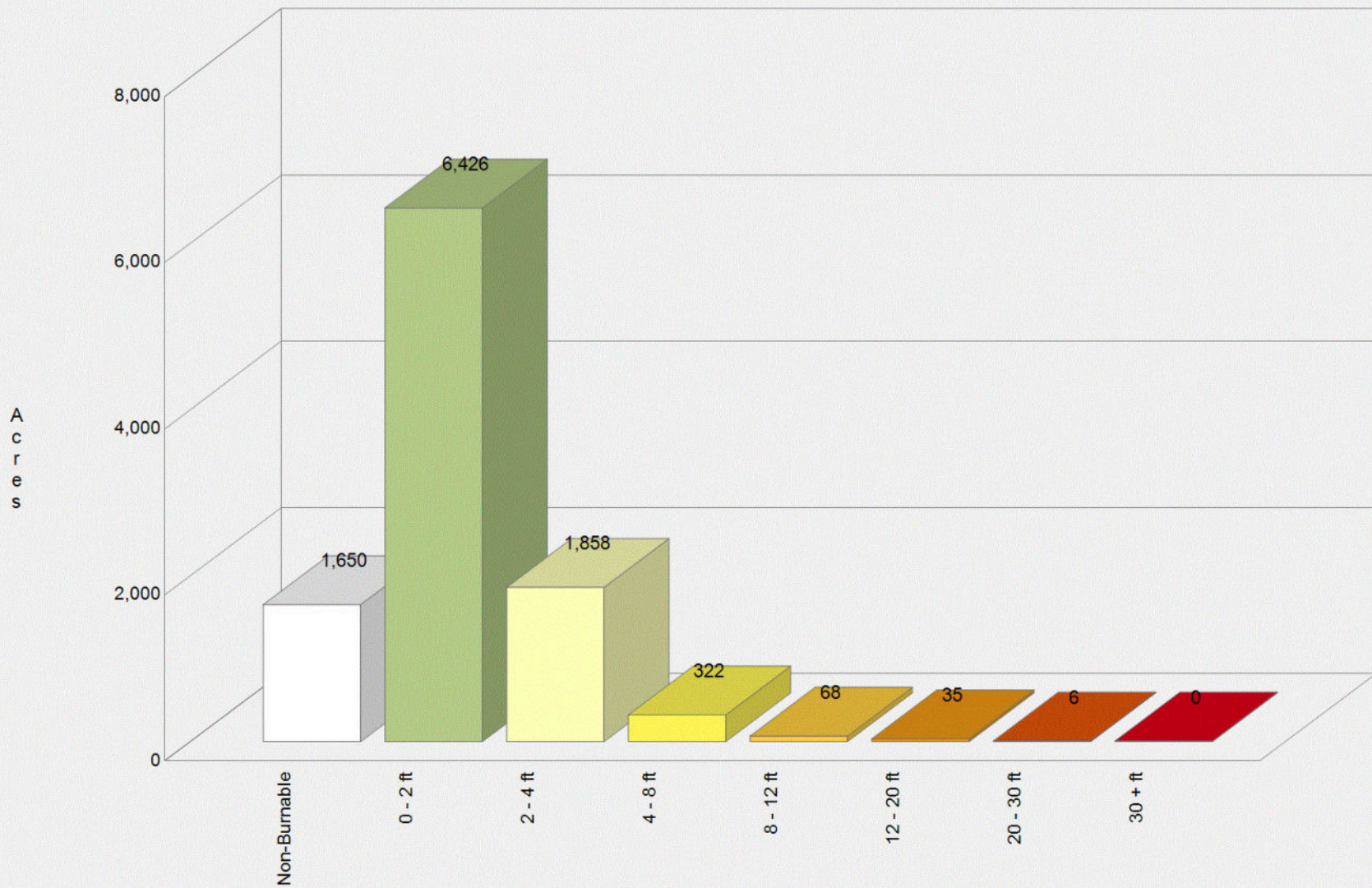
Characteristic Flame Length is the typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories. Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating. Flame length is typically measured in feet (ft). Flame length is the measure of fire intensity used to generate the response index outputs for the SWRA.

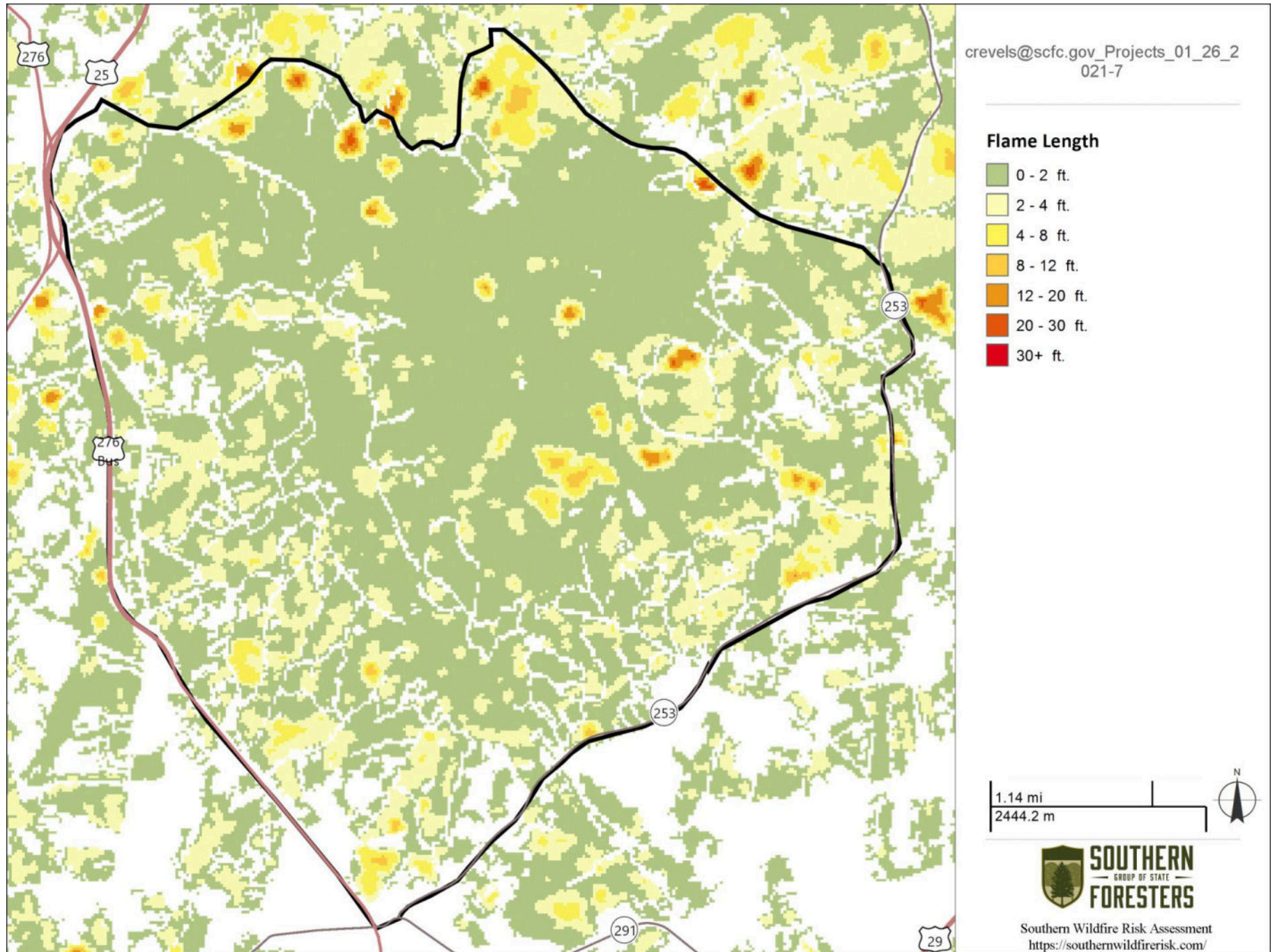
Flame length is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

Flame Length		Acres	Percent
	Non-Burnable	1,650	15.9 %
	0 - 2 ft	6,426	62.0 %
	2 - 4 ft	1,858	17.9 %
	4 - 8 ft	322	3.1 %
	8 - 12 ft	68	0.7 %
	12 - 20 ft	35	0.3 %
	20 - 30 ft	6	0.1 %
	30 + ft	0	0.0 %
Total		10,365	100.0 %

Characteristic Flame Length





Characteristic Fire Intensity Scale

Description

Characteristic Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

- **Class 1, Very Low:**
Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
- **Class 2, Low:**
Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
- **Class 3, Moderate:**
Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

- **Class 4, High:**
Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
- **Class 5, Very High:**
Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

For all Southern states, except Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed.

To aid in viewing on the map, FIS is presented in 1/2 class increments. Please consult the SouthWRAP User Manual for a more detailed description of the FIS class descriptions.

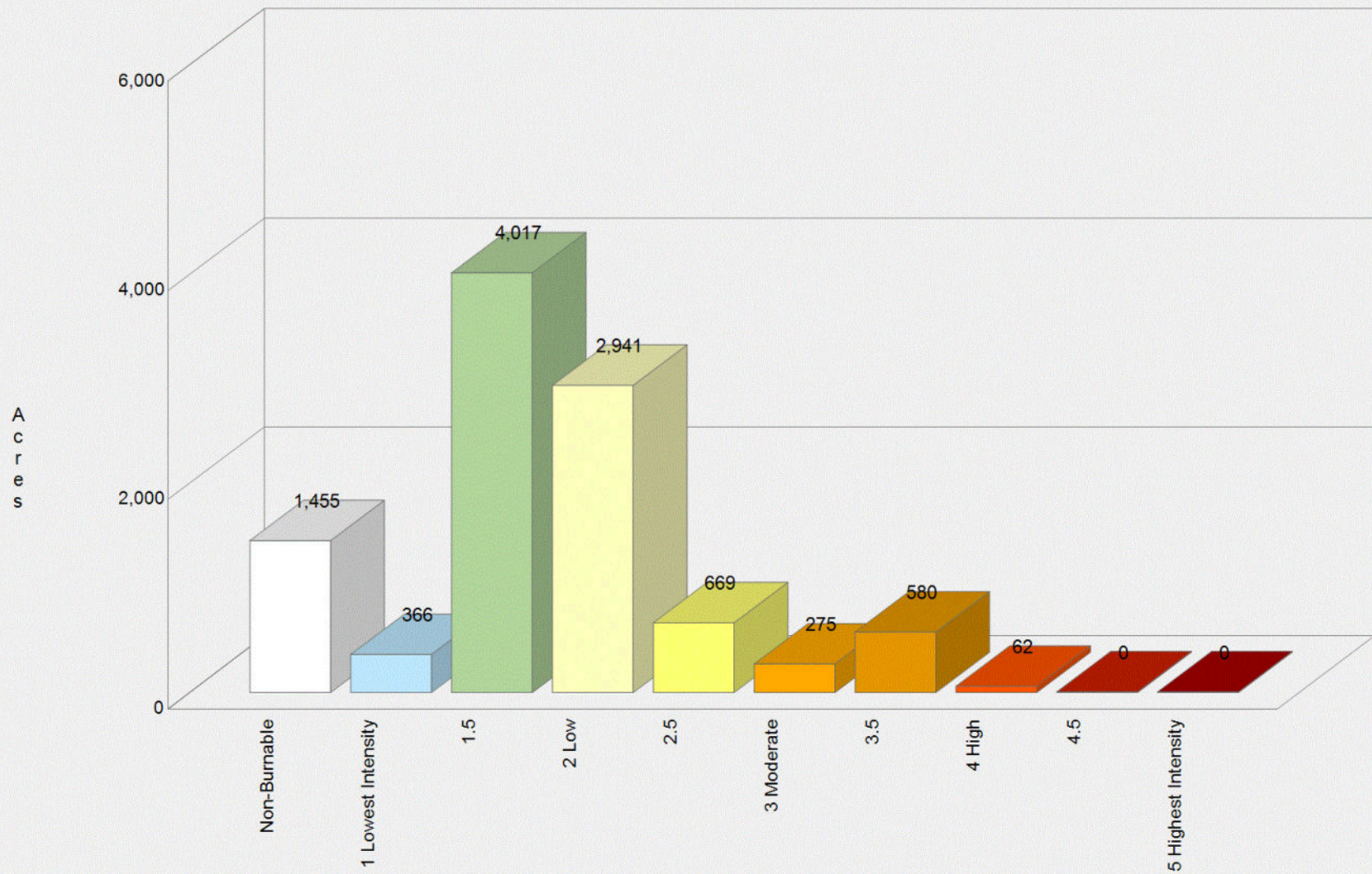
Since all areas in the South have fire intensity scale calculated consistently, it allows for comparison and ordination of areas across the entire region.

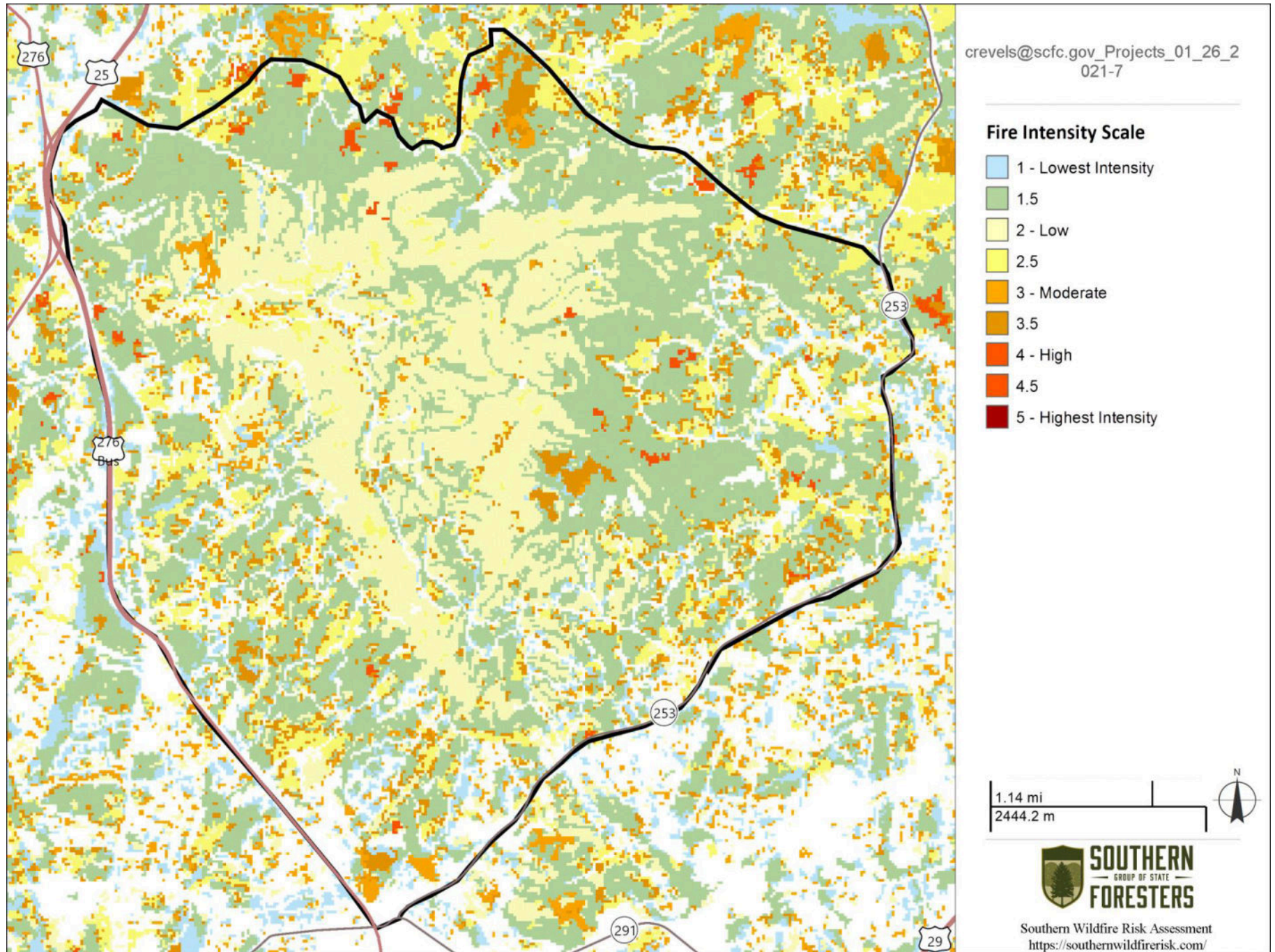
Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

The fire intensity scale map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

Class		Acres	Percent
	Non-Burnable	1,455	14.0 %
1	Lowest Intensity	366	3.5 %
1.5		4,017	38.8 %
2	Low	2,941	28.4 %
2.5		669	6.5 %
3	Moderate	275	2.7 %
3.5		580	5.6 %
4	High	62	0.6 %
4.5		0	0.0 %
5	Highest Intensity	0	0.0 %
Total		10,365	100.0 %

Characteristic Fire Intensity Scale





Fire Type – Extreme

Description

There are two primary fire types – surface fire and canopy fire. Canopy fire can be further subdivided into passive canopy fire and active canopy fire. A short description of each of these is provided below.

Surface Fire

A fire that spreads through surface fuel without consuming any overlying canopy fuel. Surface fuels include grass, timber litter, shrub/brush, slash and other dead or live vegetation within about 6 feet of the ground.

Passive Canopy Fire

A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods (Scott & Reinhardt, 2001).

Active Canopy Fire

A crown fire in which the entire fuel complex (canopy) is involved in flame, but the crowning phase remains dependent on heat released from surface fuel for continued spread (Scott & Reinhardt, 2001).



Fire Type – Extreme represents the potential fire type under the extreme percentile weather category. The extreme percentile weather category represents the average weather based on the top three percent fire weather days in the analysis period. It is not intended to represent a worst case scenario weather event. Accordingly, the potential fire type is based on fuel conditions, extreme percentile weather, and topography.

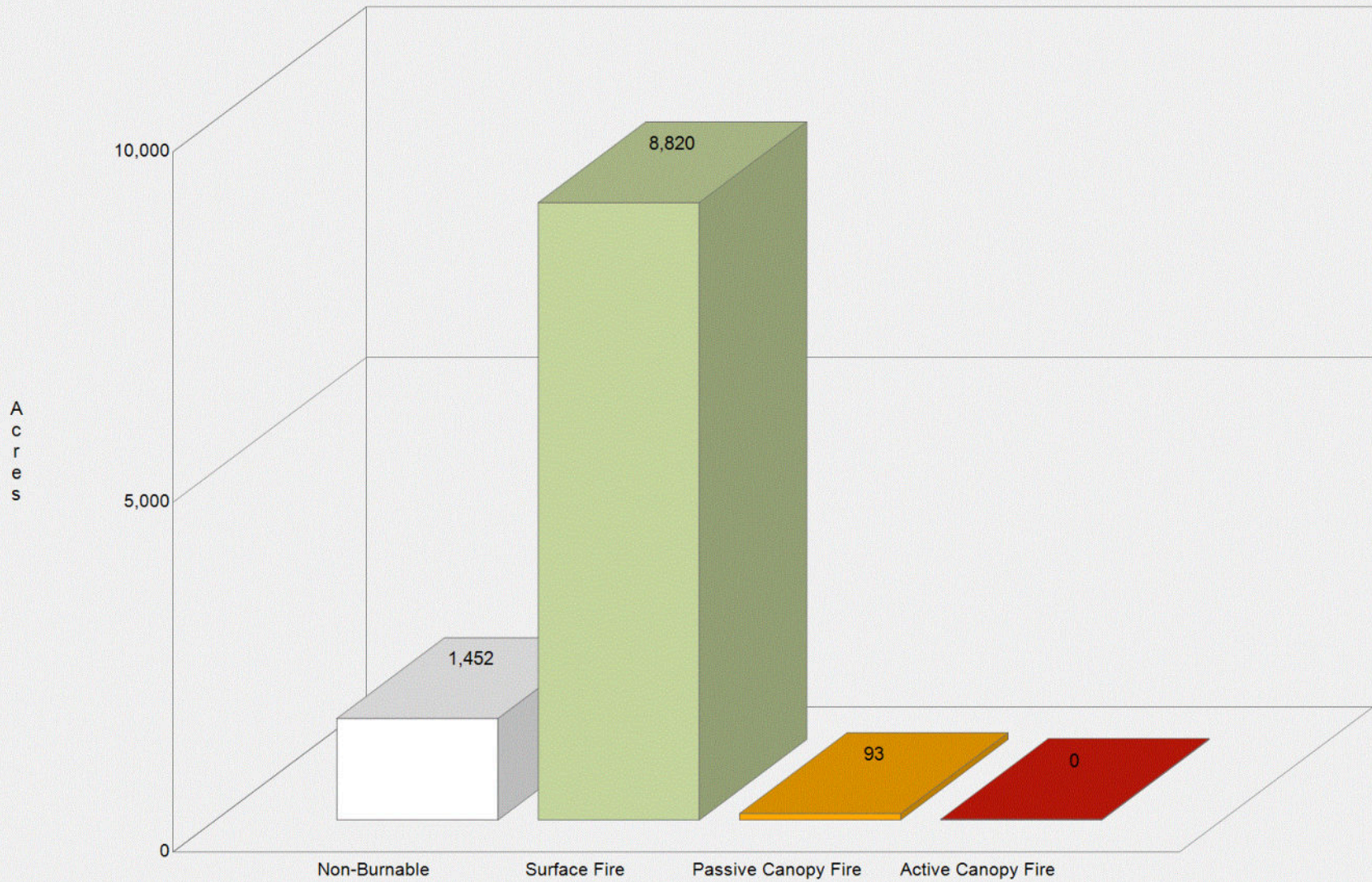
Canopy fires are very dangerous, destructive and difficult to control due to their increased fire intensity. From a planning perspective, it is important to identify where these conditions are likely to occur on the landscape so that special preparedness measure can be taken if necessary. The Fire Type – Extreme layer shows the footprint of where these areas are most likely to occur. However, it is important to note that canopy fires are not restricted to these areas. Under the right conditions, it can occur in other canopied areas.

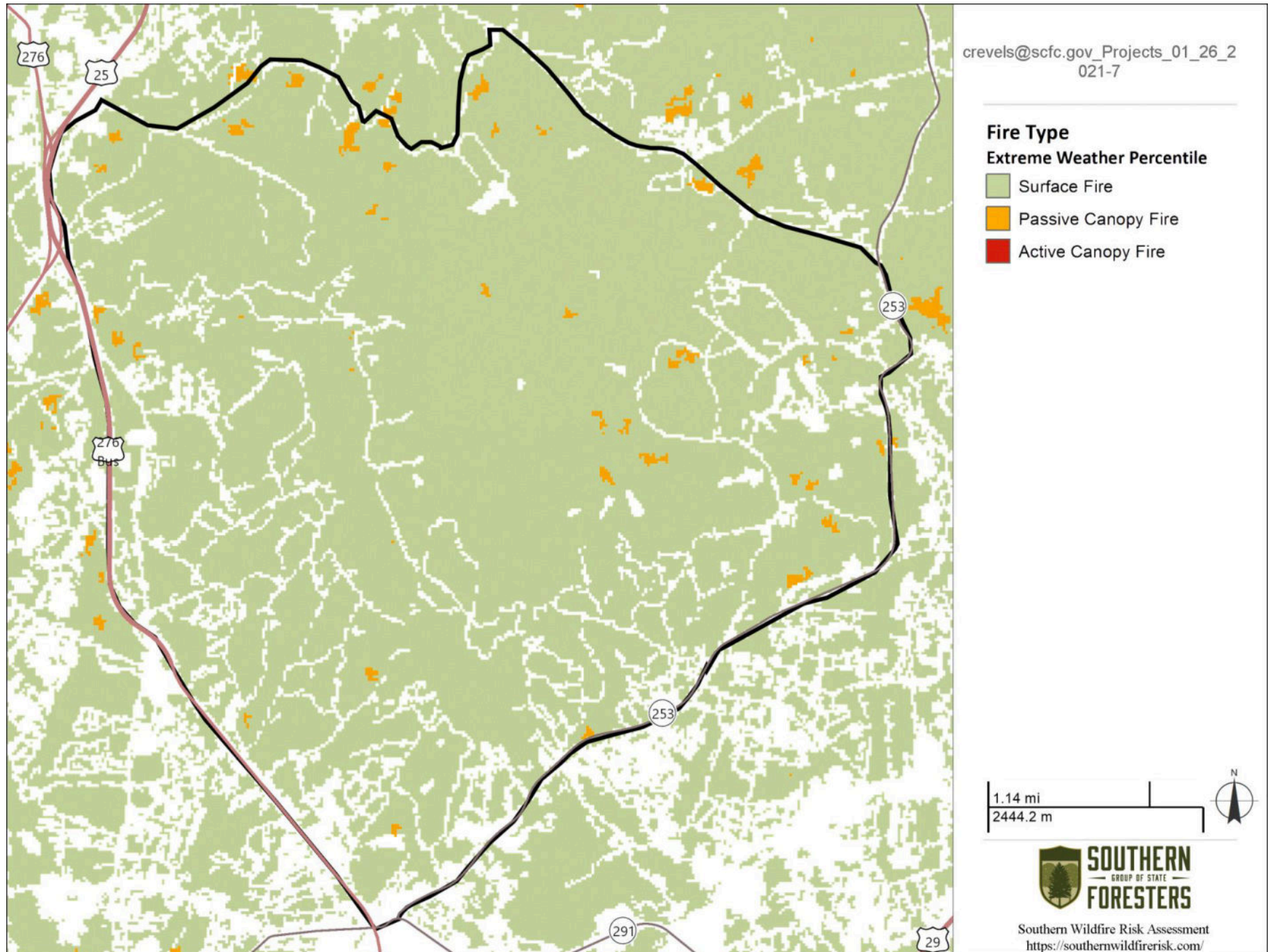
For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

The fire type - extreme map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

	Fire Type	Acres	Percent
	Non-Burnable	1,452	14.0 %
	Surface Fire	8,820	85.1 %
	Passive Canopy	93	0.9 %
	Active Canopy	0	0.0 %
	Total	10,365	100.0 %

Fire Type - Extreme





Surface Fuels

Description

Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, such as rate of spread, flame length, fireline intensity, and other fire behavior metrics. As the name might suggest, surface fuels only account for the surface fire potential. Canopy fire potential is computed through a separate but linked process. The Southern Wildfire Risk Assessment accounts for both surface and canopy fire potential in the fire behavior outputs.

Surface fuels are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire: 1) grass, 2) shrub/brush, 3) timber litter and 4) slash. There are two standard fire behavior fuel model sets published for use. The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson, 1982) contains 13 fuel models and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott & Burgan 2005) contains 40 fuel models.

The SWRA Surface Fuels have been updated to use the FBPS 2005 40 fuel model set from the LANDFIRE 2010 products, supplemented with additional enhancements obtained through calibration workshops with the Southern states. Florida uses FBPS 1982 fuel models derived based on spectral classification of Landsat Thematic Mapper (TM) satellite imagery derived as part of the Florida Forest Service fuels mapping and risk assessment projects. Texas fuels represent 2010 updates conducted as part of a statewide fuels and canopy mapping effort.

For the remaining 11 Southern states, the recently completed SWRA Update project produced a new surface fuels dataset based on 2010 LANDFIRE products. A detailed fuels calibration process was undertaken that involved collaboration with Southern state fuels and fire behavior specialists supported by federal partner involvement. Workshops were held to review the LANDFIRE fuels product and calibrate the data by modifying specific fuels classes to better reflect local knowledge and input. A key component of this calibration task involved using image processing techniques to better delineate conifer areas, and in particular pine areas (plantations and natural stands). The fuels layer represents 2010 conditions.

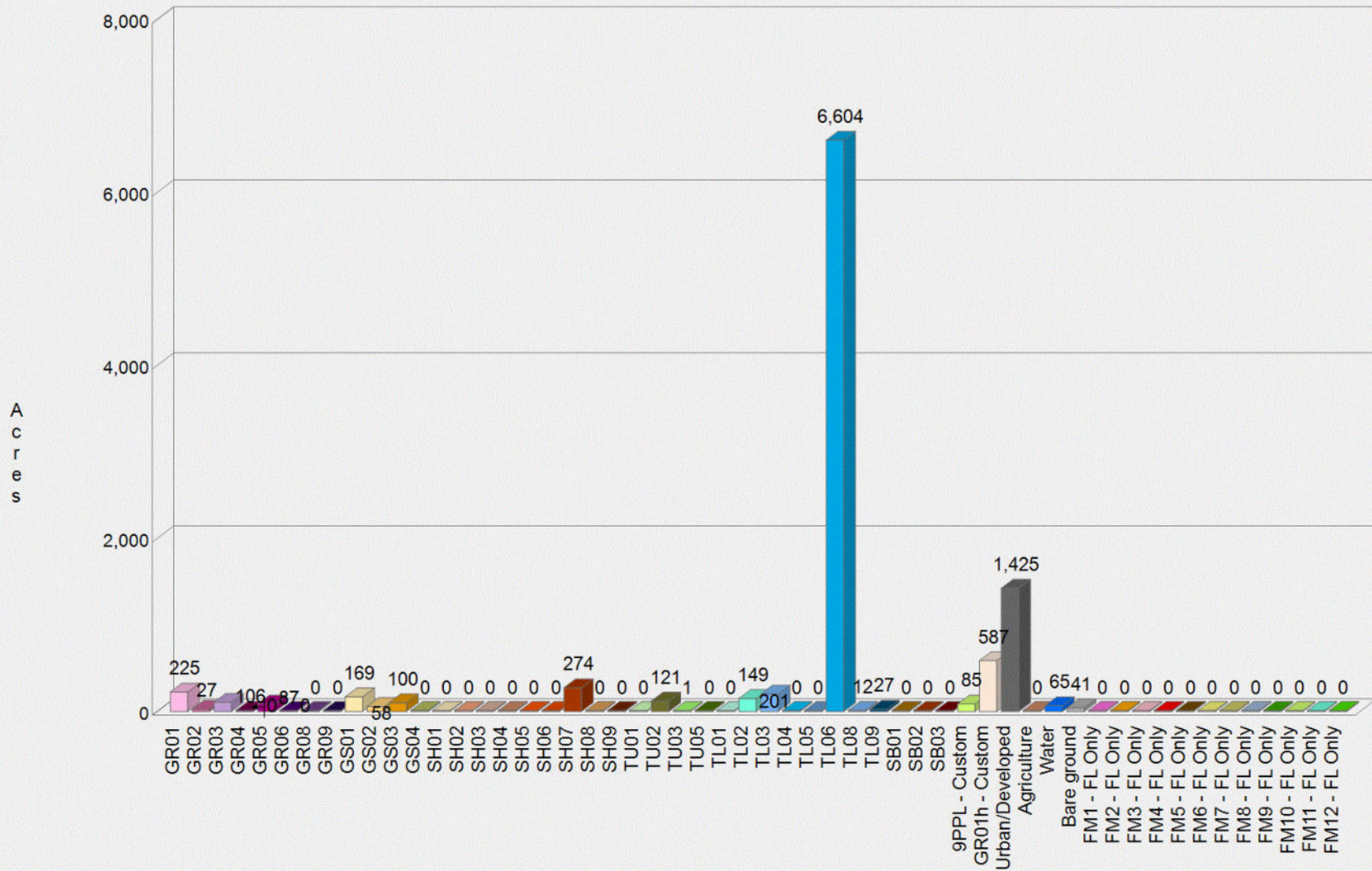
Surface Fuel		FBPS Fuel Model Set	Description	Acres	Percent
Grass Fuels Type Models (nearly pure grass and/or forb type)					
	GR01	2005	Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.	225	2.2 %
	GR02	2005	Moderately coarse continuous grass, average depth about 1 foot. Spread rate high; flame length moderate.	27	0.3 %
	GR03	2005	Very coarse grass, average depth about 2 feet. Spread rate high; flame length moderate.	106	1.0 %
	GR04	2005	Moderately coarse continuous grass, average depth about 2 feet. Spread rate very high; flame length high.	0	0.0 %
	GR05	2005	Dense, coarse grass, average depth about 1 to 2 feet. Spread rate very high; flame length high.	87	0.8 %
	GR06	2005	Dryland grass about 1 to 2 feet tall. Spread rate very high; flame length very high.	0	0.0 %
	GR08	2005	Heavy, coarse, continuous grass 3 to 5 feet tall. Spread rate very high; flame length very high.	0	0.0 %
	GR09	2005	Very heavy, coarse, continuous grass 5 to 8 feet tall. Spread rate extreme; flame length extreme.	0	0.0 %
Grass-Shrub Fuels Type Models (mixture of grass and shrub, up to 50 percent shrub coverage)					
	GS01	2005	Shrubs are about 1 foot high, low grass load. Spread rate moderate; flame length low.	169	1.6 %
	GS02	2005	Shrubs are 1 to 3 feet high, moderate grass load. Spread rate high; flame length moderate.	58	0.6 %
	GS03	2005	Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate high; flame length moderate.	100	1.0 %
	GS04	2005	Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high.	0	0.0 %
Shrub Fuel Type Models (Shrubs cover at least 50 percent of the site, grass sparse to nonexistent)					
	SH01	2005	Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low; flame length very low.	0	0.0 %
	SH02	2005	Moderate fuel load (higher than SH01), depth about 1 foot, no grass fuel present. Spread rate low; flame length low.	0	0.0 %
	SH03	2005	Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate low; flame length low.	0	0.0 %
	SH04	2005	Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate high; flame length moderate.	0	0.0 %

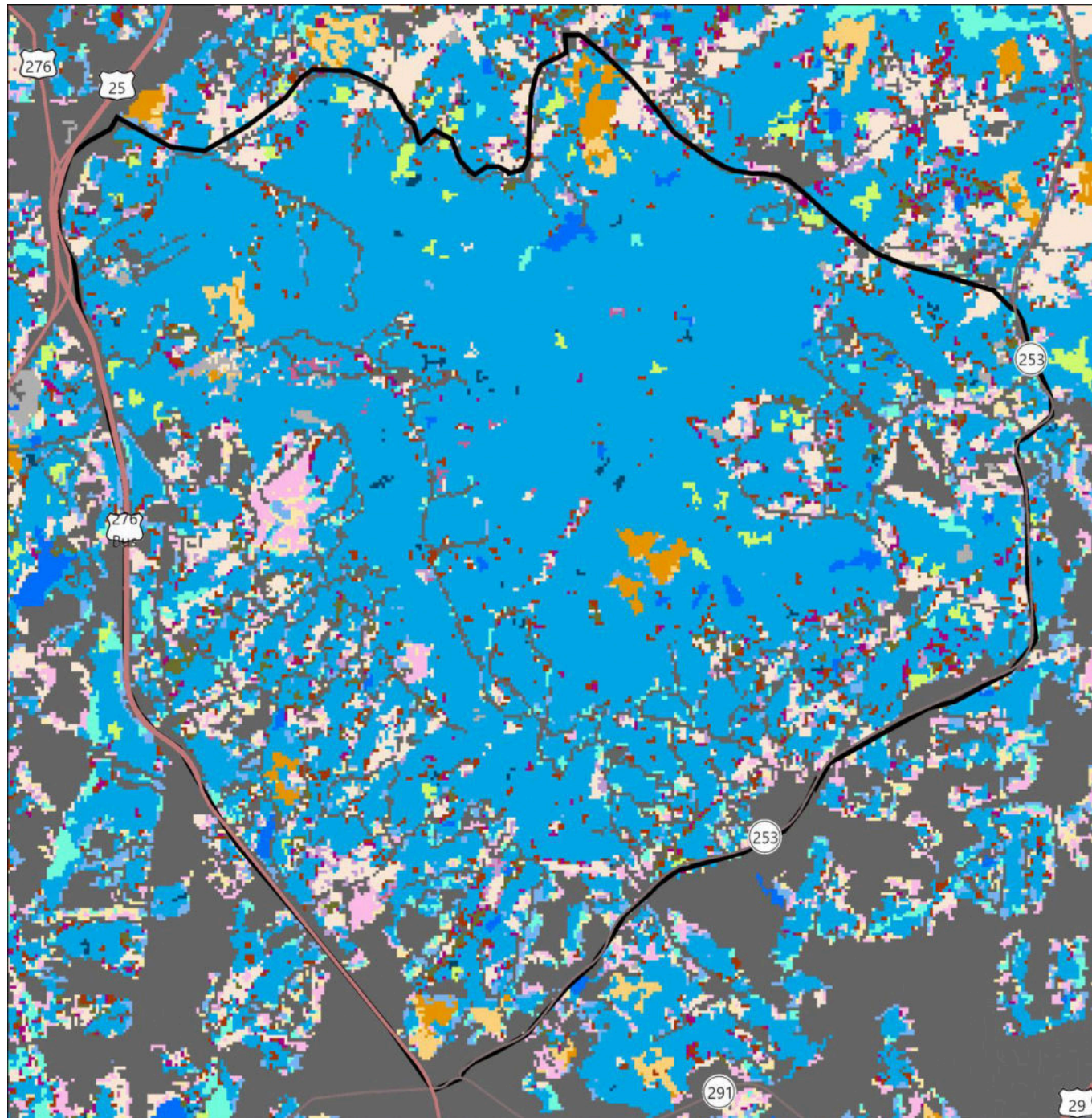
Surface Fuel	FBPS Fuel Model Set	Description	Acres	Percent
SH05	2005	Heavy shrub load, depth 4 to 6 feet. Spread rate very high; flame length very high.	0	0.0 %
SH06	2005	Dense shrubs, little or no herb fuel, depth about 2 feet. Spread rate high; flame length high.	0	0.0 %
SH07	2005	Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than SH05, but flame length similar. Spread rate high; flame length very high.	274	2.6 %
SH08	2005	Dense shrubs, little or no herb fuel, depth about 3 feet. Spread rates high; flame length high.	0	0.0 %
SH09	2005	Dense, finely branched shrubs with significant fine dead fuel, about 4 to 6 feet tall; some herbaceous fuel may be present. Spread rate high, flame length very high.	0	0.0 %
Timber-Understory Fuel Type Models (Grass or shrubs mixed with litter from forest canopy)				
TU01	2005	Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low.	0	0.0 %
TU02	2005	Fuelbed is moderate litter load with shrub component. Spread rate moderate; flame length low.	121	1.2 %
TU03	2005	Fuelbed is moderate litter load with grass and shrub components. Spread rate high; flame length moderate.	1	0.0 %
TU05	2005	Fuelbed is high load conifer litter with shrub understory. Spread rate moderate; flame length moderate.	0	0.0 %
Timber Litter Fuel Type Models (dead and down woody fuel litter beneath a forest canopy)				
TL01	2005	Light to moderate load, fuels 1 to 2 inches deep. Spread rate very low; flame length very low.	0	0.0 %
TL02	2005	Low load, compact. Spread rate very low; flame length very low.	149	1.4 %
TL03	2005	Moderate load conifer litter. Spread rate very low; flame length low.	201	1.9 %
TL04	2005	Moderate load, includes small diameter downed logs. Spread rate low; flame length low.	0	0.0 %
TL05	2005	High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low.	0	0.0 %
TL06	2005	Moderate load, less compact. Spread rate moderate; flame length low.	6,604	63.7 %
TL08	2005	Moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low.	12	0.1 %

Surface Fuel	FBPS Fuel Model Set	Description	Acres	Percent
TL09	2005	Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate.	27	0.3 %
Slash-Blowdown Fuel Type Models (activity fuel/slash or debris from wind damage)				
SB01	2005	Low load activity fuel. Spread rate moderate; flame length low.	0	0.0 %
SB02	2005	Moderate load activity or low load blowdown. Spread rate moderate; flame length moderate.	0	0.0 %
SB03	2005	High load activity fuel or moderate load blowdown. Spread rate high; flame length high.	0	0.0 %
Custom Fuel Type Models (all states except Florida)				
9PPL	Custom	Long-needle (pine litter, plantations) with a high load	85	0.8 %
GR01h	Custom	Pasture and hayland	587	5.7 %
Non-burnable Fuel Type Models (insufficient wildland fuel to carry a wildland fire under any condition)				
NB01	2005	Urban or suburban development; insufficient wildland fuel to carry wildland fire. Includes roads.	1,425	13.7 %
NB03	2005	Agricultural field, maintained in nonburnable condition.	0	0.0 %
NB08	2005	Open water	65	0.6 %
NB09	2005	Bare ground	41	0.4 %
1982 Fire Behavior Prediction System – ONLY USED FOR FLORIDA ASSESSMENT				
FM 1	1982	Short grass	0	0.0 %
FM 2	1982	Timber grass and understory	0	0.0 %
FM 3	1982	Tall grass	0	0.0 %
FM 4	1982	Chaparral	0	0.0 %

	Surface Fuel	FBPS Fuel Model Set	Description	Acres	Percent
	FM 5	1982	Brush	0	0.0 %
	FM 6	1982	Dormant brush	0	0.0 %
	FM 7	1982	Southern rough	0	0.0 %
	FM 8	1982	Compact timber litter	0	0.0 %
	FM 9	1982	Hardwood litter	0	0.0 %
	FM 10	1982	Timber (understory)	0	0.0 %
	FM 11	1982	Light logging slash	0	0.0 %
	FM 12	1982	Medium logging slash	0	0.0 %
				10,364	100.0 %

Surface Fuels





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Surface Fuels

GR01	TU01	FM1
GR02	TU02	FM2
GR03	TU03	FM3
GR04	TU05	FM4
GR05	TL01	FM5
GR06	TL02	FM6
GR08	TL03	FM7
GR09	TL04	FM 8
GS01	TL05	FM9
GS02	TL06	FM10
GS03	TL08	FM11
GS04	TL09	FM 12
SH01	SB01	GR1h
SH02	SB02	9PPL
SH03	SB03	9HWD
SH04	Urban/Developed	
SH05	Agriculture	
SH06	Water	
SH07	Bare ground	
SH08		
SH09		

1.14 mi
2444.2 m



Southern Wildfire Risk Assessment
<https://southernwildfirerisk.com/>

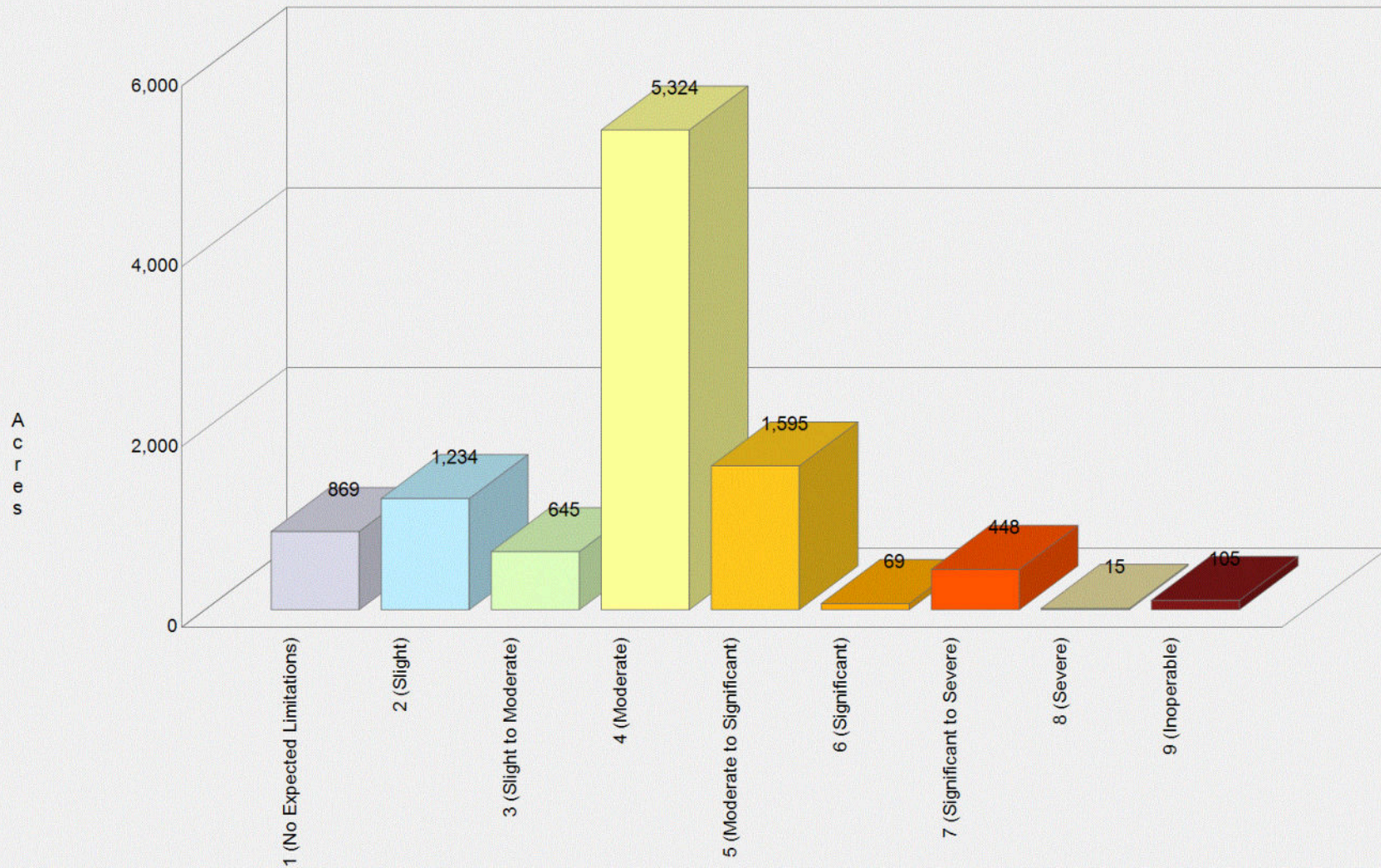
Dozer Operability Rating

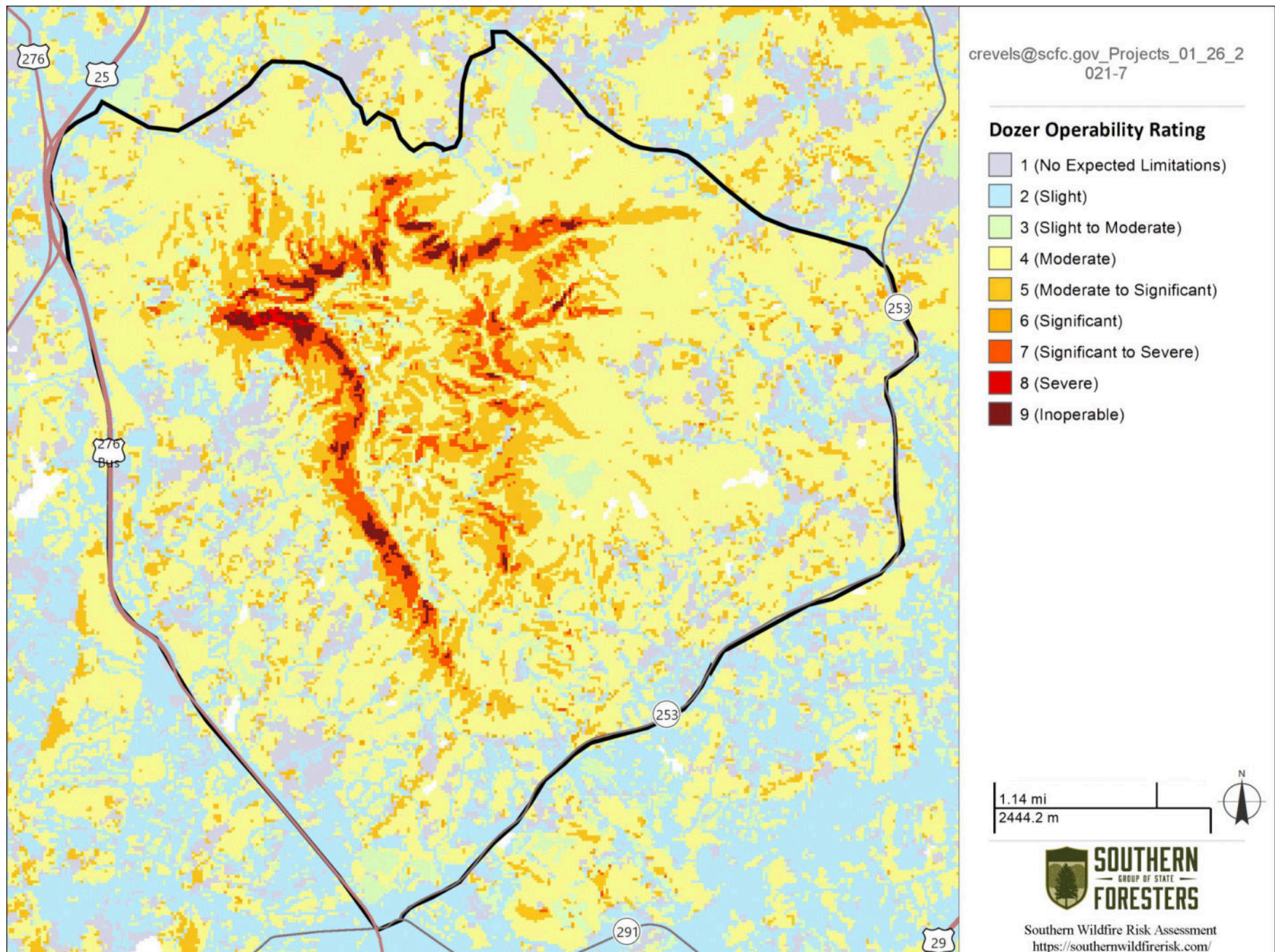
Description

The Dozer Operability Rating (DOR) expresses how difficult it is to operate a dozer in an area based on limitations associated with slope and vegetation/fuel type. Using the fireline production rates published in the NWCG Fireline Handbook 3 (PMS 410-1) as a guide, operability values were assigned to a matrix based on 6 slope classes and 10 vegetation/fuels classes. The possible values range from 1 to 9, with 1 representing no limitations and 9 being inoperable.

Class		Acres	Percent
1	(No Expected Limitations)	869	8.4 %
2	(Slight)	1,234	12.0 %
3	(Slight to Moderate)	645	6.3 %
4	(Moderate)	5,324	51.7 %
5	(Moderate to Significant)	1,595	15.5 %
6	(Significant)	69	0.7 %
7	(Significant to Severe)	448	4.3 %
8	(Severe)	15	0.1 %
9	(Inoperable)	105	1.0 %
Total		10,304	100.0 %

Dozer Operability Rating





References

Anderson, H. E. (1982). Aids to determining fuel models for estimating fire behavior. USDA For. Serv. Gen. Tech. Rep. INT-122.

Dobson, J. E., E. A. Bright, P. R. Coleman, and B.L. Bhaduri. "LandScan: a global population database for estimating populations at risk. "Remotely Sensed Cities Ed. V. Mesev, London: Taylor & Francis. 2003. 267-281.

Fire Program Analysis (FPA) System and US Forest Service Missoula Fire Sciences Laboratory, 20140307, Burn Probabilities for the Conterminous US (270-m GRID) from Calibrated FSim Runs for the 2014 FPA Submissions [bp_20140307];, Fire Program Analysis (FPA) System, National Interagency Fire Center, Boise, ID.

National Wildfire Coordinating Group (NWCG). (2008). Glossary of Wildland Fire Terminology. Publication Management System document PMS-205.

Radeloff, V.C., R.B. Hammer, S.I Stewart, J.S. Fried, S.S. Holcomb, and J.F. McKeefry. 2005. The Wildland Urban Interface in the United States. *Ecological Applications* 15: 799-805

Scott, J. H., & Burgan, R. E. (2005). Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model. Ft. Collins, CO, Rocky Mountain Research Station: USDA Forest Service, Gen. Tech. Rpt. RMRS-GTR-153.

Scott, J. H., & Reinhardt, E. D. (2001). Assessing the Crown Fire Potential by Linking Models of Surface and Crown Fire Behavior. Ft. Collins, CO, Rocky Mountain Research Station: USDA Forest Service, Research Paper RMRS-RP-29.

Scott, Joe. November 2006. Off the Richter: Magnitude and Intensity Scales for Wildland Fire. A non-published white paper prepared for the AFE Fire Congress, November 2006, San Diego, CA.

Thompson, M. P., D. E. Calkin, M. A. Finney, A. A. Ager, and J. W. Gilbertson-Day. 2011. Integrated National-Scale Assessment of Wildfire Risk to Human and Ecological Values. *Stochastic Environmental Research and Risk Assessment* 25:761-780.

More information about the Fire Program Analysis project is available from <http://www.forestsandrangelands.gov/WFIT/applications/FPA/index.shtml>

More information about the Oak Ridge National Laboratory LandScan data is available from http://web.ornl.gov/sci/landscan/landscan_documentation.shtml

More information about the U.S. Forest Service SILVIS data is available from http://silvis.forest.wisc.edu/maps/wui_main



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