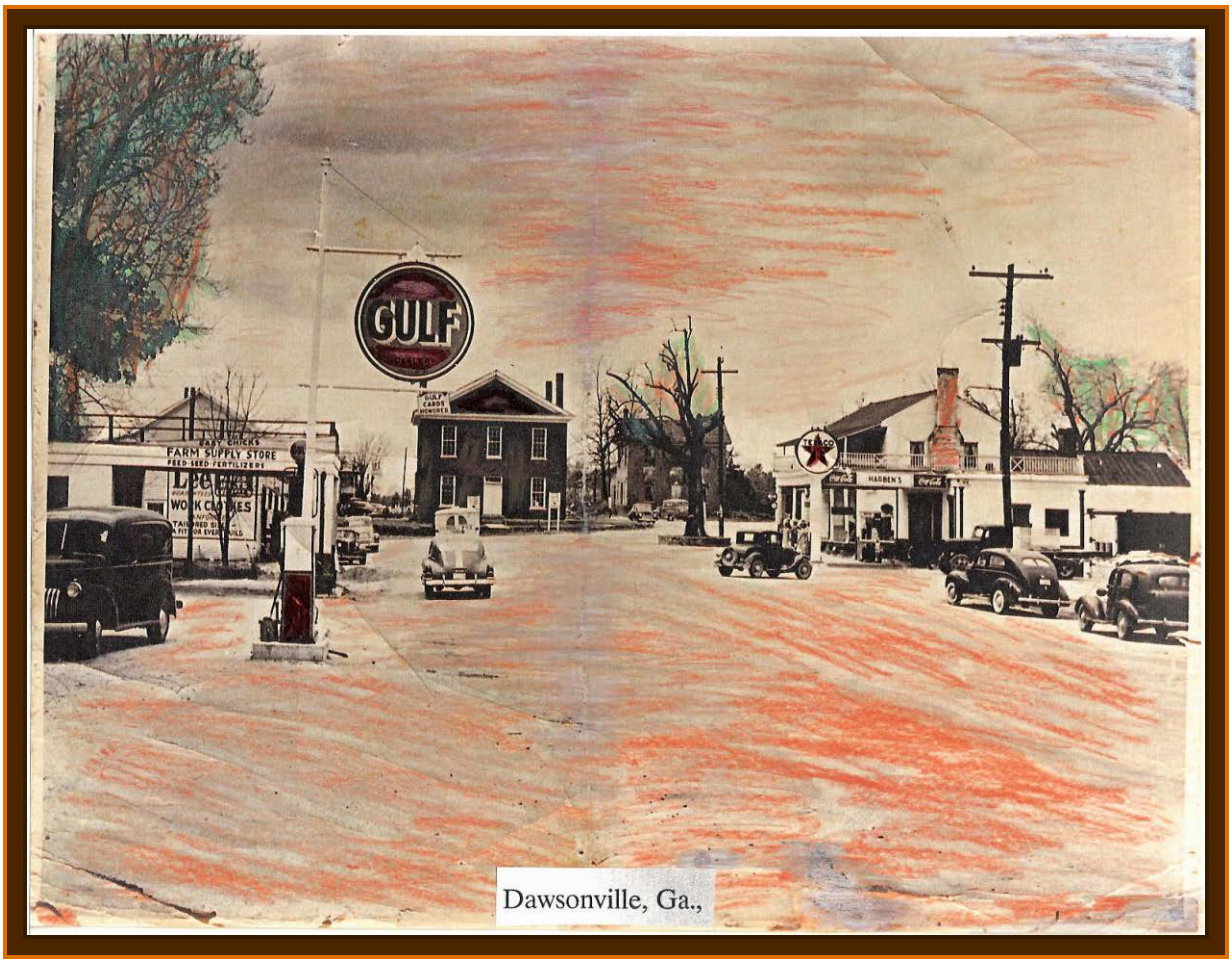
Dawson County, Georgia

Hazard Mitigation Plan (2012)



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INTRODUCTION 1

1.1 Purpose

The Disaster Mitigation Act of 2000 has helped to bring attention to the need for successful hazard mitigation planning throughout the United States. 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. According to this rule, state and local governments are required to develop, submit, and obtain FEMA approval of a hazard mitigation plan (HMP). Completion of an HMP that meets the new Federal requirements will increase access to funds for local governmentsand allow them to remain eligible for Stafford Act assistance.

The HMP becomes part of the foundation for emergency management planning, exercises, training, preparedness and mitigation within the County. Such a plan sets the stage for long-term disaster resistance through identification of actions that will, over time, reduce the exposure of people and property to identifiable hazards. This plan provides an overview of the hazards that threaten the County, and what safeguards have been implemented, or may need to considered for implementation in the future.

Hazards, for purposes of this plan, have been divided into two basic categories: natural and technological. Natural hazards include all hazards that are not caused either directly or indirectly by man and are frequently related to weather events, such as tornados and winter storms. Technological hazards include hazards that are directly or indirectly caused by man, including hazardous materials spills and weapons of mass destruction (WMD) events, although terrorism is not the particular focus of this Plan. This Plan also makes some recommendations that transcend this classification of natural and technological hazards. In other words, some of the recommendations contained within this Plan apply to many or all hazards. This is commonly referred to as an "all-hazards approach". Most hazards throughout the United States could happen anytime and anywhere. However, the main focus of this plan is on those hazards that are most likely to affect Dawson County and the City of Dawsonville in the future.

1.2 Organization of the Plan

The Hazard Mitigation Plan (HMP) consists of four main components: the narrative plan, the Critical Facilities Database, the Hazard History Database, and the Hazard Frequency Table. The narrative plan itself is the main component of the HMP. This part of the Plan includes an overview of the planning process, a summary of the County's hazard history, hazard frequency projections, and a detailed discussion of proposed mitigation measures. The interactive Critical Facilities Database (Appendix A) is an online tool developed in part by UGA for GEMA that contains detailed information on critical facilities within the County. Using the critical facilities information, including GPS coordinates and replacement values, along with different hazard maps from GEMA, this database becomes a valuable planning tool which can be used by

Counties to help estimate losses and assess vulnerabilities. This Critical Facilities Database will also help to integrate mitigation planning into their other planning processes. The Hazard History Database (Appendix B) is attached as a Microsoft Excel spreadsheet and includes relevant information on past hazards within the County. Finally, the Hazard Frequency Table (Appendix C) is derived from the hazard history and provides frequency-related statistics for each discussed hazard. This table is also attached as a Microsoft Excel spreadsheet. A risk assessment, described below, which is composed of elements from each of the four main HMP components, provides the factual basis for all mitigation activities proposed within this Plan

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. For the purposes of this Plan, critical facilities have been identified by the HMPC and important information gathered for each one. This information is located in the Critical Facilities Database (Appendix A).

Hazard Identification: During the planning process, a hazard history was created based on available records from the past fifty years. This hazard history includes the natural and technological hazards that are most likely to affect the County. Unfortunately, record keeping was not as accurate or detailed decades ago as it is now. Therefore, the most useful information relating to these hazard events is found within the last ten years. This fact is obvious upon review of the Hazard History Database (Appendix B), and the Hazard Frequency Table (Appendix C).

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

Vulnerability Assessment: This step is accomplished with the Critical Facilities Database by comparing GEMA hazard maps with the inventory of affected critical facilities and population exposed to each hazard.

Estimating Losses: Using the best available data, this step involved estimating structural and other financial losses resulting from a specific hazard. This is also accomplished using the Critical Facilities Database. 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.

Based on the HRV assessment, the Plan identifies some specific mitigation goals. These goals are only recommendations of the HMPC. Any specific recommendation must also be

individually approved by the appropriate government officials. A framework for Plan implementation and maintenance is also presented within this document.

Planning grant funds from the Federal Emergency Management Agency, administered by GEMA, funded the HMP. The HMP was developed by the HMPC, with technical assistance from the Georgia Mountains Regional Commission (GMRC).

1.3 Participants in planning process

Jurisdiction	Participation in 2005	Participation in 2010/2011	Review of 2005 Plan	Review of 2011Plan	Adoption of 2005 Plan	Adoption of 2011 Plan
Dawson County	Yes	Yes- Attended Subcommittee Meetings	Yes	Yes	Yes	Pending
City of Dawsonville	Yes	Yes- Attended Subcommittee Meetings	Yes	Yes	Yes	Pending

This Hazard Mitigation Plan ("the Plan") is designed to protect both the unincorporated areas of the County as well as the City of Dawsonville. Though the County facilitated this planning process, the City of Dawsonville provided critical input into the process. Without this mutual cooperation, the Plan would not exist in its present comprehensive form. (*Note: Please keep in mind that throughout this Plan, the term "county" refers to all of Dawson County, including the City of Dawsonville.)*

An advisory committee was appointed to assist in the update process, beginning with County and City staff with knowledge and insight into hazard mitigation efforts at each government. Staff from fire protections services, police and emergency management services, as well as planning and information services were nominated for involvement and guided the discussion of previous County and City efforts as well as potential mitigation measures going forward. In addition, several members from the private sector and general population were included in the process to provide further perspective and insight on opportunities and issues facing Dawson County.

The Hazard Mitigation Planning Committee (HMPC) met several times in the early part of 2011 to review the previous edition of the Dawson County Hazard Mitigation Plan, suggest edits and improvements and to discuss the information needed to fulfill the update process. Five different sub-committees were assigned to review specific elements of the plan and members contributed research and data development to pull each respective section together.

Upon completion of the full draft document the plan was made available for full public review and comment as well as placed before the County Commission and City Council for their review and consideration.

Throughout the process, staff from the Georgia Mountains Regional Commission assisted with meeting facilitation and development of the updated text and maps.

HMPC Members

Brooke Anderson
Charlie Auvermann
Gary Barr
Dick Bergen
Jimmy Castleberry
John Edwards
Stacey Gilleland
Corey Gutherie
Heather Halpern
David Headley
Kevin Mc Craney
David McKee
Kaye Molden
Doug Powell
Greg Rowan
Tim Satterfield
Richard Sims
Jane Stuckey
Lanier Swafford
Carolyn Sweatman
Bill Tanner
Kevin Tanner
Billy Thurmond
Linda Williams

Subcommittees

Critical Facilities and Infrastructure

David Headley
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Mitigation Review

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Kevin Tanner
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Richard Sims
John Edwards
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Billy Thurmond
Lanier Swafford
Carolyn Sweatman

1.4 HRV summary/Mitigation goals

Dawson County has experienced a number of hazard events throughout its history, most resulting in fairly localized damage. Severe thunderstorms 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. Tornados, winter storms, wildfire, flooding, and dam failure represent additional problems for Dawson County.

The HMPC used the results of the HRV assessment to identify mitigation goals and objectives as well as some recommended 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.

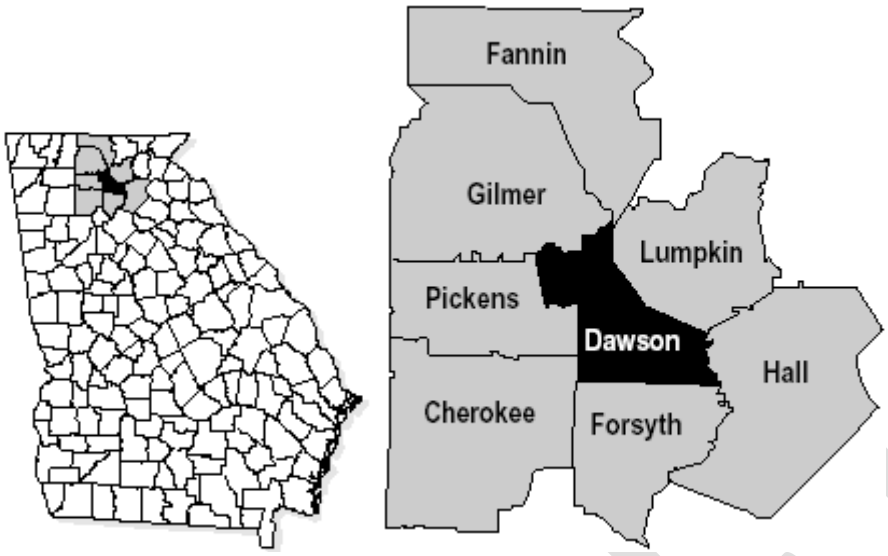
1.5 Multi-Jurisdictional Special Considerations

The City of Dawsonville was an active participant and equal partner in the planning process. As an active part of the HMPC, the City contributed to the identification of mitigation goals and objectives and potential mitigation measures contained within the HMP. Although this Plan will be officially adopted by Dawson County, the City of Dawsonville will be responsible for making its own decision regarding the same.

1.6 Adoption, Implementation, Monitoring, Evaluation

The Dawson County Board of Commissioners is the authority responsible for formally adopting this Plan. The City of Dawsonville will be provided all information necessary to formally adopt the HMP as well. Once the County approves this Plan, it 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, Dawson County and the City of Dawsonville will each be responsible for initiating any courses of action related to this Plan 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 Dawson County HMP remains an active and relevant document. The HMP maintenance process includes monitoring and evaluating the Plan annually, and producing a complete Plan revision every five years. Additionally, Dawson Co. will develop steps to ensure public participation throughout the plan maintenance process. This Plan may also be integrated into the Dawson County Comprehensive Plan at its next scheduled update. It should be noted that no recommendations found within this Plan are binding on the County or City. Such recommendations may be used by the County and City as one of many tools to better protect the people and property of their communities.

1.7 Brief County Overview



County Formed: December 3, 1857

County Seat: City of Dawsonville *(only municipality)*

Total Area: 211 square miles

History

- Dawson County was created from parts of Lumpkin, Gilmer, and Forsyth counties. Georgia's 118th county, and the county seat of Dawsonville, were named for Judge William C. Dawson, a compiler of the laws of Georgia and commander of a brigade in the Creek Indian War of 1836. Dawson also served in both houses of the state legislature and in Congress before the Civil War.

Culture

- Dawson County is home to 729-foot Amicalola Falls, the highest waterfall east of the Mississippi. Amicalola Falls State Park surrounds the falls, and the Amicalola Falls Lodge is located at the top of the falls. The approach trail to the start of the Appalachian Trail on Springer Mountain is also located in the park.

- The Dawson Forest Wildlife Management Area is maintained in Dawson County and provides more than 23,000 acres of hunting, hiking, bird watching, camping and fishing opportunities. The state purchased 2,031 acres along Wildcat Creek at the northwestern end of the wildlife area in 1993 as part of the Preservation 2000 program.

- Lake Sidney Lanier forms Dawson County's southeastern border, providing recreational and economic opportunities for local residents. The completion of Lake Lanier and development of Georgia Highway 400 has spurred growth and development in the county during the past 30 years.

- Dawson County hosts several annual events including the Moonshine Festival, Spring Fling, Veterans Memorial Day Service, and the Dawson County Chamber Gala. For three Saturdays in October, the Dawsonville town square comes alive with arts and crafts displays, clogging, and other entertainment during the Dawson County Fall Festival.

Demographics and Economy

Total Population

	1960	1970	1980	1990	2000	2010	Δ '60-'10
Dawson County	3,590	3,639	4,774	9,429	15,999	22,358	522.8%
City of Dawsonville	307	288	342	467	619	2,536	726.1%
Unincorporated	3,283	3,351	4,432	8,962	15,380	19,822	503.8%

Regional Comparison	2000	2010	Δ '00-'10
Cherokee County	141,903	217,186	53.1%
Dawson	15,999	22,358	39.7%
Fannin County	19,798	22,740	14.9%
Forsyth	98,407	179,003	81.9%
Gilmer County	23,456	29,145	24.3%
Hall	75,409	190,015	152.0%
Lumpkin	10,762	27,748	157.8%
Pickens County	22,983	31,375	36.5%

Source: US Bureau of the Census

Text reprinted from the Dawson County Comprehensive Plan, 2009

- Dawson County sits directly in the path of the northern expansion of suburban metropolitan Atlanta. As a result, dramatic growth rates have occurred over the last 15 years. From 1990 to 2005 population increased by 109 percent from 9,429 to an estimated 19,731 – an average annual growth rate of 7.3 percent. Dawson County's population grew by an estimated 23.3 percent from 2000 to 2005, the 67th-highest county growth rate in the nation and 14th -highest county growth rate in the state. Each county surrounding Dawson County ranked in the state's top 25 fastest growing counties.

- Much of Dawson County's growth has most recently occurred along the Dawson Forest Road corridor and along the State Route 400 corridor in the Southeast section of the county. A small amount of the county's growth has occurred within the city limits of

Dawsonville. Much of the growth has occurred along Dawson Forest Road near the Etowah Water and Sewer Authority's sewer trunk line. Growth taking place in other areas of the county will depend on the use of septic systems, which will require a larger minimum lot size.

- Assuming the infrastructure needs can be provided, population projections for Dawson County show that the population would continue to soar over the next 25 years to nearly 50,000, an increase of approximately 148 percent and an average annual growth rate of nearly six percent. The population increase projected for 2030 would create approximately 18,000 households, an increase of 197.9 percent and an average annual growth rate of almost seven percent. As shown, growth in number of households will outpace population growth as the average household size continues to shrink in Dawson County, as projected throughout the nation.

- Dawson County's abundant natural resources, rich history and culture, recreational opportunities and outlet shopping provide multiple options for visitors to the county. The Etowah River, Lake Lanier and many mountain streams provide ideal settings for a variety of outdoor activities. In addition, the North Georgia Premium Outlet mall draws thousands for shopping and has attracted many other businesses to State Route 400 between the Forsyth County line and area around State Route 53. Marketing campaigns are employed to encourage tourists to take advantage of these opportunities and draw more income to the county.

- Developing the State Route 400 corridor as planned with industrial and commercial uses will expand the commercial tax base and reduce the burden currently placed on residential property owners. The County has set a goal that commercial property should contribute 60 percent of the tax base. Developing as planned in this area will help the County reach that goal.

HAZARD ASSESSMENTS | 2

This chapter represents the summation of chapters 2-5 of the previous plan. To improve efficiency of the discussion the document has been reoriented based on each particular hazard. As such, the merging of chapters permits the reader to go directly from the risk and vulnerability assessment of each hazard to the respective identification of mitigation goals and objectives. Despite these moves, each and every component from the previous document remains intact and has been incorporated into this plan in accordance with GEMA and FEMA requirements.

The first part of each hazard assessment is the analysis of Risk and Vulnerability. The HMPC identified hazards that have affected Dawson County in the past and are likely to do so in the future. As a result of the planning process, the HMPC determined that seven natural hazards and two categories of man-made hazards pose a direct, measurable threat to Dawson County. Of the natural hazards severe thunderstorms, winter storms, tornados, drought, and earthquakes are all serious potential threats to the entire County. 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. In addition, wildfires pose a threat to the entire County, but some hazard models show the southeastern portions of the County as more vulnerable. Each of these potential hazards is addressed individually with relevant supporting data.

In addition to natural hazards, the HMPC identified technological hazards that have affected Dawson County in the past, and are likely to do so in the future. 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 due largely to the very limited historical data available, causing a greater level of uncertainty with regard to statistics and mitigation measures. However, enough information has been gathered to provide a basic look at technological hazards within Dawson County. Each of the technological hazards determined by the HPMC to pose a threat to Dawson county is addressed here.

The second element of each hazard assessment is the discussion of Mitigation Goals and Objectives. As each hazard is discussed for the possibility of occurrence and potential severity of threat, the HMPC evaluated past and potential mitigation measures to ensure that Dawson County and the City of Dawsonville are doing what they can to protect and serve area residents and properties. This element analyses those measures and presents the framework of what each stakeholder will do going forward to implement the plan and support the achievement of goals stated herein.

The format of each hazard assessment follows the linear presentation of elements included in the previous plan, which is in accordance with the elements required of federally approved hazard mitigation plans:

Risk and Vulnerability Analysis

- **A. Hazard Identification**
- **B. Hazard Profile**
- **C. Assets Exposed to Hazard**
- **D. Estimate of Potential Losses***
- **E. Land Use & Development Trends**
- **F. Multi-Jurisdictional Concerns**
- **G. Hazard Summary**

Mitigation Goals and Objectives

- **H. Mitigation Goals**
- **I. Range of Mitigation Options**
- **J. Mitigation Recommendations**
- **K. Multi-Jurisdictional Considerations**
- **L. Public Information and Awareness**

**= Information about estimation of asset values and potential losses is included within the appendix. Only discussion of hazard related specifics is included within the general text.*

Lastly, the end of the chapter includes a catch-all element designed to represent those issues and objectives germane to most, if not all, potential hazards that may threaten Dawson County.

It should be noted that a third possible man-made threat to Dawson Co. was researched considerably by the HMPC. This is the threat of radiological release or exposure from the former Georgia Nuclear Aircraft Laboratory located in the Dawson Forest area, once operated by Lockheed. This facility was known to have tested the effects of radiation on aircraft parts throughout the 1950s and 1960s in hopes of developing a nuclear-fueled aircraft. The facility was finally decommissioned in 1971 and soon management responsibilities for the area were assigned to the Georgia Dept. of Natural Resources. The Dawson Forest Task Force was established in June 1991 at the request of Governor Zell Miller due to concern over possible residual radiation levels at the Dawson Forest site. After extensive investigation, the conclusion reached in the Task Force's report was that "the Dawson Forest area does not present a radiological health and safety problem." Research conducted by the HMPC found no evidence to contradict the Task Force's conclusions. Many documents were obtained by the HMPC from various sources relating to this facility, including the Georgia Dept. of Natural Resources and the U.S. Nuclear Regulatory Commission. According to available documents, these government agencies consider this area safe. Unless additional information is obtained in the future that provides evidence to the contrary, the Report of the Dawson Forest Task Force, Dec. 1991, (available through Dawson County EMS) should serve as reasonable evidence of the safety of the Dawson Forest area.

2.1 Severe Thunderstorms (including Hail & Lightning)

A. Hazard Identification – A Severe Thunderstorm is defined as a thunderstorm producing wind at or above 58 mph and/or hail ¾ 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 tornados, 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 tornados very rapidly and without warning.

Note: For the purposes of this Plan, severe thunderstorms that result from tropical storms and hurricanes are also included in this section.

The most damaging phenomena associated with thunderstorms, excluding tornado activity, are thunderstorm winds. These 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 miles an hour, overturning mobile homes, damaging rooftops, and toppling trees and power lines. Such winds tend to affect areas of the 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. Severe thunderstorms can ultimately leave a population with injuries and loss of life. Thunderstorms produce two types of wind. Tornados are characterized by rotational winds. The other more predominant winds from a thunderstorm, downbursts, are small areas of rapidly descending air beneath a thunderstorm that strike 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 from 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 miles per hour, or the equivalent of an F2 tornado, 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 tornados.

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. 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 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, one of the most frightening aspects of thunderstorms is 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, hail, and lightning are serious threats to the residents of Dawson County. Over the course of a year, the County experiences dozens of thunderstorms, with about one in ten being severe. Severe thunderstorms occur more frequently than any other natural hazard event within Dawson County. Most of these storms include lightning and/or hail. There have been dozens of severe thunderstorm events within Dawson County over the past fifty years according to available documentation. It is very likely this is a low estimate due to poor record keeping in decades past. It is clear from information collected that more accurate record-keeping related to severe thunderstorms developed over the past two decades, with even more detailed information available for the past ten years.

Most of the available information relating to severe thunderstorms, hail, and lightning occurrences within Dawson County fails to describe damage estimates in great detail. However, with each thunderstorm event it is likely there are unreported costs related to infrastructure and utilities repair and public safety costs, at a minimum. Severe thunderstorms have occurred in all parts of the day and night within Dawson County. They have also taken place in every single month of the year with the exception of the month of December, according to available records.

The HMPC utilized data from the National Climatic Data Center, the National Weather Service, numerous weather-related news articles and internet sites, and the Dawson County Emergency Operations Plan in researching severe thunderstorms, hail, and lightning and their impact on the County. With most of the County's recorded severe thunderstorm events, only basic information was available. It is also likely that some severe thunderstorm events have gone unrecorded. Therefore, any conclusions reached based on available information on severe thunderstorms within Dawson County should be treated as the minimal possible threat.

At least 61 severe thunderstorm events within Dawson County can be found in meteorological records, including includes reported hail and lightning events. Based on the entire fifty-year period, it can be inferred that a severe thunderstorm is likely to occur approximately once every ten months in Dawson County, meaning there is a 122% chance of a severe thunderstorm event in any given year. However, when only the past ten-year period is taken into consideration the likelihood of such an event increases threefold to more than 350% chance per year. The HMPC believes looking at this past ten-year period, rather than the entire fifty-year period, provides the most accurate information.

Between 2004 and late 2012, Dawson County has experienced at least 7 tropical storm events, 3 hurricanes, 3 significant incidents relating to lightning, and 19 other recorded thunderstorms. Records also show some 1-4 incidents of hail per year, including one episode producing 2.75" on a single day in March of 2008. Wind related events also featured 4 days with speeds above 50 knots, and another that produced a fatality in 2005. Taken all together this information illustrates the extent of possible storm related hazards and potential damage, at most any time of the year and in any part of the county.

C. Assets Exposed to Hazard – As related to sever storm related events, all assets and critical facilities within Dawson County are considered equally susceptible to events. Since no particular part of the county is at greater risk than another for thunderstorms and related hazards, every asset is considered exposed.

D. Estimate of Potential Losses – For loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends – The one trend of note regarding land use and development is the overall growth encountered throughout the county, but particularly in the southeastern portion. The increasing number of residences and businesses coming into the area means a greater volume of structures and households at risk during events. Perhaps more critical related to severe storms, there is a strong increase in the volume of traffic along the GA 400 and SR 53 corridors. As major storms come into the area, emergency response personnel must be mindful of how to evolve management and hazard mitigation in these rapidly growing, and more densely occupied areas.

F. Multi-Jurisdictional Concerns – Any portion of Dawson County can be negatively impacted by severe thunderstorms, hail, and lightning. Therefore, any mitigation steps taken related to these weather events should be pursued on a county-wide basis and include the City of Dawsonville.

G. Mitigation Goals – The mitigation goals associated with severe thunderstorms, hail, and lighting are largely the same as those associated with tornados. Tornados 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. These weather events, including damaging hail and deadly lightning, represent one of the greatest threats to Dawson County. Severe thunderstorms are one of the most frequently occurring natural hazards

in the County. Although the severity of thunderstorms is often unpredictable, advanced planning can help limit the damages and injuries they cause. There are two main mitigation goals for severe thunderstorms within Dawson 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. The Dawson Co. Hazard Mitigation Planning Committee (HMPC) has identified several courses of action that both local officials and citizens can use to mitigate the deadly effects of severe thunderstorms.

H. Range of Mitigation Options – The HMPC 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 groups of citizens, and citizens who live in manufactured homes 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.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) Weather Radios (*Existing measure – Status: Complete*)
This measure calls on the County and stakeholders to provide weather radios to elderly and low-income citizens. Minor progress was made since the initial Plan was conceived, and there will be ongoing efforts to pursue funding that will provide for weather radios to distribute to the public. It is believed that most major operations in the county, such as senior residences and larger employment centers, do have a weather radio. However, the advent of increase telecommunications and wireless networking means most households, if not all, are using smart phones and the internet to gauge weather and communicate, rendering weather radios less popular and less effective. While this remains a possible action item for the future as need and opportunities arise, the HMPC recommends the priority for warning systems shift to another medium.

2) Access to Shelters for Vulnerable Populations: (*Existing measure – Status: Complete*)
This objective sought to ensure vulnerable populations, including children, the elderly, and the sick, have access to adequate storm shelter. If adequate storm shelter is not available at these respective facilities the City and County should assist in helping these groups identify the nearest appropriate shelter, work to create safe room(s) within existing structures or construct separate storm shelter(s) if necessary. Previous efforts have helped share information about designated shelters and how to find safe points during storms. The County has also taken lay-inventories of the residences and structures most likely to feature vulnerable population groups and help them devise evacuation and safety plans.

This effort will require ongoing monitoring and effort by both governments and new facilities are created and the information continues to evolve. The HMPC advises the

County and stakeholders to routinely review and update the data about these facilities and seek outside assistance as needed to sustain this measure.

3) Construction Standards and Techniques (*Existing measure – Status: Complete)*
To strengthen future public and private structures against severe wind damage, wind engineering measures and construction techniques are regularly updated and improved. 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. Specific recommendations for such measures should come from local planning officials with final approval coming from the appropriate County or City government officials. If approved, planning efforts and adoption of proposed changes is estimated to take approximately 24 months.

Dawson County and Dawsonville routinely review and update building codes and development regulations as needed and as advised by the State, and are currently considered optimal with regards to structural safety. Both governments will maintain these codes to their best degree and encourage developers to pursue best design practices that advance safety considerations above minimum standards.

Further, both communities will continue to enforce the standards for redevelopment and monitor aging structures for repair and maintenance. Particularly with regards to manufactured units and mobile homes, the County and City will strive to phase out sub-standard units and raise the overall caliber of structural safety throughout the community.

4) Warning Sirens (*Existing measure – Status: Ongoing)*
This measure sought to install outdoor emergency warning sirens throughout Dawson County with the goal of obtaining near 100 percent coverage. Local activation of the sirens upon issuance of a severe thunderstorm watch or warning by the National Weather Service could alert some individuals, who might have otherwise been caught unaware, to seek shelter. Also, emergency warning alarms could be installed inside structures housing large numbers of people, such as schools, factories, large stores/shopping malls, recreational facilities, etc.

Upon recently acquiring additional sirens, bringing the county total up to 8, it has been noted that future expansion of this system will be weighed on a cost effective basis. With more residents and businesses choosing internet and smart-phone based methods of communication, warning systems based on those media are considered more effective and more easily implemented. Further, the prevailing topography and rural nature of the county suggests sirens for the more remote areas would be increasingly less and less effective, especially given the costs. Future sirens may be explored and implemented in areas of high outdoor populations, especially with the aid of outside funding, however the HMPC recommends other warning systems take higher priority.

5) Lightning Detectors (New measure)
One proposal to aid in the public awareness of severe storm conditions would be to place lightning detectors at major public places such as Rock Creek Park or major shopping centers. This would allow people at these areas to better gauge their potential risk and their ability to find appropriate shelter. Costs for installing these at select locations has not been determined at this time, but the County and/or City could pursue funding assistance and strive to have them installed within 1-3 years.

J. Multi-Jurisdictional Considerations – All measures discussed herein are to be developed in coordination between the City and the County, and to be employed in patterns that offer the most protection/benefit for the area. Measures should be implemented so as to maximize the population impacted, or to target specific areas and populations as needed. Where possible, additional stakeholders and outside partners should be called upon for assistance.

K. Public Information and Awareness – As with all potential hazards identified within this Plan, the HMPC recommends steps be taken to increase public awareness of severe thunderstorms, including hail and lightning, 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 as updates to the Hazard Mitigation Plan are required. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.2 Winter Storms

A. Hazard Identification – The Dawson County HMPC researched historical data from the National Climatic Data Center, The National Weather Service, as well as information from past newspaper articles and internet sites relating to winter storms in Dawson Co. 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 relatively infrequently, they have the potential to wreak havoc on the community when they do strike. Winter storms within Dawson Co. 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.

Based on the past fifty-year period, a winter storm is likely to occur within Dawson County once every 2.5 years, meaning there is a 40% chance of such an event every year. Between 2000 and 2010, however, winter storms have occurred with greater frequency or severity, with 23 various events of at least one day with snow or ice accumulation. According to the National Climatic Data Center, there have been no fatalities in Dawson County directly attributed to these storms in that time frame, though there have been multiple auto accidents and other issues from these storms that could have lead to more injuries or deaths.

While it is unknown whether or not this constitutes a shifting trend in more inclement winter weather for Dawson County, or merely part of a large scale cycle that will recede within the next 10-20 years, the County and related stakeholders should consider the near term as likely to see a continuation of winter storm events. Even if brief in nature, the potential is clearly defined and the risk remains credible.

C. Assets Exposed to Hazard - As related to sever storm related events, all assets and critical facilities within Dawson County are considered equally susceptible to events. Since no particular part of the county is at greater risk than another for thunderstorms and related hazards, every asset is considered exposed.

D. Estimate of Potential Losses - For loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends – Dawson County and the City of Dawsonville have experienced unprecedented growth the past twenty years. Development trends include the construction of dozens of homes each year in the higher elevations of the County that are increasingly difficult to reach from a public safety standpoint. These higher elevations also are more likely to experience the most severe aspects of a winter storm. These residents are the most susceptible to the effects of winter storms.

F. Multi-Jurisdictional Concerns – Any portion of Dawson County can be negatively impacted by winter storms. Therefore, any mitigation steps taken related to winter storms should be pursued on a county-wide basis and include the City of Dawsonville.

G. 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 Dawson Co. Most damage within Dawson Co. during winter storms is caused by 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. There are two main mitigation goals for winter storms within Dawson 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. The Dawson Co. HMPC has identified several courses of action that both local officials and citizens can use to mitigate the damaging effects of winter storms.

H. Range of Mitigation Options – The HMPC 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 HMPC has focused on both structural and non-structural mitigation measures in addressing winter storms. Specific strategies could result in alterations to current policies if approved.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) Road Maintenance (Existing measure – Status: Ongoing Policy)
Unlike other portions of the United States, the County and City do not possess certain 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 GA 400, State Routes 9, 53, 136, and 183. However, many secondary roads are left to the County to maintain. These efforts could be improved by adding to existing road maintenance capabilities. The exact cost of these upgrades is impossible to determine until an exact inventory of existing equipment is completed.

The County has purchased two snow plows to assist with increased demands for road maintenance in winter events. The cost of additional trucks is approximately $160,000 each. The County Public Works Dept and the City of Dawsonville would be responsible for coordination of this effort, with final approval of the project or any potential use of matching local government funds coming from the appropriate County or City government officials.. Funding for this project would be sought from various public and private grant sources. If approved and funding obtained, all equipment purchases could be completed within 6 months.

2) Public Awareness (Existing measure – Status: Complete)
A pubic awareness campaign should be considered County-wide in order to educate the public on winter storm preparedness, and to inform them of shelter locations and other emergency/first-aid information. This campaign could include public service announcements, community forums, and flyers and mailings. Special efforts should be made to target special needs citizens and vulnerable populations. The estimated cost of this campaign is $5,000. The project would be coordinated by Dawson Co. EMA and the City of Dawsonville, with possible assistance from the Red Cross. If the project is approved and funding secured, this campaign could be organized within six months.

3) Snow and Ice Loads (Existing measure – Status: Complete)
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.

Local governments may consider new or revised construction standards to deal with the issues of snow load design, roof slopes, and building maintenance. This should include consideration of increasing the snow load design requirement from 20lb/sf, the state requirement, to 30lb/sf due to Dawson Co.'s higher elevation and more frequent winter storms than the average Georgia county. 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 local planning officials with final approval coming from the appropriate County or City government officials. Funding for this project would be sought from various public and private grant sources. If approved, a community outreach program could be developed and implemented in approximately 24 months.

4) Winter Storm Road Plan (New measure – Status: Complete)
This item has seen the County and City cooperate in developing a priority list for road clearing and treatment during storm events, winter and otherwise. It would involve a checklist of conditions to declare roads safe as well as procedural and contact lists for the respective public works personnel to address the highest priority roadways in sequential order. The listing would correspond to the nature of critical facilities and areas needing assistance during the various storm events.

J. Multi-Jurisdictional Considerations – Any portion of Dawson County can be negatively impacted by winter storms. Therefore, any mitigation steps taken related to winter storms should be pursued on a county-wide basis and include the City of Dawsonville.

K. Public Information and Awareness – As with all potential hazards identified within this Plan, the HMPC 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. 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. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those

measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.3 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 also contributing factors for floods in that water runoff is greater in areas with steep slopes and little or no vegetation.

B. Hazard Profile: The HMPC researched flood information for the past fifty years using information from the National Climatic Data Center, the Dawson County Emergency Operations Plan, newspaper articles, and internet sites. It was determined that flooding has caused moderate to severe damage on relatively few occasions, and all documented flood events occurred within the last 15 years. Relatively little information on damage estimates, in terms of dollars, was 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.

During this period, documentation of eight flood events was found. Based on the entire fifty-year period, it can be inferred that a moderate to severe flood event is likely to occur approximately once every six years in Dawson County. Another way of stating these findings is that every year in Dawson Co. there is a 16% chance of a moderate to severe flood event. However, when only the past ten-year period is taken into consideration, the likelihood of such an even in Dawson Co. increased dramatically to an 80% chance per year (or about once every 15 months). Further, between 2004 and 2010 there were 4 flash flood events that, though minor, still demonstrated capacity to impact traffic, damage culverts and put residents and travelers at risk. The HMPC believes flooding should therefore be addressed as a less common but very serious threat to the community.

C. Assets Exposed to Hazard – In evaluating assets that may potentially be impacted by the effects of flooding, the HMPC determined that, although all critical facilities, public and private property are potentially susceptible to flooding, structures located near the Etowah River and Flat Creek are the most susceptible. Flooding of the Etowah River has been successfully mitigated to a large degree thanks to past federal and state mitigation projects. One successful project during the 1970's involved the raising of a flood control dam, Etowah River Reach Sub Watershed Structure No. 12 – State I.D. No. 042-007-00625, to a height of approximately 57.6 feet in order to increase the control of Etowah River flood waters. Another important mitigation project was completed in the early 1990's that reduce Etowah River flooding at SR 53 and the present location of the Georgia Forestry Commission Dawsonville offices and near the Etowah Water & Sewer Authority water intake. This project involved the addition of numerous erosion control measures and materials including the altering of the Etowah River banks in that area. No Dawson Co. critical facilities are known to have flooded due to overflow of the Etowah River. However, since it is a major river the HMPC felt obligated to list it as a major potential threat. One body of water that does tend to flood is Flat Creek in the City of Dawsonville. This creek has flooded some nearby mobile homes from time to time. Fortunately this does not threaten any critical facilities at this time.

Dawson County has been very fortunate with regard to flooding, in large part due to the improvements made to the Etowah River. And although no distinct differences were found by the HMPC with regard to flooding characteristics in the County and the City, the City of Dawsonville's historic troublesome flood problem, Flat Creek, has been addressed through larger stormwater piping and improved drainage.

The flood zone map shows the location of Dawson County and City of Dawsonville critical facilities within the known flooding hazard areas.

D. Estimate of Potential Losses – For loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends –Dawson County participates in the National Flood Insurance Program (NFIP) and follows the Program guidelines to ensure future development is carried out in the best interests of the public. According to NFIP guidelines, the 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 – Any portion of Dawson County can potentially be impacted by flooding, however, the areas most prone to flooding have historically been those areas located

in the vicinity of Flat Creek and the Etowah River. Any mitigation steps taken related to flooding should be pursued on a county-wide basis and include the City of Dawsonville. Although no distinct differences were found by the HMPC with regard to flooding characteristics in the County and the City, the City of Dawsonville does contain the troublesome flood problem within the County: Flat Creek.

G. 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 Dawson Co. Advanced planning can help prevent much of the damage that flooding can cause. There are two main mitigation goals for winter storms within Dawson 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. The Dawson Co. Hazard Mitigation Planning Committee (HMPC) has identified several courses of action that both local officials and citizens can use to mitigate the damaging effects of flooding.

H. Range of Mitigation Options – The HMPC 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 HMPC 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. Dawson Co. has six dams classified as Category I (high risk). Many others are scheduled to be studied or have not yet been identified by the State. Specific strategies could result in alterations to current policies if approved.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) <u>Floodplain Management</u> (Existing measure – Status: Complete)
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 should be reviewed periodically and expanded to include new flood zones as necessary. Development within the flood plain should be either partially or totally restricted.

Both the County and the City employ the latest in recommended development regulations that manage land disturbance and construction throughout the community, especially within environmentally sensitive areas. Proper enforcement of these regulations, combined with regular site inspections and regular review of the codes for up-to-date information, will ensure both governments are doing their best with regard to this measure. As an extra measure, both governments could promote additional best practices for development in flood prone areas.

2) Building Design Standards (Existing measure – Status: Complete)
Building design standards can be adopted to reduce structure damage during flood events. Such standards may include: 1) that residential structures be elevated to a certain height above the floodplain; and 2) that nonresidential structures be elevated above the floodplain and flood-proofed. Other standards may be considered as well.

Dawson County and Dawsonville routinely review and update building codes and development regulations as needed and as advised by the State, and are currently considered optimal with regards to structural safety. Both governments will maintain these codes to their best degree and encourage developers to pursue best design practices that advance safety considerations above minimum standards.

3) Community Rating System: (Existing measure – Status: Complete)
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 come from local planning officials with final approval coming from the appropriate County or City government officials. This is an ongoing project with no ending date. The costs associated with these CRS actions vary but would consist of significant County and City planning costs.

4) Updated Floodplain Mapping (Existing measure – Status: Complete)
With assistance from the City, the County has updated the geographic information data for the area with regards to parcel and development records as well as topography and flood plain information. This must be regularly reviewed and updated for accuracy but is considered highly accurate for modern applications.

5) Flat Creek Area (Existing measure – Status: Complete)
The culverts in this area have been cleaned and widened where possible, with additional mitigation improvements made to drainage areas.

6) National Historic Register (Existing measure – Status: Ongoing)
This objective sought to ensure all structures related to Dawson County's listings on the National Historic Register are protected from flooding. While the local governments and various stakeholders have helped identify and improve information about historic properties, susceptibility to flooding remains to various degrees among the subject properties. It is recommended that the County's historic resources be inventoried to determine their level of risk and the viable measures that can be implemented to mitigate those risks. Any and all recommended actions can then be prioritized based on benefit and availability of funding, allowing all stakeholders to move forward as they're able.

7) Culvert Study (New measure)
The County and City should collaborate on a project to expand on the GIA data maintained for each culvert in the area, developing/collecting information about each

structures age, features, susceptibility to flooding and improvement schedule. This would allow the governments to be more effective with planning upgrades and repairs, incorporating a long-term flood improvement measure into their routine maintenance work load.

J. Multi-Jurisdictional Considerations – Any portion of Dawson County can potentially be impacted by flooding, however, the areas most prone to flooding have historically been those areas located in the vicinity of Flat Creek and the Etowah River. Any mitigation steps taken related to flooding should be pursued on a county-wide basis and include the City of Dawsonville. Although no distinct differences were found by the HMPC with regard to flooding characteristics in the County and the City, the City of Dawsonville does contain the troublesome flood problem within the County: Flat Creek.

K. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC 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. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

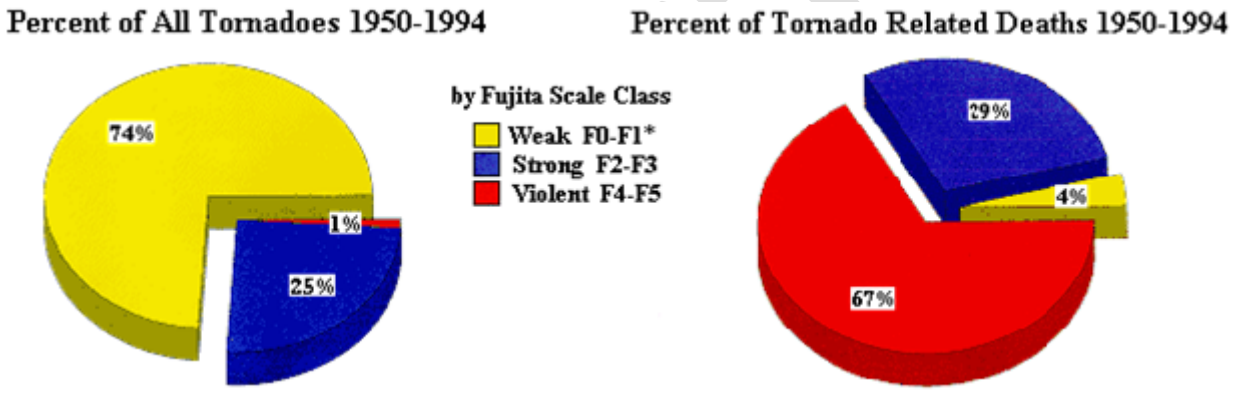
2.4 Tornados

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. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise.

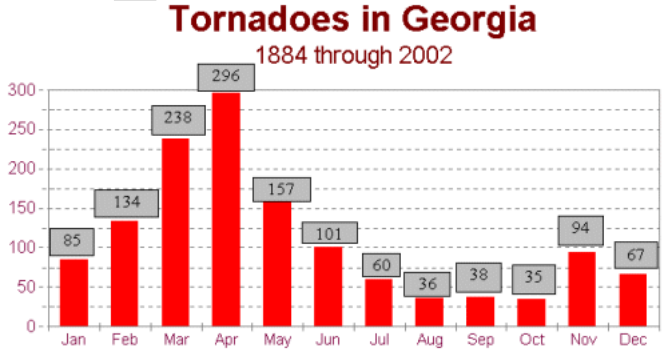
In comparison with a hurricane, a tornado covers a much smaller area but can be just as violent and destructive. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier 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 Enhanced Fujita Scale, adopted in 2007, is the current standard scale for rating the severity of a tornado as measured by the damage it causes (see table below).

Enhanced Fujita Scale		
EF-Scale	**Wind Speed**	**Damage Classification**
EF0	65-85 mph	Weak
EF1	86-109 mph	Weak
EF2	110-137 mph	Strong
EF3	138-167 mph	Strong
EF4	168-199 mph	Violent
EF5	200-234 mph	Violent

Although 74% of all tornados nationwide are classified as either F0 or F1, it isn't surprising that the more violent F4 and F5 tornados cause 67% of tornado deaths nationwide. See the related charts below.

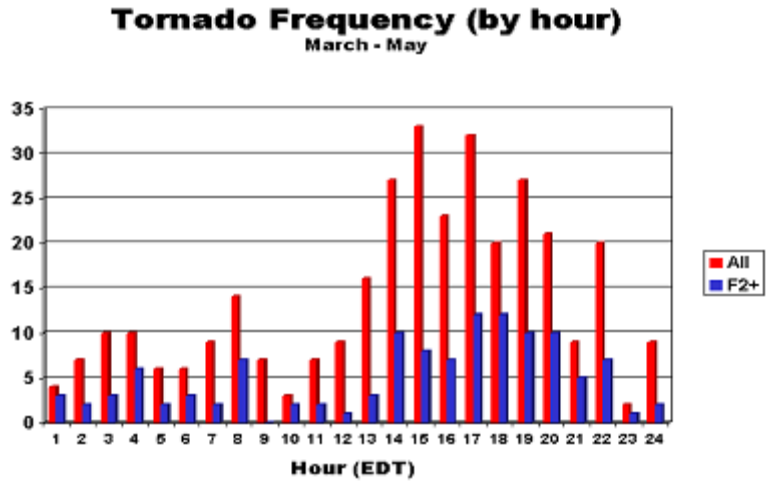


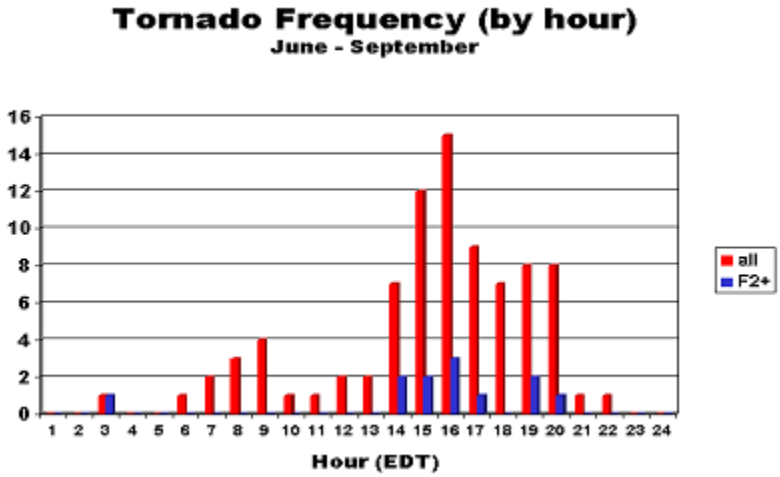
Tornados are considered to be the most unpredictable and destructive of weather events, even though they are not the most frequently occurring natural hazard within Dawson County. Tornado season in Georgia ordinarily runs from March through August, with the peak activity being in March and April. However, tornados can strike at any time of the year when certain atmospheric conditions are met.

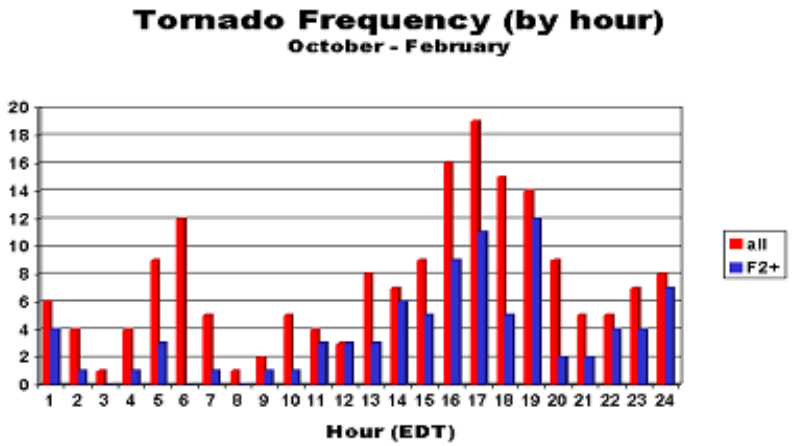


Perhaps more critically, though tornados can strike at any hour they are most common in Georgia throughout the afternoon and into the evening hours. This is suspected for various

meteorological and geographic reasons, but what's important is what this means in terms of community preparedness and susceptibility; Occurrences during day time/working hours denotes a decidedly different set of population and traffic densities than conventional evening hours, and also enables residents and business owners to see the effects of the storm rather than being in the dark. This does not excuse planning for tornado events in night-time conditions, but it does allow the residents and emergency personnel of Dawson County a better idea of when best to prepare for possible tornadoes.





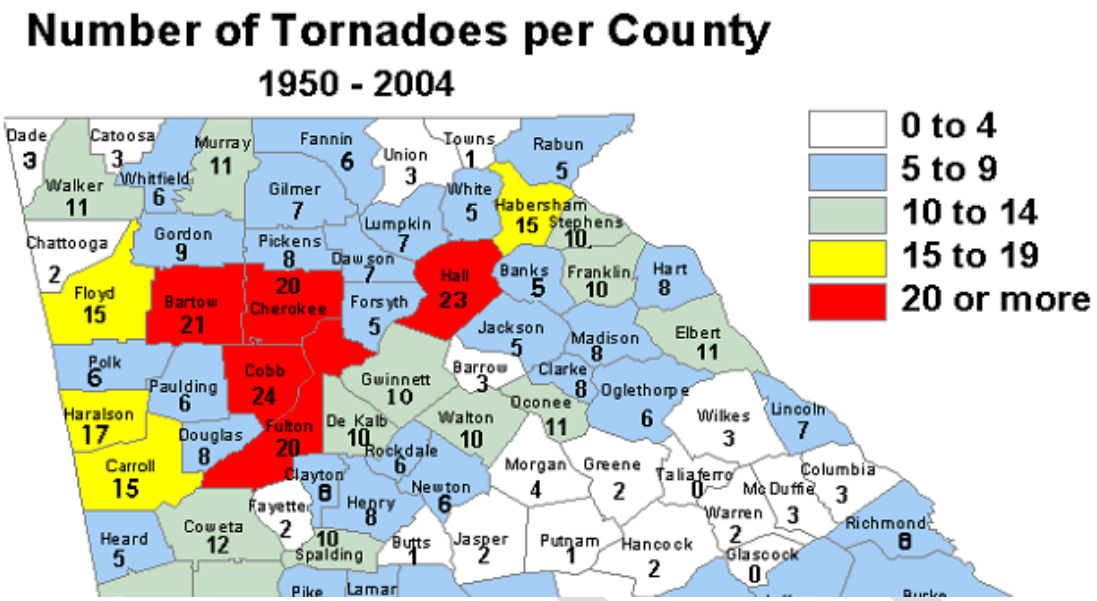


B. Hazard Profile – All areas within Dawson County are vulnerable to the threat of a tornado. There is simply no method to determine exactly when or where a tornado will occur. According to available records, Dawson Co. has experienced several confirmed tornados within the past fifty years. It is a near certainty that additional tornados have occurred during the past half-century, but the information available was limited.

The HMPC reviewed historical data from the Georgia Tornado Database, the National Climatic Data Center, newspaper articles, and internet sites in researching the past affects of tornados within the County. With most of the County's recorded tornado events, only basic information was available. However, dozens of tornado watches have been recorded during this period, and certainly some tornados go undetected or unreported. Therefore, any conclusions reached based on available information on tornados within Dawson Co. should be treated as the minimal possible threat.

According to National Climatic Data Center records there have been only 7 tornadoes in Dawson County since 1950. Since 2004 there has only been 1 documented funnel cloud (8/29/05) that did not fully evolve into a tornado, and no significant damage or injuries as a result of tornadoes. The severity of impacts from any event, however, is increasing now that the county has grown more heavily populated and with more and more visitors.

Also of note is the common occurrence of tornadoes in adjoining communities. The portion of the Georgia map below shows tornados on record between 1950 and 2004. While Dawson County registers a modest number compared to most other counties, it also lies amidst the five counties with the highest number of tornadoes during this time frame. This suggests Dawson County sits within a veritable tornado alley, and that the potential for more frequent events is very plausible.



Dawson County is located in wind zone IV, which is associated with 200-mph design wind speeds as determined by the American Society of Civil Engineers (ASCE). 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. See the following related ASCE maps and table.

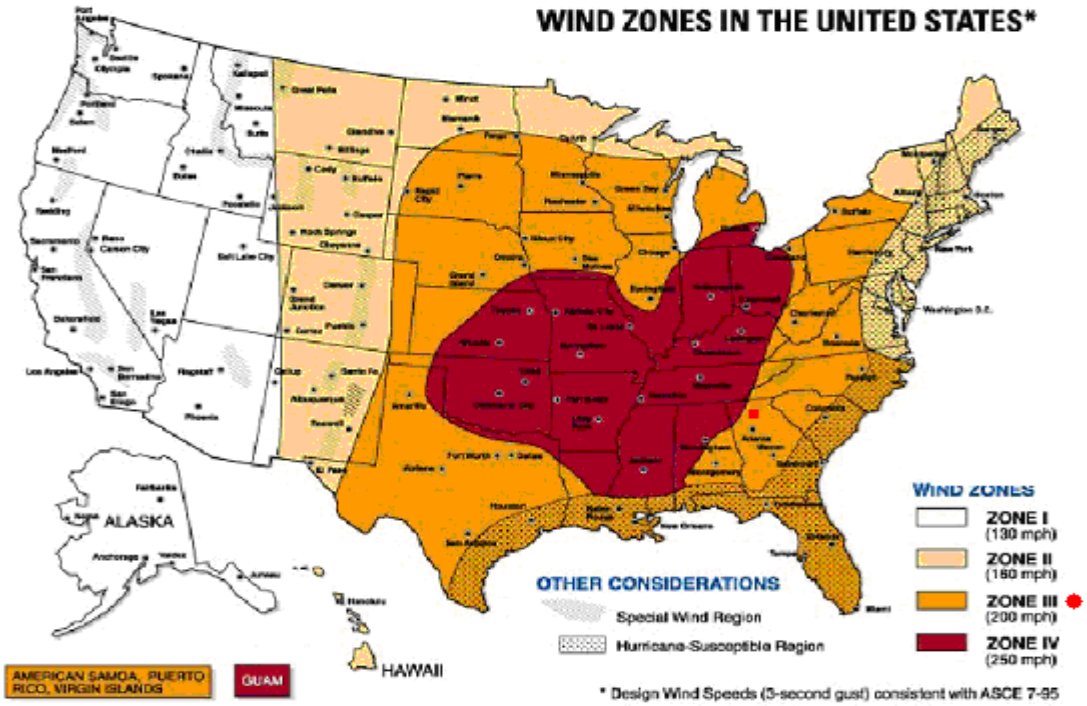
NUMBER OF TORNADOES PER 1,000 SQUARE MILES	WIND ZONE I	WIND ZONE II	WIND ZONE III	WIND ZONE IV
<1	LOW RISK	LOW RISK ★	LOW RISK ★	MODERATE RISK
1 - 5	LOW RISK	MODERATE RISK ★	HIGH RISK	HIGH RISK
6 - 10	LOW RISK	MODERATE RISK ★	HIGH RISK	HIGH RISK
11 - 15	HIGH RISK	HIGH RISK	HIGH RISK	HIGH RISK
>15	HIGH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

LOW RISK — Need for high-wind shelter is a matter of homeowner preference

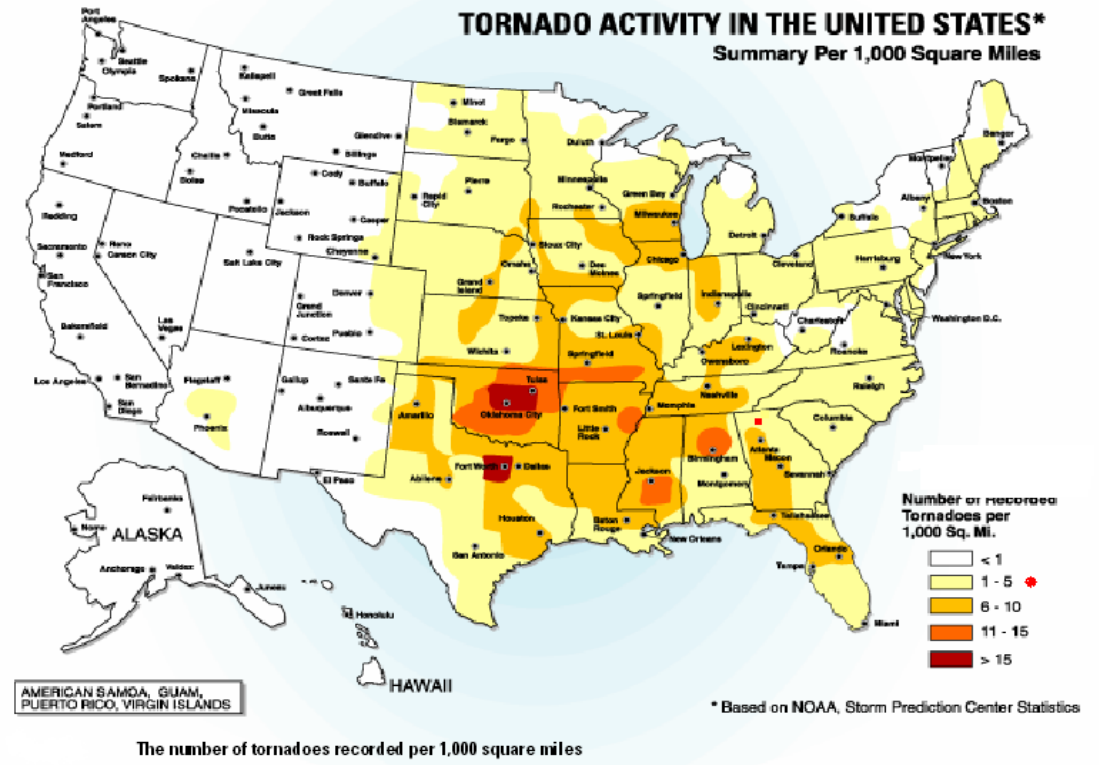
MODERATE RISK — Shelter should be considered for protection from high winds

HIGH RISK — Shelter is preferred method of protection from high winds

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



Wind zones in the United States



The number of tornadoes recorded per 1,000 square miles

C. Assets Exposed to Hazard - As related to sever storm related events, all assets and critical facilities within Dawson County are considered equally susceptible to events. Since no particular part of the county is at greater risk than another for thunderstorms and related hazards, every asset is considered exposed.

D. Estimate of Potential Losses – For loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends – The one trend of note regarding land use and development is the overall growth encountered throughout the county, but particularly in the southeastern portion. The increasing number of residences and businesses coming into the area means a greater volume of structures and households at risk during events. Perhaps more critical is the strong increase in the volume of traffic along the GA 400 and SR 53 corridors. As major storms come into the area, emergency response personnel must be mindful of how to evolve management and hazard mitigation in these rapidly growing, and more densely occupied areas.

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

G. 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. Tornados are, by far, the most deadly, unpredictable natural hazard Dawson County experiences. However, advanced planning can help limit the damages they cause. There are two main mitigation goals for tornados within Dawson 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. The HMPC has identified several courses of action that both local officials and citizens can use to mitigate the deadly effects of tornados.

H. Range of Mitigation Options – The HMPC 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 groups of citizens, and citizens who live in manufactured homes or unsafe homes. Mitigation strategies include both structural and non-structural mitigation measures. Specific strategies could result in alterations to current policies if approved.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) <u>All Mitigation Recommendations listed in Section 4.1 Severe Thunderstorms</u>: Since severe thunderstorms cause so many of the same problems as tornados, all severe thunderstorm mitigation strategies must be considered as well.

2) Manufactured Homes: (Existing measure – Status: Ongoing)
To the greatest extent possible, the County and City hope to identify all owners of inadequately installed manufactured homes within the area and offer a financial incentive to retrofit them with an appropriate level of anchoring and support. While efforts remain ongoing to upgrade specific units and will be pursued at an as-able basis, both governments have affirmed the building codes and permitting requirements to enforce this policy with all future manufactured housing applications. If and when outside funding is available to assist in the anchoring or relocation of manufactured homes, the County could assist in these improvements to secure local structures.

J. Multi-Jurisdictional Considerations – All of Dawson County has the same design wind speed of 200 mph as determined by the American Society of Civil Engineers (ASCE). Since no part of the County is immune from tornados, any mitigation steps taken related to tornados should be undertaken on a county-wide basis, including the City of Dawsonville. Installation of an emergency warning siren network should take into consideration all areas of the County, including the City of Dawsonville. An effort should be made by the County and City to cooperate to the fullest extent possible in obtaining and operating an emergency warning siren network in order to reduce costs.

K. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC recommends steps be taken to increase public awareness of tornados 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. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.5 Wildfire

A. Hazard Identification – 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 violent surface drafts. 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 Dawson Co., but this potential danger should be considered when planning mitigation efforts.

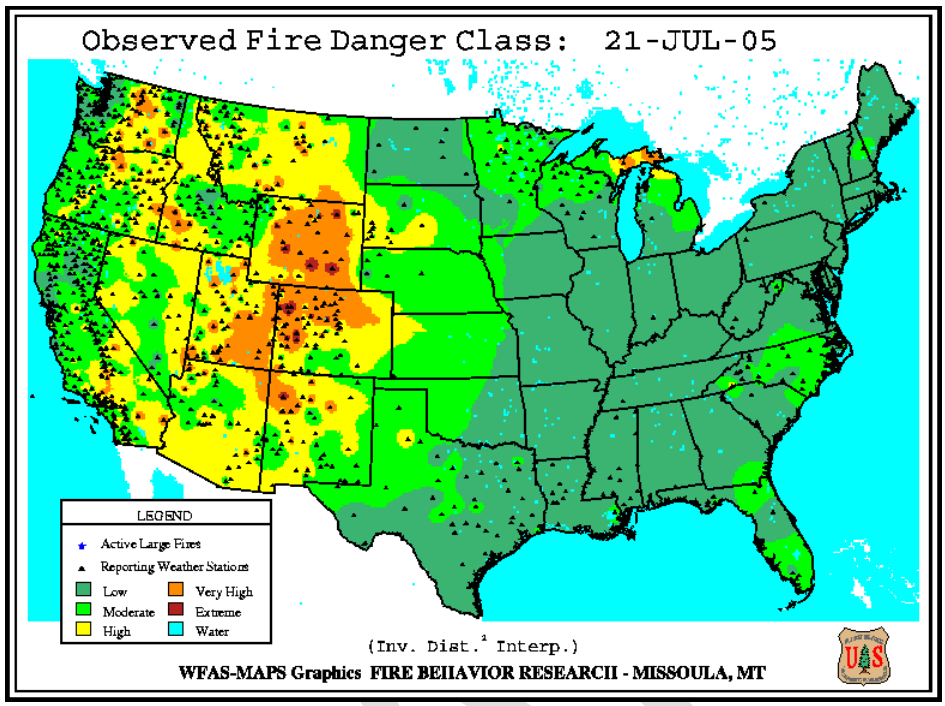
The threat of wildfire varies with weather conditions: drought, heat, and wind participate in drying out the timber or other fuel, making it easier to ignite. Once a fire is burning, drought, heat, and wind all increase its intensity. Topography also affects wildfire, which spreads quickly uphill and slowly downhill. Dried grass, 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 Dawson Co. 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 backfire 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, almost one quarter are of incendiary origin, and more than 10% are due to lightning.

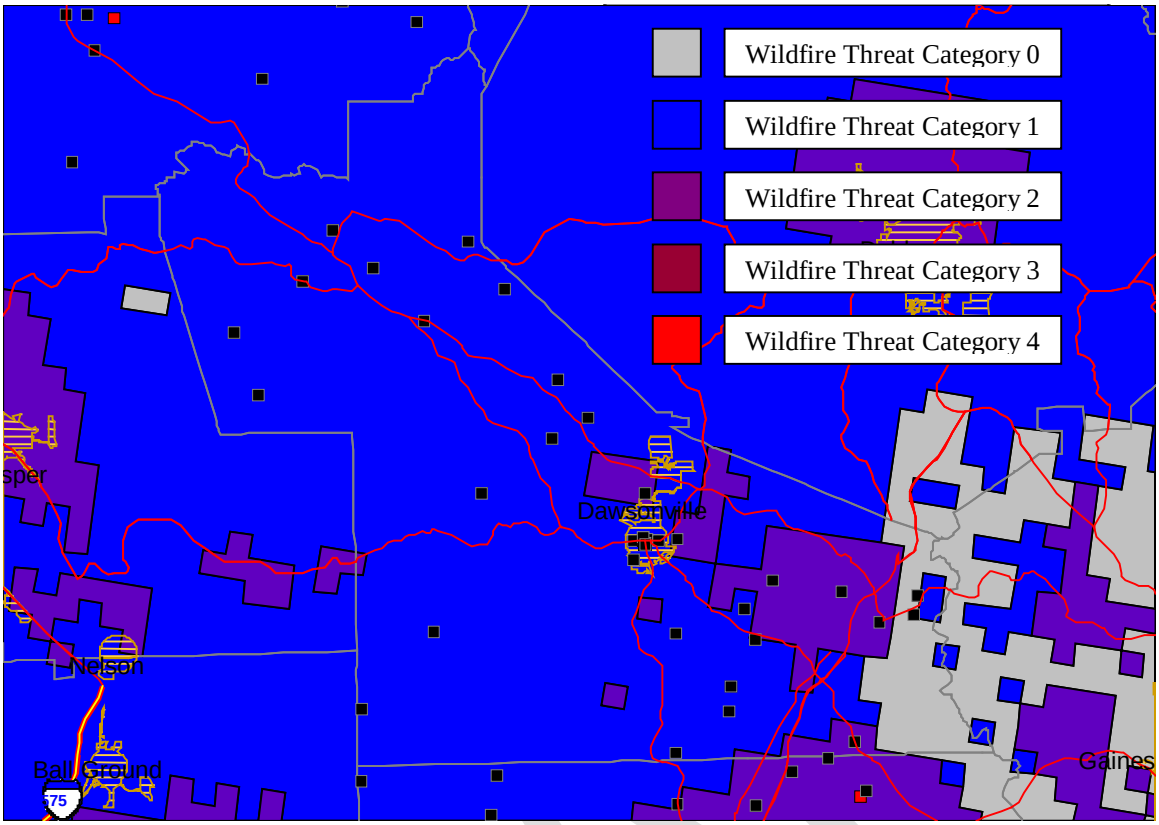
B. Hazard Profile – Wildfires are a serious threat to Dawson County. According to the Georgia Forestry Commission Dawson County has averaged 21+ fires between 2006 and 2010, most of which were incendiary events with some coming from campfires. Given the prevalence of woodlands throughout the county, any fire risks becoming a widespread wildfire and must therefore be addressed quickly and effectively. And while new development is slowly reducing the volume of wooded areas, it is also increasing the interface between natural and urbanized areas, and thereby increasing the risk to area residents.

At the time this planning effort took place, Dawson County's threat of wildfire was classified as "low". However, this status can change from week to week. See map below.



C. Assets Exposed to Hazard – In evaluating assets that are susceptible to wildfire, the committee determined that all public and private property is susceptible to wildfire, including all critical facilities. One area of particular concern due to public safety inaccessibility is the Burnt Mountain area, which contains dozens of homes. The map below identifies critical facilities located within the hazard area which, in the case of wildfire, includes the entire County, to varying degrees. The Wildfire Threat Categories are defined as:

Category	Description
0	Lowest Threat
1	Very Low Threat
2	Low Threat
3	Moderate Threat
4	High Threat



Fortunately most of the County and City has been classified under Wildfire Threat Categories 0 or 1, the lowest threats on a scale of 0 to 4. However, some facilities are located within Wildfire Threat Category 2, which is a slightly higher threat level, though still classified as a "low threat". These facilities include Dawson County Fire Station 3, Etowah Water & Sewer Authority, Robinson Elementary School, Dawson County Landfill, Scott Lake Dam, and Etowah River Water Structure No. 13. No areas within the County or City are classified under Wildfire Threat Categories 3 or 4.

D. Estimate of Potential Losses – In most of the documented cases of wildfire within Dawson Co., relatively little information on damages, in terms of dollars, was available. The potential commercial value of the land lost to wildfire cannot be accurately calculated, other than replacement costs of structures and infrastructure. With regard to the land itself, aside from the loss of timber and recreation, the damage is inestimable in terms of land rendered useless by ensuing soil erosion, elimination of wildlife cover and forage, and the loss of water reserves collected by a healthy forest. For available loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends - Dawson County and the City of Dawsonville have experienced unprecedented growth the past twenty years. Subdivisions and individual homes are being constructed year-round, and with this growth comes certain concerns relating to wildfire. Many builders are placing homes in locations difficult or impossible to reach by emergency response vehicles. Other homes are going up in densely wooded parts of the County and City, which increases the likelihood such homes will be effected by wildfire. The County and City

Planning Dept.'s have taken steps to help reduce these threats in the future by restricting certain development practices. Additional changes in the future may also be necessary as growth patterns develop.

F. Multi-Jurisdictional Concerns – Virtually all of Dawson County can potentially be affected by wildfire. There are few exceptions because of the common interface between urban developments and the forest. Both the County and the City have areas identified as Wildfire threat category 1 and 2. Neither jurisdiction has an area classified higher than this. Any steps taken to mitigate the effects of wildfire should be undertaken on a county-wide basis and include the City of Dawsonville.

G. Mitigation Goals – Wildfire is one of the most frequently occurring natural hazards within Dawson 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. The effects of such events could be devastating to Dawson County.

Most damage caused by wildfire within Dawson Co. 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 accurately 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. There is one main mitigation goals for wildfire within Dawson County. It is to minimize the loss of life and property, to include the County's forests. The Dawson Co. HMPC has identified measures that can be used to help mitigate the damaging effects of wildfire.

H. Range of Mitigation Options – The HMPC 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. Specific strategies could result in alterations to current policies if approved.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) <u>Defensible Space and Slopes</u> (Existing measure – Status: Ongoing Policy)
Dawson County and the City of Dawsonville should continue to work in conjunction with GA Forestry to find solutions to problems concerning urban interface issues. Some of the avenues that may be used to eliminate some of the urban interface problems include zoning requirements, building regulations, and educational awareness. Zoning can be used to cluster development into defensible areas and keep development away from fire hazards such as steep slopes, where fires are difficult to contain. Damage potential can also be reduced in areas most susceptible to wildfire by ensuring that structures are surrounded by defensible space or buffer zones. These manageable areas, generally 30 to 100 feet, are designed to remain clear of combustible materials. Building regulations could also require structures to be set outside of the "convection cone" of intense heat

that is projected up the slope of a hill as a wildfire "climbs". Another consideration is that slopes facing south or west are more vulnerable to increased dryness and heat from sun exposure.

Education is another essential tool. Educational materials could be provided at the time an applicant applies for a building permit. Forestry personnel have also expressed a willingness to hold public workshops to help educate the public.

Application of these measures will continue as the county continues to experience growth and new development, creating evolving priorities and demands. New elements to these measures may also be called for to update material or create new means to communicate the information with residents and builders alike.

2) Fire Wise Community: (Existing measure – Status: Ongoing Policy)
Dawson County has already helped various residential areas become established as Fire Wise Communities, sub-sets of a community with a defined and maintained fire safety awareness and prevention program. These programs not only ensure a high degree of cooperation between residents and fire protective services, but also can help with insurance costs and establish a higher level of understanding among area residents. The ongoing goal is to help make every eligible portion of the county a Fire Wise Community, which is being addressed on an as-able basis.

In addition, the County is an active partner with the Georgia Forestry Commission and the community of Big Canoe with the maintenance and update of their respective, private fire management plans. Each document has been updated within the past 5 years and the County regularly engages with each organization to assist in implementation measures, review of information and recommendations for improvements. The County will help each with their next round of updates and will ensure coordination between their efforts and those of the County's first response services.

3) Power Line Maintenance: (Existing measure – Status: Ongoing Policy)
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. The increased costs associated with these measures are difficult to estimate, but would be the responsibility of the local power companies. Specific recommendations for such measures should originate from local planning officials, with final approval coming from the appropriate County or City government officials. If approved, the initial stages of the project are estimated to take approximately 24 months.

J. Multi-Jurisdictional Considerations – Virtually all of Dawson County can potentially be affected by wildfire. There are few exceptions because of the common interface between urban developments and the forest. Both the County and the City have areas identified as Wildfire threat category 1 and 2. Neither jurisdiction has an area classified higher than this. Any steps taken to mitigate the effects of wildfire should be undertaken on a county-wide basis and include the City of Dawsonville.

K. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC 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. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.6 Drought

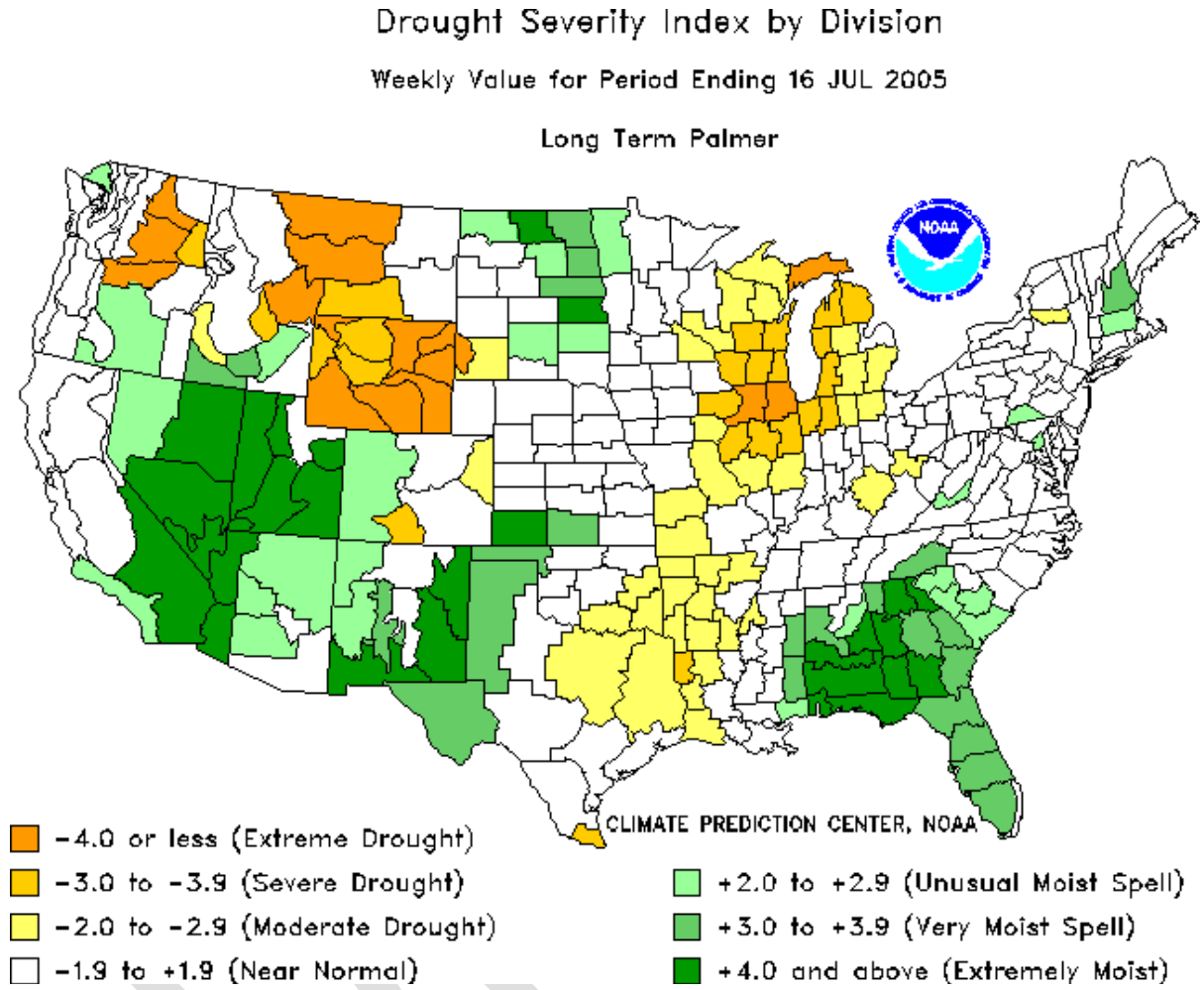
A. Hazard Identification – The definition of drought is a prolonged period of moisture deficiency. Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. These conditions originate from a deficiency of precipitation over an extended 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 Dawson County HMPC reviewed historical data from the National Oceanic and Atmospheric Administration, the National Climatic Data Center, the U.S. Geological Survey, the Georgia Department of Natural Resources and the Georgia Forestry Commission in researching drought events of the County.

Dawson County experienced drought conditions intermittently from late 2001 through early 2002. To date, agricultural losses have been the primary losses associated with drought, with crop damage during this period at a minimum in the tens of millions of dollars. Because of the extremely unpredictable nature of drought (to include duration), reliably calculating a recurrence interval is difficult. The Hazard Frequency Table in Appendix C analyzes historical data from the past fifty years to provide a rough idea of the frequency of drought within the County.

Drought conditions have also been experienced in 2005, 2007 and 2009, suggesting either a growing trend toward more droughts or a lean time in terms of cyclical droughts. The 2007 and 2009 events were considered critical and endangered basic water supplies. Further, as a region

north Georgia has grown more and more weary of drought conditions based on increased demands and compounding dry weather. Thus, though Dawson County may not be experiencing sharp conditions, the surrounding area has been under pressure and this could easily carry over into Dawson County.



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. The one exception being consideration for any assets with wells, which may feature opposite conditions from public water resources based on development and other factors.

D. Estimate of Potential Losses – No damage to facilities is anticipated as a result of drought conditions, aside from the threat of wildfire. Crop damage cannot be accurately quantified due to several unknown variables: duration of the drought, temperatures during the drought, severity of the drought, rainfall requirements for specific crops and livestock, and the different growing seasons. For available loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends - Dawson County and the City of Dawsonville have rapidly growing populations. This phenomena may make drought more of a concern in years to come as the demand for water resources grows as well.

F. Multi-Jurisdictional Concerns – Agricultural losses associated with drought are more likely to occur in the rural, less concentrated areas of the County. Although the City of Dawsonville is probably slightly less likely to experience agricultural-related drought losses, it is actually more likely to be financially impacted by water resource-related drought losses since it operates a water system serving both the City and parts of the County.

G. Mitigation Goals – Drought poses a significant threat to Dawson County, particularly to the agricultural industry and water supplies. Drought itself poses no threat to structures. However, wildfire is a threat to structures and is often a direct result of drought conditions. 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 Dawson 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. There are two main mitigation goals for drought within Dawson 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. The Dawson Co. Hazard Mitigation Planning Committee (HMPC) has identified measures that both local officials and citizens can use to mitigate the damaging effects of drought.

H. Range of Mitigation Options – The HMPC 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. Specific strategies could result in alterations to current policies if approved.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) <u>All Mitigation Recommendations listed in Section 4.5 Wildfire</u>: Since drought is often a precursor to wildfire, all wildfire mitigation strategies must be considered as well.

2) <u>Water Use Ordinances</u>: (Existing measure – Status: Ongoing Policy)
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. Dawson County and Dawsonville have implemented several policies that regulate water use and encourage wise consumption. Both communities also work with Etowah Water and Sewer to monitor and properly manage the system as a whole, promoting best practices

and working to prevent leaks and illegal tapping. Additional measures may be developed as needed and able.

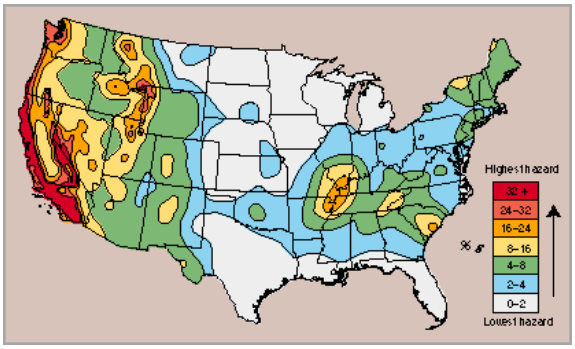
3) Water Conservation Plan: (New measure)
Dawson County has a Water Conservation Plan adopted in 2009 to help coordinate measures that will encourage and direct efficient use of the public supply. This includes policies and actions for private residents, businesses and for government operations, and will be used to foster wiser practices during normal times and as a launching pad for more strict measures during times of actual drought. However, this plan must be routinely reviewed and updated as needed to ensure its viability and effectiveness. No direct cost is associated with this measure at this time, but as opportunities to direct funding to special implementation measures arise the County and stakeholders should do what's necessary to sustain this Plan.

J. Multi-Jurisdictional Considerations – Drought can affect all areas of Dawson County. As a result, any mitigation steps taken related to drought should be undertaken on a county-wide basis and include the City of Dawsonville. Agricultural losses associated with drought are more likely to occur in the rural, less concentrated areas of the County. Although the City of Dawsonville is probably slightly less likely to experience agricultural-related drought losses, it is actually more likely to be financially impacted by water resource-related drought losses since it operates a water system serving both the City and parts of the County.

K. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC 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. 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. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.7 Earthquakes

A. Hazard Identification – One of the most frightening and destructive natural hazards is a severe earthquake. An earthquake is a sudden movement of the Earth, caused by the abrupt release of strain that has accumulated over a long time. The forces of plate tectonics shape the Earth as the huge plates that form the Earth's surface slowly move over, under, and past each other. Sometimes the movement is gradual. At



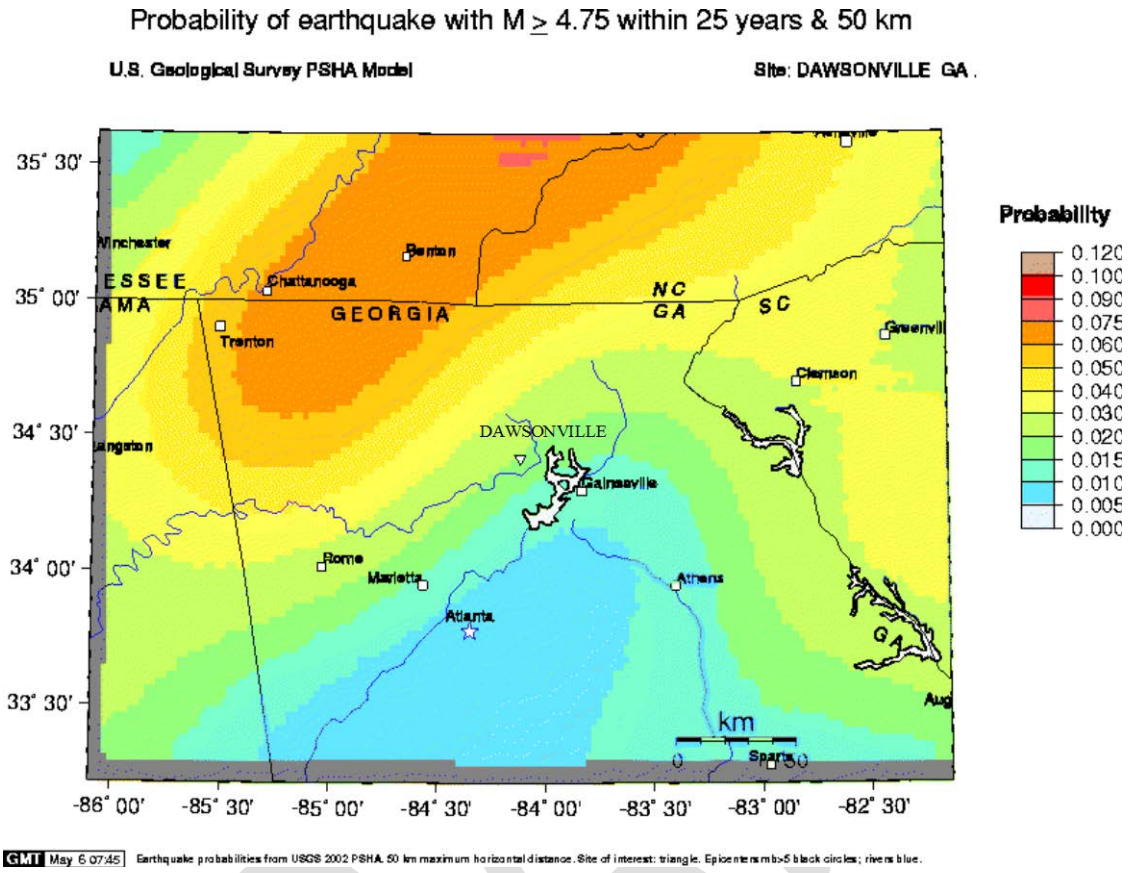
other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free. If the earthquake occurs in a populated area, it may cause many deaths, injuries and extensive property damage.

The goal of earthquake prediction is to give warning of potentially damaging earthquakes early enough to allow appropriate response to the disaster, enabling people to minimize loss of life and property. The U.S. Geological Survey conducts and supports research on the likelihood of future earthquakes. Ultimately, scientists would like to be able to specify a high probability for a specific earthquake on a particular fault within a particular year. Scientists estimate earthquake probabilities in two ways: by studying the history of large earthquakes in a specific area and the rate at which strain accumulates in the rock.

Scientists study the past frequency of large earthquakes in order to determine the future likelihood of similar large shocks. For example, if a region has experienced four magnitude 7 or larger earthquakes during 200 years of recorded history, and if these shocks occurred randomly in time, then scientists would assign a 50 percent probability to the occurrence of another magnitude 7 or larger quake in the region during the next 50 years. But in many places, the assumption of random occurrence with time may not be true, because when strain is released along one part of the fault system, it may actually increase on another part.

Another way to estimate the likelihood of future earthquakes is to study how fast strain accumulates. When plate movements build the strain in rocks to a critical level, like pulling a rubber band too tight, the rocks will suddenly break and slip to a new position. Scientists measure how much strain accumulates along a fault segment each year, how much time has passed since the last earthquake along the segment, and how much strain was released in the last earthquake. This information is then used to calculate the time required for the accumulating strain to build to the level that results in an earthquake. This simple model is complicated by the fact that such detailed information about faults is rare. In the United States, only the San Andreas fault system has adequate records for using this prediction method.

Based on U.S. Geological Survey estimations using the first method described above, the probability of an earthquake of Magnitude 4.75 or more occurring within Dawson Co. over the next 25 years is between 1.5% and 2% (see map below). As discussed above, such predictions are based on limited information, and cannot necessarily be relied upon for their precision. However, they do help demonstrate that the threat of earthquakes cannot be overlooked even in a relatively inactive geographic area such as Dawson County.



Magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake and is determined from measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment. The following two tables describe the Abbreviated Modified Mercalli Intensity Scale, and show intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

Abbreviated Modified Mercalli Intensity Scale

I. Not felt except by a very few under especially favorable conditions.

II. Felt only by a few persons at rest, especially on upper floors of buildings.

III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.

IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.

V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.

VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

Magnitude / Intensity Comparison

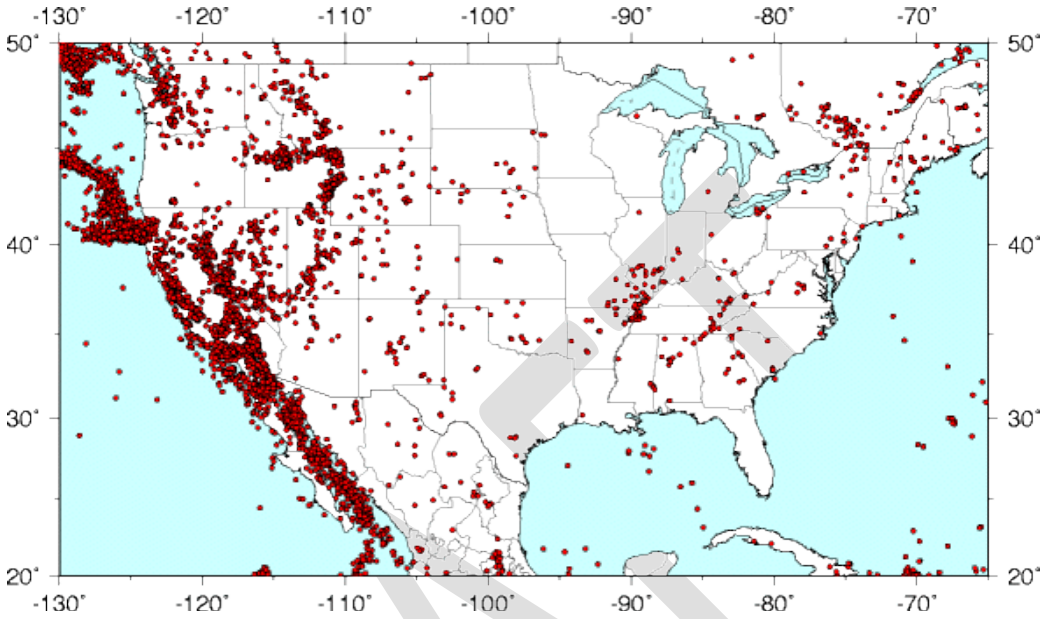
Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	**I**
3.0 - 3.9	**II - III**
4.0 - 4.9	**IV - V**
5.0 - 5.9	**VI - VII**
6.0 - 6.9	**VII - IX**
7.0 and higher	**VIII** or higher

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

B. Hazard Profile – The HMPC reviewed historical data from the National Oceanic and Atmospheric Administration, the National Climatic Data Center, and the U.S. Geological Survey in researching earthquake events of the County. Evidence of one earthquake is all that was found within the past fifty years. However, the State of Georgia has experienced seven earthquakes from 1974 to 2003 (see map below), according to USGS information. The HMPC was unable to determine which of these additional earthquakes affected Dawson Co. and, if so, to what degree. Nevertheless, the HMPC believes that these earthquakes would have occurred close enough to Dawson Co. (even if they occurred in south Georgia) to merit consideration.

The threat of earthquakes in Dawson Co. may be more significant that the one documented earthquake incident would seem to indicate. There have been no local earthquakes since 2005.

Earthquakes, Magnitude 3.5 and greater 1974 to 2003



C. Assets Exposed to Hazard - All structures and facilities within Dawson County are susceptible to earthquake damage since they can occur in any portion of the County or City. Although the likelihood of a severe earthquake is slim, it is least likely to occur in the southern and southeastern sections of the County.

D. Estimate of Potential Losses – For loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends - Dawson County currently has no land use or development trends related to earthquakes.

F. Multi-Jurisdictional Concerns – Virtually all of Dawson County can potentially be affected by earthquakes. The threat is no greater within the City than it is within the County. Any steps taken to mitigate the effects of earthquake should be undertaken on a county-wide basis and include the City of Dawsonville.

G. Mitigation Goals – Earthquakes have a great potential to cause injury, loss of life, and serious damage to public and private property, utilities, infrastructure, historical sites, crops, and livestock. Such events are uncommon within Dawson Co. As a matter of fact, no records of serious earthquake damage have been found for Dawson Co. Nevertheless, the tremendous destructive capacity of an earthquake requires the HMPC to consider mitigation strategies. The HMPC developed two main mitigation goals for drought within Dawson 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. The Dawson Co. Hazard Mitigation Planning Committee (HMPC) has identified measures to help mitigate the destructive force of earthquakes.

H. Range of Mitigation Options – The HMPC 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 earthquakes, these vulnerable populations include senior citizens and children. Specific strategies could result in alterations to current policies if approved.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) Loss Estimation Studies: (Existing measure – Status: Cancelled)
After seismic hazards have been identified, planners can create an earthquake scenario to estimate potential loss of life and injuries, the types of potential damage, and existing vulnerabilities within a community. Scenarios can be particularly useful in predicting lifeline performance, i.e., the sustainability of critical public services or systems such as electricity, water, or roadways. This knowledge can be used to develop earthquake mitigation priorities.

After some investigation by the County and other parties this measure was cancelled based on low rates of cost-benefit and a greater focus on other mitigation measures.

2) School Survey Procedures: (Existing measure – Status: Complete)
Schools are critical facilities not only because of the special population they accommodate, but also because they are often identified as shelter sites for a community. Due to this sheltering role, it is essential that these buildings function after a seismic event. A community can develop a survey procedure and guidance document to inventory structural and non-structural hazards in and near school buildings. Survey results can be used to determine mitigation priorities that can be incorporated into capital improvement plans.

Dawson County has engaged the local schools regarding their emergency preparedness plans and susceptibility to various hazards, including earthquakes. Any needed structural repairs or other improvements were noted and advised to the schools. No further action is considered necessary at this time, though this may be revisited at a future date.

3) Overlay Study (New measure)
It has been suggested that the County take advantage of modern electronic mapping technology and seek to create an overlay showing the most critical fault lines and susceptible slopes and soils within north Georgia so as to better define the community's risk. This would involve collaboration with various geographic information services and geological specialty organizations, but could aid in determining any and all special concerns facing Dawson County. Hopefully the costs

for this proposal would be minimal and could be shared with adjoining counties interested in the same information.

J. Multi-Jurisdictional Considerations – Virtually all of Dawson County can potentially be affected by earthquakes. The threat is no greater within the City than it is within the County. Any steps taken to mitigate the effects of earthquake should be undertaken on a county-wide basis and include the City of Dawsonville.

K. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC recommends steps be taken to increase public awareness of earthquakes 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. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.8 Hazardous Materials Release

A. Hazard Identification – Hazardous materials (hazmat) refers to any material that, becauseof its quantity, concentration, or physical or chemicalcharacteristics, may pose a real hazard to human healthor 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. Research institutes, industrial plants, individual households, and government agencies all generate chemical waste. Approximately one percent is classified as hazardous.

A hazmat spill or release occurs when hazardous material or waste gets into the environment in an uncontrolled fashion. Many manufacturing processes use hazardous materials or generate hazardous waste, but a hazardous spill doesn't always come from a chemical plant or a factory. Any substance in the wrong place at the wrong time in too large an amount can cause harm to the environment. The response to a spill depends on the situation. When the emergency response team is notified of a spill, it must quickly decide what sort of danger is likely. Members of the team collect appropriate clothing and equipment and travel to the scene. There they try to contain the spill, sometimes testing a sample to identify it. If necessary, they decontaminate themselves before leaving the area. Once the material has been identified, other personnel arrive to remove it.

B. Hazard Profile – The Dawson Co. HMPC 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 materials (hazmat) releases, or hazmat spills, within Dawson Co. Hazmat spills are usually categorized as either fixed releases, which occur when hazmat is released on the site of a facility or industry that stores or handles hazmat, or transportation-related releases, which occur when hazmat is released during transport from one place to another.

Both fixed and transportation-related hazmat spills represent tremendous threats to Dawson County. During the past fifty-year period, documentation of 49 hazmat spills was found. Based on this entire fifty-year period, there is an 98% chance per year that such an event will occur in Dawson County. However, when only the past ten-year period is taken into consideration, the likelihood of a hazmat spill in Dawson Co. increases threefold to a 300% chance per year (or about three incidents per year).

The higher concentration of hazardous materials releases in the past decade is largely due to improved record keeping. Increases in demand for and production and transportation of hazardous materials are also contributing factors to this phenomenon. For these reasons, the HMPC believes consideration of the past ten years, rather than the entire fifty-year period, provides the most accurate information relating to hazmat release events for Dawson Co.

C. Assets Exposed to Hazard – The environment is especially vulnerable to hazardous materials releases. Waterways are at greatest risk of contamination. Over the past fifteen years or so, the Georgia EPD has tracked information on numerous waterways within Dawson Co. that have been contaminated to varying degrees due to hazmat spills. These incidents include contamination to Lake Lanier, Etowah River, Holly Creek, Little Amicalola River, as well as dozens of unnamed creeks, storm sewers, wells, and drainage ditches. Keep in mind, due to limited record keeping, these numbers should all be treated as minimums with regard to their impact on the environment. Such releases are also a potential threat to all property and persons within any primary highway corridors of Dawson Co., especially GA 400, due to the fact that certain hazmat releases can create several square miles of contamination. The same holds true of property and persons located in the vicinity of facilities or industries that produce or handle large amounts of hazardous materials. 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.

D. Estimate of Potential Losses - It is difficult to determine potential damage to the environment caused by hazardous materials releases. Waterways within Dawson County have certainly been impacted to some degree. Such damage is difficult to calculate in dollar figures however, and future problems are almost impossible to estimate. In addition, no recorded information was located that mentioned damage to any critical facilities as a result of hazmat releases. 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. Corridors for GA 400, State Routes 9, 52, 53, 136, and 183 are most vulnerable to transportation-related releases. However, such releases can occur in virtually any part of the County accessible by road. Fixed location releases are not as likely to affect the more rural areas of the County. For additional loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends - As Dawson County continues to attract more industrial and commercial businesses, the threat of hazardous materials releases obviously continues to grow. Due to development trends over the past decade, the threat of fixed hazmat releases is highest along the corridors of GA 400 and SR 53, which have experienced the most significant commercial and industrial growth in Dawson Co. However, all main highway corridors will continue to be areas of concern with regard to transported hazardous materials.

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

G. 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 Dawson County. Although such events cannot be predicted, advanced planning and safety measures can help limit their frequency and severity. The Dawson Co. Hazard Mitigation Planning Committee (HMPC) has identified several courses of action that both local officials and citizens can use to mitigate the dangerous effects of hazmat releases. The single mitigation goal for this threat within Dawson County is to minimize the loss of life and property.

H. Range of Mitigation Options – The HMPC 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 groups of citizens, and citizens who live in manufactured homes 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.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) Industrial Site Buffering: (Existing measure – Status: Complete)
Hazardous materials exposure can be prevented or reduced by 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.

Both governments employ the latest design and development standards that reflect the concerns identified here, requiring minimum distance and physical buffering between industrial activity and neighboring land uses. Additional buffering is often pursued with developers on a case by case basis, and the County actively promotes best standards for on-site material handling. These codes and regulations are to be reviewed and updated regularly.

2) Safety Procedures, Policies, and Plans: (Existing measure – Status: In Progress)
Many safety procedures, policies and plans are essential to protecting Dawson 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; 5) 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 the County and City. 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 $50,000 per year. Specific recommendations for any related planning or inspections should come from Dawson County EMA with final approval coming from the appropriate County or City government officials. If approved, planning efforts and adoption of any changes is estimated to take approximately 24 months.

3) Local Emergency Planning Committee: (Existing measure – Status: Ongoing Policy)
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 the County and City. There may be no additional costs associated with this recommendation.

J. Multi-Jurisdictional Considerations – Hazardous materials release, both fixed and transportation-related, can affect all areas of Dawson County. As a result, any mitigation steps

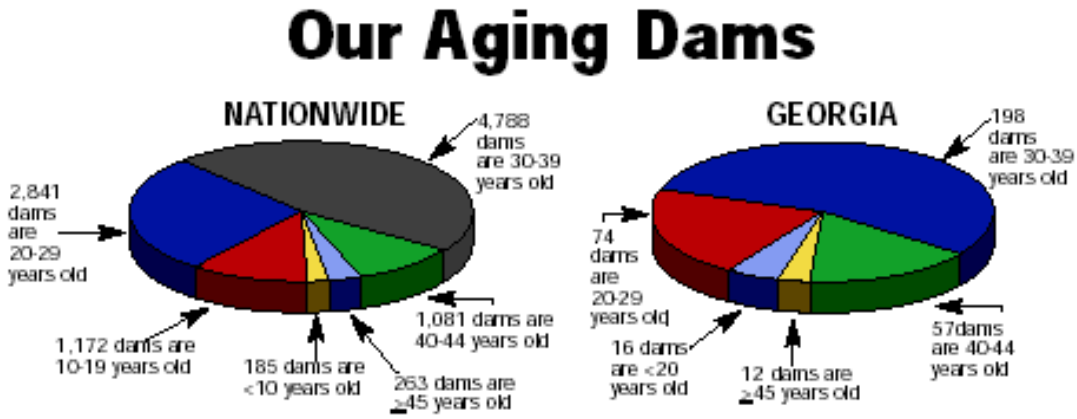
taken related to hazmat release should be undertaken on a county-wide basis and include the City of Dawsonville.

K. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC 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. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.9 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. The increasing age of dams nationwide is a contributing factor to each of the problems above. The following graphs show how the aging of dams is becoming a serious issue.



B. Hazard Profile – The Dawson Co. HMPC 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 Dawson Co. Fortunately, Dawson Co. 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 to accomplish that.

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. Specialized software is used 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). 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 seven Category I dams within Dawson County:

- Amicalola Creek Watershed Structure No. 1
- Amicalola Creek Watershed Structure No. 3
- Etowah River Reach Sub Watershed Structure No. 12
- Etowah River Reach Watershed Structure No. 13

- Etowah River Reach Watershed Structure No. 22
- Etowah River Reach Watershed Structure No. 23
- Yellow Creek Reservoir Dam

The additional eighteen identified dams within the County are Category II dams or undesignated (1). There may be a number of unclassified dams within the County as well. The 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). The complete inventory of dams in Dawson County was last surveyed in 2010 and no significant issues or concerns were cited at that time.

C. Assets Exposed to Hazard – Areas most vulnerable to the physical damages associated with dam failure within Dawson County are the low-lying and downstream areas associated with Amicalola Creek Watershed Structure No. 1, Amicalola Creek Watershed Structure No. 3, Etowah River Reach Sub Watershed Structure No. 12, Etowah River Reach Watershed Structure No. 22, Etowah River Reach Watershed Structure No. 23, and Yellow Creek Reservoir 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 approximation. Direct loss to infrastructure, critical facilities and businesses in terms of repair and replacement can be roughly estimated. However, estimating indirect costs is less accurate. For additional loss estimate information, please refer to the Critical Facilities Database (Appendix A).

E. Land Use & Development Trends – Dawson County and the City of Dawsonville each participate in the National Flood Insurance Program (NFIP). Dawson Co. (CID: 130304) has participated since December 15, 1990. The City of Dawsonville (CID: 130064A) has participated in the program since May 21, 1982. According to NFIP guidelines, both jurisdictions were required to execute 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 – All of Dawson County, including the City of Dawsonville, is vulnerable to the negative impact of dam failure.

G. 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 Dawson Co. Hazard Mitigation Planning Committee (HMPC) has identified several courses of action 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 Dawson 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.

H. Range of Mitigation Options – The HMPC 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 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.

I. Mitigation Recommendations – The HMPC recommends consideration of the following strategies:

1) Sound Design and Planning (Existing measure – Status: In Progress)
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.

While the County and City have worked to make sure the existing and proposed dams will be fully compliant with design and construction standards, there is the idea that studies could yet be done to determine the extent of flood conditions in the event of a dam breach. These would identify the potential spill zone and possible extent of damage, as well as identify any possible remediation measures that would alleviate worst case scenarios. Cost and timeline for this effort is unknown, but it is hoped that an accurate GIS database would assist in making this a comparably quick and cheap process.

2) Comprehensive Inspection (Existing measure – Status: Ongoing)
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 resources costs. Funding for inspection equipment and any necessary repairs would be sought 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 County and City Public Works Departments, with final approval coming from the appropriate County or City government officials. This initiative is to be pursued on a regular basis to ensure the integrity of existing dams.

J. Multi-Jurisdictional Considerations – Dam failure has the potential to affect all areas of Dawson 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 Dawsonville.

K. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC 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. The County and its partners should also advance the internet application of all hazard mitigation measures, both to promulgate the Plan and implement those measures identified herein to increase citizen awareness and preparation. The County should also advance the use of Swift Reach 911 service throughout the community for any significant disaster.

2.10 All-Hazards

A. Mitigation Goals – The purpose of this section, although not necessarily related to technological hazards, is to allow the HMPC to recommend mitigation measures within this Plan that transcend individual hazards. Certain common mitigation measures are needed regardless of which specific hazard is at hand. Rather than list these multiple times within each different hazard category, the HMPC decided to list these "all-hazards" mitigation measures within a separate section of the Plan. The goal with these mitigation measures is again to minimize the loss of life and property, and to prevent disruption of services to the public to the greatest extent possible.

B. Range of Mitigation Options – In this section, there is a wide variety of mitigation measures offered for consideration. Subject matter ranges from communications to supplies to public education.

C. Mitigation Recommendations –From an all-hazards approach, the HMPC also recommends consideration of the following strategies:

1) Public Notification System/Reverse 911: (Existing measure – Status: Complete)
Rather than relying solely upon outdoor warning sirens and NOAA weather radios to notify the public in the event of an emergency, the HMPC believes that an emergency

notification system, commonly referred to as "Reverse 911", would be a tremendous asset to the County and would have tremendous potential to save lives. InterAct's Emergency Notification system delivers messages and warnings to telephone subscribers, while simultaneously recording responses from call recipients. Pre-recorded emergency messages can be transmitted to every caller on record, ensuring complete distribution of the emergency message. Any situation can be covered: tornados, flooding, hazmat spills, or anything other information needing to be disseminated. The program includes extensive management options for generating detailed reports on out-bound calls, responses from call recipients, and summary reports. There are too many features of this program to list within this Plan, but even if purchased only for the features described above, the program would be a worthwhile acquisition. The lead agency responsible for pursuing this project would be Dawson Co. 911 and/or Dawson Co. EMA. The estimated project cost is $50,000. Funding for this program would be sought through private and public grants. Final approval of such a project and/or any local matching funds, would come from the appropriate County or City government officials. If approved and adequate funding obtained, the implementation of this program would take between approximately nine months.

2) Generators: Power loss is a common result of many of the hazards that occur within the County and City. Generators should be considered for many critical facilities, including emergency response facilities and designated shelters, as well as pump stations. 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 critical facilities. A portable generator should also be purchased to power facilities that will not be equipped with a fixed generator. This generator could also be used for pump stations as well. This would require that any facility or pump station be pre-wired for the portable generator. The portable generator would be approximately 50 to 100 kilowatts and would include a trailer. The estimated cost of a portable generator, trailer, and pre-wiring for pump stations alone is estimated at $50,000. Estimates for other fixed generators cannot be obtained until it is determined which facilities will be equipped with generators. Specific recommendations for such measures should originate from Dawson Co. EMA and the City of Dawsonville, with final approval coming from the appropriate County or City government officials. Funding for this project would be sought from various public and private grant sources. If approved, the purchase and installation of any given generator could be accomplished within 3 months.

3) Designated Shelters: Additional Red Cross approved shelters are needed throughout Dawson Co. to use in the event of a disaster. Liberty Baptist Church could potentially house approximately 50 persons. Harmony Baptist Church could potentially house approximately 50 persons. Dawson Co. Parks & Rec building could potentially house up to 200 persons, Robinson Elementary School could potentially house up to 350 persons, and Dawson Co. Middle School could potentially house up to 150 persons. Kilough Elementary School could potentially house up to 125 persons. These new shelters would also need to have back up power via generators. The estimated cost of the addition of these generators is approximately $250,000. The Red Cross and Dawson Co. EMA

would be responsible for coordinating this effort. If approved and funding obtained, this project would take approximately 12 to 18 months to complete. We now have three Red Cross approved shelters with generator backup. Dawson County High School, Dawson County Middle School, and Riverview Middle School)

4) Water System Security: Additional security measures are required at the Etowah Water and Sewer Authority facility on Highway 53 in order to protect the facility from hazardous materials releases and possible terrorist attacks. This improved security system would include an electronic gate, secure driveway, cameras, recording devices, alarms, and other necessary electronic equipment. The estimated cost of this project is $15,000. Funding would be sought via public and private grants, with a possible local match. If approved and adequate funding obtained, this project would take approximately six to nine months to fully implement.

5) Multi-Hazard Emergency Planning for School Course: All Dawson Co. Public School System employees could be required to take the online course entitled "Multi-Hazard Emergency Planning for School". This course is applicable to school administrators, principals, teachers, secretaries, teachers, bus drivers and other personnel. The course is offered by the Emergency Management Institute. It teaches roles, duties, operations for schools, and will develop and test a school's Emergency Operations Plan. A cost estimate for this project has not yet been determined. The time frame for all personnel to complete this course could be approximately two years from the start of the program.

6) Non-Emergency Personnel Response: Dawson Co. and the City of Dawsonville could encourage its non-emergency employees to participate in the CERT program. Their assistance could be used to assist in the event of a disaster in a number of ways that do not necessarily require specialized public safety training. Dawson Co. EMA and the City of Dawsonville would be responsible for the coordination of this proposal.

7) Electronic Messaging Traffic Signs: The HMPC recommends the purchase of electronic messaging traffic signs to be used to warn the public and/or direct traffic during a hazardous materials release, flooding event, or other emergency situation. With GA 400 running straight through the County, it is imperative that there be a way for local emergency personnel to communicate with travelers headed towards a danger zone. A bare minimum of two signs would be required at a cost of approximately $60,000. The lead agency responsible for pursuing this project would be Dawson Co. EMA and Dawson Co. Public Works. Funding for this project would be sought through private and public grants. Final approval of such a project and/or any local matching funds, would come from the appropriate County or City government officials. If approved and adequate funding obtained, the purchase of this equipment would take approximately three to four months.

D. Multi-Jurisdictional Considerations – Many of the mitigation measures stated above would be much more effective if approached from a multi-jurisdictional manner. It is the hope of the HMPC that, whenever feasible, the County and City work in concert to pursue these projects to

ensure a seamless response capability for all jurisdictions, and to maximize the cost-effectiveness of any project funds.

E. Public Information and Awareness – As with all potential hazards identified within this plan, the HMPC recommends steps be taken to increase public awareness of the different hazards that affect Dawson Co., as well as the various response capabilities used to protect the public from these hazards. This section relates more to these response capabilities than to a specific hazard. Public awareness and education of these capabilities may be accomplished through means such as 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.

Table 2.1a - Overview of Natural Hazards in Dawson County and the City of Dawsonville

Hazard	Ga. Hazard Mitigation Strategy Standard Plan	Dawson County HMP Update	Comments
Tropical Cyclonic Events (Hurricanes & Tropical Storms)	Included	Included w/ severe storms, tornados, & flooding events	Contributes to downed trees, power lines, flooding
Coastal Flooding	Included	Not Included	Not a coastal county
Wind	Included	Included w/ severe storms & winter weather	Contributes to downed trees & power lines
Severe Weather (Includes Lightning & Hailstorms)	Included	Included	Contributes to downed trees, power lines, structure damage, flooding, & fires
Tornadoes	Included	Included	None
Inland Flooding	Included	Included	None
Severe Winter Storms	Included	Included	None
Drought	Included	Included	None
Wildfire	Included	Included	High degree of woodlands in county, even around urbanized areas
Earthquake	Included	Included	Rare occurrence; very low in magnitude

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

Event - Extent	Low	Mod	High	Ext.
Tropical Cyclonic Events		*(See Wind & Inland Flooding)*		
Coastal Flooding	NA	NA	NA	NA
Wind – Wind Speed	≤ 36 MPH	37–50 MPH	51-70 MPH	71–91 MPH
Severe Weather		*(See Wind & Inland Flooding)*		
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+
Earthquake - Magnitude	NA	NA	NA	NA

Table 2.1b *(Key shown above)*

HAZARD	DAWSON COUNTY	DAWSON-VILLE
Severe Thunderstorms		
Frequency	Low	Low
Severity	Mod.	Mod.
Probability	Low	Low
Winter Storms		
Frequency	Low	Low
Severity	Mod.	Mod.
Probability	Low	Low
Flooding		
Frequency	Mod.	Mod.
Severity	Mod.	Mod.
Probability	Mod.	Mod.
Tornadoes		
Frequency	Low	Low
Severity	Mod.	Mod.
Probability	Low	Low
Wildfire		
Frequency	Low	Low
Severity	High	High
Probability	Mod	Mod
Drought		
Frequency	Low	Low
Severity	Mod.	Mod.
Probability	Low	Low
Wildfire		
Frequency	Mod.	Low
Severity	Mod.	Mod.
Probability	Mod.	Low
Earthquake		
Frequency	V. Low	V. Low
Severity	Mod	Mod
Probability	Low	Low
Hazardous Material Release		
Frequency	Low	V. Low
Severity	Low	V. Low
Probability	Low	V. Low
Dam Failure		
Frequency	V. Low	V. Low
Severity	V. Low	V. Low
Probability	Low	Low

PLAN EXECUTION | 3

3.1 – Action Plan Implementation

The hazard mitigation planning process was overseen by the Dawson County Emergency Management Agency. Facilitation of the planning process was conducted by the Georgia Mountains Regional Commission. Once GEMA completes its initial review of this Plan, it will be presented to the Dawson Board of Commissioners for consideration. Once adopted, the Dawson Co. EMA Director shall assume responsibility for the maintenance of the Plan. It shall be the responsibility of the EMA Director to ensure that this Plan is utilized as a guide for initiating the identified mitigation measures within the community. The EMA Director, or his designee, shall be authorized to convene a committee to review and update this Plan annually. The Plan will also have to be updated and resubmitted once every five years. Through this Plan updating 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 HMPC prioritized the potential mitigation measures identified in this Plan. A list of mitigation goals, objectives and related action items was compiled from the inputs of the HMPC, as well as from others within the community. The subcommittee prioritized the potential mitigation measures based on what they considered most beneficial to the community. Several criteria were established to assist HMPC 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. Most 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 the County would benefit in relation to the project costs. After review by the HMPC, the prioritized list of mitigation measures, as presented within this Plan, was determined.

3.2 – Evaluation

As previously stated, the Dawson Co. 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. A committee, perhaps with much of the same membership as the existing HMPC, will convene in order to accomplish the annual plan evaluation. Additionally, the EMA Director, or his designee, is

encouraged to 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 HMP. The EMA Director will ensure the results of the evaluation(s) are reported to the Dawson Co. Board of Commissioners, as well as to any agencies or organizations having an interest in the hazard mitigation activities identified in the plan.

3.3 – Multi-Jurisdictional Strategy and Considerations

As set forth by Georgia House Bill 489, the Emergency Management Agency is the overall implementing agency for projects such as hazard mitigation. Dawson County will work in the best interests of the County as well as the City of Dawsonville. At the start of this planning process, Dawson County solicited the participation of the City of Dawsonville and received it. The City played an instrumental role in the planning process. As a result, a truly multi-jurisdictional plan was created for Dawson County and the City of Dawsonville, with ideas and viewpoints of all participants included.

3.4 – Plan Update and Maintenance

The Dawson County Hazard Mitigation Planning Committee (HMPC) is made up of approximately 22 members. The Chairman of the HMPC is EMA Director Billy Thurmond. The HMPC was represented by a very diverse cross-section of the County's population. This included local government officials, County and City employees, representatives from state agencies, volunteers, Red Cross personnel, utilities representatives, and various members of private industry. This diverse group provided valuable input into the planning process including identifying hazards and developing important mitigation measures to be considered in the future. Members were divided into subcommittees at times in order to review proposed mitigation measures from three different perspectives. The subcommittees were as follows: Public Safety Subcommittee, Government Planning & Infrastructure Subcommittee, and Private Industry and Volunteerism Subcommittee. The entire HMPC met several times over the course of this planning process, helping to review the previous plan for updates, collecting new information for authoring the new plan, and in reviewing draft material before ultimately submitting it to the County for approval.

Two public meetings relating to this Plan are required by FEMA: one during the drafting stages of the Plan, and one after the final Plan is completed. The initial meeting was held when a working draft was available for comment and HMPC members were able to discuss the critical issues and recommended measures proposed in the new draft. The second of the two meetings will occur once GEMA has approved this Plan and prior to adoption by the County. Other informal meetings were held throughout this planning process at various times between two or more HMPC members in order to accomplish smaller tasks. The draft material was also made available to the public via the County's web site: www.dawsoncounty.org

According to the requirements set forth in the Disaster Mitigation Act of 2000, Dawson County is required to update and revise the HMP every five years. At the direction of the EMA Director,

the Dawson Co. HMPC will reconvene in order to accomplish this requirement. The revision process should include a firm schedule and timeline, and identify any agencies or organizations participating in the plan revision. The 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 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. Dawson County is dedicated to involving the public directly in review and updates of the HMP. During the plan revision process, the committee will conduct, at a minimum, one public hearing near the completion of the revision process. This public hearing 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 Dawson County Board of Commissioners for formal adoption. In addition, all holders of the HMP will be notified of affected changes. No later than the conclusion of the five-year period following initial approval of the 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.

The Dawson County Hazard Mitigation Plan will be considered for incorporation into other local plans and programs. This includes some form of incorporation into the Dawson County Comprehensive Plan and the City of Dawsonville Comprehensive Plan at their next scheduled updates. The Comprehensive Plan, which focuses on land use and community development, is required of all local governments by the Georgia Dept. of Community Affairs (DCA). Portions of the HMP may also be integrated into the Dawson Co. Local Emergency Operations Plan (LEOP), City of Dawsonville emergency plans, and other existing or future public safety-related plans. In addition, some hazard mitigation projects may be good candidates for the local Short Term Work Program (SWP) which focuses on projects that enhance the community.

CONCLUSION 4

4.1 – Summary

Dawson 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 an extensive hazard history of recorded hazard events from the past fifty years, a detailed critical facilities database with valuable information on some of the most critical county and city 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 Planning Committee with representatives from all walks of life, but public hearings were conducted to provide all Dawson County citizens with the opportunity to comment on, and offer suggestions concerning potential hazard mitigation measures within the community. Dawson County and the City of Dawsonville worked in concert to ensure a broad range of citizens were represented. Elected officials, local government employees, pubic safety officials, Red Cross representatives, GA Forestry representatives, businesspersons, media, and other volunteers and interested parties provided important varying viewpoints to create a workable Plan. GEMA and NGCG provided valuable assistance as well. These efforts have all had the effect of better protecting our Community from the threats of nature and technology. While it would be naïve to believe this Plan provides complete protection to Dawson County and its residents, it is the hope of all parties involved in this planning 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.

4.2 – References

Publications/Documents:

The Disaster Mitigation Act of 2000
Robert T. Stafford Disaster Relief and Emergency Assistance Act
FEMA Pre-Disaster Mitigation *How-to Guides #1, 2, 3, 7*
GEMA Supplements to FEMA Pre-Disaster Mitigation How-to Guides
Georgia Tornado Database 1808 – 2002 (Westbrook)
Dawson County Local Emergency Operation Plan
Dawson County Hazard Mitigation Plan

Web Sites:

www.fema.gov (FEMA)
www.usfa.fema.gov (USFA)
www.fs.fed.us (USFS Fire Danger Class)
www.cpc.ncep-noaa.gov (Drought Severity Index)
www.ncdc.noaa.gov (National Climatic Data Center)
http://eqint.cr.usgs.gov (USGS Earthquake Probability Maps)

http://roadsidegeorgia.com/nrhp/Dawson (National Register of Historic Places)
www.tornadoproject.com (Tornado Project Online)
www.disastercenter.com (The Disaster Center)
www.gema.state.ga.us (GEMA)
www.gfc.state.ga.us (GFC)
www.georgiadrought.org (Drought in Georgia)
www.dawsoncounty.org (Dawson County)
www.dawsonville.com (City of Dawsonville)

Other Sources:
American Red Cross
American Society of Civil Engineers
Dawson County, Georgia
Dawson County Chamber of Commerce
City of Dawsonville
Federal Emergency Management Agency
Georgia Department of Natural Resources
Georgia Emergency Management Agency
Georgia Forestry Commission
Georgia Safe Dams Program
National Climatic Data Center
National Oceanic & Atmospheric Administration
National Weather Service
U.S. Army Corps of Engineers
U.S. Fire Administration
U.S. Forest Service
U.S. Geological Survey

APPENDICES

APPENDIX A – CRITICAL FACILITIES DATABASE AND MAPS

APPENDIX B - RELATED DAWSON COUNTY PLANNING RESOURCES

APPENDIX C – PUBLIC PARTICIPATION DOCUMENTATION

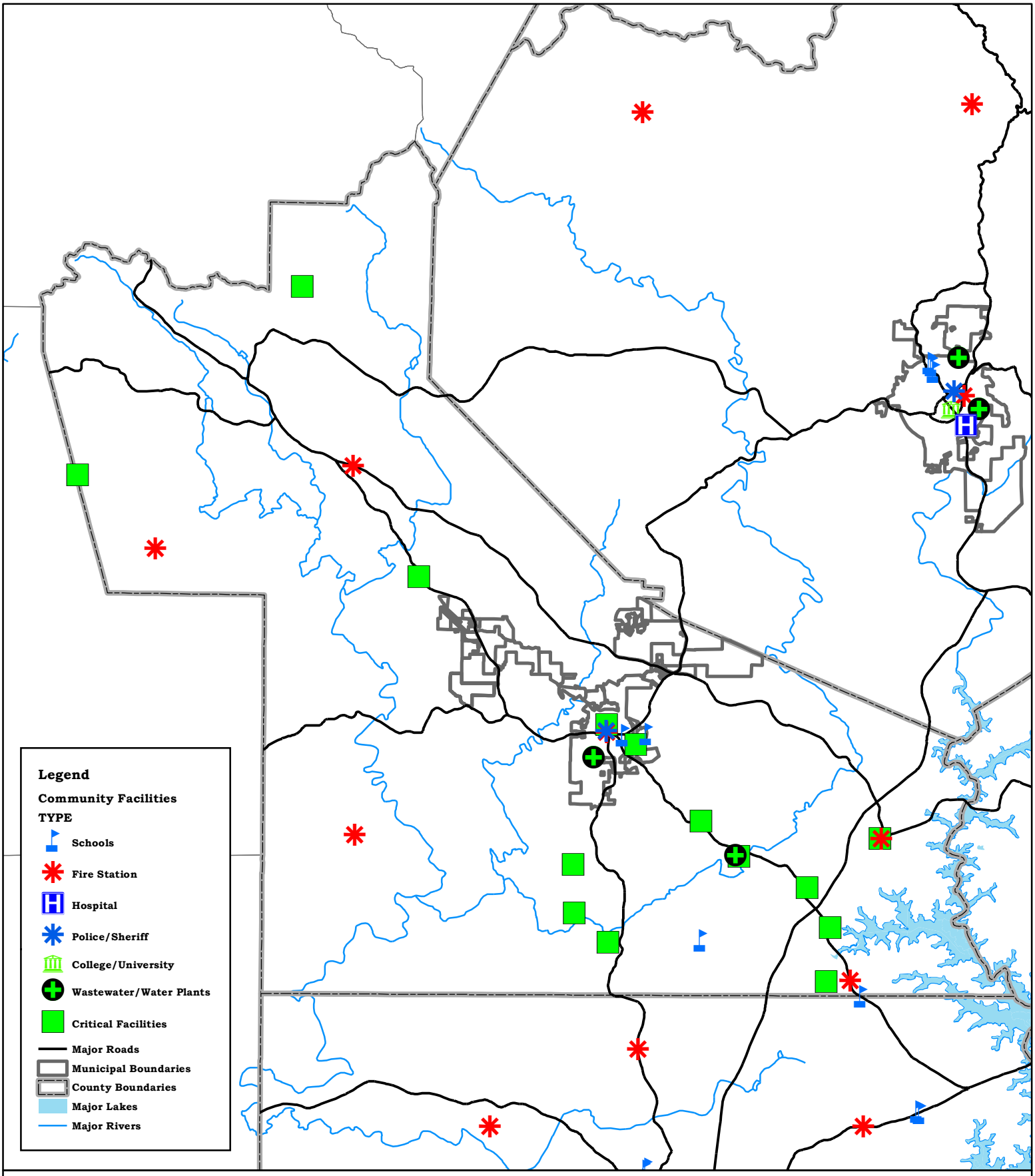
APPENDIX D – GLOSSARY

APPENDIX A – CRITICAL FACILITIES DATABASE

An inventory of the critical facilities for Dawson County and the City of Dawsonville has been compiled in an Excel workbook (see attached) in compliance with the requirements outlined by GEMA. These facilities were identified for their significance in maintaining/ restoring necessary operations within the community in the event of a major disaster. This includes fire stations, medical facilities and other structures vital to providing life saving and protective services to Dawson County.

Where applicable, secondary critical facilities have been identified and listed, as well. These facilities may not be directly related to the provision of life saving operations but their function does impact the performance of Dawson County Emergency Services. These include bridges, culverts and public enterprises considered of high importance to Dawson County residents.

Maps illustrating the location of critical facilities, including their relationship to potential hazardous areas, are included within this appendix.

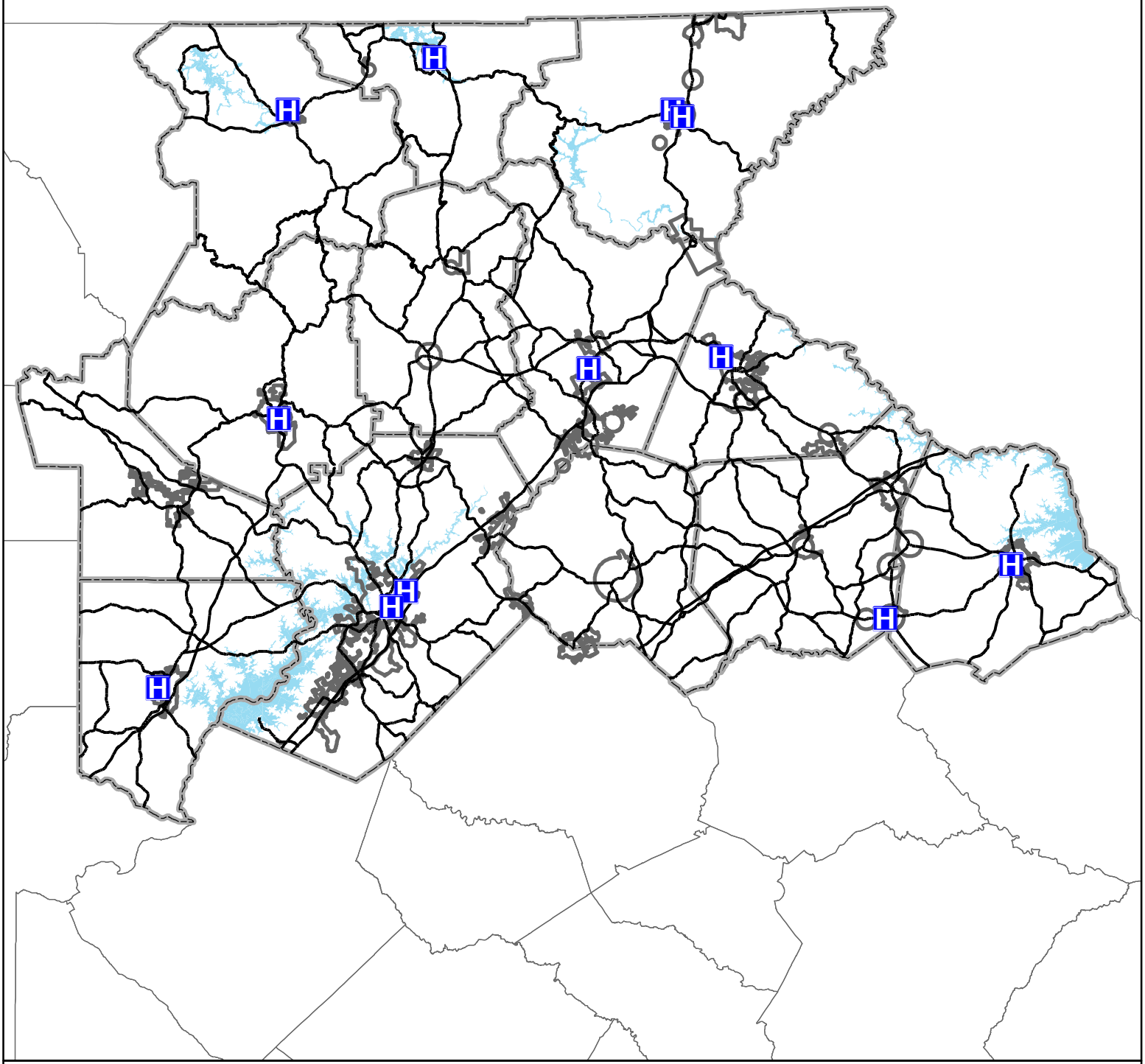


Dawson County
Hazard Mitigation Plan
Critical Facilities

N
W E
S

Georgia Mountains Regional Commission
Map Prepared By: FDB, May, 2012

0 1 2 4 6 Miles

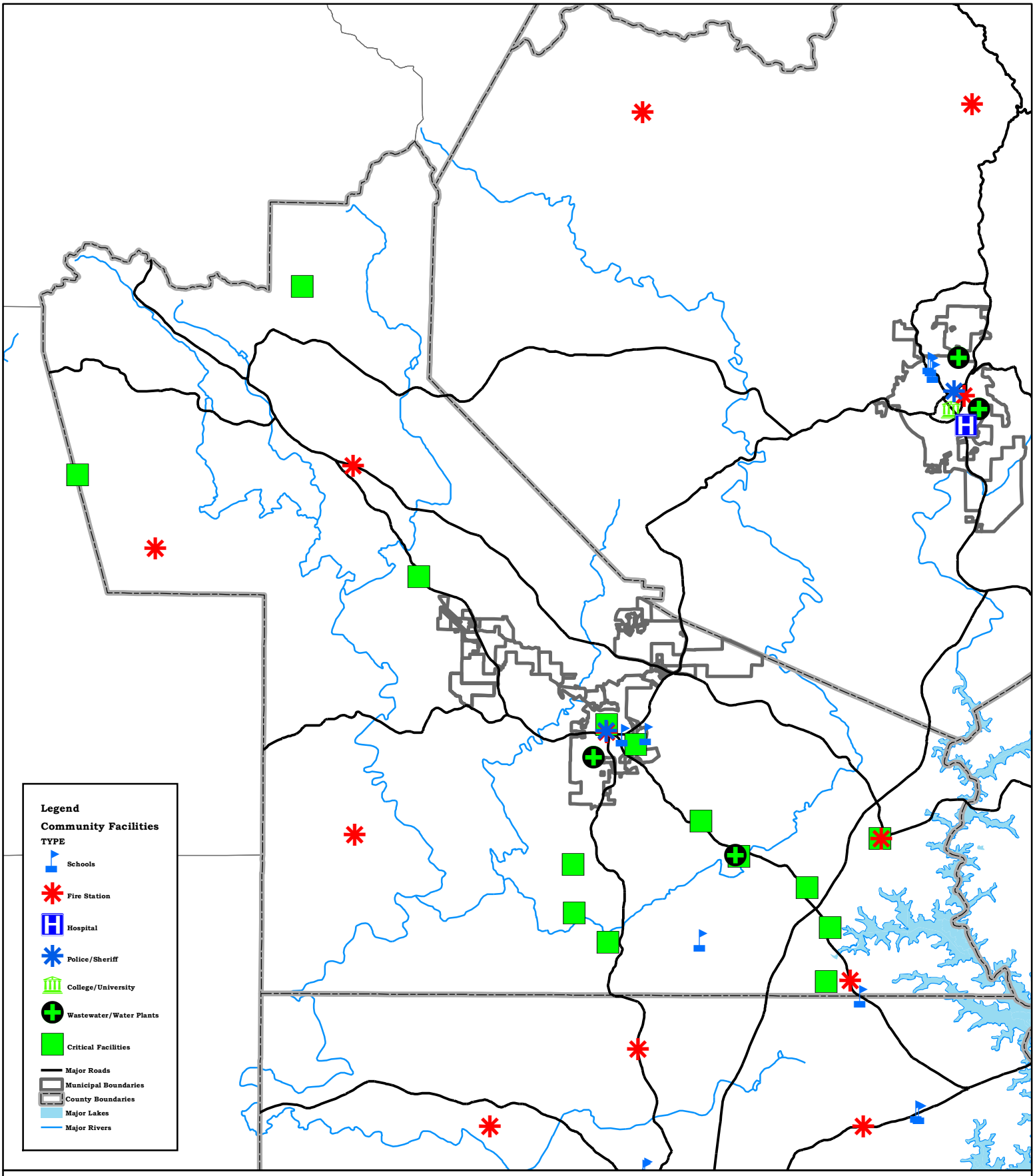


Dawson County
Hazard Mitigation Plan
Regional Medical Facilities

N
W E
S

Georgia Mountains Regional Commission
Map Prepared By: FDB, May, 2012

0 4 8 16 24
Miles

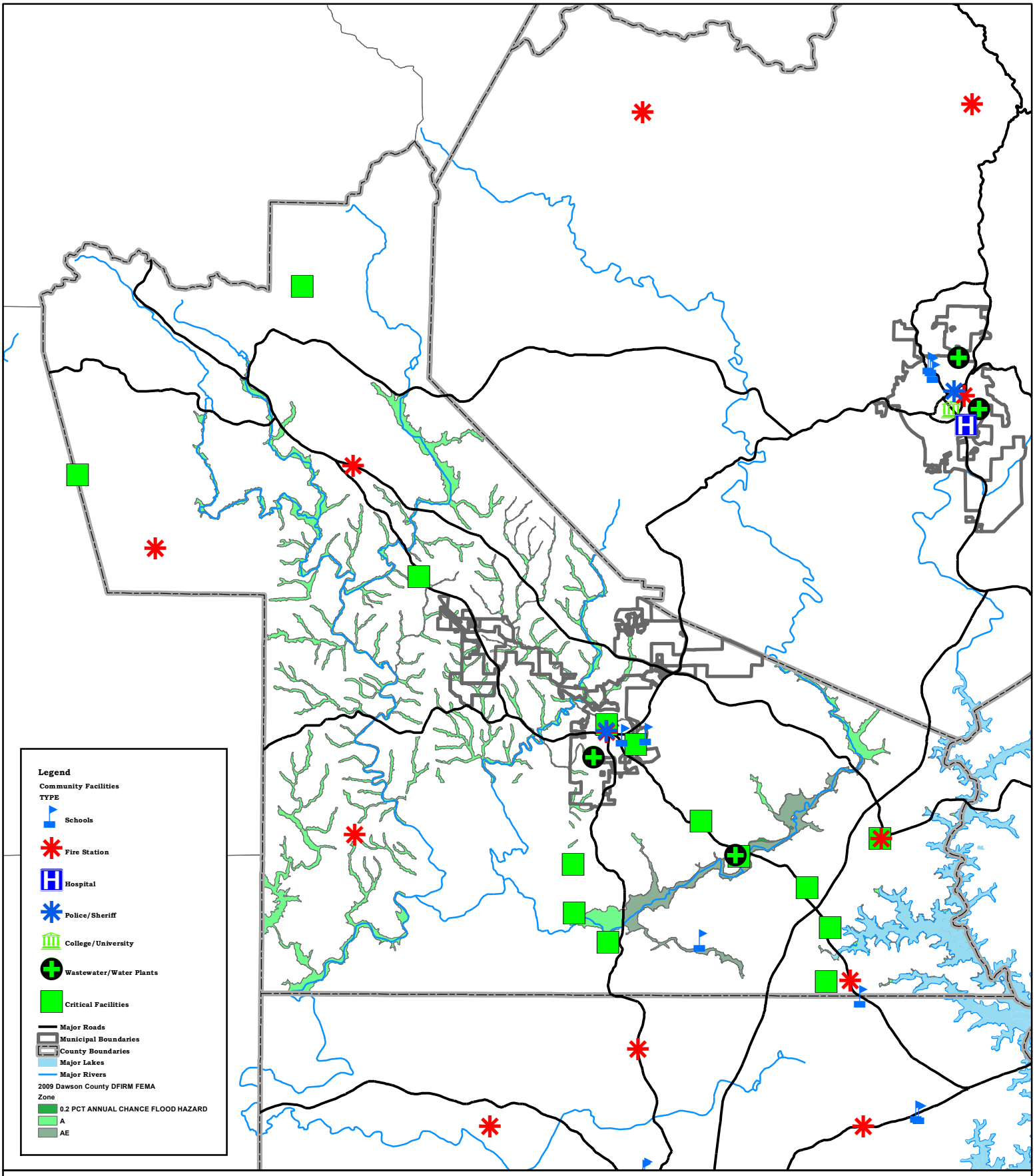


Dawson County
Hazard Mitigation Plan
Major Roads/State Routes and Critical Facilities

N
W E
S

Georgia Mountains Regional Commission
Map Prepared By: FDB, May, 2012

0 1 2 4 6 Miles

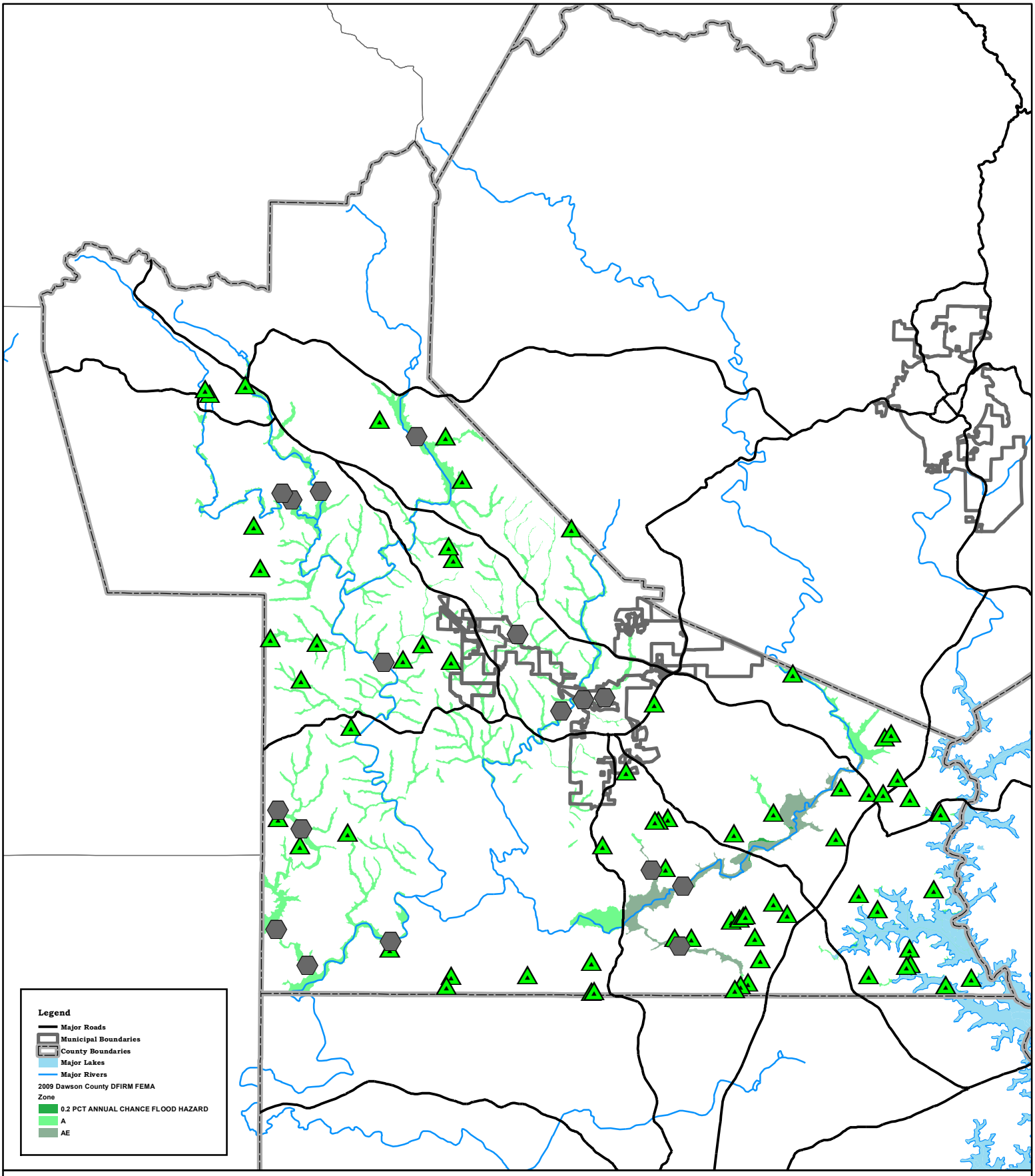


Dawson County
Hazard Mitigation Plan
Flood Plains - Critical Facilities

N
W E
S

Georgia Mountains Regional Commission
Map Prepared By: FDB, May, 2012

0 1 2 4 6 Miles

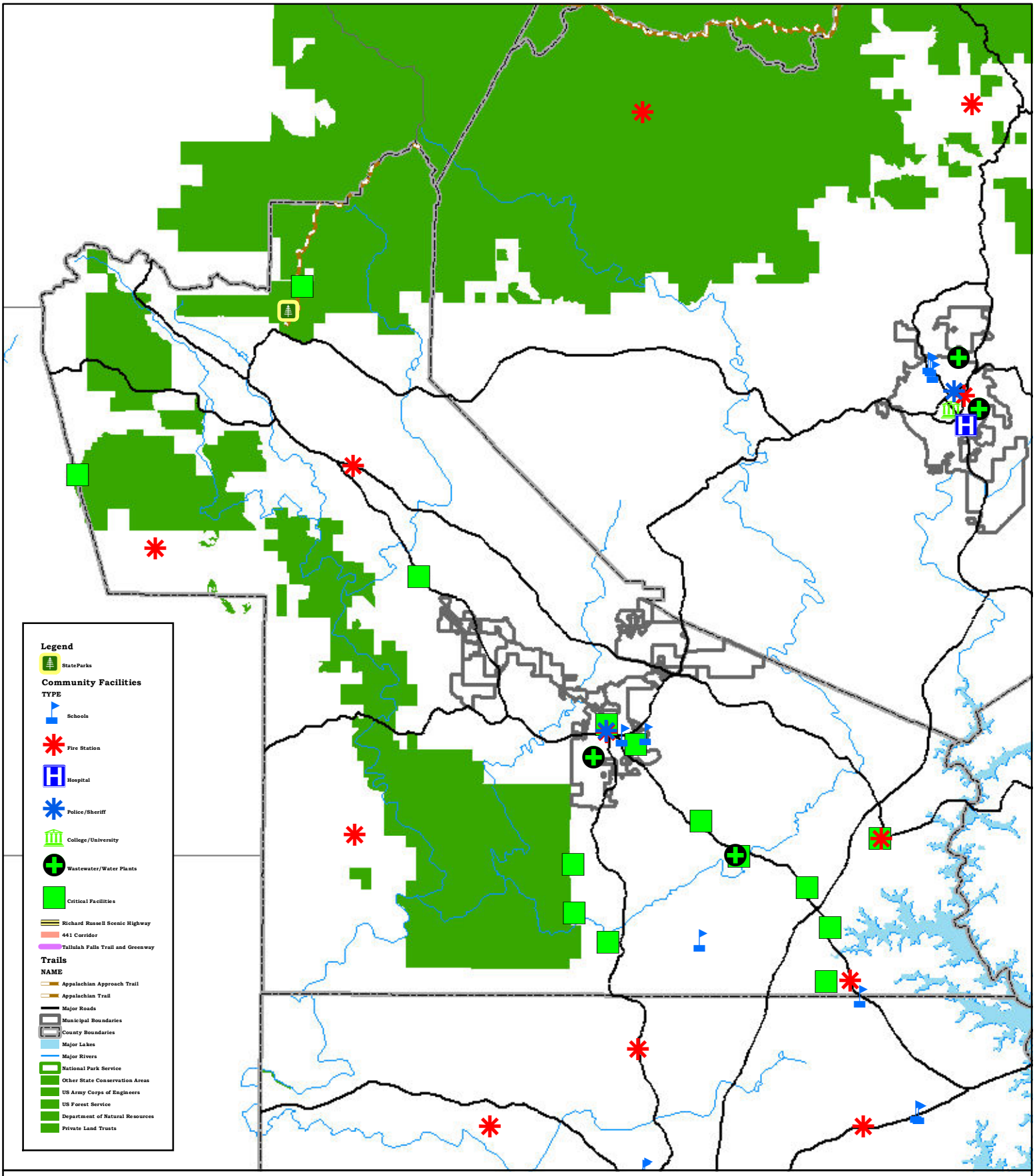


Dawson County
Hazard Mitigation Plan
Flood Plains - Culverts and Bridges

N
W E
S

Georgia Mountains
Regional Commission
Map Prepared By: FDB, May, 2012

0 1 2 4 6 Miles

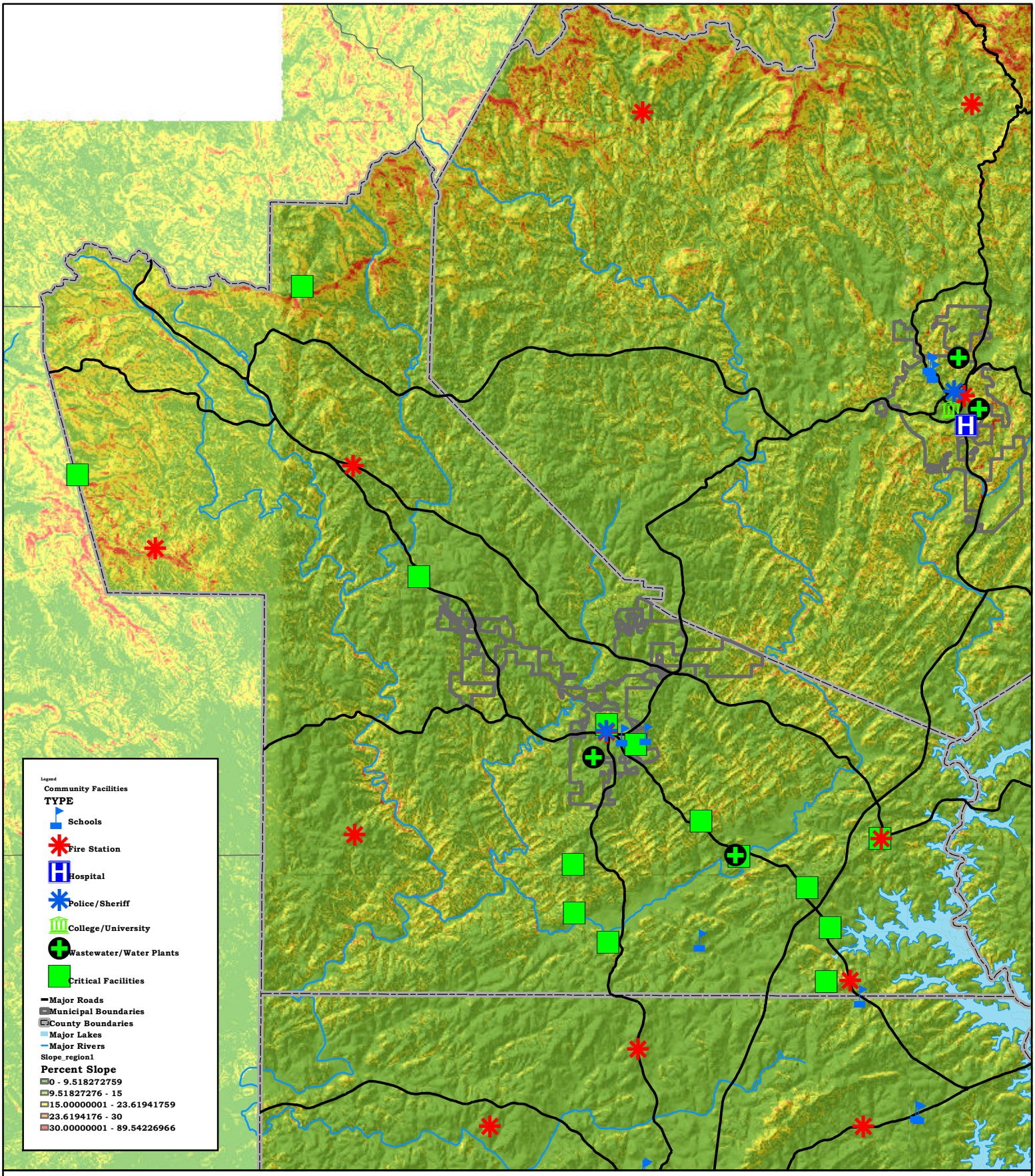


Dawson County
Hazard Mitigation Plan
Major Woodlands and Critical Facilities

N
W E
S

Georgia Mountains Regional Commission
Map Prepared By: FDB, May, 2012

0 1 2 4 6 Miles

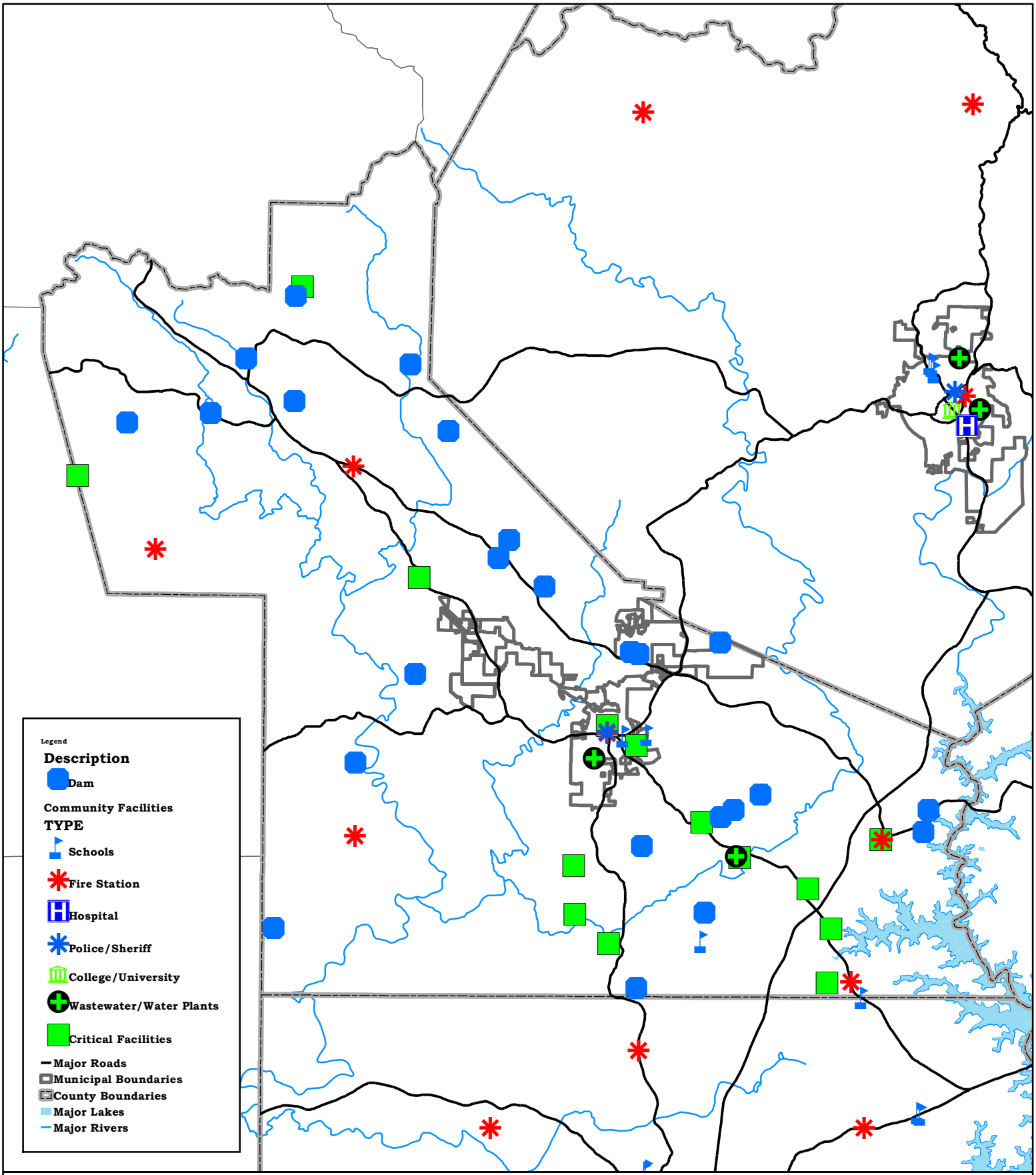


Dawson County
Hazard Mitigation Plan
Steep Slopes and Critical Facilities

N
W E
S

Georgia Mountains Regional Commission
Map Prepared By: FDB, May, 2012

0 1 2 4 6 Miles



Dawson County
Hazard Mitigation Plan
Dams and Critical Facilities

N
W E
S

Georgia Mountains Regional Commission
Map Prepared By: FDB, May, 2012

0 1 2 4 6 Miles

APPENDIX B – RELATED DAWSON COUNTY PLANNING RESOURCES

Dawson County Planning and Development

- Comprehensive Plan
- Local Ordinances and Regulations

http://dawsoncounty.org/departments/dawson-county-planning-and-development/

Dawson County Emergency Services

- Hazard Mitigation Plan
- Local Emergency Response Plan

http://dawsoncounty.org/departments/dawson-county-emergency-services/

City of Dawsonville

- Comprehensive Plan
- Local Ordinances and Regulations

http://www.dawsonville-ga.gov/

APPENDIX C – PUBLIC PARTICIPATION DOCUMENTATION

(See attached pdf file)

APPENDIX D – GLOSSARY

Disaster: The occurrence of widespread or severe damage, injury, loss of life or property, or such severe economic or social disruption that supplemental disaster relief assistance is necessary for the affected political jurisdiction(s) to recover and alleviate the damage, loss, hardship, or suffering caused thereby.

EOC: Emergency Operations Center

Extensive: Having wide or considerable extent.

Federal Emergency Management Agency (FEMA): Federal agency under the Department of Homeland Security responsible for coordinating the federal government's efforts to plan for, respond to, recover from and mitigate against the effects of natural and technological hazards.

Flash Flood Warning: Flash flooding is actually occurring or imminent in the warning area. It can be issued as a result of torrential rains, a dam failure, or ice jam.

Flash Flood Watch: Flash flooding is possible in or close to the watch area. Flash Flood Watches are generally issued for flooding that is expected to occur within 6 hours after heavy rains have ended.

Flood Insurance Rate Map (FIRM): Prepared by the Federal Emergency Management Agency to show Special Flood Hazard Areas; this map is the basis for regulating development according to the Regulations for Flood Plain Management (Chapter 64) and Standards for Construction of Streets and Drainage in Subdivisions (Chapter 82).

Flood Warning: Flooding conditions are actually occurring or are imminent in the warning area.

Flood Watch: High flow or overflow of water from a river is possible in the given time period. It can also apply to heavy runoff or drainage of water into low-lying areas. These watches are generally issued for flooding that is expected to occur at least 6 hours after heavy rains have ended.

Frequency: A measure of how often events of a particular magnitude are expected to occur.

Georgia Emergency Management Agency (GEMA): Georgia state agency responsible for coordinating state efforts to plan for, respond to, recover from, and mitigate against the effects of natural and technological hazards.

Grant: An award of financial assistance.

Grantee: A government entity to which a grant is awarded and which is accountable for use of the funds provided. The grantee is the entire legal entity even if only a particular component of the entity is designated in the grant award document.

Hazard: The natural or technological phenomena, event or physical condition that has the potential to cause property damage, infrastructure damage, other physical losses, and injuries and fatalities.

High: Of greater degree, amount, cost, value, or content than average.

Hurricane Warning: Hurricane conditions are expected in the warning area in 24 hours or less.

Hurricane Watch: Hurricane conditions (sustained winds greater than 73 mph) are possible in the watch area within 36 hours.

Low: Characterized as being toward the bottom of the range.

Measure: Any mitigation measure, project or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters.

Minor: Not serious or involving risk to life.

Mitigation: Actions taken to reduce or eliminate the long-term risk to life and property from hazards. Mitigation actions are intended to reduce the need for emergency response – as opposed to improving the ability to respond.

Moderate: Tending toward the mean or average amount.

National Flood Insurance Program (NFIP): Located within FEMA, and charged with preparing FIRMs, developing regulations to guide development, and providing insurance for flood damage.

Probability: A measure of the likelihood that a hazard event will occur.

Risk: The potential losses associated with a hazard. Ideally, risk is defined in terms of expected probability and frequency of the hazard occurring, the people and property that are exposed, and the consequences.

Severe Thunderstorm Warning: A severe thunderstorm has actually been observed by spotters or indicated on radar, and is occurring or imminent in the warning area.

Severe Thunderstorm Watch: Conditions are conducive to the development of severe thunderstorms in and close to the watch area.

Severity: Degree of critical or dangerous result; degree of inflicted physical discomfort or hardship.

Special Flood Hazard Area (SFHA) or **Floodplain:** The area adjoining a river, stream, shoreline or other body of water that is subject to partial or complete inundation. The SFHA is

the area predicted to flood during the 1% annual chance flood, commonly called the "100-year" flood.

State Hazard Mitigation Program: An ongoing program involving a coordinated effort of state agencies to reduce the threat to people and property from natural hazards. During and following periods of presidentially declared major disasters, this program or approach is the compilation of activities required under Sections 404 and 409, Federal Regulations.

Subgrant: An award of financial assistance under a grant to an eligible subgrantee.
Subgrantee: Government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided. Subgrantees may be a state agency, local government or eligible private non-profit organizations as defined in Section 206.433, 44 CFR.

Tornado Warning: A tornado has actually been sighted by spotters or indicated on radar and is occurring or imminent in the warning area.

Tornado Watch: Conditions are conducive to the development of tornadoes in and close to the watch area.

Tropical Storm Watch: Tropical storm conditions with sustained winds from 39 to 73 mph are possible in the watch area within the next 36 hours.

Tropical Storm Warning: Tropical storm conditions are expected in the warning area within the next 24 hours.

Other definitions applicable to the administration of the Hazard Mitigation Program are found in Section 206.401, 44 CFR, Part 206 and the Georgia Administrative Plan for Public Assistance.