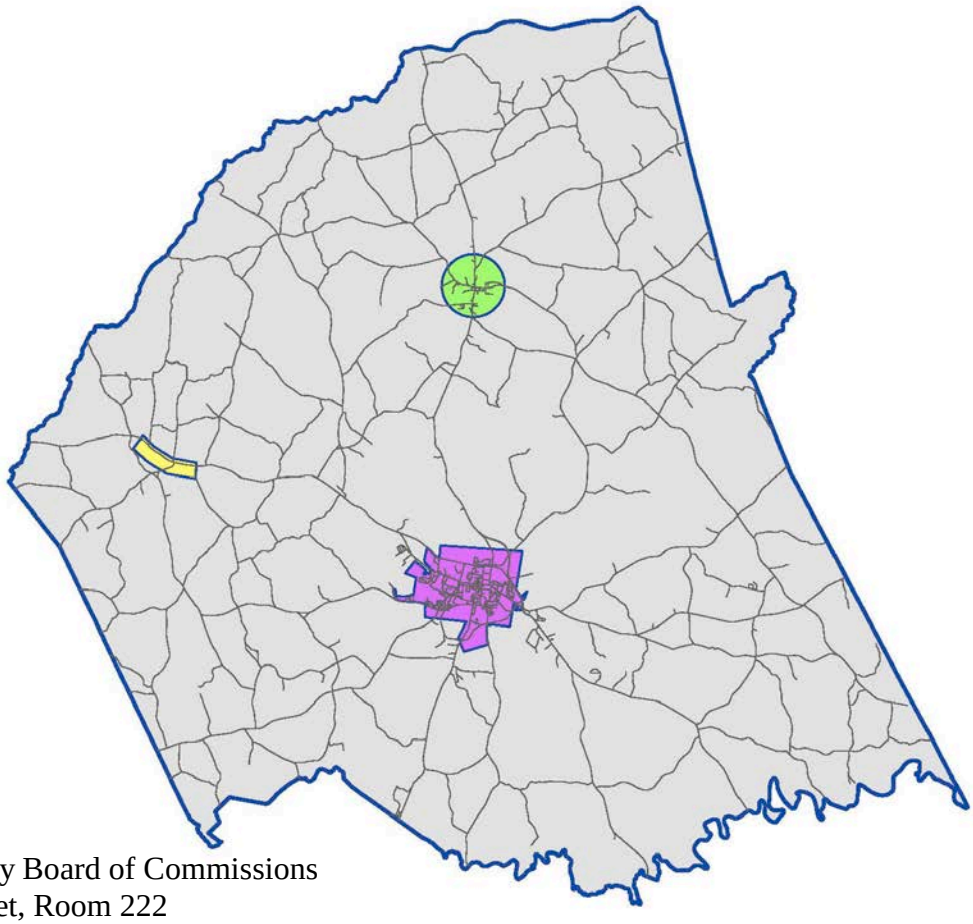
Wilkes County, Georgia
Pre-Disaster Hazard Mitigation Plan Update
Original Approval: 06/19/2006
Update Approval: 10/01/2013
Second Update Approval 00/00/2018



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CHAPTER I. INTRODUCTION TO THE PLANNING PROCESS

Table 1.1 provides a brief description of each chapter section and a summary of the changes made.

Table 1.1

Chapter I. Section		Updates to Section
I.	Purpose and need of the plan, authority & statement of problem	Updated text of this section.
II.	Local methodology, brief description of plan update process, Participants in update process	Updated the participants, planning process and how data collection was performed
III.	Description of how each section of the original plan was reviewed and analyzed and whether it was revised	Since there have been numerous changes to the GEMA-PDM planning template since the 2012 approval all sections of the original plan were analyzed and revised.
IV.	Organization of the plan	Organized updated by GEMA local planning template Local Hazard Mitigation Plan Update Template 5-23-12 and includes a timeline.
V.	Local Hazard, Risk, and Vulnerability (HRV) summary, local mitigation goals and objectives	Added new information to summary, new purpose for plan.
VI.	Multi-Jurisdictional special considerations (HRV, goals, special needs)	Added new information regarding multijurisdictional concerns.
VII.	Adoption, implementation, monitoring and evaluation	Evaluated the chapter, added additional text clearly delineating the task for implementation, and monitoring. Adopted after GEMA and FEMA reviewed and approved the update.
VIII.	Community Data (demographics, census, commerce, history, etc.)	Updated demographic and added additional information by jurisdiction.

SECTION I. PURPOSE AND NEED OF THE PLAN, AUTHORITY AND STATEMENT OF PROBLEM

The Wilkes County 2018 Plan Update is a review and improvement of our Multi-Hazard Pre-Disaster Mitigation Plan approved on October 01, 2013. The plan fulfills the requirements of the Federal Disaster Mitigation Act of 2000 (DMA2K). The Georgia Emergency Management Agency (GEMA) and the Federal Emergency Management Agency (FEMA) administer the Act. The act provides federal assistance to state and local emergency management and other disaster response organizations in an effort to reduce damage from disasters. The plan has involved many community partners including elected officials along with city, county, fire, emergency management, and law enforcement personnel. The plan's ultimate goal is to identify natural disasters that threaten our community and develop strategies to lessen the impact of these events.

The 2018 update is written to comply with Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act Title 44 CFR as amended by Section 102 of the Disaster Mitigation Act of 2000. The act gives state and local governments the framework to evaluate and mitigate all hazards as a condition of receiving federal disaster funds. The update covers all of Wilkes County to include the Towns of Rayle and Tignall, and the City of Washington.

The plan will identify all-natural disasters that threaten the lives and properties of our community. The scope of the update includes both short and long-term mitigation strategies, implementation policies and possible sources of project funding. It also identifies mitigation strategies implemented since the 2013 plan update.

The plan also contains the following information on:

- The vision of mitigation in our community;
- A profile of Wilkes County, its geography, history, physical features and other community indicators;
- The planning process and the involvement of all municipal, state and federal governments, the public, industry and other community players;
- Wilkes County's past and predicted exposure to natural hazards and the potential risks that include the impacts on critical infrastructure with anticipated losses was documented;
- An overview of Wilkes County's capabilities to implement hazard mitigation goals and objectives, and policies that will effectively mitigate risks to our community;
- Procedures for maintaining an effective, long-range hazard mitigation plan and implantation strategy;
- An assessment of Wilkes County's current policies, goals and regulations that pertain to hazard mitigation;
- Documentation of the planning process;
- Update hazard events that occurred since 2013;
- Update critical facilities that have been added since 2013;
- To document current mitigation strategies that have been implemented since 2013; and
- Examine and update mitigation strategy goals, objectives and action steps.

The update is the product of the combined efforts of Wilkes County, Rayle, Tignall, and Washington. Realizing that identifying the community's risks and working collectively toward the prevention of disasters in the community is in the county's best interest, the Wilkes County Emergency Management Agency (EMA) took the lead role. Under the agency's leadership, there has been an endorsement and a commitment by all jurisdictions.

Continued mitigation planning is imperative to lessen the impacts of disasters in Wilkes County. This plan serves as an excellent method to organize and document current and ongoing mitigation strategies; however, the implementation of the plan and its components is vital to achieve a community that is resistant to the impact of a disaster. The objective is implementation of this plan will result in a reduction of the loss of life and property, while allowing the county to prosper with minimal disruption of services to the community.

SECTION II. LOCAL METHODOLOGY, PLAN UPDATE PROCESS AND PARTICIPANTS

The Wilkes County Board of Commissioners contracted with the Central Savannah River Area Regional Commission (RC) to assist in the plan update. The RC has assisted 11 counties in the completion and update of their Pre-Disaster Mitigation Plans. The RC is currently assisting nine counties with their second update. The RC was tasked to review the current plan and to identify new information that needs to be incorporated into the update. The RC in conjunction with the EMA Director, supervised the project, organized the data, set meeting dates, documented in-kind services, and worked with GEMA to complete the update. The EMA Director, Blake Thompson assembled the Hazard Mitigation Planning Committee.

Table 1.2 identifies the 2013 committee:

Table 1.2

Name	Agency	Jurisdiction
Norman Echols, Sr	Mayor	Town of Rayle
Pam W. Hall	Clerk	Town of Rayle
Henry Brown	Mayor	Town of Tignall
Elaine Jackson	City Clerk	Town of Tignall
Mike Arrington	Police Chief	Town of Tignall Police Department
Mike Eskew	Administrator	City of Washington
Mike Hardy	Electrical Supervisor	City of Washington
Jack Garrett	Public Works Director	City of Washington
John Scott		Operations Management Inc
Jerry M. Hackney	Director	Washington-Wilkes 911
David Jenkins	Director	Washington Downtown Development Authority
Theodosia Glenn	Police Chief	Washington Police Department
Bobby Mills	Superintendent	Washington Street Department
Lyndon Amis	Executive Director	Washington-Wilkes Chamber of Commerce
David L. Tyler	County Administrator	Wilkes County Board of Commissions
Dr. Rosemary W. Caddell	Superintendent	Wilkes County Board of Education
Blake Thompson	Director	Wilkes County EMA/EMS
Jennifer Jackson	County Nurse Manager	Wilkes County Health Department
Richard A McAvoy	Director	Wilkes County Public Works
Mark A. Moore	Sheriff	Wilkes County Sheriff's Office
Gene Turner	Chief Deputy	Wilkes County Sheriff's Office
Jane Echols	CEO	Wills Memorial Hospital
Albert Huyck	Council Member	Town of Tignall
Jake Buff	Council Member	Town of Rayle

The 2013 planning committee members still employed by their respective jurisdictions received an invitation to participate in the update. The 2018 committee are identified in Table 1.3 by their respective organizations and political subdivisions.

Table 1.3

Name	Agency/Title	Jurisdiction
Pam W. Hall	Clerk	Town of Rayle
Elaine Jackson	City Clerk	Town of Tignall
Sherri Bailey	Administrator	City of Washington
Jack Garrett	Public Works Director	City of Washington
Elizabeth H Denard	Wilkes Board of Tax Assessors	Wilkes County
Amy Howard	Wilkes EMA	Wilkes County
Jerry M. Hackney	Director	Washington-Wilkes 911
Bobby Mills	Superintendent	Washington Street Department
Steve M Harrington	North Alexander School System	Wilkes County
Kathy Boardman	North Alexander School System	Wilkes County
Karen Burton	County Administrator	Wilkes County Board of Commissions
Dr. Rosemary W. Caddell	Superintendent	Wilkes County Board of Education
Blake Thompson	Director	Wilkes County EMA/EMS
Jennifer Jackson	County Nurse Manager	Wilkes County Health Department
Richard A McAvoy	Director	Wilkes County Public Works
Mark A. Moore	Sheriff	Wilkes County Sheriff's Office
Gene Marsh	Chief Deputy	Wilkes County Sheriff's Office
Ron Byrd	Red Cross	Wilkes County
Henry Binns	Street Department	City of Washington
Alvin Jones	Parks and Recreation	Wilkes County
Leon Aycock	Council Member	Town of Tignall
Albert Huyck	Council Member	Town of Tignall
Jake Buff	Mayor	Town of Rayle

The 2018 committee was responsible for the organization, data collection and completion of the plan. It is the responsibility of the committee to include all pertinent departments within their respective governments and to request information needed for plan completion. The following agencies/departments/organizations provided specific information and support for the original plan and provided any new information for the update:

- Wilkes County Board of Education was responsible for providing structural replacement and content values for all schools as well as square footage and occupancy limits.
- Wilkes County Sheriff’s Office provided staff support to the PDM planning effort.
- Wilkes County Health Department identified vulnerable populations. They also provided replacement value estimates for their properties.
- All Fire Departments provided staff support to the PDM planning effort and assisted with identifying occupancy limits for some of the critical structures and replacement value estimates.
- Officials from Wilkes County, Rayle, Tignall, and Washington provided information relative to their jurisdiction and provided replacement value estimates for their critical facilities.
- Georgia Forestry Commission provided data on wildfire events and assisted with the formulation of mitigation measures.
- Wilkes County Chamber of Commerce assisted in identifying major businesses.
- Wilkes County Code Enforcement Officer provided information about county government buildings including their respective replacement and content values and square footages.

- Wilkes County Tax Assessor's Office provided most of the aggregate values for the critical structures. The valuations were converted to full values since the values are calculated at 40%. This information, combined with demographic data, is located on GEMA Worksheet #3a in Appendix D for all jurisdictions.
- The RC's Geographical Information System (GIS) Department produced several of the maps contained in the update. Maps are located in Appendix A.
- GEMA provided the HAZ-US report for Wilkes County and provided guidance for the plans completion as needed.

Several resources were consulted to facilitate the development of the update. Data was collected from numerous sources, including the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI), Spatial Hazard Events and Losses Database for the United States (SHELDUS™), National Weather Service, US Geological Survey (USGS), Southeast Regional Climate Center (SERCC), US Census Bureau, Georgia Department of Natural Resources (DNR), Georgia Forestry Commission (GFC), Georgia Tornado History Project Database, Georgia Department of Community Affairs (DCA), US Department of Agriculture (USDA), local and regional newspaper articles, as well as personal interviews. Table 1.4 provides a list of existing planning documents used during the update.

Table 1.4

Existing planning mechanisms	Reviewed (Yes/No)	Method of use in Hazard Mitigation Plan
Washington-Wilkes Unified Comprehensive Plan 2014-2024	Yes	Development trends, capability assessment, mitigation strategies
Local Emergency Operations Plan	Yes	Identifying hazards; Assessing vulnerabilities; Capability assessment
Georgia Emergency Operations Plan	Yes	Identifying hazards; Assessing vulnerabilities;
Flood Damage Protection Ordinance	Yes	Mitigation strategies, capability assessment
Building and Zoning Codes and Ordinances	Yes	Development trends; Future growth, capability assessment, mitigation strategies
Mutual Aid Agreements	Yes	Assessing vulnerabilities, determine assets added to disaster relief and response.
State Hazard Mitigation Plan	Yes	Risk assessment, review of recommended strategies
Land Use Maps	Yes	Assessing vulnerabilities; Development trends; Future growth
Critical Facilities Maps	Yes	Locations
Community Wildfire Protection Plan	Yes	Evaluation of the wildland urban interface areas of the county, risk to properties, local firefighting resources. It further incorporates a locally devised action plan to mitigate risk from wildland fire.
Soil Survey for Lincoln and Wilkes	Yes	Physical Characteristics of the County
Flood Insurance Study	Yes	Review for historical Data and Information
Hazard Risk Analyses Supplement to the Wilkes County Joint Hazard Mitigation Plan Provided by The Polis Center	Yes	Assessing vulnerabilities; Mitigation strategies, risk assessment
CSRA Regional Plan 2035	Yes	Development trends; Future growth, regional concerns and data

Existing planning mechanisms	Reviewed (Yes/No)	Method of use in Hazard Mitigation Plan
Flood Mitigation Assistance Plan	No	The county does not have a Flood Mitigation Assistance Plan.

The committee held nine meetings over a 20-month period to guide the development of the plan. Individual jurisdictions and/or agencies were contacted, as information was needed. The committee was responsible for developing the mission statement, as well as the goals, objectives, and action steps identified in the plan. The committee researched previous hazard information in the areas of earthquakes, flooding, wildfires, tornados, winter storms, hurricanes, high winds, dam failure, lightning, hail, and drought. However, some hazards were eliminated due to their low level of risk. Committee members collected critical facilities information based on their area of expertise or jurisdiction. The RC was responsible for assessing vulnerability and estimating potential losses from the information collected. Potential losses include people, structures/properties, infrastructure, and other important community assets.

Table 1.5 provides the dates and synopsis of committee meetings. All meetings were open to the public and meeting notices posted at all governmental offices. Of the six meetings, four were advertised in *The News-Reporter*, the County's legal organ. This is the most efficient means to disseminate information to residents and organizations located in the county. In order to meet the requirement to afford an opportunity for neighboring communities, local and regional agencies, businesses, academia and other private and non-profit interests to be involved in the planning process, invitations were extended by email. Invitations were extended to the following counties: Burke, Columbia, Glascock, Hancock, Jefferson, Jenkins, Lincoln, Wilkes, Richmond, Taliaferro, Warren, and Washington including all municipalities located within the counties. It is noted that no comments or feedback was provided by the public. Copies of correspondence, emails and advertisements are in Appendix E.

Table 1.5

Meeting Date	Purpose of Meeting
August 18, 2016	Advertisement ran in *The News-Reporter* for public meeting for Kick-off with GEMA
August 29, 2016	To solicit public input on the goals and objectives of the Plan Update. Laura Radford, GEMA provided a presentation about the purpose and need of the plan along with changes to the process since the 2013.
August 24, 2017	To begin hazard collection and critical facilities adjustments. Discuss the new requirements from the update and to review STAPLEE worksheet as it applied to mitigation strategies
December 12, 2017	Ensured all data collected was correct for critical facilities. It also covered in detail the devastation and after effects of the ice storm.
February 16, 2018	Reviewed plan, mitigation strategies and HASUZ information.
	All EMA meet to review the plan and HASUZ report
March 22, 2018	An advertisement ran in *The News-Reporter* advertising the public meeting on March 28, 2018 for public input before submission of plan to GEMA
March 28, 2018	This meeting was to ensure the public had a final opportunity to provide input before submission to GEMA for review.

Meeting Date	Purpose of Meeting
April 24, 2018	This meeting was to review the final plan to ensure all information was correct.
TBD *(will add date once approved by FEMA)*	Advertisement ran in *The News-Reporter* for public review period and the final meeting.
TBD *(will add date once approved by FEMA)*	Held final meeting after FEMA Approved Pending Adoption (APA), The final meeting was held after the review period to ensure that the public was afforded the opportunity provide input.

SECTION III. ORIGINAL PLAN REVIEW AND REVISION

The Federal Disaster Mitigation Act of 2000 requires an update to the Pre-Disaster Mitigation Plan every five years. The EMA Director was responsible to meet this requirement. The committee, with the assistance of the RC, was involved in the planning process to ensure thorough data collection. All members of the committee were responsible for the evaluation of 2013 plan. During the review process, the committee noted mitigation accomplishments, updated and prioritized mitigation projects, added additional hazard information, developed new goals and objectives, solicited input from the public and made any needed or required revisions. The evaluation included analyzing any changes in the needs and/or capabilities of Wilkes County, Rayle, Tignall, and Washington.

SECTION IV. ORGANIZATION OF THE PLAN

The estimated time to complete the plan update was approximately 20 months. Plan completion was identified by adoption of resolution by all jurisdictions. The update contains a Hazard, Risk, and Vulnerability (HRV) Assessment describing the natural hazards typically occurring within the county, as well as a review of all mitigation goals, objectives, and related courses of action. In addition, plan implementation and maintenance were reviewed, which includes methods to provide opportunities for public involvement.

The hazards included in this plan are considered to have the highest probability of occurrence, vulnerability, potential loss/damages, and highest frequency of occurrence. The plan also identifies and prioritizes hazard mitigation opportunities in each vulnerable area based on the input from the committee members, relevant government agencies, local businesses, and Wilkes County citizens.

SECTION V. LOCAL HAZARD RISK AND VULNERABILITY, SUMMARY LOCAL MITIGATION PLANNING GOALS OBJECTIVES

The committee, early in the update process, established a set of goals and objectives in order to ensure the effectiveness of this plan. These goals and objectives established the paradigm for the planning process and proved very successful by the many accomplishments of the 2013 plan update. These goals and objectives are as follow:

- To actively involve and gain support from Rayle, Tignall, Washington and unincorporated

Wilkes County for the reduction of disasters in our community.

- Prioritize identified mitigation projects.
- Seek and implement any grant funding for the reduction of disasters in Wilkes County, Rayle, Tignall, and Washington.
- Monitor, evaluate, and update the progress of the plan as needed.
- To form partnerships among local, state, and federal agencies to make Wilkes County more resistant to the effects of disasters.
- Strengthen our communities against the impacts of disasters through the development of new mitigation strategies and strict enforcement of current regulations that have proven effective.
- Reduce and where possible eliminate repetitive damage, loss of life and property from disasters.
- Bring greater awareness throughout the community about potential hazards and the need for community preparedness.
- To further enhance common mitigation projects and goals between Wilkes County, Rayle, Tignall, and Washington.

An HRV assessment was accomplished by compiling and reviewing historical data on the location of specific hazards, the value of existing structures/properties in hazard locations, and analyzing the risk to life, property and the environment that could potentially result from future hazard events. The committee accomplished the HRV goals and objectives by completing the following steps:

Inventory of Critical Facilities: Critical facilities are crucial for providing essential services necessary for preserving the safety and quality of life of its residents. In addition, these facilities fulfill important public safety, emergency response, and/or disaster recovery functions. All critical facilities were added to the Georgia Mitigation Information System (GMIS). Critical facilities for Wilkes County, Rayle, Tignall, and Washington were identified, updated, mapped, and illustrated in Appendix A.

Hazard Identification: Maps and historical data sources were studied and reviewed to identify the geographic extent, intensity, and probability of occurrence for various hazard events. The 2013 committee identified five major hazards that have the potential to affect Wilkes County: flooding, drought, wildfire, severe weather (tornados, tropical storms, thunderstorms) and winter storms. The update committee reviewed current hazard data and added hail to the already identified hazard. Appendix D provides an updated comprehensive hazard.

Profiling Hazard Events: The committee analyzed the causes and characteristics of each hazard, and its effect on Wilkes County in the past to determine what segment of the population and infrastructure has historically been vulnerable to each specific hazard. A discussion of each hazard's updated profile is in Chapter 2.

Vulnerability Assessment: This step was accomplished by comparing each previously identified hazard with the inventory of affected critical facilities and population exposed to each hazard. An updated Worksheet #3a is provided in Appendix D.

Estimating Losses: Using the best available data, tax digest data, parcel maps and GMIS reports and maps for critical facilities allowed the committee to estimate damages and financial losses that might occur in a geographic area. Describing vulnerability in terms of dollar losses provides the county with a common framework in which to measure the effects of hazards on critical facilities. All information in this section has been updated *(Appendix A and Appendix D).*

Mitigation Goals and Objectives: After ensuring that all interested persons had been given ample opportunity to contribute to strategy development, mitigation action steps were next given priority status by committee members. To evaluate priorities, committee members used as a guide a planning tool prepared by FEMA known as STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria. Each mitigation strategy step was evaluated using STAPLEE criteria as the guiding principle to identify those steps best for Wilkes County. Steps were ranked as high priority, medium priority, or low priority. Past occurrences of disasters and historical trend data aided committee members in assigning priorities.

SECTION VI. MULTI-JURISDICTIONAL SPECIAL CONSIDERATIONS

Rayle, Tignall, and Washington were notified in June of 2016 of the requirement concerning the 2018 update to the 2013 plan. Representatives from Wilkes County, Rayle, Tignall, and Washington have worked collectively over the past months to gather data that included researching old records, newspaper articles, databases, historical data, past and present flood plain data, and technical information for the plan. Collected data was forwarded to the RC for review and plan development. The committee held subsequent meetings in an effort to ensure that all information was correct and that all agencies and organizations input was included.

The EMA Director led activities for mitigation planning countywide. The committee goals are to work in partnership with municipal partners toward a common mitigation strategy that significantly reduces vulnerability of natural disasters. Most natural threats overlap jurisdictions and are all susceptible to their affects. Wilkes County, Rayle, Tignall, and Washington share the same passion and desire for protecting and reducing risk through the mitigation projects. Specific risks and areas were identified through working relationships and data collection from all areas of the county and are identified in this plan.

SECTION VII. ADOPTION, IMPLEMENTATION AND MONITORING AND EVALUATION

Adoption Date

Table 1.6

Jurisdiction	Adoption Date
Wilkes County	*(will add after FEMA Approves)*
Town of Rayle	*(will add after FEMA Approves)*
Town of Tignall	*(will add after FEMA Approves)*
City of Washington	*(will add after FEMA Approves)*

The plan was submitted to GEMA for review and then to FEMA for approval. Wilkes County, Rayle, Tignall, and Washington served as active participants throughout the planning process and

identified mitigation goals, objectives, and actions specific to their jurisdiction. Their respective governing bodies have formally adopted the 2018 update after GEMA and FEMA approval. The plan is intended to be implemented into policy and to enhance state and federal recommendations for the mitigation of natural hazards in the following ways:

- Substantially reduce the risk of life, injuries, and hardship from the destruction of natural disasters.
- Create awareness to the public about the need for individual preparedness and about building safer, disaster resistant communities.
- Develop strategies for long-term community sustainability during community disasters.
- Develop governmental and business continuity plans that will continue essential private sector and governmental activities during disasters.

FEMA publishes many guidance documents for local governments for mitigating natural disasters. The plan fully recognizes, adopts, incorporates, and endorses the following principals.

- Develop a strategic mitigation plan for Wilkes County.
- Enforce current building codes.
- Develop incentives to promote mitigation.
- Incorporate mitigation of natural hazards into land use plans.
- Promote awareness of mitigation opportunities throughout Wilkes County community on a continual basis.
- Identify potential funding sources for mitigation projects.

The private sector is often an overlooked segment of the community during disasters. It is vital that this sector of a community is included in mitigation efforts that are consistent with state and federal recommendations as such:

- Develop mitigation incentives with insurance agencies and lending institutions.
- Encourage the creation of a business continuity plan for the continuance of commerce during disasters.
- Collaborate with businesses in effort to communicate with customers about the community hazards and possible solutions.

Individual citizens must be made aware of the hazards they face and educated on how to protect themselves and their property. They must be shown mitigation is an important part of reducing loss of life and property in their community. The publics support is critical to the success of any mitigation effort. The Wilkes County Plan supports the following FEMA recommendations regarding individual citizens:

- Become educated on the hazards that your community and you may face.
- Become part of the process by supporting and encouraging mitigation programs that reduce vulnerability to disasters.
- That individual responsibility for safeguarding you and your family prior to a disaster is essential.

Chapter IV. Plan Integration and Maintenance details the formal process that will ensure that the plan remains an active and relevant document. The plan maintenance process includes monitoring and evaluating the plan annually, and producing a plan revision every five year. Additionally, Wilkes County will develop steps to ensure public participation throughout the plan maintenance

process. Finally, this section describes how Wilkes County will incorporate the mitigation strategies identified in this plan into other relevant planning documents such as the Wilkes County Joint Comprehensive Plan, Short-Term Work program (STWP) and Local Emergency Operations Plan (LEOP).

SECTION VIII. COMMUNITY DATA

Political Boundaries - Wilkes County

Wilkes County

GA Department of Community Affairs Region 7

Georgia

History: Wilkes County, the 8th County formed in Georgia, was created in 1777 and incorporated on February 25, 1784. It is named for John Wilkes, a member of the British Parliament who supported the colonies' cause. The world's first cotton gin was developed by Eli Whitney on a Wilkes County plantation in 1794. Wilkes County is a rural county covering 474 square miles. Wilkes County is one of 13 counties that comprise the Central Savannah River Area (CSRA). There are three incorporated municipality in Wilkes County; Rayle, Tignall, and Washington.

Government: Wilkes County operates under a commission-based system of government in which four commissioners and commission chair are elected to four-year terms. Other County officials are the County Administrator, County Clerk, County Attorney, and Roads and Bridges Supervisor.

The Town of Rayle, which operates a Mayor and Town Council-based system of government with three elected council members. The additional officials in Rayle include the City Clerk, Water Superintendent and Fire Chief.

The Town of Tignall, which operates a Mayor and Town Council-based system of government with five elected council members. The additional officials in Tignall include the City Clerk, City Attorney, Police Chief, Fire Chief, Public Works Director, and the Municipal Court Clerk.

The City of Washington, which operates a Mayor and City Council-based system of government with six elected council members. Other officials charged with presiding over activities are the City Administrator, City Clerk, City Attorney, Finance Officer, Purchasing Agent, Personnel

Director, Police Chief, Fire Chief, City Engineer, Electrical Superintendent, Public Works Director, Code Enforcement, Municipal Court Judge and Clerk, and Downtown Manager.

Demographics: Presently, Wilkes County has a population of 10,593 persons. The two tables below provide a comparison of the jurisdictions and a historical prospective of the population trends within the county.

Table 1.7

Category	Wilkes County	Rayle	Tignall	Washington
Population	10,593	199	546	4,134
Number of Households	4,263	69	240	1,721
Average Household Size	2.40	2.71	2.28	2.34
Race - White	53.0%	47.2%	49.1%	36.0%
Race - Black	42.8%	44.7%	49.6%	60.5%
Race - Hispanic	3.4%	4.5%	1.3%	1.5%
Race - Other	0.8%	3.6%	0.0%	2.0%
Median HH Income	10,593	199	546	4,134
Per Capita Income	$19,129	$13,301	$19,166	$18,122

Source: 2010 -US Census Bureau, 2016 American Community Survey

Table 1.8

Community	Population				Growth (%)		
	1980	**1990**	**2000**	**2010**	**1980-1990**	**1990-2000**	**2000-2010**
Wilkes County	10,951	10,597	10,687	10,593	-3.20%	0.80%	-0.90%
Rayle	4662	4279	4,295	4,134	-8.20%	0.40%	-3.70%
Tignall	733	711	653	546	-3.00%	-8.20%	-16.40%
Washington	177	107	139	199	-39.50%	30%	43.20%

Source: US Census Bureau

Economy: In the year 2016, the average weekly wage for employment sectors in Wilkes County was $618, compared to the statewide average of $961. The county's per capita income was $29,758. The current unemployment rate is 5.1 percent as of November 2017.

In 2016, the total number of employees located in Wilkes County was 3,954. Of the total work force, 74 percent were employed in the private service followed by 26.0 percent in the government sector. In 2016, 22.9 percent of the population live below poverty level.

The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. The table below provides a list of jobs, number of establishments and jobs along with average weekly wages per job for 2016 in Wilkes County.

Table1.9

Annual Industry Distribution of Jobs and Average Wage in 2013 (NAICS)	Establishments	Jobs	Weekly Average Wage Per Job
Total Covered Employment and Wages	**238**	**2994**	**618**
Total Private Sector	**210**	**2178**	**618**
Total Government	**28**	**766**	**618**
Agriculture, forestry, fishing, hunting	18	85	836
Mining, Quarrying, and Oil and Gas Extraction	1	*	*
Construction	12	177	996
Manufacturing	12	626	680
Wholesale trade	10	84	895
Retail trade	45	353	403
Transportation, warehousing	11	57	499
Utilities	1	*	*
Information	2	*	*
Finance and Insurance	11	102	780
Real Estate, rental, leasing	5	*	*
Professional, Scientific, and Technical Services	15	37	750
Management of Companies and enterprises	0	0	0
Administrative and Support and Waste Management and Remediation Services	8	54	852
Educational services	0	0	0
Health care, social assistance	20	279	329
Arts, entertainment, recreation	0	0	0
Accommodation and food services	18	180	265
Other services, except public administration	15	53	446
Unclassified-Industry not assigned	6	5	698

Source: Georgia Department of Labor ** Industry group does not meet criteria for disclosure*

Climate: According to the National Weather Service, Central Georgia where Wilkes County is located experiences all four seasons. Wilkes County, GA, gets 47.4 inches of rain per year. The US average is 37. Snowfall is 0.3 inches. The average US city gets 25 inches of snow per year. The number of days with any measurable precipitation is 97. On average, there are 218 sunny days per year. The July high is around 90 degrees and the January low is 31. Our comfort index, which is based on humidity during the hot months, is a 30 out of 100, where higher is more comfortable. The US average on the comfort index is 44.

Physical Features: Wilkes County has a total land area of 474 square miles in east central Georgia, located 95 miles east of Atlanta between Athens and Augusta. It is located along the southern border of the Southern Piedmont geological region, also known as the Southern Piedmont Major Land Resource Area (MLRA). The Southern Piedmont stretches from the Sand Hills to the foot of the Appalachian Mountains and covers nearly 10.5 million acres. Elevation ranges from 500 to 1500 feet above sea level. Topography is gently rolling to steep. The soils are

underlain by acid crystalline and metamorphic rocks. Dominant soils of the Southern Piedmont have mostly clayey subsoils and kaolinitic mineralogy. Soils of the Piedmont are acid and low in nitrogen and phosphorus. In many cases, much of the original topsoil has been eroded leaving the clayey subsoil exposed.

Soils of the Piedmont are acid and low in nitrogen and phosphorus. In many cases, much of the original topsoil has been eroded leaving the clayey subsoil exposed. The less steep slopes and areas where the topsoil has not been completely eroded are adapted to corn, cotton, soybean, and grain sorghum production. Although row crops are productive in this region, the area is better adapted to pasture production. It is important to control erosion when you cultivate these soils.

Wilkes County is located within the Savannah River drainage basin. Within this basin, portions of three major watersheds can be found: the Broad River Watershed across the northern third of the county, the Upper Savannah Watershed in the central and eastern portion of the county, and the Little River Watershed across the county's southern third. In Wilkes County, wetlands are adjacent to Clarks Hill Lake, along the creeks that run throughout the County and in the vicinity of small ponds that dot the county's landscape. A map of the soil types, wetlands and flood plains are located in Appendix A.

A survey of Wilkes County soil associations was conducted and approved by the Soil Conservation Service in 2006 and can be found at the following URL: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/georgia/GA645/0/Lincoln&Wilkes.pdf A map of the soil types, wetlands and flood plains are located in Appendix A.

Transportation

Vehicle Traffic: Most streets in Wilkes County are classified as rural local roads. US highways 78 and 378 along with state highways 10, 17, 44, 47 and 80 connect the cities in Wilkes County to the surrounding counties. Currently Wilkes County has no mass transit system.

Table 1.10

Mileage by Route and Road System Report 445 for 2016			
	Total Road Mileage (2016)	Lane Mileage	Vehicle Miles Traveled (VMT)
State Route	103.68	225	242,708
County Road	417.68	835	89,687
City Street	43.78	87	19,717
Total	**565.14**	**1,147**	**352,112**

Source: Georgia Department of Transportation, Office of Transportation Data, "445 Series Reports."

Public Transportation: Public transportation is available to County residents through the Section 18 Program and is not a widespread system found in urban areas. This federally funded program apportions transit assistance funds to rural areas and places having fewer than 50,000 residents, administered by the county and the Georgia Department of Transportation (GDOT). Public buses are to assist the elderly, providing transportation to senior citizens centers for congregate meals and to deliver meals. There is no public transportation system that services the residents of Wilkes County.

Rail Traffic: Georgia Woodlands Railroad, owned by OmniTRAX of Denver, Colorado, is a 17-mile short line railroad that terminates in Washington. The spur connects Wilkes County with CSX Transportation's Atlanta to Augusta mainline and provides distribution services for rural and industrial businesses in Wilkes, Taliaferro and Warren Counties. Lumber, wood chips, pulpwood, plastic pellets, fertilizer, and grain are the major commodities handled by this railroad. Operation and daily maintenance of the spur in Washington is handled locally. Currently Wilkes County is not served by passenger rail.

Air Service: Washington-Wilkes Airport, located on Highway 78 five minutes from downtown Washington, is a Level II airport owned and operated by the city of Washington. Commercial air service is available in Augusta's Bush Field and at Atlanta's Hartsfield International Airport.

Utilities

Electricity: Residential electrical service in Wilkes County is provided by three companies: Georgia Power, Rayle Electric Membership Corporation, and the City of Washington.

Natural gas: Wilkes County's natural gas is supplied by Atlanta Gas Light Company. Natural gas is available in industrial quantities on both a firm and an interruptible basis.

Water and Sewer: The City of Washington and the Towns of Rayle and Tignall operate independent municipal water systems. All three communities serve primarily residential and commercial customers within the municipal limits.

The city of Washington's water system is by far the largest and provides water from residential to industrial clients in the unincorporated portion of the County just south of the city in addition to the residential customers inside the city limits. The city of Washington's system is dependent on surface water sources for its water supply.

Because of their small customer base, the water systems for Rayle and Tignall are supplied exclusively by groundwater sources. With some limited exceptions, residents within the unincorporated portions of Wilkes County rely on private wells for potable water.

The City of Washington and the Town of Tignall own and maintain their own municipal sewage and waste water treatment systems. Both systems service properties principally within the municipal limits, but also include some customers in adjacent portions of the unincorporated county. Most property owners in Rayle and unincorporated Wilkes County rely on septic systems to meet their sewerage needs.

Solid Waste: Solid waste generated by the residents of Rayle, Tignall and Wilkes County may be disposed of throughout the County at many unstaffed green-box collection sites. The City of Washington provides municipal solid waste collection for all residents of the city. All four communities consolidate their waste at the Wilkes County Transfer Facility. This consolidated waste is then transported by Republic Services to the Oak Grove MSW landfill located in Winder, Georgia.

Communications: Wilkes Telephone Company is the county's landline phone service providers and provides broadband internet services. Broadband cable is available from Comcast. The County has many media outlets that consist of print, radio, and television. Local print media consists of *The News-Reporter* (which serves as the legal organ of the county) and *The Augusta Chronicle*. Wilkes County is served by 19 FM radio stations. All metro Augusta television stations broadcast in Wilkes County; they are WRDW, WJBF, WAGT, and WFXG.

Fire and Emergency Services

Response: Enhanced 911 Service (E-911) is available 24-hours a day throughout the county and is operated and coordinated by the Wilkes County EMA. CodeRED® is a new County service by which County officials can notify residents by telephone about emergencies or critical community alerts. The system is capable of sending messages only to people affected or in the case of a widespread emergency like a tornado, to the County's entire population.

Fire and Rescue: Wilkes County Fire Service -- Wilkes County fire protection services are provided by fire departments in three of the four Washington-Wilkes jurisdictions. The vast majority of countywide fire service personnel are volunteers. The Wilkes County Fire Department has seven stations in the county. Its equipment includes six pumpers, eight tankers, two knockers, and one Air truck. It is operated by 70-80 volunteer firefighters. The County has an Insurance Services Organization (ISO) rating of 4-9.

Rayle relies on the county to provide fire protection. Tignall Fire Department provides volunteer fire service within its municipal limits; it is augmented by Wilkes County's fire service whenever there is need. Towns of Rayle and Tignall each have one station. Tignall has two pumpers, one knocker and one supply van. Tignall has an ISO rating of three (3) inside the town limits of Tignall. Town of Rayle has one pumper and an ISO rating of seven (7) inside the town limits of Rayle.

Washington Fire Department provides service to the city of Washington. The City of Washington has one fire station. Washington Fire Department has 11 full time paid personnel and 19 volunteer firefighters. Washington has two pumpers, one ladder truck, one rescue, one Chief's truck, and one RVT with an ISO rating of three (3) inside the city limits.

EMS services are provided to all residents countywide by Wilkes County. The EMS service is staffed by 12 full-time and 17 part-time professionals with six ambulances, one administrative vehicle, and three off-road vehicles.

Law Enforcement: The Wilkes County Sherriff's Office provides law enforcement services for the entire county. The Wilkes County jail is operated by the Sheriff's Office and both are located at the Wilkes County Law Enforcement Center. The Wilkes County Sheriff's Office employs 23 full-time deputies and five part-time deputies in the law enforcement division. They have 16 full-time jailers and four part-time jailers in the detention center. The office is served by 31 vehicles. Both divisions are supported by one administrative staff member.

CHAPTER II. NATURAL HAZARD, RISK AND VULNERABILITY (HRV)

The committee identified all-natural hazards that could potentially affect Wilkes County, Rayle, Tignall, and Washington utilizing FEMA Worksheet #1 (Appendix D). Task A of Worksheet #1 instructed committee members to research newspapers and other historical records, existing community plans and reports, as well as internet websites to determine which hazards might occur in Wilkes County. Task B then narrowed the list to only hazards most likely to impact the county by reviewing hazard websites to determine if Wilkes County is located in a high-risk area.

Initially, the committee found that droughts, earthquakes, hurricanes, extreme heat, severe winter storms, tornados, wildfire, dam failure and windstorms might affect Wilkes County. However, the committee later concluded that some of these hazards did not pose a significant threat. Because of the planning process, the committee determined that five natural hazards pose a direct, measurable threat: flooding, drought, wildfire, severe weather (to include tornados, tropical storms, thunderstorm winds, lightning and hail), and winter storms. The committee profiled each of these hazards using FEMA worksheet #2 and #3a, which included obtaining a base map and recording hazard-event profile information. Of the five hazards mentioned, the entire County is exposed to four: severe weather, winter storms, wildfire and drought while flooding is isolated to select areas. Each of these potential hazards is addressed with relevant supporting data.

Chapter II. Section	Updates to Section
I. Natural Hazard Flood	Updated events, added critical facilities to GMIS, updated tax information. Recalculated hazard frequency data. Added information from Hazus-MH analyses
II. Natural Hazard Drought	Updated events, added critical facilities to GMIS, updated tax information. Recalculated hazard frequency data.
III. Natural Hazard Wildfire	Updated events, added critical facilities to GMIS, updated tax information. Recalculated hazard frequency data.
IV. Natural Hazard Severe Weather	Updated events, added critical facilities to GMIS, updated tax information. Hail was added to hazards. Recalculated hazard frequency data. Added information from Hazus-MH analyses.
V. Natural Hazard Winter Storms	Updated events, added critical facilities to GMIS, updated tax information. Recalculated hazard frequency data.
VI. Dam Failure	Updated events, added critical facilities to GMIS, updated tax information. Recalculated hazard frequency data.
VII. Earthquake	Updated events, added critical facilities to GMIS, updated tax information. Recalculated hazard frequency data.

SECTION I. FLOODING

A. Hazard Identification: Flood plains are relatively flat lands that border streams and rivers that are normally dry, but are covered with water during floods. The susceptibility of a stream to flooding is dependent upon several different variables. Among these are

topography, ground saturation, rainfall intensity and duration, soil types, drainage, drainage patterns of streams, and vegetative cover. A large amount of rainfall over a short time period can result in flash flood conditions. A small amount of rain can also result in floods where the soil is saturated from a previous wet period or if rain is concentrated in an area of impermeable surfaces such as large parking lots, paved roadways, etc. Topography and ground cover are contributing factors for floods where water runoff is greater in areas with steep slopes and little or no vegetation. The severity of a flood is usually measured in terms of depth of flooding.

Flooding occurs when the volume of water exceeds the ability of a water body (stream, river, or lake) to contain it within its normal banks. Floodplains serve three major purposes: Natural water storage and conveyance, water quality maintenance, and groundwater recharge. These three purposes are greatly inhibited when floodplains are misused or abused through improper and unsuitable land development. For example, if floodplains are filled to construct a building, valuable water storage and recharge areas are lost. This causes unnecessary flooding in previously dry areas and can damage buildings and other structures. Wilkes County and the City of Washington participate and will continue to participate in the NFIP. Rayle and Tignall are identified as non-flood prone communities according to the Flood Insurance Study and do not participate in the NFIP. The following table provides information about each jurisdictions participation level.

Jurisdiction	Init FHBM Identified	Init. FIRM Identified	Curr. Eff. Map Date	Reg-Emer Date	Sanction Date
Wilkes County		07/22/2010	07/22/2010	07/22/2010	
Washington	06/27/1975	05/01/1987	07/22/2010	05/01/1987	
Rayle	Non-flood prone community				
Tignall	Non-flood prone community				

Source: FEMA Community Status Book

B. Hazard Profile: Severe flooding within Wilkes County is a relatively infrequent event. The county has 48 rivers/streams and 14 reservoirs. Ninety-five percent of the land in Wilkes County has slopes between two and ten percent. Steeper slopes of 10 to 25 twenty-five percent compromise only six percent of the county and are located on the hillsides of the piedmont section to the north. Slopes of less than two percent compromise three percent of the county total land area and are located in the floodplain. The committee examined historical data from the NCEI, USGS, SHELDUS™, past newspaper articles and conducted interviews on the effects of past flooding events. In the last 67 years 14 flooding events were recorded, all occurred in the unincorporated area of the County. The table below is a result of information gathered from interviews, newspaper articles, and the NCEI and SHELDUS™ databases.

Date	Fatality	Inj	PrD	CrD	Event Narrative
10/04/1995	WILKES			0.00K	
06/11/2001	WILKES	0	0.00K	0.00K	The remnants of Tropical Storm Allison with 10 inches observed in 24 hours on the Little River five miles southeast of Washington in Wilkes county. Two to three-

Date	Fatality	Inj	PrD	CrD	Event Narrative
					day rainfall totals exceeded 10 inches in several places in this area. The Little River crested at 28.4 feet, exceeding the previous highest stage ever recorded of 26.4 feet.
06/12/2001	WILKES	16	16.00k	0.00K	The Wilkes County Emergency Manager reported that high water caused minor damage to a couple of roads and culverts and washed out a few gravel roads.
09/14/2002	WILKES	0	0.00K	0.00K	Tropical Storm Hanna moved caused heavy rainfall, flooding was minimal.
09/06/2004	WILKES	0	0.00K	0.00K	The remnants of Hurricane Frances heavy rainfall caused some minor flooding of roads.
09/16/2004	WILKES	0	0.00K	0.00K	The remnants of Hurricane Ivan Average rainfall of 5-8 inches causing some flooding in the county
09/27/2004	WILKES		5.00k	0.00K	The remnants of Hurricane Jeanne Rainfall of 4-6 inches, but flooding problems observed were minor.
07/06/2005	WILKES	0	0.00K	0.00K	The remnants of Tropical storm Cindy brought strong bands of thunderstorms with damaging winds, flash flooding.
08/08/2005	WILKES	0	1.50K	0.00K	Thunderstorms persisted over Wilkes county for 3 hours minor flooding was reported on some roads. The 911 Center reported a couple of inches of water flowing across some roads in the western portion of the county. Damage was minor limited to debris cleanup.
03/01/2009	FICKLIN	1	0.00K	0.00K	Flooding was observed along the Little River. Damage was confined to minor debris removal.
03/29/2009	LITTLE RIVER	1	0.00K	0.00K	Little River west of Washington exceeded the flood stage of 22 feet. Damage was confined to minor debris clean up.
04/03/2009	LITTLE RIVER	1	0.00K	0.00K	The USGS stream gage on the Little River south of Washington briefly exceeded its flood stage of 19.0 feet. Minor flooding was observed along the woodlands and fields near the river. Damage was confined to minor debris removal.
09/21/2009	BRICK HOUSE	5	0.00K	0.00K	Kettle Creek just south of Washington reached its flood stage of 14 feet. Monetary damage was confined to minor debris removal from areas adjacent to the creek.
12/30/2015	Wilkes County		400k		The water is flowing fast, causing culverts to wash away. We got bridges underwater, roads underwater, and we got one bridge that is 7 feet underwater. If you look at it, it might look like one or two inches, but its 7 feet underwater. eight roads were closed. Not only did it rain, it poured, and flooded. Probably out of 240 miles of dirt road, every one of them was damaged or had some type of flooding over the roads or over the bridges,"
Total		24	422.5K	0.00K	

Source: NCEI, SHELDUS and The News-Reporter

The pictures show the effects of the flood event from December 2015 resulted in the 240 miles of dirt road in the county all of them was damaged or had some type of flooding over the roads or over the bridges. Culverts were washed away while bridges and roads were underwater. The damage was reported at $400,000.

Most flood events resulted in flash flooding which washed out several roads and wooden bridges. Data pinpointing the depth of floodwaters and exact locations of all washed out roads and bridges is not available. While severe flooding within the county is a very infrequent event, there is a potential for flooding. Flash flooding is the most prominent flooding event as riverbanks overflow due to rainfall. The GMIS flood hazard map assigns a flood zone rating of zero for unincorporated parts of the County, Rayle, Tignall and Washington where there are no identified or undesignated flood hazards. A hazard score of four has been assigned for known floodplain areas for unincorporated parts of the County Tignall and Washington.

The magnitude of a major flood event could have approximately 20 percent of the county experiencing some damage from flooding. While data was collected looking at 67 years of data, frequency rate was calculated using a 20-year hazard cycle per guidance from GEMA. . Based on a 20-year hazard cycle the calculated frequency per year predicts Wilkes County has a 70 percent annual chance of a significant flooding event or will experience a flooding event, one every 17 months. No predication can be made for the three incorporated jurisdictions of the county, as no data is available. *See Appendix A, Historical Event Tables, Critical Facilities Reports, and Flood Maps and Appendix D for Section I for Worksheet 3A and Hazard Frequency Tables).*

C. Assets Exposed to Hazard and Estimates of Potential Loss: For determination of assets exposed to risk maps created from FEMA data and available parcel data were used. Based on FIRM, tax digests, and FEMA Worksheet #3a, it was determined that all or a portion of 263 structures/properties valued at less more $20 million and a population of 216 are located in known flood prone areas within the County.

All 263 structures/properties have been identified by federal floodplain maps and/or parcel maps and not all structures/properties will experience damage from floods. The extent of each flood varies according to the amount of rainfall in each area. If a complete loss of the 263 structures/properties located would result in approximately $20 million in damages assuming 100 percent loss, a 75 percent loss would represent approximately $15 million, a 50

percent loss would represent approximately $10 million, and a 25 percent loss would represent approximately $5 million.

The GMIS flood hazard map has the unincorporated areas of the county along with Rayle, Tignall and Washington with a hazard score of zero. A hazard score of three has been assigned to areas in known floodplains in the unincorporated areas of the county and Washington. Rayle and Tignall have no floodplains.

Based on floodplain maps, tax digests, parcel maps and FEMA Worksheet #3a for inventory of assets, the following assets are at risk during a flood event:

- Unincorporated Wilkes County has approximately 263 structures/properties valued at approximately $18 million with a population of 81.
- Washington has approximately 63 structures/properties valued at approximately $2 million with a population of 135.
- Rayle and Tignall have no properties located in or adjacent to flood prone areas.

The table below shows the hazard scores assigned by the GMIS to critical facilities with replacement values content values and daily occupancy.

Jurisdiction	Flood Hazard Score	# of Critical Facilities	Replacement Value $	Content Value $	Occupancy	
					Day	Night
Wilkes County	1	24	$41,761,600	$5,552,017	1392	10
Wilkes County	0	9	$53,726,612	$13,250,000	973	220
Rayle	1	3	$1,238,982	$375,000	2	2
Tignall	1	6	$2,638,200	$715,000	1	1
Washington	0	20	$13,137,403	$1,150,000	60	26
Washington	1	9	$35,250,000	$145,000	0	0
Total		71	$147,752,797.00	$21,187,017.00	2428	259

The GMIS has no repetitive flooding NFIP properties and no NFIP mitigated property. There are no estimates for future structures since future development will be limited in known floodplains. *(See Appendix A and Appendix D).*

FEMA Hazus-MH Version 2.2 SP1 was used to analyze a probabilistic risk assessment of a 1% annual chance riverine flood event (100-Year Flood) for Wilkes County. A copy of the complete report can be found in Appendix C. Land area covered by floodwaters of the base flood is identified as a Special Flood Hazard Area (SFHA). The Wilkes County flood risk assessment analyzed at risk structures in the SFHA. The results of the Riverine 1% Flood Scenario revealed that buildings in Wilkes County are vulnerable to flooding from events equivalent to the 1% riverine flood. The economic and social impacts from a flood of this magnitude can be significant. The Hazus analysis generated information to building loss, essential facility loss, food and shelter requirements and debris because of the Riverine 1% Flood Scenario. The results of this scenario are as follows:

- **Building Losses:** 7 residential buildings and 1 industrial buildings damaged at a loss of $230,545.
- **Essential Facility Losses:** The analysis identified no essential facilities damaged.
- **Flood Shelter Requirements:** The scenario estimates 72 households are subject to displacement. Displaced households represent 217 individuals, of which 12 may require short-term publicly provided shelter.
- **Flood Debris:** Hazus-MH estimates that an approximate total of 1,934 tons of debris might be generated by the flood. The model breaks debris into three general categories:
    - Finishes (dry wall, insulation, etc.) - 763 tons generated;
    - Structural (wood, brick, etc.) – 471 tons generated; and
    - Foundations (concrete slab, concrete block, rebar, etc.) - 700 tons generated.

D. Land Use and Development Trends: The Washington-Wilkes Unified Comprehensive Plan 2014-2024 presents future development scenarios for Wilkes County. There has been little change to the overall county population over the course of the last 10 plus years, or to other demographic sub-categories. With any development, the enforcement of Wilkes County's Land Development Code is essential. All areas within the county that are within or upon a floodplain shall remain unalterable open space and have no impervious surfaces, except where roads and bridges may intersect the floodplain, or where a Section 404 permit has been approved by the U.S. Army Corps of Engineers. In addition, when a major commercial or industrial use requires a large paved parking lot (more than 100 spaces or one acre in area), whichever is greater, the developer may be required to provide unpaved vegetated islands or reserved strips to be integrated within the proposed parking area not to exceed fifteen percent of the area covered by paved surfaces. The Land Use section of the Wilkes County/Washington/Rayle Comprehensive Plan through 2024 indicates that all land use controls should be attentive to environmentally sensitive areas. Specifically, the plan suggests that *Rules for Environmental Planning Criteria* should be considered to provide additional protection to sensitive flood and wetland areas. A copy of the comprehensive plan on land use can be found in Appendix B.

E. Multi-Jurisdictional Concerns: During a natural hazard, it is imperative that all emergency personal can communicate with each other throughout the entire planning area. The County and its jurisdictions have numerous dead spots throughout the area due to topography and lack of adequate communication equipment. The County and its emergency personnel are dependent on the private sector for towers to use for signals. If these towers are ever removed, the County will be without any adequate means to transmit signals. The County, Rayle, Tignall, and Washington are aware of the need to develop communication capabilities that will serve their County. Since flooding has the potential to affect all of Wilkes County, any mitigation steps taken related to flooding should be undertaken on a countywide basis to include Rayle, Tignall, and Washington.

F. Hazard Summary: Based on interviews, data from the NCEI covering 67 years, and the local paper, *The News-Reporter*, there have been fourteen reported flooding events. All of these events took place in the unincorporated areas of the county. These flooding events were

the result of heavy rains. The rainfall resulted in flash flooding, washed out several roads and downed trees and power lines.

The hazard frequency table calculates a 70 percent chance of an annual flooding event countywide. Hazard frequency tables can be found in Appendix D. Severe flooding, although relatively rare in occurrence, has the potential to inflict significant damage in Wilkes County. Mitigation of flood damage requires the community to know where flood-prone areas are, what roads and bridges may be affected, and which facilities fall below anticipated flood levels. The committee recognized the potential for losses caused by flooding and identified it as a hazard requiring mitigation measures.

Based on tax data, parcel and flood maps, all or a portion of 263 known structures/properties valued at approximately $20 million and a population of 216 are located in known floodplains. The committee identified specific mitigation goals, objectives and action items related to flooding, which can be found in Chapter III, Section I.

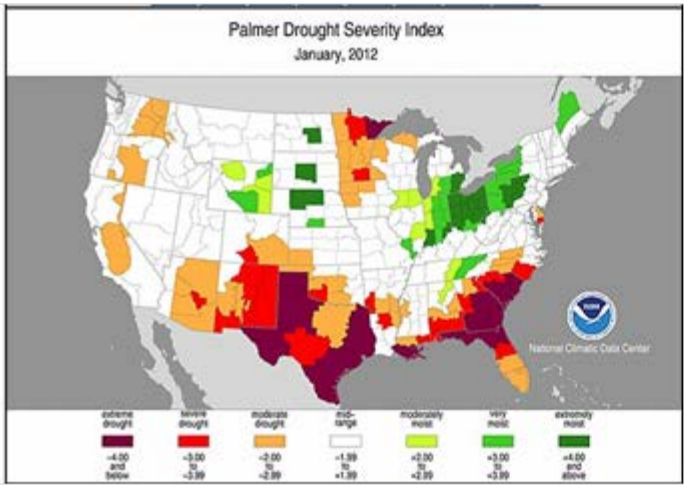
SECTION II. DROUGHT

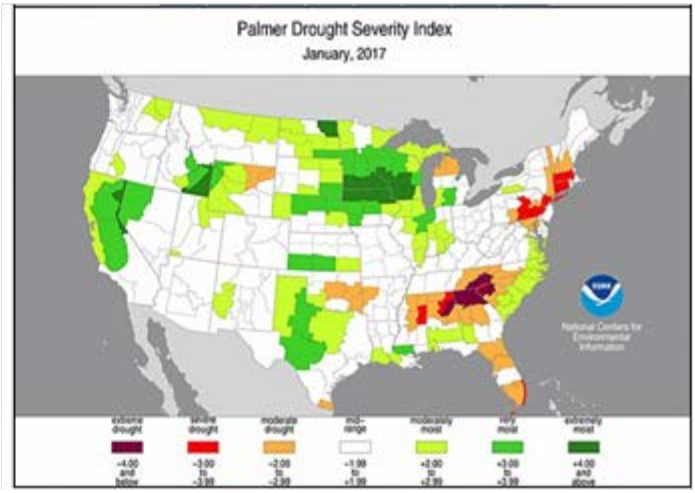
A. Hazard Identification: The committee reviewed historical data from the Palmer Drought Index, NCEI, DNR, USDA and GFC in researching drought conditions. Drought conditions are identified by a prolonged period of moisture deficiency. Climatologists and hydrologists use five indicators of drought: rainfall, soil moisture, stream flows, lake levels and groundwater level. Drought conditions affect the cultivation of crops as well as water availability and water quality. Drought is also a key factor in wildfire development. Wildfire will be addressed in a separate HRV.

B. Hazard Profile: Drought is not spatially defined and has the potential to affect the entire planning area equally. Wilkes County's consist of 474 square miles with 4.6 of these miles being water. The county is comprised of 303,360 acres with 96 percent dedicated to agricultural and forestry. According to the USDA 2012 Census of Agriculture 3,335,106 heads of livestock. Agricultural losses due to drought are the primary losses. No critical facilities have sustained any damage or functional downtime due to dry weather conditions.

The Palmer Index is most effective in determining long-term drought, a matter of several months, and is not as good with short-term forecasts (a matter of weeks). NCEI data for surrounding counties and a review of The Palmer Index (from https://www.NCEI.noaa.gov/temp-and-precip/drought/historical-palmers/) reveals there have been 26 drought events.

One of the longest running droughts in recent history began in January 2012 and ended in January 2013. The County was in severe drought conditions from January to July of 2012 and in extreme drought conditions from Augusta 2012 to January 2013. The last drought ran from August 2016 to January 2017. The drought of 2016 the county ranged between a -2.00 (severe drought) and a -4.00 (exceptional drought) on the Palmer Index. The average based on historical data is a -3.00 on the Palmer Index. The maps below show drought conditions for January 2012 and January 2017.

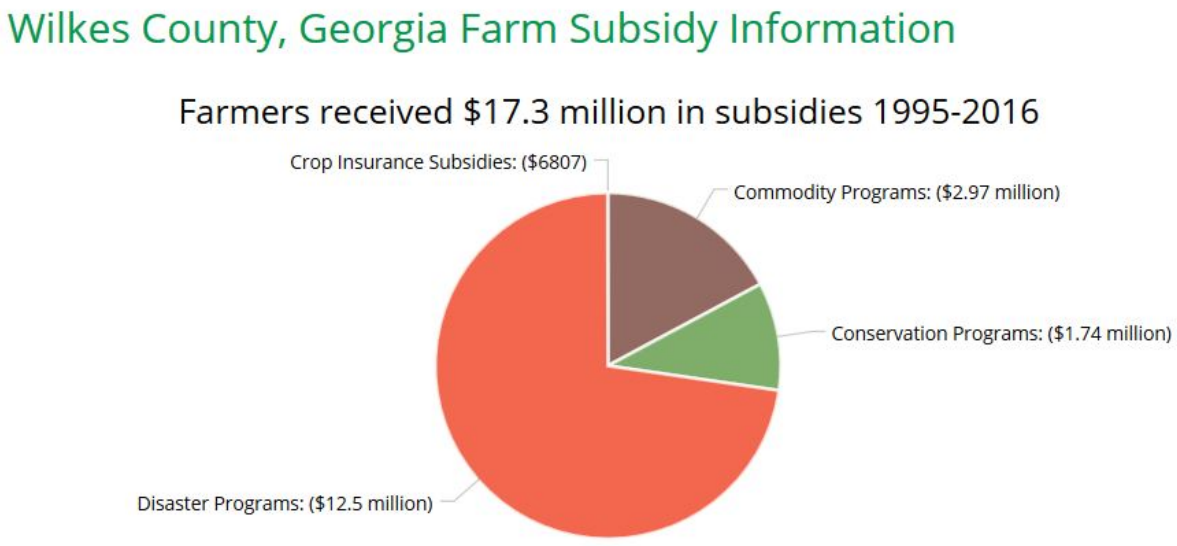




Based on the weekly data from the US Drought Monitor (http://droughtmonitor.unl.edu/MapsAndData/MapsandDataServices/StatisticalData.aspx) from January 2000 to January 2017 the county has experienced the following drought conditions:

- 141 weeks where all or a portion of the county has experienced of D0 - Abnormally Dry;
- 106 weeks where all or a portion of the county has experienced of D1 - Moderate Drought;
- 123 weeks where all or a portion of the county has experienced levels of D2 - Severe Drought;
- 128 weeks where all or a portion of the county has experienced levels of D3 - Extreme Drought; and
- 47 weeks where all or a portion of the county has experienced levels of D4 - Exceptional Drought. (US Drought Monitor and Extent Tables can be found in Appendix A.)

According to the USDA Farm Subsidies Database, there has been a total of $ $12.5 million in disaster assistance from 1995-2016. The pie chart below depicts amounts and type of assistance.



https://farm.ewg.org/progdetail.php?fips=13189&progcode=total_dis

Historical data is only for the county. A severe, prolonged drought would mainly affect the 95 percent of the county that makes up the timber and agriculture business. This could result in loss of crops, livestock and create the conditions for a major wildfire event. This would also have an impact on the incorporated cities, as water restrictions would be enforced. Based on a 20-year hazard cycle history there is a 130 percent chance of an annual drought event for the county as well as Camak. *(See Appendix A, Historical Event Tables, Critical Facilities Reports, and Appendix D for Worksheet 3A and Hazard Frequency Tables).*

C. **Assets Exposed to Hazard and Estimate of Potential Losses:** Drought conditions typically pose little or no threat to structures; however, fires can occur because of dry weather. The greatest threat to assets in the county is to forestry and agricultural properties and livestock. No damage to critical facilities is anticipated because of drought conditions. Crop damage cannot be accurately quantified due to several unknown variables: duration of the drought, temperatures during the drought, severity of the drought, different crops require different amounts of rainfall, and different growing seasons. Based on FEMA Worksheet #3a the potential loss in agricultural and forestry properties for each jurisdiction is:

- Rayle has 29 agricultural/forestry structures/properties valued at approximately $1 million with an estimated population of four (4).
- Tignall has 101 agricultural/forestry structures/properties valued at approximately $4 million with an estimated population of nine (9).
- Washington has 114 agricultural/forestry structures/properties valued at approximately $7 million with an estimated population of thirty-eight (38).
- Unincorporated Wilkes County has 5,975 agricultural/forestry structures/properties valued at approximately $501 million with an estimated population of three hundred and eighteen (318).

There are 6,219 agricultural/forestry properties in Wilkes County valued at approximately $513 million with a population of 369 that are at the greatest risk due to a drought event *(See Appendix A, Historical Event Tables, Drought Extent Tables and Drought Maps and Appendix D for Worksheet 3 A and Hazard Frequency Tables).*

D. Land Use and Development Trends: Wilkes County currently has no land use or development trends related to drought conditions. When drought conditions do occur, all jurisdictions follow the restrictions set forth by the Georgia DNR Drought Management Plan and the Statewide Outdoor Water Use Schedule. The Georgia Water Stewardship Act went into effect statewide on June 2, 2010. It allows daily outdoor watering for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants only between the hours of 4 p.m. and 10 a.m. by anyone whose water is supplied by a water system permitted by the Environmental Protection Division.

The following outdoor water uses also are allowed daily at any time of the day by anyone:

- Commercial Agriculture
- Alternative sources of water (grey water, rainwater, condensate, etc.)
- Irrigation of food gardens
- Irrigation of newly installed or reseeded turf for the first 30 days
- Drip irrigation or soaker hoses
- Hand watering with a shut off nozzle
- Water from a private well
- Irrigation of plants for sale
- Irrigation of athletic fields, golf courses or public recreational turf
- Hydroseeding

Outdoor water uses for any purposes other than watering of plants, such as power washing or washing cars, is still restricted to the current odd/even watering schedule.

- Odd-numbered addresses can water on Tuesdays, Thursdays and Sundays.
- Even-numbered and unnumbered addresses are allowed to water on Mondays, Wednesdays and Saturdays.

Projected changes in land use based on the joint comprehensive plan, has minimal or no change. Limited growth or new development is expected in the County. The vulnerability in terms of future buildings, infrastructure and critical facilities located in the identified hazard areas is not known since there is no planned or approved future development. Thus, it is impossible to determine vulnerability in terms of future buildings, infrastructure and critical facilities. Current and future land-use tables, maps and projections are in Appendix B.

E. Multi-Jurisdictional Concerns: Agricultural losses associated with drought are more likely to occur in the rural, less concentrated areas of the county. Although Rayle, Tignall, and Washington are less likely to experience drought related losses, they should not be excluded from mitigation considerations. Drought creates a deficiency in water supply that affects water availability and water quality. Droughts can and have severely affected private wells,

municipal and industrial water supplies, agriculture, stream water quality, recreation at major reservoirs hydropower generation, navigation, and forest resources.

F. Hazard Summary: Drought is not spatially defined and affects the entire planning area equally. Droughts do not have the immediate effects of other natural hazards, but sustained drought can cause severe economic stress to not only the agricultural interests in Wilkes County, but to the entire State of Georgia. The potential negative effects of sustained drought are numerous. ***Historical data is available only for the county as a whole.*** Based on a 20-year cycle hazard history there is a 130 percent chance of an annual drought event in Wilkes County. In addition to an increased threat of wildfires, drought can affect private wells, municipal and industrial water supplies, stream-water quality, water recreation facilities, hydropower generation, as well as agricultural and forest resources.

In summary, for Wilkes County as a whole, there are 6,219 agricultural/forestry properties valued at approximately $513 million and include 3,335,106 heads of livestock and an estimated population of 369 that have the greatest potential to be damaged by drought. There is a population of 10,593 and approximately 23,215 structures/properties in the county valued at slightly more than $1.1 billion, which could be affected if wildfires break out due to drought conditions. Drought mitigation goals and objectives are in Chapter III, Section III.

SECTION III. WILDFIRE

A. Hazard Identification: A wildfire is any uncontrolled fire occurring on undeveloped land that needs fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, the area's topography and air mass. There are three different classes of wildland fires. A surface fire is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire is usually started by lightning and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires by lightning have a very strong probability of occurring during drought conditions. Drought conditions make natural fuels (grass, brush, trees, dead vegetation) more fire-prone.

B. Hazard Profile: Wilkes County's consist of 474 square miles with 4.6 of the square miles being water. Of the approximate 303,360 acres in the county, 96% are dedicated to agricultural and forestry uses. Given the right weather conditions and variables, wildfire, due to natural causes, creates a potential threat to the lives of residents and property in the planning area. The NCEI has never reported a significant wildfire event in Wilkes County.
The committee reviewed historical data from the GFC, which is not found in the NCEI database, to research wildfire events. The GFC provides wildfire data on manmade and natural wildfire occurrences for the county as a whole and not for individual jurisdictions. This plan will address only natural disasters. According to Georgia Forestry data, from 1957 to 2017, there have been 1,819 fire events burning a total of 6,259 acres for an average extent of 3.4 acres. Of these 1,819 fire events, only 90 were a result of a natural hazard event that burned 659 acres. Based on best available data, the 90-wildfire events due to the natural

hazard of lightning all occurred in the unincorporated areas of the county. There is no data available for the Rayle, Tignall or Washington.

While data was collected looking at 60 years of data, frequency rate was calculated using a 20-year hazard cycle per guidance from GEMA. There were 35 wildfire events during the 20-year hazard cycle predicting a 175 percent chance of an annual wildfire due to a natural hazard event or statistically the county can expect 2.1 wildfires annually as a result of lightning. The drier the condition the more susceptible the county is to wildfire (*See Appendix D).*

- Hazard score of two (low wildfire risk)
  - City of Washington - approximately 98% of the city
- Hazard score of one (very low wildfire risk)
  - Unincorporated areas of the county – approximately 96%
  - City of Washington –approximately 2% of the city
  - Town of Rayle - 100% of the town
  - Town of Tignall – 100% of the town
- Hazard score of zero (no houses, agriculture, water, or city)
  - Unincorporated areas of the county – approximately 4%

C. Assets Exposed to Hazard and Estimate of Potential Losses: While wildfires are more likely to occur in the county outside of the incorporated areas. The committee concluded that wildfires present a threat to all existing buildings, infrastructure and critical facilities since wildfires can spread throughout the county and into the urban areas. Damages due to a wildfire event are more likely to occur in areas of the county where forestry and woodland are prevalent but does have the potential to spread into the incorporated areas and cause extensive damage. FEMA Worksheet #3a located in Appendix D shows the number and types of buildings found in Wilkes County, as well as the value of these structures/properties and their population. The following assets by jurisdiction could potentially be exposed to wildfire hazard.

Jurisdiction	Number of Structure/Properties	Value $	Population
Wilkes County (Unincorporated)	14,836	$846,678,127.50	5,714
Rayle	320	$5,906,852.50	199
Tignall	1,198	$32,787,150.00	546
Washington	6,861	$259,889,980.00	4,134
TOTAL FOR COUNTY	23,215	$1,145,262,110.00	10,593

Source: Wilkes County Tax Assessor

The following table reveals all critical facilities in the county by jurisdiction, number of facilities, hazard score, replacement value, and daily occupancy exposed to wildfire hazard. A complete breakdown of each jurisdiction by hazard can be found in Appendix A.

Jurisdiction	Wildfire Hazard Score	# of Critical Facilities	Replacement Value $	Content Value $	Occupancy	
					Day	Night
Wilkes County	1	20	$11,461,600.00	$2,552,017.00	2,039	14
Wilkes County	2	13	$84,026,612.00	$16,250,000.00	15	3
Rayle	1	3	$1,238,982.00	$375,000.00	0	0
Tignall	1	6	$2,638,200.00	$715,000.00	35	5
Washington	1	10	$30,550,000.00	$95,000.00	99	81
Washington	2	19	$17,837,403.00	$1,200,000.00	240	153
TOTAL		71	$147,752,797.00	$21,187,017.00	2,428	256

According to FEMA Worksheet #3A there are 23,215 structures/properties with a population of 10,593 with a value of slightly more than $1.1 billion worth of assets countywide. If a wildfire started, it is not likely that all of these structures/properties would be affected. *(See Appendix A Historical Event Tables, Critical Facilities Reports and Wildfire Map, and Appendix D for Worksheet 3A and Hazard Frequency Tables).*

D. Land Use and Development Trends: Wilkes County currently has no land use or development trends related to wildfire conditions. Land use codes do provide for fire protection to any proposed major and minor developments connected to the public water supply system, and minimum fire flows shall be computed based on standards promulgated by the Wilkes County Fire Services. For those proposed developments that will not have immediate access to the public water supply system, such standards and computations should be based on the National Fire Protection Association *Standards on Water Supply for Suburban and Rural Fire Fighting*.

E. Multi-Jurisdictional Concerns: Wildfire has the potential to affect the entire county. As a result, all mitigation steps taken related to wildfire should be undertaken by Wilkes County, Rayle, Tignall, and Washington. Also during a natural hazard, it is imperative that all emergency personal can communicate with each other throughout the entire planning area. Another concern is the lack of available data for the county and individual jurisdictions. A database needs to be created and maintained that provides information on all past and future occurring wildfire events.

F. Hazard Summary: Wilkes County consist of 474 square miles with 4.6 of the square miles being water. Of the approximate 303,360 acres in the county, 96% are dedicated to agricultural and forestry uses. Given the right weather conditions and variables, wildfire due to natural causes creates a potential threat to the lives and property of residents in the planning area. According to Georgia Forestry data, from 1957 to 2017, there have been 1,819 fire events burning a total of 6,259 acres for an average extent of 3.4 acres. Of these 1,819 fire events, only 90 were a result of a natural hazard event that burned 659 acres. Based on best available data, the 90-wildfire events due to the natural hazard of lightning all occurred in the unincorporated areas of the county. Based on a 20-year hazard cycle there is a 170 percent chance of an annual wildfire due to a natural hazard event

According to FEMA Worksheet #3A there are 23,215 structures/properties with a population of 10,593 with a value of slightly more than $1.1 billion worth of assets countywide. Mitigation Goals and Objectives concerning wildfires are in Chapter III, Section IV.

The County continues to follow GFC guidelines to service the construction of firebreaks around forests and structures, maintain fuel breaks along abandoned roadbeds, recommend a defensible space (30-ft minimum setbacks) between buildings, and strictly follow guidelines for control burns and permits.

SECTION IV. SEVERE WEATHER, INCLUDING TORNADOS, TROPICAL STORMS THUNDERSTORM WINDS, LIGHTNING, AND HAIL

A. Hazard Identification: The committee reviewed historical data from the county's own weather database, the NCEI, SHELDUS™, newspapers and citizen interviews in researching the past effects of severe weather. The month of February marks the beginning of the severe weather season in the South, which can last until the month of August. Five types of severe weather were identified by the mitigation team: (1) tornados, (2) tropical storms, (3) thunderstorm winds, (4) lightning and (5) hail.

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is spawned by a thunderstorm or the result of a hurricane and is produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Tornados are among the most unpredictable and destructive of weather phenomena and can strike at any time of the year if the essential conditions are present. The damage from a tornado is a result of the high wind velocity and wind-blown debris. The positions of the subtropical and polar jet streams often are conducive to the formation of storms in the Gulf region. The table below shows the original Fujita Scale and the Enhanced Fujita Scale (in use since 2007) to rate the intensity of a tornado by examining the damage caused by the tornado after it has passed over a manmade structure.

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	**EF Number**	**3 Second Gust (mph)**
0	40-72	45-78	0	65-85	**0**	**65-85**
1	73-112	79-117	1	86-109	**1**	**86-110**
2	113-157	118-161	2	110-137	**2**	**111-135**
3	158-207	162-209	3	138-167	**3**	**136-165**
4	208-260	210-261	4	168-199	**4**	**166-200**
5	261-318	262-317	5	200-234	**5**	**Over 200**

Source: NOAA

The second type of severe weather is tropical storms. Tropical Storms are an organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds of 39–73 MPH (34–63 knots). In this area, they generally occur due to a hurricane or tropical system that has come inland.

The third severe weather event, thunderstorm winds, can cause death and injury, power outages, property damage, and can disrupt telephone service, severely affect radio communications and surface/air transportation that may seriously impair the emergency management capabilities of the affected jurisdictions.

Thunderstorm winds are winds that arise from convection (with or without lightning), with speeds of at least 50 knots (58 mph), or winds of any speed producing a fatality, injury, or damage. Severe thunderstorms develop powerful updrafts and downdrafts. An updraft of warm, moist air helps to fuel a towering cumulonimbus cloud reaching tens of thousands of feet into the atmosphere. A downdraft of relatively cool, dense air develops as precipitation begins to fall through the cloud. Winds in the downdraft can reach in excess of 100 miles per hour. When the downdraft reaches the ground, it spreads out forming a gust front: the strong wind that kicks up just before the storm hits. As the thunderstorm moves through the area, the full force of the downdraft in a severe thunderstorm can be felt as horizontal, straight-line winds with speeds well over 50 miles per hour. Straight-line winds are often responsible for most of the damage associated with a severe thunderstorm. Damaging straight-line winds occur over a range of scales. At one extreme, a severe single-cell thunderstorm may cause localized damage from a microburst, a severe downdraft extending not more than about two miles across. In contrast, a powerful thunderstorm complex that develops as a squall line can produce damaging winds that carve a path as much as 100 miles wide and 500 miles long.

The fourth severe weather event is lightning. Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas. Rising and descending air within a thunderstorm separates these positive and negative charges. Water and ice particles also affect charge distribution. A cloud-to-ground lightning strike begins as an invisible channel of electrically charged air moving from the cloud toward the ground. When one channel nears an object on the ground, a powerful surge of electricity from the ground moves upward to the clouds and produces the visible lightning strike. Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.

The final severe weather event is hail. Hailstones are created when strong rising currents of air called updrafts carry water droplets high into the upper reaches of thunderstorms where they freeze. These frozen water droplets fall back toward the earth in downdrafts. In their descent, these frozen droplets bump into and coalesce with unfrozen water droplets. Then they are carried back up high within the storm where they refreeze into larger frozen drops. This cycle may repeat itself several times until the frozen water droplets become so large and heavy that the updraft can no longer support their weight. Eventually, the frozen water droplets fall back to earth as hailstones.

Hail can also be a destructive aspect of severe thunderstorms. Hail causes more monetary loss than any other type of thunderstorm-spawned severe weather in the United States, annually producing about one billion dollars in crop damage. Storms that produce hailstones only the size of a dime can produce dents in the tops of vehicles, damage roofs, break windows and cause significant injury or even death.

B. Hazard Profile: Tornados, tropical storms, thunderstorm winds, lightning and hail can affect the entire county given the right conditions. Since the exact time and location of a severe weather event is not always predictable, all of Wilkes County is vulnerable to the threats of severe weather. Based on historic data, there have been seven reported tornados in the planning area: all seven were in the unincorporated areas of the county with one of the seven going through Tignall. There is no recorded record of a tornado in Washington or Rayle. A total of two injuries were reported with $855,000 in property and crop damages reported. Hazard frequency tables using a 20-year hazard cycle calculates an annual chance for a tornado event at:

- 30% chance in the unincorporated areas of the county.
- 5% chance for the Town of Tignall.
- 5% chance for the City of Washington
- 5% for the Town of Rayle.
- 30% for Wilkes County as whole.
-

Tornados tend to strike in somewhat random fashion, making the task of calculating a recurrence interval extremely difficult. Using a 20-year hazard cycle, frequency tables calculates an annual chance for a tornado event at:

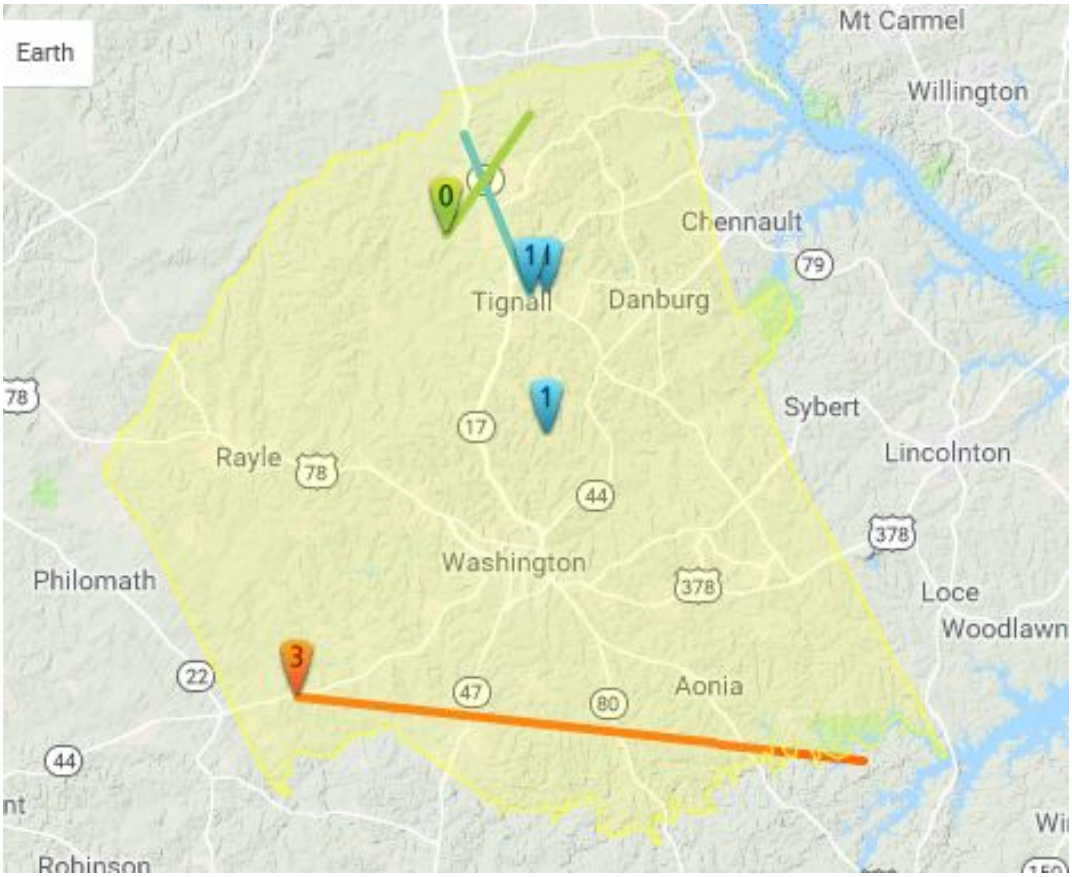
- 25% chance in the unincorporated areas of the county.
- 5% chance for the Town of Tignall.
- 0% chance for the City of Washington
- 0% for the Town of Rayle.
- 25% for Wilkes County as whole.

The following table shows the event, severity and estimated cost of damages reported. The map from the Georgia Tornado Projects shows the paths taken by the storms (*See Appendix A, Section I and Appendix D).*

Date	Location	Deaths	Inj	MAG	PD	CrD	Event Narrative
06/03/1954	Wilkesand Tignall	0	2	F1	3K	0	Injured two people
11/22/1992	Wilkes	0	0	F1	3K	0	None Reported
05/07/1998	Wilkes	0	0	FI	0	0	A tornado touched down 12.53 miles from the center of Wilkes County, Georgia. There were 0 injuries and 0 fatalities.
11/11/2002	Wilkes	0	0	F0	0K	0K	A tornado touched down 13.28 miles from the center of Wilkes County, Georgia. There were 0 injuries and 0 fatalities.
09/16/2004	Tignall and Wilkes	0	0	F1	0K	0K	A damage assessment conducted by the Wilkes County Emergency Management Director indicated that an F1 tornado, briefly at the high end of the F1 scale, touched down just south of Tignall near Georgia Highway 17 and continued north from six to seven miles

Date	Location	Deaths	Inj	MAG	PD	CrD	Event Narrative
08/26/2008	Wilkes	0	0	F0			A damage survey conducted by the National Weather Service in Peachtree City, Georgia and the Wilkes County Emergency Management Director confirmed that an EF0 tornado touched down in northeast Wilkes county about three miles northwest of Tignall near the intersection of Bunch Road and Mallorysville Road. The tornado path length was determined to be around five miles with the tornado lifting at a point approximately three miles northeast of Norman, or near Henry Hill Road. A swath of trees was downed all along the entire track of the tornado. An anchored mobile home along Georgia Highway 17 at Boyd Road was blown six feet of its foundation. Another home along Georgia Highway 17 lost several shingles from its roof.
02/18/2009	Wilkes			F3			A damage survey conducted by the National Weather Service Forecast office in Columbia, South Carolina, confirmed that an EF3 tornado had tracked across far southern Wilkes county causing considerable damage along its path. The total tornado path length was 18.6 miles. The tornado initially touched down in the Tyrone community in southwest Washington county. Here a cinder block home was completely destroyed with the cinder block debris blown downstream nearly 1/2 mile. Fifteen other homes along the path of the tornado sustained moderate to major damage from the tornado. Nineteen outbuildings and a commercial chicken house were destroyed. In addition, a steeple was blown off a church and a 2-ton truck was moved 60 feet. The maximum path width was approximately 1/2 mile with maximum winds estimated to be 160 mph.

Sources: Interviews, The News-Reporter Georgia Tornado History Project, NCEI and SHELDUS™



Source: Georgia Tornado History Project http://www.tornadohistoryproject.com/tornado/Georgia

There have been 14 tropical storms reported by the NCEI and SHELDUS™ with $200,000 of reported property damages. These storms produced winds from 35-45 mph with gust up to 55 mph. Damages because of the storms were due to power outages, downed trees and flash flooding. The tropical storms affected the entire planning area. Data for each jurisdiction is not available. Using a 20-year hazard cycle there is a 70 percent chance of an annual tropical storm event for county as a whole (*See Appendix D).*

Details	Date	PrD	CrD
Result of Tropical Storm Allison	06/11/2001	0.00K	0.00K
Result of Tropical Storm Hannah	09/14/2002	0.00K	0.00K
Result of Tropical Depression Bill	07/01/2003	0.00K	0.00K
Result of Hurricane Francis	09/06/2004	0.00K	0.00K
Result of Hurricane Ivan	09/16/2004	0.00K	0.00K
Result of Hurricane Jeanne	09/26/2004	0.00K	0.00K
Result of Tropical Storm Arlene	06/12/2005	0.00K	0.00K
Result of Hurricane Dennis	07/10/2005	0.00K	0.00K
Result of Hurricane Katrina	08/29/2005	0.00K	0.00K
Result of Tropical Storm Tammy	10/05/2005	0.00K	0.00K
Result of Tropical Storm Fay	08/21/2008	0.00K	0.00K

Details	Date	PrD	CrD
Result of Hurricane Ida	11/10/2009	0.00K	0.00K
Result of Tropical Storm Lee	09/04/2011	0.00K	0.00K
Result of Tropical Storm Irma	09/11/2017	200k	

Source: NCEI and SHELDUS

Thunderstorms are much more prevalent during the spring and summer months. There have been 56 events reported by the NCEI and SHELDUS™ in the last 67 years with highest winds reported at 60 knots. These storms with more than $687,000 in property damages reported. The table below breaks down the thunderstorm events by jurisdiction. A complete table of thunderstorm wind events can be found in Appendix A.

Location	# of Events	County-Wide Events*	Total # of events per jurisdiction
Wilkes County(Unincorporated)	16	16	32
Rayle	7	16	23
Tignall	5	16	21
Washington	16	16	32
TOTAL FOR COUNTY			**56**

** It is assumed that all 16 countywide events reported occurred in each jurisdiction. Source: NCEI and SHELDUS*

While data was collected looking at 67 years, frequency rate was calculated using a 20-year hazard cycle per guidance from GEMA. Using a 20-year hazard cycle, the frequency table calculates an annual chance for a thunderstorm event producing high winds is:

- 80% chance for the unincorporated areas of the county
- 80% chance for the City of Washington.
- 55% chance for the Town of Rayle
- 35% chance for the Town of Tignall.
- 190% for Wilkes County as whole.

Hazard frequency tables for individual jurisdictions are in Appendix D.

The fourth weather event is lightning. During the spring and summer months the county experiences numerous storms that can often produce lightning. The VAISALA National Lightning Detection Network has the average flash density per square mile between 6 and 12 from 2007-2016. A search of storm data on NCEI has only four reported lightning events in the past 67 years with slightly more than $335,000 in property damages. Since 1950 there have been 90 lightning strikes recorded resulting in wildfires. When these datasets are combined there has been 84 lightning strikes recorded.

While data was collected looking at 67 years of data, hazard frequency rate was calculated using a 20-year hazard cycle per guidance from GEMA. Based on a 20-year hazard cycle, the annual chance for a lightning strike is:

- 180% chance for the unincorporated areas of the county
- 15% chance for the City of Washington.

- 195% for Wilkes County as a whole.
- No data is available for Rayle or Tignall.

The fifth weather event is hail. A combination of SHELDUS™ and NCEI data reports 26 hail events in the last 67 years with slightly more than $107,000 in property and crop damages and 0 injuries. Hailstones ranged in size from .75 to 1.75 inches.

Location	# of Events	County-Wide Events*	Total # of events per jurisdiction
Wilkes County (Unincorporated)	8	2	10
Rayle	3	2	5
Tignall	4	2	6
Washington	9	2	11
TOTAL FOR COUNTY 26			

** It is assumed that the 2 countywide events occurred in all jurisdiction. Source: NCEI and SHELDUS™*

While data was collected looking at 67 years of data, frequency rate was calculated using a 20-year hazard cycle per guidance from GEMA. Using a 20-year hazard cycle, the annual chance for a hail event is:

- 50% chance for the unincorporated areas of the county
- 35% chance for the City of Washington.
- 15% chance for the Town of Rayle
- 35% chance for the Town of Tignall.
- 130% for Wilkes County as whole.

Hazard frequency tables for individual jurisdictions are in Appendix D.

C. **Assets Exposed to Hazard and Estimate of Potential Losses:** In evaluating assets exposed to the natural hazard, the committee determined that all critical facilities, as well as all public, private and commercial property, are susceptible to tornados, tropical storms, thunderstorm winds, lightning and hail events. The GMIS has the 100 percent of the county with a wind hazard score of one, where wind speed is less than 90 mph. Rayle, Tignall, and Washington have a hazard score of one. The table below provides data from FEMA Worksheet #3a that estimates the potential loss for each jurisdiction.

Jurisdiction	Number of Structure/Properties	Value $	Population
Wilkes County (Unincorporated)	14,836	$846,678,127.50	5,714
Rayle	320	$5,906,852.50	199
Tignall	1,198	$32,787,150.00	546
Washington	6,861	$259,889,980	4,134
TOTAL FOR COUNTY	23,215	$1,145,262,110	10,593

Source: Wilkes County Tax Assessor

Of the 71 critical facilities, 100% have a wind hazard score of one placing the critical facilities which has a wind speed of less than 90 mph. GMIS critical facility reports for wind and FEMA Worksheet #3a are located in Appendix D for each individual jurisdiction and the county as a whole. The table below shows the number of critical facilities by jurisdictions, hazard score, replacement value, content value, and daily occupancy.

Jurisdiction	Wind Hazard Score	# of Critical Facilities	Replacement Value $	Content Value $	Daily Occupancy	
					Day	Night
Wilkes County	1	33	$95,488,212.00	$18,802,017.00	2,054	17
Rayle	1	3	$1,238,982.00	$375,000.00	0	0
Tignall	1	6	$5,116,164.00	$1,465,000.00	35	5
Washington	1	29	$48,387,403.00	$1,295,000.00	339	234
TOTAL		71	$150,230,761.00	$21,937,017.00	2,428	256

FEMA Hazus-MH Version 2.2 SP1 ran a hurricane scenario for probabilistic wind-damage risk assessment modeling a Category 1 storm with maximum winds of 74 mph. There were no shelter requirements for this scenario. Hurricane-wind building damage is shown in the table below:

Storm Classification	Number of Damaged Buildings	Building Damages	Total Economic Loss	Loss Ratio
Category 1	8	$1,062,410	$1,063,130	0..06

Essential facilities are also vulnerable to storm events, and the potential loss of functionality may have significant consequences to the community. Hazus-MH identified the essential facilities that may be moderately or severely damaged by winds.

Classification	Number
EOCs	1
Fire Stations	7
Care Facilities	4
Police Stations	1
Schools	4

Wind-Damaged Essential Facility Losses Classification	Facilities At Least Moderately Damaged > 50%	Facilities Completely Damaged > 50%	Facilities with Expected Loss of Use (< 1 day)
Tropical Storm	0	0	17

Hazus-MH estimates the amount of debris that will be generated by high velocity hurricane winds by tons is:

- Reinforced Concrete and Steel Debris (none)
- Brick and Wood and Other Building Debris 63 tons
- Tree Debris 870 ton
- Other Tree Debris 25.354 tons

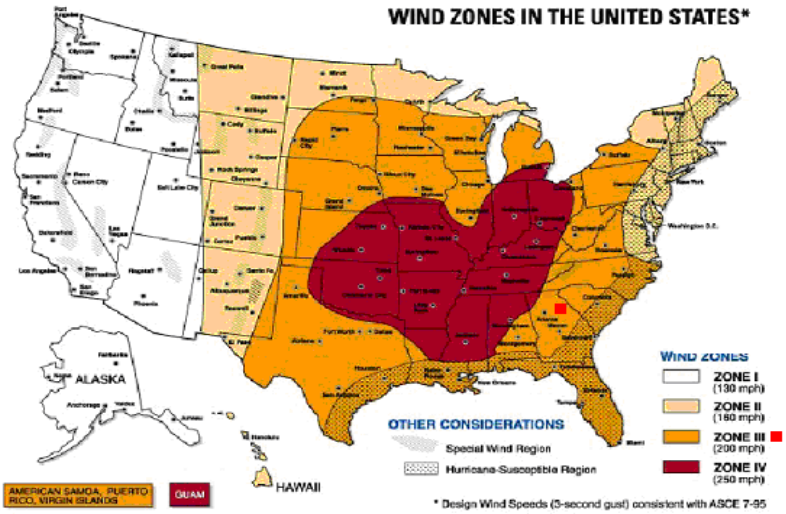
A hypothetical tornado scenario was ran using an EF3 tornado was modeled to illustrate the potential impacts of tornadoes of this magnitude in the county. The analysis estimated that approximately 421 buildings could be damaged, with estimated building losses of $11million dollars. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The table below shows estimated building losses by occupancy type.

Occupancy Classification	Buildings Damaged	Building Losses
Residential	297	$8,214,174
Commercial	11	$561,723
Industrial	3	$456,610
Government	1	$984,713
Education	4	$451,260
Religious	5	$0
Total	**321**	$11,001,510

There were no essential facilities located in the tornado path.

D. Land Use & Development Trends: Wilkes County is located in FEMA wind zone III, which is associated with 200-mph wind speeds. Currently, the county has no land use or development trends related to tornados, tropical storm, thunderstorm winds, lightning, or hail events. Information on current and future land-use projections can be found in Appendix B.

E. Multi-Jurisdictional Concerns – All of Wilkes County has the same design wind speed of 200 mph as determined by the American Society of Civil Engineers (ASCE) as evidenced by the map and table below.



Wind zones in the United States

NUMBER OF TORNADOES PER 1,000 SQUARE MILES	WIND ZONE I	WIND ZONE II	WIND ZONE III	WIND ZONE IV
<1	LOW RISK	LOW RISK ★	LOW RISK ★	MODERATE RISK
1 - 5	LOW RISK	MODERATE RISK ★	HIGH RISK	HIGH RISK
6 - 10	LOW RISK	MODERATE RISK ★	HIGH RISK	HIGH RISK
11 - 15	HIGH RISK	HIGH RISK	HIGH RISK	HIGH RISK
>15	HIGH RISK	HIGH RISK	HIGH RISK	HIGH RISK

LOW RISK	MODERATE RISK	HIGH RISK
Need for high-wind shelter is a matter of homeowner preference	Shelter should be considered for protection from high winds	Shelter is preferred method of protection from high winds

★ Shelter is preferred method of protection from high winds if house is in hurricane-susceptible region

During a natural hazard, it is imperative that all emergency personal can communicate with each other throughout the entire planning area. The county and its jurisdictions have numerous dead spots throughout the area due to topography and lack of adequate communication equipment. The county and its emergency personnel are dependent on the private sector for towers to use for signals. If these towers are ever removed, the county will be without any adequate means to bounce signals.

The entire county has the potential to be affected by tornados, tropical storms, thunderstorm winds, lightning and hail. As a result, any mitigation steps taken related for these five severe weather events should be considered on a countywide basis to include Camak, Norwood and Wilkeston. A concern is the lack of available data for the county and the city. A database needs to be created and maintained that provides information on all past and future for the four severe weather events.

F. Hazard Summary: Since the previous plan, there has been limited new development and no increase in population that would affect the overall vulnerability of the community to this hazard. This has been no new adoption of development or building regulations to increase or decrease the overall vulnerability to severe weather events.

Overall, severe weather in the form of thunderstorm winds, poses one of the greatest threats to Wilkes County in terms of property damage, injuries, and loss of life. Therefore, the committee recommends mitigation measures identified in this plan should be aggressively pursued. Tornados do not touch down as frequently; however, the unpredictability and the potential for excessive damage caused by tornados makes it imperative that mitigation measures identified in this plan receive full consideration.

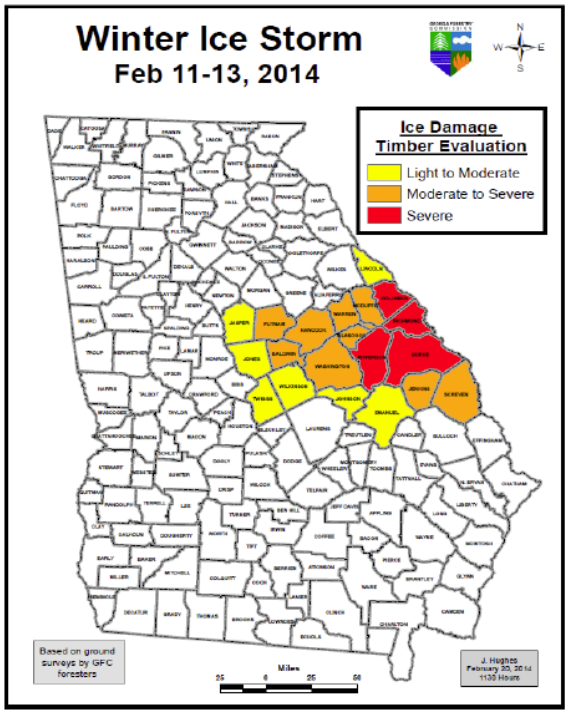
Weather Event	#	Fatalities	Injuries	Approximate Property/Crop Damage
Tornados	7	0	2	$855,000
Tropical Storms	13	0	0	$200,000
Thunderstorm Winds	56	0	0	$687,000
Lightning	90	0	0	NR
Hail	26	0	0	$107,000

To summarize, there are approximately 23,215 structures/properties in the county totaling slightly more than $1.1 billion with a population of 10,593. A breakdown of information for individual jurisdictions can be found in Appendix A and Appendix D. Specific mitigation actions for tornados, tropical storms, thunderstorm winds, lightning and hail events are identified in Chapter III, Section V.

SECTION V. WINTER STORMS

A. Hazard Identification: Southeastern snow or ice storms often form when an area of low pressure moves eastward across the northern Gulf of Mexico. To produce a significant winter storm in the south, not only must temperatures be cold enough, but there must also be enough moisture in the atmosphere to produce adequate precipitation. A major winter storm can last for several days and be accompanied by ice and freezing rain, high winds, heavy snowfall, and cold temperatures. These conditions can make driving very dangerous, as well as bring down trees and power lines.

B. Hazard Profile: Winter storms are not spatially defined and affect the entire planning area equally. The committee researched historical data from the NCEI, SHELDUS™, SERCC, as well as information from past newspaper articles relating to winter storms. There have been 29 winter storm events recorded in the county over the last 67 years with no estimated property damage or crop damage.



The most recent ice storm on February 11-13, 2014, had freezing rain and sleet with accumulations of up to 1½ inches of ice and 2 inches of snow and sleet across the area. The heavy sleet and snow overloaded branches that came down on top of power lines when the storm hit late Tuesday, Feb. 11. Electrical service for almost 70 percent of the county was interrupted.

The weight of the ice brought down trees, limbs and other vegetative debris that blocked

roads and rights of way creating hazardous conditions. The timber industry was severely affected by the storm. Wilkes was one of the nine counties hit by the storm and had moderate to severe timber damage according to the GFC. The GFC examined the levels of damage within two types of pine that were most frequently damaged: the young pine stands and pine stands on which a first thinning had recently occurred. The moderate to severe damage has branches and limbs broken from the trees with damage to the overall stand, having more than 25 percent of branches damaged.

Although winter storms are infrequent in the south, they have the potential to cause excessive damage to a community and disrupt the lives of residents. Based on the hazard frequency table located in Appendix D there is a 34 percent chance of an annual winter storm event for the entire county.

C. **Assets Exposed to Hazard and Estimate of Potential Losses:** In evaluating assets that may potentially be impacted by the effects of winter storms, the committee determined that all critical facilities, as well as all public, private and commercial property, are susceptible. The table below shows assets by jurisdiction that could be at potential risk of damage from a winter storm event.

Jurisdiction	Number of Structure/Properties	Value $	Population
Wilkes County (Unincorporated)	14,836	$846,678,127.50	5,714
Rayle	320	$5,906,852.50	199
Tignall	1,198	$32,787,150.00	546
Washington	6,861	$259,889,980.00	4,134
TOTAL FOR COUNTY	23,215	$1,145,262,110.00	10,593

Source: Wilkes County Tax Assessor

The GMIS does not provide a report for winter storm damage but there is slightly more than $1.1 billion worth of assets with potential loss to winter storm hazards countywide. The table below shows the number of critical facilities by jurisdiction, hazard score, replacement value, content value, and daily occupancy (*See Appendix A, Section VI for Historical Event Tables, Winter Storm Maps and Appendix D for Worksheet 3A and Hazard Frequency Tables).*

Jurisdiction	# of Critical Facilities	Replacement Value $	Content Value $	Daily Occupancy	
				Day	Night
Wilkes County	33	$95,488,212.00	$18,802,017.00	2,054	17
Rayle	3	$1,238,982.00	$375,000.00	0	0
Tignall	6	$5,116,164.00	$1,465,000.00	35	5
Washington	29	$48,387,403.00	$1,295,000.00	339	234
TOTAL	71	$150,230,761.00	$21,937,017.00	2,428	256

D. Land Use & Development Trends: Wilkes County currently has no land use or development trends related to winter storms. Projected changes in land use based on the joint comprehensive plan has minimal or no change to land use within the incorporated jurisdictions. The greatest change in land use and future development has a decrease in forestland that will be converted to residential. Since it is impossible to determine where future residents will move in the unincorporated areas of the county, vulnerability in terms of future buildings, infrastructure and critical facilities is not known at this time. It can be surmised that this will bring an increase in population and homes. Current and future-land use tables and projections can be found in Appendix B.

E. Multi-Jurisdictional Concerns: Wilkes County currently has no land use or development trends related to winter storms. All of the county can potentially be negatively impacted by winter storms. As a result, any mitigation steps taken related to winter storms should be undertaken on a countywide basis to include Rayle, Tignall and Washington.

F. Hazard Summary: Since the previous plan, there has been limited new development and no increase in population that would affect the overall vulnerability of the community to this hazard. This has been no new adoption of development or building regulations to increase or decrease the overall vulnerability to winter storm events.

There have been 29 winter storm events recorded in the county over the last 67 years with no property damaged reported. There is a 95 percent chance of an annual winter storm event. Winter storms can be more accurately predicted than most other natural hazards, making it possible to give advance warning to communities. The National Weather Service issues winter storm warnings and advisories as these storms make their way south. Given the infrequency of these types of storms, southern communities are still not properly equipped to sustain the damage and destruction caused by severe winter storms. To summarize, there are approximately 23,215 structures/properties in the county totaling slightly more than $1.1 billion with a population of 10,593. The committee recognized the dangers posed by winter storms and identified specific mitigation actions in Chapter III, Section III.

SECTION VI. DAM FAILURE

A. Hazard Identification – Dam failures and incidents involve unintended release or surges of impounded water. They can destroy property and cause injury and death downstream. While they may involve the total collapse of a dam, that is not always the case. Damaged spillways, overtopping of a dam or other problems may result in a hazardous situation. Dam failures may be caused by structural deficiencies in the dam itself. Dam failures may also come from other factors including but not limited to debris blocking spillways, flooding, earthquakes, improper operation and vandalism. Dam failures are potentially the worst flood events. When a dam fails, a large quantity of water is suddenly released downstream, destroying anything in its path and posing a threat to life and property.

Dams are classified into three categories:

- High Hazard – Dams where failure or disoperation will probably cause loss of human life.

- Significant Hazard – Dams where failure or disoperation will probably not result in loss of life, but can cause economic loss, environmental damage, and disruption of lifeline facilities or other concerns.
- Low Hazard – Dams where failure or disoperation will probably not result in loss of life and cause only low economic and/or environmental loss.

B. Hazard Profile – A review of the National Inventory of Dams shows that Wilkes County has 17 dams all classified as low hazard where potential losses are limited to minimal property damage. Based on the map of the dams found in Appendix A there are 17 dams located in the unincorporated area of the county. The table below is an inventory of the dams by jurisdiction.

Dam Name	Hazard	Jurisdiction
3 SISTERS LAKE DAM	L	Wilkes
BURDETTE LAKE DAM #2	L	Wilkes
BURDETTE LAKE DAM	L	Wilkes
WASHINGTON-WILKES ORCHARD DAM	L	Wilkes
GARRARD DAM	L	Wilkes
HALE LAKE DAM	L	Wilkes
GRIMAUDE LAKE DAM	L	Wilkes
BOOTH S LAKE DAM	L	Wilkes
WASHINGTON COUNTRY CLUB LAKE DAM	L	Wilkes
PALMER LAKE DAM	L	Wilkes
CITY OF WASHINGTON LITTLE BEAVER DAM CREEK RESERVOIR	L	Wilkes
CITY OF WASHINGTON BEAVER DAM CREEK DAM	L	Wilkes
CITY OF WASHINGTON SETTLING POND DAM	L	Wilkes
REVILLE LAKE DAM	L	Wilkes
LOWE IRRIGATION LAKE DAM	L	Wilkes
BOOTH S LOWER LAKE DAM	L	Wilkes
BARNWELL LAKE DAM	L	Wilkes

Source: National Inventory of Dams Army Corp of Engineers

Based on interviews and best available data, a dam failure has not occurred within the last 62 years therefore the estimated annual probability of a future event is less than one percent. Due to the lack of available data a precise calculation to determine, the probability of an annual dam failure event cannot be determined without further study (*See Appendix A and Appendix D).*

C. Assets Exposed to Hazard and Estimate of Potential Losses: The number of dams posing potential loss of life hazards to Wilkes County residents and the number of residents living downstream from these potentially hazardous dams is unknown at this time. Based on best available data Rayle, Tignall and Washington appear not to be at risk due to dam failure. The data is not available at this time for the planning committee to determine what assets are exposed to risk due to dam failure in the unincorporated areas of Wilkes County. Projected changes in land use based on the county's multi-jurisdictional comprehensive plan, has minimal or no change to land use within the incorporated jurisdictions. The greatest change

in land use and future development has a decrease in forestland that will be converted to residential. Because it is impossible to determine where future residents will move in the unincorporated areas of the county, vulnerability in terms of future buildings, infrastructure and critical facilities is not known at this time. It can be surmised that this will bring an increase in population and efforts must be made to ensure that new homes are not built downstream of where a dam break may occur. Land use tables and projections can be found in Appendix B. A dam break analysis study is recommended in Chapter III, Section VI to determine the exact assets exposed to risk because of a dam failure.

The potential losses due to dam failure flooding are unknown and cannot be estimated at this time. Using the GEMA critical facilities reports and FEMA Worksheet #3a, all 71 critical facilities have a replacement value of $150,230,761. There is slightly more than $1.1 billion worth of assets that could potentially be affected by dam failure event (*See Appendix A and Appendix D).*

D. Land Use and Development Trends – Currently the county has no guidelines that address development in areas surrounding dams.

E. Multi-Jurisdictional Concerns – All of Wilkes County can potentially be affected by a dam failure event. Any mitigation steps taken related to dam failure should be undertaken on a countywide basis and include all incorporated jurisdictions. A concern is the lack of available data for the county and its incorporated jurisdictions. A database needs to be created and maintained that provides information on past and future occurring dam break events.

F. Hazard Summary – Dam failures and incidents involve unintended release or surges of impounded water. They can destroy property and cause injury and death downstream. While they may involve total collapse of a dam, that is not always the case. Wilkes County has 17 dams all classified as low hazard where minimal property loss is expected. The committee recognized the potential for losses caused by dam failure and identified it as a hazard requiring mitigation measures. To summarize, there are approximately 23,215 structures in the county totaling more than $1.1 billion with a population of 10,593. The planning committee identified specific mitigation goals, objectives and action items related to dam failure, which can be found in Chapter III, Section II and III.

SECTION VII. EARTHQUAKE

A. Hazard Identification - Earthquakes are one of nature's most damaging hazards. An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of Earth's tectonic plates. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. They usually occur without warning and after just a few seconds can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. If the earthquake occurs in a populated area, it may cause many deaths, injuries and extensive property damage.

Magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake and is determined from

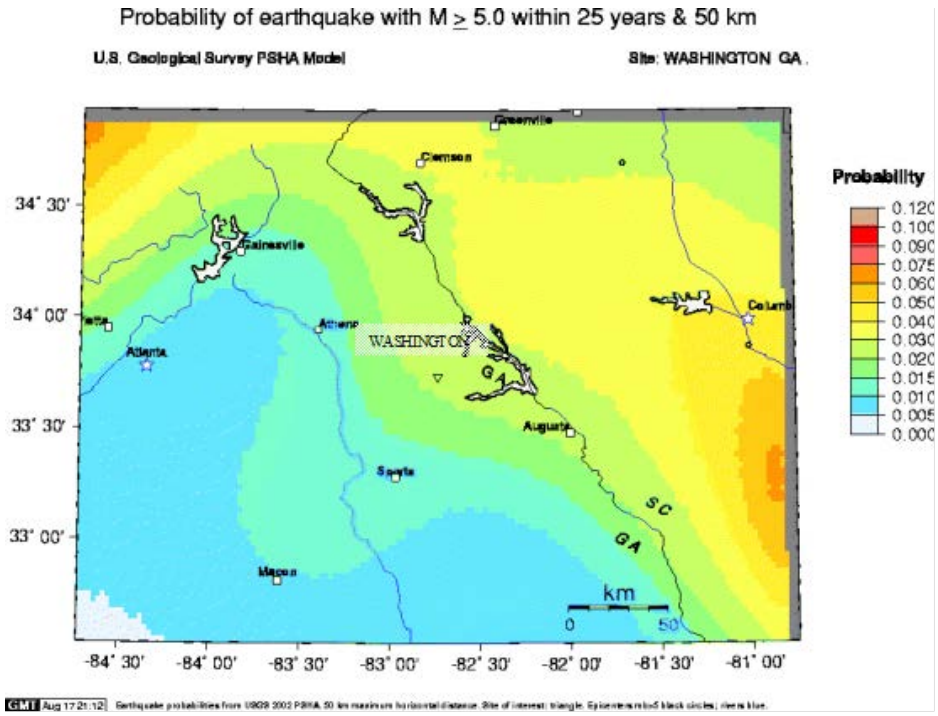
measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment. The following two tables describe the Abbreviated Modified Mercalli Intensity Scale, and show intensities that are typically observed at locations near the epicenter of an earthquake event.

Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	**I**
3.0 - 3.9	**II - III**
4.0 - 4.9	**IV - V**
5.0 - 5.9	**VI - VII**
6.0 - 6.9	**VII - IX**
7.0 and higher	**VIII** or higher

Abbreviated Description of the 12 levels of Modified Mercalli Intensity.		
Intensity	**Shaking**	**Description/Damage**
I.	Not felt	Not felt except by a very few under especially favorable conditions.
II.	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III.	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV.	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V.	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI.	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII.	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII.	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX.	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X.	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI.	Extreme	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII.	Extreme	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: USGS

Based on U.S. Geological Survey estimations the probability of an earthquake of magnitude 5.0 or less occurring within Wilkes Co. over the next 25 years is between 1% and 4% (see map below). As discussed above, such predictions are based on limited information, and cannot necessarily be relied upon for their precision. However, they do help demonstrate that the threat of earthquakes cannot be overlooked even in a relatively inactive geographic area such as Wilkes Co.



B. Hazard Profile – The planning committee examined historical data from the NCEI, past newspaper articles, and conducted interviews during its research on the effects of past earthquake events. While earthquake events are a rare occurrence, the USGS states that the probability of an earthquake of Magnitude 5.0 or more occurring within Wilkes Co. over the next 25 years is between 1% and 4% (see map above). ***All data covers the county as a whole no data is available by jurisdiction***. GMIS has 99% of the county with a seismic hazard score of three and the remaining one percent with a seismic hazard score of one.

The table below shows the date, time location and magnitude of previous events.

Location	Details	Date	Time	Mag
Wilkes	A magnitude 4.9 (4.3 MB, 4.9 LG, Class: Light, Intensity: IV - V) earthquake occurred 16.1 miles away from the county center	08/02/1974	8:52	4.9
Wilkes	A magnitude 3.2 (3.2 MD, Depth: 3.1 mi) earthquake occurred 19.9 miles away from Wilkes County center	01/03/1992	4:21	3.2
Wilkes	A magnitude 3.2 (3.2 LG, Depth: 3.1 mi) earthquake occurred 66.4 miles away from the county center	08/08/1993	9:24	3.2

Location	Details	Date	Time	Mag
Wilkes	A magnitude 3.5 (3.5 LG, Depth: 3.1 mi) earthquake occurred 60.2 miles away from the county center	01/18/2000	22:19	3.5
Wilkes	A magnitude 3.5 (3.5 LG, Depth: 3.1 mi, Class: Light, Intensity: II - III) earthquake occurred 10.2 miles away from the county center.	03/18/2003	6:04	3.5
Wilkes	A small tremor occurred as a result of a quake centered around Asheville, N.C.; and was 3.9 on the Richter Scale.	08/31/2005	23:10	
Wilkes	A small tremor was felt because of a 5.9 magnitude earthquake that was centered near Louisa, Virginia, northwest of Richmond.	08/23/2011	14:15	
Wilkes	2.1 magnitude earthquake	07/09/2017		2.1

Source: USGS, The News-Reporter, interviews, city-data.com

While data was collected looking at 67 years of data, frequency rate was calculated using a 20-year hazard cycle per guidance from GEMA. Using a 20-year hazard cycle, the annual chance for an earthquake is:

- 25% chance for the unincorporated areas of the county
- 40% chance for the City of Washington.
- 25% chance for the Town of Rayle
- 40% chance for the Town of Tignall.
- 25% for Wilkes County as whole.

Hazard frequency tables for individual jurisdictions are in Appendix D.

C. **Assets Exposed to Hazard and Estimate of Potential Losses:** All critical facilities, personal, and public property in Wilkes County are susceptible to damage caused by an earthquake. There are no damage records available in relation to earthquakes. Loss would be determined based on intensity and magnitude and would vary in each case. All critical facilities, personal, and public property in Wilkes County are susceptible to damage caused by an earthquake. Worksheet #3a has assets exposed to an earthquake hazard for each jurisdiction as:

Jurisdiction	Number of Structure/Properties	Value $	Population
Wilkes County (Unincorporated)	14,836	$846,678,127.50	5,714
Rayle	320	$5,906,852.50	199
Tignall	1,198	$32,787,150.00	546
Washington	6,861	$259,889,980.00	4,134
TOTAL FOR COUNTY	23,215	$1,145,262,110.00	10,593

The table below shows the number of critical facilities potentially at risk by jurisdictions, daily occupancy and replacement value (*See Appendix A and Appendix D).*

Jurisdiction	# of Critical Facilities	Replacement Value $	Content Value $	Daily Occupancy	
				Day	Night
Wilkes County	33	$95,488,212.00	$18,802,017.00	2,054	17
Rayle	3	$1,238,982.00	$375,000.00	0	0
Tignall	6	$5,116,164.00	$1,465,000.00	35	5
Washington	29	$48,387,403.00	$1,295,000.00	339	234
TOTAL	71	$150,230,761.00	$21,937,017.00	2,428	256

D. Land Use and Development Trends—There are no specific land use and development trends in relation to earthquakes at this time.

E. Multi-jurisdictional Concerns - All of Wilkes County can potentially be negatively impacted by an earthquake. As a result, any mitigation steps taken related to earthquakes should be undertaken on a countywide basis to include all municipalities. A concern is the lack of available data for the county and all incorporated jurisdictions. A database needs to be created and maintained that provides information on past and future occurring earthquake events.

F. Hazard Summary - An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of Earth's tectonic plates. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and after just a few seconds can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. If the earthquake occurs in a populated area, it may cause many deaths, injuries and extensive property damage. The committee recognized the potential for losses caused by an earthquake and identified it as a hazard requiring mitigation measures. There have been eight earthquake events reported in the last 67 years. Based on a 20-year cycle hazard history there is a 25% chance of an annual earthquake event. To summarize, there are approximately 23,215 structures in the county totaling more than $1.1 billion with a population of 10,593. The planning committee identified specific mitigation goals, objectives and action items related to earthquakes, which can be found in Chapter III, Section II and III.

CHAPTER III. MITIGATION STRATEGIES

Table 3.1 provides a brief description of each section in this chapter and a summary of the changes to the 2013 update plan.

Chapter III. Section	Updates to Section
I. Flooding	Completed action steps were removed. Action Steps that apply to all jurisdictions were combined. New goals were added where necessary along with any existing or new multijurisdictional concerns. Goals, Objective, and Actions Steps were updated to new format.
II. Drought	Completed action steps were removed. Action Steps that apply to all jurisdictions were combined. New goals were added where necessary along with any existing or new multijurisdictional concerns. Goals, Objective, and Actions Steps were updated to new format.
III. Wildfire	Completed action steps were removed. Action Steps that apply to all jurisdictions were combined. New goals were added where necessary along with any existing or new multijurisdictional concerns. Goals, Objective, and Actions Steps were updated to new format.
IV. Severe Weather	Completed action steps were removed. Action Steps that apply to all jurisdictions were combined. New goals were added where necessary along with any existing or new multijurisdictional concerns. Goals, Objective, and Actions Steps were updated to new format. Added Lightning and Hail Events
V. Winter	Completed action steps were removed. Action Steps that apply to all jurisdictions were combined. New goals were added where necessary along with any existing or new multijurisdictional concerns. Goals, Objective, and Actions Steps were updated to new format.
VI. Dam Failure	Completed action steps were removed. Action Steps that apply to all jurisdictions were combined. New goals were added where necessary along with any existing or new multijurisdictional concerns. Goals, Objective, and Actions Steps were updated to new format.
VII. Earthquake	Completed action steps were removed. Action Steps that apply to all jurisdictions were combined. New goals were added where necessary along with any existing or new multijurisdictional concerns. Goals, Objective, and Actions Steps were updated to new format.
VII. All Hazards	Category added to take goals that apply to all Hazards to reduce redundancy.

SECTION I. INTRODUCTION TO MITIGATION STRATEGY

This chapter addresses the mitigation strategy requirements of 44 CFR Section 201.6 (c)(3): "A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:

i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.
iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan."

A. Priority Changes from Previously Approved Plan

There have been no significant priority changes from the previous plan. The goal of Wilkes County, Rayle, Tignall, and Washington, is to protect the safety, health and well-being of all county citizens, and to protect public and private property and to lessen the overall effects of a hazard event.

There has been limited new development since the previous plan and no increase in population that would affect the overall vulnerability of the community from identified hazards. This has been no new adoption of development or building regulations to increase or decrease the overall vulnerability to hazard events.

B. Capability Assessment

Wilkes County, Rayle, Tignall, and Washington identified current capabilities for implementing hazard mitigation activities. The capability assessment identifies administrative, technical, legal and fiscal capabilities. This includes a summary of departments and their responsibilities associated with hazard mitigation as well as codes, ordinances, and plans already in place that contain mitigation activities or programmatic structure. The second part of the assessment examined the fiscal capabilities applicable to providing financial resources to implement identified mitigation action items. Wilkes County has an annual budget of around $15 million, Rayle's 2016 budget is $154,545, Tignall's 2016 budget is $246,876 and Washington's 2016 budget is approximately $22 million. It should be noted that mitigation action steps with high dollar amounts couldn't be completed without grant funds and careful budget planning by all jurisdictions.

While not all technical and administrative skills are found in-house, all jurisdictions have access to multiple staff through the RC and can contract out with private firms or any professional services needed. The three tables below identify the administrative, technical, legal and fiscal capabilities of each jurisdiction.

Table 3. 2 Legal and Regulatory Capability (Y/N)

Regulatory Tools (ordinances, codes, plans)	Wilkes County	Rayle	Tignall	Washington	Does State Prohibit
Building codes	Y	N	N	Y	N
Zoning ordinance	Y	Y	Y	Y	N
Subdivision ordinance or regulations	N	N	N	Y	N
Special purpose ordinances (floodplain management, storm water management, soil erosion)	Y	Y	Y	Y	N
Growth management ordinances (also called "smart growth" or anti-sprawl programs)	N	N	N	N	N
Site plan review requirements	Y	N	N	Y	N
General or comprehensive plan	Y	Y	Y	Y	N
A capital improvements plan	Y	N	N	Y	N
An economic development plan	Y	N	N	Y	N
An emergency response plan	Y	Y	Y	Y	N
A post-disaster recovery plan	N	N	N	N	N
A post-disaster recovery ordinance	N	N	N	N	N
Real estate disclosure requirements	N	N	N	N	N

Table 3. 3 Fiscal Capability

Financial Resources	Wilkes County	Rayle	Tignall	Washington	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG)	Y	Y	Y	Y	Y
Capital improvements project funding	Y	Y	Y	Y	Y
Authority to levy taxes for specific purposes	Y	Y	Y	Y	Y – Vote required
Fees for water, sewer, gas, or electric service	Y	Y	Y	Y	Y
Impact fees for homebuyers or developers for new developments/homes	N	N	N	N	Y

Incur debt through general obligation bonds	Y	Y	Y	Y	Y
Incur debt through special tax and revenue bonds	Y	Y	Y	Y	Y – Vote required
Withhold spending in hazard-prone areas	N	N	N	N	Y
Other Grants	Y	Y	Y	Y	Y

Table 3.4 Administrative and Technical Capacity

Staff/Personnel Resources	Wilkes County	Rayle	Tignall	Washington	Dept./Agency and Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	Y	Y	Y	Building Dept./ Code Enforcement/ Public Works CSRA RC/Contract as Needed
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Y	N	N	Y	Building Dept./ Code Enforcement
Planners or Engineer(s) with an understanding of natural and/or manmade hazards	Y	N	N	Y	Public Works/CSRA RC Staff/ Contract as Needed
Floodplain manager	N	N	N	N	
Surveyors	Y	Y	Y	Y	Contracted as needed
Staff with education or expertise to assess the community's vulnerability to hazards	Y	N	N	Y	Public Safety/EMA
Personnel skilled in GIS and/or HAZUS	Y	Y	Y	Y	CSRA RC
Emergency manager	Y	Y	Y	Y	EMA
Grant writers	Y	Y	Y	Y	CSRA RC

C. Community Mitigation Goals

Collectively, the jurisdictions reviewed the hazard profiles and the loss estimates in Section II and used it as a basis for developing mitigation goals, objectives and action steps. Mitigation goals are preventive measures to lessen the effect of and losses due to hazard events and are typically long-range visions adapted toward jurisdictional policy. Mitigation objectives are strategies to attain identified goals. Goals and objectives are formulated by reviewing hazard historical data, existing local plans, policy documents, regulations, and public input. Each jurisdiction developed objectives and actions unique to specific vulnerabilities or concerns within its boundaries.

Mitigation actions were developed as the means to carrying out the objectives and attain goals. All action steps are compatible with the plans, policies, and regulations of each jurisdiction. The jurisdictions must also have the legal, administrative, fiscal, and technical capacities to perform each action.

The capabilities assessment above aided in forming realistic mitigation actions. This capabilities assessment can then incorporate results of the STAPLEE worksheet to identified obstacles that may hinder the completion actions. Each jurisdiction identified and prioritized actions steps along with an implementation schedule, funding source, and coordinating individual or agency.

Based on the capabilities assessment, the STAPLEE and six categories listed above the county and all jurisdictions identified the following goals:

- Goal 1: Protect the safety, health and well-being of all county citizens;
- Goal 2: Protect public infrastructure and private property;
- Goal 3: Educate the community about natural hazards;
- Goal 4: Manage development to minimize loss;
- Goal 5: Natural Resources Protection; and
- Goal 6: Structural modifications to reduce the impacts of hazard events.

D. Identification & Analysis of Range of Mitigation Actions

The framework used to guide jurisdictions in identifying mitigation measures was developed by FEMA and is captured by the following six categories:

- **Prevention**: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities that reduce hazard losses. Examples include building and construction code revisions, zoning regulation changes, and computer hazard modeling.
- **Property Protection**: Actions that involve the medications of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include roadway elevations, improving wind and impact resistance, and flood proofing.
- **Public Education and Awareness**: Action to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Examples include programs that target repetitive loss properties and vulnerable populations.
- **Natural Resources Protection**: Actions that, in addition to minimizing hazard losses also preserve or restore the function of natural systems. Examples include projects to create open space, green space, and stream restoration.
- **Structural Projects**: Actions that involve the construction of structures to reduce the impact of a hazard. Examples include projects that control floodwater, reconstruction of dams, and construction of regional retention areas.

- **Emergency Services**: Actions that protect people and property during and immediately after a disaster event or hazard event. Examples include enhancements that provide advanced warning and redundant communications.

i. **Structural and Non-Structural**
Mitigation relates to concrete actions that are put into practice to reduce the risk of destruction and casualties. Mitigation is generally split into two main types of activities: Structural mitigation refers to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure. Non-structural mitigation refers to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk with related impacts. Structural and non-structural actions are identified in Table 3.7.

ii. **Existing Polices, Regulations, Ordinances, and Land Use**
Wilkes County, Rayle, Tignall, and Washington have adopted the following Mandatory codes:

- Georgia State Minimum Standard Building Code (International Building Code with Georgia State Amendments).
- Georgia State Minimum Standard One- and Two-Family Dwelling Code (International Residential Code for One- and Two-Family Dwellings with Georgia State Amendments).
- Georgia State Minimum Standard Fire Code (International Fire Code with Georgia State Amendments).
- Georgia State Minimum Standard Plumbing Code (International Plumbing Code with Georgia State Amendments).
- Georgia State Minimum Standard Mechanical Code (International Mechanical Code with Georgia State Amendments).
- Georgia State Minimum Standard Gas Code (International Fuel Gas Code with Georgia State Amendments).
- Georgia State Minimum Standard Electrical Code (National Electrical Code with Georgia State Amendments).
- Georgia State Minimum Standard Energy Code (International Energy Conservation Code with Georgia State Supplements and Amendments).
- Life Safety Code (NFPA 101).

They have also adopted the Permissive codes:

- International Property Maintenance Code.
- International Existing Building Code.

Other types of ordinances that have been adopted are:

The *Washington-Wilkes Unified Comprehensive Plan 2014-2024* was adopted by resolution by the Wilkes County Board of Commissioners, Rayle Town Council, Tignall City Council, and the Washington City Council. The planning process

examines the current and future trends and assess the strengths and opportunities available to achieve their community vision. This document drives the decision-making process for the County Dearing and Thomson. The Comprehensive Plan also examines existing land use and projects future land use. Existing and Future Land Use Maps can be found in Appendix B.

iii. **Community Values, Historic & Special Considerations**

Historical-Cultural: Wilkes County has four districts listed on the National Register of Historic Places, as well as several individual sites.

- East Robert Toombs Historic District was listed in 1972. Period of significance is from 1825-1849, 1850-1874, and 1875-1899. Architectural style: Federal, Greek Revival, and Queen Anne.
- North Washington District was listed in 1973. Period of significance is from 1750-1799, 1825-1849, 1850-1874, and 1900-1924. Architectural style: Federal, Greek Revival, and Colonial Revival.
- Washington Commercial Historic District was listed in 1986. Period of significance is from 1800-1824, 1825-1849, 1850-1874, 1875-1899, 1900-1924 and 1925-1949. Architectural style: Queen Anne, Late Victorian.
- Washington Historic District was listed in 2004. Significant year: 1783,1795, and 1800. Architectural style: Greek Revival, Federal.
- West Robert Toombs District was listed in 1973. Period of Significance: 1800-1824 and 1875-1899. Architectural style: Other, Classical Revival, Greek Revival.
- Anderson House was listed in 1976 located in Dansburg, Georgia. Architectural style is Romanesque, Other, Greek Revival. Period of significance 1850-1874.
- Arnold-Callaway Plantation was added in 1972. Architectural style is Greek Revival. Period of significance is 1825-1849 and 1850-1874.

- Campbell-Jordan House also known as Duncan G. Cambell House was listed in 1971. The house is located at 208 Liberty St. in Washington, GA. Architectural style is Federal, Classical Revival, Greek Revival. Period of Significance 1800-1824, 1825-1849.

- The Cedars also known as The Cedar Retreat was listed in 1972. Located at 210 Sims St in Washington, GA. Architectural style is Stick/Eastlake. Period of Significance: 1750-1799, 1800-1824, and 1875-1899.

- Daniel, James and Cunningham House also known as Kettle Creek Manor was listed in 1980. Architectural style is federal. Period of significance is 1800-1824.

- Fitzpatrick Hotel was added in 1982. Located at 18 W. Public Square in Washington, GA. Architectural style is Queen Anne and the period of significant is 1875-1899.

- Gartrell Family House was added in 2002, located at 854 Boyd Rd. Tignall, GA. Architectural style is Other and Greek Revival. Period of significance is 1825-1849.
- Gilbert-Alexander Hotel was added in 1972. Located at 116 Alexander Dr in Washington, GA. The architectural style is Federal and the period of significance is 1800-1824 and 1825-1849.
- Thomas M Gilmer House was added in 1977 and located 5 miles outside of Washington, GA.
- Holly Court also known as Ficklen-Lyndon-Johnson House added in 1972. Located at 301 S. Alexander St. in Washington, GA. Architectural style is federal and the period of significance is 1825-1849.
- Kettle Creek Battlefield was added in 1975 and located 9 miles SW of Washington, GA. Period of significance 1700-1749.
- Mary Willis Library added in 1972 located in Washington, GA. Architectural style is Other and Queen Anne. Period of Significance is 1875-1899.
- Old Jail was added in 1974 located at 103 Court St. Washington, GA. Architectural style is Romanesque and the period of significance is 1875-1899.

- Peacewood also known as Wingfield-Cade-Saunders House was added in 1972. Located at 120 Tignall Rd in Washington, GA. Architectural style is Federal, Other, and Greek Revival. Period of significance is 1750-1799, 1825-1849, 1850-1874.
- Pharr-Callaway-Sethness House was added in 1976. Located north of Tignall, GA. Architectural style is Greek Revival. Period of significance is 1800-1824 and 1850-1874.
- Poplar Corner was added in 1972. Located at 210 W. Liberty St in Washington, GA. Architectural style is Federal, Other and Beaux Arts. Period of significance 1800-1824, 1825-1849, 1850-1874, 1900-1924.
- Robert Shand Smith House added in 2002. Located at 902 S. Spring St in Washington, GA.
- Robert Toombs was added in 1972. Located at 216 E. Robert Toombs Ave in Washington, GA. Architectural style is Federal and Greek Revival. Significant year is 1837, 1885, 1797.
- Tupper-Barnett House was added in 1972. Located at 101 W. Robert Toombs Ave in Washington, GA. Architectural style is Federal and Greek Revival. Period of significance is 1825-1849 and 1850-1874.
- Washington Presbyterian Church added in 1972. Located at 206 E. Robert Toombs Ave in Washington, GA. Architectural Style is Other and the period of significance is 1825-1849 and 1875-1899.
- Washington-Wilkes Historical Museum added in 1970. Located at 308 E. Robert Toombs Ave in Washington, GA.
- The Washington Gymnasium Auditorium circa 1937 and was listed in 2002. Location 304 South Gibson Street Washington, GA. Architectural style is Classical Revival. The architectural firm was Merry and Parsons.

Recreation: Public parks and recreation facilities are located in Washington, Rayle, and Tignall. These municipalities contain a total of 20 acres of active and passive parks. Wilkes County in currently working with the Wilkes County School Board to improve recreational facilities and provide additional venues. The City of Washington contains multiple recreational areas including a downtown park that contains playground equipment and tennis courts. The Memorial Park located in Rayle is an excellent example of a passive park and should be replicated in other areas.

iv. **Prioritization of Actions:** Those mitigation actions given high priority are in two groups: life safety-related actions that can be accomplished relatively quickly and changes to protect critical facilities on which other emergency management systems are dependent, for example communications focal points. Those actions likely to require extended time frames to accomplish received medium priority status.

The committee consultant used the STAPLEE worksheet (Social, Technical, Administrative, Political, Legal, Economic, Environmental) to select and prioritize the most appropriate mitigation alternatives and is in Appendix D. This methodology requires that seven categories outlined in the STAPLEE be considered when reviewing potential actions. This process helped ensure that the most equitable and feasible

actions would be undertaken based on each jurisdictions capabilities. Table 3.6 provides information regarding the review and selection criteria for alternatives.

Table 3.6

STAPLEE REVIEW AND SELECTION CRITERIA FOR ALTERNATIVES

- Is the proposed action acceptable by the community?
- Is the action compatible with current and future community values?
- Are equity concerns involved that would result in unjust treatment of any segment of the population?
- Will the proposed action cause social disruption?

TECHNICAL

- Will the proposed action achieve the stated objective and further mitigation goals?
- Will the proposed action create more problems than it solves?
- Does the proposed action resolve the problem completely or partially?
- Is it the most useful action in light of other community values?

ADMINISTRATIVE

- Does the community have the capability to implement proposed action?
- Is there someone to lead or coordinate the proposed action?
- Is there sufficient funding, staff and technical support to implement the proposed action step?
- Are there ongoing administrative needs that are required?

POLITICAL

- Is the proposed action politically acceptable?
- Have political leaders participated in the planning process?
- Who are the stakeholders for this proposed action?
- Have all stakeholders been afforded an opportunity to participate in the planning process?
- Is there public support to implement and maintain the action?

LEGAL

- Does the community have the authority to implement the proposed action?
- Is there a clear legal basis for the proposed action?
- Are there legal side effects? (i.e. could the action be construed as a taking)
- Is the proposed action allowed in the general plan?
- Will the community be liable for action or lack thereof?
- Will the proposed action be challenged?

ECONOMIC

- What is the cost-benefit of the proposed action (do the benefits exceed the cost)?
- Have initial, maintenance and administrative costs been taken into account?
- Has funding been secured for the proposed action? If not have funding sources been identified?
- Will the proposed action affect the fiscal capabilities and/ or budget of the jurisdiction?
- Will the proposed action place a tax burden on the community?
- Does the proposed action contribute to other community goals? (capital improvements, economic development)

ENVIRONMENTAL

- Will the proposed action have a positive or negative effect on the environment?
- Does the proposed action require environmental regulatory approvals?

- Does the proposed action meet local and state regulations?
- Does the proposed action impact a threatened or endangered species?

E. Introduction to Action Plan

The next two sections of Chapter III., Section II. Natural Hazards and Section III. Mitigation Actions comprise the strategies Wilkes County together with Rayle, Tignall, and Washington have identified to reduce the effects of natural hazards. Mitigation actions given high priority are in two groups: (1) life safety-related actions that can be accomplished relatively quickly and (2) changes to protect critical facilities on which other emergency management systems are dependent, for example communications focal points.

SECTION II. NATURAL HAZARDS

A. Flooding Action Plan

The committee determined that due to the presence of flood plains in the county efforts to reduce the level of exposure to flooding should be considered. In previous flooding instances, damage has been sustained primarily to roads, bridges and natural resources. Specific mitigation measures identified by the committee are designed to lessen the effects of such damage to new and existing structures in the future.

Objective A1. Improve the effectiveness of existing flood insurance programs.
Objective A2. Evaluate and improve the present drainage infrastructure.
Objective A3. Warn citizens when the potential for flooding exist.
Objective A4. Lessen the impact to existing buildings, critical facilities and infrastructure due to flooding.
Objective A5. Limit future development in flood prone areas.
Objective A6. Reduce the threat of water contamination caused by flooding.

B. Drought Action Plan

As indicated in Chapter II, Section III, drought conditions can cause costly damage to crops. However, from a danger or hazard perspective, the greatest threat posed by drought conditions is from potential wildfires. As 95 percent of the county is made up of forest and woodlands, the possibility for wildfires is distinct and poses a significant threat. In general, wildfires are the result of dry conditions combined with lightning or carelessness. The committee determined that mitigation goals were necessary to prevent crop damage, as well as damage to new and existing structures.

Objective B1. Ensure that there is an adequate water supply during periods of drought.
Objective B2. Educate citizens on water conservation issues.

C. Wildfire Action Plan

As indicated in Chapter II, Section III, wildfires have the potential to cause costly damage in Wilkes County. From a danger or hazard perspective, the greatest threat posed by wildfire is the damage to forest, woodlands and agriculture property. The possibility for wildfires is distinct and poses a significant threat to the county. Forest fires are generally the result of dry conditions combined with lightning or carelessness. The committee determined that mitigation goals were necessary to prevent damage to undeveloped areas of the county as well as damage to new and existing structures caused by wildfires.

Objective C1. Ensure that adequate fire protection is available.

Objective C2. Reduce threat of wildfire occurrence.
Objective C3. Increase public awareness of wildfire dangers.

D. Severe Weather (Tornados, Tropical Storms, Thunderstorm Winds, Lightning, Hail)

As with many Georgia communities, if a tornado or tropical storm were to strike Wilkes County, significant damage to both property and agricultural crops could result. In addition, the potential for injuries and loss of life is substantial due to the unpredictability and violent nature of these storms. The committee recognizes the important role advance planning plays in the mitigation process. There is great benefit in identifying appropriate steps that can be taken to help minimize losses to new and existing structures in Wilkes County because of a severe weather event. As indicated in Chapter II, Section IV, of all of the natural hazards profiled in this plan, tornados have the potential to inflict the greatest amount of damage while thunderstorm winds are the most frequently occurring natural hazard in the county and have the greatest chance of affecting the county each year. The committee has identified several courses of action that both local officials and citizens can use in their mitigation efforts against the effects of tornados, tropical storms, thunderstorm winds, lightning and hail to both new and existing structures.

Objective D1. Minimize damage to property from severe weather events.
Objective D2. Minimize damage to public buildings and critical facilities to ensure continual operations of vital services.
Objective D3. Protect vulnerable populations from the effects of severe weather events.
Objective D4. Educate the public including citizens and business owners on disaster preparedness and safety.

E. Winter Storms Action Plan

Within Wilkes County, and the southeast region in general, there is great concern over the threat of winter storms. Although this area does not typically receive the amounts of snow and ice that other regions do, nor do they experience winter storms as frequently as other regions, Wilkes County and other southeastern communities must be prepared for the damage caused by winter storms. The fact that winter storms hit Wilkes County infrequently results in other problems, such as lack of equipment and supplies to combat treacherous winter storm conditions. In Wilkes County, the formation of ice on roads and bridges, tree limbs, and power lines is the cause of most damage. In Chapter II, Section V additional winter storm hazards are addressed, as well as information related to potential losses for the county. The committee has determined that several steps could be undertaken to minimize the effects of winter storms to protect the health and safety of citizens, as well as damage to new and existing structures.

Objective E1. Educate the public on preparedness and safety issues for winter storm events.
Objective E2. Prevent property damage because of a winter storm event.
Objective E3. Minimize power outages during winter storms.

F. Dam Failure Action Plan

Dam failure mainly affects areas that are downstream of the event. Further study of this type event is required to determine where property damage and loss of life has the greatest potential to occur. Critical facilities and vulnerable populations are located in all jurisdictions as well as the unincorporated areas of the County. As a result, any mitigation steps taken

related to dam failure events should be undertaken on a countywide basis and specifically include all incorporated jurisdictions.

Objective F1. Identify at risk population and properties.

Objective F2. Develop proposal to regulate protective measures for dam breach zones

G. Earthquake Action Plan

Objective G1. Identify at risk population and properties.

Objective G2. Educate the public on preparedness and safety issues for earthquake events.

H. All Hazard Action Steps

The purpose of this section is to allow the committee to recommend mitigation measures within this plan that transcend individual hazards. Certain common mitigation measures are needed regardless of the specific hazard event. Rather than list these multiple times within each different hazard category, the committee decided to list these "all-hazards" mitigation measures within a separate section of the plan. The goal with these mitigation measures is again to minimize the loss of life and property, and to prevent disruption of services to the public to the greatest extent possible.

Objective H1. Ensure communication capabilities exist between all Emergency Service Personnel and Agencies.

Objective H2. Ensure the ability to travel for county residents, organizations, and providers of essential services such as Law Enforcement Personnel, hospitals and utilities after a hazard event.

Objective H3. Protect critical facilities from the effects due to power outages because of a hazard event to ensure a continuation of all vital services.

Objective H4. Provide adequate notification to citizens of Wilkes County pertaining to hazard event.

Objective H5. Guarantee all evacuation plans are up to date and adequate to meet the needs of the citizens of Wilkes County.

Objective H6. Guarantee that all Emergency Response Plans are up to date and adequate to meet the needs of citizens of Wilkes County.

Objective H7. Ensure all emergency shelters are ready to meet the needs of the population of Wilkes County, town of Rayle, the city of Tignall, and the city of Washington.

Objective H8. Provide the citizens of Wilkes County educational information on Emergency Preparedness.

Objective H9. Provide the citizens of Wilkes County with accurate and timely information pertaining to Emergency Preparedness.

Objective H10. Collect accurate and complete data pertaining to hazard events within Wilkes County, Rayle, Tignall, and Washington.

SECTION III. MITIGATION ACTIONS

Table 3.7

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
1.	Investigate greater participation Level in the CRS	Wilkes/ Washington	BOC/City Councils	Flood	A1, A5	1, 2, 4, 5	Non-Structural	Staff Time	General Funds	Stalled do to funding	Ongoing	Low
2.	Continue to assess storm water runoff.	Wilkes/Rayle/ Tignall/ Washington	Public Works	Flood	A2, A6	2, 6	Non-Structural	Staff time	General Funds	1 year and Continual	Ongoing	High
3.	Construct as needed, more storm water retention facilities, storm drain improvements and channel improvements to protect existing and new developments.	Wilkes/Rayle/ Tignall/ Washington	BOC/City Council/ Public Works	Flood/ Drought	A2	2, 6	Structural	1,000,000	General Funds	2 years and Continual	Ongoing	High
4.	Clear run-off and water retention ditches.	Wilkes/Rayle/ Tignall/ Washington	Public Works/Road Dept.	Flood	A3, A4	1, 2	Structural	Staff Time	General Fund,	1 year and Continual	Ongoing	High
5.	Seek funding for communication towers and voice repeater systems.	Wilkes/Rayle/ Tignall/ Washington	EMA/Police/ Sheriff	All hazards	H1	1	Structural	$750,000	General Fund, FEMA, CJCC, JAG, USDA, DOJ	2 years and Continual	Ongoing	High
6.	Washington identified a stormwater projects on all or parts of Jackson St, Alabama St, Old Skull Shoals Rd, Booker St, Pecan St, Benson St, Williams St, Hill St, Mobile Circle, Ware St, Norman St, South Butler St, and Lincoln Drive to reduce or eliminate flooding.	Washington	Washington/ Public Works	Flood	A2, A4	1, 2, 6	Structural	2,000,000	CDBG, USDA, EPA, DNR, General Fund,	3 years	Ongoing	High

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
7.	Washington identified a stormwater project at Reese Booker Street to install catch basins and stormwater pipe can divert flooding problem away from three homes.	Washington	Washington/ Public Works	Flood	A2, A4	1, 2, 6	Structural	1,000,000	CDBG, USDA, EPA, DNR, General Fund,	3 years	Ongoing	High
8.	Wilkes County identified a stormwater projects at Peeler Road Bridge needs to be rebuilt and the road elevated	Wilkes County	Wilkes County/ Roads and Bridges	Flood	A2, A4	1, 2, 6	Structural	1,000,000	CDBG, USDA, EPA, DNR, General Fund,	3 years	Ongoing	High
9.	Wilkes County identified a stormwater project at Herbert Calloway Road to increase existing 24 inch culvert needs to be replaced with a 36 inch culvert and elevate road.	Wilkes County	Wilkes County/ Roads and Bridges	Flood	A2, A4	1, 2, 6	Structural	1,000,000	CDBG, USDA, EPA, DNR, General Fund,	3 years	Ongoing	High
10.	Wilkes identified a stormwater project at Boyd Road to increase existing 24 inch culvert to a 36 inch culvert and elevate road.	Wilkes County	Wilkes County/ Roads and Bridges	Flood	A2, A4	1, 2, 6	Structural	1,000,000	CDBG, USDA, EPA, DNR, General Fund,	3 years	Ongoing	High
11.	Wilkes County identified a stormwater project the EMS building to divert stormwater away from the building.	Wilkes County	Wilkes County/ Roads and Bridges	Flood	A2, A4	1, 2, 6	Structural	100,000	CDBG, USDA, EPA, DNR, General Fund,	3 years	Ongoing	High
12.	Promote the preservation of areas in and around watercourses.	Wilkes/Rayle/ Tignall/ Washington	BOC/City Councils	Flood	A5, A6	1, 2, 4, 5	Non-Structural	Staff time	CDBG, USDA, EPA, DNR	2 years	Ongoing	High

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
13.	Add greenspace to known flood prone areas.	Wilkes/Rayle/ Tignall/Washington	BOC/City Councils	Flood	A5	1, 2, 4, 5	Non-Structural	Staff time	CDBG, USDA, EPA, DNR	2 years	Ongoing	Medium
14.	Evaluate existing water system upgrade as needed	Rayle/Tignall/ Washington	Public Works	Flood/ Drought/ Wildfire	A6, B1, C1	1, 2, 6	Structural	1,000,000	General Fund, CDBG, USDA, EPA, DNR	1 year and Continual	Ongoing	High
15.	Investigate methods to reduce non-point source pollution.	Wilkes/ Washington	BOC/City Council	Flood	A6	1, 2, 5	Non-Structural	Staff Time	USDA, EPA, DNR	2 years	Ongoing	Medium
16.	Enact a program to educate the residents about water conservation issues	Wilkes/Rayle/ Tignall/Washington	BOC/City Councils/ Water Dept.	Drought	B1, B2	1, 3	Non-Structural	$2,000.00	USDA, EPA, DNR, General Funds	1year and Continual	Ongoing	High
17.	Increase public awareness of watering restrictions and bans.	Wilkes/Rayle/ Tignall/Washington	BOC/City Councils/ Water Dept.	Drought	B1, B2	1, 3	Non-Structural	Staff Time	General Funds	1year and Continual	Ongoing	High
18.	Develop a public awareness campaign to promote water-saving campaigns (i.e. low-flow water saving devices)	Wilkes/Rayle/ Tignall/ Washington	BOC/City Councils/ Public Works	Drought	B1, B2	1, 3	Non-Structural	Staff Time	General Funds	1year and Continual	Ongoing	High
19.	Continue training of all firefighters to include wildland fire training.	Wilkes/Rayle/ Tignall/ Washington	EMA/Fire Depts.	Wildfire	C1	1, 2	Non-Structural	100,000	General Funds, FEMA	1year and Continual	Ongoing	High
20.	Seek funding for needed firefighting equipment	Wilkes/Rayle/ Tignall/ Washington	EMA/Fire Depts.	Wildfire	C1	1, 2	Non-Structural	250,000	General Funds, FEMA	1 year and Continual	Ongoing	High
21.	Seek funding for more paid firefighters.	Wilkes/Rayle/ Tignall/ Washington	EMA/Fire Depts.	Wildfire	C1	1, 2	Non-Structural	250,000	General Funds, FEMA	1 year and Continual	Ongoing	High
22.	Inventory and replace or install more fire hydrants as needed.	Wilkes/Rayle/ Tignall/ Washington	Public Works/ Fire Depts.	Wildfire	C1	1, 2	Structural	100,000	General Funds, FEMA	1year and Continual	Ongoing	High

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
23.	Seek funding fire engines, burhs trucks, equipment trucks and tankers for local fire departments.	Wilkes/Rayle/ Tignall/ Washington EMA/	EMA/Fire Depts.	Wildfire	C1	1, 2	Non-Structural	$500,000	General Funds, FEMA	1year and Continual	Ongoing	High
24.	Enforce defensible space (30-ft minimum setbacks) between buildings and flammable brush and forestland where possible.	Wilkes/Rayle/ Tignall/ Washington	BOC/City Councils/	Wildfire	C2, C3	1, 2, 3	Structural	Staff Time	General Funds, FEMA	1 year and Continual	Ongoing	Medium
25.	Continue following GFC service of construction and maintenance of firebreaks around forests and structures, along abandoned roadbeds.	Wilkes/Rayle/ Tignall/ Washington	BOC/City Councils/ Planning and Zoning	Wildfire	C2, C3	1, 2, 3	Non-Structural	Staff Time	General Fund	1 year and Continual	Ongoing	High
26.	Strictly follow GFC's guidelines for control burns and permits.	Wilkes/Rayle/ Tignall/ Washington	BOC/City Councils/ GFC	Wildfire	C2, C3	1, 2, 3	Non-Structural	Staff Time	General Funds,	1 year and Continual	Ongoing	High
27.	Investigate the feasibility of Implementing the Firewise Community Initiative where appropriate	Wilkes/Rayle/ Tignall/ Washington	BOC/City Councils/	Wildfire	C2, C3	1, 2, 3	Non-Structural	$25,000.00	General Funds, GFC	3 years	Ongoing	Low
28.	Improve public awareness of wildfire techniques and awareness of wildfire dangers.	Wilkes/Rayle/ Tignall/ Washington	EMA/ Fire Depts.	Wildfire	C2, C3	1, 2, 3	Non-Structural	$25,000.00	General Funds	2 years and Continual	Ongoing	High
29.	Equip all county and city recreation parks with adequate early severe weather warning and lightning detection devices.	Wilkes/Rayle/ Tignall/ Washington	BOC/City Councils/ Recreation Dept.	Severe Weather	D1, D2. D3	1, 2, 6	Structural	50,000	General Funds, FEMA	2 years	Ongoing	High

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
30.	Inspects public buildings and critical facilities and retrofit to reinforce windows, doors, and roofs as needed	Wilkes/Rayle/ Tignall/ Washington	EMA/ Fire Code Enforcement and Building Inspection	Severe Weather, Winter Storms	D1, D2, D3	1, 2, 6	Structural	200,000	General Funds, FEMA	3 years	Ongoing	Medium
31.	Enforce building codes for all new buildings and critical facilities.	Wilkes/Rayle/ Tignall/ Washington	Code Enforcement and Building Inspection	Severe Weather, Winter Storm	D1, D2, E2	1, 2, 6	Structural/Non-Structural	Staff Time	General Funds, FEMA	1 year and Continual	Ongoing	High
32.	Install lightning rods in high value critical facilities.	Wilkes/Rayle/ Tignall/ Washington	EMA/ Code Enforcement and Building Inspection	Severe Weather	D1, D2, D3	1, 2, 6	Structural	100,000	General Funds, FEMA	2 years	Ongoing	High
33.	Install surge protectors on critical facilities' electronic equipment in essential county and city facilities.	Wilkes/Rayle/ Tignall/ Washington	EMA/ Code Enforcement and Building Inspection/ IT	Severe Weather, Winter Storm	D2, E3	1, 2, 6	Structural	$2,000	General Funds	Continual	Ongoing	High
34.	Review current LEOP and update when needed.	Wilkes County EMA	EMA	All hazards	H6, H8	1, 2, 3	Non-Structural	Staff Time	General Funds	2 years	Ongoing	High
35.	Review current evacuation plans paying particular attention to vulnerable populations and update as needed.	Wilkes County EMA	EMA/BOE	Flood, Wildfire, Severe Weather, Winter Storm	H5, H8	1, 2, 3	Non-Structural	Staff Time	General Funds	2 years	Ongoing	High
36.	Provide boat owners with safety tie down procedures with boat registration.	Wilkes/Rayle/ Tignall/ Washington	EMA/ Recreation Dept.	Severe Weather, Winter Storm	D1, E2	1, 2, 3	Non-Structural	2,500	General Funds	1 year and continual	Ongoing	High
37.	Develop a public awareness program about the installation of lightning grounding systems on critical infrastructure, residential and business properties.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ EMA	Severe Weather	D4	1, 2, 3	Non-Structural	Staff Time	General Funds	2 years	Ongoing	High

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
38.	Inventory all critical facilities and assess generator needs. Install generators where needed.	Wilkes/Rayle/ Tignall/ Washington	EMA	All hazards	H3	1, 2, 6	Structural/Non-Structural	150,000	General Funds, FEMA	1 year and continual	Ongoing	High
39.	Seek funding to ensure all current and future emergency shelters have back-up generators.	Wilkes/Rayle/ Tignall/ Washington	EMA	All hazards	H3, H7	1, 2, 6	Structural/Non-Structural	300,000	General Funds, FEMA	3 years	Ongoing	High
40.	Educate the public on shelter locations and evacuation routes	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ EMA/BOE	Flood, Wildfire, Severe Weather, Winter Storm	H5, H8	3	Non-Structural	Staff Time	General Funds	1 year and continual	Ongoing	High
41.	Install weather Service Radio Transmitter on existing towers to provide coverage of NWS transmissions	Wilkes/Rayle/ Tignall/ Washington	EMA/	All Hazards	H4, H8, H9	1, 3	Structural	150,000	General Funds, FEMA	2 years	Ongoing	High
42.	Develop public education and awareness programs regarding severe weather events to include home safety measures, purchase of weather radio and personal safety measures before, during and after an event.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ EMA	Flood, Wildfire, Severe Weather, Winter Storm	A3, A4 ,C3, D1, D4, E1, E2, G2,H8	3	Non-Structural	$10,000	General Funds, FEMA	2year and continual	Ongoing	High
43.	Implement a winter storm education program to include winterization of home and/or business and what to do before, during and after.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ EMA	Winter Storm	E1	3	Non-Structural	$25,000	General Funds	2 year and continual	Ongoing	High

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
44.	Create a data base to record hazard event information.	Wilkes/Rayle/ Tignall/ Washington	EMA	All hazards	H10	1, 2, 3,	Non-Structural	Staff Time	General Funds	2 years	Ongoing	Medium
45.	Inventory existing road equipment and purchase needed equipment to maintain roads before, during and after a hazard event.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ Road Dept.	Flood, Severe Weather, Winter Storm	D2, E2, H2	1, 2	Non-Structural	500,000	General Funds, FEMA	2 years	Ongoing	Medium
46.	Develop coordinated management strategies for deicing, snow plowing, and clearing roads of fallen trees and debris	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ Road Dept./EMA	Severe Weather, Winter Storm	D2, E2	1, 2	Non-Structural	Staff Time	General Funds	2 years	Ongoing	High
47.	Promote the construction of safe rooms in shelter areas and in public buildings.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ EMA	Flood, Wildfire, Severe Weather, Winter Storm	H3	1, 2, 6	Structural	1,000,000	General Funds, FEMA	4 years	Ongoing	Medium
48.	Update 911 equipment as needed.	Wilkes County	EMA/ Sheriff	All hazards	H1	1, 2, 6	Structural	250,000	General Funds, FEMA	1 year and Continual	Ongoing	High
49.	Wilkes County will relocate the EMS building to the South Bypass (Andrew Drive) and combine EMS and 911 Dispatch.	Wilkes County/EMA	BOC/EMA	All hazards	H1, H2	1, 2, 6	Structural		General Funds, FEMA, SPLOST	3 years	Ongoing	Medium
50.	Request that all new education facilities be designed to serve as public shelters for emergency purposes.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/ BOE	All hazards	H7	1, 2, 6	Non-Structural	Staff Time	General Funds	1 year and Continual	New	High

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
51.	Promote and participate in the following American Red Cross Programs • Disaster Resistant Neighborhoods Program • Business and Industry Preparedness Seminar • Community Disaster Education Preparedness presentations	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	All hazards	H4, H8, H9	1, 2 ,3	Non-Structural	5,000	General Funds, FEMA	2 years and Continual	Ongoing	Medium
52.	Work with local cable and radio providers to enhance and broadcast public education on Emergency Preparedness.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	All hazards	H8, H9	1, 2 ,3	Non-Structural	Staff Time	General Funds	1 year and Continual	Ongoing	High
53.	Implement GIS technology on fire and emergency management vehicles so data can be readily available in the field so more accurate, timely assessments for future mitigation planning activities.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Flood, Wildfire, Severe Weather, Winter Storm	H9, H10	1, 2, 6	Non-Structural	50,000	General Funds, FEMA	1 year and Continual	Ongoing	High
54.	Seek funding to purchase ambulance	Wilkes/ EMA/EMS	EMA/EMS	All Hazards	H1, H2	1, 2	Non-Structural	500,000	General Funds, FEMA	2 years	New	High
55.	Pave Roads in county that are unpassable due to flooding	Wilkes County	BOC/ Road Dept.	Flood, Severe Weather,	A1, A2	1, 2, 4, 6	Structural	$1,500,000	General Funds T-SPLOST FEMA, DOT	2 years	New	Medium

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
56.	Provide NOAA weather radios to elderly and handicap populations (moved to all hazards).	Wilkes/Rayle/ Tignall/ Washington	EMA	Flood, Wildfire, Severe Weather, Winter Storm	H4	1, 2,	Non-Structural	$50,000	General Funds, FEMA	2 years	Stalled due to funding	Medium
57.	Review existing comprehensive, development and land use plans to address flood prone areas.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Flood	A1, A2	1, 2, 4, 6	Non-Structural	Staff Time	General Funds	3 years	Ongoing	Medium
58.	Preform procurement to contract with debris removal firm to have contract in place before hazards to ensure firm can move in immediately.	Wilkes/ Washington	BOC/ City Councils/	Winter Storm, Severe Weather, Flood, Wildfire,	H2	1, 2	Non-Structural	Staff Time	General Funds	3 months	New	High
59.	Conduct a survey to determine structural capability of critical facilities to function after a seismic event. Retrofit as needed.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Earthquake	G1	3,6	Structural	Staff Time	General Funds	Stalled	Ongoing	High
60.	Distribute flyers and pamphlets to citizens and businesses on earthquake preparedness.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Earthquake	G1, G2	1, 2,3	Non-Structural	Staff Time	General Funds	3 months	Ongoing	High
61.	Conducts earthquake scenarios to estimate potential loss of life and injuries, the types of potential damage, and existing vulnerabilities.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Earthquake	G1, G2	1, 2,3,6	Non-Structural	Staff Time	General Funds	3 months	Ongoing	High
62.	Conduct dam breach analysis to identify assets and population	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Dam Failure	F1, F2	1, 2,	Non-Structural	100,000	General Funds, DNR	3 years	Ongoing	Medium

Action #	Mitigation Action and Description	Jurisdiction	Implement Agency	Hazards Addressed	Objective Supported	Goal	Structural/ Non-Structural	Estimated Project Cost	Possible Funding Source(s)	Time Frame	Status	Priority
	at risk in the event of a failure.											
63.	Draft ordinance prohibiting development in dam breach zone.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Dam Failure	F2	1, 2, 4	Non-Structural	Staff Time	General Funds	2 years	Ongoing	Medium
64.	Install dam failure alert systems.	Wilkes/Rayle/ Tignall/ Washington	BOC/ City Councils/	Dam Failure	H4	1, 2, 6	Structural	50,000	General Funds, DNR	4 years	Ongoing	Medium

A. New Buildings and Infrastructure: All objectives and action steps are applicable to new buildings and infrastructure.

B. Existing Buildings and Infrastructure: All objectives and action steps are applicable to existing buildings and infrastructure except adopt building codes. Enforcing building codes on existing buildings is not always feasible. Buildings maybe retrofitted but cannot always be brought up to stricter regulations.

C. Special Multi-Jurisdictional Strategy and Considerations: During a natural hazard, it is imperative that all emergency personal can communicate with each other throughout the entire planning area. The County has numerous dead spots throughout the area due to topography and lack of adequate communication equipment. The County and its emergency personnel are dependent on the private sector for towers to use for signals. If these towers are ever removed, the County will be without any adequate means to transmit signals.

Another concern is the lack of available data for the county and individual jurisdictions on hazard events. A database needs to be created and maintained that provides information on flooding events that occur. This database should include information such as location (road names, neighborhoods, GPS coordinates, etc.), damages reported, power outages, road closures, county and city personal that are dispatched to the area, etc.

D. Completed and Deleted Action Steps from Original Plan:
Flood

- Determine the elevation of critical facilities in known flood areas and seek funding to relocate if necessary. Completed.
- Update Floodplain Maps. FEMA updated all maps in 2010.
- Review and adopt flood plain ordinances as needed. Completed for those that participate.
- Review set back requirements from top of banks of creeks and from top of banks of major rivers. Completed set back requirements are consistent with the DNR guidelines.
- Increase the size of retention basins and run off canals where appropriate. Incorporated into Mitigation Action Step #3.
- Install water level monitoring devices on dams and on all major tributaries in Wilkes County. Removed water level devices are already installed.
- Flood and Drainage projected completed in the Danburg Road/State Highway 44 and Baston Road and Baston Trailer Park for 550,000.
- Flood and Drainage Projects in Washington County: Rocker Rd. $65,000; Stoeny Ridge Rd $120,000; Newton Rd $125,000; Oscar Thorton Rd $25,000.
- Review existing comprehensive, development and land use plans to address flood prone areas. This was completed during the 2014-2024 Comprehensive Plan Update.
- Install measuring devices in creeks, ponds, etc. to provide a warning when water levels become dangerously high. All have monitors.

- Identify property owners who are located in areas continually subject to flooding and relocate or mitigate. There are no repetitive flood properties.
- Cap wells not in use and increase wellhead waterproofing. Deleted deals with private property. Added back as an education component.
- Ensure wellhead elevations are above known flooding levels. Handled by Health Dept.

Drought

- Identify and inventory all vulnerable agricultural properties to include livestock and develops a protective action plan. Removed, as this is private property.
- Study the range of federal support programs available to assist Wilkes County's agriculture community. Removed as this is private property and all farmers know about assistance.
- Water Use Ordinances was removed from the plan. All jurisdictions have adopted GA EPD guidelines.
- Seek funding for wells that have gone dry and been removed. Funding does not exist for this activity as a grant. It is a loan and must be applied for by private citizens.
- Conduct a study of proactive measures for Wilkes County's agriculture to include livestock watering ponds and capturing storm water runoff. Private property removed from plan.
- Map all wells with a flow of 100 Gallons Per Minute (GPM) or more for use by Emergency Management during a drought. Removed as these are all private wells.

Wildfire

- Built a fire station on Hwy 47. Completed.

Severe Weather

- Inspect all county and municipal critical facilities for proper grounding. Completed.
- Seek funding for reverse 911 was removed from the plan as technology is obsolete and the county has implemented CODE RED
- Review building codes for proper wind strength and safety regulations and for consistency with state and federal regulations. Building Codes are in compliance.
- Provides NOAA weather radios to elderly and handicap populations. Promoting Code Red.
- To the greatest extent possible, identify all owners of inadequately installed manufactured homes offer a financial incentive to retrofit them with an appropriate level of anchoring and support. Removed due to funding.
- Run HAZUS scenarios once the software is updated and compatible to RC ArcGIS 10.2 update estimated losses. Completed by GEMA.
- Install eight outdoor emergency warning sirens throughout Wilkes County to obtain broader coverage. Removed using Code-Red
- Install two outdoor emergency warning sirens in Tignall. Removed using Code-Red

- Install one outdoor emergency warning siren in Rayle. Removed using Code-Red
- Seek funding for code-red. Have implemented code red
- Create an EMA website and Facebook Page with information pertaining to Emergency Preparedness. Have created and completed.
- Equip school buses with Automated Vehicle Location. Removed this decision will be made by the Board of Education.

Winter Storm

- Review current codes to comply with and enforce the State building code with criteria for design snow load for buildings and structures. All jurisdictions follow state adopted building codes.
- Encourage harvesting of trees along utility and road corridors, preventing potential winter storm damage. This is done by the electric companies.

E. Unchanged and/or Ongoing Action Steps: The following mitigation steps remain in the plan. Based on the STAPLEE Criteria these unchanged action steps were found to be relevant in limiting the damage to people and property from a natural hazard. All action steps have been reformatted to meet the action step criteria established by GEMA and FEMA after the original plan was approved. The new table format from GEMA Plan Update Guidance Template 2013 has been used to organize action steps. STAPLEE worksheet can be found in Appendix D for each action step.

Flood:

- Continue to assess storm water run-off.
- Seek funding to construct more storm-water retention facilities, storm-drain improvements and channel improvements to protect existing and new developments.
- Recommend that run-off and water retention ditches be cleared.
  - This is being done by the Wilkes County Road Department and is a continual goal.
- Promote the preservation of areas in and around watercourses.
- Add greenspace to known flood prone areas.
- Wilkes identified a stormwater project at Boyd Road to increase existing 24 inch culvert needs to be replaced with a 36 inch culvert and elevate road.
- Wilkes County identified a stormwater project at Herbert Calloway Road to increase existing 24 inch culvert needs to be replaced with a 36 inch culvert and elevate road.
- Wilkes County identified a stormwater projects at Peeler Road Bridge needs to be rebuilt and the road elevated.
- Wilkes County identified a stormwater project the EMS building to divert stormwater away from the building.
- Wilkes County will relocate the EMS building to the South Bypass (Andrew Drive) and combine EMS and 911 Dispatch.

Drought

- Evaluate existing water system. Upgrades have been made for around 750,000 to the water system over the last 3 years.
- Increase public awareness of watering restrictions.
  - Adopted the Georgia DNR Drought Management Plan and the Statewide Outdoor Water Use Schedule. The Georgia Water Stewardship Act went into effect statewide on June 2, 2010.
- Educate citizens on water conservation.
- Promote increased surface water usage for irrigation.
- Promote usage of surface artesian flow for irrigation.

Wildfire

- Seek funding to install more fire hydrants. City of Washington installed three new hydrants and installed an additional valve for $6,338.
- Review previous firefighter training and implements a schedule for the ongoing training of all firefighters to include wildland fire training.
- Seek funding for more paid firefighters.
- Seek funding for needed firefighting equipment. Over the last five years 24 sets of firefighter protective clothing have been purchased for approximately$ 41,000
- Seek funding for more fire tankers (2000 to 3000 gallons) for local fire departments. Purchased one platform truck for $875,000. Bought a new pumper for $280,000 Bought a used fire truck and refurbished for $113,000
- Increase public awareness of wildfire dangers by publishing articles in the local newspaper and providing bulletins to local churches and the schools.
- Recommend a defensible space (30-ft minimum setbacks) between buildings and strictly follow GFC guidelines for control burns and permits.
- Increase public awareness of wildfire dangers around the home and community, such as lighted matches, cigarettes, trash, and the process for obtaining burn permits by publishing articles in the local newspaper and providing bulletins to local schools.
- Participate in the Firewise Community Initiative where appropriate.

Severe Weather

- Review building codes for proper wind strength and safety regulations and for consistency with state and federal regulations.
- Inspect public buildings and critical facilities and retrofit to reinforce windows, doors, and roofs as needed.
- Review current evacuation plans paying attention to vulnerable populations and update as needed.
- Review and current Emergency Response Plan and update when needed.
- Install generators where needed. (moved to all hazards)
- Install generators on all new critical facilities. (moved to all hazards)
- Seek funding to ensure all current and future emergency shelters have back-up generators. (moved to all hazards)

- Install National Weather Service Radio Transmitter on existing tower to provide coverage of NWS transmissions Wilkes County, Rayle, Tignall, Washington.
- Educate the public on shelter locations and evacuation routes.
- Develop public education and awareness programs regarding severe weather events to include home safety measures, purchase of weather radio and personal safety measures before, during and after severe event weather.
- Promote and participate in the following American Red Cross Programs
  i. Disaster Resistant Neighborhoods Program (educating communities)
  ii. Business and Industry Preparedness Seminar (educating businesses on business continuity planning)
  iii. Community Disaster Education Preparedness presentations

Winter Weather

- Implement a winter-storm education program to include winterization of home and/or business and what to do before, during and after the winter storm event.
- Seek funding for communication towers and voice repeater systems (moved to all hazards).
- Develop coordinated management strategies for deicing, snow plowing, and clearing roads of fallen trees and debris
- Road maintenance equipment.
- Inventory and assess generator and install where needed. (moved to all hazards)

Dam Failure

- Install dam failure alert systems.
- Perform field survey including dams, spillways, downstream cross section, and downstream structures within dam breach zone.

Earthquake

- Conduct a survey to determine structural capability of critical facilities to function after a seismic event. Retrofit as needed.
- Distribute flyers and pamphlets to citizens and businesses on earthquake preparedness.
- Conducts earthquake scenarios to estimate potential loss of life and injuries, the types of potential damage, and existing vulnerabilities.

All Hazards

- Seek funding for EMA/EMS and first responder vehicles. Sheriff's Office Purchased 14 vehicles since 2013-2017 for $465,000: EMS purchased 3 F-350 Ford EMS trucks for 390,000; Purchased an F-350 SUV for EMA for $51,500.
- Seek funding for EMS equipment Six LIFEPAK® 15 monitor/defibrillator or $192,000 Six LUCAS™ Chest Compression System for 195,000
- Install generators where needed: $24,780 City of Washington portable generator for Wastewater treatment plant. Have six new portable generators for $200,000

- Seek funding to ensure all current and future emergency shelters have back-up generators. Installed a generator at the Pope Center.
- Install weather Service Radio Transmitter on existing towers to provide coverage of NWS transmissions

CHAPTER IV. PLAN INTEGRATION AND MAINTENANCE

The table below provides a brief description of each section in this chapter and a summary of the changes that have been made.

Chapter 1 Section	Updates to Section
I. Implementation Action Plan	Revised to follow New GEMA planning template
II. Evaluation, Monitoring, Updating Note whether the original method and schedule worked	Revised to follow New GEMA planning template
III. Plan update and maintenance	Regulated update and maintenance schedule and public involvement

SECTION I. Implementation Action Plan

A. Administrative Actions: Wilkes County Emergency Management Agency was responsible for overseeing the original PDM planning process and the plan update. Facilitation of the planning process was conducted by the Central Savannah River Area Regional Commission. The Wilkes County Board of Commissioners has authorized the submission of this plan to both GEMA and FEMA for their respective approvals. The Wilkes County Board of Commissioners, Town Council of Rayle, Town Council of Tignall, and the City Council of Washington have formally adopted this plan after approval from GEMA and FEMA was obtained.

B. Authority and Responsibility: Upkeep and maintenance of the plan shall be the responsibility of the EMA Director, as determined during the planning process. It shall be the responsibility of the EMA Director to ensure that this plan is utilized as a guide for initiating the identified mitigation measures within the community. The Wilkes County Board of Commissioners and the Mayors of all incorporated jurisdictions will be responsible for assigning appropriate staff members to implement the action steps identified in this plan for their jurisdictions. The EMA Director, or his designee, shall be authorized to call the committee to review and update this plan periodically (at least annually) throughout the useful life of the plan, not to exceed five years.

During the plan update process, the EMA Director and committee members shall identify projects that have been successfully undertaken in initiating mitigation measures within the community. These projects shall be noted within the planning document to indicate their completion. Additionally, the committee called together by the EMA Director shall discuss and identify any additional mitigation projects that are necessary in the community.

C. Prioritization: The mitigation goals, objectives and related action items were initially compiled from the input of the committee, as well as from others in the community. The committee prioritized the mitigation actions based on what would be perceived as most beneficial to the community, and the action steps have been listed in this plan as the committee prioritized them. Several criteria were established to assist committee members in

the prioritization of these suggested mitigation actions. Criteria included perceived cost benefit or cost effectiveness, availability of potential funding sources, overall feasibility, measurable milestones, multiple objectives, and both public and political support for the proposed actions.

1. **Methodology for prioritization:** To assist with the prioritization of mitigation actions, the STAPLEE worksheet and criteria recommended by FEMA was used. STAPLEE is a tool used to assess the costs and benefits and overall feasibility of mitigation actions. STAPLEE stands for the following:
    i. **Social:** Will the action be acceptable to the community? Could it have an unfair effect on a particular segment of the population?
    ii. **Technical:** Is the action technically feasible? Are there secondary impacts? Does it offer a long-term solution?
    iii. **Administrative:** Are there adequate staffing, funding and maintenance capabilities to implement the project?
    iv. **Political:** Will there be adequate political and public support for the project?
    v. **Legal:** Does your jurisdiction have the legal authority to implement the action?
    vi. **Economic:** Is the action cost-beneficial? Is there funding available: Will the action contribute to the local economy?
    vii. **Environmental:** Will there be negative environmental consequences from the action? Does it comply with environmental regulations? Is it consistent with community environmental goals?

    The committee was asked to review the STAPLEE score sheet with a list of mitigation actions and assign a High, Medium or Low score to each item to help determine the item's priority. Each action item was discussed and a consensus reached by the group on the importance of each item.

2. **Use of cost benefit refer to Worksheet #4:** Through the STAPLEE prioritization process, several projects emerged as being a greater priority than others. Some of the projects involved expending considerable amounts of funds to initiate the required actions. Other projects allowed the community to pursue completion of the project using potential grant funding. Still others required no significant financial commitment by the community.

    The determination of the cost benefit of a project was based upon the anticipated cost in relation to the perceived benefit of the action taken. A proposed action with a high price tag, but minimal benefit to the community, was considered to have a low-cost benefit. Conversely, if minimal expenditures were required and the entire community would benefit, this received a favorable cost benefit rating. All proposed mitigation actions were evaluated to determine the favorability of the benefit in relation to the cost associated with completing the project. Determining the economic feasibility of mitigating hazards can provide decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

3. **Use of other calculations:** Estimation of potential damages and costs in the event of a natural hazard achieves two ends: (1) it enables the identification of critical economic targets for mitigation measures and (2) to enhance the ability to prioritize post-disaster response in aiding the community to recover.

4. **Use of other review structure**: All goals were discussed in detail to determine what was considered a priority for the EMA personnel.

D. Incorporation of Local PDM Plan into other plans/planning measures: The jurisdictions completed and update to their Joint Comprehensive plan and updated their STWP in 2014. The 2013 plan was reviewed to determine if any of the mitigation activities needed to be added. Wilkes County, Rayle, Tignall, and Washington work jointly to produce these planning documents. The Joint Comprehensive Plan is due for an update in 2024. This hazard plan will be reviewed and incorporated into the Joint Comprehensive plan update as needed. In addition, relevant sections of the 2013 plan were included in the revision of the Wilkes Local Emergency Operations Plan. This hazard plan update will also be reviewed when updating the LEOP in 2018.

SECTION II. EVALUATION, MONITORING AND UPDATING

The original method for evaluation of the plan was unsuccessful. While the plan was discussed at EMA meetings, little attention was given to the monitoring and evaluation of the plan. Changes have been made to ensure a more successful and meaningful use of this plan.

A. Method: The Plan is intended to be a 'living' document that informs stakeholders about hazard mitigation projects and plans undertaken by the county and their jurisdictions. In accordance with the requirements set forth in the Disaster Mitigation Act of 2000, Warren County is required to review the plan annually and revise the plan every five years. The revision process will be consistent with the FEMA planning requirements as stipulated in the 44 CFR 201.6.

B. Criteria to be used to monitor and evaluate the plan annually or after any natural disaster event.

a. Each hazard will be reviewed. Any new information pertaining to new and/or previous events will be added to the plan.
b. Any new critical facilities will be added to the plan.
c. Critical facilities information will be updated as needed.
d. All mitigation goals, objectives and action steps will be reviewed for relevance and completion status. All mitigation goals, objectives and action steps that have been completed or are no longer relevant will be documented.
e. New mitigation activities will be added if necessary.
f. Public participation will be monitored and documented.

C. Responsibility: At the direction of the EMA Director, the committee shall be reconvened for the revision process that will include a schedule, timeline, and a list of the agencies or organizations participating in the plan revision. Wilkes County and all incorporated

jurisdictions have designated the following participants of the committee to guide plan maintenance and update activities to ensure that the information in the plan is current. The update committee will also be responsible for disseminating information to stakeholders within their respective jurisdictions.

Jurisdiction	Hazard Mitigation Update Committee	Review
	Point-of-Contact	Schedule
Wilkes County	Emergency Management Director	Annually
Rayle	Mayor	Annually
Tignall	Mayor	Annually
Washington	City Administrator	Annually

D. Timeframe: The committee has set the second Tuesday of every August for the annual review of the plan update and within two months after any natural disaster event. A public notice will be submitted to the legal organ of each jurisdiction and the notice will be published at all government and community buildings.

SECTION III. PLAN UPDATE AND MAINTENANCE

A. Public involvement: Wilkes County is committed to having active public participation during reviews and updates of the PDM Plan. Public participation will follow the guidelines set forth in 44 CFR 201.6. Future public involvement of the community will be more stringent. The original method was not as successful as anticipated in ensuring community involvement. With this in mind, two weeks before the annual August review meeting, a notice will be published in the legal organ of Wilkes County. Flyers will be placed at all government and community gathering places to ensure that citizens of the county are made aware of the annual review process. The new EMA website will also provide ongoing information about the plan and its implementation.

B. Timeframe: At the direction of the EMA Director, the committee will convene in order to accomplish the revisions the second Tuesday of every August. The EMA Director will ensure the revised plan is presented to the Wilkes County Board of Commissioners for formal adoption. In addition, all holders of the County plan will be notified of affected changes. No later than the conclusion of the five-year period following initial approval of the update plan, the EMA Director shall submit the update PDM Plan to the Georgia Emergency Management Agency and the Federal Emergency Management Agency for their review and coordination.

CHAPTER V. Conclusion

SECTION I. Summary

Through the update process of this plan, Wilkes County has developed a more thorough hazard history, an inventory of critical facilities, and an updated contact list for emergency contacts at critical facilities. Natural hazards have been identified countywide. Goals, objectives and mitigation actions have been compiled and prioritized that would reduce the risk of lives and property because of the identified hazards. The committee has been able to work together effectively and efficiently to produce this document and establish a greater awareness of our risks and our mitigation strategies.

As a result of the update PDM planning process, Wilkes County officials have obtained more complete and accurate information and knowledge regarding the County's disaster history, the presence of natural hazards, and the likelihood of each of these hazards occurring within the County, and the potential impacts and challenges these hazards present to the community.

All meetings were open to the public and advertised in *The News-Reporter*, providing Wilkes County citizens with the opportunity to comment on and offer suggestions concerning disaster mitigation actions within the community.

The committee found that it is difficult to predict the geographic threat, and therefore the resulting impact of some natural disasters as compared to others. Tornados and related severe weather strike randomly, usually affecting a small, localized area. On the other hand, natural disasters such as winter ice storms and drought can blanket the entire county, affecting all businesses, public facilities, and residents.

Recognizing this challenge, the committee identified both general and specific measures to aid in the mitigation of several natural hazards most likely to impact Wilkes County. These measures include, but are not limited to, the protection of critical facilities and infrastructure, progressive governmental policies, and the proactive use of codes and regulations. It is worth noting that local government policies can often be the single most important and cost-efficient component of PDM.

The mission of the Wilkes County Pre-Disaster Hazard Mitigation Planning Committee is to "*Make the citizens, businesses, communities and local governments of Wilkes County less vulnerable to the effects of natural hazards through the effective administration of hazard mitigation grant programs, hazard risk assessments, wise floodplain management and a coordinated approach to mitigation policy through state, regional and local planning activities.*"

The committee feels that this plan, when implemented, will help to make all of Wilkes County a safer place to live and work for all of its citizens.

SECTION II – REFERENCES

Numerous sources were utilized to ensure the most complete planning document could be assembled. In an effort to ensure that all data sources consulted are cited, references are listed in the following format: 1) Publications, 2) Web Sites, 3) Other Sources.

Publications:

FEMA Pre-Disaster Mitigation *How-to Guides #1, 2, 3, 7* (FEMA)
GEMA Supplements to FEMA Pre-Disaster Mitigation How-to Guides (GEMA)
The Warrenton Clipper
The Augusta Chronicle
Summary of Floods in the United States During 1990 and 1991
http://pubs.er.usgs.gov/publication/wsp2474
FLOODS IN GEORGIA. FREQUENCY AND MAGNITUDE. By. R. W. Carter.
Http://pubs.usgs.gov/circ/1951/0100/report.pdf
Georgia Archives University System of Georgia
http://cdm.sos.state.ga.us:2011/cdm/search/searchterm/FLOOD/mode/all/order/subjec/ad/desc

Web Sites:

FEMA www.fema.gov
GEMA www.gema.state.ga.us
Georgia Department of Community Affairs http://www.dca.state.ga.us/
Georgia Forestry Commission http://weather.gfc.state.ga.us
National Climatic Data Center www.ncdc.noaa.gov
SHELDUS™ | Spatial Hazard Events and Losses Database for the United States
http://webra.cas.sc.edu/hvri/products/sheldus.aspx
National Inventory of Dams http://crunch.tec.army.mil/nid/webpages/nid.cfm
https://www.anyplaceamerica.com/directory/ga/wilkes-county-13317/
New Georgia Encyclopedia http://www.georgiaencyclopedia.org/nge/Home.jsp
Georgia Archives University System of Georgia
http://cdm.sos.state.ga.us:2011/cdm/search/searchterm/FLOOD/mode/all/order/subjec/ad/desc
United States Census Bureau http://www.census.gov/
USDA, NASS, 2012 CENSUS OF AGRICULTURE
http://www.nass.usda.gov/Census_of_Agriculture/index.asp
http://www.sercc.com/ The Southeast Regional Climate Center (SERCC)
http://www.tornadohistoryproject.com/tornado/Georgia Tornado History Project

Other Sources:

American Red Cross
CSRA Regional Commission
Georgia Department of Natural Resources
Georgia Forestry Commission
Wilkes County
Wilkes County, Rayle
Wilkes County, Tignall
Wilkes County, Washington
Wilkes County Board of Education
Wilkes County Tax Assessor

APPENDICES

Appendix A – Hazard Identification, Risk Assessment and Vulnerability (HRV)

I. Hazard A - Flood
   a. Description
   b. Data – GEMA Critical Facility Inventory Report
   c. Maps

II. Hazard C - Drought
   a. Description
   b. Data– GEMA Critical Facility Inventory Report
   c. Maps

III. Hazard D - Wildfire
   a. Description
   b. Data– GEMA Critical Facility Inventory Report
   c. Maps

IV. Hazard E – Severe Weather, Including Tornados, Tropical Storms, and Thunder Storms
   a. Description
   b. Data– GEMA Critical Facility Inventory Report
   c. Maps

V. Hazard F – Winter Storm
   a. Description
   b. Data– GEMA Critical Facility Inventory Report
   c. Maps

VI. Hazard F – Dam Failure
   a. Description
   b. Data– GEMA Critical Facility Inventory Report
   c. Maps

VII. Hazard F – Earthquake
   a. Description
   b. Data– GEMA Critical Facility Inventory Report
   c. Maps

VIII. All Hazards --
   a. Description
   b. Data– GEMA Critical Facility Inventory Report
   c. Maps

Appendix B – Growth and Development Trends / Community Information

I. Local Comp Plan Executive Summary
II. Statistics/tables from Local Comp Plan
III. Department of Labor Community Information
IV. USDA 2012 Census Report Glascock County

Appendix C –Planning documents

I. Executive Summary Local Emergency Operations
II. State of Georgia Hazard Mitigation Strategy
III. Hazard Risk Analysis
IV. Flood Insurance Study
V. Soil Survey Glascock and Jefferson Counties
VI. Community Wildfire Protection Plan
VII. Timber Impact Assessment GFC
VIII. Executive Summary CSRA Regional Commission Regional Plan

Appendix D – Worksheets used in planning process

I. Completed GEMA/local worksheets
II. Blank GEMA/local worksheets
III. Other misc. worksheets or planning process documents

Appendix E – Copies of Required Planning Documentation

I. Public notice
II. Meeting Agendas / Meeting Minutes
III. Sign-in sheets
IV. Local proclamations (copy of all resolution)
V. GEMA/FEMA correspondence