

# Lumpkin County, Georgia

## Hazard Mitigation Plan 2011 Update



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- II. Meeting Agendas/Meeting Minutes
- III. Sign-In Sheets
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## Chapter 1- Introduction to the Planning Process

Table 1.1 provides a brief description of each section in this chapter and a summary of the changes that have been made.

<b>Chapter 1 Section</b>	<b>Updates to Section</b>
I. Purpose and need of the plan, authority & statement of the problem	<ul style="list-style-type: none"> <li>The language in this section was updated to reflect this was an update to an existing plan.</li> </ul>
II. Local methodology, brief description of plan update process, participants in update process	<ul style="list-style-type: none"> <li>Don Seabolt was once again selected to be chairman of the subcommittees. Six subcommittees were formed instead of the previous four, participants represented most of the same sectors as 2004 but primary focus was on review and update instead of plan creation.</li> </ul>
III. Description of how each section of the original plan was reviewed and analyzed and whether it was revised	<ul style="list-style-type: none"> <li>Each subcommittee reviewed their respective section of the original plan and used national, state and local data to indicate the changes that have occurred since 2004. Each section was updated to reflect current conditions.</li> </ul>
IV. Organization of the plan	<ul style="list-style-type: none"> <li>The organization of this document is consistent with the 2004 plan, with minor changes made to reflect current federal and state requirements.</li> </ul>
V. Local Hazard, Risk, and Vulnerability (HRV, goals, special needs)	<ul style="list-style-type: none"> <li>No major changes were made to this section, no significant changes in this area have occurred since the 2004 update.</li> </ul>
VI. Multi-Jurisdictional, special considerations (HRV, goals, special needs)	<ul style="list-style-type: none"> <li>No major changes were made to this section, no significant changes in this area have occurred since the 2004 update.</li> </ul>
VII. Adoption, implementation, monitoring and evaluation (a general description of the process)	<ul style="list-style-type: none"> <li>No major changes were made to this section, no significant changes in this area have occurred since the 2004 update.</li> </ul>
VIII. Community Data (demographics, census, commerce, history, etc.)	<ul style="list-style-type: none"> <li>Minor changes were made to this section; Limited data was available for Lumpkin County and the City of Dahlonega from the 2010 Census.</li> </ul>

*Table 1.1: Overview of updates to Chapter 1- Introduction to the Planning Process*

## **I. Purpose and need, Authority & Statement of Problem, Purpose of the Plan**

The Disaster Mitigation Act of 2000 created a new era in hazard mitigation planning. Section 322 of the Act emphasizes the importance of comprehensive multi-hazard planning at the local level, both natural and technological, and the necessity of effective coordination between State and local entities to promote an integrated, comprehensive approach to mitigation planning. The Hazard Mitigation Planning and Hazard Mitigation Grant Program (HMGP) interim final rule published on February 26, 2002, identifies these new local mitigation planning requirements. The Pre-Disaster Mitigation (PDM) and HMGP programs provide Federal funding to assist with the completion of the new planning requirements.

State and local governments were required to develop, submit and have approved hazard mitigation plans (HMP) that included detailed Hazard, Risk and Vulnerability (HRV) assessments. Failure to meet the new criteria made State and local governments ineligible for Stafford Act assistance, including types of emergency assistance. The completed HRV assessment and the local HMP became part of the foundation for emergency management planning, exercises, training, preparedness and mitigation. The HMP also identified future project possibilities. Completion of an HMP that met the new Federal requirements increased access to funds for local governments and allowed them to remain eligible for Stafford Act assistance.

Hazards, for purposes of this plan, may be divided into two basic categories: natural and technological. Natural hazards include all hazards that are not caused either directly or indirectly by man. Examples include weather and drought. Technological hazards include hazards that are directly or indirectly caused by man. These include weapons of mass destruction events and hazardous materials spills.

Many hazards throughout the United States could happen anytime and anywhere. However, within Lumpkin County, some hazards have been identified as more likely to occur than others. It is especially important to determine the major threats to Lumpkin County because of its relative geographical isolation from the rest of Northern Georgia due to its high elevation. This isolation causes response times from outside resources to be significantly increased. Therefore, the most likely hazards must be identified and plans developed to ensure the fastest and most adequate responses possible.

In 2004, Lumpkin County undertook the development of a Hazard Mitigation Plan due to new state and federal guidelines as well as an increasing awareness that natural and technological hazards pose a continuous threat to people and property in the area. At this time Lumpkin County is updating this Hazard Mitigation Plan due to state and federal requirements as well as awareness that since the last plan was created, new natural and technological hazards have arisen that pose a threat to the area.

## II. The Plan Update Process

This plan update was prepared by a Hazard Mitigation Plan Update Committee (HMPUC) composed of representatives from the Lumpkin County Government, Lumpkin County Water and Sewer Authority, Lumpkin County Sheriff’s Department, North Georgia College & State University, The City of Dahlonega, Local Businesses, Georgia Forestry Commission, USDA Forest Service, and Chestatee Regional Hospital. A complete list of the participants can be found in section A of this Chapter.

This Hazard Mitigation Plan Update sets the stage for continued long-term disaster resistance through identification of actions that will, over time, reduce the exposure of people and property to identifiable hazards. This update provides an overview of the main hazards that threaten Lumpkin County and what safeguards the county has in place or are considering for implementing in the future to mitigate these hazards. Of these safeguards, two of the highest priorities continue to be:

- *Continued efforts to identify and implement mitigation options in high-risk areas;*
- *Addition of certain mitigation requirements to the planning and development process*

### A. Participants in the Planning Process

Jurisdiction	Participation in 2004	Participation in 2010/2011	Review of 2004 Plan	Review of 2011Plan	Adoption of 2004 Plan	Adoption of 2011 Plan
Lumpkin County	Yes	Yes- Attended Subcommittee Meetings	Yes	Yes	Yes	Yes- Will Adopt after GEMA Approval
City of Dahlonega	Yes	Yes- Attended Subcommittee Meetings	Yes	Yes	Yes	Yes-Will Adopt After GEMA Approval

The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) was comprised of approximately 18 members. This amount of participation is significantly less than in 2004 where approximately 60 members were involved in the planning process. Efforts were made to include representatives from the Lumpkin County School System, the local utility companies, and local business owners but these efforts were unsuccessful. The lower participation number could have been due to many factors. The Chairperson of the HMPUC was Don Seabolt, Director of the Lumpkin County Emergency Management Agency. Members were selected to participate in one or more of the six subcommittees: Executive, Planning, Critical Facilities, Land Use/Planning/Zoning, Hazard Risk and Vulnerability and Infrastructure. For each subcommittee Don Seabolt acted as chairperson and Stephanie Harmon, Georgia Mountains Regional Commission staff, served as secretary.

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The number and types of subcommittees were revised from 2004 mainly due to the nature of the work to be performed. In 2004 the main focus was on plan creation whereas this process would focus on review of the existing plan and updating the information. An Executive Committee was added to oversee the process and review work completed by the other subcommittees. The Hazard Risk and Vulnerability Committee was added to review and update the hazard frequency information and analyze what mitigation measures had been completed from the 2004 plan and what additional measures needed to be added.

The HMPUC was represented by a somewhat diverse cross-section of the county's population. This included local government officials, Lumpkin County and City of Dahlonega employees, representatives from federal and state agencies, and educational institutions. These same interests were represented in the 2004 planning process.

<b>Participants in the Plan Update Process</b>	
<b>Individual</b>	<b>Affiliation</b>
<b>County Representatives</b>	
Don Seabolt	Lumpkin County EMA Director
David Wimpy	Lumpkin County Fire Department
Larry Reiter	Lumpkin County Planning Director
Mark French	Lumpkin County Budget/Grant Analyst
Ann Wigley	Lumpkin County EMA
Ed Eggert	Lumpkin County Fire/EMS
Mark Koopman	Lumpkin County GIS Manager
Dudley Owens	Lumpkin County Water & Sewer Authority
<b>City Representatives</b>	
Ricky Stewart	City of Dahlonega Engineer
Patricia Head	City of Dahlonega
C.L. Grizzle	City of Dahlonega Waste Water & Water Distribution Superintendant
<b>Public Service Representatives</b>	
Julia Berndt	Chestatee Regional Hospital
Evelyn Davis	Chestatee Regional Hospital
<b>Education Representatives</b>	
Mike Stapleton	North Georgia College & State University
Tim Perren	North Georgia College & State University
<b>Other Government Representatives</b>	
Ryan Lingerfelt	GA Forestry Commission
Kris Butler	GA Forestry Commission
Mike Davis	USDA Forest Service
Stephanie Harmon	Georgia Mountains Regional Commission
Dee Langley	GEMA

Participants were divided into the following subcommittees:

**Executive**

Don Seabolt- Chairperson, Stephanie Harmon- Secretary, Mike Davis, Kris Butler, David Wimpy, Larry Reiter, Mark French, Ann Wigley, Ed Eggert, Marc Koopman, Mike Stapleton, Dudley Owens

**Planning**

Don Seabolt- Chairperson, Stephanie Harmon- Secretary, Mark French, Julia Berndt, Mike Stapleton

**Critical Facilities**

Don Seabolt- Chairperson, Stephanie Harmon- Secretary, Mark French, Ed Eggert, Mike Stapleton, Ryan Lingerfelt, Dudley Owens, Ricky Stewart, Marc Koopman, Tim Perren

**Land Use, Planning & Zoning**

Don Seabolt- Chairperson, Stephanie Harmon- Secretary, Marc Koopman, Larry Reiter, Patricia Head, Mike Stapleton, Mark French, Ed Eggert, Tim Perren

**Hazard, Risk and Vulnerability**

Don Seabolt- Chairperson, Stephanie Harmon- Secretary, Marc Koopman, Kris Butler, Mike Stapleton, Ed Eggert, Ricky Stewart, Mark French, Tim Perren

**Infrastructure**

Don Seabolt- Chairperson, Stephanie Harmon- Secretary, Mark French, Mike Stapleton, Dudley Owens, C.L. Grizzle, Ricky Stewart, Marc Koopman, Ed Eggert, Larry Reiter, Evelyn Davis

**III. Review and Analysis of the Previous Plan**

Each section of the previous plan was reviewed by the assigned subcommittee members. These sections were analyzed for any changes that have occurred since the previous plan was created. After this analysis, any updates needed were made using federal, state and local data. The following is a summary of the sections of the previous plan reviewed by each subcommittee and the actions the members took.

The Critical Facilities and Infrastructure Committees reviewed and analyzed the critical facilities section of the 2004 plan located in Appendix A. This review and analysis updated any information for facilities currently listed and adding critical structures and infrastructure new to the county since 2004. The committee also evaluated the effects that identified hazards might have had on infrastructure and what effects newly identified hazards could have on the updated list of critical facilities and infrastructure. The goals and objectives of the previous plan were evaluated for actions taken since 2004 and new goals and objectives were identified as they relate to critical facilities and infrastructure.

The Land Use, Planning and Zoning Committee reviewed and analyzed the land use sections of the 2004 plan, located in subsections E of Chapter 2- Local Natural Hazard, Risk and Vulnerability (HRV) and Chapter 3- Local Technical Hazard, Risk and Vulnerability (HRV), under the narrative for each hazard. This review and analysis reevaluated the land use and

development trends identified in the 2004 plan. The committee also evaluated the effects that identified hazards might have had on previous land use and development trends and what effects newly identified hazards could have on the updated land use and development trends. The Updated land use and development trends includes dense residential, commercial and industrial developments that have been added to the county since 2004 as well as any newly designated cultural, historical and natural resources that are of value to the county. The goals and objectives of the previous plan were evaluated for actions taken since 2004 and new goals and objectives were identified for this section.

The Hazard, Risk and Vulnerability Committee reviewed and analyzed Chapter 2- Local Natural Hazard, Risk and Vulnerability (HRV) and Chapter 3- Local Technical Hazard, Risk and Vulnerability (HRV). This review included evaluation of past hazards and the identification of any new hazards that pose a threat to Lumpkin County. The committee also updated the Hazards History Database and the Hazards Frequency Table to reflect any occurrences since 2004. These databases are located in Appendix B and Appendix C of the 2004 plan, respectively. The goals and objectives of the previous plan were evaluated for actions taken since 2004 and new goals and objectives were identified for this section. This subcommittee also reviewed and analyzed the Hazard Mitigation Goals and Objectives sections of the 2004 plan, located in Chapter 4- Natural Hazard Mitigation Goals and Objectives and Chapter 5- Technological Hazard Mitigation Goals and Objectives. This review and analysis included the evaluation of the Hazard Mitigation Goals and Objectives of the 2004 plan to determine if these items had been completed or not. If the items had not been completed the committee worked to determine what the current status of each item was and if further action was needed. The committee produced a new set of goals and objectives to be completed before the next plan update.

The Executive Committee assumed the responsibility of reviewing and analyzing the Planning Process and Plan Maintenance sections of the 2004 plan. The committee made changes to the subcommittee structure used in the 2004 plan creation based on the fact this was a plan update and not the creation of a new document. The Executive Committee determined the current method of plan maintenance has been successful over the last five years and shall be continued. Any changes to this method will be reviewed and considered during the next plan update.

Throughout the review and update of the 2004 Hazard Mitigation Plan, subcommittees referenced other plans and regulations currently in use by the county and city to determine how each would correspond to and supplement this plan update. These plans and regulations included: The Lumpkin County Emergency Operations Plan; the Lumpkin County Comprehensive Plan; land use regulations, floodplain maps and regulations, GIS data, zoning districts, and building codes for Lumpkin County and the City of Dahlonega. During the next update the HMPUC shall review these, and any new regulations Lumpkin County or the City of Dahlonega may have adopted since this update.

#### **IV. Organization of the Plan**

The Lumpkin County Hazard Mitigation Plan (HMP) was designed to protect both the unincorporated areas of Lumpkin County and the City of Dahlonega. Though the county

facilitated this plan update, the City of Dahlonega provided invaluable information and tremendous assistance throughout this effort. Without this mutual cooperation, this Hazard Mitigation Plan update would not have come to fruition.

This Hazard Mitigation Plan Update is organized in a fashion to assist local government officials, county and city residents, and public and private sector organizations, in planning for natural and technological hazards. The updated plan contains a Hazard, Risk and Vulnerability (HRV) assessment. The HRV assessment is based upon historical data of known hazards to have occurred within the county. Information used in this assessment includes hazard description and location, information on property located in hazard-prone areas, and the potential future risk to life, property and the environment in all areas of the county. The HMPUC completed the following research and analysis in the development of the HRV assessment:

*Inventory of Critical Facilities:* Critical facilities are defined as facilities that provide essential products and services to the public. Many of these facilities are government buildings that provide a multitude of services to the public, including most public safety disciplines such as emergency management, fire, police, and EMS. Other government buildings/facilities commonly classified as critical facilities are water distribution systems, wastewater treatment facilities, public works, public schools, administrative services, and post offices. Some private buildings/facilities are also included in this classification such as chemical factories and propane distribution centers. Lumpkin County critical facilities have been identified and important information gathered for each one. This information is located in the Critical Facilities Database (Appendix A).

*Hazard Identification:* During the 2004 update process, a comprehensive hazard history for Lumpkin County was recreated based on records from the past fifty years. This hazard history included the natural and technological hazards that are most likely to affect Lumpkin County. This update includes a comprehensive hazard history for Lumpkin County since 2004. This information is located in the Hazard History Database (Appendix A).

*Profile of Hazard Events:* Each hazard identified was analyzed to determine likely causes and characteristics, and what portions of Lumpkin County's population and infrastructure were most affected. However, each of the hazards discussed in this plan update has the potential to negatively impact any given point within Lumpkin County. A profile of each hazard discussed in this plan is provided in Chapter 2.

*Vulnerability Assessment:* This step was accomplished by comparing each identified hazard with the inventory of affected critical facilities and population exposed to each hazard.

*Estimating Losses:* This step should involve estimating structural and other financial losses resulting from a specific hazard. Unfortunately the dollar amounts for structure and content value were not available for all of the critical facilities at the time of this update. Structure loss, content loss, and function loss, calculated in increments of 25 %, 50 %, 75 % and 100 %, could not sufficiently be determined. Describing vulnerability in terms of dollar amounts provides the county with a rough framework in which to estimate the potential effects of hazards on critical facilities. Due to these limitations, the HMPUC felt that this item should be as it was in the

previous update and selected this task as a mitigation item to be completed before the next plan update. See the Critical Facilities Database (Appendix A).

Based on the HRV assessment, this plan update identifies specific mitigation goals. These goals are only recommendations of the HMPUC. Any specific recommendation that Lumpkin County or the City of Dahlonega wishes to pursue must not only be approved within the framework of this plan, but must also be specifically approved by the appropriate government officials. Finally, a framework for plan implementation and maintenance is presented.

Planning grant funds from the Federal Emergency Management Agency, administered by GEMA, funded this Hazard Mitigation Plan update. This Hazard Mitigation Plan update was led by the Lumpkin County EMA staff with technical assistance provided by the Georgia Mountains Regional Commission, Gainesville, GA.

## **V. Local Hazard, Risk and Vulnerability (HRV) Summary, Local Mitigation Goals and Objectives**

Lumpkin County has experienced a number of hazard events throughout its history, most resulting in fairly localized damage. Winter storms are most likely the greatest potential natural hazard within the county. Hazardous materials spills along major truck routes are the greatest potential technological threat to the area at this time. Tornadoes, severe thunderstorms, wildfire, flooding, landslides and dam failure represent additional problems for Lumpkin County. The potential losses from these and other hazards are exponentially increased in this area due to its geographical isolation.

The Lumpkin County HMPUC reviewed the results of the 2004 HRV assessment to identify completed mitigation goals and objectives as well as recommended additional mitigation measures. Each potential mitigation measure attempts to identify an organization or agency responsible for initiating the necessary action steps, as well as potential resources, which may include grant programs and human resources. An estimated timeline, when possible, is also provided for each potential mitigation measure. When applicable, a previously uncompleted mitigation measure is identified with a recommended course of action for resolution.

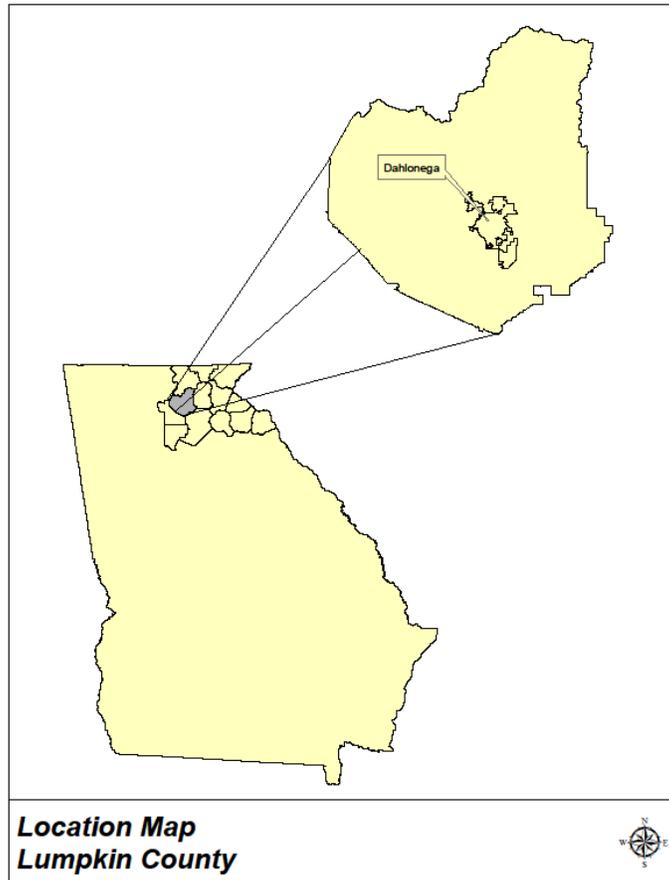
## **VI. Multi-Jurisdictional Special Considerations (HRV, Goals, Special Needs)**

The City of Dahlonega was an active participant and equal partner in the update process. As an active part of the HMPUC, the city contributed to the review and identification of mitigation goals and objectives and potential mitigation measures contained within the Hazard Mitigation Plan. Although this updated plan will be officially adopted by Lumpkin County, The City of Dahlonega will be responsible for making its own decision regarding the same.

## **VII. Adoption, Implementation, Monitoring and Evaluation**

The Lumpkin County Board of Commissioners is the authority responsible for formally adopting this updated Hazard Mitigation Plan. The City of Dahlonega may formally adopt the updated plan as well if it chooses to do so. Once the county approves the draft plan update, the document will be forwarded to GEMA for initial review. If no changes to the plan are required, GEMA will then forward the plan to FEMA for final review and approval. Once final FEMA approval has been received, Lumpkin County and the City of Dahlonega will be responsible for initiating any courses of action related to this Hazard Mitigation Plan update that they each deem appropriate. Actions taken may be in coordination with one another or may be pursued separately. The plan maintenance section of this document details the formal process that will ensure that the updated Lumpkin County Hazard Mitigation Plan remains an active and relevant document. The Hazard Mitigation Plan maintenance process includes monitoring and evaluating the Plan annually, and producing additional complete plan revisions every five years. Additionally, Lumpkin County will continue to develop steps to ensure public participation throughout the plan maintenance process. All or portions of this plan will be integrated into the Lumpkin County Comprehensive Plan, and other applicable plans, sometime in the future. It should be noted that no recommendations found within this updated plan are binding on Lumpkin County or the City of Dahlonega. Such recommendations are only to be used by the county and city as one of many tools to better protect the people and property of Lumpkin County and the City of Dahlonega.

## VIII. Brief County Overview



### A. Government

Lumpkin County is governed by a Board of Commissioners, consisting of four district commissioners and one chairman. The government of the City of Dahlonega is vested in a City Council composed of a mayor and six council members.

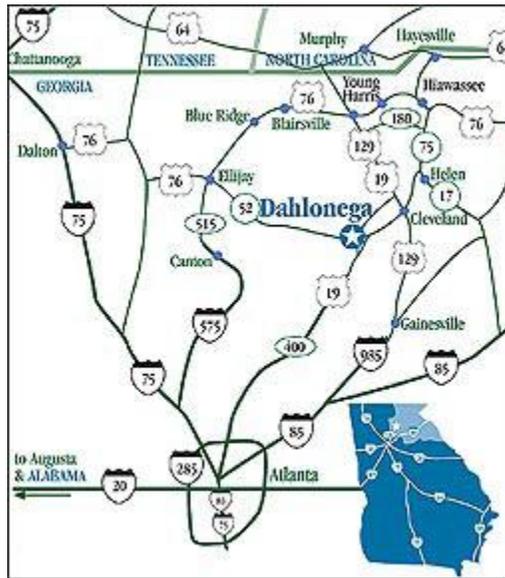
### B. Geography and Location

Lumpkin County, the 85<sup>th</sup> formed in Georgia, was created in 1832 from parts of Cherokee, Habersham and Hall Counties following its acquisition from the Cherokee Indians by a treaty calling for the removal of all Indians from North Georgia. The county is 285 square miles in area and is the 106<sup>th</sup> in size in Georgia. Approximately one third of the county is located in the Chattahoochee National Forest. Lumpkin County is in the 9<sup>th</sup> U.S. Congressional District, the 50<sup>th</sup> State Senatorial District and 7<sup>th</sup> and 8<sup>th</sup> State House Districts. The county seat is the City of Dahlonega. The Dahlonega city limits were originally set up to be one mile radius from the center of town. However, annexation has increased the area somewhat. Dahlonega averages 1,450 feet above sea level, the highest point being 1,720 feet and the lowest about 1,180 feet

above sea level. Lumpkin County’s elevation ranges from 4,400 feet at the Appalachian summits to 1,070 feet above sea level on the shore of Lake Sidney Lanier.

**C. Proximity to Regional Locations**

Lumpkin Co. is relatively close to large regional cities. Major highways serving Lumpkin County include: State Routes 9, 11, 19, 52, 60, and 400 and U.S. Routes 19 and 129. Roads in the area are generally in good condition but often difficult and slow to travel due to steep elevations.



The distance and routes from Lumpkin County to local cities:

Atlanta, GA	65 miles	south-southwest	via US 19/GA 400
Athens, GA	60 miles	southeast	via US 129
Chattanooga, TN	107 miles	northwest	via GA 52, 76, I-75
Cleveland, GA	18 miles	east	via GA 52, 115
Dalton, GA	75 miles	west	via GA 52, US 76
Gainesville, GA	30 miles	southeast	via GA 52
Blairsville, GA	35 miles	north	via US 129

## **D. Climate**

The average annual temperature is a high of 69° F. The record high of 103° F was reached on July 29, 1952 and the record low of -11° F was reached on February 13, 1899. The warmest month is July, averaging 75.5° F, and the coldest month is January, averaging 39.2° F. The average number of days reaching above 90° F is 24 and the average number of days reaching below 32° F is 77. All in all, Lumpkin County maintains a very moderate climate with 4 distinct seasons.

## **E. Population and Growth**

At the time this document was completed, limited population and housing data were available for Lumpkin County and the City of Dahlonega from the 2010 Census. The remaining data is taken from the 2000 Census or other stated sources.

According to the 2010 Census, the population of Lumpkin County grew by almost 25% between 2000 and 2010, increasing from an estimated 24,000 to an estimated 29,966. During that same time period, the City of Dahlonega's population increased from 3,500 to 5,242. According to the 2000 Census, the median household income in Lumpkin County increased from \$24,365 in 1990 to \$35,598 in 2000. ACS estimate show a median household income for Lumpkin County between 2006 and 2008 of \$43,271.

Lumpkin County has become a vibrant, growing center of tourism. Individuals from all walks of life visit Lumpkin County, many of which decide to make our community their home. Over 85% of the county's change in population between 1990 and 2000 was a result of people moving into the community. The many factors leading to this phenomenal growth- the local presence of a state university, the appealing character of the surroundings, a thriving tourist industry, and the community's adaptability to commuter living- have created a diverse population. Festivals and fairs such as Bear on the Square Mountain Festival, The Mountain Flower Fine Art Festival, Georgia Wine Country Festival, Mountain Top Rodeo and Gold Rush Days bring thousands of people to the area yearly to enjoy the good hospitality and beautiful surroundings. The close proximity of Lumpkin County to the "hub of the south" has made our community a favorite weekend getaway for residents of Atlanta and the highly developed metro areas. While tourism remains the center of Lumpkin County's economy, agriculture retains a prominent position among our industries. Still, farming is becoming less an occupation than a hobby of those living in Lumpkin County's rural areas today. The 2000 Census estimates show over 76% of rural residents were classified as "non-farm occupants". Many of these individuals, almost 43%, travel out of the county to work. Lumpkin County is the northern neighbor of two of the fastest growing counties in the nation, Forsyth County and Dawson County. Such proximity means that Lumpkin County is experiencing similar trends in growth and economic expansion and development. More extensive population and economic data collected during the 2010 Census will be available for the next Hazard Mitigation Plan update, providing a more accurate profile of the residents of Lumpkin County.

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2000 Census Information	Lumpkin County	Georgia
Housing units total, 2000	8,263	3,281,737
Per Cent Increase 1990-2000	51.5%	29.4%
Mobile Homes, 2000	23.6%	12.0%
Homeownership rate, 2000	72.3%	67.5%
Renter Occupied units, 2000	27.7%	32.5%
Households, 2000	7,537	3,006,369
Households with Householder Age 65+	6.5%	19.7%
Median Monthly Owner Costs	\$917	\$1,039
Median value of housing units	\$111,800	\$111,200
Persons per household, 2000	3.04	2.65
Households with persons under age 18, 2000	36.2%	39.1%
Housing units authorized by building permits, 2000	392	91,820
Median household money income, 1999	\$39,167	\$42,433
Per capita money income, 1999	\$18,062	\$21,154
Persons below poverty, percent, 1999	13.2%	13.0%
High school graduates, percent of persons age 25+, 2000	72%	78.6%
Bachelor's degree or higher, % of persons age 25+, 2000	17.6%	24.3%

The population density for Lumpkin County, which is made up of 323 square miles, was estimated in the 2010 Census at 92.8 people per square mile. In 2008, the estimated population density was 82.0 people per square mile. In comparison, the state average was slightly higher at 141.4 persons per square mile. One reason for this difference in population density is that portions of Lumpkin County are located on steep slopes and within the Chattahoochee National Forest, restricting opportunities for private development.

The City of Dahlonega, with 5,242 residents, showed a gain of 1,742 people from 2000 to 2010. Dahlonega's city limits are approximately 6.4 square miles, with North Georgia College and State University comprising a portion of the municipal area. Residential development has occurred primarily outside the city limits, while commercial development continues strong inside the city. Approximately 85% of Lumpkin County's population lives outside of the Dahlonega city limits.

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The minority population in Lumpkin County is relatively small. According to the 2000 Census, minorities only account for about 8% of the county’s population. The percentage of minorities could be slightly larger than other north Georgia counties due to the presence of North Georgia College and University.

2000 Census Information	Total Population	Caucasian	Hispanic	African American	Native American	Asian	Other
Lumpkin Co. Population by race	100% (21,016)	94%	3.5%	1.5%	1.0%	0.4%	1.8%

One demographic group that well represented within Lumpkin County is the retirement-age population. Over 9% of the population in Lumpkin County is over the age of 65. This situation was given special consideration during the planning process due to the increased vulnerability of the county’s disproportionate number of retirement-age citizens.

**F. Occupational Information**

Lumpkin County, located just north of the Atlanta sprawl, has a higher than average number of second homes, retirees, and commuters. The job base is characterized by low wages and high employment. Almost half (42.7%) of Lumpkin County residents commute out of the county to work. Over 84% of Lumpkin County residents are employed in the private industry or are self-employed. Approximately 15% are government workers and less than one percent of the labor force is comprised of unpaid family employees.

2000 Census Information	Number	Per Cent
Lumpkin Co. Work Force (over age 16)	10,776	100%
Management, Professional	2,562	25.3%
Service	1,415	14.0%
Sales and Office	2,573	25.4%
Farming, Fishing, Forestry	112	1.1%
Construction, Extraction, Maintenance	1,542	15.2%
Production, Transportation, Material Moving	1,926	19.0%

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2000 Census Information	Number	Per Cent
Lumpkin Co. Work Force (over age 16)	10,776	100%
Private Industry	7,536	74.4%
Government	1,544	15.2%
Self-employed	998	9.9%
Unpaid Family Employees	52	0.5%

## Chapter 2-Local Natural Hazard, Risk and Vulnerability (HRV) Summary

In 2004, the Lumpkin County Hazard Mitigation Planning Committee (HMPC) initially identified all natural hazards that could potentially affect Lumpkin County. This list was then narrowed to only the hazards that are most likely to impact the county. During this update process, the Hazard, Risk and Vulnerability subcommittee considered adding landslides to this chapter. It was determined that this hazard does occur in Lumpkin County frequently enough and the affect is significant enough to warrant the addition of landslides to this chapter. As a result of the planning process, the HMPUC determined that seven natural hazards pose a direct, measurable threat to Lumpkin County. Of these, the entire county is exposed to six of the seven hazards. Winter storms, tornadoes, severe thunderstorms, drought, wildfire, and landslides are all serious potential threats to the entire community. Flooding on the other hand is usually isolated to select areas of the county that are within the flood plain or other flood-prone areas. During this update process, the Land Use and the Hazard, Risk and Vulnerability subcommittees reviewed this chapter of the 2004 plan to evaluate to what extent these hazards had affected Lumpkin County since the last plan was created. Each of these potential hazards is addressed individually with relevant supporting data.

Table 2.1 provides a brief description of each section in this chapter and a summary of the changes that have been made.

<b>Chapter 2 Section</b>	<b>Updates to Section</b>
I. Winter Storms	<ul style="list-style-type: none"> <li>Occurrences and severity were updated based on data obtained from the National Climatic Data Center</li> </ul>
II. Tornadoes	<ul style="list-style-type: none"> <li>Occurrences and severity were updated based on data obtained from the National Climatic Data Center</li> </ul>
III. Flooding	<ul style="list-style-type: none"> <li>Occurrences and severity were updated based on data obtained from the National Climatic Data Center</li> </ul>
IV. Severe Thunderstorms	<ul style="list-style-type: none"> <li>Occurrences and severity were updated based on data obtained from National Climatic Data Center</li> </ul>
V. Wildfire	<ul style="list-style-type: none"> <li>Occurrences and severity were updated based on data obtained from the National Climatic Data Center and the US Forest Service</li> </ul>
VI. Drought	<ul style="list-style-type: none"> <li>Occurrences and severity were updated based on data obtained from the National Climatic Data Center, the U.S. Drought Monitor and the Mountain Research and Education Center</li> </ul>
VII. Landslides	<ul style="list-style-type: none"> <li>The HMPU Committee felt this hazard needed to be added due to recent events. Information was gathered from local and national sources to identify the occurrences and severity</li> </ul>

*Table 2.1: Overview of updates to Chapter 2: Local Natural Hazard, Risk and Vulnerability (HRV)*

**Table 2.1a - Overview of Natural Hazards in Lumpkin County and the City of Dahlonega**

Hazard	Ga. Hazard Mitigation Strategy Standard Plan	Lumpkin County HMP Update	Comments
<b>Tropical Cyclonic Events (Hurricanes &amp; Tropical Storms)</b>	Included	Included w/ severe storms, tornados, & flooding events	Contributes to downed trees, power lines, flooding
<b>Coastal Flooding</b>	Included	Not Included	Not a coastal county
<b>Wind</b>	Included	Included w/ severe storms & winter weather	Contributes to downed trees & power lines
<b>Severe Weather (Includes Lightning &amp; Hailstorms)</b>	Included	Included	Contributes to downed trees, power lines, structure damage, flooding, & fires
<b>Tornadoes</b>	Included	Included	None
<b>Inland Flooding</b>	Included	Included	None
<b>Severe Winter Storms</b>	Included	Included	None
<b>Drought</b>	Included	Included	None
<b>Wildfire</b>	Included	Included	1/3 of county comprised of National Forest
<b>Earthquake</b>	Included	Not Included	Occur occasionally but very low in magnitude
<b>Landslide</b>	Included	Included	County has many steep slopes
<b>Sinkhole</b>	Included	Not Included	NA

**Key for Table 2.1b – Frequency and Probability**

- NA = Not applicable; not a hazard to the jurisdiction
- VL = Very low risk/occurrence
- Low = Low risk; little damage potential (for example, minor damage to less than 5% of the jurisdiction)
- Mod = Medium risk; moderate damage potential (for example, causing partial damage to 5-15% of the jurisdiction, infrequent occurrence)
- High = High risk; significant risk/major damage potential (for example, destructive, damage to more than 15% of the jurisdiction, regular occurrence)
- Ext = Extensive risk/probability/impact

**Key for Table 2.1b – Severity**

<b>Event - Extent</b>	<b>Low</b>	<b>Mod</b>	<b>High</b>	<b>Ext.</b>
Tropical Cyclonic Events		<i>(See Wind &amp; Inland Flooding)</i>		
Coastal Flooding	NA	NA	NA	NA
Wind – Wind Speed	≤36 MPH	37–50 MPH	51-70 MPH	71–91 MPH
Severe Weather		<i>(See Wind &amp; Inland Flooding)</i>		
Tornado - Magnitude	F0- F1	F2-F3	F4	F5
Inland Flooding - Water depth	3” or less	3 – 8”	8-12”	12”+
Severe Winter Storms – Ice/ Sleet	¼ ” or less	1/3” – ½ ”	¾ -1”	1”+
Severe Winter Storms - Snow	¼ ” – 1”	1 -5”	5-12”	12”+
Drought – Duration	1 year	1 – 2 years	2-5 years	5+ years
Wildfire - # of Acres	<50	50-200	200-500	500+
Landslides- Acres Covered	½ - 1	1-2	2-5	5+
Earthquake - Magnitude	NA	NA	NA	NA
Sinkhole	NA	NA	NA	NA

**Table 2.1b** (Key shown above)

<b>HAZARD</b>	<b>LUMPKIN COUNTY</b>	<b>CITY OF DAHLONEGA</b>
<b>Tropical Cyclonic Events (Hurricanes &amp; Tropical Storms)</b>		
Frequency	Low	Low
Severity	Mod.	Mod.
Probability	Low	Low
<b>Coastal Flooding</b>		
Frequency	NA	NA
Severity	NA	NA
Probability	NA	NA
<b>Wind</b>		
Frequency	High	High
Severity	High	High
Probability	High	High
<b>Severe Weather (Includes Lightning &amp; Hailstorms)</b>		
Frequency	High	High
Severity	High	High
Probability	High	High
<b>Tornadoes</b>		
Frequency	Low	Low
Severity	High	High
Probability	Mod	Mod
<b>Inland Flooding</b>		
Frequency	Low	Low
Severity	Low	Low
Probability	Low	Low
<b>Severe Winter Storms</b>		
Frequency	Mod.	Mod.
Severity	Mod.	Mod.
Probability	Mod.	Mod.
<b>Drought</b>		
Frequency	High	High
Severity	High	High
Probability	High	High
<b>Wildfire</b>		
Frequency	High	High
Severity	High	High
Probability	High	High
<b>Landslide</b>		
Frequency	Low	Low
Severity	Mod	Mod
Probability	Mod	Mod
<b>Earthquake</b>		
Frequency	V. Low	V. Low
Severity	V. Low	V. Low
Probability	Low	Low
<b>Sinkhole</b>		
Frequency	NA	NA
Severity	NA	NA
Probability	Low	Low

## I. Winter Storms



**A. Hazard Identification** – The Lumpkin County HMPUC researched data from the National Climatic Data Center, The National Weather Service, as well as information from past newspaper articles relating to winter storms in Lumpkin County since 2003. Winter storms bring the threat of freezing rain, ice, sleet, snow and the associated dangers. A heavy accumulation of ice, especially when accompanied by high winds, devastates trees and power lines. Such storms make highway travel or any outdoor activity extremely hazardous due to falling trees, ice, and other debris.

**B. Hazard Profile** – Although winter storms occur infrequently, they have the potential to wreak havoc on the community when they do strike. Winter storms within Lumpkin County typically cause damage to power lines, trees, buildings, structures, and bridges, to varying degrees. Due to the county's high elevation, many highways have steep grades, resulting in very hazardous travel conditions when they are covered with frozen precipitation. Another hazard exists due to the large tree population. Trees and branches weighed down by snow and ice become very dangerous to person and property. Some examples of the worst recorded winter storms between 2003 and 2008 for Lumpkin County are as follows:

- 1) Between January 16-17, 2003 light snow mixed with some light pockets of sleet fell across north central and northeast Georgia. The snow was the result of a strong arctic cold front moving through the region as a weak upper-level disturbance moved over the area. Snowfall was confined to areas generally northeast of a line from Lafayette, to Canton, to Cumming, to Gainesville. Snowfall amounts in Lumpkin County were generally one inch or less. Many of the roads, especially at the higher elevations of the northeast mountains, became icy and hazardous. Strong, gusty 20 to 30 mph north winds caused blowing of the snow, especially in the areas that received more than one inch. The snow was followed by a period of extreme cold with temperatures in the teens.
- 2) On January 23, 2003 light snow fell across much of far north Georgia as a strong Arctic cold front moved through the region. Most of the snow fell north of a line from Buchanan, to Atlanta, to Cumming, to Homer. Snowfall amounts averaged from one-half to one inch in most of this area. The snow combined with 20 to 30 mph and gusty north winds and temperature in the teens and twenties to create slick and hazardous roads. However, no roads were reported to have been closed. Schools were closed in several counties because of the snow and extreme cold.

- 3) On February 6, 2003 a weak upper-level disturbance combined with temperatures near 32° F to produce light snow across several north Georgia counties. Most counties only received a trace of snow or sleet but higher elevations did receive 1 to 2 inches of snow.
- 4) Between January 25-27 2004, an extensive and formidable wedge of cold air associated with a back door cold front invaded the area during the late morning and afternoon of the 25<sup>th</sup> and moved west toward the Alabama border by the morning of the 26<sup>th</sup>. The wedge of cold air remained in place until a cold front moved the persistent wedge of cold air out of the area during the morning hours of the 27<sup>th</sup>. Temperatures within the wedge area ranged from the upper 20s in northeast Georgia near Danielsville and Homer, to around freezing in Atlanta and surrounding areas. In general, all areas north and east of a line from Dahlonega, to Atlanta, to Milledgeville were below freezing during this period. Meanwhile, several upper-level disturbances passed over the area while the wedge was in place creating periods of light freezing rain and freezing drizzle. The most significant icing occurred overnight on the 25<sup>th</sup> and during the morning of the 26<sup>th</sup>. During this time several areas in northeast and central Georgia experienced glaze ice accumulations of ¼ to ½ inch, mainly on trees and power lines, as ground surfaces were too warm to support ice accumulation. Some bridges and overpasses in the northeast and east central became ice coated and some accidents were reported.
- 5) On February 26, 2004 another wedge of cold air in place across north and central Georgia combined with a strong upper-level storm system moving across the mid-south bringing a mixture of snow and sleet to much of north and the northern parts of central Georgia. The heaviest precipitation occurred as the leading edge of the precipitation area moved east into Georgia shortly after midnight on the 26<sup>th</sup>. This activity was accompanied by thunderstorms with snow, sleet, and wind gusts of 30 to 40 mph. Even some gusts to near 50 mph were reported. The convective nature of the activity led to significant variations in snow and sleet amounts across the state, with several counties in north Georgia reporting three inches or more of snow during the 6 hour period between approximately 3 am EST and 9 am EST. Most of the snow fell north of a line from Carrollton, to Atlanta, to Madison, to Washington with a mixture of snow and sleet south of Atlanta. Temperatures across north Georgia, north of Interstate 20, averaged around 32-33° F during this event. Accumulations of snow were mostly confined to grassy, elevated surfaces and exposed objects. Some accumulation of snow was reported on the roads in the higher elevations of north central and northeast Georgia. The winter storm forced the closure of approximately 446 schools and businesses.
- 6) Between December 19-20, 2004 a strong arctic cold front moving through the region, supported by a strong eastern U.S. upper trough, combined with a weak upper-level disturbance to bring snow showers to mainly the higher elevations of north central and northeast Georgia during the evening. While the snowfall was mostly one inch or less and localized because of the spotty nature of the snow showers, the precipitation fell as temperatures were plummeting from the 30s into the low 20s. Roads quickly became slick and hazardous, especially on windy, mountainous roads in the northeast portion of the state.
- 7) Between January 22-23, 2005 a strong arctic cold front moved through the region during the late afternoon and evening, bringing very strong and gusty northwest winds to all of north

and central Georgia as much colder air was ushered into the region. The strongest winds were realized in the counties north of Atlanta. The Lumpkin County Sheriff's office reported several trees were down, causing an estimated \$1,000 in damage.

- 8) Between January 28-30, 2005 a significant and fairly prolonged winter storm/ice storm affected nearly all of north and central Georgia from the evening of Friday January 28<sup>th</sup> to late morning on Sunday January 30<sup>th</sup>. The winter storm was the result of a very strong and very cold arctic surface high pressure system located across the Mid-Atlantic States and an upper-level disturbance moving across the region from the west. North of a line from La Grange, to Thomaston, to Sandersville, the precipitation fell mostly as a mixture of sleet and freezing rain, with typical accumulations of one-half glaze ice and one to two inches of sleet. Some areas in north central and northeast Georgia experienced significant glaze ice accumulations of three-fourths to one inch. Extensive damage to trees and power lines were reported throughout the area, especially in north central, northeast and central Georgia. Damage estimates were in the millions and numerous vehicle accidents were also reported on the slick ice and sleet covered roads. The ice and sleet accumulations were largely provided by the county 911 centers or respective Emergency Management Directors. The damage information was provided by the local county/city newspaper. Lumpkin County experienced approximately  $\frac{3}{4}$  inch of glaze ice and 1.0 inch of sleet. Several trees and power lines were down in the county causing some residents to lose power.
- 9) On April 2, 2005 an unusually strong, late winter/early spring cold front moved through the area early in the day, bringing strong and gusty northwest winds to the region, along with some snow and sleet showers early in the day. The strong winds, combined with wet ground from heavy rains during the previous week, caused several trees to be blown down. Some of the trees took down power lines. The strongest winds affected the northern part of Georgia. The Lumpkin County 911 Center reported several downed trees scattered throughout the county causing estimated damages of \$2,000.
- 10) On December 15, 2005 a low pressure system moving out of the Gulf of Mexico and a strong upper-level trough pushed an area of rain across Georgia late on the 14th and early on the 15th. Meanwhile, a wedge of cold, dry air had slid down the east side of the Appalachians into north central and northeast Georgia. As the rain overspread the wedge of cold air, temperatures dropped to near or just below the freezing mark. Rainfall amounts across north and northeast Georgia averaged in the 0.50 to 0.80 inch range, resulting in substantial and damaging accumulations of ice. Ice accumulations on trees, power lines, and other elevated objects were mostly in the 0.25 to 0.33 inch range in an area bounded by Helen, Dahlonega, Ellijay, northeast Atlanta, Covington and Athens. Approximately 220,000 residents, mostly in northeast Georgia, were left without any power during the morning hours. The power outages also left traffic signals out of service in many of these areas, resulting in a number of traffic backups. Nearly 100,000 were still without power in the late afternoon. Lumpkin County experienced  $\frac{1}{4}$  inch of ice accumulation, causing numerous trees and power lines to be downed and school to be closed for two days.
- 11) On January 14, 2006 a strong cold front and closed upper low brought very strong northwest winds to north Georgia. Measured wind speeds were sustained in the 30 to 40 mph range

with a few gusts in excess of 50 mph. Higher elevations likely experienced even higher wind speeds. Most of the high wind criteria were met during the 9 am to noon EST period, with strong wind criteria for the afternoon and evening hours. The Lumpkin County 911 Center reported numerous trees and power lines down throughout the county with winds gusts of up to 51 mph reported in Dahlonega.

- 12) On February 6, 2006 light amounts of sleet and, in a few of the higher elevations, snow spread across the area. The bulk of the precipitation fell during the early morning hours between 4 am EST and 8 am EST. Temperatures across the area were mostly in the mid to upper 30s at the onset of the precipitation and had been in the 50s and 60s in prior days. Thus, accumulations of snow were limited mainly to the higher elevations of the northeast Georgia mountains, mainly for elevations above 3,000 feet near the Lumpkin, Union, White county borders, where 1.0 to 2.0 inches of snow were reported. Patchy slick spots developed during the early morning hours on a few roads, mainly in the far northern counties. A few roads in the northeast Georgia mountains were closed, but mainly as a precaution.
- 13) On February 1, 2007 a bitter arctic air mass covered much of the eastern half of the nation on the 1st of February. However, because the upper-level trough was positively tilted into the southwest and south central U.S., the bulk of the cold air was spilling southward into the southern plains and eastward into the northeast U.S. A stationary front separating the cold arctic air from warm, moist air was located across south Georgia. Considerable lift was supplied over the shallow layer of cold air as a weak upper disturbance passed over the area early in the morning of the 1st. Temperatures were cold enough north of a Rome, to Canton, to Gainesville line for much of the precipitation to fall as snow. Some freezing rain and sleet was noted on the southern end of the frozen precipitation area. Snowfall amounts north of a Rome to Gainesville line were mostly around 2.0 inches, but some counties in the northeast Georgia mountains reported 5.0-6.0 inch snowfall amounts.
- 14) During the days of January 16-17 2008 relatively cold Canadian air was in place across north Georgia as a low pressure system moved northeast from the Gulf of Mexico across south Georgia. As a result, widespread light to moderate snow and some sleet fell across north Georgia during the afternoon and evening hours of the 16th. A few areas experienced several hours of freezing rain. Snowfall of two to three inches was common in the northeast Georgia mountain counties, while snowfall further south was generally one inch or less. Lumpkin County received approximately 3.0 inches of snow during this event.
- 15) On January 19, 2008 a surface low pressure was moving northeast through the eastern Gulf. A deep upper trough dominated the eastern United States. An arctic front was moving southeast from the Ohio Valley and western Tennessee Valley. As the surface low pressure area tracked toward the northeast Gulf in advance of the arctic front, moisture spread over a cold air mass resulting in snow across north Georgia and rain across central Georgia. Most of the measurable snow fell within a narrow, 50 mile-wide area from LaGrange in west central Georgia to near Gainesville in northeast Georgia. Snowfall amounts were mostly around one inch, with a few 1.50 to 2.00 inch amounts observed across the northern suburbs of Atlanta. Lumpkin County received approximately 0.50 inches of snow during this event.

16) On January 22, 2008 a cold Canadian air mass remained over the state in the wake of the arctic front which moved through north and central Georgia earlier in the week. A week disturbance aloft moved over the cold air mass early on the 22nd and brought light precipitation to north Georgia. Temperatures in some areas of the far northwest and favorable cold air wedge areas of the northeast were just below freezing. As a result, most of the precipitation during the early morning fell as light freezing rain. A light coating of ice was observed in a few northern Georgia counties, mainly on trees and power lines. Ice accumulations were all observed to be less than ¼ inch. Lumpkin County reported minor accumulations of ice, mainly on trees and power lines.

**C. Assets Exposed to Hazard** - In evaluating assets that may potentially be impacted by the effects of winter storms, the HMPUC determined that all critical facilities, public and private property, are susceptible.

**D. Estimate of Potential Losses** - Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 2.1b shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County currently has no land use or development trends related to winter storms.

**F. Multi-Jurisdictional Concerns** - All of Lumpkin 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 county-wide basis and include the City of Dahlonega.

**G. Hazard Summary** - Winter storms, unlike other natural hazards, typically afford communities some advance warning. The National Weather Service issues winter storm warnings and advisories as these storms approach. Unfortunately, even with advance warning, some of the most destructive winter storms have occurred in the Southern United States, where buildings, infrastructure, crops, and livestock are not well-equipped for severe winter conditions. Motorists, not accustomed to driving in snow and icy conditions, pose an additional danger on roads and highways. The Lumpkin Co. HMPUC recognized the potential threats of winter storms and identified specific mitigation actions. These can be found in Chapter 4, Section I.

## II. Tornadoes



**A. Hazard Identification** – A tornado is a dark, funnel-shaped cloud containing violently rotating air that develops below a heavy cumulonimbus cloud mass and extends toward the earth. The funnel twists about, rises and falls, and where it reaches the earth causes great destruction. The diameter of a tornado varies from a few feet to a mile; the rotating winds attain velocities of 200 to 300 mph, and the updraft at the center may reach 200 mph. The Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise. In comparison with a hurricane, a tornado covers a much smaller area but can be violent and destructive. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. A tornado travels in a generally northeasterly direction with a speed of 20 to 40 mph. The length of a tornado's path along the ground varies from less than one mile to several hundred.

The Fujita Scale of Tornado Intensity			
F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage Done
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-inforced concrete structures badly damaged.

Although not the most frequent, tornadoes are considered to be the most unpredictable and destructive of weather events within Lumpkin County. Tornado season in Georgia ordinarily runs from March through August, with the peak activity being in March and April. However, tornadoes can strike at any time of the year when certain atmospheric conditions are met. Tornadoes can also strike at any time of the day, including early morning hours, though they are most common in the afternoon hours.

**B. Hazard Profile** - All areas within Lumpkin County are vulnerable to the threat of a tornado. There is simply no method to determine exactly when or where a tornado will occur. According to available records, Lumpkin County has experienced 1 confirmed tornado within the past 16 years and 10 confirmed tornadoes within the last fifty years.

The Lumpkin County Hazard Mitigation Planning Committee (HMPC) reviewed data from both the Georgia Tornado Database and the National Climatic Data Center in researching the affects of tornadoes within the County since 2003. This information was included in the 2004 Hazard Mitigation Plan. Below is a brief description of the one tornado that has occurred in Lumpkin County since 1994.

- 1) According to a damage survey conducted by the Dawson County Emergency Management Director, a F0 tornado touched down just across the Dawson County line in Lumpkin County on August 29, 2005 at approximately 5:45 pm EST. The tornado touched down approximately 2.5 miles north of Burtsboro, or just north of Georgia Highway 9. The tornado then traveled north-northwest for almost one mile before lifting. The tornado damage path was determined to be 0.9 miles long and about 125 yards wide. Most of the damage occurred along Sheep Wallow Road off Mill Creek Road. Initial damage began at 2239 Sheep Wallow Road where 12 trees were uprooted or snapped. More damage was then reported between the 3210 and 3400 block of Sheep Wallow Road where damaged occurred to a nursery. A greenhouse, warehouse, and two vehicles sustained mostly minor damage at this facility. Approximately 30 trees were also blown down on the nursery property or nearby.

The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) reviewed historical data included in the 2004 Hazard Mitigation Plan in researching the past affects of tornadoes within the county. With most of Lumpkin County's recorded tornado events, only basic information was available. However, dozens of tornado watches have been recorded since 2004, and certainly some tornadoes go undetected or unreported. Therefore, any conclusions reached based on available information on tornadoes in Lumpkin County should be treated as the minimal possible threat.

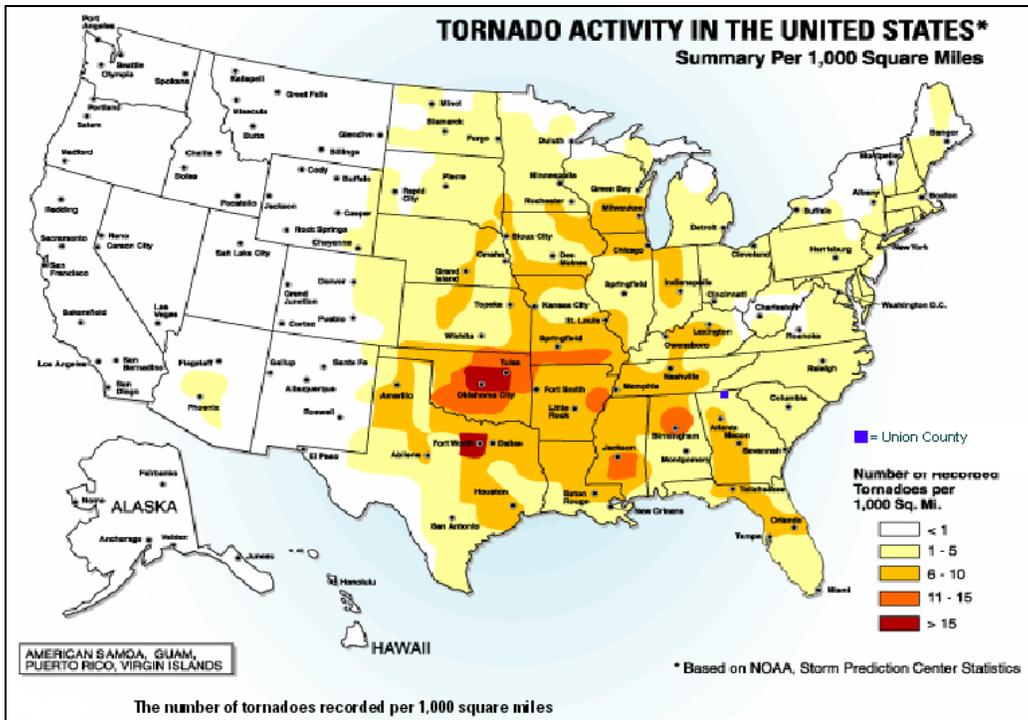
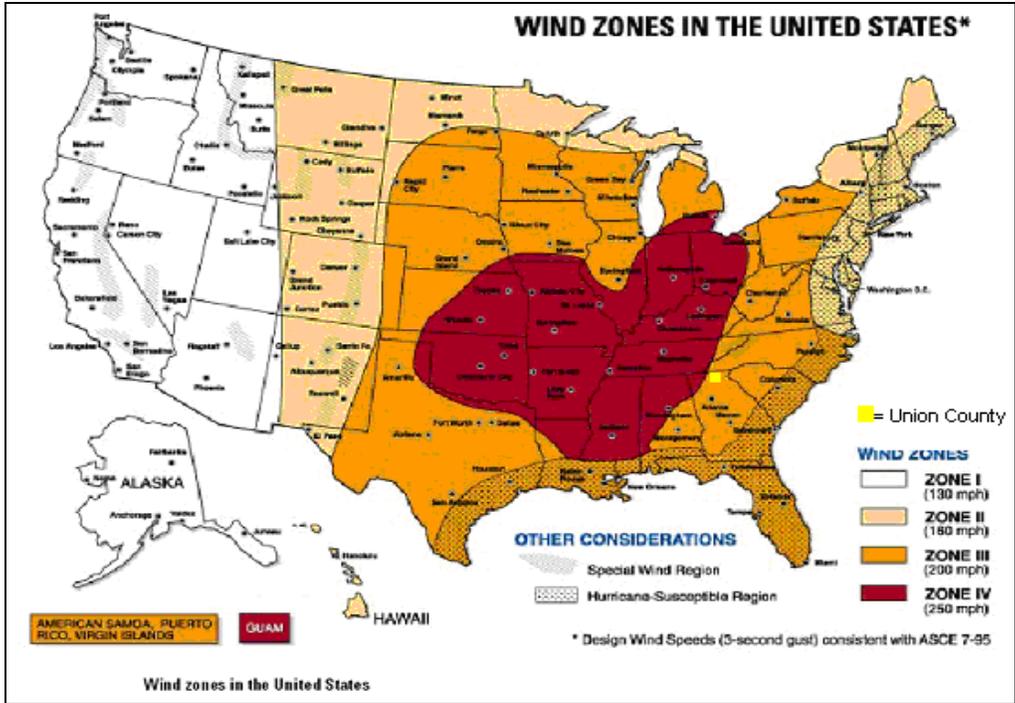
During the past fifty-five years, documentation of 10 tornado events was found. Based on the entire fifty-five year period, it can be inferred that the touchdown of a tornado within Lumpkin County is likely to occur once every 5.5 years or there is an 18.2% chance, per year, of a tornado touching down. However, when only the past 10 year period is taken into consideration, the

likelihood of such an event occurring in Lumpkin County is once every 10 years, or a 10% chance per year of a tornado touching down. The HMPUC believes an average of the statistics from the fifty-five and ten year periods should be used to develop a more accurate picture of tornado activity in Lumpkin County. Many different variables can affect the occurrence of tornadoes, causing increased activity in any given year.

**C. Assets Exposed to Hazard** - All structures and facilities within Lumpkin County are susceptible to tornado damage since tornadoes are unpredictable and are indiscriminate as to when or where they strike.

**D. Estimate of Potential Losses** - Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 2.1b shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County is located in wind zone III, which is associated with 200-mph design wind speeds as determined by the American Society of Civil Engineers (ASCE). Existing building codes do not require structures to meet or exceed design wind speeds of 200 mph, however, construction must adhere to the Georgia State Minimum Standard Codes (Uniform Codes Act) and the International Building Code (2000 edition). The minimum standards established by these codes provide reasonable protection from most natural hazards. Although manufactured homes are always high-risk structures during tornadoes, Lumpkin County adopted regulations in 2003 to strengthen the stability of manufactured housing with increased standards for installation. Lumpkin County currently has no land use or development trends related specifically to tornadoes.



		WIND ZONE			
		I	II	III	IV
NUMBER OF TORNADES PER 1,000 SQUARE MILES	<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

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

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

**F. Multi-Jurisdictional Concerns** - All of Lumpkin County has the same design wind speed of 200 mph as determined by the American Society of Civil Engineers (ASCE). Since no portion of the county is immune from tornadoes, any mitigation steps taken related to tornadoes should be undertaken on a county-wide basis, including the City of Dahlonega.

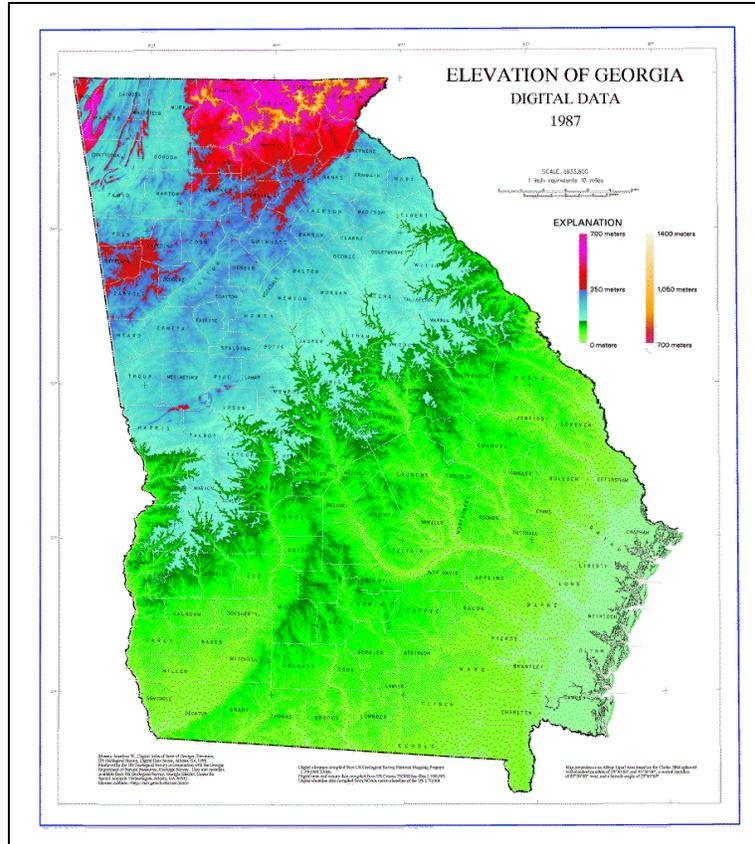
**G. Hazard Summary** – Based on its history, Lumpkin County has a high exposure to potential damage from tornadoes. Should a tornado strike dense residential areas, or certain critical facilities, significant damage and loss of life could occur. Due to the destructive power of tornadoes it is essential that the mitigation measures identified in this plan receive full consideration. Specific mitigation recommendations related to tornadoes are identified in Chapter 4, Section II.

### III.Flooding



**A. Hazard Identification-** The vulnerability of a river or stream to flooding depends upon several 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 span can result in flash flood conditions. Nationally, the total number of flash flood deaths has exceeded tornado fatalities during the last several decades. Two factors seem to be responsible for this: public apathy regarding the flash flood threat and increased urbanization. A small amount of rain can also result in floods in locations where the soil is saturated from a previous wet period or if the 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 in that water runoff is greater in areas with steep slopes and little or no vegetation.

**B. Hazard Profile-** The Lumpkin County HMPUC sought flood information on Lumpkin County for the past five years. The main sources of information used by the HMPUC were the National Climatic Data Center, the Lumpkin County Emergency Operations Plan, and newspaper articles. What was found was that flooding has caused moderate to severe damage on relatively few occasions. This positive record is largely because of the county's high elevation, which lessens the likelihood of flooding. Past data is limited due in part to limited historical records. The 2004 Hazard Mitigation Plan documented flood events between 1995 and 2002. This updated Hazard Mitigation Plan documents flood events between 2003 and 2008.



Flood events on record in Lumpkin County are usually attributed to an overflow of the Chestatee River, Yahoola Creek (which forms Ted Taft Copeland Dam), Cane Creek, Clay Creek, and other tributaries that empty into the Chestatee River. Four of the documented cases of flooding within Lumpkin County since 2002 are as follows:

- 1) On July 16, 2003 the Lumpkin County 911 Center reported that flash flooding had occurred in a small area northwest of Dahlonega, resulting in damage to Horton Road.
- 2) The Dahlonega Nugget reported that during the days of September 16-17, 2004 significant flooding was observed throughout Lumpkin County, causing damage to roads and other property. The most significant flooding occurred along the Chestatee River, which exceeded its banks by several feet and flooded Georgia Highway 52. A portion of Nimblewill Church Road and Sheep Wallow Road were washed out. Three other roads had to be closed because of flooding.
- 3) On June 25, 2006 the Lumpkin County 911 Center reported that heavy rainfall in the far southwest corner of the county, southwest of Nimblewill and near the Dawson County line, had resulted in the flooding of Little Mountain Road. A culvert under the road was washed out and the road had to be closed as a result. The flooding was caused by Poverty Creek.

- 4) On August 26, 2008 the Lumpkin County Emergency Management Director confirmed that flash flooding had occurred at several locations in eastern Lumpkin County as a result of very heavy rainfall caused by the remnants of tropical storm Fay. Five-day total rainfall for the eastern portion of the county was in the six to eight inch range, but three to four inches of this fell on this day alone, resulting in flash flooding. Approximately 7.9 miles east of Dahlonega a culvert pipe on Wahoo Creek Road, a gravel road, was washed out by flood waters. A stream crossing under Mount Olive Church Road, approximately 6.4 miles southeast of Dahlonega overflowed its banks by at least a foot resulting in minor flooding of upstream agricultural fields. Approximately six miles east of Dahlonega, a stream overflowed onto Georgia Highway 115 near Grindale Brothers Road by at least one foot. Pecks Mill Creek overflowed its banks at the Pecks Mill Creek Road Bridge with at least two feet of water over the road. Significant erosion occurred and the culvert pipe was damaged. With the exception of this later incident, overall damage was minor and mostly in the form of debris cleanup.

In many flood events, relatively little information on damage estimates, in terms of dollars, is available. However, with each of these events there were certainly significant costs related to road repair, infrastructure repair, and public safety, at a minimum. Most of the flood damage that has occurred historically within the county appears to be “public” flood damage. More specifically, roads and culverts washing out have been the most common flooding problem on record.

**C. Assets Exposed to Hazard** - Throughout the planning process, assets (particularly critical facilities) were examined using both risk-based and non-risk-based analysis to determine the most vulnerable locations within Lumpkin County. In evaluating assets that are susceptible to flooding, the committee determined virtually all public and private property can suffer damage from flooding, including any of Lumpkin County’s critical facilities. Flood plain maps are located in Appendix C of this document showing the general location of several facilities and their proximity to flood plains.

**C-1. Repetitive Loss Structures-** Based on data from the NFIP and the GMIS database, the HMPUC determined that there are not any repetitive loss structures located in Lumpkin County or the City of Dahlonega. The lack of repetitive loss structures may be due to the fact that both Lumpkin County and the City of Dahlonega have only recently begun participating in the National Flood Insurance Program. According to FEMA the current effective map date for both Lumpkin County and the City of Dahlonega is 9/26/08. Future plan updates will ensure inclusion of any newly reported repetitive loss structures. Until that time, properties in danger of flooding can be located by referencing the flood maps located in Appendix C of this document.

**D. Estimate of Potential Losses** - Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land

valuation, and tax records for some government properties do not contain values. Table 2.1b shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends-** Both Lumpkin County and the City of Dahlonega participates in the National Flood Insurance Program (NFIP). According to NFIP guidelines, Lumpkin County has executed a Flood Damage Prevention Ordinance. The purpose of this ordinance is to minimize the loss of human life and health as well as to minimize public and private property losses due to flood conditions. The ordinance requires that potential flood damage be evaluated at the time of initial construction of structures, facilities and utilities, and that certain uses be restricted or prohibited based on this county evaluation. The ordinance also requires that potential homebuyers be notified that property is located in a flood area. In addition, all construction must adhere to the Georgia State Minimum Standard Codes (Uniform Codes Act) and the International Building Code (2000 edition). The minimum standards established by these codes provide reasonable protection to persons and property within structures that comply with the regulations for most natural hazards.

**F. Multi-Jurisdictional Concerns-** Flooding is usually isolated to select areas of Lumpkin County that are within the flood plain or other flood prone areas. However, any area of Lumpkin County can potentially be affected by flooding, whether it's from flash flooding or the devastation resulting from dam failure. As a result, any mitigation steps taken related to flooding should be undertaken on a county-wide basis and include the City of Dahlonega.

**G. Hazard Summary-** Although historically uncommon, severe flooding has the potential to inflict significant damage within Lumpkin County. Mitigation of flood damage requires the community to have knowledge of flood-prone areas, including roads, bridges, bodies of water, and critical facilities, as well as the location of the county's designated shelters. The Lumpkin County HMPUC identified flooding as a hazard requiring mitigation measures and identified specific mitigation goals, objectives and action items they deemed necessary to lessen the impact of flooding. These findings are found in Chapter 4, Section III.

## IV. Severe Thunderstorms



**A. Hazard Identification** - A Severe Thunderstorm is defined as a thunderstorm producing wind at or above 58 mph and/or hail  $\frac{3}{4}$  of an inch in diameter or larger. This threshold is met by

approximately 10% of all thunderstorms. These storms can strike any time of year, but similar to tornadoes, are most frequent in the spring and summer months. They are nature's way of providing badly needed rainfall, dispersing excessive atmospheric heat buildup and cleansing the air of harmful pollutants. Not only can severe thunderstorms produce injury and damage from violent straight-line winds, hail, and lightning, but these storms can produce tornadoes very rapidly and without warning.

Thunderstorm winds are generally short in duration involving straight-line winds and/or gusts in excess of 50 mph. However, these winds can gust to more than 100 mph, overturning trailers, removing roofs from homes, and toppling trees and power lines. Such winds tend to affect areas of Lumpkin County with significant tree stands, as well as areas with exposed property, infrastructure, and above-ground utilities. Resulting damage often includes power outages, transportation and economic disruptions, and significant property damage. Thunderstorm winds can also leave a population with injuries and loss of life.

Thunderstorms produce two types of wind, rotational and downbursts. Tornadoes are characterized by rotational winds but downbursts are more predominant during a thunderstorm. Downbursts are small areas of rapidly descending air beneath a thunderstorm that strikes the ground producing isolated areas of significant damage. Every thunderstorm produces a downburst. The typical downburst consists of only a 25 mph gusty breeze, accompanied by a temperature drop of as much as 20 degrees within a few minutes. However, severe downburst winds can reach up to 58 to 100 mph or more, significantly increasing the potential for damage to structures. Downbursts develop quickly with little or no advance warning and come from thunderstorms whose radar signatures appear non-severe. There is no sure method of detecting these events, but atmospheric conditions have been identified which favor the development of downbursts. Severe downburst winds have been measured in excess of 120 mph, or the equivalent of an F2 tornado, as measured on the Fujita Scale. Such winds have the potential to produce both a loud "roaring" sound and the widespread damage typical of a tornado. This is why downbursts are often mistaken for tornadoes.

Hail can also be a destructive aspect of severe thunderstorms. Hail causes more monetary loss than any other type of thunderstorm-spawned severe weather. Annually, the United States suffers about one billion dollars in crop damage from hail. In addition, people have, on rare occasion, lost their lives from hail. 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. Unfortunately hail is often much larger than a dime and can fall at speeds in excess of 100 mph. 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 descending currents of air called downdrafts. In their descent, these frozen droplets bump into and coalesce with unfrozen water droplets and are then 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.

Finally, the most frightening aspect of thunderstorms would be considered by many to be lightning. Lightning kills nearly one hundred people every year in the United States and injures hundreds of others. A possible contributing reason for this is that lightning victims frequently are struck before or just after the occurrence of precipitation at their location. Many people apparently feel safe from lightning when they are not experiencing rain. Lightning tends to travel the path of least resistance and often seeks out tall or metal objects. With lightning however, it's all relative. A 'tall' object can be an office tower, a home, or a child standing on a soccer field. Lightning can and does strike just about any object in its path. Some of the most dangerous and intense lightning may occur with severe thunderstorms during the summer months, when outdoor activities are at their peak.

**B. Hazard Profile** – Severe thunderstorms are a serious threat to the residents of Lumpkin County. Over the course of a year, the county experiences dozens of thunderstorms, with about one in ten being severe. Other than wildfire, severe thunderstorms occur more frequently than any other natural hazard event within Lumpkin County. There have been 27 strong wind, thunderstorm wind, hail, and/or lightening events within Lumpkin County between 2003 and 2009 according to the National Climatic Data Center.

Most of the available information relating to Lumpkin County thunderstorms provides very little information concerning damage estimates. However, with each thunderstorm event it is likely there are unreported costs related to infrastructure repair, repair to public utilities, and public safety costs, at a minimum. Severe thunderstorms have occurred in all parts of the day and night within Lumpkin County. They have also taken place during the months of March through November according to available records.

Below is a brief description of the more destructive events by date and the affect they had on Lumpkin County:

- 1) On May 1, 2003, the Lumpkin County 911 Center reported penny sized hail.
- 2) On June 12, 2003, the Lumpkin County 911 Center reported that thunderstorm winds caused a tree and a nearby electrical transformer to be blown down across a road.
- 3) On July 22, 2003, the Lumpkin County 911 Center reported that thunderstorm winds caused several trees and power lines to be down.
- 4) On August 15, 2003, the Dahlonega Nugget reported that lightening struck a Poplar tree near a home on Ridge Point Road, setting an adjacent shed and the home on fire. The home was in the Frogtown area of extreme eastern Lumpkin County, near the White County line. The home was a total loss. Another lightening strike struck and killed a bull in a nearby pasture.
- 5) On August 16, 2003, the Lumpkin County 911 Center reported penny sized hail and that thunderstorm winds blew at least five trees down.

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- 6) On March 20, 2004, the public reported nickel-sized hail just west of Dahlonega. The National Weather Service in Greer, South Carolina relayed a report from an amateur radio operator of half-dollar sized hail near the White County line. This individual also reported a wind gust of 50 mph.
- 7) On July 14, 2004, the Lumpkin County 911 Center reported a few trees had been blown down. A storm spotter reported several large limbs, some up to two inches in diameter, had been broken off trees four miles east of Amicalola Falls on the western border of Lumpkin County near the Dawson County line. The Dahlonega Nugget newspaper reported a large tree had fallen in front of the Royal Guard Inn in Dahlonega.
- 8) On August 20, 2004, the Lumpkin County 911 Center reported that several trees were down along Oak Grove Road just northwest of Dahlonega.
- 9) On September 6, 2004, Lumpkin County, along with many counties in Georgia, experienced strong wind damage associated with Tropical Storm Frances. The Lumpkin County 911 Center reported numerous trees were blown down around the county. Damages were estimated to be \$25,000.
- 10) On September 16, 2004, Lumpkin County, along with many counties in Georgia, experienced high wind damage associated with Tropical Storm Ivan. The Georgia Emergency Management Agency and the Dahlonega Nugget reported extensive and widespread damage to trees and power lines throughout the county. Some structures were also damaged in the county. Several hundred trees were blown down or uprooted in the county, many of them large trees. Approximately 150 to 200 county roads were blocked by downed trees. One mobile home was destroyed, one site-built home sustained minor damage. In addition one non-profit facility was destroyed. Damages were estimated at \$500,000.
- 11) On February 21, 2005, the Lumpkin County 911 Center reported penny-sized hail.
- 12) On March 27, 2005, several reports of golf ball-sized hail were received from the public in Dahlonega and just south of the city near the intersection of Georgia Highway 60 and 400.
- 13) On April 22, 2005, the public reported penny-sized hail in Lumpkin County.
- 14) On July 10-11, 2005, Lumpkin County, along with many counties in Georgia, experienced high wind damage associated with the remnants of Hurricane Dennis. Much of west Georgia was affected from the late evening hours on the 10th through the early morning hours of the 11th. Sustained winds during this period were mostly 15 to 25 mph, but some gusts to near 40 mph were reported. The strong winds combined with heavy rain and saturated ground resulted in many downed trees and power lines across west Georgia, mainly west of a line from Americus, to Atlanta, to Chatsworth. Many power outages were reported overnight and into the early morning hours.

- 15) On April 3, 2006, the Lumpkin County 911 Center reported that thunderstorm winds caused a few trees to be blown down near Dahlonega.
- 16) On May 20, 2006, the Lumpkin County 911 Center reported thunderstorm winds had caused four or five trees to be blown down in Turners Corner, a community in the northern section of the county. Quarter-sized hail was also reported by personnel at the Forrest Hill Mountain resort near the Dawson County line, two to three miles west of Nimblewill.
- 17) On May 25, 2006, the public reported penny-sized hail from Dahlonega southward to Auraria.
- 18) On June 25, 2006, the Lumpkin County 911 Center reported repeated thunderstorms with gusty winds and heavy rain resulted in seven to eight trees being blown down and scattered about Lumpkin County. The events occurred during a rather large span of time, mostly between 10 am and noon EDT, and were not associated with any one storm. Heavy rain and saturated ground contributed to the downed trees.
- 19) On June 26, 2006, the Lumpkin County 911 Center reported that thunderstorm winds resulted in one tree was blown down on Old Dahlonega Highway in the southeast part of the county.
- 20) On November 16, 2006, a very deep closed upper low moved through the mid and deep south resulting in a significant severe weather outbreak across the deep south and southeast. Georgia was on the eastern edge of this outbreak because much of north and central Georgia remained in a wedge of cooler air. A strong squall line of thunderstorms from central and southern Alabama worked its way into west central Georgia shortly after noon. The line of thunderstorms weakened considerably as it moved farther east into the cooler, more stable air. In addition to severe weather, rainfall of two to four inches across much of north and west Georgia resulted in several street flooding incidents. Strong winds, particularly at the higher elevations in the north Georgia counties, resulted in a number of trees being blown down. The Lumpkin County 911 Center reported four large trees were blown down within the county.
- 21) On April 26, 2007, a strong upper trough was moving through the eastern half of the U.S. on the 26<sup>th</sup>. Scattered thunderstorms accompanied this system across north Georgia during the afternoon hours. A couple of these thunderstorms became strong to briefly severe across north central Georgia during the evening hours. The Lumpkin County Emergency Management Director reported thunderstorm winds contributed to approximately 20 small trees being down across the western portion of the county. In addition, one power line was also down in this area. Several reports of funnel clouds were received from the public in this part of Lumpkin County.
- 22) On May 12, 2007, a significant disturbance in northwest flow provided for scattered to numerous thunderstorms during the afternoon and evening hours. Several of the thunderstorms became severe, mainly producing large damaging hail. A Lumpkin County

Sheriff's Deputy, the Lumpkin County Emergency Management Director, and the public reported quarter-sized hail in the area of U.S. Highway 19, northwest of Porter Springs. The Lumpkin County Emergency Management Director and the public also reported penny-sized hail in extreme western Lumpkin County, two to three miles west-southwest of Nimblewill.

- 23) On July 1, 2007, a stationary front near the Georgia/Tennessee line and northwest flow aloft combined with a moist and unstable air mass to produce widespread thunderstorms during the afternoon and evening. Several of these became severe, producing hail and damaging downburst winds. The Lumpkin County Emergency Management Director reported thunderstorm winds contributed to four trees were down in the far western part of the county near the Dawson County line in the Wimpy Mill area.
- 24) On August 23, 2007, a weak back door cold front was approaching north and east Georgia from the Carolinas. Meanwhile aloft, a large upper high remained centered just west of the area. These features combined with hot afternoon temperatures and a moist low-level air mass to result in scattered afternoon and evening thunderstorms. The activity was somewhat more widespread, more intense, and further north than had been observed on several previous days. The public observed quarter-sized hail in the far southeast part of Lumpkin County. Pea-sized hail was observed just southwest of Dahlonega.
- 25) On June 11, 2008, a stationary front was situated across north Georgia. High pressure aloft had drifted off the east coast and a weak low pressure area was evident aloft over Georgia. Scattered to numerous thunderstorms developed with daytime heating during the afternoon and evening. Several of these became severe and produced damaging downburst winds, hail, and frequent cloud-to-ground lightning. The Lumpkin County Emergency Management Director reported thunderstorm winds contributed to 20 to 25 trees being blown down in the western part of the county around Nimblewill. Several roads were blocked from downed trees.
- 26) On August 7, 2008, a strong upper trough was sweeping from the Ohio Valley into the southeast U.S. An unusually strong mid-summer cold front accompanied the upper trough. These features combined with a moist tropical air mass present over the region resulted in the development of scattered to numerous thunderstorms during the heat of the afternoon and early evening. Many of these thunderstorms became severe and produced damaging straight-line and downburst winds. The Lumpkin County 911 Center reported that thunderstorm winds contributed to a power line being blown down on Long Branch Road, southeast of Dahlonega.
- 27) On April 10, 2009, a vigorous upper closed low was moving from the mid-south and Mississippi Valley region into the mid-Atlantic and southeast U.S. A strong cold front accompanied the upper system. A strong low-level jet in advance of these weather systems transported warm, moist Gulf air northward into the region. With strong dynamics, hence shear, combined with an unusually moist, unstable atmosphere, the atmosphere was primed for a major weather outbreak. One round of thunderstorms

passed through north Georgia during the early morning hours. A few minor severe weather events accompanied this system in northwest Georgia. Partial clearing followed the morning convection, allowing temperatures to soar into the mid 70s across much of north and central Georgia in advance of the main weather system. Scattered to numerous discrete supercell thunderstorms developed during mid-afternoon in northwest Georgia and progressed east and southeast across the remaining portions of the county warning area during the evening hours. Severe thunderstorms and tornadoes lingered into the early morning hours of the 11<sup>th</sup> across the southern counties of central Georgia. During the eight hour period from 5 pm EST on April 10<sup>th</sup> to 1 am EDT on April 11<sup>th</sup>, a total of 14 tornadoes were confirmed to have touched down in north and central Georgia causing millions in damages. Some injuries, but no deaths, were reported.

During this weather event Lumpkin County experienced hail and thunderstorm winds. A storm spotter for the National Weather Service observed quarter-sized hail between Dahlonega and Porter Springs. The public observed golf ball-sized hail in the extreme east central portion of Lumpkin County near the White County line and west of Dahlonega. The public also observed penny to quarter-sized hail west of Georgia Highway 9 in the Mill Creek Station Subdivision near the Dawson County line. Also in the Mill Creek Subdivision, a storm spotter/firefighter for Lumpkin County reported that more than 100 trees were blown down. One house suffered significant damage from a downed tree and a vehicle was smashed from a fallen tree. Many of the trees were uprooted or twisted off approximately 20 feet above ground level.

**C. Assets Exposed to Hazard** - In evaluating assets that are susceptible to severe thunderstorms, the Hazard, Risk and Vulnerability Subcommittee determined that all public and private property in Lumpkin County is susceptible to severe thunderstorms, including all critical facilities.

**D. Estimate of Potential Losses** - Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 2.1b shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County currently has no land use or development trends related to severe thunderstorms.

**F. Multi-Jurisdictional Concerns** - As with tornadoes, all of Lumpkin County can potentially be affected by severe thunderstorms. As a result, any mitigation steps taken to mitigate the effects of severe thunderstorms should be undertaken on a county-wide basis and include the City of Dahlonega.

**G. Hazard Summary** – Overall, severe thunderstorm events pose one of the greatest threats to Lumpkin County in terms of property damage, as well as injuries and loss of life. Other than wildfires, severe thunderstorms are the most frequently occurring natural hazard in Lumpkin County and have the greatest chance to negatively impact the county each year. Based on the frequency of this hazard, as well as its ability to negatively impact any part of the county, the mitigation measures identified in this plan should be aggressively pursued. Specific mitigation actions related to severe thunderstorm events are identified in Chapter 4, Section IV.

## V. Wildfire



**A. Hazard Identification** – The Lumpkin County HMPUC utilized data from the U.S. Forest Service, Georgia Forestry and the Lumpkin County Emergency Operations Plan in researching wildfires and their impact on the county.

A wildfire is defined as an uncontrolled fire occurring in any natural vegetation. For a wildfire to occur there must be available oxygen, a supply of fuel, and enough heat to kindle the fuel. Often, these fires are begun by combustion and heat from surface and ground fires and can quickly develop into a major conflagration. A large wildfire may crown, which means it may spread rapidly through the topmost branches of the trees before involving undergrowth or the forest floor. As a result, violent blowups are common in forest fires, and on rare occasion they may assume the characteristics of a firestorm. A firestorm is a violent convection caused by a continuous area of intense fire and characterized by destructively violent surface indrafts. Sometimes it is accompanied by tornado-like whirls that develop as hot air from the burning fuel rises. Such a fire is beyond human intervention and subsides only upon the consumption of everything combustible in the locality. No records were found of such an event ever occurring within Lumpkin County, but this potential danger should be considered when planning mitigation efforts.

The threat of wildfire varies with weather conditions: drought, heat, and wind participate in drying out the timber or other fuel, making it easier to ignite. Once a fire is burning, drought, heat, and wind all increase its intensity. Topography also affects wildfire, which spreads quickly uphill and slowly downhill. Dried grasses, leaves, and light branches are considered flash fuels; they ignite readily, and fire spreads quickly in them, often generating enough heat to ignite heavier fuels such as tree trunks, heavy limbs, and the matted duff of the forest floor. Such fuels, ordinarily slow to kindle, are difficult to extinguish. Green fuels (growing vegetation) are not considered flammable, but an intense fire can dry out leaves and needles quickly enough to allow

ready ignition. Green fuels sometimes carry a special danger: evergreens, such as pine, cedar, fir, and spruce, contain flammable oils that burst into flames when heated sufficiently by the searing drafts of a wildfire.

Tools for fighting wildfires range from the standard equipment of fire departments to portable pumps, tank trucks, and earth-moving equipment. Firefighting forces specially trained to deal with wildfire are maintained by local, state and federal entities including the Lumpkin County Fire Department, Georgia Forestry, and U.S. Forest Service. These trained firefighters may attack a fire directly by spraying water, beating out flames, and removing vegetation at the edge of the fire to contain it behind a fire line. When the very edge is too hot to approach, a fire line is built at a safe distance, sometimes using strip burning or backfires to eliminate fuel in the path of the uncontrolled fire or to change the fire's direction or slow its progress. Backfiring is used only as a last resort.

The control of wildfires has developed into an independent and complex science costing approximately \$100 million annually in the United States. Because of the extremely rapid spreading and customary inaccessibility of fires once started, the chief aim of this work is prevention. However, despite the use of modern techniques (e.g., radio communications, rapid helicopter transport, and new types of chemical firefighting apparatus) more than 10 million acres of forest are still burned annually. Of these fires, about two thirds are started accidentally by people, approximately one quarter are of incendiary origin, and more than 10% are due to lightning.

**B. Hazard Profile** –Wildfires are a serious threat to Lumpkin County. Over the past six years, during FY 2005-FY 2010, the Georgia Forestry Commission reported a total of 305 fires in Lumpkin County. Combined, these fires burned approximately 1,467.51 acres. Of these, 15 were caused by campfires, 4 by lightning strikes, 6 by smoking and 119 were caused by some type of debris burning. Wildfires caused by campfires burned 7.56 acres and wildfires caused by smoking burned 6.01. Wildfires caused by lightning strikes burned 21.33 acres. Although there were fewer instances of recorded lightning strikes, these fires burned more acreage than the campfire and smoking caused fires. Campfires tend to be more localized while lightning strikes tend to occur in more heavily wooded areas, therefore having more fuel to burn.

Debris burning consumed the highest amount of acreage of these causes, burning 769.35 acres. The Georgia Forestry Commission lists seven different categories of debris burning: Construction, Household Garbage, Residential, Agricultural, Site Prep, Escaped Prescribed Burn, and Other. Wildfires caused by Residential fires burned the most acreage of the debris categories with approximately 689.3 acres or 89.6%. Fires used to eliminate yard waste can easily get out of hand on windy days. If these fires are located adjacent to wooded areas the out of control flames have easy access to an abundant fuel supply. A national program called Firewise Communities is working to reduce the incidences of fires spreading between residential properties and wooded areas. The program stresses the responsibility of homeowners to maintain landscaped areas in the wildland urban interface to reduce the ability of fires to find a bridge between residential properties and forested areas. Lumpkin County is currently encouraging areas to become Firewise Communities. More information on the Firewise Communities program can be found at <http://www.firewise.org/>.

The National Climatic Data Center also retains wildfire records. From 2003 through 2009 2 incidences were reported in Lumpkin County:

1. On November 10, 2008 a long term persistent drought across north and central Georgia, along with an extended period of dry, cold weather from late October through mid-November resulted in an increased fire danger across the state. Several wildfires were reported during mid-month by the U.S. Forest Service in the Chattahoochee National Forest in far northeast Georgia. Wildfires were observed in Fannin, Lumpkin, and Rabun Counties. A wildfire broke out in the Woody Creek area of Lumpkin County which took three days to contain. Damages from the Woody Creek and two other fires in northeast Georgia were estimated at \$130,000.
2. On January 16, 2009 a series of Arctic air masses spread across north and central Georgia during the latter half of the month. Rainfall was well below normal during this period. Soil and ground conditions were quite dry. A couple of small wildfires in far north Georgia had to be contained by the Georgia Forestry Department. The Georgia Forestry Commission reported that a human caused wildfire had to be contained at Dockery Gap in Lumpkin County. Approximately 0.16 acres of forest were burned.

**C. Assets Exposed to Hazard** - In evaluating assets that are susceptible to wildfire, the HMPU committee determined that all public and private property is susceptible to wildfire, including all critical facilities.

**D. Estimate of Potential Losses** - Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 2.1b shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County currently has no land use or development trends related to wildfire.

**F. Multi-Jurisdictional Concerns** - Virtually all of Lumpkin County can potentially be affected by wildfire. There are few exceptions because of the common interface between urban developments and the forest. Any steps taken to mitigate the effects of wildfire should be undertaken on a county-wide basis and include the City of Dahlonega. Lumpkin County is predominately rural with large acreages of forest, some approaching the City of Dahlonega. The danger of wildfire increases within the City of Dahlonega, because of the forest and the number of structures within a small area. The City of Dahlonega should include this in their future planning and zoning.

**G. Hazard Summary** – Wildfires pose a serious threat to Lumpkin County in terms of property damage, as well as injuries and loss of life. Wildfires are the most frequently occurring natural hazard within the County each year. Based on the frequency of this hazard, as well as its ability to inflict devastation most anywhere in the County, the mitigation measures identified in this plan should be aggressively pursued. Specific mitigation actions related to wildfire are identified in Chapter 4, Section V.

## VI. Drought



**A. Hazard Identification** – The definition of drought is a prolonged period of moisture deficiency. Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. These conditions originate from a deficiency of precipitation over an extended period of time, resulting in a water shortage. Drought conditions affect the development of crops and livestock as well as a water availability and water quality. Drought is also a key factor in wildfire development by making natural fuels (grass, brush, trees, dead vegetation) more fire prone.

**B. Hazard Profile** – The Lumpkin County HMPUC reviewed historical data from the National Climatic Data Center, the Georgia Department of Natural Resources and the Georgia Forestry Commission in researching drought events of the county.

Lumpkin County most recently experienced drought conditions during the years of 2007 through 2008. Agricultural crop damage during this period was severe. To date, agricultural losses have been the primary losses associated with drought. Because of the extremely unpredictable nature of drought (to include duration), reliably calculating a recurrence interval is difficult.

The National Drought Mitigation Center monitors and records broad-scale drought conditions throughout the nation. Data is also available on a state level. In 2003, the State of Georgia was not yet experiencing drought conditions. In 2004, the central portion of the state near the South Carolina state line began experiencing Abnormally Dry conditions in regards to the water resources. Serious drought conditions became persistent throughout the state beginning in 2006. The majority of the state was categorized as experiencing Extreme drought conditions (D2) while the remainder of the state was categorized as being in Moderate drought conditions (D1). Lumpkin County was experiencing both of these levels to an extent. Conditions dramatically worsened in 2007 when the northern counties, Lumpkin County included, were categorized as

experiencing Exceptional drought conditions (D4). The rest of the state was experiencing Extreme (D3), Severe (D2), Moderate (D1) and Abnormally Dry (D0) drought conditions.

The Exceptional and Extreme drought conditions spurred Level 4 Outdoor Water-Use Schedules to be implemented statewide. Level 4 Water Use restricts all outdoor watering other than capture and re-use of cooling system condensate or storm water, re-use of gray water, irrigation of personal food gardens and newly installed landscaping for the first 30 days.

In 2008, with the combination of increased precipitation events and water conservation, drought intensities around the state began to lessen. In May of 2008 the drought intensity in the northern counties became classified as Extreme (D3) and Severe (D2). The remainder of the state was classified as Severe (D2), Moderate (D1) and Abnormally Dry (D0). Some of the coastal and southern counties were even categorized as not experiencing drought conditions. After a hot, dry summer drought intensities increased slightly for the state. In July of 2008 some of the northern counties, including Lumpkin County, were once again classified as experiencing Exceptional (D4) and Extreme (D3) drought conditions. Beginning in 2009, precipitation events increased dramatically throughout the southeast, bringing much needed drought relief. By August of 2009 the majority of the State of Georgia, including Lumpkin County, was classified as experiencing no drought conditions. Counties in central Georgia continued to experience Abnormally Dry (D0) conditions until September 2009 when 98.6% of the state was classified as being drought free. The remaining 1.4% of the state, located near the coast, was classified as experiencing Abnormally Dry (D0) conditions. These drought free conditions continue throughout the southeast U.S. due to increased precipitation events.

**C. Assets Exposed to Hazard** - Drought conditions typically pose little threat to structures. However, wildfire can be a direct result of drought and does present a significant threat to a majority of public and private property within the county, including critical facilities.

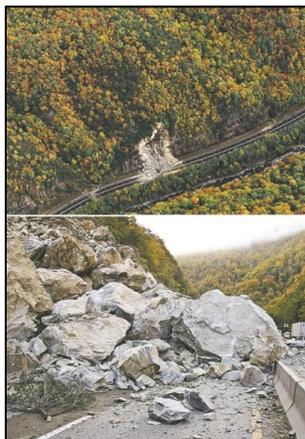
**D. Estimate of Potential Losses** - Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 2.1b shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County currently has no land use or development trends related to drought conditions.

**F. Multi-Jurisdictional Concerns** - Agricultural losses associated with drought are more likely to occur in the rural, less concentrated areas of Lumpkin County. Although the City of Dahlonega is less likely to experience drought-related losses, it should still be included in any mitigation considerations.

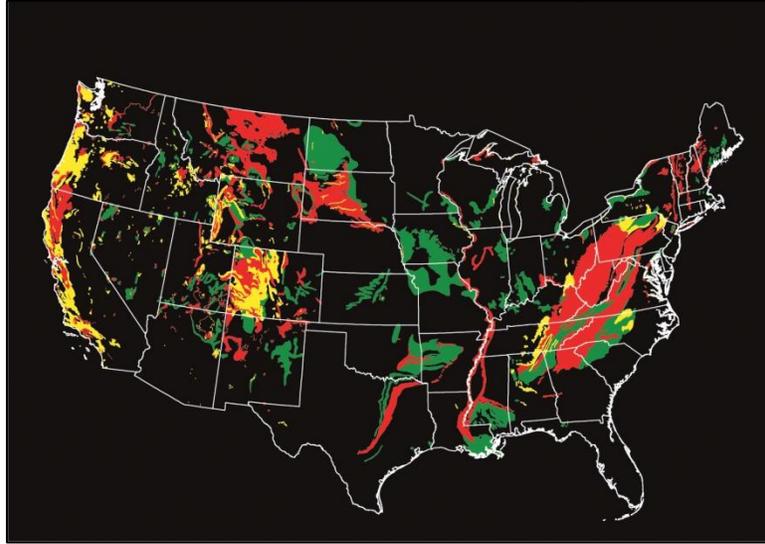
**G. Hazard Summary** - Drought events cause damage slowly, unlike other hazard events. A sustained drought can cause severe economic stress to the agricultural interests of the county and even the entire State. The potential negative effects of sustained drought are numerous. In addition to an increased threat of wildfires, drought can affect municipal and industrial water supplies, stream-water quality, water recreation facilities, hydropower generation, as well as agricultural and forest resources. The HMPUC realized the limitations associated with mitigation actions for drought, but did identify mitigation actions related to the potential threat of drought-inflicted wildfires in Chapter 4, Section VI.

## VII. Landslides



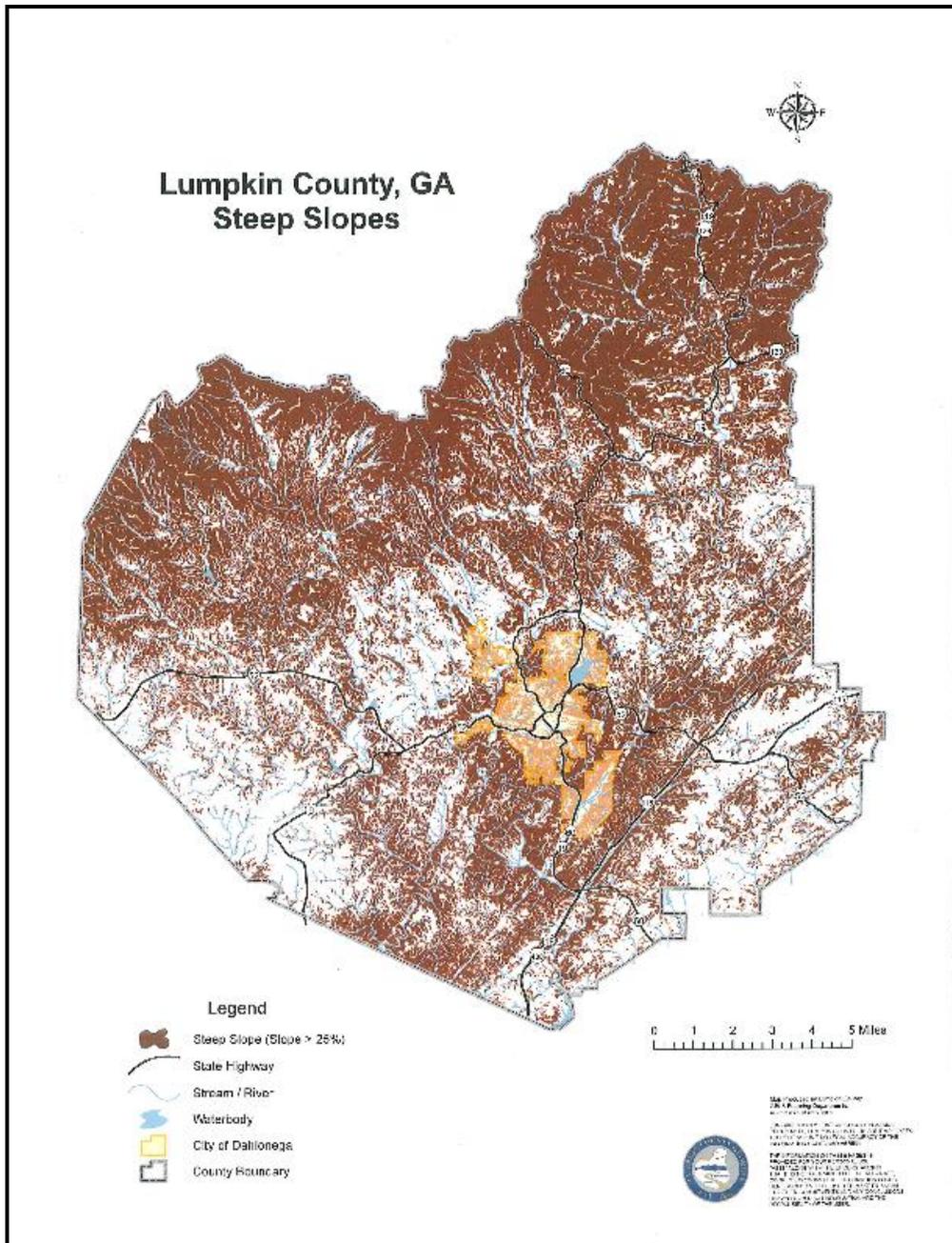
**A. Hazard Identification** - The Lumpkin County HMPUC utilized data from the USGS, FEMA, and the National Climatic Data Center in researching landslides and their impact on Lumpkin County.

Landslides (also referred to as a debris flows or mudslides) occur in every U.S. states and territory. In a landslide masses of rock, earth, or debris move down a slope. Landslides can be small, large, slow or rapid. They can be activated by storms, earthquakes, volcanic eruptions, fires, freeze/thaw, and steep slope erosion. Landslides are often more damaging and deadly than the triggering event. The dangerous conditions may be high even as emergency personnel are providing rescue and recovery services. Landslide problems can be caused by land mismanagement, particularly in mountain, canyon and coastal regions. In areas burned by forest and brush fires a lower threshold of precipitation may initiate landslides. Land-use zoning, professional inspections, and proper design can minimize many landslide, mudflow, and debris flow problems.



*Landslide Potential of U.S. (USGS) Red-Very High; Yellow- High; Green-Moderate*

**B. Hazard Profile** –Landslides are a serious threat to Lumpkin County. According to the USGS, Northern Georgia has a moderate or very high potential to experience landslides (see map above). The ridge line of the Appalachian Mountains divides the counties in Northern Georgia, creating steeper slopes in the eastern portion of the state. Lumpkin County lies within the area with very high potential for landslide activity. Steep slopes, combined with the high potential for wildfires increase the probability of a landslide or mudslide occurring in Lumpkin County or the City of Dahlonega within any given year.



Since 2004 two landslide events have affected portions of Lumpkin County. Both of these events were preceded by heavy rain events.

The National Climatic Data Center retains records of heavy rain events and flooding that can lead to landslide activity. From 2003 through 2009 1 incident was reported in Lumpkin County that resulted in a mudslide event:

1. On August 26, 2008 the remnants of tropical storm Fay continued to move northeast into central and northern Alabama then finally into eastern Tennessee on the 27<sup>th</sup>. This was the day when north and central Georgia experienced its maximum effects from tropical

storm Fay. The Lumpkin County Emergency Management Director confirmed that flash flooding had occurred at several locations in eastern Lumpkin County as a result of very heavy rainfall caused by the remnants of tropical storm Fay. Five-day total rainfall for the eastern portion of the county was in the six to eight inch range, but three to four inches of this fell on the 26<sup>th</sup> alone, resulting in flash flooding. A mudslide was observed on Corporate Road upstream from the Chestatee River Bridge approximately 5.4 miles east-northeast of Dahlonega. This resulted in the temporary closure of Corporate Road in this area. The mudslide was 20 feet by 60 feet tall.

Just over a year later, in early September 2009, north Georgia experienced a period of heavy rains. This rainfall resulted in a small landslide near the campus of North Georgia College & State University in Dahlonega. The slide caused a portion of a local road to be closed for a short period of time. Higher than normal rainfall throughout the summer of 2009 led to ground saturation, adding to the instability of the slopes in Lumpkin County and throughout northern Georgia.

**C. Assets Exposed to Hazard** - In evaluating assets that are susceptible to landslides, the HMPU committee determined that all public and private property is susceptible to landslides, including all critical facilities.

**D. Estimate of Potential Losses** - Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 2.1b shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County currently has no land use or development trends related to landslides or steep slopes.

**F. Multi-Jurisdictional Concerns** - Virtually all of Lumpkin County can potentially be affected by landslides due to the topography of the county. Any steps taken to mitigate the effects of landslides should be undertaken on a county-wide basis and include the City of Dahlonega.

**G. Hazard Summary** - Landslides pose a serious threat to Lumpkin County in terms of property damage, as well as injuries and loss of life. Landslides are not the most frequently occurring natural hazard within the County, but have the potential to be devastating. Based on the topography and continued development of Lumpkin County, as well as its ability to inflict devastation most anywhere in the county, the mitigation measures identified in this plan should be aggressively pursued. Specific mitigation actions related to landslides are identified in Chapter 4, Section V.

### Chapter 3-Local Technological Hazard, Risk and Vulnerability (HRV)

In accordance with FEMA guidelines, the Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) also included information relating to technological or “human-caused” hazards into this plan. The term, “technological hazard” refers to incidents resulting from human activities such as the manufacture, transportation, storage, and use of hazardous materials. This plan assumes that hazards resulting from technological sources are accidental, and that their consequences are unintended. Unfortunately, the information relating to technological hazards is much more limited. This causes a greater level of uncertainty with regard to mitigation measures. However, enough information has been gathered to provide a basic look at technological hazards within Lumpkin County. The two technological hazards included in the 2004 plan, Hazardous Materials Release and Dam Failure, remain in this chapter. A third hazard, Biohazards/Infections Diseases, has been added to this chapter to reflect changing global conditions. Although some of these hazards have occurred in Lumpkin County before, there is a chance they could all occur in the future.

Table 3.1 provides a brief description of each section in this chapter and a summary of the changes that have been made.

<b>Chapter 3 Section</b>	<b>Updates to Section</b>
I. Hazardous Materials Release	<ul style="list-style-type: none"> <li>The HMPUC subcommittee reviewed this portion of the 2004 plan and determined only minor changes were necessary at this time</li> </ul>
II. Dam Failure	<ul style="list-style-type: none"> <li>The HMPUC subcommittee reviewed this portion of the 2004 plan and determined only minor changes were necessary at this time</li> </ul>
III. Biological and Chemical Threats	<ul style="list-style-type: none"> <li>The HMPUC subcommittee determined this hazard needed to be added due to global conditions</li> </ul>

*Table 3.1: Overview of updates to Chapter 3: Local Technological Hazard, Risk and Vulnerability (HRV) Narrative*

**Table 3.2: Overview of Technological Hazards in Lumpkin County & the City of Dahlonega**

	HAZARDOUS MATERIALS RELEASE			DAM FAILURE			BIOLOGICAL & CHEMICAL THREATS		
<b>Ga. Hazard Mitigation Strategy Standard Plan</b>	Not Included			Included			Not Included		
<b>Lumpkin County HMP Update</b>	Included			Included			Included		
<b>Comments</b>	Included due to heavy truck & rail traffic and possible affect on natural resources			Severity depends on type of dam fails			Included due to global conditions		
	<b>Frequency</b>	<b>Severity</b>	<b>Probability</b>	<b>Frequency</b>	<b>Severity</b>	<b>Probability</b>	<b>Frequency</b>	<b>Severity</b>	<b>Probability</b>
<b>Lumpkin County</b>	Low	High	Low to Moderate	Low	Extensive to Catastrophic	Low	Low	Extensive to Catastrophic	Low
<b>City of Dahlonega</b>	Low	High	Low to Moderate	Low	Extensive to Catastrophic	Low	Low	Extensive to Catastrophic	Low

## I. Hazardous Materials Release



**A. Hazard Identification** - “Hazardous materials” (hazmat) refers to any material that, because of its quantity, concentration, or physical or chemical characteristics, may pose a real hazard to human health or the environment if it is released. Hazmat includes flammable and combustible materials, toxic materials, corrosive materials, oxidizers, aerosols, and compressed gases. Specific examples of hazmat are gasoline, bulk fuels, propane, propellants, mercury, asbestos, ammunition, medical waste, sewage, and chemical, biological, radiological, nuclear, and explosive (CBRNE) threat agents. Specific federal and state guidelines exist on transport and shipping hazardous materials.

**B. Hazard Profile** - The Lumpkin County HMPUC reviewed historical data from the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources (DNR) and county records in their research involving hazardous material releases within

Lumpkin County. Hazmat releases are classified as either fixed releases, which occur when hazmat is released on the site of a facility or industry that works with hazmat, or transportation-related releases, which occur when hazmat is released during transport from one place to another. Fixed hazmat releases in Lumpkin County have outnumbered transportation-related hazmat releases by almost a three to one margin over the past half-century. However, this ratio has shrunk somewhat within in the past decade. Today, it appears transportation-related hazmat releases are beginning to pose a larger threat to Lumpkin County than fixed hazmat releases. This is due to the existence of eight heavily-traveled U.S. and State Routes within the county where the transport of hazmat occurs on a daily basis. Another reason is that Lumpkin County is home to only two hazardous sites listed on the GAEPD's Hazardous Site Inventory: The Timken Bearing Plant in Dahlonega and the Barlow Road Municipal Solid Waste Landfill. North Georgia College & State University and Chestatee Regional Hospital use hazardous materials for chemistry labs and other operations but not in significant enough amounts to constitute a threat. Gold Creek Foods, a poultry processing company, purchased a site in Lumpkin County in 2009 and the plant is expected to be fully operational in 2010. Gold Creek Foods will most likely house hazardous materials on site and will need to be included more extensively in the next plan update.

Both fixed and transportation-related hazardous materials releases represent tremendous threats to Lumpkin County. During the past fifty-five years, documentation of 47 fixed hazmat release incidents was found. However, in the last plan, only the preceding ten-year period was taken into consideration. The likelihood of a fixed hazmat release incident in Lumpkin County was shown to be about once every 3 ½ months. Like the fixed hazmat release figures, when transportation-related hazmat figures were taken only for the same ten year period the likelihood of an incident occurring was about once every seven months.

The higher concentration of hazardous materials releases in that ten year period is largely due to improved record keeping. Increases in demand for and production and transportation of hazardous materials in more recent years are also contributing factors to this phenomenon. Due to the lack of any fixed or transportation-related incidents having occurred since 2004, the HMPUC will continue to use the figures and rate of occurrences provided in the last plan.

**C. Assets Exposed to Hazard** - The environment is especially vulnerable to hazardous materials releases. Waterways are at greatest risk of contamination. Research indicates that the waterway most often impacted by hazardous waste spills in Lumpkin County is the Chestatee River. Transportation-related hazmat releases contribute to most of the waterway contaminations. Such releases are also a potential threat to all property and persons within the major highway corridors of Lumpkin County due to the fact that certain hazmat releases can create several miles of contamination. The same holds true of property and persons located within the vicinity of facilities or industries that produce or handle large amounts of hazardous materials. Fortunately within Lumpkin County there is only one such facility or industry, Timken Bearing in Dahlonega. Timken Bearing only has one minor hazmat release event on record, when the facility was under the name Torrington Company. Historical data indicates that, for the most part, hazmat releases within Lumpkin County have been relatively minor in nature.

**D. Estimate of Potential Losses** - It is difficult to determine potential damage to the environment caused by hazardous materials releases. Waterways within Lumpkin County have certainly been impacted to some degree. It should be noted however, when either fixed or transportation hazmat releases do occur, there are significant costs incurred relating to emergency response, road closings, evacuations, watershed protection, expended man-hours, and cleanup materials and equipment. Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 3.2 shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County currently has no land use or development trends related to hazardous materials releases.

**F. Multi-Jurisdictional Concerns** - All of Lumpkin County, including the City of Dahlonega, is vulnerable to both fixed and transportation-related hazardous materials releases.

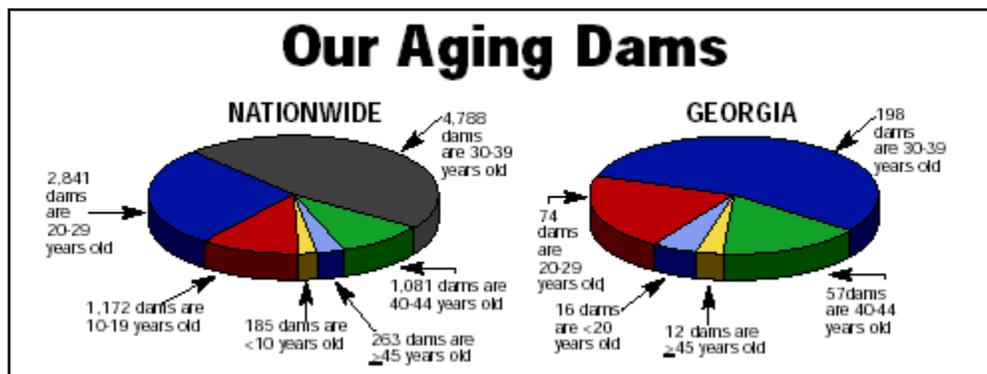
**G. Hazard Summary** – Hazardous materials releases are a relatively common occurrence in Lumpkin County. Sixty-five total recorded incidents have occurred over the past fifty-five years. All but fifteen occurred within the last fifteen years. This makes hazmat releases perhaps the most significant threat to Lumpkin County. Unknown quantities and types of hazmat are transported through the county by truck on a daily basis. The main highways of concern are State Routes 9, 11, 19, 52, 60, and 400, and U.S. Routes 19 and 129. These hazmat shipments pose a great potential threat to all of Lumpkin County. The fact that the county is unable to track these shipments seriously limits the mitigation measures that can be put into place. Fixed hazmat releases are considered to be less of a threat in Lumpkin County than are transportation-related hazmat releases due to the fact that only one company or industry within the county works with large amounts of hazardous materials. In the next plan update the full extent of the hazardous materials used by Gold Creek Foods will be know and this section can be updated at that time. The Lumpkin County HMPUC has identified some specific mitigation actions for both types of releases in Chapter 5, Section I.

## II. Dam Failure



**A. Hazard Identification** – Georgia law defines a dam as any artificial barrier which impounds or diverts water, is 25 feet or more in height from the natural bed of the stream, or has an impounding capacity at maximum water storage evaluation of 100 acre-feet (equivalent to 100 acres one foot deep) or more. Dams are usually constructed to provide a ready supply of water for drinking, irrigation, recreation and other purposes. They can be made of rock, earth, masonry, or concrete or of combinations of these materials.

Dam failure is a term used to describe the major breach of a dam and subsequent loss of contained water. Dam failure can result in loss of life and damage to structures, roads, utilities, crops, and livestock. Economic losses can also result from a lowered tax base, lack of utility profits, disruption of commerce and governmental services, and extraordinary public expenditures for food relief and protection. National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for one third of all U.S. dam failures. Foundation defects, including settlement and slope instability, account for another third of all failures. Piping and seepage, and other problems cause the remaining third of national dam failures. This includes internal erosion caused by seepage, seepage and erosion along hydraulic structures, leakage through animal burrows, and cracks in the dam.



**B. Hazard Profile** – The Lumpkin County HMPUC reviewed historical data from the Environmental Protection Division (EPD) within the Georgia Department of Natural Resources (DNR) as well as county records in their research involving dam failure within Lumpkin County. Fortunately, Lumpkin County has never experienced a major dam failure. It is possible that

some small private dams have been breached at some point in the past, but no records have been found to indicate any type of emergency response related to such a failure, or even that such a failure has taken place. However, the potential for such a disaster does exist, and the appropriate steps must be taken to minimize such risks. The Safe Dams Program helps communities take those necessary steps to reduce the risk if a dam failure does occur.

The Georgia Safe Dams Act of 1978 established Georgia's Safe Dams Program following the November 6, 1977 failure of the Kelly Barnes Dam in Toccoa, GA, in which 39 people lost their lives when the breached dam, which held back a 45-acre lake, sent a 30-foot-high wall of water sweeping through Toccoa Falls College. The Environmental Protection Division (EPD) within the Georgia Department of Natural Resources (DNR) is responsible for administering the Program. The purpose of the Program is to *provide for the inspection and permitting of certain dams in order to protect the health, safety, and welfare of all citizens of the state by reducing the risk of failure of such dams*. The Program has two main functions: (1) to inventory and classify dams and (2) to regulate and permit high hazard dams.

Structures below the State minimum height and impoundment requirements (25 feet or more in height or an impounding capacity of 100 acre-feet or more) are exempt from regulation by the Georgia Safe Dams Program. The Program checks the flood plain of the dam to determine its hazard classification. The Program uses specialized software to build a computer model to simulate a dam breach and establish the height of the flood wave in the downstream plain. If the results of the dam breach analysis, also called a flood routing, indicate that a breach of the dam would result in a probable loss of human life, the dam is classified as Category I (high-hazard). As of July 2002, the Program's statewide inventory of dams consisted of 390 Category I dams, 3,268 Category II dams and 1,182 exempt dams. The Program noted that an additional 382 Category II dams needed to be studied for possible reclassification to Category I dams. The Safe Dams Program also approves plans and specifications for construction and repair of all Category I dams. In addition, Category I dams are continuously monitored for safety by Georgia EPD.

To date, the Safe Dam Program has identified six Category I (high hazard) dams within Lumpkin County: Roskin Lake Dam, Yahoola Creek Reservoir Dam, Whitner's Lake Dam (aka Rodgers Lake Dam), R-Ranch Lake Dam, Etowah River Watershed Structure #25, and Etowah River Watershed Structure #26. Sixteen dams within the county are classified as Category II dams: Blackburn State Park Lake Dam, Burgess Lake Dam, Butler Lake Dam (aka Kale Lake Dam and Majors Lake Dam), Camp Glisson Water Supply Dam, Camp Glisson Lower Lake Dam, Dollar Lake Dam, Etowah River Watershed Structure #32, Garwood Lake Dam, Gay Lake Dam, Hidden Lake Dam, Lake Arthur Dam, Moose Dam, Poole Lake Dam (aka Moore and Tjepkema Lake Dam), Ricketts Lake Dam, Welchel Lake Dam Number 1, and Welchel Lake Dam Number 2. The Safe Dam Program requires all Category II dams to be inventoried at least every five years. The Program also offers assistance to local governments in understanding, implementing and maintaining compliance with the National Flood Insurance Program (NFIP). All other dams in Lumpkin County are either exempt or unclassified. See Appendix B for a map of dam locations in Lumpkin County.

**C. Assets Exposed to Hazard** – Areas most vulnerable to the physical damages associated with dam failure within Lumpkin County are the low-lying and downstream areas associated with Roskin Lake Dam, Yahoola Creek Reservoir Dam, Whitner's Lake Dam, R-Ranch Lake Dam,

Etowah River Watershed Structure #25, Etowah River Watershed Structure #26, and Woody Lake Dam. Although physical damages associated with dam failure would be limited to certain areas, the damage to the local economy and problems associated with delivery of water and other utilities could be felt county-wide.

**D. Estimate of Potential Losses** - Loss estimation due to dam failure is an approximate effort, at best. Direct loss to infrastructure, critical facilities and businesses in terms of repair and replacement can be roughly estimated. Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 3.2 shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Both Lumpkin County and the City of Dahlonega participate in the National Flood Insurance Program (NFIP). According to NFIP guidelines, the county has also executed a Flood Damage Prevention Ordinance. The purpose of this ordinance is to minimize the loss of human life and health as well as to minimize public and private property losses due to flood conditions. The ordinance requires that potential flood damage be evaluated at the time of initial construction of structures, facilities and utilities, and that certain uses be restricted or prohibited based on this county evaluation. The ordinance also requires that potential homebuyers be notified that property is located in a flood area. In addition, all construction must adhere to the Georgia State Minimum Standard Codes (Uniform Codes Act) and the International Building Code (2000 edition).

**F. Multi-Jurisdictional Concerns** - All of Lumpkin County, including the City of Dahlonega, is vulnerable to the negative impact of dam failure.

**G. Hazard Summary** - A dam failure has never been recorded in Lumpkin County. However, with at least six Category I dams located in the county, risks associated with dam failure cannot be ignored. The Lumpkin County HMPUC has identified some specific mitigation actions for dam failure in Chapter 5, Section II.

### III. Biological and Chemical Threats



**A. Hazard Identification** – Biological agents are organisms or toxins that can kill or incapacitate people, livestock, and crops. The three basic groups of biological agents that would likely be used as weapons are bacteria, viruses, and toxins. Most biological agents are difficult to grow and maintain. Many break down quickly when exposed to sunlight and other environmental factors, while others, such as anthrax spores, are very long lived. Biological agents can be dispersed by spraying them into the air, by infecting animals that carry the disease to humans and by contaminating food and water. Delivery methods include:

- Aerosols- Biological agents are dispersed into the air, forming a fine mist that may drift for miles. Inhaling the agent may cause disease in people or animals.
- Animals- Some diseases are spread by insects and animals, such as fleas, mice, flies, mosquitoes, and livestock.
- Food and Water Contamination- Some pathogenic organisms and toxins may persist in food and water supplies. Most microbes can be killed, and toxins deactivated, by cooking food and boiling water. Most microbes are killed by boiling water for one minute, but some require longer.
- Person-to-Person- The spread of a few infectious agents is also possible. Humans have been the source of infection for small pox, plague, and the Lassa viruses.

Chemical agents are poisonous vapors, aerosols, liquids, and solids that have toxic effects on people, animals, or plants. They can be released by bombs or sprayed from aircraft, boats, and vehicles. They can be used as a liquid to create a hazard to people and the environment. Some chemical agents may be odorless and tasteless. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (2 to 48 hours). While potentially lethal, chemical agents are difficult to deliver in lethal concentrations. Outdoors, the agents often dissipate rapidly. Chemical agents are also difficult to produce.

A chemical attack could come without warning. Signs of a chemical release include people having difficulty breathing; experiencing eye irritation; losing coordination; becoming nauseated; or having a burning sensation in the nose, throat, and lungs. Also, the presence of many dead insects or birds may indicate a chemical agent release.

**B. Hazard Profile** - The Lumpkin County HMPUC reviewed historical data from the county records in their research involving biological and chemical threats within Lumpkin County. There are no records of either threat occurring within Lumpkin County or the City of Dahlonega. Although the threat of either incidence occurring in the area is seemingly small, the presence of North Georgia College & State University and Camp Frank D. Merrell (both institutions have military affiliations) in the area does slightly increase the vulnerability of Lumpkin County and the City of Dahlonega.

**C. Assets Exposed to Hazard** - In evaluating assets that are susceptible to biological and chemical events, the HMPU committee determined that the entire population of Lumpkin County and the City of Dahlonega, as well as the populations of adjacent counties, are susceptible to biological and chemical events.

**D. Estimate of Potential Losses** - It is difficult to determine the potential damage caused by biological and chemical events. No damage to facilities is anticipated as a result of a biological or chemical event but the damage to individuals could be tremendous. Short term damages would result from the immediate loss of life and critically injured if a large portion of the population were immediately affected. This would put a strain on emergency services due to the shortage of available equipment and supplies, as well as the possible shortage of emergency personnel available. Long term affects could be even more damaging, lasting months or years.

Estimates for potential losses could not be accurately developed at this time due to limitations in data. Neither the existing GMIS database nor the Lumpkin County Tax Database have a complete, up to date listing of valuations for all critical facilities listed within this plan. Contributing to these deficiencies is the addition of new and renovated structures to the list, identification of replacement values as opposed to listed land valuation, and tax records for some government properties do not contain values. Table 3.2 shall be used as an interim means for gauging estimated losses due to hazards in Lumpkin County and the City of Dahlonega by providing a general scope of impact and probable damage to each facility in accordance with the severity rating established for each hazard.

**E. Land Use & Development Trends** - Lumpkin County currently has no land use or development trends related to biological and chemical events.

**F. Multi-Jurisdictional Concerns** - All of Lumpkin County, including the City of Dahlonega, and the north Georgia region, is vulnerable to the effects of biological and chemical events.

**G. Hazard Summary** - According to available records, neither a biological or chemical event has occurred within Lumpkin County or the City of Dahlonega. Increased tourism in the north Georgia area and military affiliations of North Georgia College & State University and Camp Frank D. Merrell do mildly increase the probability of such an event taking place. The Lumpkin County HMPUC has identified some specific mitigation actions for both types of events in Chapter 5, Section III.

## Chapter 4 - Local Natural Hazard Mitigation Goals and Objectives Overall Community Mitigation Goals, Policies and Values Narrative

In 2004, the Lumpkin County Hazard Mitigation Planning Committee (HMPC) initially identified mitigation goals and objectives for the natural hazards that are most likely to impact the county. During this update process, the Hazard, Risk and Vulnerability subcommittee determined that the affect of landslides was significant enough to add the hazard to this chapter. As a result of the planning process, the HMPUC determined that six natural hazards pose a direct, measurable threat to Lumpkin County. Of these, the entire County is exposed to five of the six hazards. Winter storms, tornadoes, severe thunderstorms, drought, and wildfire are all serious potential threats to the entire community. Flooding on the other hand is usually isolated to select areas of the County that are within the flood plain or other flood-prone areas. During this update process, the Business, Land Use and the Hazard, Risk and Vulnerability subcommittees reviewed this chapter of the 2004 plan to evaluate to what extent these hazards had affected Lumpkin County since the last plan was created. Each of these potential hazards is addressed individually with relevant supporting data.

Table 4.1 provides a brief description of each section in this chapter and a summary of the changes that have been made.

<b>Chapter 4 Section</b>	<b>Updates to Section</b>
I. Winter Storms	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives and actions were created.</li> </ul>
II. Tornadoes	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives, and actions were created.</li> </ul>
III. Flooding	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives, and actions were created.</li> </ul>
IV. Severe Thunderstorms	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives, and actions were created.</li> </ul>
V. Wildfire	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives, and actions were created.</li> </ul>
VI. Drought	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives, and actions were created.</li> </ul>
VII. Landslides	<ul style="list-style-type: none"> <li>Goals and objectives were created for this hazard. The 2004 plan did not contain this hazard.</li> </ul>

*Table 4.1: Overview of updates to Chapter 4: Local Natural Hazard Mitigation Goals and Objectives*

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*Table 4.2: Completed and Proposed Mitigation Actions for Lumpkin County and the City of Dahlonega*

Action	Jurisdiction	Applicable Hazards	Status	Possible Costs	Responsible Department	Timeframe for Completion
Inventory & add to existing winter weather equipment	Lumpkin County/City of Dahlonega	Winter Storms	Continued from 2004; no progress due to budget constraints	TBD	City & County Public Works & Road Departments	Ongoing
Update inventory & determine need for generators at critical facilities	Lumpkin County/ City of Dahlonega	Winter Storms	Continued from 2004; County has purchased 2 units to date	TBD	City & County Public Works	Ongoing
Place power lines underground	Lumpkin County/ City of Dahlonega	Winter Storms	Continued from 2004; required for new development	TBD	County, City & NGSU Officials	Ongoing enforcement of regulations
Clearing rights-of- way around power lines	Lumpkin County/ City of Dahlonega	Winter Storms/ Wildfire/ Drought/ Landslides	Continued from 2004; annually done by utility companies	TBD	County, City & utility companies	Ongoing enforcement of regulations & encouragement of homeowners
Adopt & promote latest standards for preventing snow/ice damage on roofing	Lumpkin County/ City of Dahlonega	Winter Storms	Action from 2004, completed in 2009	Staff Time	City & County Planning & Permitting Officials	Enforcement Ongoing
Purchase & Installation of Outdoor Emergency Warning Sirens	Lumpkin County/ City of Dahlonega	Tornadoes & Severe Thunderstorms	In 2004 plan; no progress due to budget constraints; removed as mitigation action	NA	NA	NA
Reverse 911 System	Lumpkin County /City of Dahlonega	Tornadoes/ Severe Thunderstorms/ Landslides	New item in 2011 plan	TBD	Lumpkin County EMA	Implemented in early 2011
Distribution of Weather Radios	Lumpkin County/ City of Dahlonega	Tornadoes & Severe Thunderstorms	In 2004 plan; partial implementation due to budget constraints; remains action item	\$50/ per radio	Lumpkin County EMA	Finish Implementation 2012-2017
Distribution of Emergency Kits	Lumpkin County/ City of Dahlonega	Tornadoes & Severe Thunderstorms	New item in 2011 plan	TBD	Lumpkin County EMA	2012-2017
Adequate Access to Storm Shelters	Lumpkin County/ City of Dahlonega	Tornadoes & Severe Thunderstorms	In 2004 plan; no progress due to budget constraints; remains action item	TBD	Lumpkin County EMA	2012-2017
Retrofit Manufactured Housing Foundations	Lumpkin County/ City of Dahlonega	Tornadoes & Severe Thunderstorms	In 2004 plan; no progress due to budget constraints	TBD	County & City Building Departments	On Hold- Will Revisit on Annual Basis for Necessity
Upgrade Construction Standards	Lumpkin County/City of Dahlonega	Tornadoes & Severe Thunderstorms	In 2004 plan; no progress due to budget constraints; remains action item	TBD	County & City Building Departments	2012-2017

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Action	Jurisdiction	Applicable Hazards	Status	Possible Costs	Responsible Department	Timeframe for Completion
Provision of Public Safe Rooms & Shelters	Lumpkin County/ City of Dahlonega	Tornadoes	In 2004 plan; no progress due to budget constraints; remains action item	TBD	Lumpkin County EMA	2012-2017
Floodplain Management	Lumpkin County/City of Dahlonega	Flooding	In 2004 plan, partial progress made; remains action item	Staff Time	County & City Planning Departments	Incomplete Items: 2012-2014 Employment of Floodplain Manager: Ongoing
Update Building Design Standards	Lumpkin County/City of Dahlonega	Flooding	In 2004 plan, completed in 2005; Enforcement ongoing action item	Staff Time	City & County Building Departments	Enforcement- Ongoing
Development & Adoption of Fire Truck Purchase Requirement	Lumpkin County/City of Dahlonega	Flooding	New item in 2011 plan	Staff Time	City & County Building Departments	2012-2017
Identify & Protect Historic Structures	Lumpkin County/City of Dahlonega	Flooding	In 2004 plan, completed in 2005; Monitoring ongoing action item	Staff Time	County & City Planning Departments	Monitoring- Ongoing
Participate in the CRS	Lumpkin County/City of Dahlonega	Flooding	In 2004 plan; no progress due to budget constraints; remains action item	Staff Time	County & City Planning Departments	2012-2017
Update Floodplain Mapping	Lumpkin County/City of Dahlonega	Flooding	In 2004 plan, completed 2007; Participation ongoing action item	Staff Time	County & City Planning Departments	Participation- Ongoing
Improve Road Culverts and Ditches	Lumpkin County/City of Dahlonega	Flooding	In 2004 plan, progress made; remains ongoing action item	Staff Time	City & County Public Works	Ongoing
Acquisition of Greenspace	Lumpkin County/City of Dahlonega	Flooding	New item in 2011 plan	Staff Time & Cost of Consultant	County & City Planning Departments	2012-2017
Alternative Site for 911 Center	Lumpkin County/City of Dahlonega	Severe Thunderstorms	New item in 2011 plan	Varies based on location	Lumpkin County EMA	2012-2017
Obtain Repeater Monitoring System	Lumpkin County/City of Dahlonega	Severe Thunderstorms	New item in 2011 plan	Varies based on location & equipment costs	Lumpkin County EMA	2012-2017
Disaster Proof EOC	Lumpkin County/City of Dahlonega	Severe Thunderstorms	New item in 2011 plan	Varies based on location	Lumpkin County EMA	2012-2017
Defensible Spaces & Slopes Programs	Lumpkin County/City of Dahlonega	Wildfire/ Drought/ Landslides	In 2004 plan, progress made; remains ongoing action item	Staff Time & Possible Equipment Purchases	City & County Fire Departments	Ongoing

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Action	Jurisdiction	Applicable Hazards	Status	Possible Costs	Responsible Department	Timeframe for Completion
Water Use Ordinances	Lumpkin County/City of Dahlonega	Drought/Landslides	In 2004 plan; Completed	NA	NA	NA
Creation of Looped Water System	Lumpkin County/City of Dahlonega	Drought/Landslides	New item in 2011 plan	Unknown, Contingent on Location and Materials	City & County Planning Departments with Water Authorities	2017
Steep Slopes Regulations	Lumpkin County/City of Dahlonega	Landslides	New item in 2011 plan	Staff Time	City & County Planning Departments	2012-2017

**I. Winter Storms**

**A. Community Mitigation Goals-** Winter storms have the potential to cause injury, loss of life and serious damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. These storms represent one of the greatest natural hazard threats to Lumpkin County. Most of the damage within Lumpkin County during winter storms is caused by high winds and the formation of ice on roads and bridges, tree limbs, and power lines. These storms are usually predictable and can often be forecasted in advance. However, some storms do come by surprise. Either way, advanced planning can help prevent much of the damage winter storms cause. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives from the 2004 Hazard Mitigation Plan in regards to winter storms. There are two main mitigation goals for winter storms within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Analysis of Range of Mitigation Options-** The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within the county. With regard to winter storms, these vulnerable populations include senior citizens and children. The HMPUC has focused on non-structural mitigation measures in addressing winter storms. Mitigation strategies include both structural and non-structural mitigation measures. The structural mitigation recommendations presented emphasize both new construction as well as modifications to older structures. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated codes and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations -** The HMPUC recommends completion of the following actions:

- 1) Road Maintenance: Unlike other portions of the United States, Lumpkin County does not possess all of the equipment and supplies that are necessary to combat treacherous winter storm conditions. Fortunately a better prepared Georgia Department of Transportation (GDOT) is responsible for the maintenance of many of the major highways within the County including US Routes 19 and 129, and State Routes 9, 11, 19, 52, 60, and 400. However, many secondary roads are left to the county to maintain.

These efforts have been improved by adding to the county and city road maintenance capabilities. These efforts could be improved by adding to existing city and county road maintenance capabilities. Inventories of existing equipment and supplies would first be conducted for the city and county, as well as a report of items needed to improve road and debris clearing capabilities. The cost of these upgrades will be based on past purchase prices with adjustments made for inflation. Specific recommendations for such measures should originate from Lumpkin County's and the City of Dahlonega's Public Works and Road Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, any changes to existing regulations could be implemented within 12 months. Funding for such an effort would be sought from FEMA, GEMA, and other viable sources.

This action is a continuation from the 2004 Hazard Mitigation Plan. No additional equipment for road maintenance has been purchased by the city or county due to limited funding. The Georgia Department of Transportation will be relocating the maintenance shop currently located in Lumpkin County to White County. The relocation of this service will result in a slower response time to maintenance needs in Lumpkin County and the City of Dahlonega. Neither Lumpkin County nor the City of Dahlonega has the staff or equipment to maintain state roads in the area. Both of these factors will increase the affect winter storms have on Lumpkin County and the City of Dahlonega, making this action a higher priority from this point forward.

2) Generators: Power loss is a common result of winter storms within Lumpkin County and the City of Dahlonega. Generators should be considered for many critical facilities, including emergency response facilities and designated shelters. This can result in a continuation of services that would otherwise not be possible. An accurate accounting of existing generators should first be conducted, followed by recommendations for adding generators to other critical facilities. Specific recommendations for such measures should originate from Lumpkin County's and City of Dahlonega's Public Works Departments, and Lumpkin County EMA, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, the purchase and installation of any given generator could be accomplished within 6 months. Purchasing and maintaining generators for all critical facilities will be an ongoing objective. The cost of purchasing generators will be based on past purchase prices with adjustments made for inflation. Maintenance costs will vary. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. This objective is a continuation from the 2004 Hazard Mitigation Plan.

This action has been partially met since 2004. A new generator has been purchased for the existing courthouse annex and a new generator has been purchased for the North Georgia College & State University Emergency Operations Center. The new Lumpkin County Justice Center is currently under construction and one or more generators should be purchased for the building. The City of Dahlonega has not purchased any new generators at this time.

3) Power Lines: Burying or otherwise protecting power lines can prevent electricity disruption by protecting lines from ice, wind or snow damage. Construction standards might be altered to require the use of underground power lines rather than overhead lines on private property. Utility companies would save money due to a reduction in the number of repairs to overhead power lines. The subdivision regulations for Lumpkin County require all new developments to place all utilities underground. North Georgia College & State University also places all utilities underground as new construction takes place on campus. Currently it is not economically feasible to consider replacing existing overhead power lines,. The utility companies serving Lumpkin County and the City of Dahlonega (Georgia Power, Habersham EMC, Jackson EMC, Amicalola EMC, and Sawnee EMC) assist in the protection of existing lines by regularly clearing their respective rights-of-way. Homeowners should also be encouraged to clear trees that are within range of power lines on their property. Specific recommendations for such measures should come from the Lumpkin County's and City of Dahlonega's Planning and Public Works Departments with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, proposed changes to construction standards would take approximately 24 months. Costs would vary depending on location. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Promoting underground utilities and maintaining existing utility right-of-ways within Lumpkin County and the City of Dahlonega will be an ongoing objective. This action is a continuation from the 2004 Hazard Mitigation Plan.

4) Snow and Ice Loads: Roof structural failure due to snow and ice buildup can cause serious property damage and even injury or death. Such a failure often begins with rafter deflection or rafter spread. Deflection results when horizontal snow and ice loads cause wood fibers to bend. Eventually, deflection causes rafters to rupture in the center third of the span or at other weak points on the top or bottom edge of the rafter. Rafter spread results from the failure of mechanical ties, such as nails, to hold ceiling joists, top plates, and studs together or, occasionally, failure in the ceiling joist itself. Rafter deflection and spread represent initial stages of structural failure. These problems should be corrected or stabilized with the assistance of a knowledgeable contractor, engineer, or architect.

Lumpkin County's Land Development Regulations, revised in 2009, require certain types of subdivisions to have a roof pitch of no less than 5 vertical to 12 horizontal (5:12), with an overhang of no less than 1 foot (excluding gutters). These same regulations encourage commercial buildings less than 10,000 square feet to have a pitched roof between 3:12 and 12:12. If this pitch is not possible, then at least 50% of the roof must be pitched. Local governments shall consider new or revised construction standards to deal with the issues of snow load design, roof slopes, and building maintenance for all structures. Besides changes in structural design, home and public building maintenance should also be encouraged in order to prevent roof and wall damage from "ice dams," resulting from ice and sleet storms. Specific recommendations for such measures should come from Lumpkin County's and the City of Dahlonega's Planning Departments with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, a community outreach program could be developed and implemented in approximately 24 months. The cost of this program would be staff time for the

enforcement of the codes and promotion of the outreach program. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Enforcement and promotion would be an ongoing action. This action is a continuation from the 2004 Hazard Mitigation Plan.

**D. Multi-Jurisdictional Considerations** – Winter storms affect all of Lumpkin County. As a result, any mitigation steps taken related to winter storms should be undertaken on a county-wide basis and include the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of winter storms in order to reduce the likelihood of injury, death, and property loss. These steps may include local newspaper articles detailing specific hazard mitigation techniques, distribution of informational materials, and county-wide workshops. They may also include adding strategies for driving in frozen precipitation to driver education classes. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## **II. Tornadoes**

**A. Community Mitigation Goals** – A tornado has the potential to cause injury, loss of life, and incalculable damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. Tornadoes are, by far, the most deadly, costly natural hazard Lumpkin County experiences. Although tornadoes are very unpredictable events, advanced planning can help limit the damages they cause. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives from the 2004 Hazard Mitigation Plan in regards to mitigation of the deadly effects of tornadoes. There are two main mitigation goals for tornadoes within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Analysis of Range of Mitigation Options** – The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within the county. These vulnerable populations include senior citizens, children, dense populations and citizens who live in manufactured or unsafe homes. Mitigation strategies include both structural and non-structural mitigation measures. The structural mitigation recommendations presented emphasize both new construction as well as modifications to older structures. Specific strategies could result in alterations to current policies if approved. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated codes and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations** - The HMPUC recommends completion of the following actions:

1) Warning Sirens: The installation of outdoor emergency warning sirens throughout Lumpkin County was an action item in the 2004 plan. Although tornadoes provide little or no advance warning, Lumpkin County believed that local activation of the sirens upon issuance of a tornado watch or warning by the National Weather Service could alert some individuals, who might have otherwise been caught unaware, to seek shelter. After the HMPUC reviewed and analyzed this action it was determined that the installation of outdoor emergency sirens should be removed from this plan update. The installation of outdoor emergency warning sirens would be cost prohibitive due to the terrain and location of several residential properties throughout Lumpkin County.

The Hazard Mitigation Review subcommittee recommends that an automated telephone system (reverse 911) be implemented in place of the outdoor emergency warning sirens. The reverse 911 system would be more effective in providing warnings to the residents of Lumpkin County and the City of Dahlonega because anyone could receive the warning if they had telephone service. Residents would not have to worry about being within hearing distance of warning sirens. This effort would most likely be coordinated by Lumpkin County EMA. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. The estimated cost and implementation schedule of this project varies. The HMPUC hopes this objective can be completed within 5 years.

2) Weather Radios: The provision of weather radios to elderly and low-income citizens was an action item in the 2004 plan. To date, weather radios have been placed in government buildings, schools, child day care centers, hospitals, nursing homes and personal care homes. Lumpkin County has been unable to provide weather radios to the remainder of the elderly and low-income citizens at this time due to budget constraints. The Hazard Mitigation Review subcommittee would also like to include the distribution of disaster emergency kits to these populations. The disaster emergency kits would include the weather radios, flashlights, extra batteries, first aid supplies and other non-perishable provisions that would be useful in any emergency situation. Lumpkin County EMA would coordinate the effort to secure additional funding and distribution of weather radios. Funding for this project would be sought from various public and private grant sources, including GEMA and FEMA. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. It is not possible at this point to determine an exact project cost. However, based on a 2006-2008 population estimate for Lumpkin County from the U.S. Census Bureau of 20,912, a below poverty rate of 13.2%, and an age 62 and above population of 27.8%, a rough calculation of elderly and low-income residents who may need a weather radio comes to just over 8,500 people. Based on an approximate cost of \$50 per radio, partial implementation of this project is estimated at \$428,700. If approved and adequate funding can be obtained (incrementally), project duration is estimated at five years.

3) Elderly Population: Ensure elderly populations have access to adequate storm shelter. If adequate storm shelter is not available at a nursing home, assisted living facility, or other similar facility, work to create safe room(s) within existing structures or construct separate storm shelter(s) if necessary. Funding for such an effort would be uncertain and probably would have to be obtained incrementally. Attempts should be made to obtain appropriate funding from the respective nursing homes/assisted living facilities, the American Red Cross and various other private and governmental grants. Lumpkin County EMA would most likely coordinate this effort. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. It is not possible at this point to determine an estimated project cost because there has been no determination made as to how many safe rooms and shelters would need to be constructed. If approved and adequate funding obtained incrementally, project duration is estimated at eight years.

This action has not been implemented due to lack of funding. After the HMPUC reviewed and analyzed this objective it was determined that the elderly population has access to adequate storm shelter should remain. Lumpkin County and the City of Dahlonega should jointly pursue funding for this measure.

4) Manufactured Homes: Identify all owners of inadequately installed manufactured homes within Lumpkin County and offer a financial incentive to retrofit them with an appropriate level of anchoring and support. Set specific guidelines for the improvements, and have the new work inspected once complete. This may be only one of the few methods to accomplish this goal since the homeowners are under no obligation to make improvements. To date there have been no studies completed to determine approximately how many inadequately installed manufactured homes exist within Lumpkin County. It is not possible at this time to determine an estimated project cost. These costs would most likely be divided between the homeowner and the local government. However, the financial incentive would have to be determined by the appropriate local government officials. Public and private grants should be pursued. Specific recommendations for such measures should be solicited from the Lumpkin County and the City of Dahlonega Planning Commissions with final approval coming from the Lumpkin County Commissioner and the Dahlonega City Council. If approved, substantial project completion is estimated at ten years.

This action has not been implemented due to lack of funding and lack of staff resources. After the HMPUC reviewed and analyzed this objective it was determined that this objective may not be feasible due to financial and social restraints. The City of Dahlonega has standards for anchoring and support within the city's zoning ordinance. These standards apply to new and relocated older manufactured homes. Lumpkin County does not currently have the same standards in place. If this action is later determined to be feasible, Lumpkin County and the City of Dahlonega should jointly pursue funding and implementation policies for this measure. A more reasonable action may be for Lumpkin County to consider implementing the same anchoring and support standards as the City of Dahlonega.

5) Construction Standards and Techniques: To strengthen future public and private structures against severe wind damage, Lumpkin County and the City of Dahlonega can require or encourage wind engineering measures and construction techniques. These measures may include structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, reinforced pedestrian and garage doors, window shutters, waterproof adhesive sealing strips, or interlocking roof shingles. Also, architectural design can make roofs less susceptible to uplift. A safe room(s) requirement can also be considered for all new construction of commercial, industrial, public, or private structures or sites that will be frequented by large numbers of people. The costs associated with these measures are difficult to determine, but would include increased planning and inspection costs for local government, and increased construction costs for developers. The initial planning costs alone are estimated at approximately \$25,000. Specific recommendations for such measures should be solicited from the Lumpkin County and the City of Dahlonega's Planning Commissions with final approval coming from the Lumpkin County Commissioner and the Dahlonega City Council. If approved, substantial project completion is estimated at ten years.

This action has not been implemented due to lack of funding. After the HMPUC reviewed and analyzed this item it was determined that the provision of enhanced construction standards and techniques should be an ongoing mitigation action.

6) Public Safe Rooms and Shelters: Usually people think of tornado safety as it relates to their homes. However, tornadoes can strike while people are in public places as well. Existing structures or sites frequently occupied by large numbers of people, such as schools, factories, large stores/shopping malls, recreational facilities, fairgrounds, etc. should be evaluated to determine whether safe rooms or separate storm shelters are needed. Future construction of such structures or sites would be covered under the changes made with the updated construction standards and techniques discussed earlier in this plan. The costs associated with these measures are difficult to determine but would include increased planning and inspection costs for local government. Money for these projects should be solicited from respective landlords in conjunction with public and private grants. Financial incentives of some type for landlords that agree to share in a certain amount of construction costs should be considered. Specific recommendations for such measures should come from the Lumpkin County and the Dahlonega Planning Commissions. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Board of Commissioners and the Dahlonega City Council. If approved and adequate funding obtained, these improvements are estimated to take approximately 60 months.

This action has not been implemented due to lack of funding. After the HMPUC reviewed and analyzed this item it was determined that the provision of public safe rooms and shelters should be an ongoing mitigation action.

**D. Multi-Jurisdictional Considerations** -Installation of an automated telephone system (reverse 911) should encompass all areas of the county, including the City of Dahlonega. An effort

should be made by both the county and city to cooperate to the fullest extent possible in obtaining and operating a reverse 911 network in order to reduce costs.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of tornadoes in order to reduce the likelihood of injury, death, and property loss. These steps may include local newspaper articles detailing specific hazard mitigation techniques, distribution of informational materials, and county-wide workshops. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

### **III.Flooding**

**A. Community Mitigation Goals** – Flooding has the potential to cause injury, loss of life, and serious damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. These events represent one of the greatest natural hazard threats to Lumpkin County. Advanced planning can help prevent much of the damage that flooding can cause. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives of the 2004 Hazard Mitigation Plan in regards to flooding. There are two main mitigation goals for flooding within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Analysis of Range of Mitigation Options** – The HMPUC has recommended certain measures that can be implemented to protect the County as a whole, and more targeted steps to protect specific vulnerable populations within the County. With regard to flooding, these vulnerable populations include senior citizens and children. The HMPUC has focused on both structural and non-structural mitigation measures in addressing flooding. The structural mitigation recommendations presented deal mainly with existing and future dams. Lumpkin Co. has three dams classified as Category I (high risk). Specific strategies could result in alterations to current policies if approved. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated codes and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations** – The HMPUC recommends completion of the following actions:

- 1) Floodplain Management: Determining and enforcing acceptable land uses through planning and regulation may not prevent inevitable flooding in flood-prone areas, but planning and regulation can alleviate the risk of damage by limiting exposure in such hazard areas. Ordinances and resolutions related to flooding shall be reviewed periodically and expanded to include new flood zones as necessary. Development within the flood plain should be either partially or totally restricted. One way of accomplishing this may be to allow for a “transfer of development rights”. In return for keeping floodplain areas in open space, a community may agree to allow a developer to increase densities on another parcel that is not at risk. This allows a developer to recoup potential

losses from non-use of a floodplain site with gains from development of a non-floodplain site. Another method of reducing development within the flood plain is the use of “conservation easements”. Conservation easements may be used to protect environmentally significant portions of parcels from development, including land located in a flood plain. These easements do not restrict all use of the land. Rather, they direct development to areas of the parcels that are not environmentally significant or flood-prone. Ensuring homes are elevated above the base flood elevation should be a priority. Manufactured homes should also be properly anchored, or more preferably, kept out of the floodplain altogether. These, and other, factors related to floodplain management shall be considered during comprehensive planning. Specific recommendations for such measures should originate from the county and city Planning Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, any changes to existing regulations could be implemented within 12 months. The costs associated with these administrative actions would consist primarily of County and City labor costs.

Since 2004 Lumpkin County has created and filled the position of floodplain manager. The floodplain manager made the recommendation to the Hazard Mitigation Review subcommittee that transfer of development rights and conservation easements continue to be action items in this plan update. The responsible party, timeframe and associated costs are the same as those in 2004.

2) Building Design Standards: An action item in the 2004 Hazard Mitigation Plan was to adopt building design standards to reduce structure damage during flood events. Lumpkin County adopted building standards in 2005 to serve these purposes. The building standards require structures to be built one foot above flood plain level or be flood proof. The Hazard Mitigation Review subcommittee recommends that the new action be for Lumpkin County to adopt standards requiring developers of structures five stories or taller purchase a serviceable late model ladder truck to ensure proper protection of the proposed structure. Specific recommendations for such measures should originate from the county and city Planning Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. The costs incurred by the county and city would only be those involved in staff time used to enforce the regulations. This action should be ongoing.

3) National Historic Register: An action in the 2004 Hazard Mitigation Plan was to ensure all structures related to Lumpkin County’s listings on the National Historic Register are protected from flooding. This action was completed in 2005 during the Lumpkin County Comprehensive Plan Update. The Historic Resources Map 2005, located in Appendix B, show the general location of all the historic resources in Lumpkin County and their relation to water bodies. These resources are closely monitored for threatening flood activity. Monitoring these resources will be an ongoing mitigation action for both Lumpkin County and the City of Dahlonega. The costs associated are staff time.

4) Community Rating System: Administered by FEMA, the Community Rating System (CRS) is a companion program to the NFIP. It rewards a community for taking actions over and above minimum NFIP requirements with the goal of further reducing flood damages in the community. The more actions a community takes, the lower the premiums for flood insurance within that community. Specific recommendations for such measures should originate from the County and City Planning Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, the CRS program could be implemented within six months with the costs consisting primarily of county and city labor costs. This action has not been achieved due to budgetary constraints. The Hazard Mitigation Review subcommittee recommends that this action remain in this plan update and be pursued over the next five years.

5) Updated Floodplain Mapping: By remapping flood-prone areas within the county, communities can obtain more accurate information with regard to flooding than would be available with existing FEMA maps. Since most other flood mitigation measures are based solely upon flood plain data, this could greatly enhance the accuracy of other mitigation efforts. This action was met in 2007 when the floodplain maps were updated for Lumpkin County and the City of Dahlonega. This updated mapping was done using digital modeling. An ongoing action item shall be for Lumpkin County and the City of Dahlonega to keep up to date with current mapping technology and make an effort to participate in any further updated mapping projects that are initiated by FEMA, the State of Georgia or the Georgia Mountains Regional Commission. Specific recommendations for such measures should originate from the County and City Planning Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council.

6) Roads: Roads are not only essential to everyday life but also to emergency operations during flooding or other hazards. Therefore keeping roads open is a top priority. There are various construction and placement factors to consider when building new roads. To maintain dry access, roads should be elevated above the base flood elevation. At the same time, if a road creates a barrier it can cause water to pond. Where ponding is problematic, drainage and flow may be addressed by making changes to culvert size and placement. In situations where floodwaters tend to wash roads out, construction, reconstruction, or repair can include attention to drainage and stabilization or armoring of vulnerable shoulders and embankments. An action item in the 2004 Hazard Mitigation Plan was to make improvements to roadside ditches where necessary by dredging and enlarging driveway culverts. This action item is currently being achieved through improved road construction. Repairs and dredging shall remain as an ongoing objective to ensure road conditions remain optimal. Specific recommendations for such measures should originate from county and city Public Works and Road Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. A time frame and cost estimate for such improvements cannot be determined until an initial assessment of roads is made.

7) Acquisition of Greenspace: A new action item the HMPUC felt should be added was the acquisition of greenspace by the county and the city. In order to accomplish this in the most effective manner possible a joint greenspace plan shall be created to determine those areas most affected by flooding and the properties that would be most benefit by acquisition. Costs would be contingent on whether or not county and city staff completed the plan or if an outside consultant was used. Specific recommendations for this measure should originate from the County and City Planning Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council.

**D. Multi-Jurisdictional Considerations** – Flooding mitigation measures should be looked at from a county-wide perspective including the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of flooding in order to reduce the likelihood of injury, death, and property loss. These steps may include local newspaper articles detailing specific hazard mitigation techniques, distribution of informational materials, and county-wide workshops. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## **IV. Severe Thunderstorms**

**A. Community Mitigation Goals** – The mitigation goals associated with severe thunderstorms are largely the same as those associated with tornadoes. Tornadoes are usually more destructive and less frequent than thunderstorms, but both represent similar threats. Severe thunderstorms have the potential to cause injury, loss of life, and serious damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. They represent one of the greatest threats to Lumpkin County. Other than wildfire, severe thunderstorms are the most frequently occurring natural hazard in the county. Although the severity of thunderstorms is often unpredictable, advanced planning can help limit the damages they cause. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives from the 2004 Hazard Mitigation Plan in regards to the deadly effects of severe thunderstorms. There are two main mitigation goals for severe thunderstorms within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Analysis of Range of Mitigation Options** – The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within the county. These vulnerable populations include senior citizens, children, dense populations, and citizens who live in manufactured or unsafe homes. Mitigation strategies include both structural and non-structural mitigation measures. The structural mitigation recommendations presented emphasize both new construction as well as modifications to older structures. Specific strategies could result in alterations to current policies if approved. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated codes and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations** – The HMPUC recommends completion of the following actions, the same recommendations made with respect to tornadoes in Section 4-II-C:

1) Warning Sirens: The installation of outdoor emergency warning sirens throughout Lumpkin County was an action item in the 2004 plan. Although tornadoes provide little or no advance warning, Lumpkin County believed that local activation of the sirens upon issuance of a tornado watch or warning by the National Weather Service could alert some individuals, who might have otherwise been caught unaware, to seek shelter. After the HMPUC reviewed and analyzed this action it was determined that the installation of outdoor emergency sirens should be removed from this plan update. The installation of outdoor emergency warning sirens would be cost prohibitive due to the terrain and location of several residential properties throughout Lumpkin County.

The Hazard Mitigation Review subcommittee recommends that an automated telephone system (reverse 911) be implemented in place of the outdoor emergency warning sirens. The reverse 911 system would be more effective in providing warnings to the residents of Lumpkin County and the City of Dahlonega because anyone could receive the warning if they had telephone service. Residents would not have to worry about being within hearing distance of warning sirens. This effort would most likely be coordinated by Lumpkin County EMA. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. The estimated cost and implementation schedule of this project varies. The HMPUC hopes this objective can be completed within 5 years.

2) Weather Radios: The provision of weather radios to elderly and low-income citizens was an action item in the 2004 plan. To date, weather radios have been placed in government buildings, schools, child day care centers, hospitals, nursing homes and personal care homes. Lumpkin County has been unable to provide weather radios to the remainder of the elderly and low-income citizens at this time due to budget constraints. The Hazard Mitigation Review subcommittee would also like to include the distribution of disaster emergency kits to these populations. The disaster emergency kits would include the weather radios, flashlights, extra batteries, first aid supplies and other non-perishable provisions that would be useful in any emergency situation. Lumpkin County EMA would coordinate the effort to secure additional funding and distribution of weather radios. Funding for this project would be sought from various public and private grant sources, including GEMA and FEMA. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. It is not possible at this point to determine an exact project cost. However, based on a 2006-2008 population estimate for Lumpkin County from the U.S. Census Bureau of 20,912, a below poverty rate of 13.2%, and an age 62 and above population of 27.8%, a rough calculation of elderly and low-income residents who may need a weather radio comes to just over 8,500 people. Based on an approximate cost of \$50 per radio, partial implementation of this project is estimated at \$428,700. If

approved and adequate funding can be obtained (incrementally), project duration is estimated at five years.

3) Elderly Population: An action item in the 2004 Hazard Mitigation Plan was to ensure elderly populations have access to adequate storm shelter. If adequate storm shelter is not available at a nursing home, assisted living facility, or other similar facility, work to create safe room(s) within existing structures or construct separate storm shelter(s) if necessary. Funding for such an effort would be uncertain and probably would have to be obtained incrementally. Attempts should be made to obtain appropriate funding from the respective nursing homes/assisted living facilities, the American Red Cross and various other private and governmental grants. Lumpkin County EMA would most likely coordinate this effort. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. It is not possible at this point to determine an estimated project cost because there has been no determination made as to how many safe rooms and shelters would need to be constructed. If approved and adequate funding obtained incrementally, project duration is estimated at eight years. No accomplishments have been made toward this item since 2004 due to budgetary constraints. The Hazard Mitigation Review subcommittee recommends this item remain an action of the updated plan

4) Manufactured Homes: An action item in the 2004 Hazard Mitigation Plan was to identify all owners of inadequately installed manufactured homes within the county and offer a financial incentive to retrofit them with an appropriate level of anchoring and support. The Hazard Mitigation Review subcommittee recommends removing this action from the plan update due to the excessive costs of these actions to both the government and residents. Lumpkin County implemented new codes in 2007 for new manufactured home installations to be properly secured and anchored.

5) Construction Standards and Techniques: An action item of the 2004 Hazard Mitigation Plan was to strengthen future public and private structures against severe wind damage, and for the county and city to require or encourage wind engineering measures and construction techniques. These measures would include structural bracing, straps and clips, anchor bolts, reinforced pedestrian and garage doors, window shutters, waterproof adhesive sealing strips, or interlocking roof shingles. Also, architectural design can make roofs less susceptible to uplift. This action item was completed in 2007 with the establishment of county codes. These codes require additional roof support and bracing for structures that are built above 2,700 feet in elevation due to those being in a different wind zone. Codes have also been established for structures built below 2,700 feet in elevation.

6) Communications: The Hazard Mitigation Review subcommittee recommends the addition of several mitigation actions related to emergency communications in Lumpkin County and the City of Dahlonega. The first action is to obtain an alternate site for the 911 center. In the event of a disaster, the existing center could be damaged to the extent it is no longer safe for occupation or the equipment could be damaged to the extent it is no longer functioning. The cost of the project would vary depending on the location and any

improvements that would be necessary to ensure the location could be used as a 911 center. Lumpkin County EMA would most likely coordinate this effort. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. If approved and adequate funding obtained, project duration is estimated at five years.

Another mitigation item recommended by the Hazard Mitigation Review subcommittee is obtaining a repeater monitoring system, alternate repeater sites and alternate repeaters in the event the current sites and equipment are damaged in the event of a disaster. This equipment is necessary for adequate emergency response and alternatives would ensure improved response during a disaster event. The cost of these projects would vary depending on the locations and equipment purchased. Lumpkin County EMA would most likely coordinate this effort. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. If approved and adequate funding obtained, project duration is estimated at five years.

The final communications related mitigation action recommended by the Hazard Mitigation Review subcommittee is to have a disaster proof Emergency Operations Center. This could be achieved through renovation of the existing Emergency Operations Center or the construction of a new Emergency Operations Center. The Emergency Operations Center is vital to coordination of emergency response during a disaster event. If the Emergency Operations Center is built to withstand the majority of anticipated disaster events, the chances of an improved disaster response are increased. The cost of this project would depend upon which option was chosen, renovation of the existing Emergency Operations Center or construction of a new Emergency Operations Center. Lumpkin County EMA would coordinate this effort. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. If approved and adequate funding obtained, project duration is estimated at ten years.

**D. Multi-Jurisdictional Considerations** -Installation of an automated telephone system (reverse 911) should encompass all areas of the county, including the City of Dahlonega. An effort should be made by both the county and city to cooperate to the fullest extent possible in obtaining and operating a reverse 911 network in order to reduce costs.

**E. Public Information and Awareness** - As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of tornadoes in order to reduce the likelihood of injury, death, and property loss. These steps may include local newspaper articles detailing specific hazard mitigation techniques, distribution of informational materials, and county-wide workshops. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## V. Wildfire

**A. Community Mitigation Goals** - Wildfire is the most frequently occurring natural hazard within Lumpkin County. Wildfires have the potential to cause injury, loss of life, and serious damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. These events represent a potentially devastating threat to Lumpkin County and the City of Dahlonega.

Most damage caused by wildfire within Lumpkin County is limited to timber destruction and the resulting environmental problems, including erosion. However, the loss of structures and injury and death of citizens is always a very real possibility. These fires are totally unpredictable and cannot be forecasted in advance. However, advanced planning can help prevent a portion of wildfires. More importantly advanced planning can go a long way in preventing much of the devastation wildfire causes. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives from the 2004 Hazard Mitigation Plan in regards to the damaging effects of wildfire. There is one main mitigation goals for wildfire within Lumpkin County. It is to minimize the loss of life and property, including forests within the county.

**B. Identification & Analysis of Range of Mitigation Options** - The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within the county. With regard to wildfire, these vulnerable populations include senior citizens and children. The HMPUC has focused on non-structural mitigation measures in addressing wildfire. Specific strategies could result in alterations to current policies if approved. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated goals and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations** - The HMPUC recommends completion of the following actions:

1) Defensible Space and Slopes: An action item in the 2004 Hazard Mitigation Plan was for Lumpkin County to continue working in conjunction with the Georgia Forestry Commission and the U.S. Forest Service to find solutions to problems concerning urban interface issues. In order to accomplish this item the Lumpkin County Fire Department, in conjunction with the Georgia Forestry Commission, is instituting the Firewise Communities program. The National Firewise Communities program is a multi-agency effort designed to reach beyond the fire service by involving homeowners, community leaders, planners, developers and others in the effort to protect people, property and natural resources from the risk of wildfire before a fire starts. The Firewise Communities approach emphasizes community responsibility for planning in the design of a safe community as well as effective emergency response, and individual responsibility for safer home construction and design, landscaping and maintenance. The Hazard Mitigation and Review subcommittee recommends that a new, ongoing action item for this plan update is to seek funding sources for training and equipment to implement the Firewise Community program and provide enhanced emergency response. Specific

recommendations for such measures should come from the Lumpkin County Fire Department with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, planning efforts and adoption of any changes is estimated to take approximately 24 months.

2) Power Line Maintenance: Local power companies can help prevent or alleviate wildfires by proper maintenance and separation of power lines, as well as efficient response to fallen power lines. This action item has been accomplished. The Blue Ridge Mountain Electricity Membership Cooperation clears utility right-of-ways annually. The Blue Ridge Mountain Electricity Membership Cooperation also responds to all fallen power lines and all reported fires close to or involving power lines. The new, ongoing action item shall be to ensure the Blue Ridge Mountain Electricity Membership Cooperation continues annual right-of-way maintenance and prompt response to downed power lines and any associated fires.

**D. Multi-Jurisdictional Considerations** – Wildfire can affect all areas of Lumpkin County. As a result, any mitigation steps taken related to wildfire should be undertaken on a county-wide basis and include the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of wildfire in order to reduce the likelihood of injury, death, and property loss. These steps may include information provided to building application applicants, local newspaper articles detailing specific fire safety techniques, and other distribution of informational materials. Forestry personnel have also expressed a willingness to assist with any fire safety public workshops the county might wish to sponsor. Information disseminated may include strategies for property maintenance to remove potential fuels, bi-annual chimney maintenance, smoke detectors/fire extinguishers, evacuation procedures, and maintenance of water supplies in accordance with National Fire Protection Association (NFPA) standards. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## **VI. Drought**

**A. Community Mitigation Goals** – Drought is a significant natural hazard to Lumpkin County, particularly to the agricultural industry and water supplies. Drought in and of itself poses no threat to structures. However, wildfire is a threat to structures and is often a direct result of drought. Therefore, drought has the potential to cause injury, loss of life, and serious damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock.

Most damage within Lumpkin County during drought is due to crop damage and insufficient water supplies. Drought is largely unpredictable with regard to beginning, ending, duration and severity. Advanced planning cannot eliminate these negative consequences, but it can help mitigate them. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives from the 2004 Hazard Mitigation Plan in regards to mitigating the damaging effects of drought. There are two main mitigation goals for drought

within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Range of Mitigation Options** – The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within the county. With regard to drought, these vulnerable populations include senior citizens and children. The HMPUC has focused on non-structural mitigation measures in addressing drought. Specific strategies could result in alterations to current policies if approved. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated codes and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations** – The HMPUC recommends completion of the following actions:

- 1) All Mitigation Recommendations listed in Section 4-V-C Wildfire: Since drought is often a precursor to wildfire, all wildfire mitigation actions must be considered as well.
- 2) Water Use Ordinances: Communities can adopt ordinances to prioritize and limit outside water use. This is done to extend the water supply for citizens and to provide water in emergency situations, such as fire fighting. Special accommodations, including possibly a permitting system, could be made for farmers pulling water out of bodies of water for crop irrigation. One of the action items in the 2004 Hazard Mitigation Plan was for such measures to be recommended by the county's three water-bottling companies. Since 2004, three water authorities that serve Lumpkin County have adopted the State Water Plan, thus completing this action item. The Hazard Mitigation Review subcommittee recommends that a new action be for Lumpkin County to encourage the three water authorities to connect all the water lines for the creation of a looped system. A looped system would allow sharing of water resources between authority service areas in times of drought and other emergencies. A looped system could also allow for the sharing of maintenance costs and resources. Specific recommendations for such measures should come from the county and city Planning Commissions, and the water authorities, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. The time and cost of completing a closed system is unknown at this time. This item should remain ongoing until completion.

**D. Multi-Jurisdictional Considerations** – Drought can affect all areas of Lumpkin County. As a result, any mitigation steps taken related to drought should be undertaken on a county-wide basis and include the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of drought in order to reduce the likelihood of injury, death, and property loss. These steps may include local newspaper articles detailing specific hazard mitigation techniques, distribution of informational materials, and county-wide workshops. Information disseminated may include strategies for water conservation, installing low-flow water saving fixtures, obtaining crop insurance, and other

wildfire-related strategies (see Section 4-V-E). The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## VII. Landslides

**A. Community Mitigation Goals** - Landslides have the potential to be a significant natural hazard to Lumpkin County, particularly to residential development and infrastructure. Landslides have the potential to cause injury, loss of life, and serious damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has determined that landslide activity has enough damage potential to include in this plan update. There are two main mitigation goals for landslides within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Range of Mitigation Options** - The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within the county. With regard to landslides, these vulnerable populations include senior citizens and children. The HMPUC has focused on structural and non-structural mitigation measures in addressing landslides. Specific strategies could result in alterations to current policies if approved.

**C. Mitigation Recommendations** - The HMPUC recommends completion of the following actions:

1) Steep Slope Regulations: Communities can adopt regulations to limit development in areas with slopes over a certain grade and to encourage slope stabilization practices when development disturbs natural steep slopes. This is done to decrease slope instability, therefore reducing the likelihood of slope failure. Specific recommendations for such measures should come from the county and city Planning Commissions with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. The time and cost of this action item would be staff time and possibly hiring of a consultant.

2) Reverse 911: An automated telephone system (reverse 911) would be effective in providing warnings to the residents of Lumpkin County and the City of Dahlonega in the event of a landslide. Warning would enable residents to either seek alternative shelter if the area they live in is affected or allow residents to avoid areas affected by landslides such as roadways. This effort would most likely be coordinated by Lumpkin County EMA. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. The estimated cost and implementation schedule of this project varies. The HMPUC hopes this objective can be completed within 5 years.

3) All Mitigation Recommendations listed in Section 4-V-C Wildfire & Section 4-VI-C Drought: Since drought and wildfire can contribute to slope instability, all wildfire and drought mitigation actions must be considered as well.

**D. Multi-Jurisdictional Considerations** – Landslides can affect all areas of Lumpkin County. As a result, any mitigation steps taken related to landslides should be undertaken on a county-wide basis and include the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of landslides in order to reduce the likelihood of injury, death, and property loss. These steps may include local newspaper articles detailing specific hazard mitigation techniques, distribution of informational materials, and county-wide workshops. Information disseminated may include strategies for slope stabilization and avoiding development in areas with increased landslide potential. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## Chapter 5- Technological Hazard Mitigation Goals and Objectives

Table 5.1 provides a brief description of each section in this chapter and a summary of the changes that have been made.

Chapter 5 Section	Updates to Section
I. Hazardous Materials Release	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives and actions were created.</li> </ul>
II. Dam Failure	<ul style="list-style-type: none"> <li>Progress on past goals and objectives were reviewed and updated. New goals, objectives and actions were created.</li> </ul>
III. Biological and Chemical Threats	<ul style="list-style-type: none"> <li>This hazard was not represented in the last plan update. Goals, objectives and actions were created.</li> </ul>

*Table 5.1: Overview of updates to Chapter 5: Local Technological Mitigation Goals and Objectives*

*Table 5.2: Completed and Proposed Mitigation Actions for Lumpkin County and the City of Dahlonega*

Action	Jurisdiction	Applicable Hazards	Status	Possible Costs	Responsible Department	Timeframe for Completion
Compliance w/ Safety Procedures, Polices, & Plans	Lumpkin County/City of Dahlonega	Hazardous Materials Release	Continued from 2004; ongoing	Staff Time	Lumpkin County EMA/City & County Fire Departments	Ongoing
Utilize & Support the LEPC	Lumpkin County/City of Dahlonega	Hazardous Materials Release	Continued from 2004; ongoing	Staff Time	Lumpkin County EMA/City & County Fire Departments	Ongoing
Emergency Response Team Creation & Training	Lumpkin County/City of Dahlonega	Hazardous Materials Release/ Biological & Chemical Threats	In 2004 plan; no progress due to budget constraints; remains action item (New for Biological and Chemical Threats in 2011)	\$300,000	Lumpkin County EMA/City & County Fire Departments	2012-2017
Industrial Site Buffering	Lumpkin County/City of Dahlonega	Hazardous Materials Release	Continued from 2004; no progress due to budget constraints; remains action item	\$25,000 & Staff Time	Lumpkin County EMA/ City & County Planning Departments	Ongoing
Reverse 911 System	Lumpkin County/City of Dahlonega	Hazardous Materials Release/ Dam Failure/ Biological & Chemical Threats	New Item in 2011 Plan	TBD	Lumpkin County EMA	Implemented in early 2011
Sound Design & Planning	Lumpkin County/City of Dahlonega	Dam Failure	In 2004 plan; no progress due to budget constraints; remains action item	TBD	Lumpkin County EMA	2013-2017

Action	Jurisdiction	Applicable Hazards	Status	Possible Costs	Responsible Department	Timeframe for Completion
Comprehensive Inspection	Lumpkin County/City of Dahlonega	Dam Failure	In 2004 plan; no progress due to budget constraints; remains action item	TBD	Lumpkin County EMA	2013-2017
Public Education Campaign	Lumpkin County/ City of Dahlonega	Biological & Chemical Threats	New Item in 2011 Plan	TBD	Lumpkin County Health Department	2012-2017; Ongoing After Implementation

## I. Hazardous Materials

**A. Community Mitigation Goals** – Hazardous materials (hazmat) releases have the potential to cause injury, loss of life, and widespread damage and contamination to public and private property, utilities, crops, and livestock. Hazmat releases are the most frequently occurring technological hazard within Lumpkin County. Although such events cannot be predicted, advanced planning and safety measures can help limit their frequency and severity. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives from the 2004 Hazard Mitigation Plan that both local officials and citizens can use to mitigate the dangerous effects of hazmat releases. The single mitigation goal for this threat within Lumpkin County is to minimize the loss of life and property.

Historical data indicates that, for the most part, hazmat releases within the county have been relatively minor in nature. The most common hazmat releases include diesel, gasoline, oil, propane, and sewage. Hazmat releases are classified as either fixed releases, which occur when hazmat is released on the site of a facility or industry that works with hazmat, or transportation-related releases, which occur when hazmat is released during transport from one place to another. Fixed hazmat releases in Lumpkin County have outnumbered transportation-related hazmat releases by almost a three to one margin over the past half-century. However, this ratio has shrunk significantly to only two to one in the past decade. Today, it appears transportation-related hazmat releases pose a larger threat to Lumpkin County than fixed hazmat releases. This is due to the existence of nine heavily traveled U.S. and State Routes within the county that see the transport of hazmat on a daily basis.

**B. Identification & Analysis of Range of Mitigation Options** – The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within Lumpkin County and the City of Dahlonega. These vulnerable populations include senior citizens, children, and dense populations. Mitigation strategies include both structural and non-structural mitigation measures. The structural mitigation recommendations presented emphasize both new construction as well as modifications to older structures. Specific strategies could result in alterations to current policies if approved. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated regulations and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations** – The HMPUC recommends completion of the following mitigation actions:

1) Safety Procedures, Policies, and Plans: Many safety procedures, policies and plans are essential to protecting Lumpkin County from the threat of hazardous materials. The Emergency Planning and Community Right-to-Know Act (EPCRA), also known as SARA Title III, provides an infrastructure at the state and local levels to plan for chemical emergencies. Regulations require training in and compliance with all safety procedures and systems related to the manufacture, storage, transport, use, and disposal of hazardous materials. Facilities that store, use, or release certain chemicals may also be subject to reporting requirements. Reported information is publicly available so that interested parties may become informed about potentially dangerous chemicals in their community. Employers must also communicate the hazards of workplace chemicals and ensure that workers receive education and training. The U.S. Environmental Protection Agency (EPA) also places requirements on sites that manufacture, store, or handle hazardous materials. EPA regulations require development of Chemical Accident Prevention and Risk Management Plans. The EPA also regulates disposal of hazardous waste, as required by the Federal Resource Conservation and Recovery Act (RCRA) with the goal of: 1) protecting us from the hazards of waste disposal; 2) conserving energy and natural resources by recycling and recovery; 3) reducing or eliminating waste; and 4) cleaning up waste that may have spilled, leaked, or been disposed of improperly.

Another important safety program is the U.S. Department of Transportation's (USDOT) labeling and placarding system for identifying the types of hazardous materials that are transported along the nation's highways, railways, and waterways. This system enables local emergency officials to identify the nature and potential health threat of chemicals being transported. If an accident were to occur, local emergency officials would be able to determine the proper emergency response procedures for the situation. Local law enforcement and other emergency officials should be well versed in compliance with and enforcement of USDOT and state regulations regarding hazardous material and hazardous waste transportation. These are only some of the safety procedures, policies, and plans in place. An effort to ensure compliance with all applicable safety rules and regulations, including reporting requirements, relating to hazardous materials should be made by Lumpkin County and the City of Dahlonega. The costs associated with these measures may include increased planning and inspection costs for local government. Additional planning and inspections alone are estimated at approximately \$25,000 per year. Specific recommendations for any related planning or inspections should come from Lumpkin County EMA with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, planning efforts and adoption of any changes is estimated to take approximately 24 months. This action item is ongoing and the Hazard Mitigation Review subcommittee recommends that this continue to be an ongoing action item.

2) Local Emergency Planning Committee: To address the possibility of hazardous material incidents, communities are required under Federal law (SARA Title III), to maintain an active and viable Local Emergency Planning Committee (LEPC) to develop a Local Emergency Operations Plan (LEOP) for preparing for and responding to chemical emergencies, such as spills, leaks, explosions, or other hazardous materials releases. The LEPC is required to review, test, and update the plan each year. The community's LEOP must include the following: identification of local facilities and transportation routes where hazardous materials are present; procedures for immediate response in case of an accident, including a community-wide evacuation plan; a plan for notifying the public that an incident has occurred; names of response coordinators at local facilities; and a plan for conducting simulation exercises that test the plan. The LEPC and LEOP should continue to be utilized and should be supported fully by Lumpkin County and the City of Dahlonega. The only additional costs associated with this recommendation are staff time. This action item is ongoing and the Hazard Mitigation Review subcommittee recommends that this continue to be an ongoing action item.

3) Emergency Response Teams: A well-trained and properly equipped emergency response team is necessary to successfully respond to hazardous material release incidents. Presently, hazardous materials releases are contained and identified by either mutual aid requests or commercial hazmat cleanup companies. It is currently too cost-prohibitive to create and maintain an independent emergency response team with hazmat response capabilities for Lumpkin County. However, if funding were available from state and federal agencies to offset these tremendous costs, it may then become possible to create such a team. Due to geographical isolation, this would be a tremendous asset not only to Lumpkin County, but to all of the mountainous communities of North Georgia. In the absence of such funding, Lumpkin County and the City of Dahlonega should continue to train and equip current and future first responders for dealing with hazmat releases as resources permit. The costs associated with creating, training, and equipping an emergency response team capable of responding to hazmat release incidents would be enormous. The initial creation of such a team alone would cost upwards of \$300,000. The source of funding for such a project would come from both public and private grants and other state or federal funding. Specific recommendations for such measures should come from Lumpkin County EMA, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, planning efforts and adoption of any changes is estimated to take approximately 24 months. This action item is ongoing and the Hazard Mitigation Review subcommittee recommends that this continue to be an ongoing action item.

4) Industrial Site Buffering: Hazardous materials exposure can be prevented or reduced with separation and buffering between industrial areas and other land uses. Industrial areas should be located away from schools, nursing homes, hospitals, and other facilities with large or vulnerable populations. Radioactive soils and high-radon areas can pose risks that should not be ignored. Mitigation actions may include avoiding development, removing soils, and capping openings in basements. The costs associated with these measures would include increased planning and inspection costs for local government. The initial planning costs alone are estimated at approximately \$25,000. Specific

recommendations for such measures should come from the Lumpkin County EMA, Lumpkin County Planning Commission and the City of Dahlonega Planning Commission with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved, planning efforts and adoption of any changes is estimated to take approximately 24 months. This action item is ongoing and the Hazard Mitigation Review subcommittee recommends that this continue to be an action item.

5) Automated Telephone System (Reverse 911): The Hazard Mitigation Review subcommittee recommends that an automated telephone system (reverse 911) be implemented. The reverse 911 system would be effective in providing warnings to the residents of Lumpkin County and the City of Dahlonega, for both natural and technological disaster events, because anyone could receive the warning if they had telephone service. This effort would most likely be coordinated by Lumpkin County EMA. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. The estimated cost and implementation schedule of this project varies. The HMPUC hopes this objective can be completed within 5 years.

**D. Multi-Jurisdictional Considerations** – Hazardous materials release can affect all areas of Lumpkin County. As a result, any mitigation steps taken related to hazmat release should be undertaken on a county-wide basis and include the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of hazardous materials in order to reduce the likelihood of injury, death, and property loss. The public will also continue to be involved with the LEPC and with the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## **II. Dam Failure**

**A. Community Mitigation Goals** – Dam failure has the potential to cause injury, loss of life, and incalculable damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. Advanced planning and safety measures can help avoid these catastrophic events. The Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) has reviewed and analyzed the goals and objectives from the 2004 Hazard Mitigation Plan that both local officials and citizens can use to mitigate the deadly effects of dam failure. There are two main mitigation goals for dam failure within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Analysis of Range of Mitigation Options** – The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within Lumpkin County and the City of Dahlonega. These vulnerable populations include all residents that live within the potential flood

zone below a dam or similar structure. Mitigation strategies include both structural and non-structural mitigation measures. The structural mitigation recommendations presented emphasize both new construction as well as modifications to older structures. Specific strategies could result in alterations to current policies if approved. These measures have been reviewed and updated from those listed in the 2004 plan, reflecting updated regulations and actions by Lumpkin County and the City of Dahlonega.

**C. Mitigation Recommendations** – The HMPUC recommends completion of the following mitigation actions:

- 1) Sound Design and Planning: National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for one third of all U.S. dam failures. Foundation defects, including settlement and slope instability, account for another third of all failures. Thus the initial design and placement of a dam is the most important phase of dam construction. Any potential problems must be taken into consideration prior to actual construction. Planning for dam breaks may also be considered, and may include constructing emergency access roads, automating pump and flood gate operation, or other emergency measures. Consideration should also be given to restriction of development in a dam's hydraulic shadow, where flooding would occur if there were a severe dam failure. This program should comply with the guidelines of the Georgia Safe Dams Act of 1978. Specific recommendations for any design review procedures should originate from the Lumpkin County and the City of Dahlonega Public Works and Planning Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved and adequate funding obtained, the creation of such a review process would take approximately 12 months. This action item is ongoing and the Hazard Mitigation Review subcommittee recommends that this continue to be an ongoing action item.
  
- 2) Comprehensive Inspection: Piping and seepage, and other problems cause the remaining third of national dam failures. This includes internal erosion caused by seepage, seepage and erosion along hydraulic structures, leakage through animal burrows, and cracks in the dam. A comprehensive inspection, maintenance, and enforcement program may be established to search for these problems before they can cause irreversible damage to the structures and great danger to the community abroad. This process would include guidelines for timely repairs. The increased costs associated with these measures are difficult to estimate, but would include specialized equipment and human resource costs. Costs for inspection equipment and any necessary repairs may be obtained through private and public grants. Human resource costs for inspections would likely be the responsibility of the county and city. This program should comply with the guidelines of the Georgia Safe Dams Act of 1978. Specific recommendations for such measures should originate from Lumpkin County and the City of Dahlonega Public Works Departments, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved and adequate funding obtained, the creation of such a program would take approximately 12 months. This action item is ongoing and the Hazard Mitigation Review subcommittee recommends that this continue to be an ongoing action item.

- 3) Automated Telephone System (Reverse 911): The Hazard Mitigation Review subcommittee recommends that an automated telephone system (reverse 911) be implemented. The reverse 911 system would be effective in providing warnings to the residents of Lumpkin County and the City of Dahlonega, for both natural and technological disaster events, because anyone could receive the warning if they had telephone service. This effort would most likely be coordinated by Lumpkin County EMA. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. The estimated cost and implementation schedule of this project varies. The HMPUC hopes this objective can be completed within 5 years.

**D. Multi-Jurisdictional Considerations** – Dam failure has the potential to affect all areas of Lumpkin County due to both physical damage and loss of water supplies. As a result, any mitigation steps taken related to dam failure should be undertaken on a county-wide basis and include the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of dam failure in order to reduce the likelihood of injury, death, and property loss. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

### **III. Biological and Chemical Threats**

**A. Community Mitigation Goals** – Biological and chemical threats have the potential to cause injury, loss of life, and incalculable damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. Advanced planning and safety measures can help avoid these catastrophic events. This hazard was not identified in the 2004 Hazard Mitigation Plan so the Lumpkin County Hazard Mitigation Plan Update Committee (HMPUC) was unable to review and analyze any previous goals and objectives that both local officials and citizens can use to mitigate the deadly effects of biological and chemical threats. The HMPUC decided there are two main mitigation goals for biological and chemical threats within Lumpkin County. The first is to minimize the loss of life and property. The second is to prevent disruption of services to the public to the greatest extent possible.

**B. Identification & Analysis of Range of Mitigation Options** – The HMPUC has recommended certain measures that can be implemented to protect the county as a whole, and more targeted steps to protect specific vulnerable populations within Lumpkin County and the City of Dahlonega. These vulnerable populations include senior citizens, children, and dense populations. Mitigation strategies include both structural and non-structural mitigation measures. Specific strategies could result in alterations to current policies if approved.

**C. Mitigation Recommendations** – The HMPUC recommends completion of the following mitigation actions:

- 1) Public Education Campaign: This campaign would provide specific information on different biological and chemical threats and the proper reaction to such events. Costs would include training, staff time, possibly hiring new staff, and materials. Specific recommendations for such measures should originate from Lumpkin County EMA and the Lumpkin County Health Department, with final approval coming from the Lumpkin County Commissioner and Dahlonega City Council. If approved and adequate funding obtained, the creation of such a program would take approximately 12 months.
- 2) Training and Supplies for Fire and Police Personnel: This effort would most likely be coordinated by Lumpkin County EMA. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. The estimated cost and implementation schedule of this project varies. The HMPUC hopes this objective can be completed within 5 years.
- 3) Automated Telephone System (Reverse 911): The Hazard Mitigation Review subcommittee recommends that an automated telephone system (reverse 911) be implemented. The reverse 911 system would be effective in providing warnings to the residents of Lumpkin County and the City of Dahlonega, for both natural and technological disaster events, because anyone could receive the warning if they had telephone service. This effort would most likely be coordinated by Lumpkin County EMA. Funding for such an effort would be sought from FEMA, GEMA, and possibly other sources. Final approval of this project or any potential use of local government funds would come from the Lumpkin County Commissioner and Dahlonega City Council. The estimated cost and implementation schedule of this project varies. The HMPUC hopes this objective can be completed within 5 years.

**D. Multi-Jurisdictional Considerations** – Biological and chemical threats have the potential to affect all areas of Lumpkin County. As a result, any mitigation steps taken related to biological and chemical threats should be undertaken on a county-wide basis and include the City of Dahlonega.

**E. Public Information and Awareness** – As with all potential hazards identified within this plan, the HMPUC recommends steps be taken to increase public awareness of biological and chemical threats in order to reduce the likelihood of injury, death, and property loss. The public will also continue to be involved in the hazard mitigation planning process, including the implementation and periodic maintenance of this Hazard Mitigation Plan.

## Chapter 6- Executing the Plan

Table 6.1 provides a brief description of each section in this chapter and a summary of the changes that have been made.

Chapter 6 Section	Updates to Section
I. Implementation Action Plan	<ul style="list-style-type: none"> <li>• A synopsis of the process used to update the 2004 plan was added.</li> </ul>
II. Evaluation, Monitoring, Updating Note whether the original method and schedule worked	<ul style="list-style-type: none"> <li>• The evaluation, monitoring and updating section was not modified due to the success of this process in the past.</li> </ul>
III. Plan update and maintenance	<ul style="list-style-type: none"> <li>• Information was added to this section to reflect the process used for this plan update.</li> </ul>

*Table 6.1: Overview of updates to Chapter 6: Executing the plan.*

### I. Action Plan Implementation

The hazard mitigation plan update process was overseen by the Lumpkin County Emergency Management Agency. The Georgia Mountains Regional Commission acted as a consultant during the plan update process, compiling the information submitted by the subcommittees into a complete final document. The Lumpkin County Sole Commissioner has officially approved this Plan and has authorized the submission of this Plan to both GEMA and FEMA for their respective approvals. The Lumpkin County EMA Director shall assume responsibility for the upkeep and maintenance of the plan. It shall be the responsibility of the EMA Director to ensure that this plan continues to be utilized as a guide for initiating the identified mitigation measures within the community. The EMA Director, or his designee, shall be authorized to convene a committee to review and update this plan annually, throughout the useful life of the plan, until the plan is five years old. Through this plan update process, the EMA Director 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 help to identify any new mitigation projects that can be undertaken in the community.

Members of the Hazard Mitigation Plan Update Committee were divided into subcommittees to review and analyze the mitigation measures identified in the 2004 Hazard Mitigation Plan. The status of each of the previous mitigation goals, objectives and related action items were determined and additional goals and objectives were recommended for completion before the next plan update in five years. The subcommittees prioritized the potential new mitigation measures based on what they considered most beneficial to the community. Several criteria were established to assist HMPUC 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. Through this 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.

All proposed mitigation actions were evaluated to determine the degree to which Lumpkin County and the City of Dahlonega would benefit in relation to the project costs. Upon reaching full committee consensus, the prioritized list of mitigation measures was determined.

As with the 2004 Hazard Mitigation Plan, Lumpkin County Georgia will incorporate the *Lumpkin County Hazard Mitigation Plan 2011 Update* as an addendum to the Lumpkin County Comprehensive Plan. The *Hazard Mitigation Plan 2011 Update* will also be used for future Capital Improvement Plans as well as Zoning and Land Use Plans.

A final copy of the adopted *Lumpkin County Mitigation Plan 2011 Update* will be copied onto a computer compact disk and distributed to every department within Lumpkin County and the City of Dahlonega for access into all planning processes within Lumpkin County. It will be explained to all departments that the Lumpkin County EMA Director will be available for explanations if needed.

A printed copy of the adopted Lumpkin County Hazard Mitigation Plan 2011 Update will be made available to the Lumpkin County Commissioner for public access.

## **II. Evaluation**

As previously stated, the Lumpkin County EMA Director, or his designee, will be charged with ensuring that this plan is monitored and updated at least annually or more often if deemed necessary. The method of evaluation will consist of utilizing a checklist to determine what mitigation actions were undertaken, the completion date of these actions, the cost associated with each completed action, and whether actions were deemed to be successful. The Lumpkin County HMPUC will convene in order to accomplish the annual plan evaluation. Additionally, the EMA Director, or his designee, will maintain a schedule of regular meetings, either quarterly or semiannually to preserve continuity throughout the continuing process. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the Hazard Mitigation Plan. The EMA Director will ensure the results of the evaluation(s) are reported to the Lumpkin County Sole Commissioner and the Dahlonega City Council, as well as to any agencies or organizations having an interest in the hazard mitigation activities identified in the plan. The Hazard Mitigation Plan Update Committee feels that this method of evaluation and update has been successful since the 2004 plan was completed and that the same method should be employed with this updated plan.

As set forth by Georgia House Bill 489, the Emergency Management Agency is the overall implementing agency for projects such as hazard mitigation. Lumpkin County EMA will work in the best interests of the county as well as the City of Dahlonega. As with the 2004 plan, the City of Dahlonega and the unincorporated areas of the county were included in this plan update process. Participation from each jurisdiction was solicited and received by Lumpkin County

EMA. As a result, a truly multi-jurisdictional plan was created for Lumpkin County and the City of Dahlonega with ideas and viewpoints of all participants included.

### **III. Plan Update and Monitoring**

#### **A. Plan Update**

According to the requirements set forth in the Disaster Mitigation Act of 2000, Lumpkin County is required to update and revise the Hazard Mitigation Plan every five years. In 2009, five years after the 2004 Hazard Mitigation Plan was approved, the update process began. At the direction of the EMA Director, the Lumpkin County HMPUC will convene in another five years in order to accomplish an additional revision. The revision process shall follow the format of the revision process that produced the current plan. This process shall include a firm schedule and timeline, and identify any agencies or organizations participating in the plan revision. The update committee will review the mitigation goals, objectives and action items to determine their relevance to changing situations in the county, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The update committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified, given any new available data. Lumpkin County is dedicated to involving the public directly in review and updates of the Hazard Mitigation Plan. During the plan revision process, the update committee will conduct, at a minimum, two public hearings. One public hearing will be held during the process and one will be held after draft plan approval by GEMA. These public hearings will provide the public a forum for which they can express their concerns, opinions, or ideas about the plan. Additionally, if persons from the community express interest in participation in the planning process, they will be provided the opportunity to suggest possible mitigation measures for the community. Documentation will be maintained to indicate all efforts at continued public involvement. All relevant information will be forwarded to GEMA and FEMA as a product of the proposed plan revision.

The EMA Director will ensure the revised plan is presented to the Lumpkin County Sole Commissioner for formal adoption. In addition, all holders of the Hazard Mitigation Plan will be notified of affected changes. No later than the conclusion of the five-year period following initial approval of the current plan, the EMA Director shall submit a revised Hazard Mitigation Plan to the Georgia Emergency Management Agency and the Federal Emergency Management Agency for their review and coordination.

#### **B. Plan Monitoring**

As previously stated, the Lumpkin County EMA Director, or his designee, will be charged with ensuring this plan is maintained and updated at least annually, or more often, if deemed necessary. The method of monitoring shall consist of utilizing a checklist to determine what mitigation actions were undertaken, the completion date of these actions, the cost associated with each completed action, and if actions were deemed to be successful.

**B-1 Public Participation**

The Lumpkin County HMPUC shall convene in order to accomplish the annual plan evaluation. Additionally the EMA Director, or his designee, shall maintain a schedule of regular public meetings, either quarterly or semiannually, to preserve continuity throughout the plan maintenance process. These public meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships essential for the sustainability of the Hazard Mitigation Plan.

As set forth by Georgia House Bill 489, the Emergency Management Agency is the overall implementing agency for projects related to hazard mitigation. Lumpkin County EMA will work in the best interests of Lumpkin County and the City of Dahlonega. As with the 2004 plan, the City of Dahlonega and unincorporated Lumpkin County were included in this plan update process. Participation from the City of Dahlonega and all other parties was solicited and received by Lumpkin County EMA. As a result, a truly multi-jurisdictional plan was created for Lumpkin County and the City of Dahlonega with ideas and viewpoints of all participants included.

## **Chapter 7- Conclusion**

### **I. Summary**

During this Hazard Mitigation Plan update, Lumpkin County has gained a great deal of information and knowledge relating to the county's disaster history and future potential for disaster as a result of the hazard mitigation planning process. This includes a hazard history of recorded hazard events from the past five years, a detailed critical facilities database with valuable information on some of the county's and city's most important structures, as well as some valuable ideas from the community abroad concerning measures that should be considered for future hazard mitigation. Community involvement has been at the heart of this effort. Not only did the planning process include the creation of a Hazard Mitigation Plan Update Committee with representatives from all walks of life, but two public hearings as required were conducted at the Lumpkin County Courthouse to provide all Lumpkin County citizens with the opportunity to comment on, and offer suggestions concerning potential hazard mitigation measures within the community. The first public hearing was held on March 22, 2011 and the second was held after GEMA approval. Both Lumpkin County and the City of Dahlonega worked in concert to ensure all citizens were represented. Elected officials, local government employees, public safety officials, Red Cross representatives, U.S. Forest Service and GA Forestry representatives, clergy, businessmen, businesswomen, the media, and other volunteers and interested parties provided important varying viewpoints to create a workable plan. GEMA and GMRC provided valuable assistance as well. These efforts have all had the aim of better protecting our community from natural and technological threats. While it would be naïve to believe this plan provides complete protection to Lumpkin County and its residents, it is the hope of all parties involved in this plan update process that the recommended mitigation measures contained within the plan will provide some level of increased preparedness as well as spur further discussion and planning related to the important subject of hazard mitigation.

### **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.

#### **A. Publications/Documents:**

FEMA Pre-Disaster Mitigation *How-to Guides #1, 2, 3, 7*  
GEMA Supplements to FEMA Pre-Disaster Mitigation How-to Guides  
*Lumpkin County Local Emergency Operation Plan 2008*  
*2004 Lumpkin County Hazard Mitigation Plan*  
*Georgia Tornado Database 1808 – 2002* (Westbrook)  
Robert T. Stafford Disaster Relief and Emergency Assistance Act  
*North Georgia College and University Hazard Mitigation Plan 2007*

**B. Web Sites:**

FEMA ([www.fema.gov](http://www.fema.gov))

GEMA ([www.gema.state.ga.us](http://www.gema.state.ga.us))

Lumpkin County ([www.lumpkincounty.gov](http://www.lumpkincounty.gov))

City of Dahlonega ([www.cityofdahlonega.com](http://www.cityofdahlonega.com))

National Climatic Data Center ([www.ncdc.noaa.gov](http://www.ncdc.noaa.gov))

National Register of Historic Places (<http://roadsidegeorgia.com/nrhp/Lumpkin>)

**C. Other Sources:**

American Red Cross

American Society of Civil Engineers (ASCE)

Lumpkin County, Georgia

Lumpkin County Chamber of Commerce

Lumpkin County Development Authority

City of Dahlonega

Georgia Department of Natural Resources

Georgia Forestry Commission

Georgia Mountains Regional Commission (GMRC)

National Weather Service

U.S. Army Corps of Engineers

U.S. Geological Survey (USGS)

## **Appendices**

### **Appendix A- Critical Facilities Databases (See Attached Excel Spreadsheets)**

#### **I. Structures, Buildings and Infrastructure**

### **Appendix B- Growth and Development Trends/Community Information (See Attached PDF Documents)**

#### **I. Lumpkin County and the City of Dahlonega Joint Comprehensive Plan Introduction**

#### **II. Statistics and Tables from the Lumpkin County and City of Dahlonega Joint Comprehensive Plan**

#### **III. Location Map**

### **Appendix C- Accessory Documents and Maps (See Attached PDF Documents)**

#### **I. Development Regulations and Building Codes**

#### **II. NGCSU Hazard Mitigation Plan, 2007- Table of Contents**

#### **III. Lumpkin County Emergency Operations Plan, 2008- Table of Contents and Introduction**

#### **IV. GMIS Report**

#### **V. Maps**

### **Appendix D Copies of Required Planning Documentation (See Attached PDF Documents)**

#### **I. Public Hearing Notices**

#### **II. Meeting Agendas/Meeting Minutes**

#### **III. Sign-In Sheets**

#### **IV. Adoption Resolutions (Samples)**

– To be completed upon GEMA approval.