STEWART COUNTY
City of Lumpkin
City of Richland

PRE-DISASTER MITIGATION PLAN

2019

PREPARED WITH STAFF ASSISTANCE FROM:
RIVER VALLEY REGIONAL COMMISSION

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Place holder for adoption resolution.
## Contents

1- INTRODUCTION 8

2- LOCAL NATURAL HAZARD, RISK AND VULNERABILITY SUMMARY 19

3 - LOCAL TECHNOLOGICAL HAZARD, RISK AND VULNERABILITY SUMMARY 28

4 – LOCAL NATURAL HAZARD MITIGATION GOALS AND OBJECTIVES 55

5 – LOCAL TECHNOLOGICAL HAZARD MITIGATION GOALS AND OBJECTIVES 86

6 – EXECUTION OF THE PLAN 98

7 – CONCLUSION 104

SEE ATTACHMENTS FOR:

**APPENDIX A**- HAZARD IDENTIFICATION, RISK ASSESSMENT AND VULNERABILITY (HRV)

**APPENDIX B**- GROWTH AND DEVELOPMENT TRENDS/COMMUNITY INFORMATION

**APPENDIX C**- OTHER PLANNING DOCUMENTS

**APPENDIX D**- WORKSHEET USED IN PLANNING PROCESS

**APPENDIX E**- COPIES OF REQUIRED PLANNING DOCUMENTATION

**APPENDIX F** – GLOSSARY OF TERMS
1- INTRODUCTION

1.1 Purpose of the Pre-Disaster Mitigation Plan, Authority, and Statement of Problem

The Robert T. Stafford Disaster Relief and Emergency Assistance Act authorizes the release of federal financial assistance to communities that have experienced a disaster, and have been declared a disaster area by the president of the United States. With the amended Disaster Mitigation Act of 2000, starting November 1, 2004, it is not enough for local governments to receive a presidential disaster declaration, but they must have prepared and adopted a federally approved pre-disaster mitigation plan in order to be eligible for federal financial disaster assistance. Thus, counties across the nation are required to create a Pre-Disaster Mitigation Plan to address the community’s vulnerability to hazards prior to a disaster event.

This amendment is trying to reduce the financial burden placed on the nation’s taxpayers, which has increased through the past years, when communities have turned to the government for help after they have experienced a disastrous event. The communities have to identify where and why they are susceptible to natural and technological hazards, and show which measures are being taken to mitigate, reduce or eliminate the exposure to these hazards. Stewart County has experienced severe weather conditions in the past, including wildfires, severe thunderstorms, tropical storms, tornados, as well as hazardous floods.

Potentially deadly weather impacts every American. About 90 percent of all presidential disaster declarations are weather related, as all five were presidential disaster declarations for Stewart County. Severe weather results in approximately 500 deaths per year in the United States and approximately $14 billion in damage. Stewart County and its municipalities are no way immune to technological hazards like materials releases, transportation accidents, and dam failure. Preparedness is the key to saving lives and protecting property.

Stewart County and the Cities of Lumpkin and Richland have included mitigation efforts in their planning processes. In their 2016 Comprehensive Plan, Stewart County outlined as one of its objectives to “Protect residents from significant hazards to life, health and property.” In 2012 the Local Emergency Operations Plan (LEOP) was updated “to ensure prior mitigation/preparedness, appropriate response and timely recovery from natural or man-made hazards that may affect this county.” For the Executive Summary of the LEOP, please refer also to Appendix C, pages C1-C4.

This Pre-Disaster Mitigation Plan represents Stewart County’s efforts to profile in detail the natural and technological hazards threatening the residents and structures in the county. With an estimation of the frequency of hazards, threats and mitigation efforts can be prioritized, and risks from natural and technological hazards reduced. Key players, who are working on reducing the effects of potential hazards, can find information and
guidance in these documents. While this plan has been trying to address most known potential hazards, it does not claim to cover all possible risks. The plan has been the first large-scale effort to fully understand the potential impact of disasters affecting the community, including analysis and evaluation of hazard events, exposure of critical facilities to hazards, potential losses, and an assessment of current plans and mitigation efforts. The result is a prioritized list of goals and strategies that can be implemented to ensure the safety of all Stewart County residents.

It is a requirement of the regulations above, local Mitigation Plans must be updated and resubmitted to FEMA for approval every five (5) years in order to continue eligibility for FEMA hazard mitigation assistance programs.

The mitigation planning regulation at §201.6(d) (3) states:

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grant funding.

Plan updates must demonstrate that progress has been made in the past 5 years for Local Mitigation Plans to fulfill commitments outlined in the previously approved plan. This involves a comprehensive review and update of each section of the Local Mitigation Plan and a discussion of the results of evaluation and monitoring activities detailed in the Plan Maintenance section of the previously approved plan. Plan updates may validate the information in the previously approved plan, or may involve a major plan rewrite. A plan update is NOT an annex to the previously approved plan; it stands on its own as a complete and current plan.

In this plan update, the communities have to identify where and why they are susceptible to natural and technological hazards, and show which measures are being taken to mitigate, reduce or eliminate the exposure to these hazards. This will reduce the financial burden placed on the nation’s taxpayers, which has increased through the past years, when communities have turned to the government for help after they have experienced a disastrous event.

1.2 Methodology, Planning Process, and Participants

The Stewart County Pre-Disaster Mitigation Committee has been appointed by the Stewart County Board of Commissioners to develop this Pre-Disaster Mitigation Plan in conjunction with the Stewart County Emergency Management Agency. Additionally, representatives from various community agencies were invited and participated in the planning process, such as the Stewart County EMS and Fire Department, the West Central Health District Office of EMS and Emergency Preparedness, the Stewart County Family Connection, Stewart County Board of Education, the Stewart Webster Rural Health Clinic and Stewart County Coroner and numerous local government officials. For a copy of the PDM Planning Committee Mail out list, please refer below. The River Valley Regional Commission (RVRC) facilitated the planning process, assisted the committee in their collection of data, research, and analysis, attended the committee
meetings, facilitated the public hearings, helped with the compilation of the map data, and developed the written document. Representatives of the public and private sector were active in the planning process.

The full committee met on January 17, 2019, which is the date of the first public hearing and continued meeting until the final public hearing on May 28, 2020. divided into subcommittees. The Pre-Disaster Mitigation Executive Committee consisted of the chief appointed officials of the cities and the county, city and county staff, and the Director of the Emergency Management Agency. This committee has been responsible for the mission and vision, for reviewing the input from the key players, and will be responsible for the implementation of the plan. This committee has also profiled hazards, identified critical facilities and their exposure to hazards, and developed mitigation strategies. Participants and their titles are listed below.

Greg Stewart, Stewart County, EMA Director
Michael J. Donahue, Stewart Detention Center
Jimmy Babb, City of Lumpkin Mayor
Adolph McLendon, City of Richland Mayor
David Davis, City of Lumpkin, City Manager
Mac Moye, Stewart County Manager
Edwin Thomas G. Turner, Stewart County, Family Connections
Teresa Thomas, GA Department of Public Health, Health Care Liaison
Robyn Fant, Stewart County, Board of Education
Joseph Williams, Stewart County, Commission Chairman
Jacqueline Sutton Ball, Stewart County, County Clerk
Mary Rushin, Stewart County, Assistant County Clerk
Rebecca Buchan, Stewart County Water Authority
Valerie Roberts, Stewart County School Superintendent of Education
Clint Story, Stewart-Webster Rural Health Clinic
Rebecca Shepherd, Stewart-Webster Rural Health Clinic
Chip Jones, Stewart County, Development Authority/Richland Main Street Program Manager
Rick Morris, River Valley Regional Commission; Planning Director

Neighboring counties and local officials were invited via email and word of mouth to planning meetings for an opportunity to provide input on plan development. The counties invited include Chattahoochee County EMA Director and Fire Chief Johnny Floyd, Webster County EMS Director Darrell Holbrook, Marion County EMA Director Samuel Schiro, Quitman County EMA Director Bradley Taylor, and Randolph County EMA Director and Fire Chief Kenneth Burns. Neighboring counties and citizens were also asked to provide input on plan development through Public Hearing announcements published in the Stewart-Webster Journal. The Public Hearing announcements can be found in Appendix E.

Sign-in sheets and labor documentation sheets were kept in order to verify that the community met the 25% local match from planning dollars awarded by GEMA. Copies of the sign-in sheets, meeting agendas and minutes can be found in Appendix E. Due to the personal salary information, labor documentation sheets are not included in this
document, but are being maintained on file by the Stewart County EMA Director for no less than three years from the date of approval, for audit purposes. Four existing planning documents were used:

Stewart County Comprehensive Plan 2016
Stewart County Local Emergency Operations Plan 2012
Community Wildfire Protection Plan for Stewart County 2018
Georgia Hazard Mitigation Strategy Update 2019
2019 GEMA HAZUS Report

Some of the items in these documents above which were considered when writing this plan include the “Land Use or Zoning Categories to be Allowed” in the 2016 Comprehensive Plan, noting that development should be discouraged in flood prone areas, and instead passive recreation and green space should be encouraged in these areas. Also, in general, as character areas are defined throughout the county, one of the overarching policies should be to encourage review of development ordinances to “Protect residents from significant hazards to life, health and property.” Action Items from the Stewart County Pre-Disaster Mitigation Plan also are included in other plans. For example the Stewart County 2016 Comprehensive Plan Community Work Program includes the construction of a new EMS building in Lumpkin and possibly new fire stations in Omaha and Florence. These facilities are needed to help improve fire and EMS services by creating more space for needed equipment like generators and water tankers, which are included as action items in the 2019 Pre-Disaster Plan.

In the Emergency Operations Plan and the Georgia Hazard Mitigation Strategy, the personnel and responsibilities related to emergency operations throughout the county for all types of hazards are assigned.

The County’s Community Wildfire Protection Plan and State Hazard Mitigation Strategy were consulted when developing the goals and objectives for each potential hazard.

Stewart County does not have a Flood Insurance Study or a Flood Mitigation Assistance Plan. As a result, information from these documents was not included in the Hazard Mitigation Planning process.

Other sources used were the National Climatic Data Center (NCDC), the Georgia Department of Natural Resources (GA DNR), the National Oceanic and Atmospheric Administration (NOAA), the Federal Emergency Management Agency (FEMA), the Office of Homeland Security-Georgia Emergency Management Agency (GEMA), the Georgia Department of Transportation (GDOT), U.S. Census data, Georgia County Guide, Georgia Department of Community Affairs (DCA), Georgia Forestry Commission, (GFC), United States Geological Services (USGS), and others. This document was created by funneling the research, data, ideas, and thoughts of the key players in Stewart County and of the Stewart County Pre-Disaster Mitigation Planning Committee, and putting them together into one comprehensive document.
Public Hearings were part of the plan creation, held in an effort to attain public participation, and input to the local plan. The first public hearing took place on January 17, 2019 at the Stewart County courthouse. The second public hearing was held on May 28, 2020 at Stewart County Courthouse. The January 17, 2019 Public Hearing was advertised in the Stewart-Webster Journal, which is Stewart County’s legal organ. At the end of each pre-disaster mitigation plan meeting the next meeting is scheduled so all citizens in attendance have knowledge of upcoming meetings. At the public hearings, the public was able to give their input to the local plan, review copies of the Pre-Disaster Mitigation Plan draft, and comment on the identified hazards and mitigation strategies. Copies of the Public Hearing Notices and minutes can be found in Appendix E.

Drafts were presented to the full committee for its review and comment on April 26, 2020. Members of the Stewart County Board of Commissioners and the Mayors of Richland and Lumpkin were also given a copy of the corrected draft. Authorization was given to submit this plan to GEMA for their review and approval. Once approved the plan will go before the county and its municipalities for adoption and will then be submitted to FEMA.

1.3 Organization of this Plan

In Chapter 2, eight natural hazards are analyzed in detail, including a description of the hazard, the damage potential, the frequency of occurrence in the past, and the probability for future events. The description is followed by an inventory of assets exposed to the hazard, and an estimate of potential losses that could be expected. Land use and development trends are also being identified in their relationship to the hazard, and multi-jurisdictional differences identified. Chapter 3 addresses two technological hazards and two man-made hazards in the same manner as the natural hazards in Chapter 2. The following two Chapters, 4 and 5, present the local mitigation goals and objectives for both natural and technological hazards respectively. These chapters list mitigation options, existing policies, and community values, and identify mitigation strategies, including tasks and action steps, and recommendations to mitigate adverse impacts of hazard events. The execution of the plan is outlined in Chapter 6, addressing the implementation, evaluation, update and maintenance of the plan. The document concludes with a summary in Chapter 7, followed by appendices as supporting documentation.

1.4 Hazards, Risk, and Vulnerability Summary, Local Mitigation Goals and Objectives

In this plan, eight natural hazards, two technological hazards, and two man-made hazards are identified and evaluated in their potential impact on Stewart County. The purpose of this hazard, risk and vulnerability assessment is to understand how vulnerable Stewart County is to each hazard, and how the exposure to the hazard can be reduced. By identifying the nature of each hazard, past events, the frequency of occurrence, and the estimated probability of a future event to take place, a profile is developed for each hazard. The most threatening natural hazards in Stewart County, as identified by the committee, are thunderstorms/hail, tropical storms/hurricanes, tornados, floods, droughts, and wildfires. In addition, as Stewart County is largely agricultural, the presence of the Southern Pine Beetle and the IPS Beetle present hazardous threats throughout the county.
Two technological hazards have been identified by the committee, the most threatening being hazardous materials incidents, released in both fixed and in transportation accidents. Stewart County is also at risk of experiencing dam failure among any of the twenty-five dams located throughout the county. Furthermore, two man-made hazards have been identified by the committee; these include civil disturbance and terrorism. Civil disturbance has been identified by the planning committee due to the increasing criminal and illegal activities which the County is currently dealing with. The committee identified terrorism as a possible threat due to the County’s close proximity to the Fort Benning Military Installation. The committee also considered landslides, funnel cloud and waterspouts, earthquakes However the committee found these to be of low to non-existent threat; therefore these hazards were not included in this plan.

The next step is to identify critical facilities, ranging from buildings to infrastructure, and assess if they are in hazard prone or susceptible areas. Should these facilities ever be damaged, potential losses could be expected, and an estimate is made at this time. Critical facilities are essential to the community because their functions and services are important to the health and welfare of the population. Included are facilities for public safety, for emergency response, and facilities with disaster recovery functions.

In order to assess and reduce the risk of exposing facilities to hazards, land use and development trends in Stewart County are reviewed. Mitigation options become apparent, and can be considered in future land use decisions. In case that the situations in the City of Richland, City of Lumpkin and Stewart County differ, these multi-jurisdictional differences have been addressed here as well.

Stewart County’s overall mitigation goals are as follows:

**Mitigation Goal #1  Protect the Public Health and Safety**
Objective 1: Increasing public awareness of the wide range of natural hazards, their effects, and hazard mitigation.
Objective 2: Provide educational programs and activities for the community to promote severe weather awareness.
Objective 3: Provide educational and meaningful programs and activities for the community to promote severe weather training.

**Mitigation Goal #2  Institutionalize mitigation**
Objective 1: Improve the comprehensive mitigation strategy.
Objective 2: Prevent losses of vital public records.
Objective 3: Increase coordination between local public departments and between the public and private sectors in pre-disaster planning.

**Mitigation Goal # 3  Provide immediate warning to the public in the event of a severe weather event or onset of a natural hazard**
Objective 1: Inform public in advance through public warnings.

**Mitigation Goal # 4  Effectively respond to and recover from severe weather events**
Objective 1: Coordinate training for members of Stewart Counties EMA office on natural Hazards.
Objective 2: Assist in the development and implementation of guidelines and procedures to respond to and recover from severe weather events or the onset of a natural hazard.

**Mitigation Goal # 5**

**Respond promptly, appropriately and efficiently in the event of a natural or man-made hazard when shelters are required**

Objective 1: Increase the capability of the employees of the Department of Family and Children Services (DFCS), American Red Cross, Public Health and EMS trained in basic shelter Operations.
Objective 2: Increase response capabilities by purchasing shelter equipment.

**Mitigation Goal #6**

**Maintain up-to-date data base and assessment of vulnerability of critical facilities endangered by hazards**

Objective 1: Use the on-line map tool from GEMA to map and identify the still any new critical facilities.
Objective 2: Keep up-to-date records of critical facilities.

### 1.5 Multi-Jurisdictional Special Considerations

This Pre-Disaster Mitigation Plan has been developed for Stewart County, the City of Richland, and the City of Lumpkin. With few exceptions, all three jurisdictions are exposed to the same hazards. Where applicable, specific mitigation actions needed to reduce the adverse impacts of specific hazards have been identified for each jurisdiction. The mitigation goals are similar for all entities.

Through analysis of the population and possible special needs in the three jurisdictions, it is apparent that the number of senior citizens 65 years and older is relatively higher than the State average of 10.7%, with 14.2% in Stewart County, 20.0% in the City of Richland, and 7.2% in the City of Lumpkin. In 2019 the number of senior citizens 65 years and older is 17.3% Stewart County, 23.9% Richland and 16.1% Lumpkin. The population of county and city is becoming increasingly older with the age category of 65 years and above experiencing the greatest increase (ESRI Business Analyst 2019).

### 1.6 Adoption, Implementation, Monitoring, and Evaluation of the Plan

Since the completions of the document, GEMA reviewed the plan to ascertain that it complies with federal regulations. A second public hearing was held on May 15, 2020. After the official GEMA approval on ____________, the Stewart County Pre-Disaster Mitigation Plan was formally adopted by the Richland and Lumpkin City Councils and the Stewart County Board of Commissioners on ____________, and __________ respectively, and subsequently submitted to GEMA and FEMA. Please refer to the adoption resolution on page 11.

A system for the implementation, evaluations, updating and maintenance of the plan is set out in Chapter 6 of this plan. Once the plan has been implemented, it will have to be
evaluated frequently by the EMA Director and an assigned committee, and updated if necessary. This will ensure that Stewart County, the City of Richland, and the City of Lumpkin have a compliant mitigation plan in place at all times.
1.7 Copy of Enacting Resolutions for Plan Adoption

RESOLUTION

WHEREAS, In accordance with federal regulations promulgated pursuant to the Disaster Mitigation Act of 2000, local governments must have prepared and adopted a pre-disaster mitigation plan, in order to be eligible for federal disaster assistance in the event of a presidential disaster declaration made after November 1, 2003; and

WHEREAS, The Stewart County Board of Commissioners requested, and received in 2011 a Pre-Disaster Mitigation Grant Program Planning Grant award from the Office of Homeland Security-Georgia Emergency Management Agency, designated project number 1858-0055, to fund preparation of a pre-disaster mitigation plan in accordance with federal regulations promulgated pursuant to the Disaster Mitigation Act of 2000; and

WHEREAS, The Stewart County Pre-Disaster Mitigation Plan has been prepared as a multi-jurisdictional document to satisfy pre-disaster mitigation planning requirements for the Stewart County Board of Commissioners, the City of Lumpkin and the City of Richland; and

WHEREAS, The Office of Homeland Security-Georgia Emergency Management Agency has officially notified the Stewart County Board of Commissioners that the Stewart County Pre-Disaster Mitigation Plan satisfies applicable federal pre-disaster mitigation planning requirements.

NOW, THEREFORE BE IT RESOLVED by the Stewart County Board of Commissioners, the Mayor and City Council of the City of Lumpkin, and the Mayor and City Council of the City of Richland, each meeting in regular session, to hereby approve and adopt the Stewart County Pre-Disaster Mitigation Plan 2020.

RESOLVED, in regular session this ______ day of ____________ 2020, by the STEWART COUNTY BOARD OF COMMISSIONERS

By: ___________________________ By: ________________________________
Hon. Joseph Williams, Chairman       Jacqueline Sutton Ball, County Clerk

RESOLVED, in regular session this ______ day of ____________ 2020, by the LUMPKIN CITY COUNCIL

By: ___________________________ By: ________________________________
Hon. James P. Babb, Mayor   Anne Holloway, City Clerk

RESOLVED, in regular session this ______ day of ____________ 2020, by the RICHLAND CITY COUNCIL

By: ___________________________ By: ________________________________
Hon. Adolph McClendon, Mayor  Wanda Wilson, City Clerk
1.8 Past and Current Hazard Mitigation Projects

Stewart County, the City of Richland, and the City of Lumpkin have performed some mitigation as well as many restoration measures in the past. These measures include installing water drainage pipes and ditches to reduce flooding in the county. These measures serve to prevent future flooding from thunderstorms, tropical storm, and hurricane events, and to reduce traffic accidents as well as adding CODE RED and other emergency alert systems.

1.9 Community Data

Stewart County was formed on December 23, 1830; it was named for General Daniel Stewart an officer in the Revolutionary War and War of 1812, and grandfather of President Theodore Roosevelt. The county consists of two cities, Lumpkin and Richland. The county total area is 458.7 square miles.

The City of Lumpkin, the county seat, was incorporated March 30, 1829. The city was named in honor of Wilson Lumpkin, a two-term governor of Georgia, U.S. Congressman and Senator. He was a leading advocate of state rights and "Indian Removal." The Woodland, Mississippian, and Creek Indians were all once inhabitants of Stewart County. In addition, two of the six largest Indian mounds in Georgia are located in the County.

Lumpkin is located in the center of the county. U.S. Highway 280, Georgia State Routes 1, 27, and 39 intersect the county. The City of Richland sits on the eastern-most side of the county, on the border with Webster county. The incorporated area is roughly 1500 by 2000 ft.2, dragging along Route 27. The courthouse in Stewart County was constructed in 1896 and burned in 1922. The courthouse was rebuilt in 1923 and is listed on the National Register of Historic Places.

Providence Canyon Conservation Park, located near Lumpkin is a collection of canyons and gullies. The largest of these is "Grandfather Canyon," which is a half mile long, 300 feet wide and 150 feet deep. The 1,061-acre park also has the largest natural collection of the rare "Plumleaf Azalea" in the world.

Lumpkin is the home of the Bedingfield Inn, which is a two-story inn built in 1835 by Bryan Bedingfield, and today is one of the great house museums in the South. The conservation and revitalization of the inn was one of the first rural preservation successes in Georgia. Stewart County is a rural county with an agricultural base and is listed a Tier I county in the Governor’s One Georgia Program. The county is approximately 40 miles from the City of Columbus and roughly 13 miles east of the Alabama State Line. Stewart County experiences long, hot, humid summers with relatively mild, short winters. Its annual rainfall is 55 inches with July being its wettest month and October it’s driest. The highest average temperature is 91 degrees in July and the lowest is 45 degrees in January.

According to the 2018 census estimates, the total population for Stewart County was 6,199, of which 45.0% of the residents are white, 49% are black, 1% American Indian and Alaska Native, Asian 3.1% and 2.2% for people who are two or more races. Hispanics,
who can be identified as either white or black in the Census data, made up 32% of the county’s population. Statewide, 61% of residents are white, 32% are black, 1% American Indian and Alaska Native, Asian 4.3%, Native Hawaiian/Other Pacific Islander 0.1%, and 2.2% for people who are two or more races, and 52% are Hispanic who can be identified as white or black. In Stewart County, 12% of county’s residents were age 18 years or younger and 16% were age 65 or older. In 2017 Stewart County has no hospital but does have a nursing home with 85 beds. In 2017 Stewart County has a ratio of 68.4 physicians per 100,000 population. (The Georgia County Guide, 2019).

The 2017 Georgia Bureau of Investigation Crime Statistics for Stewart County totaled 2 burglary property crimes for the entire county. In 2016 there were two larcenies and one vehicle theft. In 2017 Stewart County has the third lowest crime ranking in the state of Georgia. (The Georgia County Guide, 2018, 2019).

In the year 2010, the average weekly wage for all the employment sectors in the county was $606. This amount was less than the statewide average of $844. In 2017 the average weekly wage for all the employment sectors in the county is $796. This amount is less than the 2017 statewide average of $1003. In Stewart County, 94% of the labor force or 2,133 people are employed. In 2010, the largest number of jobs were in health care and social assistance. Private sector and services are the largest employment sector providing 64.3% of the jobs. In 2017 services are again the largest employers with 63.8% of the jobs. The other predominant employment sector is government with 28.2% of the jobs. (The Georgia County Guide, 2012, 2019).

The largest source of income in both 2000, 2010, and 2017 is wages or salary. Retirement income is the second largest source of income in 2010. In 2000, Social Security was the second largest source of income. The top ten employers in Stewart County in 2019 are B & S Air Inc., Four County Health and Rehab, Southwest Georgia Health Care Inc., Stewart Detention Center, Dollar General, Homer L. Moore, Jr., Kawikee Refuge, Omaha Brewing Company, Transcor America, and W. C. Bradley Farms Inc. (Georgia Department of Labor, 2019).

In July of 2012, Stewart County’s unemployment rate was higher than the States’ rate, averaging 10.9%. (www.bls.gov/lau/). The State of Georgia averaged an unemployment rate of 9.3% and nationwide the unemployment rate for the same period averaged at 8.3%. In 2017 the unemployment rate for Stewart County was 5.9%, State of Georgia 4.7, and the U.S. was 4.4 percent. (The Georgia County Guide, 2012, 2019). The October 2019 Stewart County unemployment rate was 3.5%, Georgia was 3.4%, U.S. was 3.6.

The average county per capita personal income from 2006 through 2010 was $15,612, for Lumpkin it was $17,860 and for Richland it was $12,840, as compared with $23,383 (2010) for the State of Georgia, and $26,059 (2010) for the United States. Stewart County’s average median household income from 2006 through 2010 was $30,954. This amount was less than the state’s median household income for 2010 of $44,108. Nationally, the median household income for that same year was $49,445 (U.S. Census, 2010). The average county per capita personal income from 2014 through 2018 was $16,359, for Lumpkin it was $15,196 and for Richland it was $14,941 as compared with $29,523 for Georgia, and $32,621 for the United States. Stewart County’s average median household
income from 2014 through 2018 was 25,385. This amount was less than the state’s median household income for 2014 - 2018 of $55,679. Nationally, the median household income for that same time period was $60,293 (U.S. Census Quick Facts, 2014-2018).

Between 2006 and 2010, 24.2% of the county’s population lived below the poverty level, compared with Georgia’s rate of 15.7% and the national rate of 13.8%. In addition, in 2010, 25.8% of the poverty living population were children under the age of 18 who lived in Stewart County. Statewide, 36.1% of the poverty living population were children under the age of 18 (U.S. Census, 2010). Between 2014 and 2018, 37.9% of the county’s population lived below the poverty level, compared with Georgia’s rate of 14.3% and the national rate of 11.8%. In addition, in 2018, 62% of the poverty living population were children under the age of 18 who lived in Stewart County. Statewide, 24% of the poverty living population were children under the age of 18 (U.S. Census Fact Finder, ACS 2014-2018).

According to the U.S. Census in 2009, 18.4% of Stewart County’s households with children under 18 years of age were headed by females, compared to 13.1% statewide. According to the 2019 Georgia County Guide 19.5% of Stewart County’s households with children under 18 years of age were headed by females, compared to 12.6% statewide.

Between 2009 and 2010, the Stewart County school system reported an average high school dropout rate of 10.6%, for students in grades 9 to 12. Statewide, this rate was 3.5% for the same time period (The Georgia County Guide, 2012). In 2016-2017 school year Stewart County reported 0 student drop outs. The State of Georgia reported a dropout rate of 3.8% during the 2016-2017 school year (The Georgia County Guide, 2019).

2- Local Natural Hazard, Risk and Vulnerability Summary

2.1 Thunderstorms/High Winds

2.1.A. Identify Thunderstorms

A thunderstorm, or an electrical storm, is a form of weather characterized by the presence of lightning and its attendant thunder. It is usually accompanied by abundant rainfall, hail, or rarely, snowfall in the winter months. In temperate regions, such as the southern United States, thunderstorms are most frequent...
in spring and summer, though can occur in cold fronts at any time of year. During the summer, violent thunderstorms are a common occurrence. These storms can produce very large hail and powerful tornadoes.

Thunderstorms can develop isolated, in clusters or in lines. Isolated thunderstorms tend to form where there is abundant moisture at low and middle levels of the atmosphere, and when there is a force that can lift warm air, such as a warm or cold front, a sea breeze or a mountain. The warm air is forced to rise rapidly. Thunderstorms can develop isolated, in clusters or in lines. A single thunderstorm can affect a certain location for an extended time, and cause some of the most severe weather; or several thunderstorms can affect that location over a few hours. Thunderstorm winds generally move in a straight line, and not in a rotating air column like tornados. The winds are normally short-lived, and can come in gusts over 50 miles per hour.

All thunderstorms contain lightning, which is another hazard in itself. The precipitation they bring most often is in the form of heavy rains that can cause flash flooding, but can also be in the form of hail. Tornados can be caused by thunderstorms as well.

**2.1.B. Thunderstorm Even Profile, Frequency of Occurrence, Probability**

A severe thunderstorm is a thunderstorm with winds 90 km/h (55 mph) or greater, 2 cm (3/4 inch) or larger hail, funnel clouds or tornadoes. These storms may contain frequent clouds to ground lightning and heavy downpours which can lead to localized flooding. An otherwise weak thunderstorm which produces a wind gust of the required strength would be defined as 'severe' whereas a very violent thunderstorm with continuous lightning and very heavy rain (but without the required wind gusts, hail or tornado/funnel clouds) would not be defined as severe. Many of the violent local thunderstorms which may occur frequently during the summer months in Stewart County would not be defined as severe.
Thunderstorms are a very common natural hazard, and their high winds can hit a county any time. All parts of the county have in the past experienced these high winds. A list of 59 major and noteworthy thunderstorm events can be found in the following table by the NCDC (National Climatic Data Center) Table 1 below. Thunderstorms occur on almost regular basis in Stewart County, but the events do not cause any larger damage, and therefore are not reported to the NCDC.

According to Table 1, Lumpkin sustained $77,500 worth of damage from thunderstorm winds, Richland sustained $15,000 worth of damage from thunderstorm winds and the unincorporated area of Stewart County sustained $35,000 worth of thunderstorm wind damage. There is no recorded crop damage for any of the communities of Stewart County or loss of life or injuries. These listed property damages probably include trees blown onto homes, roofs damaged etc. Other smaller charges may not be included in this number; like signs blown off businesses.

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<tr>
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<tr>
<td>5 Stewart</td>
<td>6/15/1989</td>
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<tr>
<td>6 Stewart</td>
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<td>9:00 PM</td>
<td>Tstm Wind</td>
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<td>7 Stewart</td>
<td>2/9/1990</td>
<td>5:00 AM</td>
<td>Tstm Wind</td>
<td>0 kts.</td>
<td>0</td>
<td>0</td>
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<td>8 Stewart</td>
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<td>5:15 AM</td>
<td>Tstm Wind</td>
<td>0 kts.</td>
<td>0</td>
<td>0</td>
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<tr>
<td>9 Stewart</td>
<td>2/16/1990</td>
<td>11:10 AM</td>
<td>Tstm Wind</td>
<td>0 kts.</td>
<td>0</td>
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<td>Tstm Wind</td>
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<td>Tstm Wind</td>
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<tr>
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<td>Tstm Wind</td>
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<td>0</td>
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<td>Tstm Wind</td>
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<td>Tstm Wind</td>
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<tr>
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<td>0</td>
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<tr>
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<td>0</td>
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</tr>
<tr>
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<tr>
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<td>0</td>
<td>0</td>
<td>1K</td>
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<tr>
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<td>0</td>
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<tr>
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<tr>
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<tr>
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<td>0</td>
<td>0</td>
<td>3K</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>1K</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>1K</td>
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<tr>
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<td>3:52 PM</td>
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<td>0</td>
<td>0</td>
<td>0K</td>
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<td>0 kts.</td>
<td>0</td>
<td>0</td>
<td>3K</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>2K</td>
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<tr>
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<td>0</td>
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<tr>
<td>41</td>
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<td>42</td>
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<td>50 kts.</td>
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<td>0</td>
<td>1K</td>
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<td>43</td>
<td>Richland</td>
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<tr>
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<td>50 kts.</td>
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<td>0</td>
<td>2K</td>
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<td>46</td>
<td>Beatrice</td>
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<td>0</td>
<td>0</td>
<td>2K</td>
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<tr>
<td>47</td>
<td>Florence</td>
<td>4/4/2011</td>
<td>11:22 PM</td>
<td>Tstm Wind</td>
<td>50 kts.</td>
<td>0</td>
<td>0</td>
<td>5K</td>
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<td>50 kts.</td>
<td>0</td>
<td>0</td>
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<tr>
<td>49</td>
<td>Sanford</td>
<td>01/30/2013</td>
<td>16:00</td>
<td>Tstm Wind</td>
<td>50 kts.</td>
<td>0</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>50</td>
<td>Lumpkin</td>
<td>6/6/2014</td>
<td>19:30</td>
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<td>50 kts.</td>
<td>0</td>
<td>0</td>
<td>.50</td>
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<tr>
<td>51</td>
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<td>6/8/2014</td>
<td>16:13</td>
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<td>0</td>
<td>0</td>
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<td>52</td>
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<td>2/15/2016</td>
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<td>50 kts.</td>
<td>0</td>
<td>0</td>
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<td>6/17/2016</td>
<td>18:43</td>
<td>Tstm Wind</td>
<td>50 kts.</td>
<td>0</td>
<td>0</td>
<td>5.0</td>
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</table>
According to filed reports, on the 5th of November 1993, a thunderstorm hit 6 miles north west of Lumpkin, causing $500 worth of damage from a power line being down and a Texaco gas station sign being down. On the 15th of April 1999, a thunderstorm hit Omaha and caused $1,000 worth of damage from trees falling and half dollar to golf ball sized hail causing damage to car and home windows. On the 16th of December 2000, a thunderstorm went through Richland, causing $3,000 worth of damage. Initial reports on this particular storm included the possibility of a tornado in the area, although this was never confirmed. On the 14th of June 2000, a thunderstorm struck Lumpkin, causing $3,000 worth of damage, which included down trees and power lines. In addition, a funnel cloud was sighted in the area. On the 19th of January 2002, a thunderstorm hit Omaha, causing $3,000 worth of damage, which included down trees, down power lines, and power outages. On the 27th of March, 2005 a thunderstorm and microburst hit Lumpkin causing $50,000 worth of damage, mostly from tearing off the roof of the county’s Health Department building, and damage caused to an outdoor storage bin at the Emergency Management Director’s facility. Forty or 50 trees within the same general small area were blown down, uprooted, or torn apart by the winds. The rest of the storms and damage caused were mostly due to down trees and debris pick up. Since March 27th, 2005 There are 20 further incidents involving thunderstorms and wind damage totaling $40,000. Since 2005 there are 19 thunderstorms that have caused property damage with the largest property damage being $6,000 in Richland, Georgia on April 3, 2017.

Straight line winds are traditionally associated with thunderstorms. Thunderstorms do not have rotating air columns, like tornadoes. The winds are normally over quite quickly, although they can occur in gusts of over fifty miles per hour.

According to the Hazard Frequency Table in Appendix A, Page A2. The historic occurrence for the unincorporated part of Stewart County is 1.77, which means that thunderstorms will hit that area every 1.77 years. This gives the area a 56.52% chance of being affected any given year. The historical occurrence for the City of Lumpkin is 4.31, which means thunderstorms are likely to hit Lumpkin every 4.31 years. This gives it a 23.19% chance that it will be affected any given year. The historic occurrence for the City of Richland is 17.25, meaning that it has
a historical recurrence interval of 17.25 years. This gives it a 5.80% chance of getting hit any given year.

Other side effects of thunderstorms can be lightning and/or hail. Lightning is a visible discharge of atmospheric electricity, often perceived as a lightning bolt. It occurs when a region of a cloud in a thunderstorm accumulates as excess electrical charge that is sufficiently large to break down the resistance of air. In a typical thunderstorm, about two-thirds of all lightning discharges take place within the cloud or from cloud to cloud. When lightning strikes the earth’s surface, the damage is caused through the large current flowing in the return stroke, or through the heat generated by this current. Temperatures in a bolt can reach up to 50,000°F in just a split second, and the electrical charge can be as much as 100 million volts. Lightning is accompanied by thunder, which is caused by the rapid heating and cooling of air near the bolt of lightning. No major lightning strikes occurring for Stewart County are listed in the NDCD database. This makes the probability of future occurrences unknown for lightning.
It should be noted that the GEMA Mapping Tool by ITOS has no spatial designation for lightning, therefore no maps are shown. However, according to the Vaisala National Lightning Detection Network, Stewart County averages cloud to ground flash density per square km/year of 4-8.

The precipitation originating from shower clouds and thunderstorms can not only be in raindrops but also in the form of pellets of soft hail or hail stones. Hail stones are small balls or lumps usually consisting of concentric layers of clear ice and compact snow, with a diameter of 0.2 to 4 inches. Because the formation of hail usually requires cumulonimbus or other convective clouds with strong updrafts, it often accompanies thunderstorms. Generally, these events are of great intensity and shorter in duration than that from layer clouds. Hail can cause enormous destruction to agriculture, especially fruit orchards an grain fields. Hail also causes damage to structures, windows, roofs and vehicles. According to the NCDC, Stewart County experienced 22 major hail events since 1950. Table 2 list the hail occurrences.
## Table 2: Stewart County Hail Events 1950-2019

<table>
<thead>
<tr>
<th>Location or County</th>
<th>Date</th>
<th>Time</th>
<th>Type</th>
<th>Mag</th>
<th>Dth</th>
<th>Inj</th>
<th>PrD</th>
<th>CrD</th>
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<td>1 STEWART</td>
<td>08/31/1987</td>
<td>1330</td>
<td>Hail</td>
<td>1.75 in.</td>
<td>0</td>
<td>0</td>
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<tr>
<td>2 STEWART</td>
<td>08/30/1990</td>
<td>1145</td>
<td>Hail</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
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<td>3 STEWART</td>
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<td>1435</td>
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<td>0</td>
<td>0</td>
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<td>0K</td>
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<tr>
<td>5 Louvale</td>
<td>11/01/1997</td>
<td>03:40 PM</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
<td>0</td>
<td>2K</td>
<td>0K</td>
</tr>
<tr>
<td>6 Omaha</td>
<td>04/03/1998</td>
<td>04:15 PM</td>
<td>Hail</td>
<td>1.00 in.</td>
<td>0</td>
<td>0</td>
<td>3K</td>
<td>2K</td>
</tr>
<tr>
<td>7 Richland</td>
<td>05/04/1998</td>
<td>12:08 AM</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
<td>0</td>
<td>0K</td>
<td>0K</td>
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<tr>
<td>8 Omaha</td>
<td>04/15/1999</td>
<td>06:40 AM</td>
<td>Hail</td>
<td>1.75 in.</td>
<td>0</td>
<td>0</td>
<td>2K</td>
<td>0K</td>
</tr>
<tr>
<td>9 Louvale</td>
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<td>06:55 AM</td>
<td>Hail</td>
<td>1.00 in.</td>
<td>0</td>
<td>0</td>
<td>0K</td>
<td>0K</td>
</tr>
<tr>
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<td>0</td>
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<td>05:15 PM</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
<td>0</td>
<td>0K</td>
<td>0K</td>
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<tr>
<td>13 Omaha</td>
<td>06/03/2001</td>
<td>07:00 PM</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
<td>0</td>
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<td>01/19/2002</td>
<td>03:52 PM</td>
<td>Tstm Wind/hail</td>
<td>0 kts.</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>15 Lumpkin</td>
<td>04/25/2003</td>
<td>08:00 PM</td>
<td>Hail</td>
<td>0.88 in.</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>16 Lumpkin</td>
<td>04/30/2005</td>
<td>09:00 AM</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>17 Omaha</td>
<td>12/28/2005</td>
<td>02:01 PM</td>
<td>Hail</td>
<td>1.00 in.</td>
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</tr>
<tr>
<td>18 Lumpkin</td>
<td>01/02/2006</td>
<td>11:50 AM</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
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</tr>
<tr>
<td>19 Lumpkin</td>
<td>05/10/2006</td>
<td>05:30 PM</td>
<td>Hail</td>
<td>0.75 in.</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
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<td>10:01 PM</td>
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<td>0</td>
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</tr>
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<td>21 Richland</td>
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<td>3/27/2011</td>
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<td>Hail</td>
<td>1.00 in.</td>
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</tbody>
</table>

**TOTALS:** 0 0 12K 2K

Last entry since 10/15/2019.

*Source: National Climatic Data Center*
On the 13th of March 1997, Hail caused $5,000 worth of damage in Lumpkin, pertaining to one inch of quarter sized hail falling. On the 1st of November, 1997 0.75 inches of dime sized hail fell on the county line between Chattahoochee and Stewart counties, causing $2000 worth of damage. On the 3rd of April 1998, one inch worth of quarter sized hail fell in Omaha, causing not only $3,000 worth of property damage but also causing $2,000 worth of crop damage. During the 15th of April, 1999, 1.75 inches of half dollar to golf ball sized hail fell in Omaha, causing $2,000 worth of damage to windows in vehicles and homes, as well as knocking down several trees in the area. The latest recorded hail event in Stewart County is in 2011 when 1 inch hail fell in Omaha.

According to the National Climatic Data Center, the typical hail size seen in Stewart County is marble size, ranging from ¾ inches to 1 ¾ inches in diameter. While hail size of a penny (3/4 inch) or larger is considered severe, even small hail can be damaging. Stewart County is an agricultural area and damage to crops is a real concern. Even very small hail can destroy crops depending on the crop maturity, wind speed or speed of the hail stones, and persistence. Total property damage in Stewart County due to hail is $12,000. Total crop damage in Stewart County is $2,000.

According to the Hazard Frequency Table in Appendix A, page A2, the historic recurrence for the entire area is 3.14 years meaning that a hail event will hit every 3.14. years and the historic frequency states that every year there is a 31.88% chance that hail will hit Stewart County including the unincorporated area and the cities of Richland and Lumpkin. The historic occurrence for the unincorporated part of Stewart County is 4.60, which means that hail will hit that area every 4.60 years, which gives the area a 21.74% chance of being affected any given year. The historical occurrence for the City of Lumpkin is 13.80, which means hail is likely to hit Lumpkin every 13.80 years, which gives it a 7.25% chance that it will be affected any given year. The historic recurrence for the City of Richland is 34.50 meaning that the area has been hit every 34.50 years and there is a 2.90% chance of getting hit any given year.

2.1.C Inventory of Assets Exposed to Thunderstorms

The most damage is done by the strong winds accompanying the storms, but also due to hail, lightning, or flooding from the heavy rains. The winds associated with thunderstorms affect areas with softwood trees mostly, but also above ground utilities and exposed infrastructure. The Information Technology Outreach Service (ITOS) at the University of Georgia at Athens created an on-line map tool for GEMA with the purpose of providing special data for Pre-Disaster Mitigation Plans. These maps were used extensively in the process of the development of this Pre-Disaster Plan. Please refer to the GEMA Wind Hazard Score maps by ITOS(see maps 1 to 3 below) depicting all of Stewart County, the City of Richland, and the City of Lumpkin as scoring 2 on a scale from 1 to 5, which stand for wind speeds of only 90 to 99 mph.
Anything with exposed features can suffer damage, like buildings, traffic signals, radio communication systems, etc. Thunderstorms can hit and cause damage anywhere in the county due to their random nature. This places all residents and all development at risk of damage.

In the City of Richland, there are 860 non-critical structures, of which 804 are classified residential, 37 commercial, 15 industrial, 0 agricultural and 4 religious or non-profit. In the City of Lumpkin are 623 non-critical structures, of which 572 are classified residential, 37 commercial, 10 industrial; 0 agricultural and 4 religious or non-profit. In the unincorporated area of Stewart County, there are 957 non-critical structures, of which 849 are classified as residential, 84 commercial, 15 industrial, 0 agricultural, and 9 as religious or non-profit. These non-critical structures potentially are all exposed to the high winds of a tornado, just like the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D.

All critical facilities are located in the area with a wind hazard score of 2 which stands for wind speeds 90 to 99 miles per hour. Among the critical facilities would be all government and emergency buildings, shelters, schools, fire stations, and the water system.

Lightning, accompanying the thunderstorms, can strike anywhere at any time, but tends to strike the highest object in the vicinity. Especially in the summer months, it is a frequent occurrence. All critical facilities are vulnerable. Because lightning tends to strike the highest object in the vicinity a good protection measure is to install copper lightning rods on structures. Persons, who can be severely affected and even killed by lightning, can protect themselves best against lightning by The average farm size in 2012 is 549 acres, much smaller than in 1997 when the
average size was 655 acres. However farm size did increase from 490 acres in 2007 to 549 acres in 2012. The commercial forest land comprises 84% of all land in Stewart County, mostly comprised of agriculture, forestry, fishing, and hunting as indicated on the existing land use classification map. Peanuts is the largest harvested crop, producing a value of over $2.6 million, followed by cotton with a value of $1.5 million. Harvested cropland in acres in Stewart County has risen from 9,652 acres in 2007 to 12,699 acres in 2012 which is an increase of 31.6%. being alert to the presence of the hazard, staying inside a house or car, and not using electrical appliances during a thunderstorm.

Hail causes damage to the roofs and windows of cars and buildings, and to vegetation. Farmers are affected by hail because crops can be damaged severely. In 2012, it was estimated that a total of 108 farms were in Stewart County, which is an increase of 28.6% from the total number of farms in 1997, which was 83 (see Georgia County Guide at http://www.georgiastats.uga.edu/).

2.1.D. Estimate of Potential Losses to Thunderstorms

The relatively high wind speeds of thunderstorms can damage trees, especially softwood trees, and above ground utilities. Results can include power outages, transportation and economic disturbances, major property damage, and risk of deaths and injuries. In the past, 59 thunderstorm events listed by the NCDC caused damage totaling $127,500.

Lightning strikes can cause varying degrees of damage to buildings. Most common is the destruction of electrical equipment, but also a fire can be started in the structure, further damaging the contents and potentially the entire structure. The Fire Insurance Rating (ISO) is 7.0 within 5 miles of the city limits of Lumpkin and
Richland, and 10 in all other parts of the county. This rating gauges the capacity of the local fire department to respond if flames engulf a property. The assigned Public Protection Classification ranges from 1 to 10; Class 1 representing the best public protection; a Class 9 or 10 rating means that the community’s ability to suppress fires is severely challenged.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural vale is 93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total structural replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $ 9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value 63,698,965 and a contents replacement value of 95,548,373. For a complete listing of replacement values of each critical facility, please refer to the GEMA worksheet #3b on Wind Hazard Scores in Appendix D.

The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

2.1.E. Land Use and Development Trends Related to Thunderstorms

Due to the random nature of thunderstorm winds, lightning, and hail, the entire community is at risk and land use and development trends do not apply. Stewart County and the City of Richland and Lumpkin currently adhere to the Southern Building Code. The accepted standards of resistance to wind speeds up to 90 miles per hour is required.

Of the 65 critical facilities identified in the GEMA Critical Inventory Map by ITOS, 33 are located in the unincorporated area of Stewart County, 17 critical facilities are situated within the city limits of Richland, and 15 are located within the city limits of Lumpkin. All critical facilities are located within the same wind hazard score area.

The county has an Erosion Control Ordinance. Trees that fall as a result of thunderstorms have and could continue to cause damage to public and private property. Examples of property damage include damage to private homes and automobiles, damage to public facilities and infrastructure such as sewer and water lines, power lines and roads. Each jurisdiction is responsible for its own clean up when thunderstorms bring trees down onto city or county roads. Property owners in the county and both cities are responsible for their own clean up and pick up of
falling trees. The Power Company is responsible for the removal of down trees from power lines.

2.1.F. Multi-Jurisdictional Thunderstorm Differences

As mentioned above, there is no difference in risk of a thunderstorm wind in Stewart County, city of Richland, and city of Lumpkin. The same mitigation measures apply in all jurisdictions.

The Wind Hazard Scores depicted in the GEMA maps by ITOS are based on the 2000 International Building Code.

All of Stewart County (see map below), the City of Richland and the City of Lumpkin (see close up Maps 2 and 3 below) scored a 2 on a scale from 1 to 5, which stands for wind speeds of 90 to 99 mph (or Zone IV).
Map 1: Wind Hazard Scores in Stewart County

Source: GEMA by ITOS 2019
All of the City of Lumpkin scored a 2 on a scale from 1 to 5, which stands for wind speeds of 90 to 99 mph (ZONE IV).
Map 3: Wind Hazard Scores in the City of Richland

Source: GEMA by ITOS 20019

All of the City of Richland scored 2 on a scale from 1 to 5, which stands for wind speeds of 90 to 99 mph (Zone IV).
2.1. G. General Overall HRV Summary of Thunderstorms

For Stewart County, City of Lumpkin, and the City of Richland, thunderstorms pose the most common natural hazard, and can affect any part of the cities or the county at any time. To be able to limit damage from high winds and lightning strikes, mitigation must be prepared in advance.

Since it is difficult to mitigate with structural measures against lightning and hail damage, it is important to educate the population of the dangers of natural hazards. Precaution measures to avoid being struck outdoors by lightning include avoiding natural lightning rods such as tall, isolated trees in an open area or on the top of a hill, and to avoid touching metal objects such as wire fences, golf clubs, and metal rods. According to the Hazard Frequency Table in Appendix A the historic recurrence for the entire county for severe thunderstorms is 1.17, meaning that a thunderstorm will hit every year. There is also a 31.88% chance that hail will hit Stewart County in any given year. The likelihood of thunderstorms and hail in the cities, based on historical data, are as follows. A 23.19% chance of a thunderstorm in Lumpkin in any given year with a 7.25% chance of hail; and a 5.80% chance of a thunderstorm in Richland, with an 2.9% chance of hail within the city limits.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2014. The E911 system was established in 2009. As of 2019, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

2.2. Hurricanes and Tropical Storms

Both types of tropical cyclones, tropical storms and hurricanes, begin as tropical depressions over warm oceanic water. The life span of a tropical cyclone can be anywhere from a few hours to almost three weeks; most lasting approximately 5 to 10 days. Tropical depressions are generally characterized by wind speeds of 39 MPH (34 KTS) or under. Wind speeds of 39 to 73 MPH (34-63 KTS) are associated with tropical storms, and everything above 74 MPH wind speed is characterized as a hurricane. Hurricanes occur especially in the western Atlantic under warm, humid conditions and are accompanied by excessive rain, thunder, and lightning. Although hurricanes are tropical storms, they can move into temperate latitudes and they tend to slow down as they make landfall. Tropical Storms are normally associated with a storm surge, which is an abnormal rise in water levels caused by the storm in coastal areas.
2.2.A. Hurricane and Tropical Storm Event Profile, Frequency of Occurrence, Probability

Hurricane season is from June 01- November 30. From 1900 to 2012, the central circulation of 29 tropical systems has made landfall or significantly affected portions of coastal South Carolina and Georgia. Twenty-five of these storms are hurricanes, 9 are tropical storms, 7 were tropical depressions. Charleston, South Carolina has seen most of the landfall followed by Beaufort County, South Carolina (10) and Chatham County, Georgia (6). From 1900 to 2020, 16 hurricanes and 13 tropical storms hit the South Carolina/Georgia County Warning Area (CWA). Please refer to Table 4 for a detailed listing.

Table 3: Saffir Simpson Scale for Hurricanes

<table>
<thead>
<tr>
<th>Category</th>
<th>Wind Speed, Storm Surge</th>
<th>Expected Damage (Examples of Past Hurricanes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>74-95 mph, *4-5 feet</td>
<td>Primary damage to unanchored mobile homes, shrubbery, and trees. Some coastal road flooding, minor pier damage. Little damage to building structures.</td>
</tr>
<tr>
<td>2</td>
<td>96-110 mph, *6 – 8 feet</td>
<td>Considerable damage to mobile homes, piers, and vegetation. Coastal and low-lying escape routes, flood 2 to 4 hours before arrival of hurricane center. Buildings sustain roofing material, door, and window damage. Small water craft in unprotected moorings break mooring.</td>
</tr>
<tr>
<td>3</td>
<td>111-130 mph, *9-12 Feet</td>
<td>Mobile homes destroyed. Some structural damage to small homes and utility buildings. Large trees are toppled. Flooding near coast destroys smaller structures; larger structures damaged by floating debris.</td>
</tr>
<tr>
<td>4</td>
<td>131-155 mph, *13-18 feet</td>
<td>Extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beaches. Major damage to lower floors of structures near the shore. Terrain continuously lower than 10 feet. ASL may flood and require mass evacuation.</td>
</tr>
<tr>
<td>5</td>
<td>&gt;155 mph, &gt;*18 feet</td>
<td>Complete road failure on many homes and industrial buildings. Some complete building failures. Major damage to lower floors of all structures located less than 15 feet. ASL may flood and require mass evacuation.</td>
</tr>
</tbody>
</table>

*Storm Surge in feet above normal sea level

Table 4: Tropical Systems in the South Carolina/Georgia CWA 1900-2019

<table>
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<th>Category</th>
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<tr>
<td>Hurricane Category 2</td>
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<tr>
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<td>Hurricane Category 5</td>
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</table>

(Intensities Based upon landfall)

Source: NOAA 2019

From 1959 to 1989, there were no major hurricanes (i.e. Category 3 or more) to affect the Carolinas or Georgia. With the exception of Hurricane Hugo, an active
decade for tropical activity in the Atlantic basin had not occurred since the 1950s. The 1970s and 1980s were inactive. Following Hugo, it was not until 1995 when tropical activity greatly increased. 19 storms formed. Most developed in the central and eastern Atlantic Ocean, staying hundreds of miles east of the U.S. mainland. 1996, also an above average year, featured several storms impacting the Carolinas and Georgia. 1997 was a year with no activity as El Nino conditions increased by mid-summer. See Table 5 for a listing of Hurricane and Tropical Storm events in Stewart County. Only two hurricane events impacted Stewart County. One event on July 10, 2005 and again on August 29, 2005. All other events in Stewart County are tropical storms.

Table 5: Stewart County Hurricane and Tropical Storm Events 1996-2019

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<td>STEWART</td>
<td>STEWART</td>
<td>GA</td>
<td>9/04/2011</td>
<td>11:00</td>
<td>EST-5</td>
<td>Tropical Storm</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
<td>0.00K</td>
<td></td>
</tr>
<tr>
<td>ZONE</td>
<td>ZONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>STEWART</td>
<td>STEWART</td>
<td>GA</td>
<td>9/11/2017</td>
<td>09:00</td>
<td>EST-5</td>
<td>Tropical Storm</td>
<td>0</td>
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<td>50.00K</td>
<td>0.00K</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>STEWART</td>
<td>STEWART</td>
<td>GA</td>
<td>10/10/2018</td>
<td>13:00</td>
<td>EST-5</td>
<td>Tropical Storm</td>
<td>0</td>
<td>0</td>
<td>0.00K</td>
<td>0.00K</td>
<td></td>
</tr>
<tr>
<td>ZONE</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Totals: 0 0 50.00K 0.00K

Last entry since 10/15/2019.

Source: National Climatic Data Center 2019
In 1990, Stewart County was one of the counties affected by severe storms, flooding, and tornados. After Tropical Storm Alberto brought torrential rain, high winds, and major flooding to Georgia in July of 1994. In 1995, Hurricane Opal made landfall near Pensacola Beach, Florida as a marginal Category 3 hurricane, causing extensive storm surge damage to the immediate coastal areas of the Florida panhandle. It was the first hurricane to strike the Florida panhandle since Eloise in 1975. The accompanying winds and rainfall caused mainly tree and power line damage in Stewart County. In September of 1998, Tropical Storm Earl produced widespread moderate to heavy rains and strong winds as it trekked northeast from Southwest to East-central Georgia. Rainfall totals associated with Earl ranged from three to six inches, and peak wind gust of 40 to 50 mph were common.

September 2004 brought several tropical storm systems to Georgia. Beginning of September, Tropical Storm Frances moved into southwest Georgia. Maximum sustained winds reached 38 knots at Albany, GA with a peak wind gust of 59 knots. Rainfall totals ranged from two inches at Newton, GA to nearly seven inches at Tifton, GA. Many schools and local businesses were closed on September 7, 2004. There were numerous reports of washed out roads, downed trees and power lines. Several counties in southwest Georgia suffered crop yield losses, on the order of 25 to 50 percent. Damage estimates were realized at the time of the autumn harvest. A state of emergency was declared for much of southwest Georgia.

In the middle of September 2004, Tropical Storm Ivan moved into southwest Georgia. The maximum sustained wind recorded was 29 knots at Albany, Ga. The peak wind gust recorded was 37 knots at Valdosta, GA. Rainfall totals varied from 0.75 inches at Tifton and Valdosta, GA to 6.50 inches at Blakely, GA. An estimated 20,000 customers were without power. There were numerous reports of downed trees and power lines. The hardest hit areas were Early and Miller counties, with many homes and businesses damaged. Many schools and businesses were closed on September 16 and 17 of 2004. A state of emergency was declared for the affected counties. In July of 2005, a nearly stationary feeder band from the eastern Florida panhandle into southwest Georgia produced four to eight inches in connection with Hurricane Dennis, with isolated amounts up to a foot. Several counties in the area observed wind damage to trees and power lines. Peak wind gust recorded were 42 mph, at Albany, GA. Heavy rainfall commenced July 10, and persisted into the early morning hours of July 11, 2005.

In 2008, Tropical Storm Fay moved across the Florida panhandle into extreme southeast Louisiana, dumping catastrophic amounts of rain across the area. In November 2009, Hurricane Ida moved inland near Mobile, Alabama early on the 10th and then tracked east-northeast across southern Alabama, southern Georgia, and the Florida Panhandle before emerging off the east coast as a strong low pressure system.

According to the Hazard Frequency Table in Appendix A, the historic recurrence interval for a tropical storm is 4.60, which means one storm happens almost every 4.06 years, and the historic frequency states that there is approximately 21.74%
chance a storm with strong winds and heavy rain will hit Stewart County in a given year.

The historical record is not precise enough to have the breakdown for this hazard by jurisdiction. Also, this type of occurrence does not just affect one region or jurisdiction due to its sheer size, if the unincorporated areas of Stewart County are affected, so will the cities of Lumpkin and Richland. Therefore, the probability is the same for all jurisdictions.

Stewart County’s proximity to the Gulf Coast raises its chance of being directly affected by a tropical storm or hurricane during the June through November season. While the probability of an intense hurricane of category 3 to 5 directly affecting Stewart County during the hurricane season is not high, aspects such as flooding and tornado spin offs from outer rain bands is major.

2.2.C. Inventory of Assets Exposed to Hurricanes and Tropical Storms

Due to their unpredictable nature, tropical storm systems can cause damage in the entire county and its municipalities. The high winds associated with hurricanes affects areas with significant tree stands and all above ground utilities and exposed infrastructure. This places all residents and all development at risk of damage. The University of Georgia Carl Vinson Institute did a hurricane wind analysis for a category 1 hurricane in Stewart County. Inserted below verbatim is the wind damage assessment from the 2019 Stewart County Hazus report. The damage scenario is based on a Category 1 storm. The model estimates that 17 building would be damaged with a total damage value of $471,120 and a total economic loss of $593,700. There are 13 essential facilities that would have a loss of use for less than 1 day.

Separate analyses were performed to determine wind and hurricane storm surge related flood losses. This section describes the wind-based losses to Stewart County. Wind losses were determined from probabilistic models run for the Category 1 Storm which equates to the 1% chance storm event. Figure 3 shows wind speeds for the modeled Category 1 Hurricane.
Buildings in Stewart County are vulnerable to storm events, and the cost to rebuild may have significant consequences to the community. The following table shows a summary of the results of wind-related building damage in Stewart County for the Category 1 (100 Year Event) hurricane. The loss ratio expresses building losses as a percentage of total building replacement cost in the county. Figure 4 illustrates the building loss ratios of the modeled Category 1 storm.

Table 5: Hurricane Wind Building Damage

<table>
<thead>
<tr>
<th>Category</th>
<th>Buildings Damaged</th>
<th>Damage</th>
<th>Total Economic Loss</th>
<th>Loss Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>17</td>
<td>$471,120</td>
<td>$593,700</td>
<td>0.18%</td>
</tr>
</tbody>
</table>

Includes property damage (infrastructure, contents, and inventory) as well as business interruption losses.

Note that wind damaged buildings are not reported by jurisdiction. This is due to the fact that census tract boundaries – upon which hurricane building losses are based – do not closely coincide with jurisdiction boundaries.
Essential facilities are also vulnerable to storm events, and the potential loss of functionality may have significant consequences to the community. Hazus-MH identified the essential facilities that may be moderately or severely damaged by winds. The results are compiled in Table 6.

Table 6: Wind-Damaged Essential Facility Losses

<table>
<thead>
<tr>
<th>Classification</th>
<th>Facilities At Least Moderately Damaged &gt;50%</th>
<th>Facilities Completely Damaged &gt; 50%</th>
<th>Facilities With Expected Loss Of Use (&lt;1 Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>0</td>
<td>0</td>
<td>13</td>
</tr>
</tbody>
</table>

Check for Blue Table in other document
Hazus-MH estimates the number of households evacuated from buildings with severe damage from high velocity winds as well as the number of people who will require short-term sheltering. Since the 1% chance storm event for Stewart County is a Category 1 Hurricane, the resulting damage is not enough to displace households or require temporary shelters as shown in the results listed in Table 7.

Table 7: Displaced Households and People

<table>
<thead>
<tr>
<th>Classification</th>
<th>Number Of Displaced Households</th>
<th>Number Of People Needing Short-Term Shelter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Hazus-MH estimates the amount of debris that will be generated by high velocity hurricane winds and quantifies it into three broad categories to determine the material handling equipment needed:

- Reinforced Concrete and Steel Debris
- Brick and Wood and Other Building Debris
- Tree Debris

Different material handling equipment is required for each category of debris. The estimates of debris for this scenario are listed in Table 8. The amount of hurricane wind related tree debris that is estimated to require pick up at the public’s expense is listed in the eligible tree debris column.

Table 8: Wind-Related Debris Weight (Tons)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Brick, Wood</th>
<th>Concrete And Steel</th>
<th>Eligible Tree Debris</th>
<th>Other Tree Debris</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforced and Other</td>
<td>58</td>
<td>0</td>
<td>1,646</td>
<td>49,862</td>
<td>51,566</td>
</tr>
</tbody>
</table>

Figure 5 shows the distribution of all wind related debris resulting from a Tropical Storm. Each dot represents 20 tons of debris within the census tract in which it is located. The dots are randomly distributed within each census tract and therefore do not represent the specific location of debris sites.
The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. These non-critical structures potentially are all exposed to the high winds of a hurricane or tropical storm, just like the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D on pages.

In the GEMA Critical Facility Inventory Map by ITOS, 65 critical facilities are mapped for Stewart County. Critical Facilities affected include the County Courthouse, the City Hall, all fire stations, schools, the emergency shelter as well as the water system.

In the City of Richland, there are 860 non-critical structures, of which 804 are classified residential, 37 commercial, 15 industrial, 0 agricultural and 4 religious or non-profit. In the City of Lumpkin are 623 non-critical structures, of which 572 are classified residential, 37 commercial, 10 industrial; 0 agricultural and 4 religious or non-profit. In the unincorporated area of Stewart County, there are 957 non-critical
structures, of which 849 are classified as residential, 84 commercial, 15 industrial, 0 agricultural, and 9 as religious or non-profit. These non-critical structures potentially are all exposed to the high winds of a tornado, just like the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D. Since the total population of Stewart County is not increasing, not a lot of future development is expected. In 2010 Stewart County has a total population 6,101 people. In 2016 the total population is 5,705. The 2018 Georgia County Guide, Stewart County ranks 150 out of 159 in population, with a loss of total population of 7% from 2010 to 2016.

2.2. D. Estimate of Potential Losses to Hurricanes and Tropical Storms

The National Climatic Data Center (NCDC) lists damages totaling $12,540,000 caused by the 2004 tropical storms Frances and Ivan, but this adds up the damage in 17 to 26 Georgia counties. Numbers for Stewart County alone are not known.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural value is $93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value 63,698,965 and a contents replacement value of 95,548,373. For a complete listing of replacement values of critical facilities, please refer to the GEMA worksheet #3b on Wind Hazard Scores in Appendix D.

Possible damages to the county and its critical facilities can include power outages, transportation and economic disturbances, major property damage, and sometimes even deaths and injuries. On top of that, the accompanying heavy rain can cause flooding and extensive water damage in low-lying areas.

2.2. E. Land Use and Development Trends Related to Hurricanes and Tropical Storms

Due to the random nature of tropical storm systems, the entire community is at risk. The County currently adheres to the International Building Code. The accepted standard of resistance to wind speeds up to 90 miles per hour is required.

The county has an Erosion Control Ordinance. The schools have a hazardous event program. Once a month, a fire drill is held for the schools, which is going to be supervised by the fire department, and once a year a tornado drill is executed.
2.2. F. Multi-Jurisdictional Hurricane and Tropical Storm Differences

There is no differentiation in the possible risk of tropical storm winds which can cause damage to public and private property; in addition, flooding due to the excessive rainfall can affect low-lying parts of the county.

2.2. G. General Overall HRV Summary of Hurricanes and Tropical Storms

For Stewart County and its municipalities, tropical storms and hurricanes are an ever present threat. Due to the cities and the counties geographical location close to the Gulf and Atlantic coast in southwest Georgia, all jurisdictions are susceptible to the torrential rainfalls of tropical systems. To be able to limit damage from high winds, mitigation must be developed through advance notice.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2008. The E911 system was established in 2009. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

2.3. Tornado

2.3. A. Identify Tornadoes

A tornado is a violent destructive whirling wind, accompanied by a funnel-shaped cloud. Tornados occur most often in association with tropical thunderstorms during warm and humid weather and are commonly associated with the spring and summer season. Tornados can generate the strongest winds known on earth, many of which can exceed speeds of 250 miles per hour. Structural destruction is often caused by these high-speed winds and the impact of wind-borne debris.

Tornados normally move from southwest to northeast, and their paths of destruction can be approximately one mile wide and fifty miles long. The tornado season in Georgia normally lasts from March until August, although tornados can strike at any time of the year given the right atmospheric conditions. Tornados can also develop as a spin-off from hurricanes. To categorize the intensity of the winds and the levels of damage, the Fujita-Scale (F-scale) listed below is used internationally. Considering the possible damage caused by tornados and the winds associated with them, tornados are rightfully called the most violent storms.
Table 6: The Enhanced Fujita-Scale for Tornados

<table>
<thead>
<tr>
<th>Category</th>
<th>3 Second Gusts</th>
<th>Level Of Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF0</td>
<td>65 - 85 MPH</td>
<td>Chimneys damaged; branches broken off trees; shallow-rooted trees uprooted; sign boards damaged.</td>
</tr>
<tr>
<td>EF1</td>
<td>86-110 MPH</td>
<td>Roof surfaces peeled off; mobile homes pushed off foundations or overturned; moving autos pushed off roads.</td>
</tr>
<tr>
<td>EF2</td>
<td>111-135 MPH</td>
<td>Roofs torn off frame houses; mobile homes demolished; box cars pushed over; large trees snapped or uprooted; light-object projectiles generated.</td>
</tr>
<tr>
<td>EF3</td>
<td>136-165 MPH</td>
<td>Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.</td>
</tr>
<tr>
<td>EF4</td>
<td>166-200 MPH</td>
<td>Well-constructed houses leveled; structures with weak foundations relocated; cars thrown and large projectiles generated.</td>
</tr>
<tr>
<td>EF5</td>
<td>Greater than 200 MPH</td>
<td>Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized projectiles hurtle through the air in excess of 100 yards; trees debarked; other incredible phenomena expected.</td>
</tr>
</tbody>
</table>

Source: Federal Emergency Management Agency, SSEC

2.3. B. Tornado Event Profile, Frequency of Occurrence, Probability

While the Tornado Alley, the region of maximum tornado frequency, is located in the western portions of the southern Great Plains, Stewart County has experienced at least 16 tornados since 1950, with at least six of them being classified Category F2 or EF2 with 3 second gusts between 111-135 MPH.

Table 7: Stewart County Tornado Events (1950-2019)

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Time</th>
<th>Type</th>
<th>Magnitude</th>
<th>Deaths</th>
<th>Injuries</th>
<th>Property Damage</th>
<th>Crop Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-County</td>
<td>12/5/1954</td>
<td>1440</td>
<td>Tornado</td>
<td>F2</td>
<td>1</td>
<td>20</td>
<td>250 K</td>
<td>0</td>
</tr>
<tr>
<td>2-County</td>
<td>12/5/1954</td>
<td>1530</td>
<td>Tornado</td>
<td>F2</td>
<td>0</td>
<td>0</td>
<td>250 K</td>
<td>0</td>
</tr>
<tr>
<td>3-County</td>
<td>12/5/1954</td>
<td>1600</td>
<td>Tornado</td>
<td>F2</td>
<td>0</td>
<td>0</td>
<td>250 K</td>
<td>0</td>
</tr>
<tr>
<td>4-County</td>
<td>4/9/1961</td>
<td>1040</td>
<td>Tornado</td>
<td>F2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5-County</td>
<td>3/18/1981</td>
<td>1345</td>
<td>Tornado</td>
<td>F1</td>
<td>0</td>
<td>0</td>
<td>25 K</td>
<td>0</td>
</tr>
<tr>
<td>6-Omaha</td>
<td>4/3/1998</td>
<td>16:20</td>
<td>Tornado</td>
<td>F0</td>
<td>0</td>
<td>0</td>
<td>10 K</td>
<td>5 K</td>
</tr>
<tr>
<td>7-County</td>
<td>3/1/2007</td>
<td>16:11</td>
<td>Tornado</td>
<td>F1</td>
<td>0</td>
<td>0</td>
<td>20 K</td>
<td>0</td>
</tr>
<tr>
<td>8-County</td>
<td>2/17/2008</td>
<td>16:52</td>
<td>Tornado</td>
<td>F0</td>
<td>0</td>
<td>0</td>
<td>420 K</td>
<td>0</td>
</tr>
<tr>
<td>9-County</td>
<td>11/23/2014</td>
<td>15:07</td>
<td>Tornado</td>
<td>EF1</td>
<td>0</td>
<td>0</td>
<td>25.00K</td>
<td>0</td>
</tr>
<tr>
<td>10-County</td>
<td>11/23/2014</td>
<td>15:27</td>
<td>Tornado</td>
<td>EF1</td>
<td>0</td>
<td>0</td>
<td>5.0 K</td>
<td>0</td>
</tr>
<tr>
<td>11-County</td>
<td>4/7/2016</td>
<td>0.55</td>
<td>Tornado</td>
<td>EF0</td>
<td>0</td>
<td>0</td>
<td>20.00K</td>
<td>0</td>
</tr>
<tr>
<td>12-County</td>
<td>1/2/2017</td>
<td>17.58</td>
<td>Tornado</td>
<td>EF1</td>
<td>0</td>
<td>0</td>
<td>60.00K</td>
<td>0</td>
</tr>
<tr>
<td>13-County</td>
<td>4/3/2017</td>
<td>11.10</td>
<td>Tornado</td>
<td>EF0</td>
<td>0</td>
<td>0</td>
<td>100.00K</td>
<td>0</td>
</tr>
<tr>
<td>14-County</td>
<td>4/3/2017</td>
<td>11.16</td>
<td>Tornado</td>
<td>EF0</td>
<td>0</td>
<td>0</td>
<td>20.00K</td>
<td>0</td>
</tr>
<tr>
<td>15-County</td>
<td>4/5/2017</td>
<td>11.28</td>
<td>Tornado</td>
<td>EF2</td>
<td>0</td>
<td>0</td>
<td>50.00K</td>
<td>0</td>
</tr>
<tr>
<td>16-County</td>
<td>3/3/2019</td>
<td>17.10</td>
<td>Tornado</td>
<td>EF2</td>
<td>0</td>
<td>0</td>
<td>400.00K</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTALS:                                                                                       1   20  1,635K   5 K

Last entry since 10/15/2019.

Source: National Climatic Data Center

Since 1950 Stewart County has been hit by two (2) F1 tornados and three (3) EF1 tornados. Tornados can occur at any time of day or night, anywhere, during any
season of the year. Although Stewart County does not lie in the center of the known tornado activity, there is always a possibility of the occurrence of tornados. The potential damage caused by a tornado event is extremely high. In view of the fact that tornados behave erratically, and can change their direction quickly, no predictions are possible as to where they might hit. Tornados are still considered a real-life threat for Stewart County and its municipalities.

Based on the below map developed by Northern Illinois University the southeast which includes Stewart County is located in an upward trending area of tornado frequency.

![Tornado frequency map](image)

According to a map of Design Wind Zones located below, created by the American Society of Civil Engineers, most of Georgia is located in Wind Zone III, meaning that extreme wind speeds can be expected to be up to 200 mph. Please refer to the GEMA maps by ITOS (see Maps 7 to 9 below), depicting all of Stewart County, Richland and Lumpkin as scoring 2 on a scale from 1 to 5, which stands for wind speeds of only 90 to 99 mph.
Tornadoes are a major threat, both in terms of lives and property, to the residents of Stewart County. Of the eight recorded tornadoes in Stewart County, four was categorized as an EF2. The other tornadoes in Stewart County are categorized as EF0 or EF1. An EF0 tornado typically leaves superficial damage to structures and vegetation. Well-built structures remain unscathed, but may suffer minor damage to roofs, chimneys and windows. An EF1 tornado causes significantly more damage with well-built structures suffering major harm and mobile homes being pushed off their foundations or flipped. Resulting fatalities are also more commonly seen with an EF1 tornado; however, even the weakest tornado can kill.
Map 7: Wind Hazard Scores in Stewart County

Source: GEMA by ITOS 2019
Map 8: Wind Hazard Scores in the City of Lumpkin

All of the City of Lumpkin scored a 2 on a scale from 1 to 5, which stands for wind speeds of 90 to 99 mph (ZONE IV).

Source: GEMA by ITOS 2019
All of the City of Richland scored 2 on a scale from 1 to 5, which stands for wind speeds of 90 to 99 mph (Zone IV). When the tornado activity zone is combined with the wind zone information in a table created by FEMA, Stewart County is said to be at high risk, and that a shelter is the preferred method of protection for home owners from high winds in this area. The close-up of the County in the GEMA map by ITOS however shows slightly slower wind speeds, and therefore a somewhat reduced risk.

According to the Hazard Frequency Table in Appendix A, page A2, the historic recurrence interval for a tornado is roughly every 4.3 years, and the historic frequency states that there is about a 23.19% chance that a tornado will hit Stewart County in a given year. The historic data available for this region is not detailed enough to be able to give a breakdown by the jurisdiction.

2.3. C. Inventory of Assets Exposed to Tornados

Destruction occurs through the combined action of strong rotary winds and the impact of wind-borne debris. Due to the unpredictable and random nature of tornados, all of the geographical areas and critical facilities in the county and its
municipalities are at risk of a tornado hazard. It is not possible to predict or pin-point the geographic area where a tornado may hit therefore it is difficult to determine what structures or facilities are at risk during a tornado event. Among the critical facilities in danger are all government and emergency buildings, shelters, schools, fire stations, and the water supplies within the county and the cities of Lumpkin and Richland.

In the GEMA Critical Facility Inventory Map by ITOS, 65 critical facilities are mapped for Stewart County. Please refer also to the GEMA maps by ITOS (see Maps 10 to 12 below), depicting all of Stewart County, Richland and Lumpkin as scoring 2 on a scale from 1 to 5, which stands for wind speeds of only 90 to 99 mph.

Stewart County, Lumpkin, and Richland are rural jurisdictions and the housing stock is indicative of this fact. Many homes are older and were built of materials that were readily available at a time when economy took precedence over efficiency.

Private homes are at risk of being damaged by high winds, in Stewart County, the majority of homes are older; over half of all housing units (65%) were constructed before 1979. These houses may be more vulnerable to natural hazards than newer houses. In Lumpkin and Richland, the situation is even more precarious, 77% and 76% of homes respectively were constructed before 1979. Time will continue to stress these homes making them increasingly more vulnerable to severe weather events.

Table 8: Stewart County– Age of Housing 2000, 2011, and 2017

<table>
<thead>
<tr>
<th>Built Between</th>
<th>2000</th>
<th>2011</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-1979</td>
<td>410</td>
<td>375</td>
<td>489</td>
</tr>
<tr>
<td>1960-1969</td>
<td>330</td>
<td>381</td>
<td>410</td>
</tr>
<tr>
<td>1950-1959</td>
<td>289</td>
<td>293</td>
<td>243</td>
</tr>
<tr>
<td>1940-1949</td>
<td>125</td>
<td>233</td>
<td>112</td>
</tr>
<tr>
<td>1939 or earlier</td>
<td>402</td>
<td>566</td>
<td>270</td>
</tr>
<tr>
<td>Total Housing Units</td>
<td>2,354</td>
<td>2,612</td>
<td>1,524</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2000, 2011, American Community Survey Five-Year Estimates 2013 to 2017

Table 9: Lumpkin– Age of Housing 2000, 2011, and 2017

<table>
<thead>
<tr>
<th>Built Between</th>
<th>2000</th>
<th>2011</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-1979</td>
<td>113</td>
<td>146</td>
<td>156</td>
</tr>
<tr>
<td>1960-1969</td>
<td>90</td>
<td>152</td>
<td>112</td>
</tr>
<tr>
<td>1950-1959</td>
<td>103</td>
<td>145</td>
<td>68</td>
</tr>
<tr>
<td>1940-1949</td>
<td>30</td>
<td>62</td>
<td>32</td>
</tr>
<tr>
<td>1939 or earlier</td>
<td>101</td>
<td>184</td>
<td>70</td>
</tr>
<tr>
<td>Total Housing Units</td>
<td>602</td>
<td>689</td>
<td>438</td>
</tr>
</tbody>
</table>


Table 10: Richland– Age of Housing 2000, 2011, and 2017

<table>
<thead>
<tr>
<th>Built Between</th>
<th>2000</th>
<th>2011</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-1979</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960-1969</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950-1959</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1940-1949</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1939 or earlier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Housing Units</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regardless of age, mobile homes are even more susceptible to wind damage than stick-built homes. Of the 2,225 housing units in Stewart County in 2019, 776 were mobile homes or trailers, which is a percentage of 35%. In the City of Lumpkin, 125 housing units or 22% were mobile homes or trailers in 2017, and in Richland the percentage of mobile homes or trailers was 28% or 227 housing units.

The presence of mobile homes or trailers is increasing significantly in Stewart County and its municipalities. This type of housing unit has and continues to gain popularity primarily because of its affordability. Although, practical and affordable, mobile homes or trailers are highly susceptible to wind and severe weather damage. In addition, the housing units do not provide adequate protection for residents during severe weather events.

Table 11: Stewart County– Types of Housing 1990, 2000, and 2017

<table>
<thead>
<tr>
<th>Type</th>
<th>1990</th>
<th>2000</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family</td>
<td>1,478</td>
<td>1,434</td>
<td>1,484</td>
</tr>
<tr>
<td>Multi- Family</td>
<td>101</td>
<td>138</td>
<td>95</td>
</tr>
<tr>
<td>Mobile Home or Trailer</td>
<td>196</td>
<td>741</td>
<td>776</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>41</td>
<td>0</td>
</tr>
<tr>
<td>Total Housing Units</td>
<td>2,156</td>
<td>2,354</td>
<td>2,225</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 1990, 2000, ESRI Business Analyst 2019

Table 12: Lumpkin– Types of Housing 1990, 2000, and 2017

<table>
<thead>
<tr>
<th>Type</th>
<th>1990</th>
<th>2000</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family</td>
<td>348</td>
<td>384</td>
<td>426</td>
</tr>
<tr>
<td>Multi- Family</td>
<td>32</td>
<td>47</td>
<td>21</td>
</tr>
<tr>
<td>Mobile Home or Trailer</td>
<td>96</td>
<td>171</td>
<td>125</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Housing Units</td>
<td>488</td>
<td>602</td>
<td>572</td>
</tr>
</tbody>
</table>

In the City of Richland, there are 860 non-critical structures, of which 804 are classified residential, 37 commercial, 15 industrial, 0 agricultural and 4 religious or non-profit. In the City of Lumpkin are 623 non-critical structures, of which 572 are classified residential, 37 commercial, 10 industrial; 0 agricultural and 4 religious or non-profit. In the unincorporated area of Stewart County, there are 957 non-critical structures, of which 849 are classified as residential, 84 commercial, 15 industrial, 0 agricultural, and 9 as religious or non-profit. These non-critical structures potentially are all exposed to the high winds of a tornado, just like the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D.

Since the total population of Stewart County is not increasing, not a lot of future development is expected. In 2010 Stewart County has a total population 6,101 people. In 2016 the total population is 5,705. The 2018 Georgia County Guide, Stewart County ranks 150 out of 159 in population, with a loss of total population of 7% from 2010 to 2016.

2.3. D. Estimate of Potential Losses to Tornados

When the F1-tornado hit Stewart County in 1981, property damage was estimated to be approximately $25,000. This has been the third greatest loss to date for Stewart County to any one natural hazard. The total property damage from one F2-tornado that touched down three times in 1954 was estimated to be $250,000. The most recent tornado that hit Stewart County was in March of 2007 however the estimated damage totals have not been made available by NOAA on their NCDC site.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural value is 93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $ 9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $11,245,109.

<table>
<thead>
<tr>
<th>Type</th>
<th>1990</th>
<th>2000</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family</td>
<td>441</td>
<td>452</td>
<td>520</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>24</td>
<td>91</td>
<td>57</td>
</tr>
<tr>
<td>Mobile Home or Trailer</td>
<td>170</td>
<td>168</td>
<td>227</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Housing Units</td>
<td>644</td>
<td>711</td>
<td>804</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 1990, 2000; ESRI Business Analyst 2019
replacement value of $8,774,023. Unincorporated Stewart County has a structural
replacement value 63,698,965 and a contents replacement value of 95,548,373. For
a complete listing of replacement values of critical facilities, please refer to the
GEMA worksheet #3b on Wind Hazard Scores in Appendix D.

It can be assumed that structures with the greatest replacement value will sustain the
most monetary damage. The Stewart County Detention Facility has the highest
replacement value, approximately $22,000,000. In the City of Lumpkin, the highest
replacement value is for the Stewart County Elementary, which is $8,860,000.

The non-critical structures in the City of Richland have a value of $87,515,423. The
City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical
structure value of $46,815,299. The Stewart County wide value for non-critical
structures total $204,663,740. For a complete listing of values of non-critical
structures, please refer to the GEMA worksheet #3a on Inventory of Assets in
Appendix D.

Below is a detailed tornado damage analysis developed by the University of
Georgia’s Carl Vinson Institute of Government. The damage scenario is based on an
EF3 tornado. The model estimates that 80 residential structures with building loses
of $1,086,997; $35,906 worth of damage to 2 religious structures and $64,657 in
damage to 2 government facilities.

Estimate of Potential Losses
Hypothetical Tornado Scenario

For this report, an EF3 tornado was modeled to illustrate the potential impacts of
tornadoes of this magnitude in the county. The analysis used a hypothetical
path based upon an EF3 tornado event running along the predominant direction
of historical tornados (southeast to northwest). The tornado path was placed to
travel through Lumpkin. The selected widths were modeled after a re-creation of
the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path
lengths. There is no guarantee that every tornado will fit exactly into one of these
categories. Table 11 depicts tornado path widths and expected damage.

<table>
<thead>
<tr>
<th>Fujita Scale</th>
<th>Path Width (feet)</th>
<th>Maximum Expected Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF-5</td>
<td>2,400</td>
<td>100%</td>
</tr>
<tr>
<td>EF-4</td>
<td>1,800</td>
<td>100%</td>
</tr>
<tr>
<td>EF-3</td>
<td>1,200</td>
<td>80%</td>
</tr>
<tr>
<td>EF-2</td>
<td>600</td>
<td>50%</td>
</tr>
<tr>
<td>EF-1</td>
<td>300</td>
<td>10%</td>
</tr>
<tr>
<td>EF-0</td>
<td>300</td>
<td>0%</td>
</tr>
</tbody>
</table>
Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path, with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map, the process is modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 11 describes the zone analysis.

![Figure 11: EF Scale Tornado Zones](image)

An EF3 tornado has four damage zones, depicted in Table 12. Major damage is estimated within 150 feet of the tornado path. The outer buffer is 900 feet from the tornado path, within which buildings will not experience any damage. The selected hypothetical tornado path is depicted in Figure 12 and the damage curve buffer zones are shown in Figure 13.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Buffer (feet)</th>
<th>Damage Curve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-150</td>
<td>80%</td>
</tr>
<tr>
<td>2</td>
<td>150-300</td>
<td>50%</td>
</tr>
<tr>
<td>3</td>
<td>300-600</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>600-900</td>
<td>0%</td>
</tr>
</tbody>
</table>
Figure 12: Hypothetical EF3 Tornado Path in Stewart County
EF3 Tornado Building Damages

The analysis estimated that approximately 84 buildings could be damaged, with estimated building losses of $1 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels provided by Stewart County that were joined with Assessor records showing estimated property replacement costs. The Assessor records often do not distinguish parcels by occupancy class if the parcels are not taxable and thus the number of buildings and replacement costs may be underestimated. The results of the analysis are depicted in Table 13.
Table 13: Estimated Building Losses by Occupancy Type

<table>
<thead>
<tr>
<th>Occupancy</th>
<th>Buildings Damaged</th>
<th>Building Losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>80</td>
<td>$1,086,997</td>
</tr>
<tr>
<td>Religious</td>
<td>2</td>
<td>$35,906</td>
</tr>
<tr>
<td>Government</td>
<td>2</td>
<td>$64,657</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>$1,187,560</td>
</tr>
</tbody>
</table>

EF3 Tornado Essential Facility Damage

There were four essential facility located in the tornado path – one school, two medical care facilities and one emergency operations center. Table 14 outlines the specific facility and the amount of damage under the scenario.

Table 14: Estimated Essential Facilities Damaged

<table>
<thead>
<tr>
<th>Facility</th>
<th>Amount of Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stewart County Elementary School</td>
<td>Major Damage</td>
</tr>
<tr>
<td>Stewart County Health Department</td>
<td>Minor Damage</td>
</tr>
</tbody>
</table>

According to the Georgia Department of Education, Stewart County Elementary School’s enrollment was approximately 226 students as of October 2018. Depending on the time of day, a tornado strike as depicted in this scenario could result in significant injury and loss of life. In addition, arrangements would have to be made for the continued education of the students in another location.

The location of the damaged Essential Facility is mapped in Figure 14.
2.3. E. Land Use and Development Trends Related to Tornadoes

No local land use or development trends apply to the hazard of a tornado event, since a tornado can strike anywhere in the county. FEMA recommends tornado shelters for homeowners in high risk areas. Another risk factor is that the greatest increase in housing units has been in the number of manufactured housing units (mobile homes). From 1990 to 2017 mobile homes increased by 296 percent.

In the county, the number of traditional stick-built housing units actually increased from 1990 to 2017. In 1990 there were 1,478 stick-built units and 1,484 stick-built units in 2017. Of the 2,225 housing units in Stewart County, multifamily units decreased from 191 in 1990 to 95 in 2017. Mobile homes increased from 196 in 1990 to 776 in 2017. Lumpkin saw an increase in stick-built single-family homes from 348 in 1990 to 426 in 2017. Multi-family units decreased by 11 units from 32 units in 1990 to 21 units in 2017. Mobile Homes or Trailers increased from 96 units in 1990 to 125 units in 2017, which is a percentage of 31.4% (please refer to Tables 9-11 below). In the City of Richland, stick-built housing increased from 441 units in 1990 to 520 units in 2017 for a gain of 89. Multi-family units increased as well from 24 units in 1990 to 57 units in 2017 for a gain of 33 units. Mobile homes in Richland increased from 170 to 227 units from 1990 to 2017. Stewart County is
also seeing a deterioration of its housing stock due to minimal population growth and the number of vacant houses.

The deterioration of substandard units and those in need of minor repair is expected to continue unless efforts are made to address the problem. The dilapidated housing units in the county as well as those within the city limits create not only a blighting influence, but also are at a higher risk of being severely damaged during a tornado, hurricane, or severe thunderstorm.

2.3. F. Multi-Jurisdictional Tornado Differences
There are no differences in risk between Stewart County, the City of Lumpkin and the City of Richland as it pertains to the tornado hazard. The risk is the same in all jurisdictions, and the mitigation measures for tornados also apply to all three. The Wind Hazard Scores depicted in the GEMA maps by ITOS are based on the 2000 International Building Code.

All of Stewart County (see Map 7 above) and the City of Lumpkin and the City of Richland (see close-up Maps 14 and 15 below) scored 2 on a scale from 1 to 5, which stands for wind speeds of 90 to 99 mph (or ZONE IV).

2.3. G. General Overall HRV Summary of Tornados
Three F1-tornados have caused great losses of property for Stewart County in the past. Since Stewart County, Lumpkin, and Richland are located in a medium high risk area, and since tornados can be expected in all parts of the county at any time, the county and cities must prepare for this hazard in advance. The best chance to survive a tornado is to plan in advance, and to respond quickly to a tornado watch or warning.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2014. The E911 system was established in 2009. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

2.4. Flood

2.4. A. Identify Floods
Floods are defined as the rising of bodies of water, like rivers and streams, overflowing their natural or artificial banks onto normally dry land. These high-water stages are often related with severe tropical storms or torrential rains from hurricanes. Floods can be slow as the result of extended rain or a storm event, or fast rising as the result of a flash flood. Flash floods can be expected when an area is affected by large amounts of rainfall in a short time; these floods can often result in dam failure. Generally however, they develop over a period of days.
As defined by the National Flood Insurance Program, a flood is:

"A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is your property) from:

Overflow of inland or tidal waters, Unusual and rapid accumulation or runoff of surface waters from any source, or A mudflow.

[The] collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood."

In order to determine if an area is susceptible to flooding, many different factors have to be considered; among them, precipitation intensity and duration, topography, basin size, drainage patterns of streams, ground saturation, soil permeability, drainage, and vegetation cover.

The installation of more and more impermeable surfaces, for example roads, parking lots, and roofs, increases the amount of surface water directly flowing into the rivers and creeks, and increases the risk of these streams flooding.

2.4. B. Flood Event Profile, Frequency of Occurrence, Probability

Floors are one of the most common and widespread of all natural disasters. Stewart County and its cities, like the majority of other communities in the United States, have experienced some flooding after spring rains, heavy thunderstorms or tropical storms.

Heavy rains can potentially cause flooding and/or flash flooding. Periodic floods occur naturally on many rivers, forming an area known as the flood plain. These river floods usually result from heavy rain, which causes rivers to overflow their banks. A flood that rises and falls rapidly with little or no advance warning is called a flash flood. Flash floods usually result from intense rainfall over a relatively small area. There are often many causes for a flood.

A flood happens when an area of land, usually low-lying, is covered with water. The worst floods usually occur when a river overflows its banks. Floods happen when soil and vegetation cannot absorb all the water; water then runs off the land in quantities that cannot be carried in stream channels or kept in natural ponds or man-made reservoirs.

A flash flood is a rapid flooding of low-lying areas, rivers and streams; caused by the intense rainfalls associated with a thunderstorm, or multiple training thunderstorms. Flash flooding occurs when the ground becomes saturated with quickly fallen rain water that was unable to be absorbed. The runoff collects in low-lying areas and rapidly flows downhill, threatening anything in its path with suddenly rising water. Flash floods most often occur in normally dry areas that have
recently received precipitation, but may also be seen anywhere downstream from the source of the precipitation (even dozens of miles from the source).

Flash floods are extremely dangerous due to their sudden nature. Vehicles do not provide protection against flash floods, as vehicles can be swept away. Being in a vehicle can make people overly confident and less likely to avoid the flash flood; more than half of the fatalities attributed to flash floods are a result of people being swept away in vehicles when trying to cross flooded intersections. As little as six (6) inches of water can be enough to carry away most SUV-sized vehicles. In the United States, the National Weather Service (part of NOAA) reported in 2005 that in a national 30-year average more people die yearly in floods (127 on average) than by lightning (73), tornadoes (65), or hurricanes (16).

On September 29, 1998 the remnants of Hurricane George brought 5 inches or greater of rain across Stewart County. Numerous roads were flooded with water making some impossible to travel on and left others closed. This flood event caused a reported $25,000 of property damage and $8,000 in crop damage.

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Time</th>
<th>Type</th>
<th>Magnitude</th>
<th>Deaths</th>
<th>Injuries</th>
<th>Property Damage</th>
<th>Crop Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Habersham Zone</td>
<td>7/6/1996</td>
<td>11:20</td>
<td>Flash Flood</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>2-County Line (Stewart County)</td>
<td>9/29/1998</td>
<td>11:50</td>
<td>Flash Flood</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
<td>$25,000</td>
<td>$8,000</td>
</tr>
<tr>
<td>3-Richland (multi-county)</td>
<td>3/27/2005</td>
<td>06:00</td>
<td>Flood</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4-Blufftown</td>
<td>12/14/2009</td>
<td>23:00</td>
<td>Flood</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
<td>$3,000</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTALS:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td><strong>$28,000</strong></td>
<td><strong>$8,000</strong></td>
</tr>
</tbody>
</table>

*Updated 10/15/2019

Source: National Climatic Data Center 2019

The local police department reported that during the night of March 27, 2005 heavy rains had caused flooding of several streets in Richland. Stewart County experienced 4 to 5 inches of rain fall on March 27th between the hours of midnight and noon. This flood event caused a reported $25,000 of property damage. The major flood areas within the County include low lying areas, areas close to natural water features, and lakes. These areas are predominantly low lying meaning that they have the potential to flood during periods of heavy rain fall. These areas can occur in various places throughout the county, from private water features or man-made lakes and ponds to areas such as the entire western border of Stewart County, which is comprised of the Chattahoochee River also Lake Walter F. George rests within the county. This flooding of the area is usually associated with drainage problems, for the ground has become saturated, making it hard for the water to follow its normal pattern of drainage. It is usually recommended that development not be allowed or at least limited in the flood plains or low lying areas due to the problem with the ground saturation problems.
According to the Hazard Frequency Table in Appendix A, the historic recurrence interval for a flood in Stewart County is roughly every 13.80 years, and the historic frequency states that there is about a 7.25% chance that a flood will hit Stewart County in a given year. The historical record is not accurate enough to allow for a breakdown by jurisdiction, although it does list one occurrence as happening in one jurisdiction, but allows for the disclaimer and area, which makes it unclear as to only the particular area being hit or the entire Stewart County jurisdiction. The City of Richland has had one flood event as part of a multi-county area. The historic recurrence interval for a flood in the City of Richland is roughly every 69 years, and the historic frequency states that there is about a 1.45% chance that a flood will hit Richland in a given year. There are no NCDC flood events recorded in Lumpkin.

In 2009, a series of strong southern stream short waves were embedded within a large scale mean trough located across the central into the northeast United States. The heavy rain on totally saturated ground from recent months of much above normal rainfall led to renewed flooding and flash flooding, especially across central Georgia, where two to four inches of rain was common during this period. The Stewart County Emergency Management Director reported minor flooding of some roads and property across the county, mostly adjacent to overflowing creeks and streams. Monetary damage was confined to minor debris removal in these areas. Several sources were researched in order to determine the extent of the Flood hazard. The USGS gauge at Hannahatchee Creek does not have any historic crest levels recorded. The National Climatic Data Center hazard history also does not have any recorded flood depths. In addition, Base Flood Elevations have not been established in Stewart County or Richland. There are no other known sources that may be used to determine the extent of the Flood hazard in Stewart County. Therefore, a potential extent cannot be scientifically or statistically determined based on known available data.

2.4. C. Inventory of Assets Exposed to Floods

Floods can cause severe damage by flooding buildings, damaging septic tanks, contaminating private wells, and cause crop losses. Individual events might not be disastrous; however the costs and losses can have a lasting impact on a community as well as property owners. In the GEMA Critical Facility Inventory Map by ITOS, 65 critical facilities are mapped for Stewart County. As can be seen from the GEMA Flood Hazard Score map by ITOS depicted below in Maps 10 to 12, the flood score hazard is minimal, ranging from 0 to 1 in some cases, the 1 score happening amongst areas that are on or beside waterways.

Stewart County and Richland participate in the National Flood Insurance Program (NFIP). Both jurisdictions were mapped by FEMA in 2010. Base Flood Elevations have not been established in Stewart County or Richland. Lumpkin does not participate in the NFIP. There are five mitigated properties in Stewart County. Two properties lie in the unincorporated area of Stewart County, two mitigated properties rest in Lumpkin and one mitigated property lies in Richland. There are no NFIP Repetitive Loss Structures in Stewart County.
Map 10. Flood Score Hazards, Stewart County

Source: GEMA by ITOS 2019
Map 11. Flood Score Map, City of Richland

Source: GEMA by ITOS 2019

Map 12. Flood Hazard Score, City of Lumpkin

Source: GEMA by ITOS 2019
For a complete listing of all structures in the cities and county at risk from flooding, please refer to GEMA worksheet #3a in Appendix D.

The University of Georgia Carl Vinson Institute did a probabilistic risk assessment analysis of a 1% annual chance riverine flood event (100-Year Flood) and a 1% annual chance coastal flood analysis for Stewart County. Inserted below verbatim is the flood damage assessment from the 2019 Stewart County Hazus report. The model estimates that 21 buildings totaling $896,022 would be damaged. One commercial structure would be damaged at a cost of $1,193 and that 20 residential structures would sustain $894,809 worth of damage.

**Riverine 1% Flood Scenario**

Riverine losses were determined from the 1% flood boundaries downloaded from the FEMA Flood Map Service Center in January 2019. The flood boundaries were overlaid with the USGS 10 meter DEM using the Hazus-MH Enhanced Quick Look tool to generate riverine depth grids. The riverine flood depth grid was then imported into Hazus-MH to calculate the riverine flood loss estimates. Figure 6 illustrates the riverine inundation boundary associated with the 1% annual chance.
Figure 6: Riverine 1% Flood Inundation
Riverine 1% Flood Building Damages

Buildings in Stewart County are vulnerable to flooding from events equivalent to the 1% riverine flood. The economic and social impacts from a flood of this magnitude can be significant. Table 9 provides a summary of the potential flood-related building damage in Stewart County by jurisdiction that might be experienced from the 1% flood. Figure 7 maps the potential loss ratios of total building exposure to losses sustained to buildings from the 1% flood by 2010 census block and Figure 8 illustrates the relationship of building locations to the 1% flood inundation boundary.

Table 9: Stewart County Riverine 1% Building Losses

<table>
<thead>
<tr>
<th>Total Buildings in the Jurisdiction</th>
<th>Total Buildings Damaged in the Jurisdiction</th>
<th>Total Building Exposure in the Jurisdiction</th>
<th>Total Losses to Buildings in the Jurisdiction</th>
<th>Loss Ratio of Exposed Buildings to Damaged Buildings in the Jurisdiction</th>
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<tr>
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<tr>
<td>Commercial</td>
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<tr>
<td>County Total</td>
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<td>21</td>
<td>$106,267,559</td>
<td>$896,002</td>
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</table>

Figure 7: Stewart County Potential Loss Ratios of Total Building Exposure to Losses Sustained to Buildings from the 1% Riverine Flood by 2010 Census Block
Riverine 1% Flood Essential Facility Losses

An essential facility may encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). The analysis identified no essential facility that were subject to damage in the Stewart County riverine 1% probability floodplain.
Riverine 1% Flood Shelter Requirements

Hazus-MH estimates that the number of households that are expected to be displaced from their homes due to riverine flooding and the associated potential evacuation. The model estimates 28 households might be displaced due to the flood. Displacement includes households evacuated within or very near to the inundated area. Displaced households represent 85 individuals, of which 2 may require short term publicly provided shelter. The results are mapped in Figure 9.

Figure 9: Riverine 1% Estimated Flood Shelter Requirements
Riverine 1% Flood Debris

Hazus-MH estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories:

- Finishes (dry wall, insulation, etc.)
- Structural (wood, brick, etc.)
- Foundations (concrete slab, concrete block, rebar, etc.)

Different types of material handling equipment will be required for each category. Debris definitions applied in Hazus-MH are unique to the Hazus-MH model and so do not necessarily conform to other definitions that may be employed in other models or guidelines.

The analysis estimates that an approximate total of 643 tons of debris might be generated:
1) Finishes- 212 tons; 2) Structural – 165 tons; and 3) Foundations- 266 tons. The results are mapped in Figure 10.
2.4. D. Estimate of Potential Losses to Floods

According to the data from the NCDC, the flood in March 1998 caused property damage along the county line, estimating $25,000 worth of property damage and $8,000 worth of crop damage in the area. The local police department reported that during the night of March 27, 2005 heavy rains had caused flooding of several streets in Richland. Stewart County experienced 4 to 5 inches of rain fall on March 27th between the hours of midnight and noon. This flood event caused a reported $25,000 of property damage.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural vale is $93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $ 9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value 63,698,965 and a contents replacement value of $95,548,373.

The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

In the City of Richland, there are 860 non-critical structures, of which 804 are classified residential, 37 commercial, 15 industrial, 0 agricultural and 4 religious or non-profit,. In the City of Lumpkin are 623 non-critical structures, of which 572 are classified residential, 37 commercial, 10 industrial; 0 agricultural and 4 religious or non-profit. In the unincorporated area of Stewart County, there are 957 non-critical structures, of which 849 are classified as residential, 84 commercial, 15 industrial, 0 agricultural, and 9 as religious or non-profit.

Some of these non-critical structures are potentially exposed to flooding just like the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D.
For a complete listing of replacement values of each critical facility, please refer to the GEMA worksheet #3b on Flood Hazard Scores in Appendix D. Please refer to the GEMA maps by ITOS (Maps 10-12), depicting no Flood Hazard score for Stewart County and the Cities of Richland and Lumpkin. Stewart County and Richland participate in the NFIP both are mapped for Flood Hazards. However, in both Stewart County and Richland a base line flood elevation has never been determined. A score of 0 to 1 means that either the floodplains have not been determined, are undesignated, or outside the flood zones. For the benefit of the plan, these areas are listed as a 1, with the definition of not being mapped. One critical facility identified has been found to be within a Flood Plain, that being Florence Marina.

According to the Hazard Frequency Table in Appendix A., the historic recurrence interval for a flood is roughly every 17.25 years, and the historic frequency states that there is about a 5.80% chance that a flood will hit Stewart County in a given year. It can be assumed that structures with the greatest replacement value will sustain the most monetary damage. The Stewart County Detention Facility has the highest replacement value, approximately $42,367,200. In the City of Lumpkin, the highest replacement value is for the Stewart County Elementary, which is $2,607,250.

According to GMIS there are five mitigated properties in Stewart County. Two properties lie in the unincorporated area of Stewart County, two mitigated properties rest in Lumpkin and one mitigated property lies in Richland. There are no NFIP Repetitive Loss Structures in Stewart County.

2.4. E. Land Use and Development Trends Related to Floods

Lakefronts and river sides are popular sites for residential development. However, development within the floodplain is not ideal because of two factors: it slows the flow of the storm water because it impedes the storm flow, and at the same time increases the size of the storm flow, because the soil’s ability to absorb precipitation is reduced through the installation of impervious surfaces. Without floodplain maps, development can occur in the county in flood hazardous areas, because no restrictions can be enforced. Stewart County has been mapped for flood prone areas under the Federal Emergency Management Agency program and participates in the National Flood Insurance Program. The Cities of Lumpkin and Richland have been mapped but only Richland participates in the National Flood Insurance Program and are sanctioned as such. The Stewart County Flood Hazard Map can be found in Appendix A. According to the Stewart County Comprehensive plan, adopted in 2014, land use and development of flood plains, wetlands, and various other limiting soil types will be encouraged to respect the natural limitation of these soil types. Flood prone areas, accordingly, will be used for passive recreation and other open space uses. Overall development is currently discouraged in the flood plain areas.
2.4. F. Multi-Jurisdictional Flood Differences

Most flooding is a result of creek overflow and not due to storm drainage problems. Improper drainage can lead to flooded streets, which in turn can cause aquaplaning of the vehicles traveling on the roads. Stewart County has been mapped for flood prone areas under the Federal Emergency Management Agency program and participates in the National Flood Insurance Program. The Cities of Lumpkin and Richland have been mapped; but only Richland participates in the National Flood Insurance Program and has been sanctioned for such. The Stewart County Flood Hazard Map can be found in Appendix A, page. All of Stewart County scored 0 to 1 on a scale from 0 to 4 as depicted on the GEMA Flood Hazard Score Map 10-12 below, which means that floods are undesignated or that area has not been mapped. The flood hazard scores used for the GEMA map by ITOS are derived from the FEMA Q3 “Zone” values. The Q3 layer is derived from the FEMA paper flood insurance rate maps. This layer cannot be used for a legal flood determination. Detailed flood studies are not completed for the county, which means that 100-year flood elevations are not mapped on the FIRM map.

The Cities should request the Federal Emergency Management Agency to map the county for flood prone areas. The cities should have base flood elevations determined by FEMA, since without floodplain maps, development can occur in the county in flood hazardous areas. Stewart County adopted its Flood Hazard map in 2010 Richland adopted its flood map in 2019. Protection from the flooding hazard requires a county-wide enforcement of floodplain and wetlands ordinances. Once flood control structures are constructed, threats for the cities and county will be reduced.

2.4. G. General Overall HRV Summary of Floods

Stewart County has experienced some flooding in the past, and all can expect a similar event in the future. Most flooding is a result of creek overflow and not due to storm drainage problems. Stewart County and the cities of Lumpkin and Richland, like the majority of all other communities in the United States, has experienced flooding after spring rains, heavy thunderstorms or tropical storms. Due to its geographical location close to the Gulf and Atlantic coast, all three jurisdictions are and will remain susceptible to torrential rainfalls from tropical systems. Therefore, in order to reduce future risk of monetary damage, sound mitigation strategies are needed in both cities and county.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code.
Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2014. In 2015 Stewart County created Facebook page that it uses as a community storm alert system. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

2.5. Drought

2.5. A. Identify Drought

A drought is a period of time when there is not enough water to support agricultural, urban or environmental water needs. A drought usually refers to an extended period of below-normal rainfall, but can also be caused by drying bores or lakes, or anything that reduces the amount of available liquid water. Although what is considered "normal" varies from one region to another; droughts are a threat of nearly all the world's climatic regions. In addition, the effects of drought vary depending on agricultural, urban and environmental water needs. A drought is most harmful during the planting and growing season in agricultural areas. A drought can result in extensive damage to crops or prevents their successful growth.
The hydrologic imbalance is caused when the evaporation and transpiration of soils and plants is greater than the precipitation. Lack or insufficient rain for an extended period leads to water shortages, crop damage, stream flow reduction, and depletion of groundwater and soil moisture. It can even upset the hydrologic cycle and impact fish, wildlife and plant species. Drought can therefore have a serious economic impact on a community and its population, including food shortages.

In Georgia, droughts affect municipal and industrial water supplies, streamwater quality, recreation at reservoirs, navigation, agricultural and forest resources. Since drought conditions make natural fuels (grass, brush, trees, dead vegetation, etc.) more fire-prone, drought is also a key factor in wildfire development.

2.5. B. Drought Event Profile, Frequency of Occurrence, Probability

A drought lasting one to three months is considered short term; four to six months is considered immediate; and a drought event over 6 months is considered long term.

Currently, none of Stewart County is below normal. The 7-day average of stream flow as shown in the map below. The National Climatic Data Center estimated crop losses in Stewart County between 2000 and 2016 is $2.84 million
### Table 18: Stewart County Drought Events 2000-2019

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Source: National Climatic Data Center 2019
In Stewart County, approximately 2.1 drought events (many spanning several months each) have been reported to the National Climatic Data Center. None were reported before the year 2000. It is difficult to determine how often drought conditions can be predicted. According to the NOAA information listed above, recurrence intervals for droughts in Stewart County are every 3 years, depending on severity.

According to the Hazard Frequency Table in Appendix A the historic recurrence interval of a drought is approximately one every three years (3) and the historic frequency states that there is a 30% chance that a drought will occur in Stewart County in a given year. The historical data is not detailed enough to have a breakdown per jurisdiction, particularly due to the fact that the hazard is broad enough to affect the areas of the cities of Lumpkin and Richland and Stewart County.

Stewart County was named a Disaster Area by the President of the United States in 1992, 1993, 1997, 1999 and 2003 for drought. The last state drought declaration was in January 2017 when the State of Georgia declared a Level 1 drought. Currently, the State of Georgia is not in an extended drought.

The Palmer Drought Index is a measurement of dryness based on recent precipitation and temperature. It was developed by meteorologist Wayne Palmer. The Palmer Drought Index is based on a supply-and-demand model of soil moisture. Supply is comparatively straightforward to calculate, but demand is more complicated as it depends on many factors — not just temperature and the amount of moisture in the soil but hard-to-calibrate factors including evapotranspiration and recharge rates. Palmer tried to overcome these difficulties by developing an algorithm that approximated them based on the most readily available data — precipitation and temperature. The index has proven most effective in determining long-term drought — a matter of several months — and not as good with conditions over a matter of weeks. It uses a 0 as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer's algorithm also is used to describe wet spells, using corresponding positive numbers. Palmer also developed a formula for standardizing drought calculations for each individual location based on the variability of precipitation and temperature at that location. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available (wikipedia.com). Since January 2000 there are 240 months where there are 37 molecule droughts, 21 severe droughts and 16 extreme droughts for a total of 74 drought events in Southwest Georgia. The remaining 166 months are classified as mid-range, moderately moist, very moist, or extremely moist.
Table 19: South-West Georgia Palmer Drought Severity Index 2000-2019

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<td>moderate drought</td>
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Source: National Climatic Data Center
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</tbody>
</table>

As can be seen in the table above, the Palmer Drought Severity Index ranges from extremely moist to extreme drought in south-west Georgia. In the past 15 years, Stewart County has been in a drought 36% of the time, in a state of mid-range moisture 38% of the time, and in a state of excess moisture 26% of the time.

### 2.5. C. Inventory of Assets Exposed to Drought

Critical facilities and non-critical structures, as well as the population, tend not to be at physical risk from a drought. Most prone to experience drought damage is the agricultural sector.

Based on Stewart County Tax parcel records there are 0 agricultural structures within in Stewart County. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D. Please note that concerning droughts, there is no spatial depiction available in the GEMA mapping tool by ITOS.

In the GEMA Critical Facility Inventory Map by ITOS, 65 critical facilities are mapped for Stewart County. It is not expected that any of them would be damaged through drought conditions.
The average farm size in 2012 is 549 acres, much smaller than in 1997 when the average size was 655 acres. However, farm size did increase from 490 acres in 2007 to 549 acres in 2012. The commercial forest land comprises 84% of all land in Stewart County, mostly comprised of agriculture, forestry, fishing, and hunting as indicated on the existing land use classification map. Peanuts is the largest harvested crop, producing a value of over $2.6 million, followed by cotton with a value of $1.5 million. Harvested cropland in acres in Stewart County has risen from 9,652 acres in 2007 to 12,699 acres in 2012 which is an increase of 31.6%.

Since the total population of Stewart County is decreasing with a loss of total population from 5,803 in 2014 to 5,705 in 2016 and is estimated to continue to decrease over the next 10 to 20 years not a lot of future development is expected. According to the Georgia County Guide, information gathered from the U.S. Census Bureau, Stewart County ranks 150 out of 159 fastest growing counties. The lack of growth means there no pressure being placed on existing water resources. Stewart County adheres to the International Building Code. New buildings should then be well insulated, especially around air conditioners and ducts, to prevent waste of water for cooling purposes. Therefore, the probability of future occurrences is the same for each jurisdiction.

2.5. D. Estimate of Potential Losses to Drought

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural value is $93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value $63,698,965 and a contents replacement value of 95,548,373.

In the City of Richland, there are 860 non-critical structures, of which 804 are classified residential, 37 commercial, 15 industrial, 0 agricultural and 4 religious or non-profit. In the City of Lumpkin are 623 non-critical structures, of which 572 are classified residential, 37 commercial, 10 industrial; 0 agricultural and 4 religious or non-profit. In the unincorporated area of Stewart County, there are 957 non-critical structures, of which 849 are
classified as residential, 84 commercial, 15 industrial, 0 agricultural, and 9 as religious or non-profit.

These non-critical structures are not exposed draught per say, but a draught with associated high temperatures could very well put a strain on well water supplies and air conditioning units, just as it could impact the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D.

The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D. For a complete listing of replacement values of critical facilities, please refer to the GEMA worksheet #3b on Wind Hazard Scores in Appendix D. While the hazard score from this report is not relevant to this hazard, the report serves as the best available for a total inventory of critical facilities for these purposes.

The population is normally not directly at risk either, except in the latter stages of a severe drought, when drinking water drops to critically low levels. In today’s world, no deaths should be expected due to droughts, since both water and food can be transported into the affected areas. However, the loss of crops in the agricultural sector can impose a severe economic burden on the local peanut farmers. Crop damage cannot be accurately quantified since different crops require different amounts of rain, temperature are different during the droughts, the duration and the severity of the droughts vary. The peanut farmers are most likely to be affected by water shortages due to drought conditions.

Potential losses would occur from the exposure of crops planted in Stewart County, and farmers would need to be compensated for the loss. Since the agricultural producers’ percentage of return on economic investments is among the lowest of any economic sector, the economic impact for the community is getting less and less.

2.5. E. Land Use and Development Trends Related to Drought

The average farm size in 2012 is 549 acres, much smaller than in 1997 when the average size was 655 acres. However farm size did increase from 490 acres in 2007 to 549 acres in 2012. The commercial forest land comprises 84% of all land in Stewart County, mostly comprised of agriculture, forestry, fishing, and hunting as indicated on the existing land use classification map. Peanuts is the largest harvested crop, producing a value of over $2.6 million,
followed by cotton with a value of $1.5 million. Harvested cropland in acres in Stewart County has risen from 9,652 acres in 2007 to 12,699 acres in 2012 which is an increase of 31.6%.

2.5. F. Multi-Jurisdictional Drought Differences

Usually, a meteorological drought due to changed weather patterns affects a large area. Stewart County, the City of Richland and the City of Lumpkin would be affected at the same time, but farmers in the county would be affected to a more severe extent.

Please note that concerning droughts, there is no spatial depiction available in the GEMA mapping tool by ITOS. The threat applies mainly in the agricultural parts of the county, to a lesser extent in the cities. Please refer to the basic Maps 14 to 16 below.

An agricultural drought would affect Stewart County more than the cities, since there are farms in the countryside.

Map 14: Basic Map with Critical Facilities of Stewart County
Map 15: Basic Map with Critical Facilities of the City of Richland
2.5. G. General Overall HRV Summary of Drought

Most other natural hazards have a sudden, dramatic impact on the community, whereas a drought is a longer, slower moving process. It starts with a meteorological drought - reduced rainfall, which can turn into an agricultural drought – loss of crops, and have its climax in a hydrological drought, where the surface and ground water supplies fall below normal levels. This process can take years to develop.
Droughts affect municipal water supplies, stream-water quality, recreation at reservoirs, navigation, agricultural and forest resources. The farmers are most likely to be affected by water shortages due to drought conditions. The average farm size in 2012 is 549 acres, much smaller than in 1997 when the average size was 655 acres. However farm size did increase from 490 acres in 2007 to 549 acres in 2012. The commercial forest land comprises 84% of all land in Stewart County, mostly comprised of agriculture, forestry, fishing, and hunting as indicated on the existing land use classification map. Peanuts is the largest harvested crop, producing a value of over $2.6 million, followed by cotton with a value of $1.5 million. Harvested cropland in acres in Stewart County has risen from 9,652 acres in 2007 to 12,699 acres in 2012 which is an increase of 31.6%. The farmland of Stewart County is most endangered by drought conditions.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has expanded its E911 system, established which was adopted in 2009, to improve the county's ability to warn citizens of local emergencies. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

2.6 Wildfires

2.6.A. Identify Wildfires

Fires are one of the most common and widespread of all natural disasters besides floods. Wild fires are a sweeping and destructive conflagration, especially in a wilderness of a rural area, and are usually signaled by dense smoke that fills the area for miles around.

A distinction is normally made between three classes of wildfires: surface, ground, and crown fires. A surface fire, the most common type, burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire is usually started by lightning and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. These fires are generally the result of dry conditions combined with lightning or carelessness, and spread unconstrained through the environment.
It may take decades after a wildfire for the scorched and barren land areas to return to pre-fire conditions. If the wildfire destroyed the ground cover, then erosion becomes one of several potential problems.

2.6.B Wildfire Event Profile, Frequency of Occurrence, Probability

Georgia has several “danger zones”, including all wooded, brush, and grassy areas in the state. However, the observed fire danger usually ranges from low to moderate.

According to the available records, no Forest Fire Presidential Disaster Declarations has been made for Stewart County.

According to the Wildfire Risk Layer in the GEMA maps by ITOS (depicted in Maps 26 to 28 below), most of Stewart County scored either a 1, meaning that the wildfire danger is “very low”, or a 0, meaning that there is “no fire danger because no houses, agriculture, water, or city.” A couple of patches did show up as 2 on the scale, however this rating is defined as low for any fire danger. The city of City of Richland fell under the same classifications as did the City of Lumpkin.

The Georgia Forestry Commission uses a Burning Index to determine the fire danger class. When the Burning index is at or above the 97 percentile, it is considered to be a class 5 (i.e. Extreme Fire Danger Day); class 5 being the highest fire danger class. When the Burning Index is between 90 to 97 percentiles, it is a Class 4 (i.e. Very High Fire Danger Day). The fire danger class changes frequently, and it is very important for the Fire Department and EMA Director to stay informed about the current fire danger for better preparedness.

| Table 20: Wildfire Class Day Determination Points |
|-----------------|-----------------|-----------------|
| Class | Description     | BI Percentiles* |
| 5    | Extreme         | 97<sup>th</sup> |
| 4    | Very High       | 90<sup>th</sup> to 97<sup>th</sup> |
| 3+   | High to Very High | 81<sup>st</sup> to 90<sup>th</sup> |
| 3    | High            | 61<sup>st</sup> to 80<sup>th</sup> |
| 3-   | Low to Moderate | 46<sup>th</sup> to 60<sup>th</sup> |
| 2    | Moderate        | 21<sup>st</sup> to 45<sup>th</sup> |
| 1    | Low             | 0<sup>th</sup> to 20<sup>th</sup> |

*Source: Georgia Forestry Commission*
*BI: Dividing Burning Index (BI) by 10 gives a reasonable estimate of flame length in feet at the head of a fire. Burning Index is fuel model dependent. At the Georgia Forestry Commission, this is the basis for Class Day.

A Fire Occurrence data of Stewart County for the fiscal years 2002-2006, created by the Georgia Forestry Commission, shows that there are 136 occurrences during the four years. The 2012-2016 data period identifies 76 occurrences which is much less than the 2002-2006 period. The 2012 to 2016 fire occurrences are distributed as follows. There are a total of 76 fires, of which 48 covered 1 to 2 acres, 24 fires covered 2 to 4 acres, and 4 fires covered 4 to 8 acres. None of the 76 fires occurring in the years of 2012-2016 covered an area larger than 6 acres.
The complete Community Wildfire Protection Plan for Stewart County may be found in Appendix A. According to this plan, on a year-to-year basis, the leading cause of wildfires in Stewart County is debris burning followed by machine use (example: harvesting combine) followed by incendiary fires or arson fires. As recorded in 2017, there are 20 fires. The largest fire recorded is an incendiary incident that burned 228 acres. In 2017 seven fires occurred that are classified as miscellaneous, 4 debris, 1 machine use and 1 lightning. Other causes include campfire, children, smoking and undetermined.
Communities-at-risk are locations where a group of two or more structures is close proximity to a forested or wildland area place homes and residents at some degree of risk from wildfire. Other characteristics of the “community” such as the closeness of structures, building materials, the accumulation of combustible debris near the structures, access in and out, and the distance from the nearest fire station or a permanent water source (pond or dry hydrant) may contribute to the risk.

In Stewart County, there are many individual (isolated) homes and outbuilding on farms and small properties that could be damaged or destroyed in the event of a disastrous wildfire. On these properties, the owners must be educated so they can assume a greater responsibility for wildfire protection by making improvements to their residential landscape and their homes that will provide some wildlife protection until the fire department can arrive. This can only be accomplished if rural residents know how to make their homes and properties “Fire wise.”

Improvements to the community infrastructure (roads, utilities, etc.) may be beyond the capabilities of the homeowners. However, if access by emergency vehicles can be enhanced by widening the entrance right-of-way(s), creating “hammerhead-T’s” or other ways for fire trucks to turn around and operate safely and residences can be identified with reflective “911 addresses” wildfire protection can be greatly improved.

Modifications in and around individual residences may need to be budgeted by the residents over time (for example, making a roof more fire resistance may have to wait until it is time to replace the current roof covering), however, moving firewood away from the home, skirting raised decks and keeping roofs free of accumulated flammable debris are improvements most families can do in the short-run.

In most instances, communities-at-risk will benefit from the reduction/removal of flammable vegetation within 100 feet of homes and outbuildings through prescribed burning or by mechanical means. Fuel management with the home ignition zone (within 100 feet from the home) either by removing highly flammable vegetation or by replacing the vegetation with fire resistant plant species will significantly improve wildfire safety.
According to the Hazard Frequency Table, in Appendix A the historic occurrence interval of wildfires is approximately over 100% of occurrence per year. The historic data is not sufficient enough to be able to detail jurisdictional differences or occurrences.

2.6.C. **Inventory of Assets Exposed to Wildfires**

According to the Wildfire Risk Layer in the GEMA maps by ITOS (depicted in Maps 26 to 28 below), most of Stewart County scored either a 1, meaning that the wildfire danger is “very low”, or a 0, meaning that there is “no fire danger because no houses, agriculture, water, or city.” A couple of patches did show up as 2 on the scale, however this rating is defined as low for any fire danger. The city of City of Richland fell under the same classifications as did the City of Lumpkin. Therefore, the wildfire danger is low for all critical facilities and non-critical structures in the cities and the county. Critical Facilities and non-critical facilities are not impacted as much by wildfires as are timber and forest land. According to the 2018 Georgia County Guide, Stewart County has approximately 233,600 acres of forest land, which
amounts to almost 79% of all land in the county. Thus a wildfire out of control could damage Stewart's natural resources considerably.

In the City of Richland, there are 860 non-critical structures, of which 804 are classified residential, 37 commercial, 15 industrial, 0 agricultural and 4 religious or non-profit. In the City of Lumpkin are 623 non-critical structures, of which 572 are classified residential, 37 commercial, 10 industrial; 0 agricultural and 4 religious or non-profit. In the unincorporated area of Stewart County, there are 957 non-critical structures, of which 849 are classified as residential, 84 commercial, 15 industrial, 0 agricultural, and 9 as religious or non-profit. These non-critical structures potentially are all exposed to the high winds of a tornado, just like the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D.

Since the total population of Stewart County is not increasing, not a lot of future development is expected. In 2010 Stewart County has a total population 6,101 people. In 2016 the total population is 5,705. The 2018 Georgia County Guide, Stewart County ranks 150 out of 159 in population, with a loss of total population of 7% from 2010 to 2016.

2.6.D. Estimates of Potential Losses to Wildfires

None of the critical facilities are in danger of being damaged by a wildfire according to the GEMA Wildfire Hazard Score Maps by ITOS depicted in Maps 26 to 28 below. The same is true for the non-critical structures in the cities and county, since the risk of wildfires in Stewart County is very low. Losses from previous wildfires are not known, but it can be expected that private citizens experience some losses due to wildfires in their forest lands.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural value is $93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value 63,698,965 and a contents replacement value of 95,548,373. For a complete listing of replacement values of critical facilities, please refer to the GEMA worksheet #3b in Appendix D.
The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

2.6.E. Land Use and Development Trends Related to Wildfires

As residential areas expand into relatively untouched wilderness areas, people living in these communities become threatened by forest fires. Protecting structures in these areas from fire poses special problems, and can stretch firefighting resources to the limit.

The county has an excellent ground water supply and individual wells provide an adequate water supply. The Georgia Forestry Commission (GFC) has developed a fire weather system; an enhanced version of the forecast segment of the Forestry Weather Interpretation System (FWIS). With this system, 3-day 5-period forecasts are generated twice per day (6:00 am and 12:30 pm EST) for each district or district component. In addition to the text weather forecasts, maps, and graphs of selected observed or forecast weather and fire related variables are produced. Current and forecast fire danger rating information for GFC and co-operators weather station network is generated. The National Fire Danger Rating Systems (NFDRS) was developed by the US Forest Service for predicting fire occurrence and behavior based on fuels, topography, and man-caused fire risk factors, along with current weather conditions. Although the National Fire Danger Rating System indices should not be directly applied to any particular site, they do not supply the practitioner with a set of indices that can be used to compare recent history, and adjacent fire management areas.

Fire danger rating relates only to the potential of the initiating fire, and the ratings are relative, not absolute. To do this, the GFC operates a network of 19 automated weather stations throughout the state of Georgia. The stations record current weather conditions each hour. Weather data from stations maintained by cooperating agencies, including the US Forest Service, the US Park Service, the Department of Defense, and the University of Georgia, are collected as well.

2.6.F. Multi-Jurisdictional Wildfire Differences

The aforementioned Fire Occurrence Map for Stewart County by the Georgia Forestry Commission, inserted as Fire Occurrence Map shows that the 136 fire occurrences were well dispersed throughout the county and two cities. The Wildfire Risk Layer in the GEMA map by ITOS is based on the USDA Forest Services, RMRS Fire Sciences Laboratory “Wildland Fire Risk to
Flammable Structures, V 1.0” map. Although this data is not intended for use at a detail greater than state-wide analysis, it has been included as the best available data on wildfire risk. Most of Stewart County scored either a 0 or a 1, meaning very low to no fire danger.. There are also a large areas located inside and outside of the city limits of Lumpkin and Richland that score either a 3 or 4. These areas have a greater fire danger potential. Please refer to maps 17 to 19 below.

Map 17: Wildfire Hazard Score, Stewart County

Source: GEMA by ITOS 2019  Please refer to the appendix for a further definition of the hazard scores.
Map 18: Fire Hazard Score, City of Richland

Source: GEMA by ITOS 2019

Please refer to the appendix for a further definition of the hazard scores.
The western part of Stewart County scored a 1, meaning very low threat of fire, while the Eastern part of the county scored either a 1 or a zero, meaning low threat to no threat at all. The central part of the county, which comprises of the City of Richland, scored in the range of 0 to 2, which ranges from no threat to that of a low threat tolerance. The Southern part of the county, comprising of the city of Lumpkin scored primarily as a 1, meaning a very low threat threshold. Stewart County is not served by a paid fire department. The volunteer fire departments of the incorporated areas as well as the volunteer fire department in Louvale serve the unincorporated areas of the county. There are 10 registered volunteer fire fighters in the City of Lumpkin and one fire truck. The City of Richland has a 8 person registered volunteer fire department and three fire trucks. The county operates a full-time Emergency Medical Service with five full time paramedics, four full time emergency technicians, thirteen part-time paramedics, and three part-time emergency technicians. This allows for emergency medical service coverage 24 hours a day, seven days a week. All EMTS and Paramedics are state certified and most are nationally certified. The county also has 3 ambulances. In 1991, Stewart County began its operation of the water and sewer authority, which serves the community of Louvale, which is the most densely populated area of the unincorporated county. Stewart county also owns the City of Omaha’s water system and Providence Canyon and Florence Marina have their own water systems. The City of Lumpkin also has its own water system, which currently has an excess capacity of 120,000 gallons per day. The City
of Richland is currently upgrading its water system and in the future will increase the number of water storage tanks.

2.6.G. General Overall HRV Summary of Wildfires

Wildfires are generally the result of dry conditions combined with lightning or carelessness, and spread unconstrained throughout the environment.

According to the Wildfire Risk Layer in the GEMA map, the wildfire danger in Stewart county is low. There are a few patches, within the City of Richland, where the rating is of the score 2, however, this is still a low rating. Lack of public water or access to water in some of the outlying areas in the county impedes the firefighting capabilities. The Fire Insurance Rating (ISO) is 7.0 within 5 miles of the city limits of Lumpkin and Richland, and 10 in all other parts of the county. Public awareness helps to mitigate such fires. This might include banning outdoor burning during the dry season.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2008. The E911 system was established in 2009. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

3 – LOCAL TECHNOLOGICAL HAZARD, RISK AND VULNERABILITY SUMMARY

3.1. Hazardous Materials (in-transit and fixed)

3.1. A. Identify Hazardous Materials

Categorized as hazardous materials are chemical substances, which can pose a threat to the community health and/or the environment, when released or misused. Exposure to hazardous materials can result in long-lasting health effects, serious injury, and even death. Sources of such hazardous materials include agriculture, industry, medicine and research, and consumer goods.
In the United States, an estimated five million facilities manufacture, use, and/or store hazardous materials in varying quantities. Facilities which manufacture, use and/or store hazardous materials include not only isolated large industrial plants, but also local dry cleaners, gardening supply stores, and even homes, where hazardous chemicals often used for cleaning are stored and used regularly. The presences of hazardous materials are increasing in volume and number of locations.

Millions of tons of hazardous materials are transported throughout the United States every single day. In fact, the U.S. DOT Pipeline and Hazardous Materials Safety Administration* estimates that there are more than 800,000 hazmat shipments every day, and more than 3.1 billion tons are transported each year. While most carriers deliver their cargo to the intended destination without any problems, accidents do occur from time to time. Most of these accidents involve incidental releases that do not pose a major threat to people or property, but some spills result in a more serious threat.

Hazardous materials are also commonly shipped via railway, and incidents like train derailments can result in massive hazmat spills that can be devastating to the environment and post serious risks to human health and safety.

The most common types of hazmat shipping spills include flammable items—combustible liquid, corrosive material, nonflammable compressed gas, oxidizer and poisonous materials.

*U.S. DOT Pipeline and Hazardous Materials Safety Administration
Air Sea Containers Compliance Blog

Hazardous materials come in solid, liquid or gas forms. Such materials can be explosive, flammable and combustible to include poisons and radioactive materials. Most often hazardous materials are released as a result of transportation accidents (in-transit source) on highways, railroads, waterways, and pipelines. In addition, chemical accidents can occur at industrial and manufacturing plants resulting in the release of hazardous materials (fixed source).

According to the Emergency Planning and Community Right-to-Know Act, information about hazardous materials is available for communities, emphasizing the importance of the awareness of hazardous materials.

3.1. B. Hazardous Materials Event Profile, Frequency of Occurrence, Probability

Hazardous Materials can be accidentally released in two situations: In-transit-when the materials are transported; fixed locations- where the materials are produced, processed and/or stored.
According to the Federal Motor Carrier Safety Administration* (FMCSA), the rate of hazmat carrier crashes, injuries, fatalities and spills is low in comparison to the overall amount of hazardous materials transported along U.S. highways. Though not extremely common, hazmat spills come at a significant cost. They have a major impact on the economy and can cause significant property damage.

The United States Census Bureau** estimates that hazardous materials make up approximately 11 percent of the freight transported by trucks in the U.S., and the U.S. Department of Transportation*** estimates that hazardous materials are carried in about 7 percent of all trucks. While hazmat transportation makes up a significant portion of the type of material being transported on U.S. roadways, crashes and accidents involving hazardous materials are under-represented in overall accident statistics.

In 2017, the U.S. DOT Pipeline and Hazardous Materials Safety Administration reported a total of 3,391 incidents of hazmat spills during transit. These incidents resulted in two hospitalizations, six fatalities and $32,806,352 in damages. Spills are much more likely during unloading. incidents during the unloading phase of transportation resulted in 8,036 incidents. The damages incurred during unloading incidents, however, only totaled $4,976,052.

Spills are much less common when hazardous materials are shipped by railway. In the same year, there were only 431 incidents that occurred while hazardous materials were in transit by train. These incidents resulted in no fatalities and $19,214,653 in damages. Hazmat spills when materials are transported by train occur most commonly during transit with only nine incidents occurring during unloading.

*Federal Motor Carrier Safety Administration, April, 2018)
**United States Census Bureau)
***U.S. DOT Pipeline and Hazardous Materials Safety Administration, April, 2018)
Air Sea Containers Compliance Blog

The Environmental Protection Division (EPD) of the Georgia Department of Natural Resources maintains a list of all facilities and their chemical inventory, plus a history of spill events. This allows the State to keep track of fixed spills.

Since 2003, there have been eleven (11) incidents related to hazardous materials. Eight (8) related to some type of spill, several on Hwy 27, 280, and 520. Hazardous materials are transported on U.S. Hwy 27 and GA State Highways 280 and 520 which provide north to south passage through Stewart
County. The areas adjoining these state routes are vulnerable to accidents and handle the majority of truck traffic trips in Stewart County.

Spills of hazardous materials must be reported to the Department of Natural Resources (DNR) and to the National Response Center (NRC) by the responsible party. For Stewart County, the DNR and NRC have information about the following events since 2000. Please refer to Table 21 depicted below.

Table 21: Reported Hazardous Material Incidents in Stewart County 2000-2019

<table>
<thead>
<tr>
<th>Complaint Id:</th>
<th>Complaint Received Date:</th>
<th>Caller Name</th>
<th>Nature of Complaint</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>24909</td>
<td>11/17/2003</td>
<td>Phoenix Lumber Co</td>
<td>Diesel Oil spill</td>
<td>Bojangles Chicken at Hwy 520 &amp; 280</td>
</tr>
<tr>
<td>28371</td>
<td>8/5/2004</td>
<td>Unknown</td>
<td>Improper disposal of sewage</td>
<td>110 Banks St</td>
</tr>
<tr>
<td>30153</td>
<td>12/8/2004</td>
<td>Larry Eason Trucking</td>
<td>Diesel Oil spill</td>
<td>Bojangles Truck Stop</td>
</tr>
<tr>
<td>33402</td>
<td>7/3/2005</td>
<td>Unknown</td>
<td>Petroleum spill</td>
<td>B/w Docks of 1 &amp; 3 at Florence Marina</td>
</tr>
<tr>
<td>34743</td>
<td>9/9/2005</td>
<td>Unknown</td>
<td>Burning copper wire</td>
<td>Junkyard on Co Rd 61</td>
</tr>
<tr>
<td>35898</td>
<td>11/28/2005</td>
<td>Circle Environmental</td>
<td>Diesel spill</td>
<td>Intersection of Hwy 520 &amp; 280</td>
</tr>
<tr>
<td>37407</td>
<td>2/17/2006</td>
<td>Estes</td>
<td>Overturned Tractor Trailer with something labeled poison but is not leaking.</td>
<td>Ga 520 at Brooklyn, Stewart County</td>
</tr>
<tr>
<td>40524</td>
<td>7/24/2006</td>
<td>B&amp;S Air</td>
<td>Unknown substance spill</td>
<td>City Water Tower</td>
</tr>
<tr>
<td>46811</td>
<td>6/12/2007</td>
<td>Unknown</td>
<td>Diesel fuel spill</td>
<td>Hwy 520 &amp; 27</td>
</tr>
<tr>
<td>63592</td>
<td>10/18/2010</td>
<td>Unknown</td>
<td>Unknown substance spill in Marina</td>
<td>Lakepoint Marina</td>
</tr>
<tr>
<td>66451</td>
<td>9/20/2011</td>
<td>SE Freightliner</td>
<td>C3 Flammable Liquid spill</td>
<td>Intersection of Mathis Store Rd and Hwy 280E/520</td>
</tr>
</tbody>
</table>

Source: DNR and NRC 2020

According to the Hazard Frequency Table in Appendix A the historic recurrence interval is 1.73, or roughly 2 incidents per year; or a 58% historic
frequency chance per year for a fixed source spill. The historic frequency chance per year for an in-transit spill 0.0. Although the chance of an in-transit spill appears minimal, it is still considered in mitigation efforts. Historical frequencies could not be broken down by jurisdiction due to lack of data. With no known scale or other scientific statistic, there is no way to identify the potential extent of this hazard, other than by potential damage or losses.

3.1. C. Inventory of Assets Exposed to Hazardous Materials

The transportation routes that traverse Stewart County enhance not only the economic potential of the county, but also serve as corridors along which unknown volumes of hazardous materials are transported daily. U.S. highways and state highways service Stewart County. The main thoroughfares in Stewart County are U.S. Highway 27 and Georgia Highway 520. According to the Georgia Guide, there are 419.7 miles of road in the county. The county contains 280.4 miles of county roads. Of these roads, 44% are unpaved. According to the Georgia Traffic Flow Map of 2018 by GDOT, which measures the annual average 24-hour traffic for all types of motor vehicles, the busiest stretch of road in Stewart County is the part of GA 520 going through Stewart County, with about 4,000 to 6,000 traffic counts. Both counts are increases from 2016. Going west to east through Richland traffic counts range from 1,890 just west of Richland to 3,410 located inside the city of Richland. Both 2018 AADT counts are increase from 2016. Along U.S. 27 traffic counts are highest at a point just north of Harmony Church Road and its intersection with U.S 27 at 3,050 AADT. The traffic count in 2016 at this same location is 2,310 AADT. The lowest traffic count along U.S. 27 is located inside the city limits of Lumpkin. In 2018 the traffic count at the Lumpkin location is 1,620 AADT, which is an increase of traffic from the 2016 AADT count. The count in 2016 is 1,560. As you go south of Lumpkin just north of the county line the 2018 traffic count 1,670. The 2016 traffic county at the same location is 1,610. Traffic going east to west along SR 27 ranges from 940 just west of Lumpkin and 2,330 in Lumpkin sharing. AADT truck trips along US 27 range from 25% to 31% of daily traffic trips. North of Lumpkin 25% of traffic is due to truck trips. Along U.S. 27 and located inside the city limits of Lumpkin, truck trips are 31% of daily traffic trips. South of Lumpkin along U.S. 27, truck trips are 27%. Along SR 27 west of Lumpkin truck trips are 39% of daily trips. East of Lumpkin along SR 27 traffic trips are 30% of total trips. The Omaha area has the highest amount of traffic truck trips with 51% of all traffic trips related to truck traffic. North of Richland along U.S. 520/280 truck trips are 27% of total trips, traffic truck trips increase to 36% south of Richland. Along SR 27 truck trips range from 18% west of Richland to 24% of total traffic trips east of Richland. Increasing truck traffic trips lay the foundation for a higher chance of a chemical spill.
Stewart County has railroad service although the lines are leased out and currently sit in-active. Therefore, a railway is not another potential source of hazardous material spills.

In the GEMA Critical Facility Inventory Map by ITOS, 65 critical facilities are mapped for Stewart County. Assuming an accident is happening on one of the major thoroughfares like U.S. Highway 27 or GA State Highway 520, any of these 65 critical facilities could potentially be affected by a hazardous material spill, especially within a buffer area of 1 mile around all major thoroughfares in the cities and county. Concerning non-critical structures, it is not known how many are located along the major thoroughfares.

Since some hazardous material spills occur even at home, potentially all non-critical structures in the city and county are endangered of being affected. In the City of Richland, there are 860 non-critical structures, of which 804 are classified residential, 37 commercial, 15 industrial, 0 agricultural and 4 religious or non-profit. In the City of Lumpkin are 623 non-critical structures, of which 572 are classified residential, 37 commercial, 10 industrial; 0 agricultural and 4 religious or non-profit. In the unincorporated area of Stewart County, there are 957 non-critical structures, of which 849 are classified as residential, 84 commercial, 15 industrial, 0 agricultural, and 9 as religious or non-profit. These non-critical structures potentially are all exposed to the high winds of a tornado, just like the identified critical facilities. For a complete listing of all structures in the cities and county, please refer to GEMA worksheet #3a in Appendix D.


Potential losses can be estimated for fixed source spills because the location and a rough estimate of the hazardous material are known. However, in-transit spills are caused by such a large number of variables that the loss potential is hard to judge.

Should an accident occur on U.S. Highway 27, many of the critical facilities would be affected as would the facilities located along Hwy 520.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural value is 93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $9,448,810 and a contents replacement value
of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value $63,698,965 and a contents replacement value of $95,548,373. For a complete listing of replacement values of critical facilities, please refer to the GEMA worksheet #3b in Appendix D.

The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

When the Fire Department responds to hazardous materials incidents, and the responsible party is known, this polluter is charged for the clean-up. The cities or county only have to pay when the cause or source of the incident cannot be found.

3.1. E. Land Use and Development Trends Related to Hazardous Materials

Stewart County has a total of 419.7 miles of road in the county. The county contains 280.4 miles of county roads. Of these, 44% are unpaved roads. Roads with a substantial number of households located on them are paved. The majority of the roads in the City of Richland are paved. Many of these paved streets need to be repaved and widened. The dirt streets need to be paved and drainage problems need to be addressed. All streets in the City of Lumpkin are paved, however many need to be repaved and widened. Drainage problems in the eastern part of the city need to be addressed.

3.1. F. Multi-Jurisdictional Hazardous Materials Differences

There is no spatial depiction per se available in the GEMA mapping tool by ITOS. The threat applies mainly along the major thoroughfares as depicted in the Transportation Maps 20 to Map 22 below.
Map 20: Stewart County Critical Facilities, Roads, and Highways
Map 21: Richland Critical Facilities, Roads, and Highways

Map 22: Lumpkin Critical Facilities, Roads, and Highways
3.1. G. General Overall HRV Summary of Hazardous Materials

The location at a minor traffic intersection and the fairly low traffic volume going through the county, place the community at a lesser risk of hazardous material releases and transportation accidents. The potential for loss exists countywide along roads. The main thoroughfares in Stewart County and Richland are Georgia Highways 27 and 520 and U.S. Highway 27 and Georgia Highway 520. U.S. Highway 27 extends through the City of Lumpkin.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2008. The E911 system was established in 2009. As of 2020, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

3.2. Dam Failure

3.2. A. Identify Dam Failure

A dam is a barrier constructed for the purpose of preventing the flow of water. Dams are especially effective when built across a watercourse for impounding water. Dams have many benefits including improved navigation, agricultural irrigation, provision of drinking water, and possible hydroelectric power generation. Dams also create lakes for recreation, and can help in preventing or reducing floods.

Dam failure can pose serious risks. Dams fail for two main reasons: a physical weakness in the structure caused by a faulty design, improper operation or poor maintenance and the inundation of the dam by flood waters during extreme events such as a hurricane.

Dam failure has the potential to cause extreme property damage and fatalities.

Stewart County has a series of 25 dams located within the county. These dams are primarily in the classification listed as II which means that there is a very low risk of loss of life due to dam failure. Most of
these dams are small, local dams on private property that do not endanger the lives of those living near them.

3.2. B. Dam Failure Event Profile, Frequency of Occurrence, Probability

There are 21 dams located in the county, all on small ponds. So far, no problems were recorded pertaining to dam failure. All twenty-one of the dams are Category II dams, meaning that a malfunction is not expected to cause loss of life.

Table 22: Georgia Safe Dams in Stewart County 2020

<table>
<thead>
<tr>
<th>Name</th>
<th>Classification</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bradley Lake Dam</td>
<td>II</td>
<td>Columbus</td>
</tr>
<tr>
<td>Brian Dennis Lake Dam</td>
<td>II</td>
<td>Omaha</td>
</tr>
<tr>
<td>Briscoe Lake Dam</td>
<td>II</td>
<td>Columbus</td>
</tr>
<tr>
<td>Davis Pond Dam</td>
<td>II</td>
<td>Lumpkin</td>
</tr>
<tr>
<td>Forts Pond Dam</td>
<td>II</td>
<td>Lumpkin</td>
</tr>
<tr>
<td>Gussie Lake Dam</td>
<td>II</td>
<td>Richland</td>
</tr>
<tr>
<td>Halliday Lake Dam</td>
<td>II</td>
<td>Columbus</td>
</tr>
<tr>
<td>Hadchodiekee Pond Dam</td>
<td>II</td>
<td>Columbus</td>
</tr>
<tr>
<td>Holders Lake Dam</td>
<td>II</td>
<td>Lumpkin</td>
</tr>
<tr>
<td>Loiselle Dam</td>
<td>II</td>
<td>Columbus</td>
</tr>
<tr>
<td>Lumpkin Sewage Treatment Plant</td>
<td>II</td>
<td>Lumpkin</td>
</tr>
<tr>
<td>McGlaun Dam</td>
<td>II</td>
<td>Cusseta</td>
</tr>
<tr>
<td>Merrit Large Lake Dam</td>
<td>II</td>
<td>Weston</td>
</tr>
<tr>
<td>Merrit Small Lake Dam</td>
<td>II</td>
<td>Weston</td>
</tr>
<tr>
<td>Minick lake Dam</td>
<td>II</td>
<td>Richland</td>
</tr>
<tr>
<td>Red Hill Farms Lake Dam</td>
<td>II</td>
<td>Stewart county</td>
</tr>
<tr>
<td>Singers Pond Dam</td>
<td>II</td>
<td>Stewart County</td>
</tr>
<tr>
<td>Usehrs Millpond Dam</td>
<td>II</td>
<td>Stewart County</td>
</tr>
<tr>
<td>Van Cleve Lake Dam</td>
<td>II</td>
<td>Stewart County</td>
</tr>
<tr>
<td>Williams Lake Dam</td>
<td>II</td>
<td>Stewart County</td>
</tr>
<tr>
<td>Williams Pond Dam</td>
<td>II</td>
<td>Stewart County</td>
</tr>
</tbody>
</table>

Source: Georgia Safe Dams 2019

The failure of any of the dams is not expected to cause loss of life. According to the Hazard Frequency Table in Appendix A, page A2, the historic recurrence interval is not established, and the historic frequency does not indicate a dam failure will cause flooding in Stewart County in a given year. With no known scale or other scientific statistic, there is no way to identify the potential extent of this hazard, other than by potential damage or losses.

3.2. C. Inventory of Assets Exposed to Dam Failure

Stewart County is mapped for flooding and flood-prone areas under the FEMA program. Most of Stewart County scored 0 on a scale from
0 to 4 as depicted on the GEMA Flood Hazard Score Map in Chapter 2.4.F., which means possible but undetermined flood hazards or outside the 500-year floodplain. However, there are a few areas within the county that scored 1, which means the area was not included in any flood study or there are possible but undetermined flood hazards.

The twenty-five (25) privately and county-owned, smaller dams impound small ponds, and flooding from a failure of one of these dams would not cause extensive damage or loss of life. As mentioned above in the chapter on flooding, no critical facilities are located in flood-prone areas. In the City of Lumpkin and the county, no non-critical structures are known to be endangered by flooding. For a complete listing of all structures in the cities and county at risk from flooding, please refer to GEMA worksheet #3a in Appendix D.

Since the total population of Stewart County is fairly stable, not much future development is expected. According to the 2018 Georgia Guide, Stewart County ranked 150 out of 159 counties in population growth.

3.2. D. Estimate of Potential Losses to Dam Failure

As mentioned above in the chapter on flooding, one critical facility, Florence Marina is located in a flood prone area. Should Lake Oliver Dam fail, and release tons of impounded water at once, structures along the river downstream to Stewart County could be in danger of being damaged. At risk of inundation due a dam failure like that would be all low lands adjacent to the Chattahoochee River. A property impacted would be Florence Marina State Park and its many structures and recreational areas. A limited number residential properties, hunting camps, crops and agricultural machinery would also have a chance of being impacted.. Please refer to the Chattahoochee River Dam Map 12 below. Failures of any of the smaller earthen dams would not lead to the loss of life or larger damage, according to Georgia Safe Dams.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural value is $93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The
city of Lumpkin has a structural replacement value of $9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value 63,698,965 and a contents replacement value of 95,548,373. For a complete listing of replacement values of critical facilities, please refer to the GEMA worksheet #3b in Appendix D.

The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

3.2. E. Land Use and Development Trends Related to Dam Failure

Flooding is the main effect of dam failure. The same patterns apply here that were mentioned in the chapter on floods.

3.2. F. Multi-Jurisdictional Dam Failure Differences

There is a chance that Stewart County would be flooded due to dam failure. Should the Lake Oliver Dam fail, and release tons of impounded water at once, structures along the river downstream to Stewart County could be in danger of being damaged. At risk of inundation due a dam failure like that would be all low lands adjacent to the Chattahoochee River and the limited number of structures located in the low land area. It is not anticipated that a breach of the Lake Oliver dam would impact Lumpkin or Richland.
Map 23. Flood Score Hazards, Stewart County
Map 24. Flood Score Map, City of Richland

Source: GEMA by ITOS 2019
3.2. G. General Overall HRV Summary of Dam Failure

The county has not experienced serious flooding in the past and the little that has occurred is a result of creek overflow.

The two cities are not mapped for flooding and flood prone areas under the FEMA program and flood areas are undetermined.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local
emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2008. The E911 system was established in 2009. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

3.3. Civil Disturbance

3.3. A. Identify Civil Disturbance

Civil Disturbance involves an event or public crisis that disrupts a community and its average, normal peace, and generally threatens the safety of the community and its citizens. Examples include political demonstrations, riots, prison uprisings, strikes, and public nuisances or assemblies that have become significantly disruptive. Effects of civil disturbance include injury to participants and spectators, and property damage. Generally, it is cities with populations of more than 100,000 which are the most vulnerable to civil disturbance, although communities with concentrated areas of residents that are economically disadvantaged are also vulnerable. Communities located in proximity of Military bases may also have an elevated risk of experiencing civil disturbance. Communities that have private prison facilities may also have an elevated risk of a protest or civil disturbance. The control of such groups requires law enforcement agencies that have been trained and are experienced in riot control.

3.3. B. Civil Disturbance Event Profile, Frequency of Occurrence, Probability

Since Civil Disturbance is hard to predict and is generally guided by the persons participating in the demonstration, there is no data available for Stewart county as far as an event profile. Currently, no information exists as to the frequency of occurrence for civil disturbance in Stewart County and the Cities of Richland and Lumpkin. Currently, the hazardous event profile does not include any information for the Civil Disturbances. However, the Committee for this plan feel that the areas surrounding the Stewart County Detention Center has a civil disturbance risk hazard of 2 on a scale of 1 to 10, with 1 being no disturbance and 10 being a worst-case scenario. Civil Disturbance Stewart County and the Cities of Richland and Lumpkin may not be large enough centers for a civil disturbance to occur, but any part of the area has the potential for being affected at any one time. With no known scale or other scientific statistic, there is no way to identify the potential extent of this hazard, other than by potential damage or losses.
3.3. C. Inventory of Assets Exposed to Civil Disturbance

Since civil disturbances are hard to predict and could occur at any point in time and place, a specific inventory of exposed assets cannot be determined. However, any of the critical facilities could be targeted at any one time.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural value is 93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value.

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The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

3.3. D. Estimate of Potential Losses to Civil Disturbance

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value 63,698,965 and a contents replacement value of 95,548,373. For a complete listing of replacement values of critical facilities, please refer to the GEMA worksheet #3b in Appendix D.
The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

3.3. E. Land Use and Development Trends Related to Civil Disturbance

There is currently no determination of land uses and development trends that can be attributed to Civil Disturbance or action against them occurring with exception of the Stewart County Detention Center.

3.3. F. Multi-Jurisdictional Civil Disturbance Differences

There is a very low chance that Stewart County and the Cities of Richland and Lumpkin would be affected by the occurrence of a civil disturbance. Damage from a civil disturbance would be greater within the Cities of Richland or Lumpkin, due to number of critical facilities located within their city designation.

Map 26: Basic Map of Stewart County
Map 27: Basic Map of the City of Richland

Source: GEMA by ITOS 2019
Map 28: Basic Map of the City of Lumpkin

Source: GEMA by ITOS 2019
3.3. G. General Overall HRV Summary of Civil Disturbance

Neither the county or the two cities have experienced any civil disturbances, but the potential is always there.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This E911 system was established in 2009. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.

3.4. Terrorism

3.4. A. Identify Terrorism

Based on a standard definition, Terrorism is the use of force or violence to elicit a general climate of fear in a population, with the goal of bringing about a certain political objective, or coercing or intimidating a government or civilian population. Terrorists therefore may be members of political organizations, nationalistic and religious groups, revolutionaries, and even state institutions (such as armies and intelligence services).

Acts of Terrorism can take many different forms; including but not limited to, threats of terrorism, assassinations, kidnappings, hijackings, the use of explosives, bomb scares and bombings, cyber-attacks (computer-based), contaminating water or food supplies, and the use of chemical, biological, nuclear and/or radiological agents in populated areas.

High-risk targets for acts of terrorism include military and civilian government facilities, international airports, large cities, and high-profile landmarks.

3.4. B. Terrorism Event Profile, Frequency of Occurrence, Probability

Terrorist attacks are often based on a political agenda or national cause. Stewart County and its jurisdictions are in close proximity to
the Ft. Benning Military Installation. Ft. Benning is the largest Infantry base in the nation. A terrorist attack on the base would severely impact the installation and many surrounding counties to include Stewart County. In addition to property damage and fatalities, an unknown number of Stewart County residents are employed by Ft. Benning; this would have a direct impact on the county’s economy. Being an agricultural county, Stewart County would suffer greatly from an agro-terrorism event which could result in contaminated food and water supply, affecting the economy and the well-being and quality of life for the citizens. There are currently no historical records of acts of terrorism, and as of the writing of this grant, there have been no probabilities of future attacks predicted or developed. Fort Benning may have developed these occurrences for their base, but the information is not public at this time. With no known scale or other scientific statistic, there is no way to identify the potential extent of this hazard, other than by potential damage or losses.

3.4. C. Inventory of Assets Exposed to Terrorism

In addition to injuries and fatalities to people, pets and livestock a terrorist event can affect many areas of the environment and economy.

3.4. D. Estimate of Potential Losses to Terrorism

It is hard to estimate the potential losses to terrorism due to the nature of the act. Any one of the Critical facilities or non-critical facilities could be targeted. The Critical Facilities for Stewart County, the City of Richland, and The City of Lumpkin are outlined below, on the GEMA Hazard Score Maps by ITOS depicted in Maps 35 to 37 below.

The estimated total value of structures in Stewart County is $283,660,878. The city of Lumpkin total structural value is $79,781,842, and the city of Richland’s total structural vale is 93,364,772. Unincorporated Stewart County Structural total is $110,514,264. The aforementioned estimate totals do not include content value

All 65 critical facilities identified in the GEMA Critical Facility Inventory Map by ITOS have a combined total replacement value of $78,997,124 and a contents replacement value of $118,495,611. The city of Lumpkin has a structural replacement value of $ 9,448,810 and a contents replacement value of $14,173,215. The city of Richland has a structural replacement value of $5,849,349 and a contents replacement value of $8,774,023. Unincorporated Stewart County has a structural replacement value 63,698,965 and a contents replacement value of 95,548,373. For a complete listing of replacement values of
critical facilities, please refer to the GEMA worksheet #3b in Appendix D.

The non-critical structures in the City of Richland have a value of $87,515,423. The City of Lumpkin $70,333,032. The unincorporated Stewart County non-critical structure value of $46,815,299. The Stewart County wide value for non-critical structures total $204,663,740. For a complete listing of values of non-critical structures, please refer to the GEMA worksheet #3a on Inventory of Assets in Appendix D.

Map 29. Critical Facilities in Stewart County
Map 30. Critical Facilities in the City of Richland

Map 31: Critical Facilities, City of Lumpkin
3.4. E. Land Use and Development Trends Related to Terrorism

There is currently no determination of land uses and development trends that can be attributed to Terrorism.

3.4. F. Multi-Jurisdictional Terrorism Differences

There is a very low chance that Stewart County or Cities of Richland and Lumpkin would be affected by the occurrence of terrorism. There is no substantial chance for a terrorist act and each location would react appropriately. Damage from an act of terrorism would be greater within the Cities of Richland or Lumpkin due to the number of critical facilities located within their city designation.

3.4. G. General Overall HRV Summary of Terrorism

Neither the county or the two cities have experienced any terrorism, but the potential is always there.

To decrease vulnerability to this hazard, Stewart County and the Cities of Richland and Lumpkin have adopted the International Building Code. Stewart County and the City of Lumpkin employs a Code Enforcement Officer and the City of Richland contracts with a local independent contractor for code enforcement. In addition to updating the development regulations, Stewart County has also implemented an E911 system to improve the county’s ability to warn citizens of local emergencies. This has occurred since the previous Stewart County Pre-Disaster Mitigation Plan was updated in 2008. The E911 system was established in 2009. The EM Facebook site was established in 2015. As of 2014, there have been no changes in codes, ordinances, development patterns, or mitigations projects that would affect the risk that the county faces from this hazard.
4 – Local Natural Hazard Mitigation Goals and Objectives

There have been no changes in the overall priorities of Stewart County, the City of Lumpkin or the City of Richland as they relate to mitigation since completion of the 2008 Stewart County Pre-Disaster Mitigation Plan. Most of the mitigation efforts listed below will be implemented by the county’s EMA department. Other represented departments in the process will be the county Fire, EMS, Sheriff, Senior Centers, Board of Education, DFCS, and the local Red Cross. On the municipal level, most of the mitigation efforts will be implemented by the local government and its local police and public works department. The funding for necessary projects will be included in the public safety or public works portion of the yearly budget.

Six general mitigation goals have been established. Reaching for these goals will have positive impacts on mitigation for all hazards. The overall goals are as follows:

<table>
<thead>
<tr>
<th>General Mitigation Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1</td>
</tr>
<tr>
<td>Goal 2</td>
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<td>Goal 3</td>
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<tr>
<td>Goal 4</td>
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<tr>
<td>Goal 5</td>
</tr>
<tr>
<td>Goal 6</td>
</tr>
</tbody>
</table>

Mitigation Goal # 1

Objective 1

Protect the public health and safety by increasing public awareness of the wide range of natural hazards, their effects, and hazard mitigation

Task 1

Provide educational programs and activities for the community to promote severe weather awareness

Action Step 1

Continue scheduling training classes for the volunteer fire fighters through GA Public Safety Training Center (GPSTC)

| Category: | Training |
| Responsible Org: | Stewart Co. Fire Dept. |
| Coordinating Org: | Stewart Co. EMA |
| Jurisdiction: | Stewart Co., Richland, Lumpkin |
| Timeline: | Annually |
| Status: | Ongoing, 24 – 80 hours per year |
| Cost: | Free for staff except staff time |
| Funding Source: | GPSTC |
| Priority: | High |

Action Step 2

Utilize the Stewart County Facebook Page and website” to disseminate hazard mitigation information to the general public
Objective 2: Provide educational and meaningful programs and activities for the community to promote severe weather training

Action Step 1  Form Public Education Committee

Category: Public Education, Awareness
Responsible Org: Stewart County EMA

Action Step 3  Utilize public information outlets such as newspapers to disseminate hazard mitigation information to the general public by providing the media with information

Category: Public Education and Awareness
Responsible Org: Stewart Co. EMA
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Weekly
Status: Ongoing: Use Stewart-Webster Journal

Cost: $100/year
Funding Source: Local Government
Priority: Medium

Action Step 4  Provide public with hazard mitigation information through severe weather awareness forms displayed in Courthouse and other public places

Category: Public Education, Awareness
Responsible Org: Stewart Co. EMA
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Daily
Status: Ongoing. Distribute materials to public places. Ex. Hurricane awareness pamphlets. County primarily uses social media (i.e. Facebook) to post EMA, EMS, Fire Department and Stewart County Board of Commissioners information.

Costs: $100 (copies + staff time)
Funding Source: Dept. Operating Budget
Priority: Medium
**Mitigation Goal #2**

**Objective 1** Improve the comprehensive mitigation strategy

**Task 1** Monitor plan implementation annually

**Action Step 1** Establish a date for formal annual review of mitigation strategy implementation

- **Category:** Prevention
- **Responsible Org:** Pre-Disaster Mitigation Executive Committee
- **Coordinating Org:** Stewart Co. EMA
- **Jurisdiction:** Stewart Co., Richland, Lumpkin
- **Timeline:** Completed date established for the October BOC budget meetings which Occur annually
- **Status:** 2014 Completed
- **Costs:** $200 staff time
- **Funding Source:** Departmental Operating Budget
- **Priority:** Medium

**Task 2** Maintain current Local Emergency Operations Plan (LEOP) for Stewart County

**Action Step 1** Update the Local Emergency Operations Plan (LEOP) for Stewart County

- **Category:** Preparedness
- **Responsible Org:** County and city departments
- **Coordinating Org:** Stewart Co. EMA
- **Jurisdiction:** Stewart Co., Richland, Lumpkin

**Benefit:** In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of $78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately $87,515,423 million dollars.
Objective 2  Prevent losses of vital public records

Task 1  Duplicate and safely store vital public sector records off-site

Action Step 1  Local government and constitutional officers adopt policy of (1) duplicating existing, essential records, (2) duplicating essential records annually thereafter, and (3) designating a secure, off-site depository for essential public records

Category: Emergency Services
Responsible Org: Local Governments
Coordinating Org: Chief Appointed Officials
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: 2014-2016, annually
Status: Ongoing
Cost: $10,000
Funding Source: Local Government
Priority: Low

Benefit: In the event of a disaster, Mitigation Goal #2, Objectives 2 offers insurance of up-to-date, well maintained and safely stored county records while preventing the loss of vital records.

Objective 3  Increase coordination between local public departments and between the public and private sectors in pre-disaster planning

Task 1  Share information between emergency agencies concerning services, regulations, capabilities, personnel, equipment, needs, limitation, etc.

Action Step 1  Continue good communication and coordination between emergency services

Category: Emergency Services
Responsible Org: City and County Law (Police, Sheriff), Fire Dept., Public Works, EMS
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Monthly
Status: Daily/weekly Stewart County Fire Department, EMA, EMS, located in the same building. Cities maintain fire and police services.
Costs: Nominal, $300 staff time
Funding Source: Dept. Operating Budget
Priority: High

Action Step 2  Maintain good working relationship with surrounding counties and their emergency services

Category: Emergency Services
Responsible Org: Emergency Service providing agencies (local and state), City and County governments
Mitigation Goal # 3  

Provide immediate warning to the public in the event of severe weather or onset of a natural hazard

Objective 1

Inform public in advance through public warnings

Task 1

Procure equipment and software on a regular basis to insure proper function of warning equipment

Action Step 1

Conduct monthly tests of the outdoor emergency warning siren system (once procured)

Category: Equipment

Responsible Org: Stewart Co. EMA

Coordinating Org: Stewart Co. EMA

Jurisdiction: Stewart Co., Richland, Lumpkin

Timeline: Monthly

Status: Completed, Started testing in 2017

Cost: $20/month staff time

Funding Source: Local Government

Priority: High

Action Step 2

Monitor for and participate in the weekly test of the NOAA tone alert radio (once received)

Category: Equipment

Responsible Org: Stewart Co. EMA

Coordinating Org: Stewart Co. EMA

Jurisdiction: Stewart Co., Richland, Lumpkin

Timeline: Weekly

Status: Completed, started in 2018

Cost: $10/week

Funding Source: Local Government

Priority: High

Task 1

Acquire funding to purchase and install additional weather sirens

Action Step 1

Through a grant, acquire a second weather siren for the portion of the county with the majority of the population, and later a third siren for the remainder of the county

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.
Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

**Mitigation Goal #4**

**Objective 1** Respond effectively to and recover from severe weather events
Coordinate training for members of Stewart Counties EMA office on natural hazards

**Task 1** Work through State and Federal agencies to identify funding for and coordinate, schedule and register for appropriate training classes

**Action Step 1** Identify funding sources in order to send members of Stewart Co. EMA to training classes

<table>
<thead>
<tr>
<th>Category:</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>Annually</td>
</tr>
<tr>
<td>Status:</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Cost:</td>
<td>$2,000/year (Rick is this the correct #)</td>
</tr>
<tr>
<td>Funding Source:</td>
<td>GEMA/FEMA/USDA/DCA/</td>
</tr>
<tr>
<td>Priority:</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Task 2** Conduct periodic exercises and drills to insure effective coordination and cooperation among all agencies.

**Action Step 1** Promote participation in the National Weather Service yearly tornado drill in critical facilities (School campus, Senior Center, DFCS)

<table>
<thead>
<tr>
<th>Category:</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. Board of Education, DFCS, Senior Center</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>Annually</td>
</tr>
<tr>
<td>Status:</td>
<td>Ongoing, 3 per year, including CoreCivic/CCA</td>
</tr>
<tr>
<td>Cost:</td>
<td>$5,000</td>
</tr>
</tbody>
</table>
**Task 3** Conduct post-disaster assessment of preparation for, and response to hazard event

**Action Step 1** Request GEMA to provide an experienced emergency response professional or team of professionals to perform a detailed, post-disaster assessment of disaster preparations and response as soon as possible after a disaster event

- **Category:** Emergency Services
- **Responsible Org:** Stewart Co. EMA
- **Coordinating Org:** Regional All Hazards Council
- **Jurisdiction:** Stewart Co., Richland, Lumpkin
- **Timeline:** As needed, based on event
- **Status:** Completed, Ongoing, all information loaded into Web EOC after a disaster event for GEMA to review
- **Cost:** $2,500
- **Funding Source:** GEMA
- **Priority:** High

**Action Step 2** Support the fire drills in the critical facilities (Schools-monthly, Senior Center-annually, Head Start-quarterly)

- **Category:** Prevention
- **Responsible Org:** Stewart Co. Board of Education, DFCS, Senior Center
- **Coordinating Org:** Stewart Co. Fire Department
- **Jurisdiction:** Stewart Co., Richland, Lumpkin
- **Timeline:** Monthly/Annually/Quarterly
- **Status:** Ongoing
- **Costs:** $1,000 staff time
- **Funding Source:** Dept. Operating Budget
- **Priority:** High

**Action Step 3** Continue to distribute NOAA tone alert radios to city and county employees in key positions for their homes

- **Category:** Prevention
- **Responsible Org:** Stewart Co. EMA
- **Coordinating Org:** Stewart Co. EMA
- **Jurisdiction:** Stewart Co., Richland, Lumpkin
- **Timeline:** Monthly
- **Status:** Ongoing
- **Cost:** $5,000 plus installation time
- **Funding Source:** FEMA/GEMA
- **Priority:** High
Benefit: In the event of a disaster, Mitigation Goal #4 insures well trained and informed EMA and other public agency staff in the event of a natural hazard and/or severe weather. In addition, Mitigation Goal #4 provides an effective post-disaster assessment to determine the success and efficiency of the natural hazard and/or severe weather preparation as well as response. Mitigation Goal #4 will prevent further disaster related deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin. In addition, Goal #4 will prevent further damage to the areas critical facilities with a replacement value of less than 78,997,124 million dollars, and non-critical structures with a replacement value of approximately 87,515,423 million dollars.

Mitigation Goal # 5

Respond promptly, appropriately and efficiently in the event of a natural or man-made hazard when shelters are required.

Objective 1

Increase the capability of the employees of the Department of Family and Children Services (DFCS). These DFCS employees have been trained in basic shelter operations.

Task 1 Presenting the American Red Cross Shelter Simulation course to the DFCS employees.

Action Step 1 Schedule and perform simulation course
Category: Disaster Response
Responsible Org: American Red Cross
Coordinating Org: Stewart Co. DFCS
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: 2013
Status: Completed. DFCS does their training
Cost: $4.50 per student
Funding Source: Local Red Cross
Priority: Medium

Action Step 2 Increase response capabilities by purchasing shelter equipment.
Category: Disaster Response
Responsible Org: Stewart Co. EMA
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Ongoing
Status: Completed 2016.
Cost: $1,000/year
Funding Source: GEMA/FEMA/USDA/DCA/
Priority: High

Benefit: In the event of a disaster, Mitigation Goal #5 insures well trained and informed DFCS employees in the event of a natural hazard or man-made hazard when shelters are required. In addition, Mitigation Goal # 5 will be beneficial by having informed and prepared emergency shelter operators to prevent fatalities and injuries among the 5,705 residents of the Stewart County, the Cities of Richland and Lumpkin.
Mitigation Goal #6

Maintain up-to-date data base and assessment of vulnerability of critical facilities endangered by hazards

**Objective 1:** Use the on-line map tool from GEMA to map and identify any new critical facilities.

**Task 1** Update and map all critical facilities using ITOS

**Action Step 1** Determine critical facilities through Pre-Disaster council and tax assessor

<table>
<thead>
<tr>
<th>Category</th>
<th>Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org.</td>
<td>Stewart Co.</td>
</tr>
<tr>
<td>Coordinating Org.</td>
<td>Stewart Co.</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
</tbody>
</table>

**Timeline:** Completed 2013

**Status:** Ongoing, update 2019/2020

**Cost:** $25/hour

**Funding Source:** Stewart Co.

**Priority:** High

**Objective 2:** Keep up-to-date records of critical facilities.

**Task 1** Maintain records every five years as each Pre-Disaster Plan gets updated

**Action Step 1** Make assessment of any new or deleted facilities since last update

<table>
<thead>
<tr>
<th>Category</th>
<th>Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org.</td>
<td>Stewart Co.</td>
</tr>
<tr>
<td>Coordinating Org.</td>
<td>Stewart Co.</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
</tbody>
</table>

**Timeline:** 2019

**Status:** Complete 2020

**Cost:** $25/hour

**Funding Source:** Stewart Co.

**Priority:** High

**Benefit:** In the event of a disaster, Mitigation Goal #6 insures that all critical facilities within the county are accounted for. Without proper identification of critical facilities, the county and cities may not receive proper funding for recovery should a disaster strike. In addition, Goal #6 will prevent further damage to the areas critical facilities with a replacement value of 78,997,124 million dollars, and non-critical structures with a replacement value of approximately 87,515,423 million dollars.

**4.1. Thunderstorm**

**4.1. A. Community Mitigation Goals**

For Stewart County, thunderstorms pose the most common natural hazard. To be able to limit damage from high winds, and lightning strikes, mitigation must be prepared in advance. The winds accompanying thunderstorms are not as fast as a tornado, but the damage caused is similar. Therefore the goals, objectives, tasks and
action steps are the same. The mitigation efforts can also be used for
tropical storms and hurricanes, as well as winter storms.

4.1. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation

The goals identified are both structural and non-structural options. Home owners are responsible for structural improvement of existing buildings, for example, installing lightning rods. Non-structural options encourage the expansion of public education to supplement the property owner’s structural options. It is important to educate the population of the dangers of lightning and hail which accompany thunderstorms. Some precaution measures regarding lightning includes avoiding natural lightning rods such as tall, isolated trees in an open area or on the top of a hill, and to avoid touching metal objects such as wire fences, golf clubs, and metal rods during a thunderstorm.

2. Existing policies, regulations, ordinances and land use

Stewart County, the Cities of Richland, and Lumpkin have officially adopted off the Southern Building Codes Standards.

3. Community values, historic, and special considerations

The community values both private and public property. The community also values the historic and scenic value of public and private property. Any aspect of the community that helps maintain or build its unique character is of the utmost importance to the community.

4. New buildings and infrastructure

Concerning thunderstorms, enforced building codes require structures to be built to the design wind speeds and Manufactured Housing has to be tied down.

5. Existing buildings and infrastructure

Existing buildings normally do not suffer as much damage from the winds and the rain, but rather the lightning associated with thunderstorms. The local governments encourage residents in older buildings, to retrofit their buildings, and to bring them up to a safe standard to include power surge protectors and/or lightning rods. The analysis did not reveal anything else the local governments can do to
reduce the impact of thunderstorms in existing buildings and infrastructure. However, life saving measures can be accomplished through early warnings. Therefore, as part of the public awareness strategy, residents are advised to secure outdoor objects that could blow away, and to shut windows securely. Residents are also advised not to handle any electrical appliances or telephones to avoid lightning strikes, and to avoid water faucets and sinks, because metal pipes can transmit electricity.

Residents on the streets in a car are advised to stay in the car and pull safely onto the shoulder away from trees.

### 4.1. C. Thunderstorm - Mitigation Strategy and Recommendation

<table>
<thead>
<tr>
<th>Mitigation Goal #1</th>
<th>Reduce the potential for loss of life and property damage from high winds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
<td>Mitigate additional damage for vulnerable manufactured homes</td>
</tr>
<tr>
<td>Task 1</td>
<td>Protect manufactured homes against damage from high winds</td>
</tr>
<tr>
<td>Action Step 1</td>
<td>Through building code standards, require mobile homes to be tied down and withstand a 75 mph wind load</td>
</tr>
</tbody>
</table>

**Category:** Property Protection  
**Responsible Org:** Local Governments  
**Coordinating Org:** City Councils/County Comm.  
**Jurisdiction:** Stewart Co., Richland, Lumpkin  
**Timeline:** Daily  
**Status:** Completed. Follow International Building Codes  
**Costs:** staff time  
**Funding Source:** Dept. Operating Budget  
**Priority:** Low  
**Benefit:** In the event of a thunderstorm (and other high wind disasters), Tasks 1 will insure safe residences, while preventing fatalities and injuries among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin.

<table>
<thead>
<tr>
<th>Objective 2</th>
<th>Educate citizens on the dangers and potential of severe weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>Educate citizens about the importance of (1) monitoring weather information, (2) heeding public weather warnings, (3) using the installed weather radios in the home and workplace, and (4) take disaster response courses</td>
</tr>
<tr>
<td>Action Step 1</td>
<td>Encourage the general public to purchase additional weather radios</td>
</tr>
</tbody>
</table>

**Category:** Public Education/Awareness  
**Responsible Org:** Stewart Co. EMA  
**Coordinating Org:** Stewart Co. EMA  
**Jurisdiction:** Stewart Co., Richland, Lumpkin  
**Timeline:** Annually  
**Status:** Completed: Staff has distributed all but a handful of weather radios  
**Costs:** $500 for staff time and copies  
**Funding Source:** Citizens  
**Priority:** Medium
<table>
<thead>
<tr>
<th>Action Step 2</th>
<th>Encourage the American Red Cross to teach a Citizen’s Disaster Course on a frequent basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Public Education/Awareness</td>
</tr>
<tr>
<td>Responsible Org:</td>
<td>American Red Cross</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>Annually</td>
</tr>
<tr>
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<tr>
<td>Costs:</td>
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<tr>
<td>Funding Source:</td>
<td>American Red Cross</td>
</tr>
<tr>
<td>Priority:</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Benefit:** In the event of a disaster, Mitigation Goal #1, Objective 2 will benefit the county and cities by educating citizens of the dangers involved with thunderstorms while enabling them to receive the most advanced severe weather warnings through additional weather radios. Mitigation Goal #2 will prevent further disaster related deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin. In addition, Goal #2 will prevent further damage to the areas critical facilities with a replacement value of less than 78,997,124 million dollars, and non-critical structures with a replacement value of approximately 87,515,423 million dollars.

---

<table>
<thead>
<tr>
<th>Mitigation Goal #2</th>
<th>Prevent property damage and fatalities due to lightning strikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
<td>Educate residents of the county of the danger of being exposed to lightning</td>
</tr>
<tr>
<td>Task 1</td>
<td>Educate the population on potential damage and loss of life from lightning</td>
</tr>
<tr>
<td>Action Step 1</td>
<td>Alert citizens to the presence of lightning through weather radios and other broadcasts</td>
</tr>
<tr>
<td>Category:</td>
<td>Public Education/Awareness</td>
</tr>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>Annually</td>
</tr>
<tr>
<td>Status:</td>
<td>Completed, Weather radio</td>
</tr>
</tbody>
</table>

**Benefit:** In the event of a disaster, Mitigation Goal #1, Objective 2 will benefit the county and cities by educating citizens of the dangers involved with thunderstorms while enabling them to receive the most advanced severe weather warnings through additional weather radios. Mitigation Goal #2 will prevent further disaster related deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin. In addition, Goal #2 will prevent further damage to the areas critical facilities with a replacement value of less than 78,997,124 million dollars, and non-critical structures with a replacement value of approximately 87,515,423 million dollars.

---

<table>
<thead>
<tr>
<th>Action Step 2</th>
<th>Inform the public that staying inside a house or car, and not using electrical appliances during a thunderstorm can reduce the risk of lightning strikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category:</td>
<td>Public Education/Awareness</td>
</tr>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
</tbody>
</table>

**Benefit:** In the event of a disaster, Mitigation Goal #1, Objective 2 will benefit the county and cities by educating citizens of the dangers involved with thunderstorms while enabling them to receive the most advanced severe weather warnings through additional weather radios. Mitigation Goal #2 will prevent further disaster related deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin. In addition, Goal #2 will prevent further damage to the areas critical facilities with a replacement value of less than 78,997,124 million dollars, and non-critical structures with a replacement value of approximately 87,515,423 million dollars.
Benefit: In the event of a disaster, Mitigation Goal #2 will benefit the county and cities by informing and preparing citizens thereby preventing thunderstorm and severe weather related deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin.

Objective 2 Prevent damage to private and public property
Task 1 Protect critical facilities from damage due to lightning strikes
Action Step 1 Make sure critical facilities and equipment are grounded
Category: Prevention
Responsible Org: City and County Public Services
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: 2014-2016
Status: Completed 2016, Annual inspections on facilities and equipment
Costs: Nominal, $700 staff time
Funding Source: Local
Priority: High
Action Step 2 Install lightning rods on all critical facilities those are not equipped yet
Category: Prevention
Responsible Org: Public Services
Coordinating Org: Department of Engineering
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: 2014-2016
Status: Not complete. Will complete in 2021.
Cost: $500 per facility
Funding Source: Local
Priority: High
Action Step 3 Identify and remove weak, aging and diseased trees
Category: Prevention
Responsible Org: City and County Public Services
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Seasonally/Annually
Status: Ongoing, as requested by residents or as part of local
Task 2  Install back-up power generators for critical facilities

Action Step 1  Obtain and install power generators or other back-up systems where needed

Category:  Prevention
Responsible Org:  Public Services
Coordinating Org:  Department of Engineering
Jurisdiction:  Stewart Co., Richland, Lumpkin

Timeline:  2021-2023
Status:  Complete/Ongoing Stewart County Water Authority purchased two. County needs three, Richland needs two, nursing home needs one, Lumpkin needs one.

Cost:  $20,000 per facility
Funding Source:  Local
Priority:  High

Action Step 2  Assure that the Fire Department’s mobile power generators are in good working order

Category:  Prevention
Responsible Org:  Stewart Co. Fire Department
Coordinating Org:  Stewart Co. EMA
Jurisdiction:  Stewart Co., Richland, Lumpkin

Timeline:  2019-2024
Status:  Completed. Monthly basis.
Costs:  Nominal, $70 staff time
Funding Source:  Dept. Operating Budget
Priority:  High

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

4.1. D. Special Multi-Jurisdictional Strategy

In regards to thunderstorms and other severe weather there is no geographical difference in the risk involved. Therefore the same mitigation measures apply in each jurisdiction, Stewart County, Richland and Lumpkin.

4.1. E. Public Information and Awareness Strategy

Conveying public announcements to the residents, and promoting the purchase and use of weather radios as proposed in one of the action steps
above will enhance public information and awareness, and reduce the risk of fatalities due to thunderstorms and other severe weather.

4.2. Hurricane and Tropical Storm

4.2. A. Community Mitigation Goals

For Stewart County, the rainfall associated with tropical storms and hurricanes are an ever present threat. Tropical cyclones above 74 miles per hour are considered a hurricane. Due to its geographical location, Stewart County and the Cities of Richland and Lumpkin will always be susceptible to the torrential rainfalls of tropical systems. In order to limit damage from high winds, mitigation plans must be developed for advanced notice. Mitigation includes activities to lessen the damage from such storms, including identification of floodplains for preservation of lives and property. The development of a plan to evacuate and shelter residents prior to a storm is a component of preparedness.

Since the damage from the high winds is similar to thunderstorms and tornadoes, the goals, objectives, tasks and action steps are the same with a few modifications. Many of the mitigation efforts for flooding caused by tropical storms can be found in the chapter in Flood Mitigation.

4.2. B. Identification and Analysis of Range of Mitigation Options

See Tornado (Chapter 4.3.B.), Thunderstorm (Chapter 4.1.C.), and Flood Mitigation (Chapter 4.4.B.) for additional information.

Life saving measures can be accomplished through early warnings and emergency retrofitting. Therefore, the following mitigation actions can be taken in the event of a hurricane or tropical storm in addition to the measures mentioned.

Prior to a tropical storm and/or hurricane shutters and/or pre-cut plywood should be hung covering all windows, and secured with screws every 18 inches. Manufactures Homes should be strapped or tied to concrete foundations with cables or chains. Owners of boats are advised to have the boats moored securely or chained to a trailer. All household members should be aware of different evacuation routes.

4.2. C. Hurricane and Tropical Storm - Mitigation Strategy and Recommendation

See Thunderstorm (Chapter 4.1.C.), Tornado (Chapter 4.3.C.), and Flood Mitigation (Chapter 4.4.C.)
4.3. Tornado

4.3. A Community Mitigation Goals

Since Stewart County lies in a medium high risk area, and tornados can be expected in all parts of the community, the county and cities must prepare for this hazard in advance. In previous years Stewart County has not experienced much structural damage or serious injuries or fatalities. Tornados have most commonly caused tree and agricultural damage within Stewart County. The best chance to survive a tornado is to plan in advance, and to respond quickly to a tornado watch or warning.

The official tornado season begins in March and extends through August, but these violent whirling winds may occur throughout the year. Weather band radios, tie-downs for mobile homes and warning systems are mitigating activities. Search and rescue, and public information training are preparedness areas. Safe shelters are a key to response. The general public does not understand how little time responders have to a sudden tornado strike, and how important it is that all parties be prepared at all times to respond correctly. Due to the similarities in the damage caused by tornados and thunderstorm winds, all goals, objectives, tasks and action steps of the hazards are interchangeable.

4.3. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation

The identified goals address structural and non-structural options. Stewart County, as well as the Cities of Richland and Lumpkin responders, including the Stewart County Fire and Rescue volunteers, will be certain that personnel, vehicles and equipment are maintained and protected. Education and early warning of citizens are non-structural options.

2. Existing policies, regulations, ordinances and land use

Stewart County, the Cities of Richland and Lumpkin have adopted official building code standards according to Southern Building Codes

3. Community values, historic, and special considerations

The community values it’s residential and historic assets and is determined to protect them against severe weather.

4. New buildings and infrastructure
Stewart County and its jurisdictions will adopt the official building codes to ensure the safety of residential housing. However, mobile homes are not safe during a tornado under any circumstances, and residents are advised to take shelter in any well-built building, or seek the designated emergency shelter for the most immediate safety.

The proposed mitigation strategies and heightened building standards will reduce the impact of the tornado hazard on existing structures greatly, especially by lessening the debris field.

5. Existing buildings and infrastructure

Cars, older buildings, and mobile homes are not safe during a tornado, and can rarely be effectively secured against tornados. The local governments encourage residents in older buildings to retrofit their buildings, and to bring them up to a safe standard. The analysis did not reveal anything else the local governments can do to reduce the impact of tornados in existing buildings and infrastructure. However, life saving measures can be accomplished through early warnings. As part of the public awareness strategy, residents are advised to leave their cars and mobile homes, and take shelter in any well-built building with a strong foundation, or seek the designated emergency shelter for safety.

### 4.3. C. Tornado – Mitigation Strategy and Recommendation

<table>
<thead>
<tr>
<th>Mitigation Goal #1</th>
<th>Reduce the potential for loss of life and property damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
<td>Reduce the risk of personal injury and loss of life by educating the citizens on tornado safety issues</td>
</tr>
<tr>
<td>Task 1</td>
<td>Obtain and distribute comprehensive material on tornado safety</td>
</tr>
<tr>
<td>Action Step 1</td>
<td>Promote regular tornado drills at high occupancy locations such as schools, Court Houses, the Doctor’s Offices, daycare facilities, hospitals, and industries</td>
</tr>
<tr>
<td>Category:</td>
<td>Public Education/Awareness</td>
</tr>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>Annually</td>
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<tr>
<td>Status:</td>
<td>Completed. Participated in statewide Tornado Drill in April, using Facebook to educate about hazards.</td>
</tr>
<tr>
<td>Costs:</td>
<td>Nominal, $200 staff time</td>
</tr>
<tr>
<td>Funding Source:</td>
<td>Dept. Operations Budget</td>
</tr>
<tr>
<td>Priority:</td>
<td>Medium</td>
</tr>
<tr>
<td>Action Step 2</td>
<td>Distribute tornado safety information in form of flyers, brochures, or public safety announcements</td>
</tr>
<tr>
<td>Category:</td>
<td>Public Education/Awareness</td>
</tr>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
</tbody>
</table>
Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

Mitigation Goal # 2

Objective 1

Prepare emergency personnel and local government to respond effectively to needs both during and after tornado event.

Task 1

Provide emergency personnel with needed equipment

Research funding for the development of a pager system to notify emergency personnel of impending weather warning prior to issuance by the National Weather Service to allow more time for mobilization.

Action Step 1

Develop grant application for pager system for emergency personnel notifying them of impending weather warnings.

Category: Emergency Services

Responsible Org: Stewart Co. EMA

Coordinating Org: Stewart Co. EMA

Jurisdiction: Stewart Co., Richland,

Lumpkin

Timeline: 2014-2016

Status: Completed. Use application on cell phones, activated by E-911.

Costs: $20,000

Funding Source: GEMA/FEMA/USDA/DCA

Priority: High
Task 2  Develop a call-in procedure for emergency personnel
Action Step 1  Create procedure to call off-duty employees at the scene
of the disaster event.
Category:   Emergency Services
Responsible Org:  Stewart Co. EMA
Coordinating Org:  Stewart Co. EMA
Jurisdiction:  Stewart Co., Richland, Lumpkin
Timeline:  2014-2016
Status:   Completed 2018.
Cost:   $50 for staff time
Funding Source:  Department Operating Budget
Priority:   High

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

4.3. D. Special Multi-Jurisdictional Strategy

There are no differences between Stewart County, the Cities of Richland and Lumpkin pertaining to tornado hazards. The risk is the same in each jurisdiction; therefore, most of the mitigation measures for tornados apply to each. Tornado drills in the school are measures the County EMA will be taking for the residents of the cities and the county. The county and cities’ emergency personnel have access to emergency radar via the Internet in key locations throughout the community. The weather warning system, especially in the county, could be improved via stated mitigation goals.

4.3. E. Public Information and Awareness Strategy

The installation of emergency sirens will enhance this strategy. Promoting tornado drills and encouraging home and property owners to purchase weather radios will enhance public information and awareness.

4.4. Flood

4.4. A. Community Mitigation Goals

Floods are one of the most widespread and regularly recurring natural hazards and Stewart County has experienced serious flooding in the past with considerable property damage. Stewart County, the City of Richland, and the City of Lumpkin must expect the possibilities of similar events in the future. Due to its geographical location, each of the two municipalities will always be susceptible to torrential rainfalls from tropical systems. Flooding does not
Pose so much a risk to the lives of the residents, but mainly causes monetary damage to some homes, to roads and bridges. Achieving the following mitigation goals will aid in diminishing significant damage from this hazard.

Flooding occurs due to excessive rainfall, severe thunderstorms, heavy rainfall connected with tropical storms and hurricanes, as well as dam failure. The goals, objectives, tasks and action steps described in this chapter therefore also apply to mitigate flooding from heavy rain from the above mentioned natural hazards in this chapter, and from dam failure as discussed in 5.3.

4.4. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation
   Structural mitigation includes identifying problem areas, as well as keeping the storm drainage system free of debris to reduce the risk of flooding. These efforts need to be supplemented and completed with non-structural mitigation measures, for example increasing public awareness of the dangers of flooded rivers, and developing flood insurance rate maps for the county.

2. Existing policies, regulations, ordinances and land use
   Stewart County and the Cities of Richland and Lumpkin each have a zoning ordinance in place. The zoning ordinance lays out permitted uses for land. Lakefronts and river sides are popular sites for residential development. However, development within the floodplain is not ideal because of two factors: it slows the flow of the storm water because it impedes the storm flow, and at the same time increases the size of the storm flow, because the soil’s ability to absorb precipitation is reduced through the installation of impervious surfaces. Without floodplain maps, development can occur in the county in flood hazardous areas, because no restrictions can be enforced. Stewart County has been mapped for flood prone areas under the Federal Emergency Management Agency program and participates in the National Flood Insurance Program. The Cities of Lumpkin and Richland have been mapped. However, they do not participate in the National Flood Insurance Program and are sanctioned as such. The Stewart County Flood Hazard Map can be found in Appendix A, page A13. According to the Stewart County Comprehensive plan, adopted in 2006, land use and development of flood plains, wetlands, and various other limiting soil types will be encouraged to respect the natural limitation of these soil types. Flood prone areas, accordingly, will be used for passive recreation and other open space uses. Overall development is currently discouraged in the flood plain areas.

3. Community values, historic and special conditions
   The community values it’s residential and historic assets and is determined to protect them against severe weather.
4. New buildings and infrastructure
Stewart County and its jurisdictions will adhere to the official building codes standards of the Southern Building Codes to ensure the safety of residential housing. New roads and bridges are being built with sufficient culverts and appropriate storm drainage systems.
The county is currently mapped for flooding and has a FIRM rating. Any new construction should refer to floodplain maps.

5. Existing buildings and infrastructure
The proposed mitigation strategies will help reduce the effects of flooding on existing buildings and infrastructure by optimizing the flow of storm waters. Most flooding in the county is a result of creek overflow.

Residents in flood prone areas are also advised, as part of the public storm information, to turn off electricity, water and propane gas services, and elevate fuse boxes. Residents traveling in cars and on streets are advised to turn around if they come to a flooded road, and to abandon stalled cars. Existing roads can be upgraded by improving storm drainage systems and enlarging culverts to allow storm waters to run off.

4.4. C. Flood - Mitigation Strategy and Recommendation

<table>
<thead>
<tr>
<th>Mitigation Goal #1</th>
<th>Reduce damage to private and public property due to flooding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
<td>Ensure that private properties are safe from flood damage</td>
</tr>
<tr>
<td>Task 1</td>
<td>Develop flood insurance rate maps for Stewart County, the City of Richland and the City of Lumpkin</td>
</tr>
<tr>
<td>Action Step 1</td>
<td>Work with FEMA to create digital flood insurance rate maps with base flood elevation for all of Stewart County including the Cities of Richland and Lumpkin</td>
</tr>
<tr>
<td>Category</td>
<td>Prevention</td>
</tr>
<tr>
<td>Responsible Org</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Coordinating Org</td>
<td>Stewart Co. EMA</td>
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<tr>
<td>Jurisdiction</td>
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</tr>
<tr>
<td>Timeline</td>
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<td>Funding Source</td>
<td>FEMA</td>
</tr>
<tr>
<td>Priority</td>
<td>Low</td>
</tr>
</tbody>
</table>

| Action Step 2     | Develop Flood Damage Prevention Ordinance and complete other requirements for participation in the NFIP for the City of Lumpkin and Richland |
| Category          | Prevention |
| Responsible Org   | City of Lumpkin/City of Richland |
| Coordinating Org  | City of Lumpkin/City of Richland |
| Jurisdiction      | Richland/Lumpkin(Not Completed) |
| Timeline          | 2014-16 Completed: Richland 2017 |
| Costs             | $500 staff time and materials |
| Funding Source    | Local |
Action Step 3  The jurisdictions will continually review and uphold ordinances related to remaining in compliance with the NFIP program

Category: Property Protection

Responsible Org: Stewart Co. EMA, Stewart Co. BOC

Coordinating Org: Stewart Co. EMA, Stewart Co. BOC

Jurisdiction: Stewart County (participates in NFIP)

Timeline: Annually

Status: Updated as needed

Costs: $250 staff time

Funding Source: Local

Priority: Medium

Benefit: In the event of flooding (and dam failure), this Task 1 would help having informed and prepared citizens, and prevent deaths among residents of Stewart County and the Cities of Richland and Lumpkin in flood prone areas.

Objective 2  Ensure that public roads and bridges are safe from flooding

Task 1  Enlarge storm drainage pipes located under roads in key locations to avoid flooding of the streets.

Action Step 1  Petition GDOT to enlarge storm drainage pipes and construct new pipes in key locations under roads to avoid flooding of the roads

Category: Prevention

Responsible Org: City and County Public Works

Coordinating Org: Stewart Co. EMA

Jurisdiction: Stewart Co., Richland, Lumpkin

Timeline: 2014-2016

Status: Completed in part, need funds

Costs: $500,000

Funding Source: GDOT

Priority: Medium

Benefit: In the event of flooding (and dam failure), this Task 1 would help having a storm drainage system large enough to handle flood waters, and prevent deaths among the residents of Stewart County and the Cities of Richland and Lumpkin in flood prone areas. Residents traveling on affected roads could also be saved.

4.4. D. Special Multi-Jurisdictional Strategy

In general, Stewart County is more affected by flooding of roads than the City of Richland and the City of Lumpkin, especially since most of the earthen dams are located in the county. This is why efforts to prevent flooding apply mainly to the county.
4.4. E. Public Information and Awareness Strategy

Residents of Stewart County and the Cities of Richland and Lumpkin should be made aware of the danger of floods and the necessary actions to protect property and prevent fatalities.

4.5. Wildfire

4.5. A. Community Mitigation Goals

Wildfires impact timber and forest land, and can spread unconstrained through the environment. Since these fires are generally the result of dry conditions combined with lightning or carelessness, public awareness helps to mitigate such fires. Preparedness may include banning outdoor burning during the dry season.

4.5. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation
2. 
3. Most mitigation measures against wildfires are of the non-structural kind, raising awareness, and raising the preparedness level.
4. 
3. Existing policies, regulations, ordinances and land use. Currently, there are no policies, regulations, ordinances, or land use standards for wildfire prevention due to the “random” quality of wildfires. Prevention could include non-development of areas that have had wildfire affects on a more frequent interval.

4. Community values, historic, and special considerations
The community values it’s residential and historic assets and is determined to protect them against severe weather.

5. New buildings and infrastructure
Stewart County will ensure the safety of residential housing. New houses constructed near wooded areas should be built using fire-resistant materials, avoiding wooden shakes and shingles for a roof. Safety zones should be created between the home and the woods through stone walls or swimming pools. All newly built structures are required to have smoke detectors installed.

6. Existing buildings and infrastructure
The purchase of more effective firefighting equipment, as proposed, will greatly improve the ability of the fire department to respond quickly to a possible wildfire, and therefore save existing buildings from the harmful effects of fire.
Existing buildings near wooded areas can be kept safe by removing fire hazards around the home, like trimming trees and shrubs, and keeping them free of dead wood. Debris should be removed from gutters. During a wildfire, all windows and doors should be closed to avoid draft. Flammable drapes should be removed and blinds shut. As part of the public awareness strategy, residents are advised to close gas valves and leave their homes if a wildfire gets too close.

### 4.5. C. Wildfire – Mitigation Strategy and Recommendation

**Mitigation Goal #1**

**Objective 1**

- **Mitigation Goal #1**: Strengthen the firefighting capabilities of Stewart County
- **Objective 1**: Renew and enhance the firefighting equipment and staff capabilities of the Stewart County Volunteer Fire Department

**Task 1**

- Find funding sources to purchase newer fire equipment for the Stewart County Volunteer Fire Department

**Action Step 1**

- Through grant money, purchase new firefighting equipment

<table>
<thead>
<tr>
<th>Category:</th>
<th>Emergency Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. Fire Department</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>2014-2016</td>
</tr>
<tr>
<td>Status:</td>
<td>Completed, 2016 will continue purchasing new equipment as funds are available in 2019-2024</td>
</tr>
<tr>
<td>Costs:</td>
<td>$48,000</td>
</tr>
<tr>
<td>Funding Source:</td>
<td>FEMA/GEMA/DCA/ USDA</td>
</tr>
<tr>
<td>Priority:</td>
<td>High</td>
</tr>
</tbody>
</table>

**Benefit:** In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of $78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately $87,515,423 million dollars.

**Task 2**

- Promote certification of fire fighters and cross-certification

**Action Step 1**

- Get more volunteer fire fighters certified and recertified through GA Public Safety Training Center (GPSTC)

<table>
<thead>
<tr>
<th>Category:</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. Fire Dept.</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
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<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>Annually</td>
</tr>
<tr>
<td>Status:</td>
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<td>Cost:</td>
<td>Free for staff except staff time</td>
</tr>
<tr>
<td>Funding Source:</td>
<td>GPST</td>
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</table>
Priority: High

Mitigation Goal #2

Objective 1
Inform the public about dry conditions that would increase the potential for wildfires

Task 1
Coordinate the information efforts between the Stewart County Fire Department and the Georgia Forestry Commission (GFC)

Action Step 1
Get regular forecasts from the GFC’s fire weather system on fire danger ratings

Category: Preparedness
Responsible Org: Stewart Co. Fire Department
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Regularly/Monthly
Status: Ongoing/Gets updates daily as produced by GFC.
Costs: Nominal, $200 staff time
Funding Source: Dept. Operating Budget
Priority: Medium

Task 2
Educate the public about preventive measures

Action Step 2
Send out information about wildfire danger and prevention measures

Category: Prevention/Protection
Responsible Org: City and County, Fire, Pub. Works and Utilities
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Seasonally
Status: Ongoing/Use social media
Costs: $500 for staff time and copies
Funding Source: Local
Priority: Medium

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.
Status: Completed, Follow GFC
Guidelines on a seasonal basis
Costs: $500 for staff time and copies
Funding Source: Local
Priority: High

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

Mitigation Goal #3
Implementation of the Community Wildfire Protection Plan

Objective 1
Complete the CWPP Action Plan

Task 1
Educate local citizens on the CWPP

Action Step 1
Implement community fuel reduction/improve emergency access/educate homeowners in 3 high priority “communities-at-risk”

Category: Education
Responsible Org: Omaha, Wrightsville, Ragtown

Coordinating Org: Stewart Co. EMA, GFC
Jurisdiction: Stewart Co.
Timeline: Annually
Status: Completed, GFC meets with the Stewart County BOC annually to discuss fire reduction activities.

Costs: $15,000
Funding Source: Local
Priority: High

Action Step 2
Hold a wildfire prevention/Firewise Communities workshop

Category: Education
Responsible Org: Stewart Co.
Coordinating Org: Stewart Co., GFC
Jurisdiction: Stewart Co.
Timeline: Annually
Status: Completed, done with Stewart County BOC

Costs: $1,500
Funding Source: Local
Priority: Medium

Task 2
Implement firefighter training

Action Step 1
Two course training for firefighters: Standards for Survival and Wildland Fire Behavior

Category: Training
Responsible Org: Stewart Co.
Coordinating Org: Stewart Co., GFC
Jurisdiction: Stewart Co.
Timeline: Annually
Status: Not completed, do in 2021
Costs: $15,000  
Funding Source: Local  
Priority: High

**Task 3** Provide necessary infrastructure and equipment

**Action Step 1** Install 10 dry hydrants in strategic locations of county  
Category: Equipment  
Responsible Org: Stewart Co.  
Coordinating Org: Stewart Co.  
Jurisdiction: Stewart Co.  
Timeline: Annually  
Status: Not completed, don in 2021  
Costs: $15,000  
Funding Source: Local  
Priority: Medium

**Action Step 2** Obtain/maintain two water tankers to improve water availability for firefighting in rural areas of the county  
Category: Equipment  
Responsible Org: Stewart Co.  
Coordinating Org: Stewart Co.  
Jurisdiction: Stewart Co.  
Timeline: Annually  
Status: Not completed, don in 2022  
Costs: $200,000  
Funding Source: Local  
Priority: High

**Action Step 3** Obtain Personal Protective Equipment and Fire Shelters plus hand tools  
Category: Equipment  
Responsible Org: Stewart Co.  
Coordinating Org: Stewart Co.  
Jurisdiction: Stewart Co.  
Timeline: Annually  
Status: Completed  
Costs: $25,000  
Funding Source: Local  
Priority: High

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

Communities-at-risk are locations where a group of two or more structures is close proximity to a forested or wildland area place homes and residents at some degree of risk from wildfire. Other characteristics of the “community” such as the closeness of structures, building materials, the accumulation of combustible debris near the structures, access in and out, and the distance from the nearest fire station or a permanent water source (pond or dry hydrant) may contribute to the risk.
In Stewart County, there are many individual (isolated) homes and outbuildings on farms and small properties that could be damaged or destroyed in the event of a disastrous wildfire. On these properties, the owners must be educated so they can assume a greater responsibility for wildfire protection by making improvements to their residential landscape and their homes that will provide some wildlife protection until the fire department can arrive. This can only be accomplished if rural residents know how to make their homes and properties “Firewise.”

Improvements to the community infrastructure (roads, utilities, etc.) may be beyond the capabilities of the homeowners. However, if access by emergency vehicles can be enhanced by widening the entrance right-of-way(s), creating “hammerhead-T’s” or other ways for fire trucks to turn around and operate safely and residences can be identified with reflective “911 addresses” wildfire protection can be greatly improved.

Modifications in and around individual residences may need to be budgeted by the residents over time (for example, making a roof more fire resistance may have to wait until it is time to replace the current roof covering), however, moving firewood away from the home, skirting raised decks and keeping roofs free of accumulated flammable debris are improvements most families can do in the short-run.

In most instances, communities-at-risk will benefit from the reduction/removal of flammable vegetation within 100 feet of homes and outbuildings through prescribed burning or by mechanical means. Fuel management with the home ignition zone (within 100 feet from the home) either by removing highly flammable vegetation or by replacing the vegetation with fire resistant plant species will significantly improve wildfire safety.

4.5. D. Special Multi-Jurisdictional Strategy

The county is at a higher risk for wildfires, so the fire ban needs to be applied in the county more so than in the cities. The fire danger in the City of Richland is slightly lower than in the county, since the county has more timberland than the city. The City of Richland and Lumpkin have an ISO rating of 7; the county, 10.

4.5. E. Public information and Awareness Strategy

Since carelessness can cause wildfires, public awareness and banning outdoor burning during the dry season help to mitigate such fires. Both the city and the county residents have to be made aware of the dangers of wildfires in the county.
4.6. Drought

4.6. A. Community Mitigation Goals

Most other natural hazards have a sudden, dramatic impact on the community, whereas a drought is a longer, slower moving process. It starts with a meteorological drought - reduced rainfall, which can turn into an agricultural drought – loss of crops, and have its climax in a hydrological drought, where the surface and ground water supplies fall below normal levels. This process can take years to develop. Farmers are most likely to be affected by water shortages due to drought conditions.

Droughts affect municipal water supplies, stream-water quality, recreation at reservoirs, navigation, agricultural and forest resources. Farmland irrigation is a means of mitigation and preparedness. Additional sources of water may be identified to assist with individual and family consumption during time of response and recovery.

4.6. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation
Most important is promoting the awareness of the importance and value of water as a non-structural mitigation effort, brought about by involving the community in the efficient use of limited water resources. Structural measures include the allocation of emergency water supplies.

2. Existing policies, regulations, ordinances and land use
There are no existing policies, regulations, or ordinances applicable concerning droughts or water conservation. The farmland of Stewart County is most endangered. The county has a great deal of agricultural mixtures on single tracts of land. The loss of crops in the agricultural sector can impose a severe economic burden on the local peanut farmers. Since the agricultural producers’ percentage of return on economic investments is among the lowest of any economic sector, the economic impact of a potential drought for the community is diminishing.

3. Community values, historic, and special considerations
The community values its farmers and agricultural sector. Stewart County’s farmers have experienced drought conditions in the past, and know that effective mitigation measures are needed.

4. New buildings and infrastructure
Stewart County will ensure the safety of residential housing. New buildings should be well insulated, especially around air conditioners and ducts. Outdoor awnings or solar screens on windows can reduce heat entering the house by as much as 80%.
5. Existing buildings and infrastructure
Buildings and infrastructure are not threatened from drought conditions, but residents are encouraged to keep their faucets or water wells well maintained in order to reduce wasting of water.

During a drought, water use should be lowered by repairing any leaks in faucets, pipes and wells, and by reusing water. Fans can be used to circulate cool air, and air conditioner filters should be cleaned weekly during periods of high use to run more efficiently. Outdoor awnings or solar screens on windows can reduce heat entering the house by as much as 80%. Farmers should contact the County Farm Service Agency for assistance and information on drought procedures.

4.6. C. Drought – Mitigation Strategy and Recommendation

Mitigation Goal #1  Manage available water resources during drought events
Objective 1   Ensure the reasonable allocation of supply during drought events through a coordinated public and private effort

Task 1   Educate the residents of Stewart County about the effects of drought on public health and safety, economic activity, and environmental resources
Action Step 1  Heighten the public awareness on actions the public and private sector can take to conserve water through public announcements
Category:   Preparedness
Responsible Org:  Stewart Co. EMA
Coordinating Org: Stewart Co. EMA
Jurisdiction:  Stewart Co., Richland, Lumpkin
Timeline:   Annually
Status:   Completed. Use social media and city and county water bills
Costs:   $500 for staff time and copies
Funding Source:  Dept. Operating Budget
Priority:   Medium

Task 2   Conserve water during times of drought
Action Step 1  Formulate policies for conservation of water during times of water shortage and drought
Category:   Prevention
Responsible Org:  Stewart Co. EMA
Coordinating Org: Stewart Co. EMA
Jurisdiction:  Stewart Co., Richland, Lumpkin
Timeline:   As needed
Status:   Not completed, 2023
Costs:   Nominal, $200 staff time
Funding Source:  Dept. Operating Budget
Priority:   Medium

Benefit: In the event of a drought, these Tasks 1 and 2 would help having informed and prepared citizens. Critical facilities and non-critical structures are not at risk of experiencing damage or downtime from droughts; however, fires can occur as a result
of dry weather. No structural damage is expected in the event of a drought; however, a drought can result in severe loss of agricultural products and/or livestock which are likely stored in such structures. Preserving water resources and redirecting sources to the agricultural sector could prevent loss of crops and livestock.

4.6. D. Special Multi-Jurisdictional Strategy

If at all, the drought hazard is a problem in Stewart County, and not in either of the cities, thus the residents in the county, and especially the farmers, need to be educated on water conservation. The education campaign by the EMA Director will target both city and county residents.

Both the Cities of Richland and Lumpkin have public water systems. The public water systems service all households within the city limits. The residents of Stewart County receive water from private wells. County residents on wells are always at risk of being without water if private wells fall dry due to drought. An agricultural drought would affect Stewart County more, since there are more farms in the countryside than in the city.

4.6. E. Public Information and Awareness Strategy

Public announcements and education activities advise and educate citizens, property owners, renters, businesses and local officials about the effects of drought on public health and safety, economic activity, and environmental resources, and inform them on mitigation measures that can be taken to conserve water.
5 – Local Technological Hazard Mitigation Goals and Objectives

There have been no changes in the overall priorities of Stewart County, Lumpkin or Richland as they relate to mitigation since completion of the 2008 Stewart County Pre-Disaster Mitigation Plan. Most of the mitigation efforts listed below will be implemented by the county’s EMA department. Other represented departments in the process will be the county Fire, EMS, Sheriff, Senior Centers, Board of Education, DFCS, and the local Red Cross. On the municipal level, most of the mitigation efforts will be implemented by the local government and its local police and public works department. The funding for necessary projects will be included in the public safety or public works portion of the yearly budget.

5.1. Hazardous Materials

5.1. A. Community Mitigation Goals

There is one industry within Stewart County that utilizes a significant quantity of hazardous materials, in addition to the businesses, city services, and private citizens who are all responsible for avoiding hazardous material incidents in-transit. Classified chemicals are transported through the county daily. This increases the county’s risk of hazardous materials being released and transportation accidents.

The most important goal in mitigation of accidental releases of these potentially dangerous substances is the quick identification, control, and containment, which requires the first responders to have a sound knowledge of hazardous materials’ properties.

Mitigation for in-transit accidents involving different modes of transportation is accomplished by proper maintenance of roads, railroad tracks, traffic control devices, inspection of vehicles to eliminate safety deficiencies, and by careful routing traffic on the safest highways. In the event of an accident, outlining responsibilities and developing operational plans are critical as a coordinated approach to response.

5.1. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation

Structural measures can mainly be taken by the private sector in securing their handled materials. The public sector’s primary options are non-structural measures.

2. Existing policies, regulations, ordinances and land use

Stewart County’s Volunteer Fire Department is first responders in the case of a Hazard Material release, and is only responsible for the containment of the hazard, not the clean-up. Normally the clean-up is performed by contractors of the insurance companies or the polluter company(s) involved. Local traffic
laws and their enforcement mitigate in-transit releases due to transportation accidents.

3. Community values, historic, and special considerations
The community is aware of the significant risk involved with the release of a hazardous material as a result of transportation accidents. Releases of hazardous materials have to be avoided as much as possible, and handled promptly and effectively.

4. New buildings and infrastructure
Stewart County will ensure the safety of residential housing. This will be accomplished as a by-product of the actions outlined as goals and objectives below.

5. Existing buildings and infrastructure
In the mitigation strategy, the goal is to reduce the risk involved with potentially harmful effects of commercial vehicles transporting hazardous materials through the county by offering them a secure parking area for temporary overnight parking. This action step will reduce the risk of accidents due to tired drivers, and prevent trucks from stopping in inappropriate spaces. This will ensure the safety of existing roads and adjoining buildings.

In the event of a hazardous material accident, residents can be asked to stay indoors or inside cars, and to seal homes and buildings to prevent contaminate from entering. Wet towels and duct tape should be used to seal gaps under doorways and windows, fireplace dampers should be closed, and ventilation systems should be turned off. In extreme cases, evacuation might be necessary.

5.1. C. Hazardous Materials Incident/Transportation accidents – Mitigation Strategy and Recommendation

Mitigation Goal #1 Ensure that public safety officials are trained and stay current with the properties, risks, and appropriate mitigation measures associated with hazardous materials

Objective 1 Secure and maintain active memberships in emergency, governmental and non-governmental associations as appropriate

Task 1 Establish budget for associational memberships

Action Step 1 Incorporate costs for membership into EMA budget

<table>
<thead>
<tr>
<th>Category:</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. Fire Department</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>City Council/County Comm.</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
<tr>
<td>Timeline:</td>
<td>2014-2016 Completed</td>
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<tr>
<td>Status:</td>
<td>Annually during BOC budget sessions</td>
</tr>
<tr>
<td>Costs:</td>
<td>$400</td>
</tr>
</tbody>
</table>
Funding Source: Local
Priority: Low

Task 2 Designate an individual to (1) serve as local hazardous material resource contact and (2) have responsibility for local and cooperative capacity building

Action Step 1 Formal designation by EMA Director
Category: Emergency Services
Responsible Org: Stewart Co. Fire Department
Coordinating Org: City Council/County Comm.
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Completed, 2014, EMA Director is Hazardous Materials Resource contact
Status: Ongoing
Costs: None
Funding Source: Local
Priority: Low

Benefit: In the event of a hazardous material release, Tasks 1 and 2 would assure effective emergency knowledge and response, and prevent injury or deaths among the 6,058 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a replacement value of less than 85 million dollars, and damage to non-critical structures with a replacement value of approximately 141 million dollars.

Mitigation Goal # 2 Be prepared to respond appropriately to any foreseeable hazardous material event

Objective 1 Maintain active membership on GEMA All Hazards Council and other associations as appropriate

Task 1 Secure position on All Hazards Council

Action Step 1 Network with emergency personnel staff on All Hazards Council
Category: Emergency Services
Responsible Org: Stewart Co. EMA
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Annually
Status: Participated in area and statewide EMA meeting
Costs: Negligible, $100 staff time
Funding Source: Local
Priority: Low

Action Step 2 Participate in all Hazards Council educational programs and training exercises
Category: Emergency Services
Responsible Org: Stewart Co. EMA
Coordinating Org: Stewart Co. EMA
Jurisdiction: Stewart Co., Richland, Lumpkin
Timeline: Annually
Objective 2  Secure external funding sources to help finance local capacity building

Task 1  Submit competitive applications to fund equipment/training when potential funding sources are identified

Action Step 1  Be in contact with emergency personnel staff at state and federal level to find funding sources

Category:  Emergency Services
Responsible Org:  Stewart Co. EMA Director
Coordinating Org:  Stewart Co. EMA
Jurisdiction:  Stewart Co., Richland, Lumpkin
Timeline:  Annually, as needed
Status:  Applied for 2018
Costs:  Nominal, $200 staff time
Funding Source:  Local
Priority:  Medium

Objective 3  Protect the community from the effects hazardous material potentially parked locally for short periods (overnight) while in transit.

Task 1  Identify and designate a secure area for temporary parking of commercial vehicles transporting hazardous materials.

Action Step 1  Analyze land uses for the purpose of identifying and securing an area

Category:  Prevention
Responsible Org:  Stewart Co. EMA Director
Coordinating Org:  City and County. Fire, EMS, Law Enforcement
Jurisdiction:  Stewart Co., Richland, Lumpkin
Timeline:  2014
Status:  Not completed due to staff risk concerns. Project will be deleted.
Costs:  Nominal, $100 staff time
Funding Source:  Local
Priority:  Medium

Objective 4  Protect the lives of county residents in the event of a spill

Task 1  Issue public safety announcements in the event of a spill

Action Step 1  Inform the public of location, extent, dangers, and procedures to follow in the event of a release

Category:  Protection
Responsible Org:  Stewart Co. EMA Director
Coordinating Org:  City and County. EMS, Law Enforcement
Jurisdiction:  Stewart Co., Richland, Lumpkin
Timeline:  2019-2024
Status:  Completed, ongoing event.
Costs:  $500 for staff time and copies
Funding Source:  Local
Priority:  Low
Action Step 2  Develop an evacuation plan for locations with high concentration of people (using GA Hwy 37 and 39)

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<tr>
<th>Category:</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org:</td>
<td>Stewart Co. EMA Director</td>
</tr>
<tr>
<td>Coordinating Org:</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction:</td>
<td>Stewart Co., Richland, Lumpkin</td>
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<tr>
<td>Timeline:</td>
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<tr>
<td>Cost:</td>
<td>$500 for staff time</td>
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<td>Funding Source:</td>
<td>Local</td>
</tr>
<tr>
<td>Priority:</td>
<td>High</td>
</tr>
</tbody>
</table>

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

5.1. D. Special Multi-Jurisdictional Strategy

Each of the municipalities are vulnerable to hazardous materials released in transportation accidents. The mitigation strategies mentioned above are joint effort of the Volunteer Fire Department and EMA, and will benefit each municipality.

5.1. E. Public Information and Awareness Strategy

Conveying public service announcements will enhance public information and awareness.

5.2. Dam Failure

5.2. A. Community Mitigation Goals

The integrity of all publicly-owned dams is important to avoid flooding due to a technological error. The presented goal attempts to supplement currently ongoing efforts to ensure the safe condition of all dams and therefore the community. Protective construction techniques of dams may assist in mitigating such a hazard. Planning and training to ensure adequate warning communication, identification of evacuation routes and movement to high ground is considered preparedness. Coordinated reaction by community agencies to evacuate, shelter, and rescue injured persons is part of response and recovery.
Due to the similarities in the damage cause by flooding due to excessive rainfall, tropical storms and hurricanes, all goals, objectives, tasks and action steps for the mitigation of these hazards with the mitigation for dam failure are interchangeable.

5.2. B. Identification and Analysis of Range of Mitigation Options

See Flood Mitigation (Chapter 4.4.B.)

5.2. C. Dam Failure – Mitigation Strategy and Recommendation

Mitigation Goal #1  Prevent damage or interruption to the economic and recreational benefits the community gains from the county and privately-owned dams

Objective #1  Maintain the county owned dams, and support maintaining the physical integrity of the privately owned dams

Task 1  Respond promptly to any physical threats to the county and privately owned dams

Action Step 1  Maintain a stockpile of sandbags and appropriate materials on site for immediate application if needed

Category: Prevention

Responsible Org: City and County. Public Works

Coordinating Org: Stewart Co. EMA

Jurisdiction: Stewart Co., Richland, Lumpkin

Timeline: 2014

Costs: $4,000 for overtime and materials

Funding Source: Local Government

Priority: Medium

Benefit: In the event of flooding from dam failure, Task 1 will assure effective and quick emergency response, and prevent deaths among the residents of Stewart County and the cities of Richland and Lumpkin, particularly those who reside in flood prone areas. Task 1 will also prevent damage to the non-critical structures. In addition Task 1 will offer security to residents traveling on affected roads. There are no critical structures identified in hazardous areas.

5.2. D. Special Multi-Jurisdictional Strategy

Stewart County is in general more affected by flooding of roads than the City of Richland and the City of Lumpkin, especially since most of the earthen dams are located in the county. This is why efforts to prevent dam failure apply mainly to the county.

5.2. E. Public Information and Awareness Strategy
Residents of Stewart County and the Cities of Richland and Lumpkin must be made aware of the danger of dam failure; similarly dam owners and operators must be made aware of their responsibility of maintaining the dams.

5.3 Civil Disturbance

5.3. A. Community Mitigation Goals

The random aspect of a civil disturbance makes it hard for a community to prepare for the occurrence of any type of disturbance. In the previous years, Stewart County has not experienced any such occurrence or any structural damage or serious injuries or fatalities. A Warning system is a mitigating activity. Search and rescue, and public information training are preparedness areas. Safe shelters are a key response. The general public does not understand how little time responders have to a sudden civil disturbance of any kind and how important it is that all parties be prepared at all times to respond correctly.

5.3. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation
   The goals identified are both structural and non-structural options. Home owners are responsible for structural improvement of existing buildings. Non-structural options encourage the expansion of public education. It is important to educate the population of the dangers of possible civil disturbances.

2. Existing policies, regulations, ordinances and land use
   Currently there are no special policies, regulations, ordinances, or land use directives in Stewart County, the Cities of Richland and Lumpkin for dealing with civil disturbances.

3. Community values, historic, and special considerations
   The community values it’s residential and historic assets and is determined to protect them against Civil Disturbance.

4. New buildings and infrastructure
   Residents should be advised to take shelter in any well-built building, or seek the designated emergency shelter for the most immediate safety, should the need arise.

5. Existing buildings and infrastructure

Analysis did not reveal anything tangible that the local governments can do to reduce the impact of civil disturbances on existing buildings and infrastructure.
### 5.3. C. Civil Disturbance – Mitigation Strategy and Recommendation

**Mitigation Goal #1**

Analyze probable areas prone to Civil Disturbance Activity

**Objective 1**

Defining the target area

**Task 1**

Obtain comprehensive material on civil disturbance areas

**Action Step 1**

Research and analyze potential locations for civil disturbances

<table>
<thead>
<tr>
<th>Category</th>
<th>Awareness</th>
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<tbody>
<tr>
<td>Responsible Org</td>
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<tr>
<td>Coordinating Org</td>
<td>Stewart Co. EMA</td>
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<td>Jurisdiction</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
</tbody>
</table>

**Timeline:** Annually

**Status:** Completed, Identified new detention facility as a potential civil disturbance site.

**Costs:** Nominal, $200 staff time

**Funding Source:** Dept. Operations Budget

**Priority:** Medium

**Benefit:** In the event of a civil disturbance, Mitigation Goal #1 will benefit the county and the cities by informing and educating citizens of the threats and dangers involved.

**Action Step 2**

Distribute civil disturbance safety information in form of flyers, brochures, or public safety announcements

<table>
<thead>
<tr>
<th>Category</th>
<th>Public Education/Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Org</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Coordinating Org</td>
<td>Stewart Co. EMA</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Stewart Co., Richland, Lumpkin</td>
</tr>
</tbody>
</table>

**Timeline:** Annually

**Status:** Use social media to distribute civil disturbance information

**Costs:** $500 for staff time and copies

**Funding Source:** Dept. Operating Budget

**Priority:** Medium

**Action Step 3**

Provide print media with “print ready” articles on Civil disturbance safety, present civil disturbance awareness programming on local television station, and provide public service announcements to all local media

<table>
<thead>
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<th>Category</th>
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<td>Jurisdiction</td>
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</tbody>
</table>

**Timeline:** Annually

**Status:** Ongoing, Use social media and print media to educate the public about disturbance awareness.

**Cost:** $500 for staff time

**Funding Source:** Departmental Operating Budget

**Priority:** Medium
Mitigation Goal # 2  Prepare emergency personnel and local government to respond effectively to needs both during and after civil disturbance event.

**Objective 1**  Provide emergency personnel with needed equipment

**Task 1**  Research funding for the development of a system to notify emergency personnel of any civil disturbance

**Action Step 1**  Develop grant application for system for Notifying emergency personnel

| Category: | Emergency Services |
| Responsible Org: | Stewart Co. EMA |
| Coordinating Org: | Stewart Co. EMA |
| Jurisdiction: | Stewart Co., Richland, Lumpkin |

**Timeline:** 2014-2016

**Status:** Completed 2015

**Costs:** Staff time, anywhere from $10 per hour to $50 per hour

**Funding Source:** GEMA/FEMA/USDA/DCA

**Priority:** High

**Task 2**  Develop a call-in procedure for emergency personnel

**Action Step 1**  Create procedure to call off-duty employees at the scene of the disturbance.

| Category: | Emergency Services |
| Responsible Org: | Stewart Co. EMA |
| Coordinating Org: | Stewart Co. EMA |
| Jurisdiction: | Stewart Co., Richland, Lumpkin |

**Timeline:** 2014

**Status:** Complete in 2017, will not continue to work item

**Cost:** $50 for staff time

**Funding Source:** Department Operating Budget

**Priority:** High

Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

5.3. D. Special Multi-Jurisdictional Strategy

There are no differences between Stewart County, the Cities of Richland and Lumpkin pertaining to civil disturbance hazards. The risk is the same in each jurisdiction; therefore most of the mitigation measures for civil disturbances apply to each.

5.3. E. Public Information and Awareness Strategy

Developing a warning system and making available information about civil disturbances will enhance public information and awareness.
5.4 Terrorism

5.4. A. Community Mitigation Goals

The random aspect of terrorism makes it hard for a community to prepare for the occurrence of any type of disturbance. In the previous years, Stewart County has not experienced any such occurrence or any structural damage or serious injuries or fatalities. A Warning system is a mitigating activity. Search and rescue, and public information training are preparedness areas. Safe shelters are a key response. The general public does not understand how little time responders have to a sudden terrorist attack of any kind and how important it is that all parties be prepared at all times to respond correctly.

5.4. B. Identification and Analysis of Range of Mitigation Options

1. Structural and non-structural mitigation
The goals identified are both structural and non-structural options. Home owners are responsible for structural improvement of existing buildings Non-structural options encourage the expansion of public education to supplement property owner’s structural options. It is important to educate the population of the dangers terrorism and terrorist attacks.

2. Existing policies, regulations, ordinances and land use
Currently there are no special policies, regulations, ordinances, or land use directives in Stewart County, the Cities of Richland and Lumpkin for dealing with terrorism and terrorist attacks.

3. Community values, historic, and special considerations
The community values it’s residential and historic assets and is determined to protect them against terrorism and terrorist attacks.

4. New buildings and infrastructure
Residents should be advised to take shelter in any well-built building, or seek the designated emergency shelter for the most immediate safety, should the need arise.

5. Existing buildings and infrastructure
Analysis did not reveal anything tangible that the local governments can do to reduce the impact of civil disturbances on existing buildings and infrastructure.

5.4. C. Terrorism – Mitigation Strategy and Recommendation

<table>
<thead>
<tr>
<th>Mitigation Goal #1</th>
<th>Objective 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce the potential for loss of life and property damage</td>
<td></td>
</tr>
<tr>
<td>Reduce the risk of personal injury and loss of life by educating the citizens of terrorism and terrorist attacks</td>
<td></td>
</tr>
</tbody>
</table>

Task 1 Obtain and distribute comprehensive material on terrorism
Action Step 1  Promote regular drills at high occupancy locations such as schools, Court Houses, the Doctor’s Offices, daycare facilities, detention facility, hospitals, and industries  
Category:   Public Education/Awareness  
Responsible Org:  Stewart Co. EMA  
Coordinating Org:  Stewart Co. EMA  
Jurisdiction:  Stewart Co., Richland, Lumpkin
  Timeline:  Annually  
  Status:  Ongoing, Use Facebook site to promote drill activities  
  Costs:  Nominal, $200 staff time  
  Funding Source:  Dept. Operations Budget  
  Priority:  Medium

Action Step 2  Distribute terrorism information in form of flyers, brochures, or public safety announcements  
Category:   Public Education/Awareness  
Responsible Org:  Stewart Co. EMA  
Coordinating Org:  Stewart Co. EMA  
Jurisdiction:  Stewart Co., Richland, Lumpkin
  Timeline:  Annually  
  Status:  Not done add link to DHS.gov  
2021  
  Costs:  $500 for staff time and copies  
  Funding Source:  Dept. Operating Budget  
  Priority:  Medium

Action Step 3  Provide print media with “print ready” articles on terrorism safety, present terrorism awareness programming on local television station, and provide public service announcements to all local media  
Category:   Public Education/Awareness  
Responsible Org:  Stewart Co. EMA  
Coordinating Org:  Stewart Co. EMA  
Jurisdiction:  Stewart Co., Richland, Lumpkin
  Timeline:  Annually  
  Status:  Not completed, Remove  
  Cost:  $500 for staff time  
  Funding Source:  Departmental Operating  
  Priority:  Medium

Benefit: In the event of a tornado, Mitigation Goal #1 will benefit the county and the cities by informing and educating citizens of the threats and dangers involved with terrorism. In addition, Mitigation Goal # 1 will prevent terrorism related fatalities among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin.

Mitigation Goal # 2  Prepare emergency personnel and local government to respond effectively to needs both during and after terrorist event.

  Objective 1  Provide emergency personnel with needed equipment  
  Task 1  Develop a call-in procedure for emergency personnel
Benefit: In the event of a hazardous material release, Objectives 1 to 4 would assure effective emergency knowledge and response, and prevent injury or deaths among the 5,705 residents of Stewart County and the Cities of Richland and Lumpkin, as well as prevent damage to the critical facilities with a structural replacement value of 78,997,124 million dollars, and damage to non-critical structures with a replacement value of approximately 87,515,423 million dollars.

5.4. D. Special Multi-Jurisdictional Strategy

There are no differences between Stewart County, the Cities of Richland and Lumpkin pertaining to terrorist hazards. The risk is the same in each jurisdiction; therefore most of the mitigation measures apply to each. Terrorism drills in the school are measures the County EMA will be taking for the residents of both the cities and the county.

5.4. E. Public Information and Awareness Strategy

Promoting terrorism drills will enhance public information and awareness.
6 – EXECUTION OF THE PLAN

6.1. Implementation Action Plan

6.1. A. Administrative Actions

The chief elected officials and the appointed officials of Stewart County, the City of Richland and the City of Lumpkin in the executive committee are responsible for the administrative personnel and operations of the local government and the mitigation activities proposed in this plan. The Emergency Management Agency (EMA) coordinates disaster planning, develops Standard Operating Procedures, and coordinates all local and state resources involved in conducting disaster operations. The EMA maintains emergency notification rosters for 24-hour emergency notification, and other data to ensure prompt and effective response.

It is also the responsibility of the EMA to implement this plan after the County Commission and City Councils have authorized the adoption of this plan, after GEMA has given its approval, and prior to FEMA approval. To do this, the officials will present the necessary policy changes, ordinance adoptions, or other revisions in procedures to the governing body, and make recommendations on how to accomplish the goals of this mitigation plan. The action steps have to be implemented and the executive committee has to report on the progress. The EMA Director shall assume the responsibility to coordinate and support these activities, and to oversee the implementation of the plan. The EMA Director also assures the upkeep and maintenance of the plan, and is authorized to call a committee meeting to review and update the plan at least every five years. Completion of mitigation projects shall be noted in the document, and additional mitigation measures shall be developed.

6.1. B. Authority and Responsibility

The office of the EMA Director has the authority and responsibility for implementation vested. The EMA Director will brief the appropriate officials concerning their roles and responsibilities in emergency management and in this plan. Responsible Organizations to conduct the diverse mitigation measure are the following.

Cities and County:
City and County Officials
EMA
Fire Department
Law Enforcement
Pre-Disaster Mitigation Committee
Public Services and Utilities
School Board
Senior Center
Other Agencies:
American Red Cross
DFCS Department of Family and Children Services
FEMA
Georgia DOT
GEMA

For a list of mitigation activities prioritized by Responsible Organizations, please refer to Appendix D, pages D65-D67.

6.1. C. Prioritization: Methodology, and Use of Cost Benefit

In order for this plan to be effective, its contents must be known and understood by those who are responsible for its implementation. The Pre-Disaster Mitigation Plan Committee was tasked to prioritize the alternative mitigation actions based on their perceived cost benefit, community benefit and/or support for the action, and the potential that the action will receive the necessary funding. Please see GEMA worksheet #4 Evaluate Alternative Mitigation Actions in Appendix D.

1. Methodology
The methodology used to prioritize the mitigation measures is the review by committees. Each department identified as responsible organizations for an action step has to review the action steps. Those action steps which are not difficult to conduct, which have broad acceptance, and which are low-cost measures with local funding available, will be conducted first. Action steps, where funding is not certain, are tackled in a second step.

2. Use of Cost Benefit
Since purchases are involved in some of the action steps of the EMA office, the EMA Director will have to meet with city and county officials to review the costs and the benefits of the purchases. As soon as funding sources like grants are identified, a review of the purchase proposals has to be conducted. The review of the county and city officials evaluates the costs and the foreseen benefits of the purchases, and prioritizes them accordingly. Therefore, prioritization is based on the costs, the available funding, and the benefits of the projects.

3. Use of Other Calculations
Each department identified as responsible organization for an action step will review the action steps. Those action steps which are not difficult to conduct, and which are low-cost measures with local funding available, will be
conducted first. Action steps, where funding is not certain, are addressed in a second step.

4. Use of Other Review Structure
No other review structures are identified at this moment, but will be used if the need arises.

6.1. D. Incorporation of Local PDM Plan into other Plans/Planning Measures

Stewart County updated the Local Emergency Operations Plan in 2014. This Pre-Disaster Mitigation Plan will be among the documents reviewed for inclusion in these documents. Once GEMA and FEMA have determined the relevance of this plan, the River Valley Regional Development Center representative will go before the Board of Commissioners and ask them to adopt the plan.

Pursuant to Georgia law, local governments must prepare and adopt a comprehensive plan to maintain eligibility for state grants, loans and/or permits. All three jurisdictions are diligent in maintaining their “Qualified Local Government” status. Although the chief elected official of the jurisdiction is accountable for ensuring these plans are prepared in accordance with stringent state planning and procedural standards, and formally adopted, responsibility for ensuring this is accomplished is commonly deferred to the chief administrative official. The chief elected and/or appointed officials of all three jurisdictions and the EMA Director serve on the pre-disaster mitigation plan executive committee. Annual review and evaluation of this mitigation plan will serve to facilitate incorporation of mitigation measures into daily management functions (budgeting, permit issuance) of the local governments as well as the joint, local comprehensive plan. The current joint comprehensive plan for Stewart County, and the Cities of Lumpkin and Richland was adopted in 2014. It is scheduled to be updated no later than February 2019. The River Valley Regional Commission has helped not only with preparation of this pre-disaster mitigation plan, but has also assisted the community to maintain compliance with state-mandated comprehensive and other planning requirements.

The Stewart County Emergency Operations Plan will be available with updates made frequently by the EMA Director, and resubmitted and approved. Any changes to this document through findings of the Pre-Disaster Mitigation Plan will be incorporated.

Elements of the 2014 local pre-disaster mitigation plan were incorporated into the 2014 joint comprehensive plan update and the Local Emergency Operations Plan for Stewart County to assist them in their planning efforts. Specifically elements were included in the sections referencing ongoing environmental protection efforts by the County. Elements of the current pre-
disaster mitigation plan will be incorporated into any future planning documents including the Joint Comprehensive Plan (to be updated in 2019) as well.

6.2. Evaluation, Monitoring, Updating

6.2. A. Method

The Pre-Disaster Mitigation Committee will be responsible for evaluating the plan. The first task of the committee will be to determine the criteria to be used for evaluation of the plan. Included among these criteria shall be:

* Is the risk assessment still appropriate, or has the nature or magnitude of the hazard and/or the vulnerability of the county changed over time?
* Are current resources appropriate for implementing this plan?
* Have members of the public been adequately involved in the process? Are their comments being heard?
* Do the goals and objectives continue to address expected conditions in Stewart County?
* Have outcomes been adequate?
* Have lead agencies participated as originally proposed?
* What problems have occurred in the implementation process?

An evaluation handbook will be developed using the goals, objectives, tasks and action steps of Chapters 4 and 5 as the format. This document will be used to record the name and contact information of the individual assigned responsibility for overseeing implementation of each action step included in the plan. These assignments will be made at the “organizational” meeting held after formal plan adoption. This handbook will be used by the executive committee to maintain a current, written record of progress made with plan implementation. The record of project information recorded during the course of the year(s) will be useful for the end-of-year evaluation (and five-year update). Future updates will use a similar format as the update for this plan. This process included monthly involvement of committee members at meetings to discuss each aspect of the plan. Each chapter was read and discussed. If an update was needed, changes were made in the final document. The critical facilities were established in conjunction with the committee members and the tax assessor. The tax assessor also provided information on building areas and values. The remainder of information to be updated involved research to several sources, to include U.S. Census Bureau, NCDC, CWPP, DNR, and GDOT. The same process described in this paragraph will be used for future updates of the plan.
6.2. B. Responsibility

The Pre-Disaster Mitigation Committee will be responsible for evaluating the plan. The office of the EMA Director has the authority and responsibility to call the appropriate meeting of the Committee. The EMA Director will brief the appropriate officials concerning their roles and responsibilities in emergency management and in evaluating this plan.

6.2. C. Timeframe

An evaluation and update of the plan shall be conducted at least every five years. The EMA Director will call a meeting of the Pre-Disaster Mitigation Committee for this purpose.

6.2. D. Reporting

Changes to the Stewart County Pre-Disaster Mitigation Plan will be reported to GEMA and FEMA.

6.3. Multi-Jurisdictional Strategy and Considerations

The Stewart County Emergency Management Agency is the authorized agent of Stewart County and the Cities of Lumpkin and Richland for Pre-Disaster Mitigation planning. Both the cities and the county have been working partners in the development of this Pre-Disaster Mitigation Plan. Upon GEMA approval of the Stewart County Pre-Disaster Mitigation Plan, and prior to FEMA approval, both City Councils and the County Commission will publish their resolutions to adopt the plan, and oversee the implementation of the actions prescribed in the Stewart County Pre-Disaster Mitigation Plan. This precludes the need for each jurisdiction to produce different/separate action plans in order to manage hazard risks.

6.4. Plan Update and Maintenance

6.4. A. Public Involvement

Public involvement will be assured for the review and update of this plan. The public is invited to serve on the Pre-Disaster Mitigation Committee, and give input at the public hearings. Public hearings are a forum for expressing opinions, and proposing mitigation strategies. The plan will be published, and copies will be kept at the Emergency Management Agency for review and comments. Contained in the plan will be the contact information of the EMA Director responsible for collecting and incorporating public comments in the plan.
6.4. B. Timeframe

Updates to the Stewart County Pre-Disaster Mitigation Plan will be made every five years. The EMA Director will coordinate, publish and report changes to this plan as required. Updated are going to be needed if there are changes to the risk assessment, if problems have occurred in the implementation process, if deficiencies have been identified through drills and exercises, and when proposed mitigation actions have been completed. New mitigation projects will be identified at that point. Has a natural or technological disaster occurred, the effectiveness of the implementation of this plan will be reviewed and if necessary updated, as soon as the emergency response activities have been terminated.

6.4.C. Reporting

Any changes and updated to the plan will be reported by the EMA Director to GEMA and FEMA.
7 – CONCLUSION

7.1. Conclusion Summary

Through the planning process necessary to create this Pre-Disaster Mitigation plan, the officials in Stewart County and the Cities of Richland and Lumpkin have obtained a better understanding of the dangers of natural and technological hazards, assessed the community’s vulnerability and risk through study of its disaster history, and developed strategies to mitigate the damaging effects of hazards. The planning committee, formally approved by the County Commission and City Councils, held many work sessions, but also two public hearings, where the members of the community had the opportunity to comment and make suggestions about disaster mitigation. Efforts were taken to include as many persons as possible in the planning process.

The local adoption of this mitigation plan completes another important step. The community now has the task of implementing the action steps identified. Out of the prioritization of the goals and strategies, an action plan has evolved, giving Stewart County the tools needed to be proactive rather than reactive to hazards and their destructive effects.

Stewart County can capitalize on past successes in emergency preparedness, and continue its efforts to provide for the health, safety and general well-being of the residents of Stewart County, making the community a safer place to live and work.

7.2. References

7.2.A. Publications

FEMA Pre-Disaster Mitigation How-to Guides (FEMA)
Georgia Department of Transportation (GDOT): 2019 Traffic Flow Map.
GEMA Supplements to FEMA Pre-Disaster Mitigation How-to Guides (GEMA)
Southwest Georgia News, Edison, Georgia.

7.2.B. Web Sites

Atlantic Oceanographic and Meteorological Laboratory
http://www.aoml.noaa.gov/
Department of Motor Vehicle Safety (DMVS)  
http://www.dmvs.ga.gov/reports/index.asp

Department of Transportation  
http://www.dot.gov

Drought in Georgia  
http://www.droughtingeorgia.org

Federal Emergency Management Agency  
http://www.fema.gov

ISO - Insurance Services Office, Inc  
http://www.iso.com

National Climatic Data Center  
http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent-storms

National Weather Service Tropical Prediction Center – National Hurricane Center  
http://www.nhc.noaa.gov/aboutshs.shtml

National Weather Service Forecast Office  
http://www.erh.noaa.gov/chs/hurrstats.shtml

Office of Homeland-Security-Georgia Emergency Management Agency  
GEMA  
http://www.gema.state.ga.us/.

7.2.C. Other

Stewart County, City of Richland and City of Lumpkin Joint  
Comprehensive Plan 2014,

Stewart County Emergency Operations Plan 2012

Federal Emergency Management Agency FEMA

Georgia Department of Natural Resources GDNR

Georgia Department of Transportation GDOT

GEMA

National Climatic Data Center NCDC

National Oceanic and Atmospheric Administration NOAA


7.3. Additional Sources of Information

Interviews with local sources

Please see attachment for Appendix A – F.