

Greenville County Multi- Jurisdictional Hazard Mitigation Plan

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

February 2020



Greenville County Floodplain
Management

Executive Summary

Greenville County created its initial Hazard Mitigation Plan (HMP) in January 2005 using Mitigation 20/20 software. The 2005 HMP was created 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 and 2015. The 2010 HMP converted the original plan to a multi-jurisdictional, multi-hazard plan and included the Cities of Greenville, Travelers Rest, Mauldin, Simpsonville, and Fountain Inn in the planning process. These communities also participated in the 2015 HMP and are participants in the 2020 HMP as well. Specific hazard mitigation initiatives developed for each of these jurisdictions are included as appendices to this plan.

While this plan is being prepared in accordance with the requirements stated above, its real intent is to reduce the impact of multiple natural hazards to infrastructure and people across Greenville County. The County is threatened by a number of 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
- Sinkholes
- Hail
- Climate Change

During the planning process, mitigation initiatives associated with each natural hazard were discussed and included as appropriate. Since flooding is the hazard having the most frequent and largest impact on the County, the majority of mitigation initiatives are associated with this hazard. The Pinnacle Mountain wildfire disaster of 2016 reinforced the significance of potential wildfire events at the urban-forest interface in Greenville County and brought wildfire to the forefront of the planning process as well.

Since Greenville County was awarded a mitigation grant to prepare a comprehensive Paris Mountain Wildfire Mitigation Plan, wildfire was given just a cursory review in creating this plan. It is the intent of the County to add the comprehensive Paris Mountain Wildfire Mitigation Plan to the HMP as an appendix upon its completion, and it is noted as one of the mitigation initiatives in this plan.

Climate change is a relatively new concern and has a greater potential impact on coastal communities than inland communities (e.g., sea level rise, increased intensity of coastal storms and hurricanes). However, Greenville County has seen more extremes in climate events over recent years such as a decrease in annual precipitation and an increase in average annual temperature. Therefore, Greenville County also included consideration of climate change in 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 over 200 homes and permanently removed them from the floodplain.

Due to the diligence of the County in implementing mitigation measures over the last fifteen (15) years and its resolve to not create new problems, the number of mitigation initiatives in this plan are fewer and more targeted than in previous plans.

Greenville County Council and the governing bodies of each jurisdiction represented in the HMP fully support the development and implementation of the 2020 HMP. Resolutions supporting the 2020 HMP are contained in Appendix G. The implementation, monitoring, and maintenance of the 2020 HMP rests with the Disaster Mitigation Committee (DMC) (Section 3), which is coordinated by the Greenville County Floodplain Administrator. The policies and procedures of the DMC are addressed fully in Section 3 and Section 4.

10 Prioritized Mitigation Initiatives

10.1 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.

10.2 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
 - o 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

- Proactive Maintenance of Stormwater Infrastructure
 - o 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

- 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/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.

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.

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.

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.

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
 - o 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
 - o 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

- Realtor Flood Hazard Education
 - o 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

- Pre-Prepared Hazard Info Ads
 - o Prepare ads for hazard preparation to be released immediately before and during natural disasters to provide for a timely response

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
 - o 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

- Enhance Hazards Education
 - o 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

- Early Warning System Evaluation
 - o 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	Floods, Winter Storms, High Winds/Tornados, Wildfires, Drought, Hail	Greenville County, All Municipalities

- Social Media Public Communication
 - o Leverage social media and cell phones by creating hashtags to keep the public engaged and informed.
 - o Communicate emergency services available to the public on multiple platforms to reach a wider audience.

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.

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.

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.

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
 - o Create focused riparian buffer protection plans to target specific issues related to flooding.
 - o Identify properties that can be acquired by the county to restore and enhance current riparian 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
 - o Enhance runoff reduction criteria by including creative practices such as Green Infrastructure and Low Impact Development.

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)
 - o 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.
 - o 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	As budget / grant become available	Floods, Winter Storms, High Winds/Tornados	Greenville County

- Continue Improvements to Radio Communications
 - o 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	Hazards Addressed	Jurisdictions Covered
Administration Emergency Management	County Budget Grant	On-going	All Hazards	Greenville County

- Communications Protocol
 - o Review and continue to coordinate a communication protocol with the news media and to guide the media in disaster reporting

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

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
 - o 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

- Comprehensive Training
 - o Provide appropriate level of emergency response training to all County 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
 - o 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

- Heating and Cooling
 - o 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	Hazards Addressed	Jurisdictions Covered
Emergency Management Codes Enforcement	County Budget Grants	As budget / grant become available	Winter Storms, Drought, Hail	Greenville County

- Backup Power
 - o 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	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
 - o 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	Floods	Greenville County

- Flood Mitigation Acquisition Program
 - o Continue acquiring appropriate, eligible properties to reduce buildings at high risk of flooding.

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
 - o Identify infrastructure at risk through basin studies and mitigate as appropriate.

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
 - o Identify and evaluate critical facilities for risk and mitigate as appropriate.

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