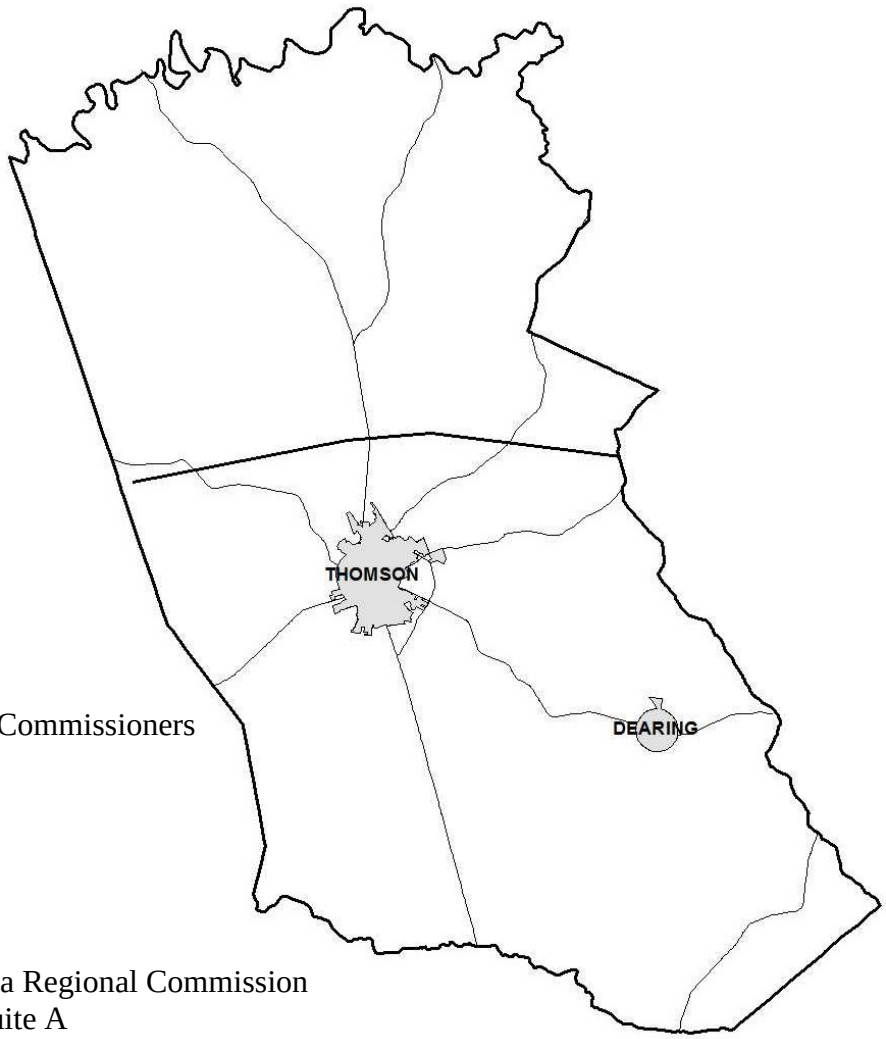
McDuffie County, Georgia
Pre-Disaster Hazard Mitigation Plan Update
Original Approval: 01/26/2005
Update Approval: 04/27/2012
2nd Update Approval: 00/00/201



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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 McDuffie County 2017 Plan Update is a review and improvement of our Multi-Hazard Pre-Disaster Mitigation Plan Update approved on April 27, 2012. 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 and 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 reduce or lessen the impact of these hazard events.

The 2017 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 2017 update covers all of McDuffie County to include the Town of Dearing and the City of Thomson. 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 2012 plan update.

The plan also contains the following information on:

- The vision of mitigation in our community.
- The profile of McDuffie 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.
- McDuffie 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 McDuffie 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 strategy to implement.
- An assessment of McDuffie County's current policies, goals and regulations that pertain to hazard mitigation.
- Documentation of the planning process.
- Update hazard events that occurred since 2012;
- Update critical facilities that have been added since 2012;
- To document current mitigation strategies that have been implemented since 2012; and
- Examine and update mitigation strategy goals, objectives and action steps.

The update is the product of the combined efforts of McDuffie County, Dearing and Thomson. 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 McDuffie County Emergency Management Agency took the lead role in the update. Under the agency's leadership, there has been an endorsement and a commitment by McDuffie County, Dearing and Thomson.

Continued mitigation planning is imperative to lessen the impacts of disasters in McDuffie County, Dearing and Thomson. 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 McDuffie County Board of Commissioners contracted with the Central Savannah River Area Regional Commission (RC) to assist in the update to the 2012 plan update. The RC has assisted ten counties in the completion and update of their Pre-Disaster Mitigation Plans. The RC is currently assisting four 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 Acting EMA Director, Stephen Sewell assembled the Hazard Mitigation Planning Committee. Table 1.2 identifies the 2012:

Table 1.2

Name	Agency	Jurisdiction
Bruce Tanner	McDuffie County Fire EMA	McDuffie County
Rick Sewell	Thomson Fire Rescue	City of Thomson
Don Norton	County Manager	McDuffie County
Don Clauson	McDuffie County Solid Waste	McDuffie County
Eric Reisinger	McDuffie County Public Works	McDuffie County
Stephen Sewell	McDuffie County Fire EMA	McDuffie County
Danny Cason	Dearing Fire Department	City of Dearing
Hal Sharpe	GA Forestry Commission	McDuffie County
Don Powers	City Administrator	City of Thomson
Kelly Evans	McDuffie County Housing Authority	McDuffie County
Edith Smith	McDuffie County Board of Education	McDuffie County
Kathy Linebarger	McDuffie County Health Department	McDuffie County
Tracy Neal	McDuffie County E-911	McDuffie County

The 2012 planning committee members still employed by their respective jurisdictions received an invitation to participate in the update. The 2017 committee are identified in Table 1.3 by their respective organizations and political subdivisions.

Table 1.3

Name	Agency	Jurisdiction
Stephen Sewell	Acting EMA Director/Fire Chief	McDuffie County
John A. Thigpen	Thomson Fire Rescue	City of Thomson
David Crawley	County Manager	McDuffie County
Chuck Cason	Public Works	Thomson/McDuffie County
Scott Huff	Public Works	Thomson/McDuffie County
Kay Lord	Fire/EMS	McDuffie County
Sean Kelly	Mayor	Town of Dearing
Robert Moore	GA Forestry Commission	McDuffie County
Don Powers	City Administrator	City of Thomson
Kelly Evans	East GA Housing Authority Director	McDuffie County

J.J. Cooper	East GA Housing Authority Maintenance	McDuffie County
Neal Tam	Board of Education	McDuffie County
Kathy Linebarger	Health Department	McDuffie County
Jamie Bridges	Police Department	City of Thomson
Harry Lamar Fain	Waste Water Treatment Plant	Thomson/McDuffie County
Dan Hilson	Police Department	City of Thomson
Rhusha Mack	Fire Department	Town of Dearing
Lawrence Bruce	University Hospital	McDuffie County
Ronnie Williamson	Sheriff's Office	McDuffie County
Debbie Jones	Chamber of Commerce	McDuffie County

The 2017 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:

- McDuffie County Board of Education was responsible for providing structural replacement and content values for all schools as well as square footage and occupancy limits.
- Thomson Police Department provided staff support to the PDM planning effort and were responsible for providing structural replacement and content values for all critical facilities located in their respective cities as well as square footage and occupancy limits.
- McDuffie County Sheriff's Office provided staff support to the PDM planning effort.
- McDuffie 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.
- City officials from McDuffie County, Dearing and Thomson 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.
- McDuffie County Chamber of Commerce assisted in identifying major businesses.
- McDuffie County Code Enforcement Officer provided information about county government buildings including their respective replacement and content values and square footages.
- McDuffie County Tax Assessor's Office provided most of the aggregate values for the critical structures. The valuations were converted to full values since they 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 McDuffie 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 Climatic Data Center (NCDC), 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
McDuffie County Joint Comprehensive Plan	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	No	The plan is being updated and the GFC could not find me a copy of the old plan. Will incorporate into plan once it is completed.
Soil Survey for Columbia, McDuffie and Warren Counties	Yes	Physical Characteristics of the County
Flood Insurance Study	Yes	Review for historical Data and Information
Hazard Risk Analyses Supplement to the McDuffie 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
Flood Mitigation Assistance Plan	No	The county does not have a Flood Mitigation Assistance Plan and is listed as a mitigation action in Chapter III

The committee held six meetings over a 17-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 McDuffie Progress*, 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, Richmond, Taliaferro, Warren, Washington, and Wilkes including all municipalities located within the counties. Copies of correspondence, emails and advertisements are in Appendix E.

Table 1.5

Meeting Date	Purpose of Meeting
November 5, 2015	Advertisement ran in *The McDuffie Progress* for public meeting on November 12, 2015.
November 12, 2015	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 2012
May 26, 2016	Advertisement ran in *The McDuffie Progress* for public meeting on May 26, 2016.
June 9, 2016	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
July 20, 2016	This meeting was to ensure all data collected to date was correct for critical facilities and to reviewed mitigation strategies and action steps.
August 31, 2016	This meeting was a continuation of the July 20, 2016 meeting. Ensured all data collected was correct for critical facilities. It also covered in detail the devastation and after effects of the ice storm. The discussion of lessons learned continued.
April 20, 2017	Advertisement ran in *The McDuffie Progress* for public meeting on April 27, 2017.
April 27, 2017	Reviewed plan, mitigation strategies and HASUZ information.
May 18, 2017	An advertisement ran in *The McDuffie Progress* advertising the public meeting on May 25, 2017 for public input before submission of plan.
May 25, 2017	This meeting was to ensure the committee and public had a final opportunity to provide input before submission to GEMA for review.
September 7, 2017	Advertisement ran in *The McDuffie Progress* for public review period and the final meeting.

Meeting Date	Purpose of Meeting
September 21, 2017	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 2012 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 McDuffie County, Dearing, and Thomson.

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 McDuffie 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 2012 plan update. These goals and objectives are as follow:

- To actively involve and gain support from Dearing, Thomson and unincorporated McDuffie 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 McDuffie County, Dearing, and Thomson.
- Monitor, evaluate, and update the progress of the plan as needed.

- To form partnerships among local, state, and federal agencies to make McDuffie 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 McDuffie County, Dearing, and Thomson.

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 McDuffie County, Dearing and Thomson 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 2012 committee identified five major hazards that have the potential to affect McDuffie 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 McDuffie 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 McDuffie 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

McDuffie County, Dearing and Thomson provided active participants in the planning process and have identified mitigation goals, objectives and action items specific to their jurisdiction. The governing bodies for McDuffie County, Dearing and Thomson have formally adopted the Multi-Hazard Pre-Disaster Mitigation Plan.

Dearing and Thomson were notified in June of 2015 of the requirement concerning the 2017 update to the 2012 plan. Representatives from McDuffie County, Dearing and Thomson 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 Acting 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. McDuffie County, Dearing and Thomson 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
McDuffie County	*(will add after FEMA Approves)*
Town of Dearing	*(will add after FEMA Approves)*
City of Thomson	*(will add after FEMA Approves)*

The plan was submitted to GEMA for review and then to FEMA for approval. McDuffie County, Dearing and Thomson served as active participants in the planning process and have identified mitigation goals, objectives, and actions specific to their jurisdiction. Their respective governing bodies have formally adopted the 2017 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 McDuffie 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 McDuffie 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 McDuffie 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

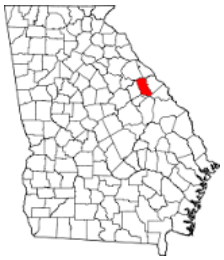
monitoring and evaluating the plan annually, and producing a plan revision every five years. Additionally, McDuffie County will develop steps to ensure public participation throughout the plan maintenance process. Finally, this section describes how McDuffie County will incorporate the mitigation strategies identified in this plan into other relevant planning documents such as the McDuffie County Joint Comprehensive Plan, Short-Term Work program (STWP) and Local Emergency Operations Plan (LEOP).

SECTION VIII. COMMUNITY DATA

Political Boundaries - McDuffie County

McDuffie County

GA Department of Community Affairs Region 7



Georgia

History: McDuffie County, established October 18, 1870, was named after named for George McDuffie, a native Georgian and distinguished lawyer, statesman, governor, and U.S. senator of South Carolina. McDuffie County is a rural county covering 266 square miles. McDuffie County is one of 13 counties that comprise the Central Savannah River Area (CSRA). There are two incorporated municipality in McDuffie County; Dearing and Thomson.

Government: McDuffie County operates under a commission-based system of government in which five commissioners are elected to four-year terms. Other county officials are the County Attorney, Clerk of Superior Court, Probate Judge, Coroner, Magistrate Judge, Sheriff, and Tax Commissioner.

The Town of Dearing, which operates a Mayor and Town Council-based system of government with three elected council members.

The City of Thomson, which operates a Mayor and City Council-based system of government with five elected council members. Other officials charged with presiding over activities within the city are the City Manager, Clerk, Attorney, Finance Officer, Engineer, and Public Works Director.

Demographics: Presently, McDuffie County has a population of 21,875 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	McDuffie County	Dearing	Thomson
Population	21,875	549	6,778
Number of Households	8,289	210	2,662
Average Household Size	2.60	2.61	2.49
Race - White	57.2%	87.8%	34.7%
Race - Black	39.8%	9.1%	62.7%
Race - Hispanic	2.2%	2.7%	1.5%
Race - Other	1.5%	2.3%	1.2%
Median HH Income	$37,899	$30,000	$21,211
Per Capita Income	$18,743	$15,388	$12,077

Source: 2010 -US Census Bureau, 2014 American Community Survey

Table 1.8

Community	Population				Growth (%)		
	1980	**1990**	**2000**	**2010**	**1980-1990**	**1990-2000**	**2000-2010**
McDuffie County	18,546	20,119	21,231	21,875	8.49%	5.53%	3.04%
Dearing	539	547	441	549	1.49%	-19.38%	24.49%
Thomson	7,001	6,852	6,828	6,778	-2.13%	-0.35%	-0.74%

Source: US Census Bureau

Economy: In the year 2015, the average weekly wage for employment sectors in McDuffie County was $668, compared to the statewide average of $1,001. The county's per capita personal income was $18,743. The current unemployment rate is 8.1 percent as of April 2015.

In 2013, the total number of employees located in McDuffie County was 6,781. Of the total work force, 76.62 percent were employed in the private service followed by 23.0 percent in the government sector. In 2014, 27.6 percent of the people in McDuffie County were living 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 2015 in McDuffie 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	**464**	**6,781**	**668**
Total Private Sector	**422**	**5,496**	**680**
Total Government	**42**	**1,285**	**616**
Agriculture, forestry, fishing, hunting	11	311	749
Mining	4	13	984
Construction	44	321	707

Manufacturing	29	1,502	839
Wholesale trade	16	55	787
Retail trade	87	936	550
Transportation, warehousing	11	203	1,020
Utilities	2	*	*
Information	4	69	1,148
Finance and Insurance	28	141	924
Real Estate, rental, leasing	11	32	659
Professional, technical services	30	126	638
Mgmt. of companies, enterprises	0	0	0
Administrative and support and waste management services	14	146	556
Educational services	1	*	*
Health care, social assistance	47	884	691
Arts, entertainment, recreation	5	32	294
Accommodation and food services	33	521	224
Other services, except public administration	28	159	405
Unclassified-Industry not assigned	17	23	671

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

Climate: According to the National Weather Service, Central Georgia where McDuffie County is located experiences all four seasons. McDuffie County, GA, gets 48 inches of rain per year. The US average is 37. Snowfall is 1 inches. The average US city gets 25 inches of snow per year. The number of days with any measurable precipitation is 91. On average, there are 222 sunny days per year. The July high is around 91 degrees. The January low is 35. 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: The County encompasses an area of roughly 266 square miles or 170,373 acres. The topography of McDuffie County ranges from that of level in the low-lying flood plain areas to around 549 feet of elevation. The county contains 9,817 acres of forested wetlands, 190 acres of wetlands, and 5,944 acres of open water. In addition, McDuffie County has 29 rivers/streams and 28 reservoirs. According to the GFC, McDuffie County has 96,975 acres of forestland.

Portions of McDuffie County are located within the Carolina and Georgia Sand Hills Major Land Resource Area (MLRA), and the Southern Piedmont MLRA. The Carolina and Georgia Sand Hills MLRA actually forms a very narrow band between the Southern Piedmont MLRA and the Coastal Plain MLRA. As a result, the principal soil associations apparent in the central and southern portions of McDuffie County (*Lakeland-Vaucluse-Orangeburg* and *Vaucluse-Lakeland-Orangeburg*) exhibit characteristics that are more typical of the Coastal Plain MLRA. *Cecil-Madison-Pacolet* soils are found in the northern portions of the county and are more typical of the Southern Piedmont MLRA.

Lakeland-Vaucluse-Orangeburg and *Vaucluse-Lakeland-Orangeburg* soils are found on uplands of the Carolina and Georgia Sand Hills MLRA and Coastal Plain MLRA that include fairly broad and flat ridge tops to slopes ranging up to 25 percent. These soils exhibit a sandy composition mixed with loam and clay. They exhibit good permeability and drain well. Exposure of such soils on steeper slopes can create erosion problems if not properly contained.

Cecil-Madison-Pacolet soils are found on ridges and side slopes of the Piedmont uplands. This association consists of deep well-drained soils that are formed in felsic, igneous and metamorphic rocks. Surface layers consist principally of gravelly sandy loam. A map of the soil types, wetlands and flood plains are located in Appendix A.

A survey of McDuffie County soil associations was conducted and approved by the Soil Conservation Service in 1977 and can be found at the following URL: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/georgia/columbia_mcduffie_warrenGA1981/CMW.pdf. A map of the soil types, wetlands and flood plains are located in Appendix A.

Transportation

Vehicle Traffic: There are roughly 501 miles of roads in the County network. This mileage includes 90 miles of state highways, 357 miles of county roads, 53 miles of city streets (town of Dearing and city of Thomson). State highways 10, 17, 12, 43, 150, 223, and 47 are major transportation routes along with Interstate 20 and US highways 78, 278 and 221. Currently McDuffie County has no mass transit system.

Table 1.10

Mileage by Route and Road System Report 445 for 2012			
	Total Road Mileage (2014)	Lane Mileage	Vehicle Miles Traveled (VMT)
State Route	90.81	243	729,579
County Road	357.35	717	137,244
City Street	53.67	107	44,834
Total	**501.83**	**1,067**	**911,656**

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.

Rail Traffic: McDuffie County is bisected by CSX Transportation's Atlanta to Augusta mainline (the "Georgia Railroad"). The Federal Surface Transportation Board defines CSX as a Class 1 Railroad, meaning its average annual operating revenue meets or exceeds $255.9 million. The rail line running through the county serves only freight operations and is defined as a "mainline" because it serves a large number of trains conveying a high volume of tonnage between major markets (terminals). The Augusta-Aiken MSA is a particular beneficiary of the railroad's

mainline status because Augusta is home to a CSX Transflo bulk transfer terminal that allows for rail/truck transfers of freight. Currently McDuffie County is not served by passenger rail.

Air Service: McDuffie County is home to the Thomson-McDuffie County Regional Airport (HQU). This airport is categorized by Aviation Programs, Georgia Department of Transportation as a Level III airport and accommodates various aviation related activities including recreational flying, agricultural spraying, corporate/business jets, ultra-lights, experimental aircraft, and flight training. Commercial air service is available in Augusta's Bush Field, (33 miles east) and at Atlanta's Hartsfield International Airport (120 miles west).

Utilities

Electricity: Georgia Power, a subsidiary of the Southern Company, provides electricity to the county.

Natural gas: The City of Thomson Natural Gas Department supplies natural gas to the citizens of Thomson. The department also provides gas to certain areas of McDuffie County, Warren County, Glascock County and Jefferson County.

Water and Sewer: McDuffie County and the City of Thomson operate several joint departments, one of which is the Water and Sewer Utility. The town of Dearing joined with the city and the county in 2012 to form a joint water and sewer system. This department is responsible for supplying water and sewer service to residential, commercial and industrial customers throughout the city and county. Two filter plants treat raw surface water from Clarks Hill Lake and Usry Pond. The Water and Sewer Utility is permitted to withdraw and treat 3.1 million gallons per day (GPD) from Clarks Hill Lake and 1.5 million GPD from Usry Pond. Current average daily use is 2 million GPD. This leaves an additional 2.6 million GPD available for future use.

Solid Waste: The Department of Solid Waste Management provides the customers of McDuffie County with an environmentally responsible and cost-effective system for reduction and disposal of solid waste through quality service, education and public involvement. McDuffie County operates a solid waste transfer station located off Mesena Road. All solid waste generated in McDuffie County is processed through this facility. The waste goes to the Waste Management owned R&B Landfill in Homer, Ga. McDuffie County operates a transfer station and inert landfill with some source separated recycling. A special residential waste drop-off site is maintained for a clean, quick disposal area for those wishing to haul their own trash and save a little cash.

Communications: McDuffie County's landline phone service primary provider is AT & T. McDuffie County has many media outlets that consist of print, radio, and television. Local print media consists of *The McDuffie Progress* (which serves as the legal organ of the county), *The McDuffie Mirror*, and *The Augusta Chronicle*. McDuffie County is served by 19 FM radio stations. All metro Augusta television stations broadcast in McDuffie County. These 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 McDuffie County EMA. CodeRED® is a new County service by which County officials can notify County 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:

McDuffie County Fire Service -- McDuffie County has six fire departments and provides fire protection services to the unincorporated areas of the county. The McDuffie County Fire Rescue Service (FRS) has 52 firefighters - five (5) full-time, 10 part-time, and 37 paid per call. Of these, 85 percent are trained as either paramedics, emergency medical technicians (EMTs) or first responders. The FRS has six (6) fire stations with a split ISO rating of 5/9. Five is for properties located within five road miles of a station and within 1,000 ft. of a hydrant or creditable water source. The nine is for properties within five road miles of a station but more than 1,000 ft. from a water source. They provide services to approximately 15,000 citizens in an area of 250 square miles.

Dearing Fire Department provides service to the city and operates out of two fire station. The Dearing Volunteer Fire Department was founded in 1953. All members are volunteer, trained firefighters with medical emergency response capabilities. There are two captains, three lieutenants, one training officer, one safety officer, and 4 firefighters. The town has two fire stations and an ISO rating of 4.

Thomson Fire Department provides service to the city of Thomson. They have 28 firefighters - nine (9) full-time, five (5) part-time and 14 volunteers, many of whom are also trained either paramedics, EMTs or first responders. The city has two stations and an ISO rating of 4.

Law Enforcement: The McDuffie County Sheriff's Department services the unincorporated areas of the county along with the town of Dearing. The department consists of 1 sheriff, 1 chief deputy, 2 criminal investigators, 1 deputy assigned to the courthouse and 14 uniformed patrol officers. The county substation is located in Dearing and is manned part-time. There is one county jail, which is located in Thomson. The city of Thomson operates its own police department and consists of an investigative unit, uniformed patrol unit (UPU) and K-9 unit. The department has 14 officers. The UPU has ten uniformed patrol officers. Two patrol officers are also certified firefighters.

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

The committee identified all natural hazards that could potentially affect McDuffie County, Dearing Thomson 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 McDuffie County. Task B then narrowed the list to only hazards most likely to impact the county by reviewing hazard websites to determine if McDuffie 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 McDuffie 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.

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. McDuffie County and Thomson participate and will continue to participate in the NFIP. The Town of Dearing does not participate in the NFIP. According to the McDuffie County Flood Insurance Study and FEMA flood maps there are no known flood prone areas within the town limits. Dearing does not intend to participate in the NFIP based on this information. The following table provides information about each jurisdictions participation level.

Jurisdication	Init FHBM Identified	Init. FIRM Identified	Curr. Eff. Map Date	Reg-Emer Date	Sanction Date
McDuffie County	03/29/1976	10/01/2004	09/29/2010	11/08/2004	NA
Dearing	N/A				
Thomson	06/28/1974	09/29/2010	09/29/2010	10/05/2010	NA

Source: FEMA Community Status Book

B. Hazard Profile: Severe flooding within McDuffie County is a relatively infrequent event. The county has one lake, 29 rivers/streams and 28 reservoirs. Countywide, slopes range from level to 25 %. Floodplains are narrow except along the principal rivers that have a wide expanse of swamp bordering both sides of the channel. Elevations in the district range from 500 to 700 feet. The committee examined historical data from the NCDC, USGS, SHELDUS™, past newspaper articles and conducted interviews on the effects of past flooding events. In the last 67 years six flooding events were recorded, where three occurred in the unincorporated area of the County, and one was countywide. The table below is a result of information gathered from interviews, newspaper articles, and the NCDC and SHELDUS™ databases.

Date	Fatality	Inj	PrD	CrD	Event Narrative
10/4/1995	0	0	0.00K	0.00K	Flood conditions were reported beginning at 1:00 a.m. and ending at 7:00 p.m., resulting in 18 hours of flash flooding.
6/13/2001	0	0	0.00K	0.00K	A result of Tropical Storm Allison. Water moving over Folly Lake Bridge and on Stagecoach Road. GSP responded to 6 accidents with three injuries. Damage was reported at Thomson and Dearing Elementary and Pine St. School, Flood conditions lasted app. 4 hours.
9/10/2008	0	0	10K	0K	Secondary dirt roads washed out from flash flooding Heavy rains produced 3 to 5 inches over portions of

Date	Fatality	Inj	PrD	CrD	Event Narrative
					northern McDuffie
1/24/2010	0	0	20k	0k	Flooding at apartment complex with up to a foot of water in several apartments. A squall line moved through, took down some trees and power lines.
12/29/2015	0	0			Rutted roads and swollen creeks and ponds were the aftermath of 4.81 inches of rain that fell in Thomson-McDuffie County between Dec. 21 and Dec. 28.
12/30/2016	0	0			According to WTHO-FM, the Thomson area has received 7.11" from Dec. 21 through the morning of Dec. 31. Throughout the day on Dec. 30, the radio station measured 1.52 inches. Roads including First Avenue, Manassass Drive, A Street and Sill Street were affected by the flooding and standing water.

Source: NCDC, SHELDUS and The McDuffie Progress

Picture of event from 12/29/2015

Water from the Clarks Hill Lake partially covers a campsite at Raysville Campground in McDuffie County

Source: The McDuffie Progress

Picture of event from 12/30/2016

Most flood events resulted in flash flooding which washed out several roads and wooden bridges. The average flood depth is 2.5 feet. 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, Dearing and Thomson 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 and Thomson.

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 chance of an annual flooding event occurring is:

- 25 percent for all of McDuffie County;
- 25 percent for the unincorporated areas of McDuffie County;
- 5 percent for Dearing; and
- 20 percent for Thomson (*See Appendix A, Section I for Worksheet 3A, Historical Event Tables, Critical Facilities Reports, and Flood Maps and Appendix D for 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 218 structures/properties valued at more than $9 million and a population of 459 are located in known flood prone areas within the County.

All 218 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 a given area. If a complete loss of the 218 structures/properties located would result in approximately $9 million in damages assuming 100 percent loss, a 75 percent loss would represent approximately $ 6.75 million, a 50 percent loss would represent approximately $4.5 million, and a 25 percent loss would represent approximately $ 2.25 million.

The GMIS flood hazard map has the unincorporated areas of the county along with Dearing and Thomson with a hazard score of zero. A hazard score of four has been assigned to areas in known floodplains in the unincorporated areas of the county and Thomson. Dearing has no none floodplains.

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
McDuffie County	0	21	$58,050,600	$16,655,000.00	3,444
McDuffie County	1	10	$38,550,000	$8,485,000.00	2,254
McDuffie County	3	15	$2,783,355	$500,000.00	0
Dearing	0	1	$350,000.00	$500,000.00	2
Dearing	1	3	$730,000.00	$280,000.00	0
Thomson	0	9	$4,372,600	$1,435,000.00	47
Thomson	1	18	$9,087,500	$3,251,500.00	433
TOTAL		77	$113,924,055.00	$31,106,500.00	6,180

The GMIS has no repetitive flooding NFIP properties and one NFIP mitigated property. There are no estimate for future structures since future development will be limited in known floodplains. *(See Appendix A, Section I 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 McDuffie 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 McDuffie County flood risk assessment analyzed at risk structures in the SFHA. The results of the Riverine 1% Flood Scenario revealed that buildings in McDuffie 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:** Residential buildings 22 residential buildings damaged at a loss of $893,304.
- **Essential Facility Losses:** The analysis identified the County Fire Station # 6 on Stage Coach Rd was subject to damage.
- **Flood Shelter Requirements:** The scenario estimates 149 households are subject to displacement. Displaced households represent 446 individuals, of which 47 may require short-term publicly provided shelter.
- **Flood Debris:** Hazus-MH estimates that an approximate total of 2512 tons of debris might be generated by the flood. The model breaks debris into three general categories:
    - Finishes (dry wall, insulation, etc.) - 1,150 tons generated;
    - Structural (wood, brick, etc.) – 541 tons generated; and
    - Foundations (concrete slab, concrete block, rebar, etc.) - 821 tons generated.

D. Land Use and Development Trends: The McDuffie County Joint Comprehensive Plan 2015-2035 presents future development scenarios for McDuffie County. The County should see future growth patterns as the Augusta metro area sprawls westward. McDuffie County's population is projected to increase by more than 30% by 2025. Areas where rapid development or change of land use is likely are:

- ***Southeastern Dearing*** Large undeveloped parcels of land in this area of the town are likely to develop and change the land use from agricultural to residential.
- ***Three Points Road Interchange*** The construction of a new major highway interchange in the very near future has the potential to shift the primary land use in this area from agricultural and forestry uses to higher density, higher-impact development very quickly.
- ***Proposed new R-3 Zoning District northeast of Thomson:*** This is another area where large tracts of undeveloped agricultural lands will be converted to residential uses.
- ***Thomson East Bypass Corridor*** The construction of a new limited access bypass also has the potential to shift the primary land uses from lower intensity to higher intensity very rapidly.

With all new development, the enforcement of McDuffie 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 McDuffie County/Thomson/Dearing Comprehensive Plan through 2029 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, Dearing, and Thomson are aware of the need to develop communication capabilities that will serve their County. Since flooding has the potential to affect all of McDuffie County, any mitigation steps taken related to flooding should be undertaken on a countywide basis to include Dearing and Thomson.

F. Hazard Summary: Based on interviews, data from the NCDC covering 67 years, and the local papers, *The McDuffie Progress and the McDuffie Mirror*, there have been six reported flooding events. All of these events took place in the unincorporated areas of the county, while four of the six impacted Thomson and one in Dearing. 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 nine 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 McDuffie 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 218 known structures/properties valued at approximately $9 million and a population of 456 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.

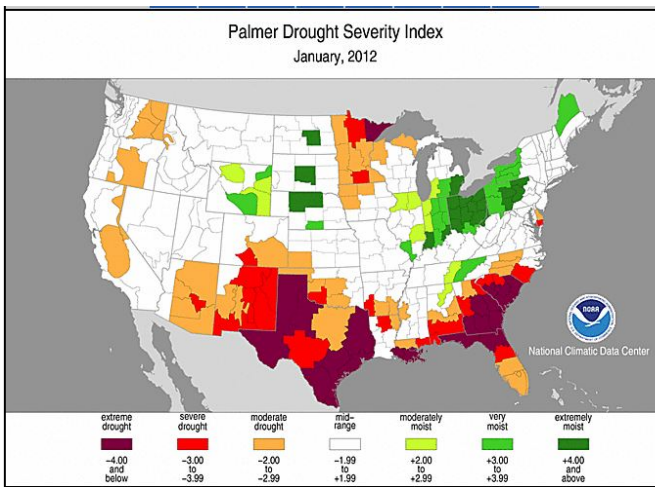
SECTION II. DROUGHT

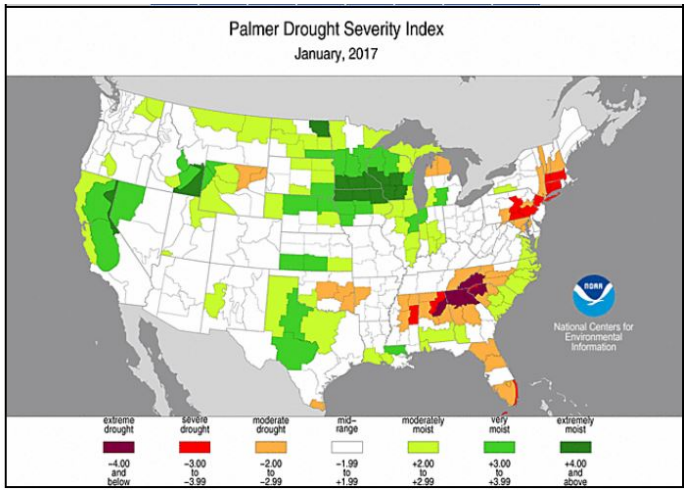
A. Hazard Identification: The committee reviewed historical data from the Palmer Drought Index, NCDC, DNR, USDA and GFC in researching drought conditions. Drought conditions are identified by a prolonged period of moisture deficiency. Climatologists and hydrologists use five indicators of drought: rainfall, 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. McDuffie County's consist of 266 square miles with 8.9 of these miles being water. The county is comprised of 170,373 acres with 37,989 (22.3 percent) acres dedicated to agricultural and 90,141 acres (54.2 percent) acres dedicated to forestry. According to the USDA 2012 Census of Agriculture 6,384 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.

According to the NCDC, there have been no reported drought events in McDuffie County. 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). The Palmer Index uses a zero as normal, and drought is shown in terms of minus numbers; for example, minus two is moderate drought, minus three is severe drought, and minus four is extreme drought.

NCDC data for surrounding counties and a review of The Palmer Index (from https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/) reveals there have been 24 drought events since 1997. 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 maps below show drought conditions for January 2012 and January 2017.



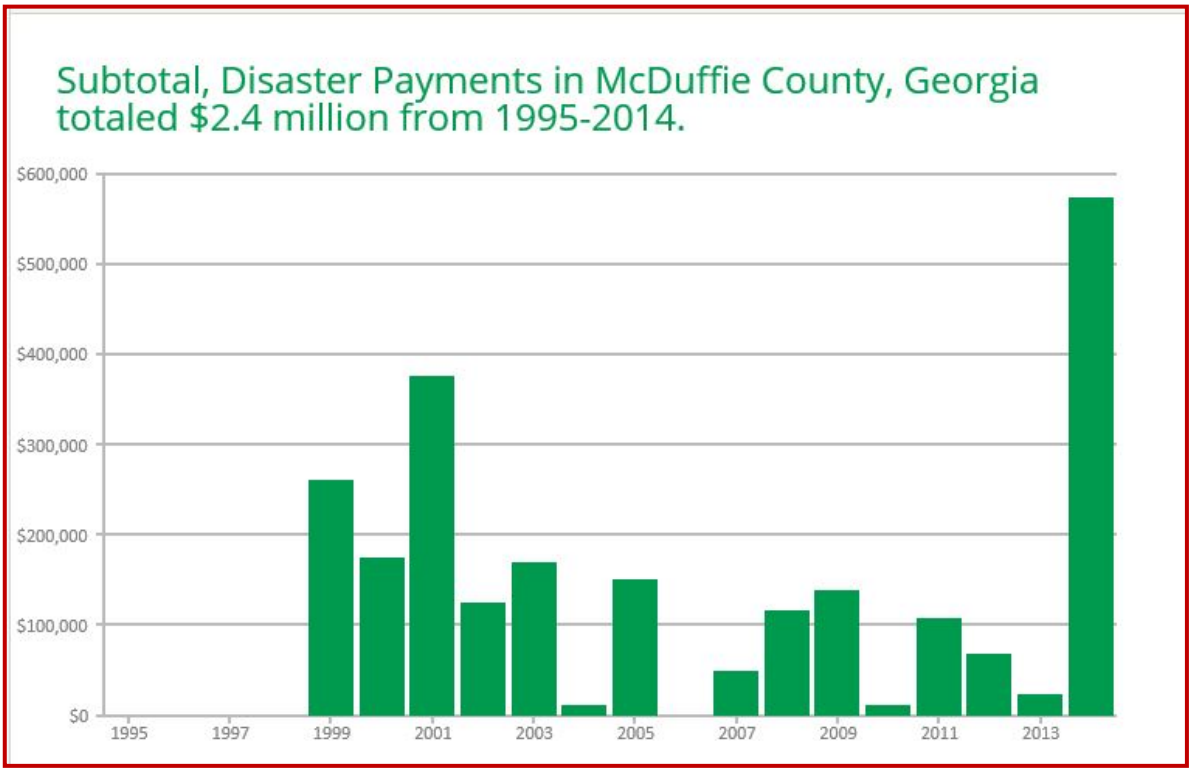


Based on the weekly data from the US Drought Monitor (http://droughtmonitor.unl.edu/MapsAndData/MapsandDataServices/StatisticalData.aspx) from January 2000 to December 2016 the county has experienced the following drought conditions:

- 218 weeks where all or a portion of the county has experienced of D0 - Abnormally Dry;
- 204 weeks where all or a portion of the county has experienced of D1 - Moderate Drought;
- 166 weeks where all or a portion of the county has experienced levels of D2 - Severe Drought;
- 165 weeks where all or a portion of the county has experienced levels of D3 - Extreme Drought; and
- 41 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.)

The drought of 2012 the county ranged between a -3.00 (severe drought) and a -4.00 (extreme drought) on the Palmer Index. The average based on historical data is a -3.00 on the Palmer Index.

According to the USDA Farm Subsidies Database, there has been a total of $ $2,366,772 million in disaster assistance from 1995-2014. The graph below depicts amounts and years of payments.



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

Historical data is only for the county as a whole. A severe, prolonged drought would mainly affect the 76.5 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 120 percent chance of an annual drought event for the county as well as Dearing and Thomson *(See Appendix A, Section III, for Worksheet 3a and Appendix D.)*

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:

- Dearing has 21 agricultural/forestry structures/properties valued at approximately $1,694,670 with an estimated population of twelve.
- Thomson has 10 agricultural/forestry structures/properties valued at approximately $613,490 with an estimated population of eight.
- Unincorporated McDuffie County has 2,662 agricultural/forestry structures/properties valued at approximately $264 million with an estimated population of 350.

There are 2,693 agricultural/forestry properties in McDuffie County valued at approximately $266 million with a population of 370 that are at the greatest risk due to a drought event *(See Appendix A, Section III for Worksheet 3A, Historical Event Tables, Drought Extent Tables and Drought Maps and Appendix D for Hazard Frequency Tables).*

D. Land Use and Development Trends: McDuffie 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 use 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 Dearing and Thomson 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 equally affects the entire planning area. 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 McDuffie 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 120 percent chance of an annual drought event in McDuffie 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 McDuffie County as a whole, there are 2,693 agricultural/forestry properties valued at approximately $266 million and include 6,384 heads of livestock and an estimated population of 370 that have the greatest potential to be damaged by drought. There is a population of 21,875 and approximately 31,022 structures/properties in the county with a value just slightly more than $1.7 billion, which could be affected if wildfires break out due to drought conditions. Drought mitigation goals and objectives are in Chapter III, Section III.

All water departments have adopted the Georgia Water Stewardship Act that 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 enforcement of these restrictions helps to ensure an ample water supply during drought times. All citizens are informed of water restrictions as they occur.

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: McDuffie County's consist of 266 square miles with 8.9 of these miles being water. The county is comprised of 170,373 acres with 37,989 (22.3 percent) dedicated to agricultural and 90,141 acres (54.2 percent) dedicated to forestry. 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 NCDC has never reported a significant wildfire event in McDuffie County.

The committee reviewed historical data from the GFC, which is not found in the NCDC 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 2,241fire events burning a total of 11,081 acres for an average extent of 4.9 acres. Of these 2,241 fire events, only 58 were a result of a natural hazard event that burned 771 acres. Based on best available data, the 58-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 Dearing or Thomson.

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 26 wildfire events during the 20-year hazard cycle predicting a 130 percent chance of an annual wildfire due to a natural hazard event or statistically the county can expect 2.9 wildfires because of a natural hazard annually. The drier the condition the more susceptible the county is to wildfire (*See Appendix D).*

- Hazard score of three (moderate wildfire risk)
  - City of Thomson - approximately 30% of the city
- Hazard score of two (low wildfire risk)

  - Unincorporated areas of the county – approximately 15%
  - City of Thomson - approximately 30% of the city
- Hazard score of one (very low wildfire risk)
  - Unincorporated areas of the county – approximately 70%
  - Town of Dearing– 100% of the city
- Hazard score of zero (no houses, agriculture, water, or city)
  - Unincorporated areas of the county – approximately 15%
  - City of Thomson – approximately 40% of the city

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 A shows the number and types of buildings found in McDuffie 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
McDuffie County (Unincorporated)	22,870	1,366,492,650.00	14,548
Dearing	830	34,175,25.00	549
Thomson	7,322	391,566,202.50	6,778
TOTAL FOR COUNTY	31,022	1,792,234,477.50	21,875

Source: McDuffie 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 $	Daily Occupancy
McDuffie County	0	10	$45,295,000.00	$13,225,000.00	2,238
McDuffie County	1	23	$9,426,355.00	$2,350,000.00	551
McDuffie County	2	12	$39,162,600.00	$8,815,000.00	2,248
McDuffie County	3	1	$5,500,000.00	$1,250,000.00	661
Dearing	1	4	$1,080,000.00	$780,000.00	2
Thomson	0	13	$9,170,000.00	$3,495,000.00	459
Thomson	1	3	$1,058,100.00	$85,000.00	4
Thomson	2	5	$2,190,000.00	$473,500.00	4
Thomson	3	6	$1,042,000.00	$633,000.00	13
TOTAL		77	$113,924,055.00	$31,106,500.00	6,180

According to FEMA Worksheet #3a there are 31,022 structures/properties with a population of 21,875 with a value of slightly more than $1.7 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, Section IV, for Worksheet 3A, Historical Event Tables, Critical Facilities Reports and Wildfire Map, and Appendix D for Hazard Frequency Tables).*

D. Land Use and Development Trends: McDuffie 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 McDuffie 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 McDuffie County, Dearing and Thomson. 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: McDuffie County's consist of 266 square miles with 8.9 of these miles being water. The county is comprised of 170,373 acres with 37,989 (22.3 percent) acres dedicated to agricultural and 90,141 (54.2 percent) acres dedicated to forestry. 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 2,241fire events burning a total of 11,081 acres for an average extent of 4.9 acres. Based on a 20-year hazard cycle there is a 130 percent chance of an annual wildfire due to a natural hazard event or statistically the county can expect 2.9 wildfires annually.

According to FEMA Worksheet #3a there are 31,022 structures/properties with a population of 21,875 with a value of slightly more than $1.7 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 and 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 NCDC, 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.

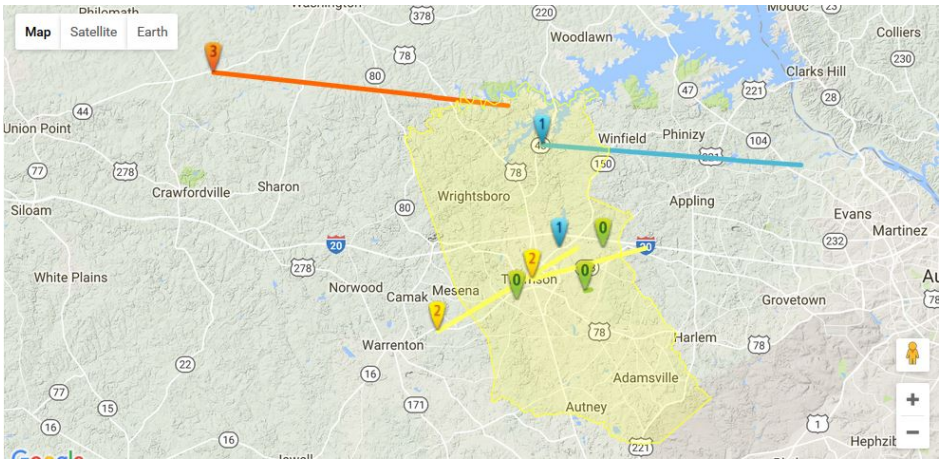
B. Hazard Profile: Tornados, tropical storms, thunderstorm winds, lightning and hail can affect the entire county given the right conditions. Since the exact time and location of a severe weather event is not always predictable, all of McDuffie County is vulnerable to the threats of severe weather. Based on historic data, there have been seven reported tornados in the planning area: seven in the unincorporated areas of the county and two of the seven traveling into the city limits of Thomson. There are no records of a tornado in Dearing. The highest magnitude reported was an F2. The longest path was 15 miles. Reported property and crop damages for all seven events totaled more than $120,000 in property and crop damages with three fatalities reported. 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 percent for McDuffie County as a whole;
- 25 percent for Unincorporated McDuffie County; and
- 10 percent for Thomson
- No calculation is available for Dearing

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
5/24/1955	McDuffie	3	0	F0	3K	0	None Reported
2/2/1973	McDuffie	0	0	F1	3K	0	None Reported
1/13/2005	Thomson	0	0	F0	0	0	F0 broke trees in half at intersection of I-20/ White Oak Rd.
3/1/2007	McDuffie Thomson	0	0	F2	0K	0K	An EF2 started in Warren county moved through McDuffie county taking down numerous trees and power lines. It moved along HWY 278 then along HWY 150 to I-20. Several vehicles were totaled/ homes and a private school had moderate damage. Ground survey found a damage path of 9 miles but a real survey found the total length to be 15 miles
3/15/2008	Thomson McDuffie Airport	0	0	F0	0K	0K	Storm survey found an F0 started in McDuffie county taking down many trees and continued into Columbia county.
2/18/2009	Thomson McDuffie Airport	0	0	F0	0K	50K	Storm survey found the tornado path coming out of Wilkes county into McDuffie county. Only trees were in the path of the tornado with many taken down south of the lakeshore.
4/10/2009	Boneville	0	0	F0	72K	0K	Trees down, some on vehicles, on Moose Club road. NWS damage survey also found minor damage to several homes.

Sources: Interviews, The McDuffie Progress, Georgia Tornado History Project, NCDC and SHELDUS™



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

There have been 12 tropical storms reported by the NCDC and SHELDUS™ with no reported property and crop 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 50 percent chance of an annual tropical storm event for county as a whole (*See Appendix D).*

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

Source: NCDC and SHELDUS

Thunderstorms are much more prevalent during the spring and summer months. There have been 67 events reported by the NCDC and SHELDUS™ in the last 67 years with highest winds reported at 80 knots. These storms with more than $3,532,000 in property and crop 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
McDuffie County(Unincorporated)	15	13	28
Dearing	8	13	21

Thomson	31	13	44
TOTAL FOR COUNTY			**67**

** It is assumed that all 54 countywide events reported occurred in each jurisdiction. Source: NCDC 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:

- 270 percent for McDuffie County as a whole;
- 95 percent for Unincorporated McDuffie County; and
- 155 percent for Thomson
- 60 percent for Dearing

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 NCDC has only two reported lightning events in the past 67 years with slightly more than $8,000 in property damages with one injury. Since 1950 there have been 58 lightning strikes recorded resulting in wildfires. When these datasets are combined there has been 60 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:

- 290 percent for McDuffie County as a whole;
- 130 percent for Unincorporated McDuffie County;
- 10 percent for Thomson; and
- No data is available for Dearing.

The fifth weather event is hail. A combination of SHELDUS™ and NCDC data reports 51 hail events in the last 67 years with slightly more than $69,500 in property and crop damages and 15 injuries. Hailstones ranged in size from .75 to 1.75 inches.

Location	# of Events	County-Wide Events*	Total # of events per jurisdiction
McDuffie County(Unincorporated)	4	18	22
Dearing	5	18	23
Thomson	24	18	42
TOTAL FOR COUNTY	33	18	**51**

** It is assumed that all 18 countywide events occurred in all jurisdiction. Source: NCDC 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:

- 160 percent for McDuffie County as a whole;
- 25 percent for Unincorporated McDuffie County;
- 120 percent for Thomson; and
- 25 percent for Dearing.

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 70 percent of the county with a wind hazard score of two, where wind speed is between 90 to 99 mph. The remaining 30 percent with a hazard score of one, where wind speed is less than 90 mph. Dearing and Thomson have a hazard score of two. The table below provides data from FEMA Worksheet #3a that estimates the potential loss for each jurisdiction.

Jurisdiction	Number of Structure/Properties	Value $	Population
McDuffie County (Unincorporated)	22,870	1,366,492,650.00	14,548
Dearing	830	34,175,25.00	549
Thomson	7,322	391,566,202.50	6,778
TOTAL FOR COUNTY	31,022	1,792,234,477.50	21,875

Source: McDuffie County Tax Assessor

Of the 77 critical facilities, 67 have a wind hazard score of two placing the critical facilities in Zone IV which has a wind speed of 90 to 99 mph and the remaining 10 have a hazard score of one. GMIS critical facility reports for wind and FEMA Worksheet #3a are located in Appendix A 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
McDuffie County	1	9	$10,575,400.00	$1,850,000.00	10
McDuffie County	2	37	$88,808,555.00	$23,790,000.00	5,688
Dearing	2	4	$1,080,000.00	$780,000.00	2
Thomson	1	1	$522,600.00	$85,000.00	4
Thomson	2	26	$12,937,500.00	$4,601,500.00	476
TOTAL		77	$113,924,055.00	$31,106,500.00	6,180

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 now 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	35	$2,513,710	$4,000	0.10

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 116 tons
- Tree Debris 1,108 ton
- Other Tree Debris 15,676 tons

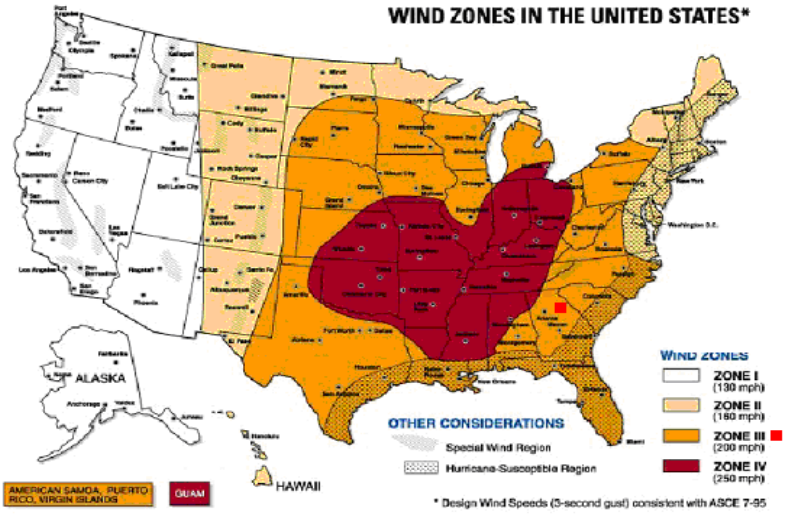
A hypothetical tornado scenario was ran using an EF3 tornado was modeled to illustrate the potential impacts of tornadoes of this magnitude in the county. The analysis estimated that approximately 421 buildings could be damaged, with estimated building losses of $35 million dollars.The building losses 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	388	$26741771
Commercial	29	$4,225,446
Education	2	$3,750,231
Religious	1	$355,902
Total	**421**	$35,259,387

There were two essential facilities located in the tornado path – McDuffie County Board of Education, Thomson Middle School. According to the modeling, these two facilities would suffer major damage should such a tornado strike occur. According to the Georgia Department of Education, Thomson-McDuffie Middle School enrollment was approximately 840 students as of October 2015. Depending on the time of day, a tornado strike as depicted in this scenario could result in significant injury and loss of life. In addition, arrangements would have to be made for the continued education of the students in another location. A complete copy of the

D. Land Use & Development Trends: McDuffie 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 McDuffie 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 — Need for high-wind shelter is a matter of homeowner preference

MODERATE RISK — Shelter should be considered for protection from high winds

HIGH RISK — 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 Dearing and Thomson. 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 McDuffie 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.

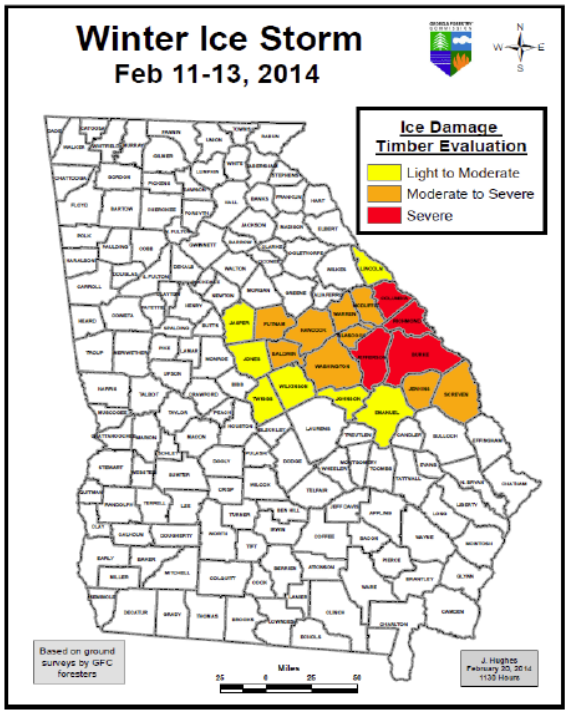
Weather Event	#	Fatalities	Injuries	Approximate Property/Crop Damage
Tornados	7	3	0	$120,000.00
Tropical Storms	12	0	0	$0.00
Thunderstorm Winds	67	0	0	$3,532,000.00
Lightning	60	0	1	$8,000.00
Hail	51	0	15	$69,500.00

To summarize, there are approximately 31,022 structures/properties in the county totaling slightly more than $1.7 billion with a population of 21,875. 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 NCDC, SHELDUS™, SERCC, as well as information from past newspaper articles relating to winter storms. There have been 23 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 85 percent of the county was interrupted. In McDuffie County, 6,195 customers were without power and some for up to five days.

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. McDuffie 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
McDuffie County (Unincorporated)	22,870	$1,366,492,650.00	14,548
Dearing	830	$34,175,625.00	549
Thomson	7,322	$391,566,202.50	6,778
TOTAL FOR COUNTY	31,022	$1,792,234,477.50	21,875

Source: McDuffie County Tax Assessor

The GMIS does not provide a report for winter storm damage but there is slightly more than $1.7 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, Worksheet 3A, Winter Storm Maps and Appendix D for Hazard Frequency Tables).*

Jurisdiction	# of Critical Facilities	Replacement Value $	Content Value $	Daily Occupancy
McDuffie County	46	$99,383,955	$25,640,000.00	5,698
Dearing	4	$1,080,000.00	$780,000.00	2
Thomson	27	$13,460,100.00	$4,686,500.00	480
TOTAL	77	$113,924,055.00	$31,106,500.00	6,180

D. Land Use & Development Trends: McDuffie 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: McDuffie 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 Dearing Thomson.

Another major issue is countywide communications capabilities. 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 removed the county will be without any adequate means to bounce signals. The County, Dearing and Thomson are aware of the need to develop communication capabilities that will serve the entire county.

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 23 winter storm events recorded in the county over the last 67 years with no property damaged reported. There is a 65 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 31,022 structures/properties in the county totaling slightly more than $1.7 billion with a population of 21,875. The committee recognized the dangers posed by winter storms and identified specific mitigation actions in Chapter III, Section VI.

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 2012 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.
III. 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.
IV. 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.
V. 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
VI. 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.
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 McDuffie County, Dearing, and Thomson, 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

McDuffie County, Dearing, and Thomson 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. McDuffie County has an annual budget of around $55 million, Dearing's 2016 budget is one million and Thomson's 2016 budget is $18 million. It should be noted that mitigation action steps with high dollar amounts cannot 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 identifies administrative, technical, legal and fiscal capabilities of each jurisdiction.

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

Regulatory Tools (ordinances, codes, plans)	McDuffie County	Dearing	Thomson	Does State Prohibit
Building codes	Y	Y	Y	N
Zoning ordinance	Y	Y	Y	N
Subdivision ordinance or regulations	Y	Y	Y	N

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

Table 3. 3 Fiscal Capability

Financial Resources	McDuffie County	Dearing	Thomson	Accessible or Eligible to Use (Yes/No)
Community Development Block Grants (CDBG)	Y	Y	Y	Y
Capital improvements project funding	Y	Y	Y	Y
Authority to levy taxes for specific purposes	Y	Y	Y	Y – Vote required
Fees for water, sewer, gas, or electric service	Y	N	Y	Y
Impact fees for homebuyers or developers for new developments/homes	N	N	N	N
Incur debt through general obligation bonds	Y	Y	Y	Y
Incur debt through special tax and revenue bonds	Y	Y	Y	Y – Vote required
Withhold spending in hazard-prone areas	N	N	N	N
Other Grants	Y	Y	Y	N

Table 3.4 Administrative and Technical Capacity

Staff/Personnel Resources	McDuffie County	Dearing	Thomson	Dept./Agency and Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	N	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	Y	Building Dept./ Code Enforcement
Planners or Engineer(s) with an understanding of natural and/or manmade hazards	Y	N	Y	Public Works/CSRA RC Staff
Floodplain manager	N	N	N	
Surveyors	N	N	N	Contracted as needed
Staff with education or expertise to assess the community's vulnerability to hazards	Y	Y	Y	Public Safety/EMA
Personnel skilled in GIS and/or HAZUS	Y	N	Y	CSRA RC
Emergency manager	Y	Y	Y	EMA
Grant writers	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**

McDuffie County, Thomson and Dearing 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 *McDuffie County Joint Comprehensive Plan 2015-2035* was adopted by resolution by the McDuffie County Board of Commissioners, Dearing Town Council, and the Thomson 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: McDuffie County has five districts listed on the National Register of Historic Places, as well as several individual sites.

- The Boneville historic district was listed in 2000. Boneville is located at the junction of Boneville Rd and Georgia RR approximately 5 miles SE of Thomson.

- The Thomas Carr historic district was listed in 1975. Located North of Thomason near jct. of GA 150 and I-20.

- The Hayes Line historic district, listed in 2000, located at the junction of Twin Oaks Rd and GA 233.

- Thomson Commercial historic district, listed in 1989. Roughly bounded by Journal St., Greenway St., Railroad St., Hendricks St., and Church St.

- Bowdre-Rees-Knox House, listed in 1979. Located SW of Thomson on Old Wrightsboro Rd.

- The James L. Hardaway House, listed in 1993. Located at Old Mesena Rd. W of Thomson. It was built in the Greek Revival style by George Washington Hardaway in 1842. The house is a classic sand hills raised cottage with a four-over-four floor plan. The ground floor is constructed of weathered granite. The second floor is southern modified braced beam construction. The ground floor ceilings are 8 feet tall while the second story is 12 feet tall. All ceilings are wood except the room with faux marble walls that has a plaster ceiling. The second floor has extensive molding around all windows and doors. All architectural details except the rear addition are original. Of major interest are the pediments over the front façade windows and sidelights on the second story. The home has had only four owners since leaving the Hardaway family in 1896.

- Hickory Hill, also known as the Thomas E Watson House, listed in 1979. Located at 502 Hickory Hill Dr. Hickory Hill is located on a wooded 70-acre parcel of land, bounded on the north by Magnolia Drive, the east by North Lee Street, the south by Hickory Hill Drive, and the west by the Thomson city line. A large Classical Greek Revival dentillated and pedimented portico projects from its front, supported by four two-story Ionic columns.

- Hillman-Bowden House, listed in 2002. A Greek Revival architectural style. Located at 1348 Pyland Crossing Rd.

- McNeill House, listed in 1992. An international architectural style. Located at 220 Lee St.

- Old Rock House, listed in 1970. Located NW of Thomson on Old Rock House Rd. It was built in 1785 by Thomas Ansley. The house was purportedly the home to the ancestors of former president Jimmy Carter.

- Pine Tope Farm, listed in 1996. Located at the junction of US 78 and US 278.

- Sweetwater Inn, listed in 1985. Located off GA 17 on Old Milledgeville Rd. It was built in 1826. The structure functioned as a residence and an inn.

- Usry House, listed in 1974. Located at 211 Milledge St. The house is a beautifully preserved NeoClassic plantation house surrounded by gardens and a white wooden fence. A treasure located in the heart of town. Usry House built by William Usry about 1795 as the seat of his extensive cotton plantations. Usry House became the center of Antebellum social activity in this region . In its parlor the Goodrich Usry Railroad was conceived and Lafayette reputedly hosted. Architecturally it is along Neoclassical lines and its suspended balcony is one of the largest in the south. The builder of Usry House was a greatgrandson of Sir Robert Usry of England, founder of the family in America. Its owner is a seventh generation grandson of the builder.

Recreation: Most of the recreation needs of McDuffie County residents are served by Sweetwater Park. The 85 acre complex contains playlots, ball fields, and tennis and volleyball courts. Additionally the Army Corps of Engineers operates the Raysville Campground area with both primitive campsites and full RV hookups. The Raysville Campground is open from March 1 to October 31 and located within U.S. Army Corp managed property that encompasses a large portion of the county's frontage on Clarks Hill Lake.

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 McDuffie County together with Dearing and Thomson 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. Those actions likely to require extended time frames to accomplish received medium priority status.

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 54.2 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 McDuffie 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 McDuffie 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 McDuffie 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 McDuffie 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, McDuffie County and other southeastern communities must be prepared for the damage caused by winter storms. The fact that winter storms hit McDuffie County infrequently results in other problems, such as lack of equipment and supplies to combat treacherous winter storm conditions. In McDuffie 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. 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 F1. Ensure communication capabilities exist between all Emergency Service Personnel and Agencies.
Objective F2. 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 F3. Protect critical facilities from the effects due to power outages because of a hazard event to ensure a continuation of all vital services.
Objective F4. Provide adequate notification to citizens of McDuffie County pertaining to hazard event.
Objective F5. Guarantee all evacuation plans are up to date and adequate to meet the needs of the citizens of McDuffie County.
Objective F6. Guarantee that all Emergency Response Plans are up to date and adequate to meet the needs of citizens of McDuffie County.
Objective F7. Ensure all emergency shelters are ready to meet the needs of the population of McDuffie County, town of Dearing, and the city of Thomson.
Objective F8. Provide the citizens of McDuffie County educational information on Emergency Preparedness.
Objective F9. Provide the citizens of McDuffie County with accurate and timely information pertaining to Emergency Preparedness.
Objective F10. Collect accurate and complete data pertaining to hazard events within McDuffie County, Dearing and Thomson.

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	McDuffie/ Dearing/ Thomson	BOC/City Councils	Flood	A1, A2	1, 2, 4, 5	Non-Structural	Staff Time	General Funds	3 years	Ongoing	Low
2.	Continue to assess storm water runoff.	McDuffie/ Dearing/ Thomson	Public Works	Flood	A5, B2	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.	McDuffie/ Dearing/ Thomson	BOC/City Council/ Public Works	Flood/ Drought	A3,	2, 6	Structural	Unknown	General Funds	2 years and Continual	Ongoing	High
4.	Clear run-off and water retention ditches.	McDuffie/ Dearing/ Thomson	Public Works/Road Dept.	Flood	A5	2, 1	Structural	Staff Time	General Fund,	1 year and Continual	Ongoing	High
5.	Seek funding for communication towers and voice repeater systems.	McDuffie/ Dearing/ Thomson	EMA/Police/ Sheriff	All hazards	F1, F9	1	Structural	$750,000	General Fund, FEMA, CJCC, JAG, USDA, DOJ	2 years and Continual	Ongoing	High
6.	A Strom drainage project has been identified along A,B, C Watson and Pecan Avenues	Thomson	Thomson/ Public Works	Flood	A5	2, 1	Structural	2,000,000	CDBG, USDA, EPA, DNR, General Fund,	3 years	Ongoing	High
7.	Promote the preservation of areas in and around watercourses.	McDuffie/ Thomson	BOC/City Councils	Flood	A6	1, 2, 4, 5	Non-Structural	Staff time	CDBG, USDA, EPA, DNR	2 years	Ongoing	High
8.	Add greenspace to known flood prone areas.	McDuffie/ Dearing/ Thomson	BOC/City Councils	Flood	A6	1, 2, 4, 5	Non-Structural	Staff time	CDBG, USDA, EPA, DNR	2 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
9.	Evaluate existing water system upgrade as needed	McDuffie/ Thomson	Public Works	Flood/ Drought/ Wildfire	A7, B1	1, 2, 6	Structural	Unknown	General Fund, CDBG, USDA, EPA, DNR	1 year and Continual	Ongoing	High
10.	Investigate methods to reduce non-point source pollution.	McDuffie/ Thomson	BOC/City Council	Flood	A1	1, 2, 5	Non-Structural	Unknown	USDA, EPA, DNR	2 years	New	Medium
11.	Enact a program to educate the residents about water conservation issues	McDuffie/ Dearing/ Thomson	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
12.	Increase public awareness of watering restrictions and bans.	McDuffie/ Dearing/ Thomson	BOC/City Councils/ Water Dept.	Drought	B1, B2	1, 3	Non-Structural	Staff Time	General Funds	1year and Continual	Ongoing	High
13.	Develop a public awareness campaign to promote water-saving campaigns (i.e. low-flow water saving devices)	McDuffie/ Dearing/ Thomson	BOC/City Councils/ Public Works	Drought	B1, B2	1, 3	Non-Structural	Staff Time	General Funds	1year and Continual	New	High
14.	Continue training of all firefighters to include wildland fire training.	McDuffie /Dearing/ Thomson	EMA/Fire Depts.	Wildfire	C1	1, 2	Non-Structural	Unknown	General Funds, FEMA	1year and Continual	Ongoing	High
15.	Seek funding for needed firefighting equipment	McDuffie/ Dearing/ Thomson	EMA/Fire Depts.	Wildfire	C1	1, 2	Non-Structural	Unknown	General Funds, FEMA	1 year and Continual	Ongoing	High
16.	Inventory and replace or install more fire hydrants as needed.	McDuffie/ Dearing/ Thomson	Public Works/ Fire Depts.	Wildfire	C1	1, 2	Structural	Unknown	General Funds, FEMA	1year and Continual	Ongoing	High
17.	Seek funding fire engines, burhs trucks, equipment trucks and tankers for local fire departments.	McDuffie/ Dearing/ Thomson EMA/	EMA/Fire Depts.	Wildfire	C1	1, 2	Non-Structural	$500,000	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
18.	Enforce defensible space (30-ft minimum setbacks) between buildings and flammable brush and forestland where possible.	McDuffie/ Dearing/ Thomson	BOC/City Councils/	Wildfire	C2, C3	1, 2, 3	Structural	unknown	General Funds, FEMA	1 year and Continual	Ongoing	Medium
19.	Continue following GFC service of construction and maintenance of firebreaks around forests and structures, along abandoned roadbeds.	McDuffie/ Dearing/ Thomson	BOC/City Councils/ Planning and Zoning	Wildfire	C2, C3	1, 2, 3	Non-Structural	Staff Time	General Fund	1 year and Continual	Ongoing	High
20.	Strictly follow GFC's guidelines for control burns and permits.	McDuffie/ Dearing/ Thomson	BOC/City Councils/ GFC	Wildfire	C2, C3	1, 2, 3	Non-Structural	unknown	General Funds,	1 year and Continual	Ongoing	High
21.	Investigate the feasibility of Implementing the Firewise Community Initiative where appropriate	McDuffie /Dearing/ Thomson	BOC/City Councils/	Wildfire	C2, C3	1, 2, 3	Non-Structural	$25,000.00	General Funds, GFC	3 years	Ongoing	Medium
22.	Improve public awareness of wildfire techniques and awareness of wildfire dangers.	McDuffie/ Dearing/ Thomson	EMA/ Fire Depts.	Wildfire	C2, C3	1, 2, 3	Non-Structural	$25,000.00	General Funds	2 years and Continual	Ongoing	High
23.	Equip all county and city recreation parks with adequate early severe weather warning and lightning detection devices.	McDuffie/ Dearing/ Thomson	BOC/City Councils/ Recreation Dept.	Severe Weather	D1, D2. D3	1, 2, 6	Structural	unknown	General Funds, FEMA	2 years	New	High
24.	Inspects public buildings and critical facilities and retrofit to reinforce windows, doors, and roofs as	McDuffie/ Dearing/ Thomson	EMA/ Fire Code Enforcement and Building Inspection	Severe Weather, Winter Storms	D1, D2, D3	1, 2, 6	Structural	Unknown	General Funds, FEMA	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
	needed											
25.	Enforce building codes for all new buildings and critical facilities.	McDuffie/ Dearing/ Thomson	Code Enforcement and Building Inspection	Flood, Severe Weather, Winter Storm	A5, A6, D1, D2	1, 2, 6	Structural/Non-Structural	Unknown	General Funds, FEMA	1 year and Continual	Ongoing	High
26.	Install lightning rods in high value critical facilities.	McDuffie/ Dearing/ Thomson	EMA/ Code Enforcement and Building Inspection	Severe Weather, Lightning	D1, D2. D3	1, 2, 6	Structural	100,000	General Funds, FEMA	2 years	New	High
27.	Install surge protectors on critical facilities' electronic equipment in essential county and city facilities.	McDuffie/ Dearing/ Thomson	EMA/ Code Enforcement and Building Inspection/ IT	Severe Weather, Lightning, Winter Storm	D2, F1	1, 2, 6	Structural	$10,000	General Funds	3 years	New	High
28.	Review current Emergency Response Plan and update when needed.	McDuffie County EMA	EMA	All hazards	F6, F8	1, 2, 3	Non-Structural	Staff Time	General Funds	2 years	Ongoing	High
29.	Review current evacuation plans paying particular attention to vulnerable populations and update as needed.	McDuffie County EMA	EMA/BOE	Flood, Wildfire, Severe Weather, Winter Storm	F5, F8	1, 2, 3	Non-Structural	Staff Time	General Funds	2 years	Ongoing	High
30.	Provide boat owners with safety tie down procedures with boat registration.	McDuffie/ Dearing/ Thomson	EMA/ Recreation Dept.	Severe Weather, Winter Storm	E2, D1	1, 2, 3	Non-Structural	2,500	General Funds	1 year and continual	New	High
31.	Develop a public awareness program about the installation of lightning grounding systems on critical infrastructure, residential and business properties.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ EMA	Severe Weather, Lightning	D4	1, 2, 3	Non-Structural	Staff Time	General Funds	2 years	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
32.	Inventory all critical facilities and assess generator needs. Install generators where needed.	McDuffie/ Dearing/ Thomson	EMA	All hazards	F3	1, 2, 3, 6	Structural/Non-Structural	Unknown	General Funds, FEMA	1 year and continual	Ongoing	High
33.	Seek funding to ensure all current and future emergency shelters have back-up generators.	McDuffie/ Dearing/ Thomson	EMA	All hazards	F7	1, 2, 3, 6	Structural/Non-Structural	Unknown	General Funds, FEMA	3 years	New	High
34.	Educate the public on shelter locations and evacuation routes	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ EMA/BOE	Flood, Wildfire, Severe Weather, Winter Storm	F8, F9	3	Non-Structural	Staff Time	General Funds	1 year and continual	Ongoing	High
35.	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.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ EMA	Flood, Wildfire, Severe Weather, Winter Storm	F8, F9	3	Non-Structural	$10,000	General Funds, FEMA	2year and continual	Ongoing	High
36.	Implement a winter storm education program to include winterization of home and/or business and what to do before, during and after.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ EMA	Winter Storm	E1	3	Non-Structural	$25,000	General Funds	2 year and continual	Ongoing	High
37.	Review current codes to comply with and enforce the State building code with criteria for design snow load for buildings and	McDuffie /Dearing/ Thomson	BOC/ City Councils/ Planning and Zoning	Winter Storm	E2	1, 2, 3,	Non-Structural	Staff Time	General Funds	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
	structures.											
38.	Create a data base to record hazard event information.	McDuffie/ Dearing/ Thomson	EMA	All hazards	F10	1, 2, 3,	Non-Structural	Staff Time	General Funds	2 years	Ongoing	Medium
39.	Inventory existing road equipment and purchase needed equipment to maintain roads before, during and after a hazard event.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ Road Dept.	Flood, Severe Weather, Winter Storm	F2	1, 2	Non-Structural	Unknown	General Funds, FEMA	2 years	New	Medium
40.	Develop coordinated management strategies for deicing, snow plowing, and clearing roads of fallen trees and debris	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ Road Dept./EMA	Flood, Severe Weather, Winter Storm	F2	1, 2	Non-Structural	Staff Time	General Funds	2 years	New	High
41.	Promote the construction of safe rooms in shelter areas and in public buildings.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ EMA	Flood, Wildfire, Severe Weather, Winter Storm	F3	1, 2, 6	Structural	Unknown	General Funds, FEMA	4 years	New	Medium
42.	Update 911 equipment as needed.	McDuffie/ Thomson	EMA/ Sheriff	All hazards	F1, F3	1, 2, 6	Structural	Unknown	General Funds, FEMA	1 year and Continual	New	High
43.	Request that all new education facilities be designed to serve as public shelters for emergency purposes.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/ BOE	All hazards	F7	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
44.	Promote and participate in the following American Red Cross Programs • Disaster Resistant Neighborhoods Program • Business and Industry Preparedness Seminar • Community Disaster Education Preparedness presentations	McDuffie/ Dearing/ Thomson	BOC/ City Councils/	All hazards	F4, F8, F9	1, 2 ,3	Non-Structural	Unknown	General Funds, FEMA	2 years and Continual	Ongoing	Medium
45.	Work with local cable and radio providers to enhance and broadcast public education on Emergency Preparedness.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/	All hazards	F8, F9	1, 2 ,3	Non-Structural	Staff Time	General Funds	1 year and Continual	New	High
46.	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.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/	Flood, Wildfire, Severe Weather, Winter Storm	F9, F10	1, 2, 6	Non-Structural	50,000	General Funds, FEMA	1 year and Continual	New	High
47.	Seek funding to purchase ambulance	McDuffie/ EMA/EMS	EMA/EMS	All Hazards	F4, F8, F9	1, 2	Non-Structural	500,000	General Funds, FEMA	2 years	New	High
48.	Pave Roads in county that are unpassable due to flooding	McDuffie County	BOC/ Road Dept.	Flood, Severe Weather,	A1, A2	1, 2, 4, 5	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
49.	Provide NOAA weather radios to elderly and handicap populations (moved to all hazards).	McDuffie/ Dearing/ Thomson	EMA	Flood, Wildfire, Severe Weather, Winter Storm	F4, F8, F9	1, 2,3	Non-Structural	$50,000	General Funds, FEMA	2 years	Ongoing	Medium
50.	Review existing comprehensive, development and land use plans to address flood prone areas.	McDuffie/ Dearing/ Thomson	BOC/ City Councils/	Flood	A1, A2	1, 2, 4, 5	Non-Structural	Staff Time	General Funds	3 years	Ongoing	Medium
51.	Preform procurement to contract with debris removal firm to have contract in place before hazards to ensure firm can move in immediately.	McDuffie County/ Thomson	BOC/ City Councils/	Winter Storm, Severe Weather, Flood, Wildfire,	A4, F2	1, 2	Non-Structural	Staff Time	General Funds	3 months	New	High

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

- Review existing floodplain zoning/ordinances update and adopt floodplain ordinances as needed. Completed.
- Town of Dearing participate in the NFIP accomplished.
- Update Floodplain Maps. FEMA updated all maps in 2010.
- Adopt ordinances to control building and development in known flood prone areas. Completed
- 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.
- Thomson identified a storm drainage project in the Pitts Street Area. Thomson received two $500,000 CDBG grants to address flood and drainage issues on Forest Clary, the project cost a total of $675,000, and the Dell Street project will cost around $650,000 and will be completed by February 2018.

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 McDuffie 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.

Severe Weather

- Inspect all county and municipal critical facilities for proper grounding. Completed.

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 2012 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 McDuffie County Road Department and is a continual goal.
- Promote the preservation of areas in and around watercourses.
- Add greenspace to known flood prone areas.

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. Installed six new hydrants.
- Review previous firefighter training and implements a schedule for the ongoing training of all firefighters to include wildland fire training.

- Seek funding for needed firefighting equipment. Over the last five years 45 sets of firefighter protective clothing have been purchased for approximately$ 70,000
- Seek funding for more fire tankers (2000 to 3000 gallons) for local fire departments. Purchased two brush trucks and on equipment truck for $176,000
- 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.
- Provide NOAA weather radios to elderly and handicap populations.
- Review current evacuation plans paying particular attention to vulnerable populations and update as needed.
- Review and current Emergency Response Plan and update when needed.
- Install generators where needed.
- Install generators on all new critical facilities.
    - A generator was installed at the road department and two mobile generators were purchased.
- Seek funding to ensure all current and future emergency shelters have back-up generators.
- 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.
- Install generators where needed.

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: McDuffie 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 McDuffie County Board of Commissioners has authorized the submission of this plan to both GEMA and FEMA for their respective approvals. The McDuffie County Board of Commissioners, Town Council of Dearing, and the City Council of Thomson 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 McDuffie 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 2015. The 2012 plan was reviewed to determine if any of the mitigation activities need to be added. McDuffie County, Dearing and Thomson work jointly to produce these planning documents. The Joint Comprehensive Plan is due for an update in 2020. This hazard plan will be reviewed and incorporated into the Joint Comprehensive plan update as needed. In addition, relevant sections of the 2012 plan were included in the revision of the McDuffie 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, McDuffie 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. McDuffie 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
McDuffie County	Emergency Management Director	Annually
Dearing	Mayor	Annually
Thomson	City Administrator	Annually

D. Timeframe: The committee has set the second Tuesday of every December 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: McDuffie 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 December review meeting, a notice will be published in the legal organ of McDuffie 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 December. The EMA Director will ensure the revised plan is presented to the McDuffie 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, McDuffie 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, McDuffie 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 McDuffie Progress,* providing McDuffie 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 McDuffie 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 McDuffie County Pre-Disaster Hazard Mitigation Planning Committee is to "*Make the citizens, businesses, communities and local governments of Hancock 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 McDuffie 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 McDuffie Progress
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
http://www.placenames.com
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
McDuffie County
McDuffie County, Dearing
McDuffie County, Thomson
McDuffie County Board of Education
University Hospital_ McDuffie
McDuffie 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. 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. Community Information

Appendix C –Planning documents

I. Executive Summary Local Emergency Operations
II. 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