

Approved by FEMA – Effective 12/11/2018 through 12/10/2023

# Ware County, Georgia



## Hazard Mitigation Plan 2018-2023

### **Including the City of Waycross**

This Plan produced for the Ware County Board of Commissioners  
by the Southern Georgia Regional Commission  
through funding provided by the Federal Emergency Management Agency  
and the Georgia Emergency Management Agency

Adopted by Ware County April 9, 2018  
And by the City of Waycross April 3, 2018

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# **Chapter 1:** **Introduction to the Planning Process**

Summary of changes:

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

<b><u>CHAPTER 1 Section</u></b>	<b><u>Updates to Section</u></b>
<b><u>I. Purpose and Need, Authority, and Statement of Problem</u></b>	<b><u>• Language updated to reflect that this was an update to the existing plan</u></b>
<b><u>II. Local Methodology, Brief Description of the Plan Update Process and Participants in the Update Process</u></b>	<b><u>• All participating jurisdictions are the same as in the original plan</u></b>
<b><u>III. Description of How Each Section of the Original Plan Was Reviewed and Analyzed and Whether It Was Revised</u></b>	<b><u>• Planning Committee reviewed each section</u></b> • Updates made using national, state, and local data
<b><u>IV. Organization of Plan</u></b>	<b><u>• Consistent with original plan</u></b>
<b><u>V. Local Hazard, Risk and Vulnerability (HRV) Summary, Local Mitigation Goals and Objectives</u></b>	<b><u>• Updates made using national, state, and local data</u></b>
<b><u>VI. Multi-Jurisdictional Special Considerations (HRV, Goals, Special Needs)</u></b>	<b><u>• No major changes from original plan</u></b>
<b><u>VII. Adoption, Implementation, Monitoring and Evaluation (A General Description of the Processes)</u></b>	<b><u>• Evaluation method revised and updated.</u></b>
<b><u>VIII. Community Data (Demographics, Census, Commerce, History, Etc.)</u></b>	<b><u>• Updates made using most recent available Census Bureau data</u></b>

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

## **Section I.** **Purpose and Need, Authority and Statement of Problem**

This document is the official plan update to the original Ware County Pre-Disaster Mitigation Plan, which was approved by the Georgia Emergency Management Agency (GEMA) and the Federal Emergency Management Agency on September 22, 2006 and expired on September 22, 2011. The subsequent Plan Update took effect on December 9, 2013 and expires on December 9, 2018.

The purpose of this document is to provide an overview of the natural hazards that may impact Ware County and the City of Waycross, Georgia. Its purpose is also to outline Ware County's and the City of Waycross's plans for the Hazard Mitigation of potential loss of life and damages to property and the economy that may occur with these events.

This Plan is a direct result of research and a planning and public involvement process undertaken by the local government officials and citizens of Ware County and the City of Waycross after they formed the Ware County Hazard Mitigation Plan Update Committee (hereafter known as the Ware County HMPUC). This Plan is the result of their commitment to reduce the risks of natural hazards and the effects of those natural hazards to their communities. The City of Waycross is the only incorporated city located in Ware County.

Hazard Mitigation is a means to address the potential damage that may be caused by natural or man-made disasters. This extends to addressing potential loss of life, property, economy, etc. that would not otherwise be addressed.

Authority for the development of this Plan was given by the Ware County Commission as a result of their execution of the Grantee-Subgrantee Agreement for the Ware County Hazard Mitigation Grant Program (HMGP) Planning Project; and by the City of Waycross, located in Ware County, through their participation in the planning project.

In order to initiate an outreach program to neighboring communities, governments, agencies, businesses, and the public, two Public Hearing Notices were published in the Ware County legal organ newspaper. In addition, e-mail lists were kept updated and those on them were informed of meetings through e-mails, letters, and/or telephone calls. Surrounding county EMA Directors were notified of the plan update and invited to participate in the process. Additionally, some nearby counties' Hazard Mitigation Plans were being updated at the same time and an active meeting list was maintained for scheduling purposes.

Planning Division staff from the Southern Georgia Regional Commission, which represents eighteen counties in the region (including Ware County), attended the Ware County meetings. They participated in all aspects of the planning process and provided a regional perspective in the formation of the multi-jurisdictional Ware County Hazard Mitigation Plan.

Through all of the above efforts, the multi-jurisdictional Ware County/City of Waycross Hazard Mitigation Plan was updated, including a comprehensive range of Mitigation Goals, Objectives, and Action Steps (see Chapter 4) which will assist the local governments in emphasizing a more direct approach to Hazard Mitigation. The long-term goal is to reduce potential natural disaster losses to life, property, and the economy through Hazard Mitigation efforts.

## **Section II.**

### **Local Methodology, Plan Update Process, and Participants**

This Ware County Hazard Mitigation Plan Update encompasses the jurisdictions of Ware County and the City of Waycross, both located in Southeast Georgia. Each of these jurisdictions also participated in the 2006 Hazard Mitigation Plan and the 2013 Hazard Mitigation Plan update. The Southern Georgia Regional Commission provided technical assistance. A Ware County Hazard Mitigation Plan Update Committee (Ware County HMPUC) was formed, and a year-long planning effort was undertaken, the final product of which was a Plan Update containing updated Mitigation Goals, Objectives, and Action Steps to reduce or eliminate the potential for loss of life and damage to property and the economy caused by natural disasters (see Chapter 4).

An important part of the planning process is the organization of resources. Assessing risks is also an important step in the development of the Plan. This includes identifying hazards, profiling hazard events, inventorying assets and estimating losses. Developing the Hazard Mitigation Plan, as well as implementing the plan and monitoring its progress, are the final key parts of the planning process.

Potential members of the Ware County HMPUC were contacted by telephone or by letter/e-mail concerning their participation on the Committee. Southern Georgia Regional Commission (SGRC) staff provided technical assistance to the Ware County HMPUC. The Ware County HMPUC was comprised of representatives from Ware County and the City of Waycross and also included representatives from other groups and individuals, as shown below, who attended meetings and/or conducted research:

- Ware County Board of Commissioners – Jimmy Brown, Chairman
- Ware County Emergency Management Agency – Jonathan Daniel, Director
- Ware County EMS – Bill Parham, Director
- Ware County Planning and Zoning Department – James Shubert, Director
- Ware County Fire and Rescue – Donnie Griffis, Chief
- Ware County Department of Family and Children’s Services – Cathy Cason, Director
- Ware County Sheriff’s Department – Carl James, Major
- Ware County Facilities – Spencer Baxley, Administrative Assistant
- Ware County Board of Education – Robert Benchoff, Director
- Ware County Health Department – Connie Barefield, Director
- Ware County – M. Brooks, Road Superintendent
- City of Waycross – Jessica Deal, City Engineer
- City of Waycross – Wilton Deloach, Public Works Director
- City of Waycross Fire Department – David Eddins, Chief
- Southern Georgia Regional Commission – Ariel Godwin, Planner
- Southeast Health District – Mary Beth Butler, Public Information Officer

The Committee held the following meetings, the sign-in sheets of which are included in Appendix E:

- Kick-off public hearing – January 11, 2017

- First workshop – February 8, 2017
- Second workshop – March 8, 2017
- Third workshop – April 12, 2017
- Fourth workshop – May 10, 2017
- Final public hearing – March 22, 2018

Building upon the approved 2013 Plan, each chapter was reviewed chronologically with updated hazard, risk, and vulnerability data, as well as previous accomplishments of mitigation strategy efforts.

Open discussion was permitted at all public meetings for suggestions and/or comments regarding the plan update process. Also, during general question and answer periods, comments (if any) were noted by the Southern Georgia Regional Commission staff and incorporated into the plan as appropriate.

Copies of the 2013 Plan were made available at each meeting, while relevant chapters and sections under discussion were photocopied and distributed to those in attendance for comments. Outside the formal meetings, parts of the plan were e-mailed to certain individuals who were unable to attend the meetings, and their comments were sought. Copies of the 2013 Plan and the draft Plan Update document were also available at the Ware County Commission, Waycross-Ware County EMA Office, City of Waycross, and on the SGRC website.

For the plan update, the Ware County Hazard Mitigation Plan Update Committee (HMPUC) reviewed all chapters and sections of the prior plan and updated them as appropriate using national, state, and local data sources. The prior plan was used as a basis for the update. The HMPUC reviewed the individual parts of the prior plan (with an emphasis on the hazards, goals, objectives, and action steps) and update these elements through open discussion in which updates were noted by SGRC staff, who then used notes from the workshops to create the new Hazard Mitigation Plan document. The Wildfire section was updated using the Georgia Forestry Commission’s Ware County “Community Wildfire Protection Plan.” The CWPP was consulted to ensure consistency between the CWPP and HMP, and all action items from the CWPP that were still relevant were included as action steps in the HMP. Land use descriptions, information about zoning, and information about community services were updated using the Ware County/City of Waycross Comprehensive Plan. Other documents used were the State of Georgia Hazard Mitigation Plan, Flood Insurance Studies, and information from the National Climatic Data Center (NCDC). The State Hazard mitigation plan was consulted to ensure the HMP would be consistent with both this plans, and data from the NCDC were used to create the Hazard Frequency Table and associated information regarding each hazard, which can be found in Chapter 2. Ware County does not have a Flood Mitigation Assistance Plan.

## **Public Comment and Participation**

The publication of a Public Notice in the legal organ is considered the legal method of notifying the public and inviting them to meetings.

The public was invited to attend and comment during two public hearings. The “kick-off” public hearing was held on January 11, 2017 and was advertised in *The Waycross Journal-Herald* (see Appendix E, Section I). 16 citizens, including staff and members of the Ware County HMPUC, attended this public hearing, as well as one staff member from the Southern Georgia Regional Commission and one GEMA representative (see Appendix E, Section II). There were no substantive comments other than those complimentary of the planning process itself. Therefore, there was no need to consider or add materials derived from public comments at that time.

A second and final public hearing was held on March 22, 2018 and was advertised in *The Waycross Journal-Herald* (see Appendix E). Citizens including staff and members of the Ware County HMPUC were present (see Appendix E).

As mentioned above, in order to initiate an outreach program to neighboring communities, governments, agencies, and businesses, two Public Hearing Notices were published in the Ware County legal organ newspaper. In addition, e-mail lists were kept updated and those on them were informed of meetings through e-mails and/or telephone calls.

The Ware County HMPUC decided on the following Mission Statement and the following Vision Statement in the original plan and re-confirmed them in this update to help guide them through the planning process.

**Ware County/City of Waycross**  
**Hazard Mitigation Plan Update Committee**  
**Mission Statement**

**This committee’s mission is to make Ware County, The City of Waycross, its citizens, local governments, communities, residences, and businesses less vulnerable to the effects of natural hazards. This will be accomplished through the effective administration of Hazard Mitigation Programs, hazard risk assessments, wise floodplain management, and a coordinated approach to mitigation policy through state, regional, and local planning activities.**

**Ware County/City of Waycross**  
**Hazard Mitigation Plan Update Committee**  
**Vision Statement**

**This committee’s vision is to institutionalize a local Hazard Mitigation ethic through leadership, professionalism, and excellence, thus leading the way to a safe, sustainable Ware County and City of Waycross.**

Due to Ware County and the City of Waycross being such close-knit communities, the Ware County HMPUC chose not to break into subcommittees, but to address issues as a whole group. Various members of this group had direct knowledge relating to Ware County and City of Waycross infrastructure and agencies, emergency planning, hazard planning, and the operations of major departments and emergency services. Through their efforts, this Plan was developed.

The Ware County HMPUC was responsible for identifying natural hazard events and completing a profile (see Chapter 2, Sections I-IX, Appendix A, Sections I-IX, and Appendix D, Section I), vulnerability assessment (please see Chapter 2, Sections I- IX, Appendix A, Sections I- IX, and Appendix D, Section I), potential loss estimation (see Chapter 2, Sections I- IX, Appendix A, Sections I- IX, and Appendix D Section I), and updating the Georgia Mitigation Information System (GMIS) Critical Facilities Inventory (please see <https://www.itos.uga.edu/gema>). They were also responsible for reviewing and updating the Mitigation Goals, Objectives, and Action Steps (please see Chapter 4 Sections I- IX), among other responsibilities.

### **Section III.**

#### **Description of Review, Analysis, and Revision Method**

For the plan update, the Ware County Hazard Mitigation Plan Update Committee (HMPUC) reviewed all chapters and sections of the original plan and updated them, as appropriate, using national, state, and local sources. In particular, the Wildfire section(s) were updated using the Georgia Forestry Commission's Ware County Community Wildfire Protection Plan; other chapters and sections were updated using the Ware County/City of Waycross Comprehensive Plan Five-Year Short Term Work Program, State of Georgia Hazard Mitigation Plan, and information from the National Climatic Data Center (NCDC). Ware County does not have a Flood Mitigation Assistance Plan. However, the County does have a Flood Insurance Study conducted by FEMA.

After organizing resources, an update of the risk assessment was performed. New forms, worksheets, and data (included in the Appendix) were also completed. Afterward, the Mitigation Goals, Objectives, and Action Steps were reviewed to determine if they were to remain the same, be added to, modified, or removed.

Chapters 1, 2, 4, 6, and 7 have been updated to reflect the new material. Please see the tables at the beginning of the chapters for further information regarding which sections were changed and what items were updated.

### **Section IV.**

#### **Organization of the Plan**

This Plan focuses on nine natural hazards chosen by the Ware County HMPUC that may affect and cause damage to Ware County and the City of Waycross. Chapter 2, Chapter 4, and Appendix A are each subdivided into Sections I through IX; these sections reflect the 9 natural hazards that were chosen. The natural hazards are as follows (in order of priority): I. Wildfire; II. Drought; III. Thunderstorm/Wind; IV. Flood; V. Extreme Heat; VI. Tornado; VII. Hail; VIII. Hurricane/Tropical Storm; and IX. Severe Winter Storm.

Six of these hazards constitute an equal threat to all geographic areas of the community. Of the remaining three, flood, wildfire, and wind are the only spatially definable hazards chosen by Ware County and the City of Waycross. Flood and wildfire are limited to somewhat smaller areas (For Flood, see Chapter 2, Section IV and Appendix A, Section IV; For Wildfire, see



Chapter 2, Section I and Appendix A, Section I). Ware County contains two different wind hazard zones (see Chapter 2, Section III).

Other information on these hazards was obtained from GEMA Worksheet 3A: Inventory of Assets, contained in Appendix A, and the National Climatic Data Center Information in Appendix F.

Various wildfire maps and other information have been produced through the Georgia Forestry Commission and included in their “Community Wildfire Protection Plan” for Ware County (see Appendix C).

Other hazards, such as Avalanche, Coastal Erosion, Coastal Storm, Dam Failure, Earthquake, Expansive Soils, Extreme Heat, Land Slide, SLOSH (Sea, Lake, and Overland Surges from Hurricanes), Tsunami, and Volcano, were examined and determined to be non-factors in Ware County and the City of Waycross, based on past history and information contained in Appendix F.

This Plan also contains a Hazard, Risk and Vulnerability (HRV) Assessment (see Appendix A), a comprehensive range of Mitigation Goals, Objectives, and Action Steps (Chapter 4, Sections I-IX), other information on implementation of the Action Plan, monitoring, and plan update and maintenance (see Chapter 6), as well as other FEMA-required items and materials (Various Chapters, Sections and Appendices).

In the future, Ware County Commissioners and City Council Members of the City of Waycross will assign staff to implement the comprehensive range of Mitigation Goals, Objectives, and Action Steps and other pertinent items and reports contained in this Plan.

The Ware County and City of Waycross Hazard Mitigation Plan exists in one bound volume appended with various papers and documents, as well as a single PDF that is available on the SGRC website. The planning efforts of Ware County and the City of Waycross are intended to be an ongoing process and the Plan is to be amended as appropriate.

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Copies of the Plan are on file and may be examined at the Ware County Commission Offices, Waycross City Hall, Waycross-Ware County Emergency Management Agency, the Southern

Georgia Regional Commission (as well as the SGRC website), and at the Georgia Emergency Management Agency (GEMA).

## **Section V.**

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

The Ware County HMPUC determined that the hazards established in the 2013 plan were still the most significant threats to Ware County and the City of Waycross.

A Hazard, Risk, and Vulnerability (HRV) Assessment has been formulated through a variety of information obtained during the planning process. Information has been obtained from web sites, published sources, and personal accounts regarding hazards, their history in the community, and when and where they were active. These may be seen in Appendix A, Appendix D, and Appendix F.

The vulnerability of Ware County and the City of Waycross to natural hazards (including types, numbers, and value of properties) is included in the GEMA Worksheet #3A: Inventory of Assets (contained in Appendix A), the GMIS Critical Facilities Inventory (see Appendix F), and the GEMA Worksheet: Ware County/City of Waycross PDM Hazard Frequencies Table (see Appendix D Section I). Chapter 2, Sections I-IX contain an overall summary of each hazard and its past and potential effect on the community.

The type and value of the various properties in the communities is obtained as a base value as reported on GEMA Worksheet #3A: Inventory of Assets (contained in Appendix A I-IX Parts B and adjusted for the coverage of each possible selected hazard). Critical Facilities and Critical Infrastructure are also examined as to the present value and potential losses from natural hazards (see Appendix F).

A description that identifies and analyses a comprehensive range of Mitigation Goals, Objectives, and Action Steps to reduce the effects of each hazard (based on risk assessment findings) is included in Chapter 4, Sections I-IX. In Chapter 6, Section I, there is a description related to prioritization of these Mitigation Goals, Objectives, and Action Steps through the use of cost/benefit analysis, STAPLEE (Social, Technical, Administrative, Political, Legal, Economic and Environmental), and other criteria.

In Chapter 6 there are sections on Implementing the Action Plan (see Section I), Evaluation, Monitoring, Updating (see Section II), and Plan Update and Maintenance (see Section III). Each jurisdiction has identifiable comprehensive ranges of Mitigation Goals, Objectives, and Action Steps related to them that are contained in Chapter 4, Sections I-IX.

## **Section VI.**

### **Multi-Jurisdictional Special Considerations**

The Ware County HMPUC is comprised of staff members chosen by the Ware County Commission and the City of Waycross. In addition, Southern Georgia Regional Commission staff provided technical assistance for the Ware County HMPUC. Please see Chapter 1 Section II for more information regarding the formation and composition of the Ware County HMPUC.

Ware County has approximately 908 square miles of total area, according to the Georgia Statistics System ([www.georgiastats.uga.edu](http://www.georgiastats.uga.edu)), ranking 1<sup>st</sup> among counties in Georgia in terms of area. As such, certain services, including emergency services, may be located considerable distances away from residents. There is only one incorporated city in Ware County, the City of Waycross.

In Chapter 2, Sections I-IX, there are risk assessments for Ware County and the City of Waycross, as needed, to reflect the unique and varied risks associated with the 9 chosen natural hazards.

## **Section VII.**

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

Prior to the final public hearing, the final draft plan was submitted to both local governments (Ware County and the City of Waycross) for their final review.

The final draft plan was submitted to GEMA and FEMA for their approval. After their approval, and any recommended changes, resolutions adopting the Plan Update were passed by the local governments after a public hearing for comment and review on March 22, 2018. Copies of the resolutions are available in Appendix E.

The comprehensive range of Mitigation Goals, Objectives, and Action Steps (see Chapter 4 Sections I-IX), which contains items related to all local governments, will be implemented as soon as feasible and/or as funds become available to do so.

All sections of the Plan shall be monitored and evaluated annually by the Waycross-Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission Meetings, etc.).

The Waycross-Ware County EMA Director will be charged with ensuring that this plan is implemented, monitored, and periodically updated in subsequent years. The EMA Director will oversee implementation, monitoring, and updates for both jurisdictions (Ware County and the City of Waycross). The method that the Waycross-Ware County EMA will use to monitor the plan and evaluate implementation progress will be the following:

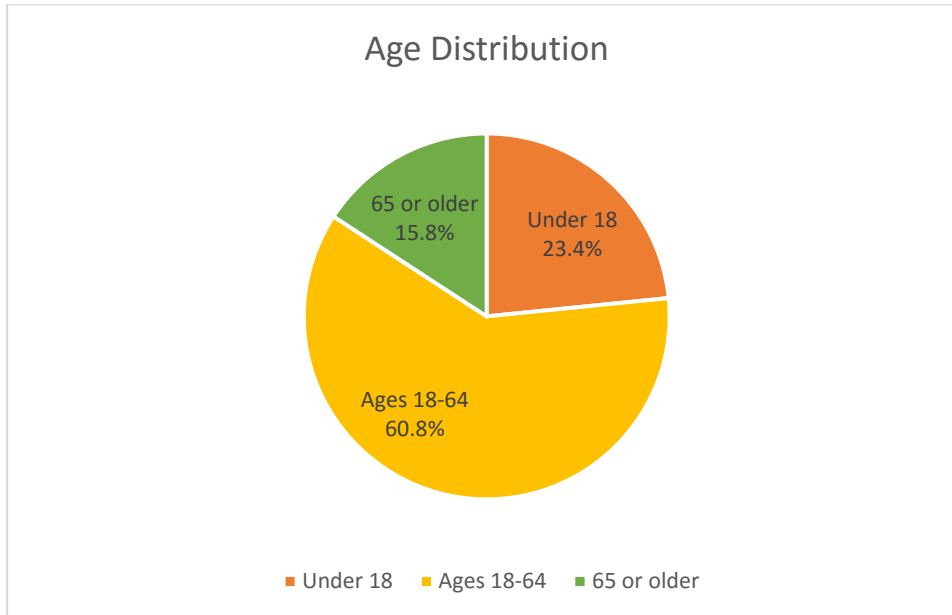
- The Waycross-Ware County EMA will conduct quarterly telephone interviews with the local governments and various area agencies in order to chart their plan progress.

- The EMA Director will hold formal public meetings at least once a year to monitor the progress of the plan implementation and allow the public a forum for expressing concerns, opinions, and ideas.
- Throughout the year, a series of informal meetings will be held in which various aspects of the plan, including monitoring and evaluation, are discussed.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

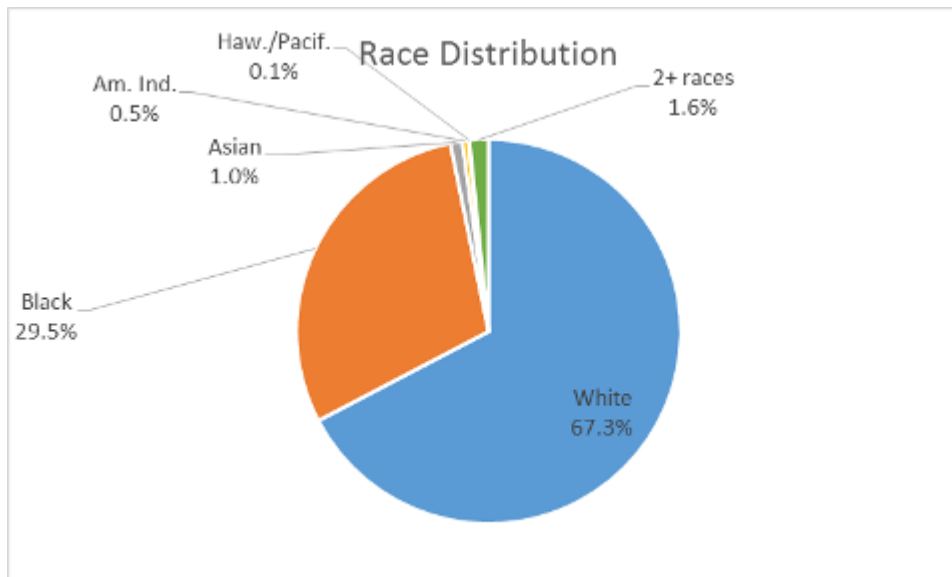
## **Section VIII.** **Community Data**

### **Ware County**



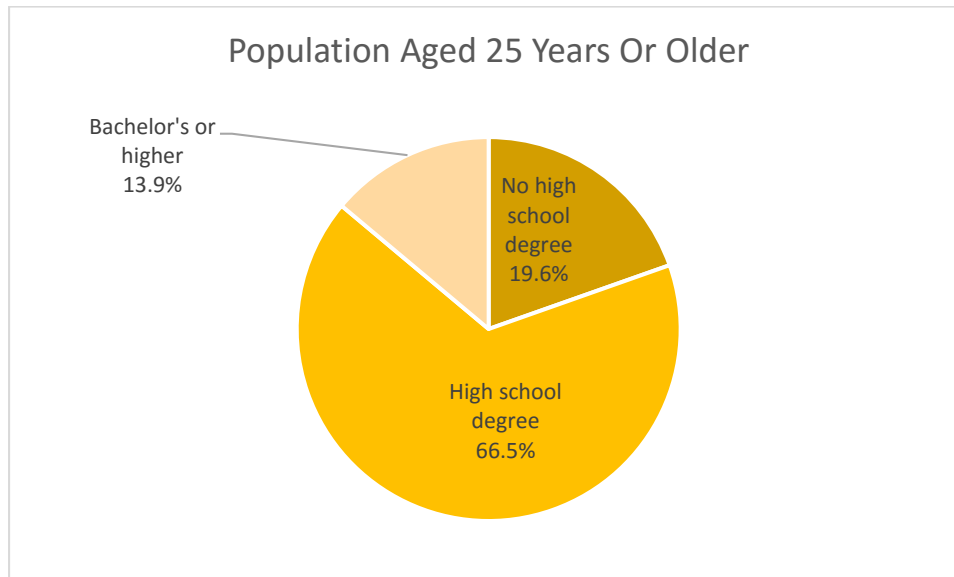
Data source: U.S. Census Bureau, American Community Survey, 2014 1-year estimates.

The 2014 population of Ware County is 35,515. Since the 2010 Census, the population has decreased by 2.2 percent. As of the U.S. Census Bureau's 2013 estimate, 23.4 percent of the population are under age 18, 60.8 percent are between 18 and 64, and 15.8 percent are aged 65 or older. The population is 50.3 percent female and 49.7 percent male.



Data source: U.S. Census Bureau, American Community Survey, 2013 1-year estimates.

As of 2013, Ware County's population is 67.4 percent White, 29.5 percent Black or African American, 1.0 percent Asian, 0.5 percent American Indian and Alaska Native, 0.1 percent Native Hawaiian and Other Pacific Islander, and 1.6 percent of two or more races. 3.6 percent of the population are of Hispanic/Latino ethnicity (regardless of race). 3.4 percent of the population are foreign-born and 5.8 percent of people aged 5 or older speak a language other than English at home.



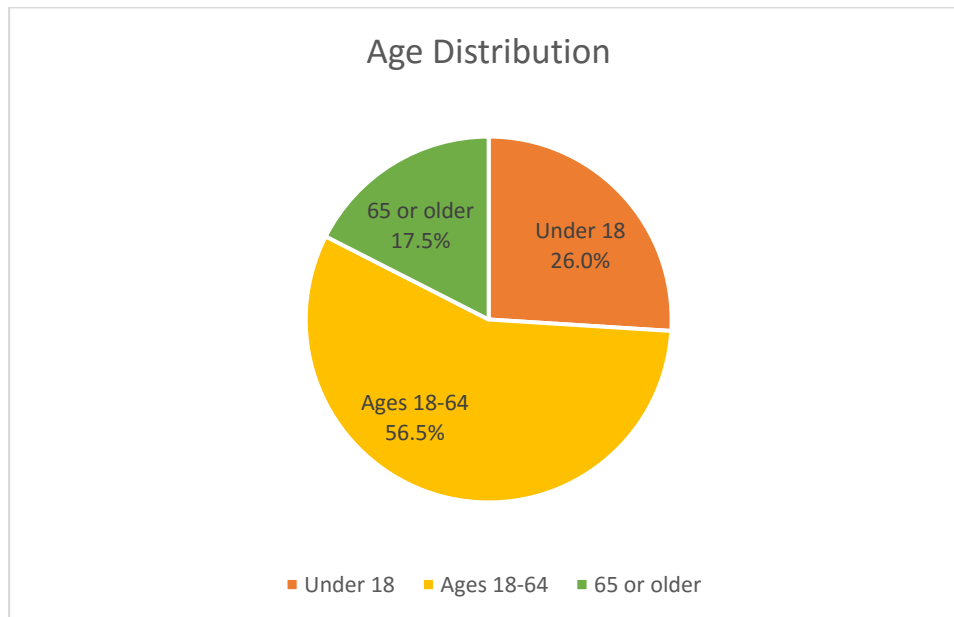
Data source: U.S. Census Bureau, American Community Survey, 2009-2013 5-year estimates.

According to 2009-2013 five-year Census Bureau estimates, 80.4 percent of the population aged 25 or older have at least a high school degree, while 66.5 percent have a high school degree but no additional degree at the level of bachelor's or higher. 13.9 percent have a bachelor's or higher degree. 19.6 percent of those 25 or older do not have a high school degree.

There are 13,460 households in Ware County, with an average of 2.48 persons per household. The homeownership rate is 65.3 percent, and the median owner-occupied home value is \$79,600. The median household income is \$34,572 and the per capita income is \$18,842, measured in 2013 dollars. 24.3 percent of the population lives below the poverty level.

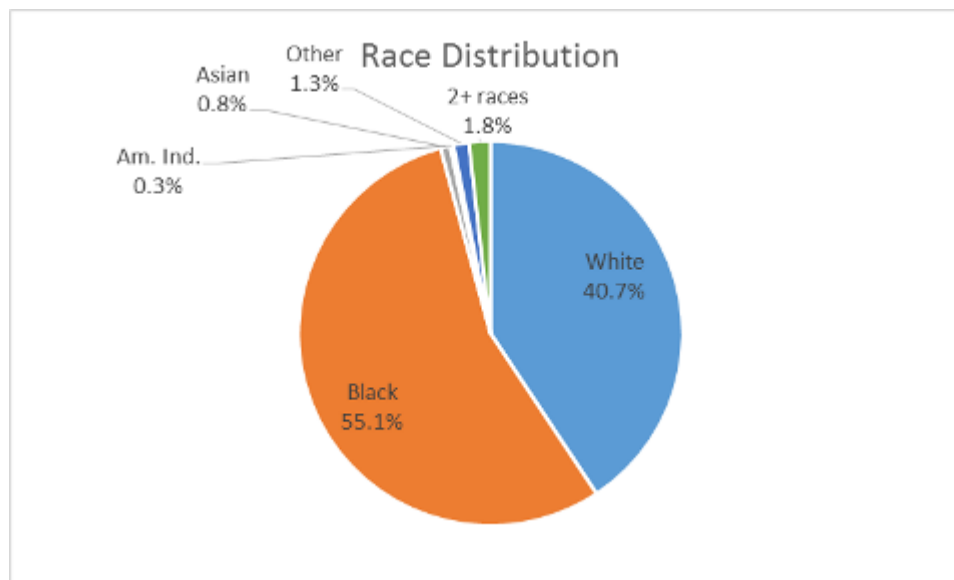
Note: The above statistics for Ware County apply to the entire county, including the City of Waycross.

## Waycross



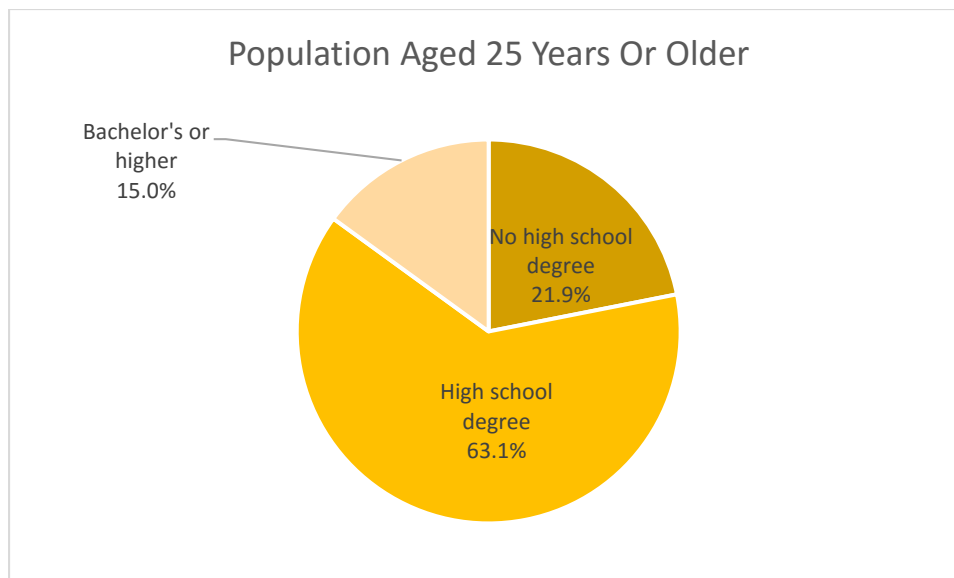
Data source: U.S. Census Bureau, American Community Survey, 2013 1-year estimates.

The 2013 estimated population of the City of Waycross is 14,250. As of the U.S. Census Bureau's 2013 estimate, 26.0 percent of the population are under age 18, 56.5 percent are between 18 and 64, and 17.5 percent are aged 65 or older. The population is 54.9 percent female and 45.1 percent male.



Data source: U.S. Census Bureau, 2010 Census, Summary File 1.

As of the 2010 Census, Waycross's population was 55.1 percent Black or African American, 40.7 percent White, 0.8 percent Asian, 0.3 percent American Indian and Alaska Native, 1.3 percent from other races, and 1.8 percent of two or more races. 2.8 percent of the population were of Hispanic/Latino ethnicity (regardless of race).



Data source: U.S. Census Bureau, American Community Survey, 2009-2013 5-year estimates.

According to 2009-2013 five-year Census Bureau estimates, 78.1 percent of the population aged 25 or older have at least a high school degree, while 63.1 percent have a high school degree but no bachelor's or higher degree. 15.0 percent have a bachelor's or higher degree. 21.9 percent of those 25 or older do not have a high school degree.

There are 6,083 households in Waycross, with an average of 2.29 persons per household. The homeownership rate is 52.7 percent. The median household income is \$24,779 and the per capita income is \$16,221. 32.7 percent of the population lives below the poverty level.



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

### Summary of changes:

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

<b>Chapter 2 Section</b>	<b>Updates to Section</b>
I. Wildfire	Updated data and information; edited for clarity
II. Drought	Updated data and information; edited for clarity
III. Thunderstorm/Wind	Updated data and information; edited for clarity
IV. Flood	Updated data and information; edited for clarity
V. Extreme Heat	Updated data and information; edited for clarity
VI. Tornado	Updated data and information; edited for clarity
VII. Hail	Updated data and information; edited for clarity
VIII. Hurricane/Tropical Storm	Updated data and information; edited for clarity
IX. Severe Winter Storm	Updated data and information; edited for clarity

Table 2.1: Overview of updates to Chapter 2

Through the use of GEMA Worksheet #1: Identify The Hazard (copy contained in Appendix D Section I), the FEMA-described methodology, and other factors, various data were collected (see Appendix A, Appendix D, and Appendix F). The Ware County HMPUC listed all of the natural hazards that may occur. Afterward, they focused on the natural hazards commonly recognized as threats to the jurisdictions that were the most prevalent and most likely to occur and cause damages in Ware County and the City of Waycross.

The nine chosen hazards are the same nine hazards that were included in the 2013 Hazard Mitigation Plan. No hazards have been added to or subtracted from that 2013 Hazard Mitigation Plan.

Six of these hazards constitute an equal threat to all geographic areas of the community. Of the remaining three, flood, wildfire, and wind are the only spatially definable hazards chosen by Ware County and the City of Waycross. Flood and wildfire are limited to somewhat smaller areas (For flood, see Chapter 2, Section IV and Appendix A, Section I; For wildfire, see Chapter 2, Section I and Appendix A, Section I). Ware County contains two different wind hazard zones (see Chapter 2, Section III).

Various wildfire maps and other information have been produced through the Georgia Forestry Commission's "Community Wildfire Protection Plan" for Ware County (see Appendix C).

Other hazards such as Avalanche, Coastal Erosion, Coastal Storm, Dam Failure, Earthquake, Expansive Soils, Extreme Heat, Land Slide, SLOSH (Sea, Lake and Overland Surges from Hurricanes), Tsunami, and Volcano were examined and determined not to be significant hazards for Ware County and the City of Waycross, based on past history and information contained in

Appendix D, the GMIS Critical Facilities Inventory materials, and maps available in Appendix A of this plan.

## **Section I. Wildfire**

### **A. Identification of Hazard:**

The threat of wildfire has been chosen by the Ware County HMPUC as the most likely hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA-described methodology, and other factors.

Historic data have been examined from various sources (see Appendix A), from the Georgia Forestry Commission's Ware County "Community Wildfire Protection Plan," and from the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events.

In addition, hazard maps generated by The GMIS Critical Facilities Inventory for wildfire (see Appendix A Section I) were examined. Complete inventory information is contained at <https://www.itos.uga.edu/gema>. These map values come from the predicted model of the GEMA database.

Nationwide, approximately 80 percent of wildfires are caused by people. Smoking in forested areas and improperly extinguishing campfires are two common causes of wildfire. Lightning is also a major igniter of fires. Between 1960 and 2015, according to the National Interagency Fire Center ([www.nifc.gov](http://www.nifc.gov)), an average of 4.5 million acres each year were burned in wildfires in the United States. Over 10 million acres burned in 2015 alone in the U.S. Although wildfires occur naturally and serve important functions for forest ecosystems, they also present a danger to human life and property. In Ware County, where a significant portion of the land is used for forestry, wildfires can have an economic impact. Between 1967 and 2017, a total of 190,710 acres burned—an average of 3,739 acres per year. Some years have seen extreme levels of wildfire activity with a great many acres burned; for example, in 2007, 116,669 acres burned (during this event, infrastructure was destroyed, such as power lines and roads), and in 2011, 40,737 acres burned. At the same time, periodic controlled burns may be necessary to maintain healthy forest ecosystems.

Low humidity, lack of recent precipitation (or drought conditions), wind speed, and temperature are a combination of weather conditions that favor the kindling and spread of forest or brush fires. Dead fuel moisture, in combination with the above, also provides for the kindling and spread of forest or brush fires. Much of Ware County and some areas in and near the City of Waycross are wooded with commercial and free-growing pine trees and other trees. These trees can and do catch fire frequently in both small and large fire events.

Wildfires often begin unnoticed. They spread quickly and can change direction rapidly, igniting brush, trees, and homes. Also, fire may smolder for weeks at a time in the underbrush and then ignite some distance away from where it started, resisting efforts to eradicate it and spreading quickly throughout the area. Surface fires are the most common type of wildfires, moving slowly and burning along the forest floor, killing and damaging vegetation. Ground Fires, another type, are usually started by lightning and burn on or below the forest floor through the root systems. The final type, Crown Fires, spread by wind moving quickly along the tops of trees.

## **B. Profile of Wildfire Events, Frequency of Occurrences, Probability:**

The historic record for minor to major wildfire is spotty at best, with many unreported or underreported events. All of Ware County and the City of Waycross are vulnerable to wildfires due to their unpredictability and random occurrences. The effects can range from minimal damage to severe and widespread damage. Wildfires can occur at any time of the year.

Members of the Ware County HMPUC have witnessed many unreported and underreported cases of minor to major wildfire events occurring in Ware County and the City of Waycross, some lasting for days, weeks, or months at a time.

According to the Georgia Forestry Commission, on a year to year basis, the leading cause of fires in Ware County has been debris burning, causing 35% of fires and 25% of the acres burned.

According to National Climatic Data Center (NCDC) information (see Appendix G, Section I), there are 11 reports of wildfires occurring in Ware County (including the City of Waycross) between 01/01/1950 and 12/31/2016. More complete data are provided by the Georgia Forestry Commission. According to GFC data, there were 6,039 wildland fires in Ware County (including the City of Waycross) from Jan. 1, 1967 to Dec. 31, 2016, an average of 122 per year. (This total figure includes the 11 events reported by the NCDC.) The Historic Recurrence Interval is 0.01 years. The Historic Frequency Chance is 12,078% per year. The past 10-year Record Frequency Per Year is 58.9, the past 20-year frequency is 89.4, and the past 50-year frequency is 120.78.

Since the previous Hazard Mitigation Plan was completed, there have been an estimated 150 wildfire events in Ware County and the City of Waycross.

Most of Ware County has a wildfire hazard score of 1. Scattered areas throughout the county have a score of 0. Much of the area surrounding the City of Waycross has a hazard score of 2. No areas have a score higher than 2. A map of wildfire hazard areas with critical facilities is shown in Appendix A. The Community Wildfire Protection Plan is included in Appendix C.

The Ware County and City of Waycross Fire Departments and the Georgia Forestry Commission, in their “Community Wildfire Protection Plan” (see Appendix C), have determined through hazard ratings that the following areas have a Low, Moderate or High level of probability concerning wildfire:

### **Ware County Assessment Ratings**

Boggy Bay (Moderate)  
Telmore (Moderate)  
Millwood Plantations (High)  
Southeastern (Moderate)  
Millwod (Moderate)  
Emerson Park (Moderate)  
Aycock Road (Moderate)  
Dixie Union (Moderate)  
Astoria Road (Extreme)

Waresboro (Moderate)  
Manor (Moderate)  
Josephine Park (Extreme)  
Musket Trail (Moderate)  
Jamestown Road (Moderate)  
Palmetto Place (Moderate)

As can be seen from the above information, there are several sources of information that have different determinations of wildfire risks although all place certain areas of Ware County and the City of Waycross within wildfire hazard areas.

### **C./D. Inventory of Assets Exposed and Potential Loss to Wildfire:**

From a fire management perspective, the Wildland-Urban Interface (WUI) is commonly defined as an area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. As fire is dependent on a certain set of conditions, the National Wildfire Coordinating Group has defined the wildland-urban interface as a set of conditions that exists in or near areas of wildland fuels, regardless of ownership. This set of conditions includes type of vegetation, building construction, accessibility, lot size, topography and other factors such as weather and humidity. When these conditions are present in certain combinations, they make some communities more vulnerable to wildfire damage than others. This “set of conditions” method is perhaps the best way to define wildland-urban interface areas when planning for wildfire prevention, mitigation, and protection activities.

There are three major categories of wildland-urban interface. Depending on the set of conditions present, any of these areas may be at risk from wildfire. A wildfire risk assessment can determine the level of risk. These three categories are:

- 1) “Boundary” Wildland-Urban Interface is characterized by areas of development where homes, especially new subdivision, press against the public and private wildlands, such as private or commercial forest land or public forests or parks. This is the classic type of wildland-urban interface, with a clearly defined boundary between the suburban fringe and the rural countryside.
- 2) “Intermix” Wildland-Urban Interface areas are places where improved property and/or structures are scattered and interspersed in wildland areas. These may be isolated rural homes or an area that is just beginning to go through the transition from rural to urban land use.
- 3) “Island” Wildland-Urban Interface, also called occluded interface, are areas of wildland within predominantly urban or suburban areas. As cities or subdivisions grow, islands of undeveloped land may remain, creating remnant forests. Sometimes these remnants exist as parks, or as land that cannot be developed due to site limitations, such as wetlands.

Approximately 43.3% of Critical Facilities are in a wildfire hazard area (i.e. an area with a wildfire hazard score of 1 or 2; no areas have higher scores in Ware County and Waycross). This 43.3% figure has been extrapolated as an estimate for all properties in the community. Therefore, it is estimated that 43.3% of Residential property (7,380 of 17,044) in Ware County (which

includes the Residential properties in the City of Waycross) may be affected, with a total value of \$353,242,173. Also, approximately 43.3% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (1,854 of 4,281) in Ware County (which includes those property types in the City of Waycross) may be affected, with a total value of \$561,832,126.

In addition, 74 of the Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in wildfire hazard areas. 54 Critical Facilities have a wildfire hazard score of 2, and 20 facilities have a wildfire hazard score of 1. The total value of critical facilities within a wildfire hazard area is \$ \$628,565,241.95, with a value of \$ \$501,403,489.95 in areas with a hazard score of 2 and \$ \$127,161,752.00 in areas with a hazard score of 1 (see table 2.3 below as well as the GMIS Critical Facilities Inventory Database Reports contained in Appendix F and maps contained in Appendix A).

Jurisdiction:	Wildfire Hazard Score 1	Wildfire Hazard Score 2	Totals:
City of Waycross – Number of Facilities:	1	35	36
Total Value:	\$20,910.00	\$370,380,154.95	<b>\$370,401,064.95</b>
Ware County – Number of Facilities:	19	19	38
Total Value:	\$127,140,842.00	\$131,023,335.00	<b>\$258,164,177.00</b>
Total – Number of Facilities:	20	54	74
<b>Total Value:</b>	<b>\$127,161,752.00</b>	<b>\$501,403,489.95</b>	<b>\$628,565,241.95</b>

Table 2.3: Critical Facilities by Wildfire Hazard Zone (data source: GMIS, Ware County, City of Waycross)

## E. Land Use and Development Trends Related to Wildfire:

Development continues to take place in Ware County and the City of Waycross, with a large amount of new construction taking place in areas bordered by pine tree production and other naturally growing trees. More and more people are making their homes in woodland settings in or near forest or in rural areas. These homeowners enjoy the beauty of the environment, but face the real danger of wildfires. This is not a new phenomenon, but has always been the case. The trend is for this is to continue.

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning

Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

Georgia law requires that a permit be issued for most types of outdoor burning. To request a permit, users can contact the local Georgia Forestry Commission or visit [www.gatrees.org](http://www.gatrees.org) to apply online. If conditions are favorable for burning, a permit will be granted. According to Georgia law, burning without a permit is a misdemeanor punishable by fines up to \$1,000.

#### **F. Multi-Jurisdictional Wildfire differences:**

Virtually all of Ware County and the City of Waycross may be affected by wildfire. Geographical differences are not so much dependent on jurisdiction, as on land use and fire district resources. The Ware County Fire Department is made up of 15 paid firefighters and 50 volunteers at 11 stations throughout the County. The City of Waycross Fire Department has 52 paid firefighters.

#### **G. General Overall HRV Summary of Wildfire Events And their Impact On The Community:**

Wildfire has the potential to cause damage in any wildfire-prone area, at any time, throughout Ware County and the City of Waycross. The cost of the damage and the potential loss of life may be higher if a wildfire occurs in the more densely populated areas. The effects could range from minimal damage to severe and widespread damage. Wildfires can occur at any time of the year.

The Ware County HMPUC recognized wildfire as the most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen wildfire impact on Ware County and the City of Waycross, which are contained in Chapter 4, Section I.

Ware County and the City of Waycross have completed a comprehensive mapping of the community's environmentally sensitive areas and performed a historic resource survey within the community. The County and City have completed their Community Wildfire Protection Plan, which contains goals and objectives to decrease the community's overall vulnerability to this hazard.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Section II. Drought**

### **A. Identification of Hazard:**

The threat of a drought has been chosen by the Ware County HMPUC as the second most likely hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine frequency of events. In addition, hazard maps generated by The GMIS Critical Facilities Inventory were examined.

What is known as drought is usually the result of several factors that come together to gradually increase dry conditions in the community until they reach a severe and extreme level. These factors could be related to weather patterns, lack of rainfall, wind conditions, lack of water from rivers and upstream areas, or other factors.

Although drought is usually associated with the summer months due to its more visible effects, it can occur at any time and its effects can last throughout the year and continue from year to year. These effects may range from agricultural losses, to increased wildfire and fire risk, to lack of water for citizens and firefighting, to increased flooding risk (because dry land can be less absorbent of rainfall), as well as other effects that influence other hazards and the safety of the community.

Crops (including trees) are usually most adversely affected by drought events, along with community residents whose water supplies are restricted or cut off (especially those using individual wells). Many residents of Ware County and the City of Waycross have shallow wells which often go dry during drought periods, thus leaving those residents without water for extended periods of time.

The ***Palmer Z Index*** measures short-term drought on a monthly scale. The ***Palmer Crop Moisture Index (CMI)*** measures short-term drought on a weekly scale and is used to quantify drought's impacts on agriculture during the growing season.

The ***Palmer Drought Severity Index (PDSI)*** (known operationally as the ***Palmer Drought Index (PDI)***) attempts to measure the duration and intensity of the long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns plus the cumulative patterns of previous months. Since weather patterns can change practically overnight from a long-term drought pattern to a long-term wet pattern, the PDSI (PDI) can respond fairly rapidly.

The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop and it takes longer to recover from them. The ***Palmer Hydrological Drought Index (PHDI)***, another long-term drought index, was developed to quantify these hydrological effects. The PHDI responds more slowly to changing conditions than the PDSI (PDI).



The U.S. Drought Monitor (<http://droughtmonitor.unl.edu>) is produced in partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration and has been used to determine some of information in this section.

The U.S. Drought Monitor utilizes a variety of sources, including the Palmer Index(s), to rate an area as D0 (Abnormally Dry), D1 (Moderate Drought), D2 (Severe Drought), D3 (Extreme Drought) and D4 (Exceptional Drought). Any area rated at D0 or above was considered to be in a drought for the purposes of this plan.

There have been cases in Ware County and the City of Waycross where some level of drought conditions have persisted for years in a row.

### **B. Profile of Drought Events, Frequency of Occurrences, Probability:**

The historic record for drought is spotty at best, especially prior to the year 2000, with many unreported or underreported drought events. All of Ware County and the City of Waycross are vulnerable to drought due its unpredictability and widespread coverage. The effects vary depending on the severity of the drought and the length of time that it has occurred. Members of the Ware County HMPUC have witnessed many unreported and underreported cases of drought events occurring within Ware County and the City of Waycross.

According to National Climatic Data Center information (see Appendix G), there was only one report of drought occurring in Ware County (including Waycross) between 01/01/1950 and 5/2/2017. However, the U.S. Drought Monitor (<http://droughtmonitor.unl.edu>) offers more complete data, reporting that some level of drought occurred in Ware County in the majority of years between 2000 and 2017. While most of these events were D0 (Abnormally Dry) and D1 (Moderate Drought), there were D4 events (Exceptional Drought) reported in 2011 and 2012, as well as many years with some instance of D3 events (Extreme Drought). D2 events (Severe Drought) have occurred in most years since 2000. Most recently, in May 2017, between 74 and 76 percent of Ware County was under D3 conditions, and in April 2017 100% of the County was under D1 conditions.

According to US Drought Monitor data, a total of 530 drought events (D0, D1, D2, D3, and D4) are recorded for the 2000–2017 timeframe (which includes the 1 event listed by the NCDC). The Historic Recurrence Interval is 0.03 years. This is a 3,312.5% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 33.7, the past 20-year frequency is 26.5, and the past 50-year frequency is 10.6. (However, it should be noted that no drought events are recorded prior to the year 2000 in the available data.) For further information, see Appendix A and Appendix F.

Since the previous Hazard Mitigation Plan was adopted, there have been an estimated 99 drought events in Ware County. 13 of these were D2 events, 23 were D1 events, and 63 were D0 events. None were D3 or D4 events. Drought has caused substantial crop loss in Ware County since the last Hazard Mitigation Plan was adopted.

### **C./D. Inventory of Assets Exposed and Potential Loss to Drought:**

The threat of a drought is a constant in Ware County and the City of Waycross due to the unpredictability and widespread coverage of the hazard. Drought events tend to be area-wide and will likely not be limited to certain areas of the community, although the effect on residents will depend on the infrastructure and services available (for example, the depth of wells).

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by drought. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

### **E. Land Use and Development Trends Related to Drought:**

The dry conditions caused by drought can be conducive to a further hazard covered in this Plan, namely wildfire. During periods of drought, the community must be on high alert for wildfire hazards. This hazard is exacerbated due to the fact that new construction in Ware County and the City of Waycross continues to take place in areas bordered by pine tree production and other naturally growing trees. These homeowners enjoy the beauty of the environment, but face the real danger of wildfires. This is not a new phenomenon, but has always been the case. The trend is for this to continue. For more specific information, see Chapter 2, Section I (Wildfire).

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

### **F. Multi-Jurisdictional Drought Differences:**

Due to the area-wide nature of drought events, all of Ware County and the City of Waycross are at equal risk. However, households in unincorporated Ware County are served by well water

while the City of Waycross operates its own water and sewer systems. Due to the capacity of the municipal water system, it is predicted that households in the City of Waycross will be better protected from drought-related water shortages than households in the unincorporated county, which must rely on their own local wells for water. Data regarding the depth of individual wells are not currently available.

#### **G. General Overall HRV Summary of Drought Events And their Impact On The Community:**

Drought has the potential to cause damage at any place, at any time, throughout Ware County and the City of Waycross. The cost of the damage may be higher if the drought occurs at certain critical times of the year that would exacerbate its impact on agricultural production or greatly increase the risk of wildfires.

The Ware County HMPUC recognizes drought as the second most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impact of drought on Ware County and the City of Waycross. These are contained in Chapter 4, Section II. Due to continued population growth, increased water usage has the potential to put a strain on the municipal water system and on public and private wells, which can become dry under drought conditions.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Section III. Thunderstorms and Wind**

### **A. Identification of Hazard:**

The threat of thunderstorms and wind has been chosen by the Ware County HMPUC as the third most likely hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F) as well as from local history and personal accounts, in order to determine frequency of events.

In addition, hazard maps generated by The GMIS Critical Facilities Inventory for wind (see Appendix A, Section III) were examined. The values on the map come from the predictive model of the GEMA database.

Thunderstorms and wind have the potential to be destructive and may occur at any time. Thunderstorms may develop quickly in Ware County and the City of Waycross due to inclement weather conditions, a passing front, or hurricane/tropical storm events. Wind events may occur on their own, due to inclement weather, as a result of a passing front, or as part of thunderstorm or hurricane/tropical storm events.

Thunderstorms are one of the most common weather products of our atmosphere and should not be underestimated. They can cause serious injury, substantial property damage, and even death. Dangers associated with thunderstorms include lightning, hail, heavy rain, flooding, and strong winds. Wind speeds in a thunderstorm can exceed 100 mph and can be as damaging as a tornado. Lightning associated with these events may be one of the leading causes of wildfire in Ware County. Lightning can also occur even if it is not raining.

### **NOAA Types of Thunderstorms:**

#### **THE SINGLE CELL STORM:**

Single cell thunderstorms usually last from 20 to 30 minutes. A true single cell storm is actually quite rare because often the gust front of one cell triggers the growth of another.

Most single cell storms are not usually severe. However, it is possible for a single cell storm to produce a brief severe weather event. When this happens, it is called a pulse severe storm. Their updrafts and downdrafts are slightly stronger, and typically produce hail that barely reaches severe limits and/or brief [microbursts](#) (a strong downdraft of air that hits the ground and spreads out). Brief heavy rainfall and occasionally a weak tornado are possible. Though pulse severe storms tend to form in more unstable environments than a non-severe single cell storm, they are usually poorly organized and seem to occur at random times and locations, making them difficult to forecast.

#### **THE MULTICELL CLUSTER STORM:**

The multicell cluster is the most common type of thunderstorm. The multicell cluster consists of a group of cells, moving along as one unit, with each cell in a different phase of the thunderstorm life cycle. Mature cells are usually found at the center of the cluster with dissipating cells at the downwind edge of the cluster.

Multicell Cluster storms can produce moderate size hail, flash floods and weak tornadoes.

Each cell in a multicell cluster lasts only about 20 minutes; the multicell cluster itself may persist for several hours. This type of storm is usually more intense than a single cell storm, but is much weaker than a supercell storm.

#### THE MULTICELL LINE STORM (SQUALL LINE):

The multicell line storm, or squall line, consists of a long line of storms with a continuous well-developed gust front at the leading edge of the line. The line of storms can be solid, or there can be gaps and breaks in the line.

Squall lines can produce hail up to golf-ball size, heavy rainfall, and weak tornadoes, but they are best known as the producers of strong downdrafts. Occasionally, a strong [downburst](#) will accelerate a portion of the squall line ahead of the rest of the line. This produces what is called a [bow echo](#). Bow echoes can develop with isolated cells as well as squall lines. Bow echoes are easily detected on radar but are difficult to observe visually.

#### THE SUPERCELL STORM:

The supercell is a highly organized thunderstorm. Supercells are rare, but pose a high threat to life and property. A supercell is similar to the single-cell storm because they both have one main updraft. The difference in the updraft of a supercell is that the updraft is extremely strong, reaching estimated speeds of 150-175 miles per hour. The main characteristic which sets the supercell apart from the other thunderstorm types is the presence of rotation. The rotating updraft of a supercell (called a [mesocyclone](#) when visible on radar) helps the supercell to produce extreme severe weather events, such as giant hail (more than 2 inches in diameter, strong downbursts of 80 miles an hour or more, and strong to violent tornadoes.

The surrounding environment is a big factor in the organization of a supercell. Winds are coming from different directions to cause the rotation. And, as precipitation is produced in the updraft, the strong upper-level winds blow the precipitation downwind. Hardly any precipitation falls back down through the updraft, so the storm can survive for long periods of time.

The leading edge of the precipitation from a supercell is usually light rain. Heavier rain falls closer to the updraft with torrential rain and/or large hail immediately north and east of the main updraft. The area near the main updraft (typically towards the rear of the storm) is the preferred area for severe weather formation.

Most thunderstorm and wind events in Ware County and the City of Waycross are relatively minimal, typically lasting about 30 minutes. However, there is also the possibility of longer-

duration thunderstorms and wind events associated with hurricane/tropical storm events or passing fronts. Thunderstorms and wind events can occur at any time, but are most likely to occur in the afternoon and evening hours in the spring and summer.

**B. Profile of Thunderstorm and Wind Events, Frequency of Occurrences, Probability:**

The historic record for thunderstorms and wind is spotty at best, with many unreported or underreported events. All of Ware County and the City of Waycross are vulnerable to thunderstorms and wind due to their unpredictability and random occurrences, but the effects, if any, are usually minimal.

Members of the Ware County HMPUC have witnessed many unreported and underreported cases of minimal to severe thunderstorm and wind events occurring within Ware County and the City of Waycross.

## Beaufort Wind Scale

### Developed in 1805 by Sir Francis Beaufort of England

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Source: NOAA

According to National Climatic Data Center information (NCDC), there were 165 thunderstorm/wind events reported in Ware County between Jan 1, 1950 and Dec. 31, 2016. 1 injury was reported. Total property damage was reported as \$2,747,000. The events involved wind speeds between 45 and 67 knots. The Historic Recurrence Interval is 0.40 years. This is a 250.00% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 6.7, the past 20-year frequency is 6.6, and the past 50-year frequency is 3.3 (see GEMA PDM Hazard Frequencies Table contained in Appendix D, Section III).

Since the previous Hazard Mitigation Plan was completed, 16 thunderstorm/wind events have occurred in Ware County and the City of Waycross. During one recent event on Feb. 15, 2017, with average winds in excess of 50 mph, portions of the Ware County Middle School auditorium roof were torn off, a fence was blown down by the wind, and tennis courts and dugouts were damaged at the Middle School. Damage was estimated at \$200,000. Fortunately, there were no injuries.

All of Ware County has the same design wind speed of 200 miles per hour for a 3-second gust, as determined by the American Society of Civil Engineers (ASCE). In addition, Ware County is in a special Hurricane Susceptible Region (see Appendix A).

According to [www.gema.ga.gov](http://www.gema.ga.gov), the MEOW (Maximum Envelope of Wind) for a Georgia Coast Landfall for Ware County ranges from 39-57 mph in the county (for a Category 1 hurricane with sustained winds of 75 mph and forward speed of 9 mph) to 109-126 mph in the eastern 1/3 of the county and 92-108 mph in the western 2/3 of the county (for a Category 4 hurricane with sustained winds of 144 mph and forward speed of 25 mph).

100% of Ware County and the City of Waycross are included in some wind hazard area. As shown on the wind hazard map (see Appendix A, Section III), most of Ware County is within the 90-99 mph wind speed area, while some areas in the eastern part of the county (including a substantial portion of the City of Waycross) are within the 100-109 mph wind speed area. These wind speed areas correspond to basic wind speeds for a 3-second gust with a 50-year return interval, contained in the 2012 International Building Code.

#### **C./D. Inventory of Assets Exposed and Potential Loss to Thunderstorms and Wind:**

The threat of thunderstorms and wind is a constant in Ware County and the City of Waycross due to the unpredictability and random occurrence of the hazard. When and where they will occur and the potential damage that they will cause is not easy to predict.

In GEMA Worksheet 3A: Inventory of Assets (appearing in Appendix A Section III), we estimate that all of Ware County and the City of Waycross are vulnerable to thunderstorms and wind. Property values were provided by the Ware County Tax Assessor's Office using the most recent data available.

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be



affected by thunderstorms and wind. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

#### **E. Land Use and Development Trends Related to Thunderstorms and Wind:**

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **F. Multi-Jurisdictional Thunderstorm and Wind Differences:**

All of Ware County and the City of Waycross may be equally affected by thunderstorms and wind. No differences between the two jurisdictions in this regard have been determined.

#### **G. Overall HRV Summary of Thunderstorm/Wind Events And their Impact On The Community:**

Thunderstorms and wind have the potential to cause damage at any place, at any time, throughout Ware County and the City of Waycross. Of course, the cost of the damage and potential loss of life may be higher if thunderstorms and wind occur in populated areas and municipalities, as opposed to if they were to occur in more rural sections of Ware County. A majority of the thunderstorms and wind that pass through the area, however, cause minimal to no damage.

The Ware County HMPUC recognizes thunderstorms and wind as the third most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen thunderstorm and wind impact on Ware County and the City of Waycross. These are contained in Chapter 4, Section III.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Section IV. Flood**

### **A. Identification of Hazard:**

The threat of a flood has been chosen by the Ware County HMPUC as the fourth most likely hazard to occur and cause damage in Ware County and the City of Waycross based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine frequency of events. For further information, see the HAZUS Report in Appendix G.

In addition, hazard maps generated by the GMIS Critical Facilities Inventory for Flood (see Appendix A) were examined. Complete inventory information is contained at <https://www.itos.uga.edu/gema>. These map values come from the predicted model of the GEMA database.

Floods may occur at any time, in many cases without warning, and may cause widespread destruction. Drainage ditches and canals that are improperly cleaned or maintained may exacerbate flooding, causing homeowners to experience hours, if not days, of water-filled yards as well as water damage.

There are several different kinds of floods, three of which can occur in Georgia: River floods, coastal floods, and urban floods. most flash floods are caused by rain from slow moving thunderstorms, storms repeatedly moving over the same area, or heavy rains from hurricane/tropical storm events.

Flash floods are the number one weather-related killer in the United States, and flooding accounts for the majority of natural hazard damages. Six inches of fast moving water can knock a person off of his or her feet. Two feet of water can float a full-sized automobile. More than half of flood victims are in vehicles that moving water sweeps away.

Ware County and the City of Waycross are both members of the National Flood Insurance Program. Both local governments have some part of their jurisdictions located within a floodplain. As of 2017, both jurisdictions are in compliance with NFIP requirements. Both jurisdictions intend to remain in compliance by enforcing flood plain ordinances (for example: City of Waycross Code of Ordinances Sec. 105-23; City of Waycross Zoning Ordinance Section 712, Flood Damage Prevention District) which prohibit or severely limit development in floodplains.

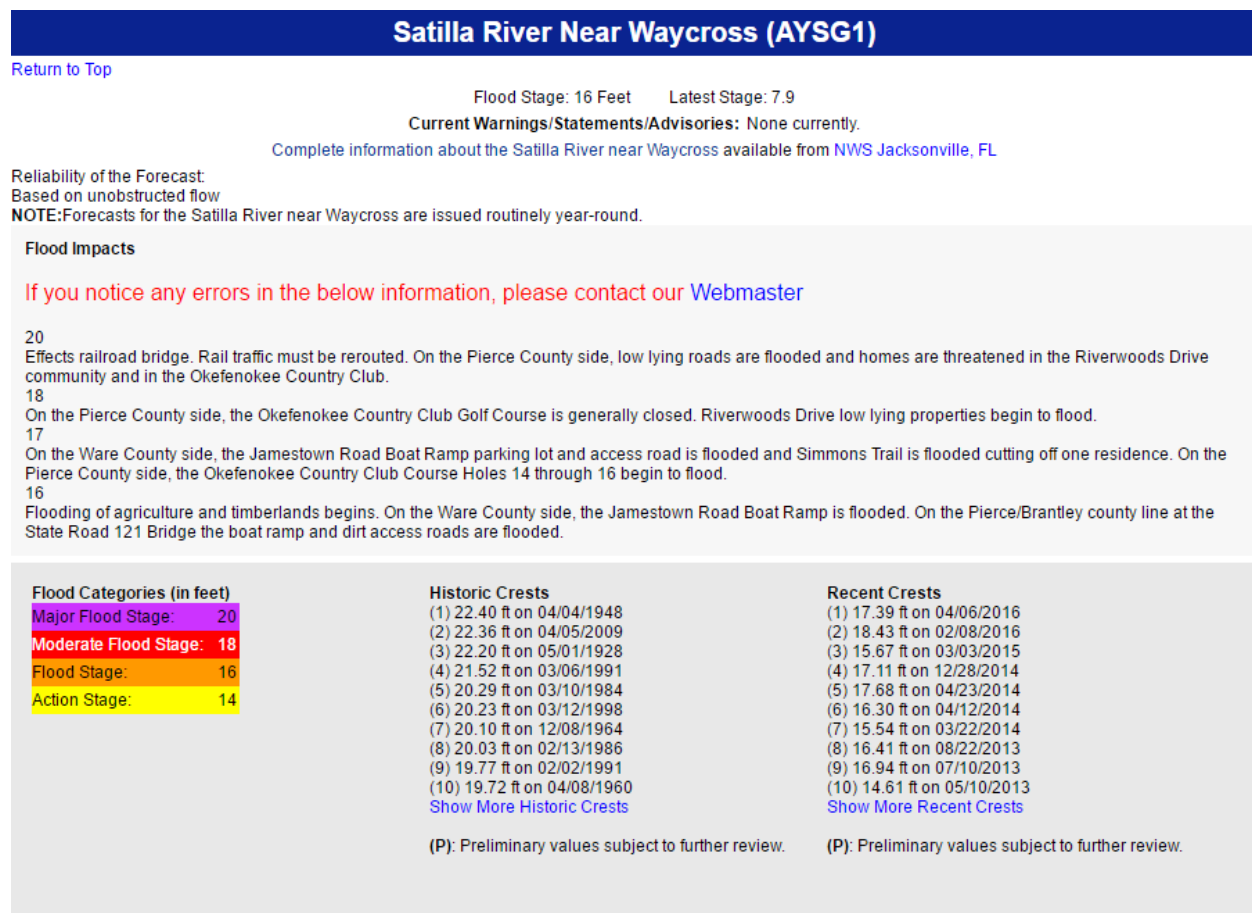
Ware County and the City of Waycross do not participate in the Community Rating System (CRS) program. As of 2017, they were not eligible, according to FEMA (<http://www.fema.gov/library/viewRecord.do?id=3629>).

### **B. Profile of Flood Events, Frequency of Occurrences, Probability:**

The historic record for floods is spotty at best, with many unreported or underreported flood events. Members of the Ware County HMPUC have witnessed many unreported and underreported cases of minor to major flooding occurring within Ware County and the City of Waycross, some lasting for days at a time, following large rain events. However, only certain areas of Ware County and the City of Waycross are usually vulnerable to major flooding.

Many of these major flooding areas are located on or adjacent to the Satilla River and numerous other creeks and streams. Several areas of Ware County and the City of Waycross are subject to flooding, especially in areas around drainage canals and areas where improved stormwater infrastructure is needed. Flooding regularly occurs in certain areas due to rainfall and other factors.

Base flood elevations are provided by FEMA in their floodplain maps. Within Ware County, the base flood elevations range between 141 feet above sea level and 149 feet above sea level. The chart below, generated on the NOAA website (water.weather.gov), shows Flood Stages and Historic Crests for the Satilla River near Waycross. The historical crests show the highest crest of 22.40 feet in 1948.



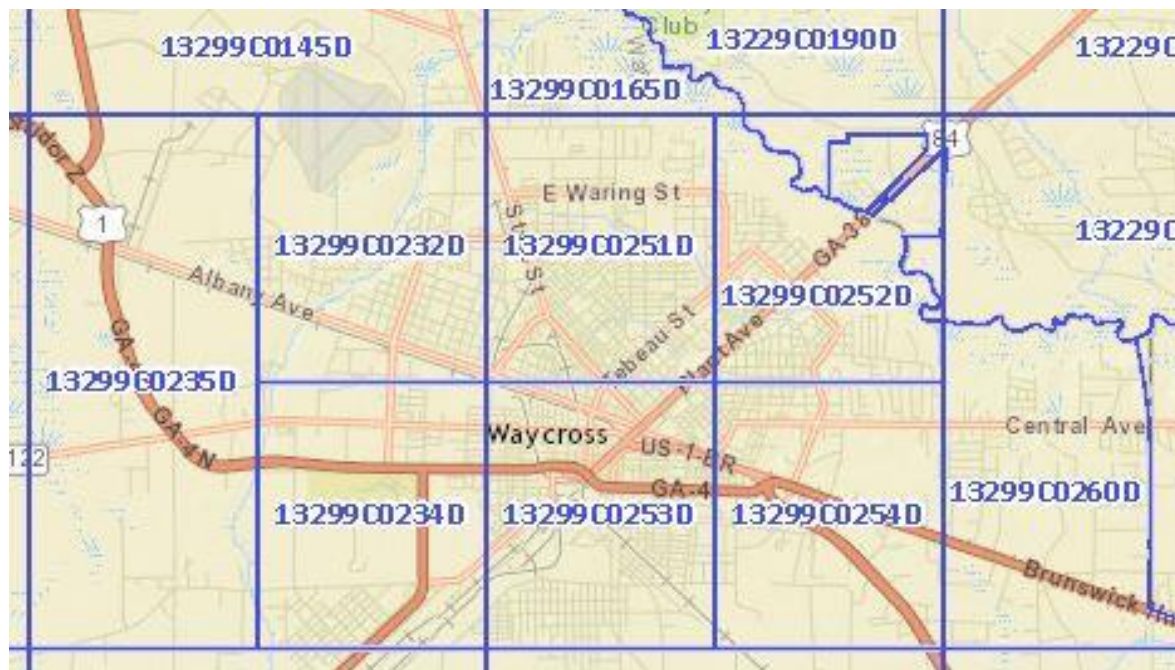
According to the National Climatic Data Center (NCDC), there are 19 flood events reported (including Flash Flood and Heavy Rain) occurring in Ware County between Jan 1, 1950 and Dec. 31, 2016. Five of these events were Flood events, five were Flash Flood events, and nine

were Heavy Rain events. The estimated total property damage from these events was \$140,000. Total injuries were reported as zero.

The Historic Recurrence Interval is 3.47 years. This is a 28.79% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.3, the past 20-year frequency is 0.95, and the past 50-year frequency is 0.38 (see GEMA PDM Hazard Frequencies Table contained in Appendix D, Section I).

Since the previous Hazard Mitigation Plan was completed, two flood events have occurred in Ware County and the City of Waycross. One recent flood event, on Feb. 20<sup>th</sup>, 2017, was caused by heavy rains, with up to 6 inches of rain and localized flooding that temporarily made some streets impassable. Some power outages were reported.

Flood Insurance Rate Maps (FIRMs) in effect for Ware County and the City of Waycross include maps 13299C0050D, 13299C0075D, 13299C0105D, 13299C0110D, 13299C0130D, 13299C0095D, 13299C0115D, 13299C0120D, 13299C0140D, 13299C0145D, 13299C0200D, 13299C0225D, 13299C0210D, 13299C0230D, 13299C0235D, 13299C0232D, 13299C0234D, 13299C0251D, 13299C0253D, 13299C0252D, 13299C0254D, 13299C0260D, 13299C0240D, 13299C0245D, 13299C0265D, 13299C0270D, 13299C0350D, 13299C0375D, 13299C0400D, 13299C0425D, 13299C0475D, 13299C0500D, 13299C0525D, 13299C0550D, 13299C0575D, 13299C0600D, 13299C0625D, 13299C0635D, and 13299C06745D (see index map below).



Flood Insurance Rate Maps for the City of Waycross and surrounding area. Data Source: FEMA website.



Flood Insurance Rate Maps for Ware County and the City of Waycross. Data Source: FEMA website.

The GMIS Critical Facilities Inventory Database Reports contained in Appendix F show that certain areas of Ware County and the City of Waycross fall within the Flood Hazard Area. Complete inventory information is contained at <https://www.itos.uga.edu/gema>. There does not appear to be enough data information at the present time to determine differences in flood hazard level between Ware County and the City of Waycross hazards and/or risks.

#### **C./D. Inventory of Assets Exposed and Potential Loss to Flood:**

When and where floods will occur and the potential damage that they will cause cannot be predicted with any high level of confidence due to the variation in the strength levels of the causes that may trigger the occurrence. To determine what assets in Ware County and the City of Waycross are potentially exposed to flooding, a GIS analysis was conducted using FEMA flood zone data, tax roll data from the Ware County Tax Assessor's Office, and Critical Facilities data housed in the GMIS database (corresponding to the Critical Facilities Inventory which is provided in Appendix F). Approximately 53.2 percent of Ware County's total area is within a flood zone, and approximately 17.9 percent of the City of Waycross is within a flood zone. Much of Ware County's flood-prone areas are within the Okefenokee Swamp and are not populated. However, flooding has been and continues to be a persistent problem within the City of Waycross and other populated areas of Ware County. In some neighborhoods, due to drainage issues and other factors, any significant amount of rainfall brings about some degree of flooding.

Approximately 13.1% of the Residential property (2,235 of 17,044) in Ware County (including the City of Waycross) lies within a flood zone and therefore may be affected, with a total value of \$90,147,068. Approximately 35.9% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (1,537 of 4,281) in Ware County (including the City of Waycross) may be affected, with a total value of \$694,951,565. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, 12 of the Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in a Flood Hazard Area (11 with a Hazard Score of 3, one with a Hazard Score of 2), with a total value of \$46,031,443 and a content values of \$4,244,921 (see GMIS Critical Facilities Inventory Database Reports contained in Appendix F and maps contained in Appendix A).

Many individuals do not have access to transportation and thus are susceptible to weather hazards. It is very important to notify these individuals through weather radios, radio stations, and other means so that they may seek shelter and/or make arrangements for transportation to shelter facilities. Therefore, a major consideration should be helping individuals, government, and non-profit organizations prepare for the pending flood hazard events.

The GMIS report lists 3 Repetitive Loss Properties in the community. One is in Ware County and two are in the City of Waycross. All three are residential properties.

#### **E. Land Use and Development Trends Related to Floods:**

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

The river corridors are protected through zoning in the 100-year floodplain and up to 25 feet from the rested edge of the river. Wetland areas are protected by Corps of Engineers permitting requirements. Soil and Sedimentation Control Ordinances are in effect.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **F. Multi-Jurisdictional Flood Differences:**

Both local governments have some part of their jurisdiction located within a floodplain. As mentioned above, according to GIS analysis conducted by SGRC Staff, Approximately 53.2 percent of Ware County's total area is within a flood zone, and approximately 17.9 percent of the City of Waycross is within a flood zone. No other differences between the two jurisdictions in this regard have been determined.

#### **G. General Overall HRV Summary of Flood Events And their Impact On the Community:**

Floods have the potential to cause damage in any flood-prone area, at any time throughout Ware County and the City of Waycross. Of course, the cost of the damage and potential loss of life may be higher if the Flood were to occur in more densely populated areas. Damage caused by flooding can vary depending on the amount of flooding and severity, among other factors.

The Ware County HMPUC recognizes Floods as the fourth most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen Floods impact on Ware County and the City of Waycross. These are contained in Chapter 4, Section IV.

Ware County and the City of Waycross have completed a comprehensive mapping of the community's environmentally sensitive areas and performed a historic resource survey within the community.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## Section V. Extreme Heat

**A. Identification of Hazard:** The threat of Extreme Heat has been chosen by the Ware County HMPUC as the fifth most likely natural hazard to occur and cause damage in Ware County and in the City of Waycross, based on past experience, the FEMA described methodology, and other factors. Historic data have been examined from various sources (see Appendix A, Section V) including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine frequency of events. In addition, hazard maps generated by the GMIS Critical Facilities Inventory were examined.

The major hazard presented by heat waves is not so much to infrastructure as to the population. Despite the comparatively warm climate of Ware County and the City of Waycross, there are many residents who are not adequately prepared to handle extreme heat events (for example, those without air conditioning in their homes). The risk is particularly high for the elderly and the young. Extreme heat is a hazard that may result in loss of life or damage to property and the economy. Due to weather forecasting methods, most extreme heat events can be predicted with some level of accuracy ahead of time.

The table below shows the average high and low temperatures and record temperatures for Ware County and the City of Waycross. During June, July, and August, average daily high temperatures are in excess of 90° F. The record high temperature is 108° F.

Climate data for Waycross 4NE (1981-2010) extremes 1897–present													[hide]
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	88 (31)	88 (31)	95 (35)	98 (37)	104 (40)	106 (41)	108 (42)	106 (41)	104 (40)	99 (37)	92 (33)	87 (31)	108 (42)
Average high °F (°C)	62.2 (16.8)	65.9 (18.8)	72.9 (22.7)	79.2 (26.2)	86.4 (30.2)	90.9 (32.7)	92.9 (33.8)	91.2 (32.9)	87.3 (30.7)	79.7 (26.5)	72.7 (22.6)	64.0 (17.8)	78.8 (26)
Daily mean °F (°C)	48.9 (9.4)	52.5 (11.4)	58.9 (14.9)	64.7 (18.2)	72.8 (22.7)	79.3 (26.3)	81.8 (27.7)	80.8 (27.1)	76.2 (24.6)	66.9 (19.4)	58.9 (14.9)	50.8 (10.4)	66.0 (18.9)
Average low °F (°C)	35.7 (2.1)	39.0 (3.9)	44.9 (7.2)	50.2 (10.1)	59.1 (15.1)	67.7 (19.8)	70.8 (21.6)	70.4 (21.3)	65.0 (18.3)	54.1 (12.3)	45.2 (7.3)	37.6 (3.1)	53.3 (11.8)
Record low °F (°C)	2 (−17)	2 (−17)	15 (−9)	22 (−6)	33 (1)	43 (6)	54 (12)	57 (14)	34 (1)	22 (−6)	18 (−8)	8 (−13)	2 (−17)
Average precipitation inches (mm)	4.34 (110.2)	3.89 (98.8)	4.49 (114)	2.89 (73.4)	2.80 (71.1)	6.51 (165.4)	5.91 (150.1)	6.39 (162.3)	4.16 (105.7)	3.25 (82.6)	2.46 (62.5)	2.96 (75.2)	50.05 (1,271.3)
Average precipitation days (≥ 0.01 in)	9.0	8.0	8.0	6.0	7.0	11.0	12.0	12.0	8.0	6.0	7.0	8.0	102

Source: NOAA online weather data - <http://w2.weather.gov/climate/xmacis.php?wfo=jax>

### HEAT INDEX:

The table below shows the heat index as calculated by the National Weather Service. It is based on temperature and humidity.



### Heat Index category and effects

<b>Category</b>	<b>Heat Index</b>	<b><i>Possible heat disorders for people in high risk groups</i></b>
Extreme Danger	130° F or higher	Heat stroke or sunstroke likely.
Danger	105 - 129° F	Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	90 - 105° F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80 - 90° F	Fatigue possible with prolonged exposure and/or physical activity.

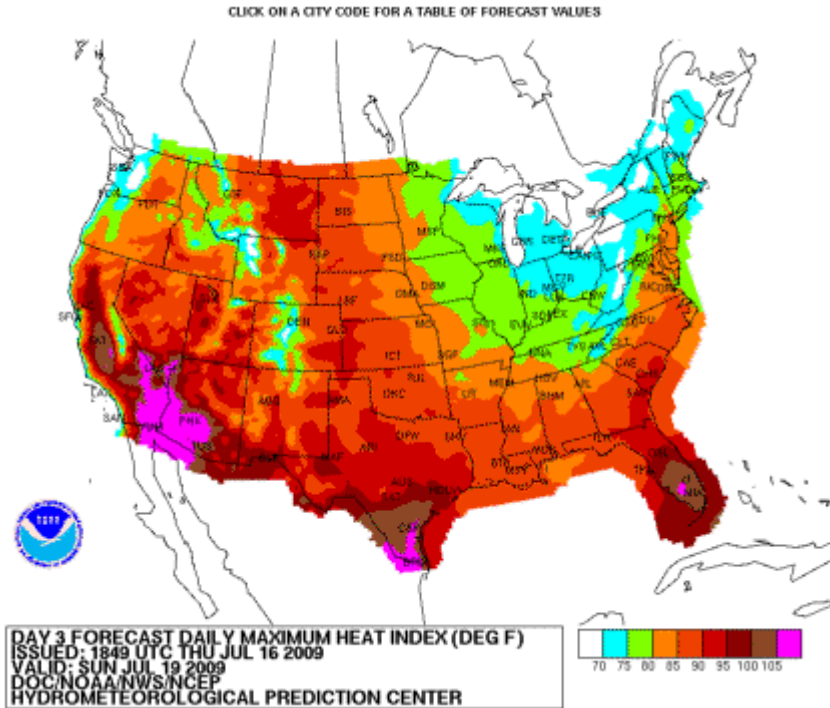
### **NOAA's Watch, Warning, and Advisory Products for Extreme Heat**

Each [National Weather Service Forecast Office](#) issues the following heat-related products as conditions warrant:

**Excessive Heat Outlooks:** Issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead time to prepare for the event, such as public utility staff, emergency managers, and public health officials. See the mean heat index and probability forecasts maps.

**Excessive Heat Watches:** Issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain. A Watch provides enough lead time so that those who need to prepare can do so, such as cities officials who have excessive heat event mitigation plans.

**Excessive Heat Warning/Advisories:** Issued when an excessive heat event is expected in the next 36 hours. These products are issued when an excessive heat event is occurring, is imminent, or has a very high probability of occurring. The warning is used for conditions posing a threat to life or property. An advisory is for less serious conditions that cause significant discomfort or inconvenience and, if caution is not taken, could lead to a threat to life and/or property.

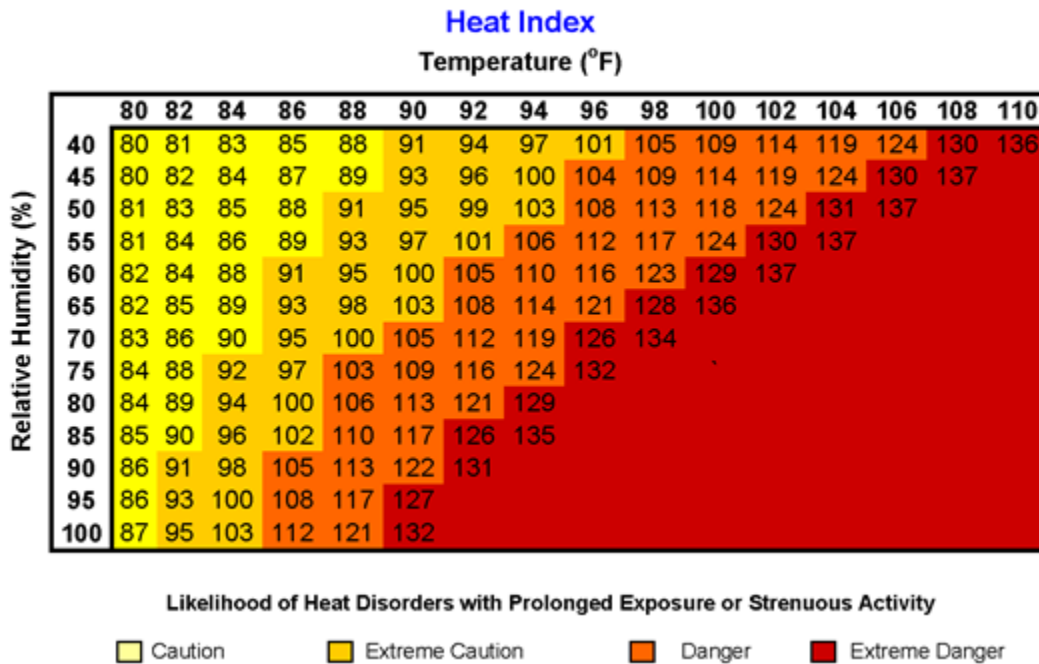


### **How Forecasters Decide Whether to Issue Excessive Heat Products**

NOAA's heat alert procedures are based mainly on Heat Index Values. The Heat Index, sometimes referred to as the apparent temperature, is given in degrees Fahrenheit. The Heat Index is a measure of how hot it really feels when relative humidity is factored with the actual air temperature.

The Heat Index chart below shows Heat Index Values for various temperatures and humidity levels. As an example, if the air temperature is 96° F and the relative humidity is 65%, the heat index—i.e., how hot it feels—is 121° F. The Weather Service will initiate alert procedures when the Heat Index is expected to exceed 105°-110° F (depending on local climate) for at least 2 consecutive days.

## NOAA's National Weather Service



**Figure 1. Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity**

**IMPORTANT:** Since heat index values were devised for shady, light wind conditions, **exposure to full sunshine can increase heat index values by up to 15° F.** Also, **strong winds**, particularly with very hot, dry air, can be extremely hazardous.

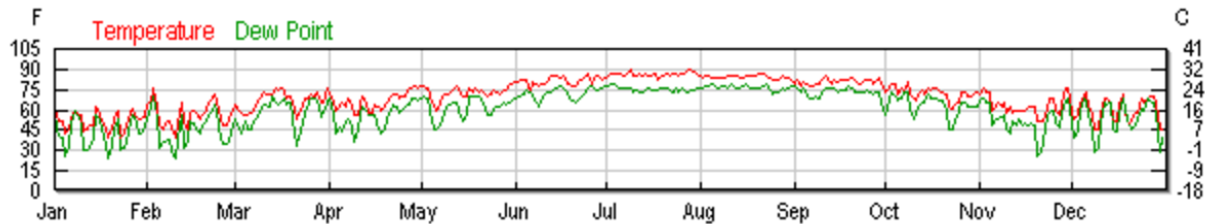
### **B. Profile of Extreme Heat Events, Frequency of Occurrences, Probability:**

The historic record for extreme heat is spotty at best, with many unreported or underreported events. All of Ware County and the City of Waycross are equally vulnerable to extreme heat, although more severe effects are likely to be seen in densely populated areas. Extreme heat can occur at any time during the warmer months of the year. Most extreme heat events can be predicted somewhat in advance.

The Heat Index in relation to the number of Heat Disorders during extreme heat events is unknown. Extreme heat events, however, can significantly increase certain other listed hazards including wildfire and drought.

Extreme Heat events are defined in this Hazard Mitigation Plan as those events where the heat index falls within the “Danger” or “Extreme Danger” zone as defined by the National Weather Service (see Figure 1). While historical heat index data are not available for Ware County and the City of Waycross, historical temperature data are available. According to information provided by Weather Underground ([www.wunderground.com](http://www.wunderground.com)), the average humidity level throughout the year 2016 in Ware County was 76.28%. Assuming this average humidity level, Extreme Heat events are therefore defined as any days with temperatures of 88° F or higher (according to Figure 1, 88° F at 75 percent humidity = 103° heat index).

The chart below (source: Weather Underground website) shows the temperatures measured in Ware County during 2016. 139 days with maximum temperatures of 88° F or higher (and therefore potentially dangerous levels of heat) occurred in 2016. The highest daily maximum temperature in 2016 was 102° F, recorded on 3 consecutive days, July 28, 29, and 30. These temperatures affected all of Ware County and the City of Waycross.



By this definition, according to Weather Underground data, there have been 4,294 Extreme Heat events between Feb. 1, 1979 and May 22, 2017 (the date range for which data are available). The Historic Recurrence Interval is 0.01 years. The Historic Frequency Chance is 11,300% per year. The past 10-year Record Frequency Per Year is 206.4, the past 20-year frequency is 129.5, and the past 50-year frequency is 85.88. (Note: NCDC data are not used for this section since the NCDC reports zero Extreme Heat events between 1/1/1950 and 12/31/2016.)

Since the previous Hazard Mitigation Plan was completed, there have been an estimated 696 Extreme Heat events in Ware County and the City of Waycross (again according to Weather Underground data and using the criteria described above).

### **C. Inventory of Assets Exposed to Extreme Heat & Estimate of Potential Loses:**

The threat of extreme heat in Ware County and the City of Waycross would primarily occur in the summer months, usually with some advance warning being possible.

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by extreme heat. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

Typically, the damage caused by extreme heat events consists of illness and injury to people (for example, heat stroke and sunstroke), rather than damage to buildings and infrastructure. However,

extreme heat can increase the risk of wildfires (see Chapter 2, Section I and Chapter 4, Section I for more information).

#### **D. Land Use and Development Trends Related to Extreme Heat:**

The dry conditions caused by extreme heat can be conducive to a further hazard covered in this Plan, namely wildfire. During periods of extreme heat, the community must be on high alert for wildfire hazards. This hazard is exacerbated due to the fact that new construction in Ware County and the City of Waycross continues to take place in areas bordered by pine tree production and other naturally growing trees. These homeowners enjoy the beauty of the environment, but face the real danger of wildfires. The trend is for this is to continue. For more specific information, see Chapter 2, Section I (Wildfire).

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **E. Multi-Jurisdictional Extreme Heat Differences:**

All of Ware County and the City of Waycross may be equally affected by extreme heat. No differences between the two jurisdictions in this regard have been determined. However, some densely populated areas in the City of Waycross may contain older buildings with unreliable air conditioning or no air conditioning. Higher numbers of residents in such areas could be adversely affected by extreme heat.

#### **F. General Overall HRV Summary of Extreme Heats Events and Their Impact On the Community:**

Extreme heat has the potential to cause damage at any place, at any time, throughout Ware County and the City of Waycross. The cost of the damage may be higher if an extreme heat event is accompanied by a power failure, preventing air conditioning systems from functioning.

The Ware County HMPUC recognizes extreme heat as the fifth most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impact of extreme heat on Ware County and the City of Waycross. These are contained in Chapter 4, Section V.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Section VI. Tornado**

### **A. Identification of Hazard:**

The threat of a tornado has been chosen by the Ware County HMPUC as the sixth most likely hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events. For further information, see the HAZUS Report in Appendix G.

A tornado is a violently rotating column of air extending to the ground. Tornadoes are one of nature's most destructive forces. Tornadoes can generate wind speeds of up to 318 miles per hour. A tornado's damage path can be more than a mile wide and fifty miles in length.

**ENHANCED FUJITA WIND DAMAGE SCALE**

<b>Number</b>	<b>Wind Speed</b>	<b>Damage</b>
EF-0	65 To 85 mph	Light damage. Some damage chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF-1	86 mph to 110 mph	Moderate Damage., The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF-2	111 mph to 135 mph	Significant Damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; high rise windows broken and blown in; light-object missiles generated.
EF-3	136 mph to 165 mph	Severe Damage. Roofs and walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF-4	166 mph to 200 mph	Devastating, damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
EF-5	Above 200 mph	Incredible, damage. Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 m (109 yards); trees debarked; steel reinforced concrete structures badly damaged.

Tornadoes may occur at any time of year and may develop quickly. Tornadoes can occur due to inclement weather conditions, as a result of a passing front, or as part of thunderstorm or hurricane/tropical storm events. Tornado season in Georgia is typically from March through August. Tornadoes are most likely to occur between 3:00 p.m. and 9:00 p.m. Hurricane/tropical cyclone season (June 1 to November 30th) is another time during which tornadoes are more likely to occur. The path and severity of a tornado cannot be determined in advance. The best defense is to heed tornado warnings and seek appropriate shelter when a tornado has been sighted in the area or when conditions conducive to a tornado are present.

## B. Profile of Tornado Events, Frequency of Occurrences, Probability:

The historic record for tornadoes is spotty at best, with many unreported or underreported tornado events. All of Ware County and the City of Waycross are vulnerable to tornadoes due to their unpredictability and random occurrences. The effects of this hazard are usually substantial and occur with little to no warning. Members of the Ware County HMPUC have witnessed many unreported and underreported cases of tornado events occurring within Ware County and the City of Waycross.

According to National Climatic Data Center information (see Appendix F), there are 14 reports of tornadoes occurring in Ware County (including the City of Waycross) between 01/01/1950 and 12/31/2016. The total cost of damage reported from these 14 events was \$3,606,000, with 18 injuries reported. Four were F0, four were F1, one was F2, one was F3, one was EF0, and two were EF1. A recent tornado event, in the community of Millwood on April 1, 2016, involved an EF-1 tornado with a path 2.6 miles long and 0.45 miles wide, with estimated peak winds of 100 mph. This tornado destroyed several structures such as a travel trailer and farm outbuildings, and took the roof off a trailer home. It also caused major trees to fall, and resulted in power outages, downed power lines, and debris on roads. Injuries to livestock and disappearance of pets was reported. The tornado track is shown below (source: National Weather Service website).



The Historic Recurrence Interval for tornadoes is 4.71 years. This is a 21.21% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.4, the past 20-year



frequency is 0.2, and the 50-year frequency is 0.28 (See GEMA PDM Hazard Frequencies Table contained in Appendix D, Section I).

Since the previous Hazard Mitigation Plan was completed, one tornado event has occurred in Ware County and the City of Waycross. This was an EF-1 tornado on 4/1/2016.

#### **C./D.: Inventory of Assets Exposed and Potential Loss to Tornadoes:**

The threat of tornadoes is a constant in Ware County and the City of Waycross due to their unpredictability and random occurrence. In GEMA Worksheet 3A: Inventory of Assets, appearing in Appendix A, Section VI, we estimate that all of Ware County and the City of Waycross are equally vulnerable to tornadoes.

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by tornadoes. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

#### **E. Land Use and Development Trends Related to Tornadoes**

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **F. Multi-Jurisdictional Tornado Differences:**

All of Ware County and the City of Waycross may be equally affected by tornadoes. No differences in hazard level between the two jurisdictions have been identified. However, due to the higher population density within the City of Waycross, a direct hit from a powerful tornado

in that area would likely cause more damage and casualties than in the less populous areas of unincorporated Ware County.

#### **G. General Overall HRV Summary of Tornado Events And their Impact On The Community:**

Tornadoes have the potential to cause damage at any place, at any time, throughout Ware County and the City of Waycross. The cost of the damage and potential loss of life may be higher if the tornado occurs in a more densely populated areas as opposed to a sparsely populated or unpopulated area. Most tornadoes do cause substantial damage.

The Ware County HMPUC recognizes tornadoes as the sixth most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impact of tornadoes on Ware County and the City of Waycross. These are contained in Chapter 4, Section VI.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Section VII. Hail**

### **A. Identification of Hazard:**

The threat of hail has been chosen by the Ware County HMPUC as the seventh most likely hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events.

Hail is precipitation in the form of lumps of ice that form in some storms. They are usually round and vary from the size of a grain of millet all the way up to grapefruit size. Hailstones generally form in thunderstorms between currents of rising air called the updraft and the current of air descending toward the ground called the downdraft. Large hailstones indicate strong updrafts in storms. The larger the hail, the stronger the updraft needed to hold it aloft in the storm.

In storms that cause tornadoes, hail often falls directly to the northeast or east of the path of the tornado. The strong updraft is associated with the part of the storm that produces the tornado. Fortunately, hail very rarely kills anyone. However, a couple of dozen people are injured by hailstones each year. The best way to keep safe during a hailstorm is to seek shelter immediately.

Hailstorms cause an enormous amount of damage to property and crops across the U.S. every year. In just two years (1993 and 1994), hail caused over \$500 million in damages. In May 1995, a severe thunderstorm struck the Dallas/Fort Worth metro area, causing between 1 and 2 billion dollars' worth of damage, much of it due to hail and flooding.

Individual hail events, although they can be destructive, tend to be relatively short in duration. They can occur at any time of year, but are more likely to occur during tornado season in Georgia, which is typically from March through August, or during hurricane/tropical storm season, which is typically June 1 through November 30.

### **B. Profile of Hail Events, Frequency of Occurrences, Probability:**

The historic record for hail is spotty at best, with many unreported or underreported hail events. All of Ware County and the City of Waycross are vulnerable to hail due to its unpredictability and random occurrence, but the damage effects, if any, vary with the storm. Members of the Ware County HMPUC have witnessed many unreported and underreported hail events occurring in Ware County and the City of Waycross.

According to National Climatic Data Center information (see Appendix F), there were 47 reports of hail occurring in Ware County (including the City of Waycross) between 01/01/1950 and 12/31/2016. Total injuries were reported as zero. Damage estimates were reported as zero. Hail sizes ranged between 0.75 and 1.75 inches. The Historic Recurrence Interval is 1.40 years. This is a 71.21% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 1.5, the past 20-year frequency is 2.1, and the past 50-year

frequency is 0.94 (See GEMA PDM Hazard Frequencies Table contained in Appendix D, Section I).

Since the previous Hazard Mitigation Plan was completed, two hail events have occurred in Ware County and the City of Waycross.

As evidenced by the data collected, hail storms are infrequent for Ware County and the City of Waycross, and are usually short lived in duration, typically producing .75 inch to .88 inch size hail. This is the size of hailstones that the community might be able to expect in future events.

#### **C./D.: Inventory of Assets Exposed and Potential Loss to Hail:**

The threat of hail is a constant in Ware County and the City of Waycross due to the unpredictability and the random occurrence of the hazard, however it may occur more frequently during tornado season (March through August) or during hurricane/tropical storm season (June 1 through November 30). When and where it will occur and the potential damage that it will cause is not easy to predict. In addition, hail may move randomly from place to place and miss entire areas completely.

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by hail. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

#### **E. Land Use and Development Trends Related to Hail:**

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

## **F. Multi-Jurisdictional Hail Differences:**

All of Ware County and the City of Waycross have an equal chance of being affected by hail. No differences between the two jurisdictions have been identified at this time.

## **G. General Overall HRV Summary of Hail Events And their Impact On The Community:**

Hail has the potential to cause damage at any place, at any time, throughout Ware County and the City of Waycross. The cost of the damage will vary depending on the size and quantity of hailstones and where they land. Damage to vehicles (especially roof dents) is one of the most widespread effects of major hailstorms; injuries to people are rarer but not unheard of. The damage effects of hail, if any, vary with the storm.

The Ware County HMPUC recognizes hail as the seventh most likely natural hazard to occur and cause damage. They developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen hail impacts on Ware County and the City of Waycross. These are contained in Chapter 4, Section VII.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Section VIII. Hurricanes/Tropical Storms**

### **A. Identification of Hazard:**

The threat of hurricanes/tropical storms has been chosen by the Ware County HMPUC as the eighth most likely hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine frequency of events. For further information, see the HAZUS Report in Appendix G.

Tropical Cyclones are the general term used for all circulating weather systems over tropical water. Tropical Cyclones are destructive and have the potential to cause great damage and loss of life. They are divided into four major types: Tropical Disturbances, Tropical Depressions, Tropical Storms, and Hurricanes.

A tropical disturbance is a discrete tropical weather system of apparently organized convection originating in the tropics or subtropics, having a non-frontal migratory character, and maintaining its identity for 24 hours or more.

A tropical depression is defined as an organized system of clouds and thunderstorms with a defined circulation and maximum sustained winds of 38 mph.

A tropical storm is defined as an organized system of strong thunderstorms with a defined circulation and maximum sustained winds of 39 to 73 mph.

A hurricane is defined as an intense tropical weather system with a well-defined circulation and maximum sustained winds of 74 mph or higher. Hurricanes are categorized as Category 1 through Category 5, as described in the table below.

**SAFFIR-SIMPSON HURRICANE SCALE**

<i>Category</i>	<i>Wind Speed</i>	<i>Damage</i>
1	74-95 mph	Minimal, no real damage to building structures. Unanchored mobile homes, shrubbery and trees damaged. Also some coastal road flooding and minor pier damage.
2	96-110 mph	Moderate, some damage to roofs, door and windows. Considerable damage to vegetation, mobile homes and piers.
3	111-130 mph	Extensive, some structural damage to small residences and utility buildings. Mobile homes are destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris.
4	131-155 mph	Extreme, some complete roof failure on small residences. Major erosion of beach areas. Major damage to lower floors of structures near the shore.
5	>155 mph	Catastrophic, complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away.

Hurricane/tropical storm season in Georgia is officially from June 1 through November 30, but they may occur slightly before or after those dates.

Whether the hurricane/tropical storm is a short-term event or a long term event depends on many factors including category, strength, speed, and impact of other weather systems, including fronts and wind patterns.

Because of their location, Ware County and the City of Waycross are vulnerable to severe hurricanes/tropical storms forming in both the Atlantic Ocean and the Gulf of Mexico. Also due to location, Hurricanes may degrade into Tropical storms, tropical depressions or tropical disturbances by the time they reach Ware County and the City of Waycross. These may or may not contain tornadoes or hail. In some cases, tropical storms, depressions, or disturbances may never reach hurricane strength before reaching the shore. The effects vary depending on the severity of the hurricane/tropical storm and the duration of the event.

#### **B. Profile of Hurricane/Tropical Storm Events, Frequency of Occurrences, Probability:**

The historic record for hurricanes/tropical storms is spotty at best, with many unreported and underreported events. All of Ware County and the City of Waycross are vulnerable to hurricanes/tropical storms due to their proximity to the coasts of both the Atlantic Ocean and the Gulf of Mexico. The effects of the hazard are usually substantial. Members of the Ware County HMPUC have witnessed many unreported and underreported tropical events occurring in Ware County and the City of Waycross.

According to National Climatic Data Center information (see Appendix F), there are four reports of tropical storms occurring in Ware County (including the City of Waycross) between 01/01/1950 and 12/31/2016. The total cost is reported as \$0. Total injuries are reported as zero. The Historic Recurrence Interval is 16.5 years. This is a 6.06% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.2, the past 20-year frequency is 0.2, and the past 50-year frequency is 0.08 (see PDM Hazard Frequencies Table contained in Appendix D).

Since the previous Hazard Mitigation Plan was completed, 2 hurricane/tropical storm events have occurred in Ware County and the City of Waycross. These were associated with Hurricane Hermine in September 2016 and by Hurricane Matthew in October 2016. Weather associated with Hurricane Hermine (with wind gusts up to 53 mph and 4 to 7 inches of rain) caused damage to the Courthouse roof, and one government building was flooded. Ware County was less severely affected by Hurricane Matthew, although a state of emergency was declared. During Hurricane Matthew, according to NOAA data, wind gusts up to 49 mph were measured in some locations, as well as sustained wind speeds of 31 mph. Total rainfall was between 2 and 4 inches. This rainfall caused some localized flooding, especially flooding of streets in certain residential areas of Waycross that have persistent drainage issues. Roads were also littered with storm debris.

All of Ware County has the same design wind speed of 200 miles per hour for a three-second gust as determined by the American Society of Civil Engineers (ASCE), plus it is in a special Hurricane Susceptible Region (see Appendix A, Section VIII).

According to [www.gema.ga.gov](http://www.gema.ga.gov), the MEOW (Maximum Envelope of Wind) for a Georgia Coast Landfall for Ware County ranges from 39-57 mph in the county (for a Category 1 hurricane with sustained winds of 75 mph and forward speed of 9 mph) to 109-126 mph in the eastern 1/3 of the county and 92-108 mph in the western 2/3 of the county (for a Category 4 hurricane with sustained winds of 144 mph and forward speed of 25 mph).

The GMIS Critical Facilities Inventory does not address hurricanes/ tropical storms but does address wind (see Appendix A). This model has determined that all of Ware County and the City of Waycross are all within the wind hazard area. This model also attempts to determine certain wind speed areas for the hazard of wind, and has identified wind speeds of 90 to 99 mph and 100 to 109 mph exist. 100% of Ware County and the City of Waycross are included in some wind hazard area. Complete inventory information is contained at <https://www.itos.uga.edu/gema>.

#### **C/D.: Inventory of Assets Exposed and Potential Loss to Hurricanes/Tropical Storms:**

In Worksheet 3A: Inventory of Assets appearing in Appendix A, Section VIII, we estimate that all of Ware County and the City of Waycross are equally vulnerable to hurricanes/tropical storms.

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by hurricanes/tropical storms. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

#### **E. Land Use and Development Trends Related to Hurricanes/Tropical Storms:**

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and



zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **F. Multi-Jurisdictional Hurricane/Tropical Storm Differences:**

All of Ware County and the City of Waycross may be affected by hurricanes/tropical storms. Such events are normally area-wide and no difference in the severity is expected between Ware County and the City of Waycross. However, the impact of a hurricane/tropical storm will likely be more severe in places with higher population density due to more people being in danger, more people needing to be evacuated, more debris from damaged buildings, and other impacts associated with higher population density.

Ware County and the City of Waycross are both members of the National Flood Insurance Program. Ware County and the City of Waycross do not participate in the Community Rating System (CRS) program. As of 2016, they were not eligible, according to FEMA (<http://www.fema.gov/library/viewRecord.do?id=3629>).

#### **G. General Overall HRV Summary of Hurricanes/Tropical Storms Events And Their Impact On The Community:**

Hurricanes/tropical storms have the potential to cause damage at any place, at any time, throughout Ware County and the City of Waycross. They are usually preceded by some watch or warning well in advance. The cost of the damage and potential loss of life may be higher if the path of the hurricanes/tropical storms covers populated areas as opposed to more sparsely populated or unpopulated areas.

The Ware County HMPUC recognizes hurricanes/tropical storms as the eighth most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen hurricane/tropical storm impacts on Ware County and the City of Waycross. These are contained in Chapter 4, Section VIII.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Section IX. Severe Winter Storm**

### **A. Identification of Hazard:**

The threat of a severe winter storm has been chosen by the Ware County HMPUC as the ninth most likely hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine frequency of events.

Although this natural hazard did not rank high in any dataset of occurrences or damages happening in Ware County or the City of Waycross, undocumented personal accounts of the Ware County HMPUC members rated this hazard as likely to occur and cause damage. Because of the infrequency of severe winter storms in this region, residents of Ware County and the City of Waycross are not well prepared to handle such events. Icy roads may result in a disproportionate number of automobile crashes because residents are not accustomed to driving in icy conditions. Bridges and overpasses may be more susceptible to icing over, creating an additional hazard. Being unprepared may result in loss of life or substantial damage to property and the economy.

Severe winter storms, at the worst, will produce sleet, freezing rain, and/or 1 to 2 inches of snow, with temperatures as low as the teens (°F). Snow accumulation usually melts away within 24 hours. Possible damage that may occur includes downed tree limbs, impassable roadways, power outages, increased emergency service workloads, failed water/sewer/septic systems, crop damage, and vehicle crashes.

### **B. Profile of Severe Winter Storm Events, Frequency of Occurrences, Probability:**

The historic record for severe winter storms is spotty at best, with many unreported or underreported events. All of Ware County and the City of Waycross are vulnerable to severe winter storms, but the effects of most such events are minimal. Severe winter storms can occur at any time during winter months, usually with some warning being given in advance.

According to National Climatic Data Center information (see Appendix F), there are 3 reports of a severe winter storms (including frost/freeze and sleet) occurring in Ware County (including the City of Waycross) between 01/01/1950 and 12/31/2016. The total cost reported has been zero. Total injuries were reported as zero. No measurable snow or ice accumulation was recorded. Temperatures in recent severe winter storm events have been in the low 20s. A recent significant winter weather event occurred on Jan. 29, 2014 with temperatures around 20 degrees Fahrenheit, ice accumulation reported on bridges, and sleet falling (but with no accumulation). The Historic Recurrence Interval is 22.0 years. This is a 4.55% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.3, the past 20-year frequency is 0.15, and the past 50-year frequency is 0.06 (see GEMA PDM Hazard Frequencies Table contained in Appendix D, Section I).

Since the previous Hazard Mitigation Plan was completed, one severe winter storm event has occurred in Ware County and the City of Waycross. An estimated 50 percent of Ware County's blueberry crop was damaged, resulting in approximately two-thirds crop loss during March 2017. Damage was due to low temperatures (low 20s Fahrenheit) and frost; no ice accrual was observed.

#### **C./D.: Inventory of Assets Exposed and Potential Loss to Severe Winter Storms:**

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by severe winter storms. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

However, it should be noted that damage to buildings and other structures is not usually the most significant effect seen from severe winter storms. As described above, the major hazards from severe winter storms are vehicle crashes and crop damage, as well as frozen/burst water pipes, power outages, overtaxed emergency services, and roadway blockages.

#### **E. Land Use and Development Trends Related to Winter Storms:**

A slight population decline has occurred in Ware County in the last few years since the 2010 U.S. Census. The 2016 population of Ware County (the most recent figure currently available) is estimated at 35,738, a 1.6% decrease since 2010. The 2015 population of Waycross (the most recent available) is estimated at 14,053, a 4.1% decrease since 2010. The number of households in Ware County (including Waycross) is estimated at 13,901.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **F. Multi-Jurisdictional Severe Winter Storm Differences:**

All of Ware County and the City of Waycross have an equal chance of being affected by severe winter storms. In the event of icy roads, hazards would be greater along high-traffic corridors and in more densely populated areas (mainly the City of Waycross).

## **G. General Overall HRV Summary of Severe Winter Storm Events And their Impact On The Community:**

Severe winter storms have the potential to cause damage at any place, at any time during the winter months, throughout Ware County and the City of Waycross. The cost of the damage may be higher in terms of vehicle crashes in the City of Waycross and other population centers, and higher in terms of crop damage in the agricultural areas of the county. A majority of the severe winter storms that pass through the area cause minimal to no damage.

The Ware County HMPUC recognizes severe winter storms as the ninth most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen severe winter storm impacts on Ware County and the City of Waycross. These are contained in Chapter 4, Section IX.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

## **Chapter 3:** **Local Technological/Man-Made Hazard, Risk,** **and Vulnerability (HRV) Summary**

Summary of changes:

- This is the first Ware County and City of Waycross Hazard Mitigation Plan Update to include this chapter.

### **I. MANMADE Hazard – Public Health Emergency**

#### **A. Hazard Identification and Description**

A public health emergency is an event that impacts the health of a significant portion of the population. Public Health emergencies can occur at any time without warning. Examples of public health emergencies arising from natural causes include disease outbreaks (including pandemics and food-borne illnesses) and poisoning from naturally occurring environmental factors. Public health emergencies may occur by themselves or may occur secondary to other natural hazards, for example when flooding leads to contamination of drinking water supplies. Public health emergencies may also be man-made (for example, chemical spills, radiation incidents, and bioterrorism).

The [National Disaster Medical System](#) Federal Partners Memorandum of Agreement defines a public health emergency as "an emergency need for health care [medical] services to respond to a disaster, significant outbreak of an infectious disease, bioterrorist attack or other significant or catastrophic event. For purposes of NDMS activation, a public health emergency may include but is not limited to, public health emergencies declared by the [Secretary of HHS](#) [Health and Human Services] under 42 U.S.C. 247d, or a declaration of a major disaster or emergency under the [Robert T. Stafford Disaster Relief and Emergency Assistance Act](#) (Stafford Act), 42 U.S.C. 5121-5206).

Source: "Public Health Emergency-United States"

[A Public Health Emergency from the Perspective of the U.S. National Disaster Medical System \(NDMS\)](#)". 2007-04-10.

[NATIONAL DISASTER MEDICAL SYSTEM MEMORANDUM OF AGREEMENT AMONG THE DEPARTMENTS OF HOMELAND SECURITY, HEALTH AND HUMAN SERVICES, VETERANS AFFAIRS, AND DEFENSE](#)" (PDF). 2005-09-26.

#### **B. Hazard Profile**

Many identified natural hazards in Ware County have the potential to lead to secondary public health emergencies. These include but are not limited to:

- Large numbers of injuries requiring treatment after an extreme weather event
- Contamination of drinking water, food supplies, and/or living spaces due to flooding
- Health effects resulting from extreme heat/cold events

- Health effects resulting from people being displaced/homeless due to a natural hazard event
- Contamination of drinking water and/or soil resulting from industrial activity

Ware County is also vulnerable to public health emergencies that may occur naturally on their own, including but not limited to:

- Communicable disease outbreaks
- Pandemic influenza
- Mosquito-borne illness
- Food-borne illness

Diseases that cause a public health emergency may have a rapid onset or a slow onset. They may be highly localized or may be widespread in nature. Depending on the nature of the public health emergency, treatment may or may not be immediately available.

Some examples of recent public health emergencies include:

## **H1N1**

2009 H1N1 was first detected in the United States in April 2009. This virus was a unique combination of influenza virus genes never previously identified in either animals or people. The virus genes were a combination of genes most closely related to North American swine-lineage H1N1 and Eurasian lineage swine-origin H1N1 influenza viruses. Because of this, initial reports referred to the virus as a swine origin influenza virus. However, investigations of initial human cases did not identify exposures to pigs and quickly it became apparent that this new virus was circulating among humans and not among U.S. pig herds.

[Infection with this new influenza A virus \(then referred to as ‘swine origin influenza A virus’\) was first detected in a 10-year-old patient in California](#) on April 15, 2009, who was tested for influenza as part of a clinical study. Laboratory testing at CDC confirmed that this virus was new to humans. Two days later, CDC laboratory testing confirmed a second infection with this virus in another patient, an 8-year-old living in California about 130 miles away from the first patient who was tested as part of an influenza surveillance project. There was no known connection between the two patients. Laboratory analysis at CDC determined that the viruses obtained from these two patients were very similar to each other, and different from any other influenza viruses previously seen either in humans or animals. Testing showed that these two viruses were resistant to the two antiviral drugs amantadine and rimantadine, but susceptible to the antiviral drugs oseltamivir and zanamivir. CDC began an immediate investigation into the situation in coordination with state and local animal and human health officials in California.

The cases of 2009 H1N1 flu in California occurred in the context of sporadic reports of human infection with North American-lineage [swine influenza viruses](#) in the United States, most often associated with close contact with infected pigs. (During December 2005 – January 2009, 12 cases of human infection with swine influenza were reported; five of these 12 cases occurred in patients who had direct exposure to pigs, six patients reported being near pigs, and the source of

infection in one case was unknown). Human-to-human spread swine influenza viruses had been rarely documented and had not been known to result in widespread community outbreaks among people. In mid-April of 2009, however, the detection of two patients infected with swine origin flu viruses 130 miles apart, raised concern that a novel swine-origin influenza virus had made its way into the human population and was spreading among people.

CDC worked closely with state and local animal and human health officials on epidemiological investigations by tracing contacts of both patients to try to determine the source of their infection and by examining whether there was any link between the patients and pigs. Surveillance also was enhanced to try to detect additional cases of human illness with this virus. Based on the geographic location of the first cases, lack of contact between these cases and swine, and data collected through contact tracing and laboratory testing, CDC epidemiologists suspected that human-to-human transmission of this virus had taken place. In an article entitled [Swine Influenza A \(H1N1\) Infection in Two Children --- Southern California, March-April 2009](#) published on April 21, 2009 in the [Morbidity and Mortality Weekly Report \(MMWR\)](#), CDC described the cases and requested that state public health laboratories send to CDC all influenza A specimens that could not be subtyped. That same day CDC responded to media inquiries related to the MMWR from medical reporters. Within a day, three additional samples of this new virus were identified in San Diego County and Imperial County California hospitals and sent to CDC for further testing. CDC laboratory testing confirmed that these samples also were positive for the virus that would come to be called “2009 H1N1.”

On April 23, 2009, samples submitted by Texas revealed two additional cases of human infections with 2009 H1N1, transforming the investigation into a multistate outbreak and response. At the same time, CDC was testing 14 samples from Mexico, some of which had been collected from patients who were ill before the first 2 U.S. (California) patients. Results from seven of the samples were positive for 2009 H1N1 and similar findings were reported for specimens submitted by Mexico to Canada. It had now become clear that cases were occurring in multiple countries and human to human spread of the virus appeared to be ongoing. That same day CDC held the first formal full press briefing to inform the media and guide the public and health care response to the rapidly evolving situation. CDC held nearly 60 press briefings during the 2009 H1N1 response.

On April 24, 2009, CDC uploaded complete gene sequences of the 2009 H1N1 virus to a publicly-accessible international influenza database, which enabled scientists around the world to use the sequences for public health research and for comparison against influenza viruses collected elsewhere, and an updated report on the outbreak was published online in the MMWR. On Saturday, April 25, 2009, under the rules of the International Health Regulations, [the Director-General of WHO declared the 2009 H1N1 outbreak a Public Health Emergency of International Concern](#) and recommended that countries intensify surveillance for unusual outbreaks of influenza-like illness and severe pneumonia. Also on April 25, 2009, New York City officials reported an investigation into a cluster of influenza-like illness in a high school, and CDC testing confirmed two cases of 2009 H1N1 influenza infection in Kansas, and another case in Ohio shortly after.

On April 26, 2009, the United States Government determined that a public health emergency existed nationwide; CDC's Strategic National Stockpile (SNS) began releasing 25% of the supplies in the stockpile that could be used to protect and treat influenza. This included 11 million regimens of [antiviral](#) drugs, and personal protective equipment including over 39 million respiratory protection devices (masks and respirators), gowns, gloves and face shields, to states (allocations were based on each state's population). [On April 27, the WHO Director-General raised the level of influenza pandemic alert from phase 3 to phase 4](#), based primarily on epidemiological data demonstrating human-to-human transmission and the ability of the virus to cause community-level outbreaks. Based on reports of widespread influenza-like-illness and many severe illnesses and deaths in Mexico, CDC issued a travel health warning recommending that United States travelers postpone all non-essential travel to Mexico. As in past influenza seasons, CDC urged the public and especially those people at highest risk of influenza-related complications, to protect themselves by taking antiviral drugs early in their illness when recommended by their doctor; CDC also advised that everyone take every day preventive actions like covering coughs and sneezes and staying home from work and school when ill to help reduce the spread of illness.

[On April 29, 2009 WHO raised the influenza pandemic alert from phase 4 to phase 5](#), signaling that a pandemic was imminent, and requested that all countries immediately activate their pandemic preparedness plans and be on high alert for unusual outbreaks of influenza-like illness and severe pneumonia. The U.S. Government was already implementing its pandemic response plan. CDC continued to post and update [guidance](#) for states, clinicians, laboratories, schools, partners and the [public](#) on topics ranging from the non-pharmaceutical measures communities could take to limit spread of disease, to how to evaluate a patient for possible infection with 2009 H1N1 influenza, to how to care for children who might be sick with 2009 H1N1 influenza. On April 30, 2009, CDC issued an [MMWR Dispatch describing the initial outbreak of 2009 H1N1 influenza in Mexico](#). Findings in Mexico indicated that transmission in Mexico involved person-to-person spread with multiple generations of transmission. CDC also issued an [MMWR Dispatch on the outbreak of 2009 H1N1 influenza infection in a high school in New York City, that was, at the time, the largest reported cluster of 2009 H1N1 cases in the United States](#). The Dispatch suggested that the high school age students had respiratory and fever symptoms similar to those caused by a seasonal flu, but in addition, about half had diarrhea, which is more than expected with seasonal flu. As the details of the outbreak unfolded, the Federal response continued in high gear. Also on April 30, 2009, [HHS announced that the Federal government would purchase an additional 13 million treatment courses of antiviral drugs to help fight influenza](#). The additional treatment courses would be added to the SNS.

As the outbreak spread, CDC began receiving reports of school closures and implementation of community-level social distancing measures meant to slow the spread of disease. School administrators and public health officials were following their pandemic plans and doing everything they could to slow the spread of illness. (Social distancing measures are meant to increase distance between people. Measures include staying home when ill unless to seek medical care, avoiding large gatherings, telecommuting, and implementing school closures).

## **Enterovirus D68**



In 2014, the United States experienced a nationwide outbreak of EV-D68 associated with severe respiratory illness. From mid-August 2014 to January 15, 2015, CDC or state public health laboratories confirmed a total of 1,153 people in 49 states and the District of Columbia with respiratory illness caused by EV-D68. Almost all of the confirmed cases were among children, many whom had asthma or a history of wheezing. Additionally, there were likely millions of mild EV-D68 infections for which people did not seek medical treatment and/or get tested.

CDC received about 2,600 specimens for enterovirus lab testing during 2014, which is substantially more than usual. About 36% of those tested positive for EV-D68. About 33% tested positive for an enterovirus or rhinovirus other than EV-D68.

EV-D68 was detected in specimens from 14 patients who died and had samples submitted for testing. State and local officials have the authority to determine and release information about the cause of these deaths.

In general, infants, children, and teenagers are most likely to get infected with enteroviruses and become ill. That's because they do not yet have immunity (protection) from previous exposures to these viruses. We believe this is also true for EV-D68. Adults can get infected with enteroviruses, but they are more likely to have no symptoms or mild symptoms.

Children with asthma may have a higher risk for severe respiratory illness caused by EV-D68 infection.

## **MERS**

Middle East Respiratory Syndrome (MERS) is an illness caused by a virus (more specifically, a [coronavirus \(http://www.cdc.gov/coronavirus/index.html\)](http://www.cdc.gov/coronavirus/index.html)) called Middle East Respiratory Syndrome Coronavirus (MERS-CoV). MERS affects the respiratory system (lungs and breathing tubes). Most MERS patients developed severe acute respiratory illness with symptoms of fever, cough and shortness of breath. About 3-4 out of every 10 patients reported with MERS have died.

Health officials first reported the disease in Saudi Arabia in September 2012. Through retrospective investigations, health officials later identified that the first known cases of MERS occurred in Jordan in April 2012. So far, all cases of MERS have been linked through travel to or residence in countries in and near the Arabian Peninsula. The largest known outbreak of MERS outside the Arabian Peninsula occurred in the Republic of Korea in 2015. The outbreak was associated with a traveler returning from the Arabian Peninsula.

MERS-CoV has spread from ill people to others through close contact, such as caring for or living with an infected person. MERS can affect anyone. MERS patients have ranged in age from younger than 1 to 99 years old.

CDC continues to closely monitor the MERS situation globally and work with partners to better understand the risks of this virus, including the source, how it spreads, and how infections might be prevented. CDC recognizes the potential for MERS-CoV to spread further and cause more cases globally and in the U.S. We have provided information for travelers and are working with

health departments, hospitals, and other partners to prepare for this. In May 2014, CDC confirmed two unlinked imported cases of MERS in the United States – one to [Indiana](#), the other to [Florida](#). Both cases were among healthcare providers who lived and worked in Saudi Arabia. Both traveled to the U.S. from Saudi Arabia, where they are believed to have been infected. Both were hospitalized in the U.S. and later discharged after fully recovering.

CDC and other public health partners continue to closely monitor the MERS situation. The CDC recognizes the potential for MERS-CoV to spread further and cause more cases in the United States and globally. In preparation for this, The CDC has done the following:

- Continued to collaborate with international partners on epidemiologic and laboratory studies to better understand MERS
- Improved the way they collect data about MERS cases
- Increased lab testing capacity in states to detect cases
- Developed guidance and tools for health departments to conduct public health investigations when MERS cases are suspected or confirmed
- Provided recommendations for healthcare infection control and other measures to prevent disease spread
- Provided guidance for flight crews, Emergency Medical Service (EMS) units at airports, and U.S. Customs and Border Protection (CPB) officers about reporting ill travelers to CDC
- Disseminated up-to-date information to the general public, international travelers, and public health partners
- Used Advanced Molecular Detection (AMD) methods to sequence the complete virus genome on specimens from the two U.S. MERS cases to help evaluate and further describe the characteristics of MERS-CoV.

### **Ebola Virus Disease**

Ebola, previously known as Ebola hemorrhagic fever, is a rare and deadly disease caused by infection with one of the Ebola virus species. Ebola can cause disease in humans and nonhuman primates (monkeys, gorillas, and chimpanzees).

Ebola viruses are found in several African countries. Ebola was first discovered in 1976 near the Ebola River in what is now the Democratic Republic of the Congo. Since then, outbreaks have appeared sporadically in Africa.

The natural reservoir host of Ebola virus remains unknown. However, on the basis of evidence and the nature of similar viruses, researchers believe that the virus is animal-borne and that bats are the most likely reservoir. Four of the five virus strains occur in an animal host native to Africa.

People get Ebola through direct contact (through broken skin or mucous membranes in, for example, the eyes, nose, or mouth) with:

- blood or body fluids (including but not limited to urine, saliva, sweat, feces, vomit, breast milk, and semen) of a person who is sick with or has died from Ebola,

- objects (like needles and syringes) that have been contaminated with body fluids from a person who is sick with Ebola or the body of a person who has died from Ebola,
- infected fruit bats or primates (apes and monkeys), and
- possibly from contact with semen from a man who has recovered from Ebola (for example, by having oral, vaginal, or anal sex)

Ebola Virus Disease has no cure or vaccine and due to the high mortality rate and highly infectious nature of the virus, planning efforts in the United States have been focused on controlling exposure for potentially exposed travelers from the countries where the outbreaks have been rampant. Because the timeframe between a person contracting the disease and exhibiting symptoms can be up to 21 days, combined with the ease of international travel, prevention and planning have become a focal point in public health preparedness.

## **Zika**

Zika virus disease (Zika) is a disease caused by Zika virus that is spread to people primarily through the bite of an infected *Aedes* species mosquito. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting for several days to a week after being bitten by an infected mosquito. People usually don't get sick enough to go to the hospital, and they very rarely die of Zika. For this reason, many people might not realize they have been infected. Once a person has been infected, he or she is likely to be protected from future infections.

Zika virus can be spread from a pregnant woman to her fetus and has been linked to a serious birth defect of the brain called [microcephaly](#) in babies of mothers who had Zika virus while pregnant. CDC recommends special precautions for pregnant women. Pregnant women should consider delaying travel to [areas with Zika](#).

Zika virus was first discovered in 1947 and is named after the Zika forest in Uganda. In 1952, the first human cases of Zika were detected and since then, outbreaks of Zika have been reported in tropical Africa, Southeast Asia, and the Pacific Islands. Zika outbreaks have probably occurred in many locations. Before 2007, at least 14 cases of Zika had been documented, although other cases were likely to have occurred and were not reported. Because the symptoms of Zika are similar to those of many other diseases, many cases may not have been recognized.

- In May 2015, the Pan American Health Organization (PAHO) issued an alert regarding the first confirmed Zika virus infection in Brazil and on Feb 1, 2016, the World Health Organization (WHO) declared Zika virus a public health emergency of international concern (PHEIC). Local transmission has been reported in many other countries and territories. Zika virus likely will continue to spread to new areas. As an arboviral disease, Zika virus is nationally notifiable.

## **C. Assets Exposed to Hazard - Community Exposure**

The areas of the county with the highest population density would likely be most vulnerable to diseases that spread from person to person. The main area of high population density in Ware

County is the City of Waycross. In addition, facilities that serve large volumes of people could potentially be vehicles for the transmission of communicable disease, as in an influenza pandemic; such areas include schools, colleges, large employment centers, and large retail areas such as malls.

Due to Ware County's humid subtropical climate, mosquito-borne illness is a greater hazard here than in many other parts of the country. Levels of exposure to mosquito-borne illness depend on several factors, including:

- Presence and prevalence of an illness-causing mosquito-borne virus;
- Presence of mosquitoes, which may be exacerbated both by natural standing water (such as lakes and ponds) and by standing water in man-made structures, such as old tires, buckets, and other containers;
- Human exposure to mosquito bites, which may be influenced by factors such as the use of insect repellent, the amount of time spent outside, and the availability of air conditioning and window screens in residences.

The City of Waycross operates a mosquito control program, which include spraying, surveillance, and public education. Ware County does not have a mosquito control program. Mosquito-borne disease is an especially great concern as of early 2016 due to a Zika virus outbreak based in South and Central America that included many cases in Florida.

Public health emergencies involving food-borne illness are typically quite localized because the illness affects those people who have consumed food from a contaminated source, e.g. a certain product from a grocery store or restaurant. Consequently, no single part of Ware County is more or less vulnerable to such an emergency. A public health emergency involving illness transmitted through water can affect the entire population of a city, in cases where that city's entire water supply is affected. In rural areas where drinking water is obtained from wells, the effects of such an emergency may be more localized.

Damage from Public Health Emergencies is equally likely to occur in any area of the county so all assets are exposed equally to potential Public Health Emergency damage to some degree.

#### **D. Estimate of Potential Loss**

The potential loss from a public health emergency depends entirely on the scope and severity of the emergency and the capacity of emergency management agencies and health care facilities to respond. Public health emergencies may be small and highly localized in nature, or may affect an entire community and result in many fatalities. Due to the wide variety of possible public health emergencies, it is impossible to make precise generalized estimates of the potential loss.

In Worksheet 3A: Inventory of Assets appearing in Appendix A Section I Part A, we estimate that all of Ware County and the City of Waycross are vulnerable to Public Health Emergencies.

#### **Ware County (including the City of Waycross):**

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education

and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by a public health emergency. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.

#### **E. Land Use and Development Trends**

A wide range of land use and development regulations act to protect public health in Ware County, such as animal control ordinances, plumbing codes, solid waste management regulations, environmental regulations, and zoning regulations that minimize incompatible land uses. All such regulations contribute to reducing the likelihood of a public health emergency.

#### **F. Multi-Jurisdictional Differences**

Jurisdictional differences in vulnerability to public health emergencies depend on the nature and severity of the emergency, and on the mitigation measures in place. For example, communities not covered by any active mosquito control program may be more vulnerable to outbreaks of mosquito-borne illness. The City of Waycross is generally more vulnerable to public health emergencies that are exacerbated by higher population density.

#### **G. Hazard, Risk and Vulnerability Summary**

The entire population of Ware County and the City of Waycross is conceivably at risk from a public health emergency. The level of risk depends on the emergency type and severity and the measures that are in place to control and respond to it. Some types of public health emergency are impossible to predict and occur swiftly, leaving little or no time to respond. Others are more gradual in their onset, and mitigation measures can be put in place ahead of time.

## **II. MANMADE Hazard – Chemical, Biological, Radiological, Nuclear And Explosive (CBRNE) Incidents**

### **A. Hazard Identification and Description**

The threat of CBRNE has been chosen by Ware County as a likely man-made hazard to occur and cause damage in Ware County and the City of Waycross, based on past experience, the FEMA described methodology, and other factors.

#### **CBRNE: Chemical, Biological, Radiological, Nuclear, and Explosives**

**Chemical:** A **chemical weapon** (CW) is a device that uses chemicals [formulated](#) to inflict death or harm to human beings. They may be classified as [weapons of mass destruction](#), and have been "condemned by the civilized world". They are separate from biological weapons (diseases), nuclear weapons (which use sub-nuclear fission) and radiological weapons (which use radioactive decay of elements). Chemical weapons can be widely dispersed in gas, liquid and solid forms and may easily afflict others than the intended targets. [Nerve gas](#) and [tear gas](#) are two modern examples

For our purposes, this category could also include a wide variety of chemicals (including gasoline/diesel fuels), pesticides, etc. that are transported by rail, truck, or other means through the area, or are stored/used for business, manufacturing or agricultural purposes.

There have been several reports of LUST (Leaking Underground Storage Tanks), chemical spills, or vehicle accidents that could potentially cause damage to individuals or the environment. In May, 1991, approximately 1/3 of the population of the City of Ashburn was evacuated due to a Chemical Fire at Wilbur Ellis Company burning various pesticides and herbicides.

**Biological:** A **biological agent** — also called **bio-agent** or **biological threat agent** — is a [bacterium](#), [virus](#), [prion](#), or [fungus](#) that can be used purposefully as a biological weapon in [bioterrorism](#) or [biological warfare](#) (BW). In addition to these living and/or replicating [pathogens](#), [biological toxins](#) are also included among the bio-agents. More than 1,200 different kinds of potentially weaponizable bio-agents have been described and studied to date.

Biological agents have the ability to adversely affect [human health](#) in a variety of ways, ranging from relatively mild [allergic reactions](#) to serious medical conditions, including [death](#). Many of these organisms are ubiquitous in the [natural environment](#) where they are found in water, soil, plants, or animals. Bio-agents may be amenable to "weaponization" to render them easier to deploy or disseminate. Genetic modification may enhance their incapacitating or lethal properties, or render them impervious to conventional treatments or preventives. Since many bio-agents reproduce rapidly and require minimal resources for propagation, they are also a potential danger in a wide variety of occupational settings.

For our purposes, this category could also include significant events/threats from viruses, diseases, or other medical occurrences that are either natural or man-made in origin, such as the "Flu/Influenza".

Radiological: A **radiological weapon** or **radiological dispersion device (RDD)** is any weapon that is designed to spread [radioactive material](#) with the intent to kill and cause disruption. One version, known as a [dirty bomb](#), is not a true [nuclear weapon](#) and does not yield the same explosive power. It uses [conventional explosives](#) to spread radioactive material, most commonly the spent fuels from [nuclear power plants](#) or radioactive [medical waste](#).

Another version is the [salted bomb](#), a true nuclear weapon designed to produce larger amounts of nuclear fallout than a regular nuclear weapon.

For our purposes, this category could also include radiological materials that are transported through the community by truck or train, accidents caused by radiotherapy and accidents resulting from material stored (or improperly disposed of) in medical devices or medical waste.

Nuclear: A **nuclear weapon** is an explosive device that derives its destructive force from [nuclear reactions](#), either [fission](#) or a combination of fission and [fusion](#).

Explosives: An **explosive weapon** generally uses [high explosive](#) to project [blast](#) and/or [fragmentation](#) from a point of [detonation](#).

Explosive weapons may be subdivided by their method of manufacture into explosive [ordnance](#) and [improvised explosive devices](#) (IEDs).

Certain types of explosive ordnance and many improvised explosive devices are sometimes referred to under the generic term [bomb](#).

When explosive weapons fail to function as designed they are often left as [unexploded ordnance](#) (UXO).

An **explosive material**, also called an **explosive**, is a reactive substance that contains a great amount of potential energy that can produce an [explosion](#) if released suddenly, usually accompanied by the production of [light](#), [heat](#), [sound](#), and [pressure](#). An **explosive charge** is a measured quantity of explosive material.

This potential energy stored in an explosive material may be

- [chemical energy](#), such as [nitroglycerin](#) or [grain dust](#)
- [pressurized gas](#), such as a [gas cylinder](#) or [aerosol can](#).
- [nuclear](#) energy, such as in the [fissile isotopes uranium-235](#) and [plutonium-239](#)

Explosive materials may be categorized by the speed at which they expand. Materials that [detonate](#) (explode faster than the [speed of sound](#)) are said to be "high explosives" and materials that [deflagrate](#) are said to be "low explosives". Explosives may also be categorized by their [sensitivity](#). Sensitive materials that can be initiated by a relatively small amount of heat or pressure are [primary explosives](#) and materials that are relatively insensitive are [secondary](#) or [Tertiary explosives](#).

Because of its location, and especially because of the large volume of freight that passes through the area (by rail and by truck) Ware County and the City of Waycross are vulnerable to the effects of CBRNE events. The effect may vary depending on the severity of the CBRNE and the duration of the event.

## **B. Hazard Profile**

The possible extent of CBRNE events is unknown due to the numerous types and strengths of events that may occur.

## **C. Assets Exposed to Hazard - Community Exposure**

The areas of the county with the highest population density would likely be most vulnerable to CBRNE Events. Areas of high population density in Ware County are generally within the City of Waycross. In addition, facilities that serve large volumes of people could potentially be vehicles for a CBRNE event. Such areas include malls, hospitals, and other large employment and retail centers. Airports and large rail facilities could also be targets.

Damage from CBRNE is equally likely to occur in any area of the community, so all assets are exposed equally to potential CBRNE damages to some degree.

## **D. Estimate of Potential Loss**

The potential loss from CBRNE depends entirely on the scope and severity of the event and the capacity of emergency management agencies and health care facilities to respond. CBRNE events may be small and highly localized in nature, or may affect an entire community and result in many fatalities. Due to the wide variety of possible CBRNE Events, it is impossible to make precise generalized estimates of the potential loss.

In Worksheet 3A: Inventory of Assets appearing in Appendix A Section I Part A, we estimate that all of Ware County and the City of Waycross are vulnerable to CBRNE events.

Approximately 100% of the Residential property (17,044 of 17,044) in Ware County (including the City of Waycross) may be affected, with a total value of \$815,801,786. Also, approximately 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (21,325 of 21,325) in Ware County (including the City of Waycross) may be affected, with a total value of \$1,297,533,777. The values are based on the most recent available tax roll data for Ware County and the City of Waycross, provided by the Ware County Tax Assessor's Office.

According to the inventory database reports and maps, all of the 171 Critical Facilities and Infrastructure for Ware County (including the City of Waycross) are located in areas that may be affected by CBRNE events. The total value of these 171 Critical Facilities is \$1,470,743,776, plus a content value of \$82,868,302.



### **E. Land Use and Development Trends**

A wide range of laws and regulations act to protect the public in Ware County from CBRNE Events. Ware County and the City of Waycross each have their own law enforcement departments, individual fire departments, and joint Emergency Management Agency.

Land use and development trends that influence the vulnerability of Ware County and the City of Waycross are: The large number of rail lines and the relatively small number of overpasses (meaning that some communities are separated by rail lines from other places); the large volumes of freight and truck traffic that pass through the region; the relatively high density of the City of Waycross compared to the rest of the county; and the presence of some industrial areas with potentially hazard chemicals present.

### **F. Multi-Jurisdictional Differences**

Jurisdictional differences in vulnerability to CBRNE depend on the nature and severity of the emergency, and on the mitigation measures in place. The City of Waycross is generally more vulnerable to CBRNE events that are exacerbated by higher population density.

### **G. Hazard, Risk and Vulnerability Summary**

The entire population of Ware County is conceivably at risk from a CBRNE Event. The level of risk depends on the emergency type and severity and the measures that are in place to control and respond to it. CBRNE are impossible to predict and occur swiftly, leaving little or no time to respond.

## **Chapter 4:** **Local Natural Hazard Mitigation Goals and Objectives**

### Summary of Changes:

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

<b>Chapter 4 Section</b>	<b>Updates to Section</b>
I. Wildfire	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
II. Drought	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
III. Thunderstorm/Wind	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
IV. Flood	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
V. Extreme Heat	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
VI. Tornado	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
VII. Hail	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
VIII. Hurricane/Tropical Storm	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.
IX. Severe Winter Storm	Updated Goals, Objectives, and Action Step formatting, numbering, and data fields. Updated or deleted prior Action Steps and added new Action Steps if applicable.

Table 4.1: Overview of updates to Chapter 4: Local Natural Hazards, Mitigation Goals and Objectives

## **Overall Community Mitigation Goals, Policies and Values Narrative**

While Ware County and the City of Waycross each operate autonomously, there is a high level of cooperation exhibited when it comes to hazard mitigation and emergency planning efforts. Each local government has designated representatives to participate in the emergency management process, whether it be during planning, response, or recovery phases. The local Emergency Management Agency hosts regular meetings to gather all of the relevant local, regional and state partners together to develop effective plans and strengthen relationships among all of the stakeholders. Working together, Ware County and the City of Waycross have been able to access resources available through several state and federal sources that have been instrumental in improving the technical capabilities of these communities to more effectively mitigate hazards and provide more accurate warning and preparatory information to their citizens.

Overall, the priorities for each of the local communities has remained relatively unchanged. The hazards and risks associated with each have not changed and many of the action steps identified during previous versions of this plan are still relevant and remain a priority in this plan as well.

Authority for the development of this Plan was given by the Ware County Commission as a result of their execution of the Grantee-Subgrantee Agreement for the Ware County Hazard Mitigation Grant Program (HMGP) Planning Project; and by the City of Waycross, located in Ware County, through their participation in the planning project. The Ware County Emergency Management Agency is authorized to oversee emergency management within both Ware County and the City of Waycross.

The two jurisdictions have many current policies and programs related to hazard mitigation, which are described in detail in the goals, objectives, and action steps contained in Sections I through IX of Chapter 4 of this Plan. Both jurisdictions (within the boundaries of their budgets) have the ability to expand and improve their existing policies and programs as evidenced by the new and existing goals, objectives, and action steps included in this plan. The amount of resources available to the two jurisdictions for expansion and improvement of existing programs will depend on factors such as the local government budgets and the availability of state and federal funding to support hazard mitigation activities.

Below is a description of the comprehensive range of Mitigation Goals, Objectives, and Action Steps that were developed by the Ware County HMPUC to reduce damages and improve safety through Hazard Mitigation. These have been arranged by the natural hazards contained in Chapter Two, Sections I-IX. In this Chapter, in Sections I-IX, there is an analysis and description of a comprehensive range of specific Mitigation Goals, Objectives, and Action Steps to reduce the effects of each hazard. There is particular emphasis on future and existing buildings and infrastructure as well as public awareness and communication.

The Ware County HMPUC discussed and identified the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Chapter 4 of this Plan after identifying the hazards noted in Chapter 2 Sections I-IX of this Plan. All areas of Ware County and the City of Waycross were taken into account in the development of the comprehensive range of Mitigation Goals, Objectives, and Action Steps. These were identified after weighing many factors

discovered during the planning process, including risk assessment, storm history, past damage, community resources, and other factors.

A list of the comprehensive range of Mitigation Goals, Objectives, and Action Steps was compiled from the input of the Ware County HMPUC, as well as from others within the community. Members of the Ware County HMPUC prioritized the identified comprehensive range of Mitigation Goals, Objectives, and Action Steps based on what would be perceived as most beneficial to the community. The benefits were all determined to be greater than the costs involved (if any).

Several criteria were established to assist the Ware County HMPUC members in the prioritization of these suggested comprehensive range of Mitigation Goals, Objectives, and Action Steps. Criteria included perceived cost vs. benefit or cost effectiveness, availability of potential funding sources, overall feasibility, measurable milestones, multiple objectives, both public, political support for the proposed actions, and the STAPLEE criteria.

Through this prioritization process, several projects emerged as being a greater priority than others. Some of the projects involved expending considerable amounts of funds to initiate the required actions. The determination of the cost/benefit analysis (such as the FEMA B/CA model) of a project will be implemented at the time of project application or funding request. Other projects allowed the communities to pursue completion of the project using potential grant funding. Still others required no significant financial commitment by the communities.

In Chapter 6, Section I-III, there is a description of the planning process involved in selecting the comprehensive range of Mitigation Goals, Objectives, and Action Steps. The Action Steps are given a rating of High, Medium, or Low Priority by the Ware County HMPUC based on a number of factors (with a primary emphasis on prioritized cost versus benefit review) identified in Chapter 6 Section I.

Relevant comprehensive ranges of Mitigation Goals, Objectives, and Action Steps are listed below throughout the chapter. The Waycross-Ware County EMA Director has been chosen by Ware County and the City of Waycross to oversee the projects. The Waycross-Ware County EMA has been designated by Ware County and the City of Waycross to be the coordinating agency for implementation and administration of these projects.

## **Section I. Wildfire**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, wildfire may cause substantial damage to life, property, and the economy in Ware County and the City of Waycross. Wildfire is unpredictable and could happen at any place and at any time in the community. The Ware County HMPUC believes that, due to the great damage wildfire may cause, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce the threat of wildfire damage in the community.

### **B. Identification and Analysis of the Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include measures to reduce structural ignitability, expanded firefighting facilities, improving infrastructure such as water lines, and encouraging the maintenance of clear right-of-way.

Non-structural options include first responder training, upgrades to fire department equipment, conducting various training and outreach programs, improving public awareness of the dangers of wildfires, and promoting “Firewise” knowledge in the community.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. The Community Wildfire Protection Plan outlines strategies for mitigating wildfire damage in the community.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

#### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

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

*Goal #1:* Prevent or reduce damage caused by Wildfire in Ware County and in the City of Waycross.

*Objective #1:* Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, and woodlands due to wildfire.

Action Step #1: Provide additional first responder training, air units, air unit chargers, Class A Pumper & Fire Knocker trucks, and other specialized equipment & training to all Ware County Volunteer Fire Departments for Wildfire use.

<b>Responsible Department</b>	Ware County EMA, Ware County FD
<b>Anticipated Cost</b>	\$5,000,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds/DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Provide additional first responder training, air units, air unit chargers, Class A Pumper & Fire Knocker trucks, and other specialized equipment & training to the City of Waycross Fire Departments for Wildfire use.

<b>Responsible Department</b>	Ware County EMA, City of Waycross FD
<b>Anticipated Cost</b>	\$1,500,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds/DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3: Support & enforce GA Forestry Commission burn ordinances and bans and promote hazardous fuel reduction by prescribed burning, mechanical treatment, or chemical treatment carried out and promoted by the GA Forestry Commission in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA, Ware County FD, City of Waycross FD
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance. An ordinance has been passed by the City of Waycross supporting this Action Step.

Action Step #4: Plan to acquire property and construct new Ware County Volunteer Fire Stations, new additions to existing stations, and a wildfire command post.

<b>Responsible Department</b>	Ware County EMA, Ware County FD
<b>Anticipated Cost</b>	\$50,000.00 each
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #5: Establish a paid force at County Fire Station #3.

<b>Responsible Department</b>	Ware County FD
<b>Anticipated Cost</b>	\$1,200,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, SPLOST, grants
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #6: Construct & maintain the Comprehensive Training Facility for fire personnel training in Wildfire tactics.

<b>Responsible Department</b>	Ware County EMA, Ware County FD, City of Waycross FD
<b>Anticipated Cost</b>	\$200,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #7: Complete construction of fire training tower & facility

<b>Responsible Department</b>	Ware County EMA, Ware County FD, City of Waycross FD
<b>Anticipated Cost</b>	\$1,000,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Partially Completed-Site Under Construction. Ongoing – Extended beyond 5-year time period due to importance.

Action Step #8: In the City of Waycross, replace the four-inch water lines with six-inch water lines and hydrants in the Gilmore/Brunel Street area.

<b>Responsible Department</b>	City of Waycross Community Development
<b>Anticipated Cost</b>	\$750,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, HUD GDBG & SPLOST
<b>Jurisdiction</b>	City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

*Objective #2:* Obtain FireWise Community Status by educating the Ware County and City of Waycross Fire Department personnel and the public on the hazards of Wildfire and the pre-disaster mitigation thereof.



Action Step #1: Maintain good public relations between the citizens of Ware County and the City of Waycross and the County/City Fire Departments and plan to increase levels of awareness and resources during peak hazard conditions through the use of education sessions, community meetings, etc.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Partner with the Georgia Forestry Commission to provide education to Ware County and City of Waycross communities and citizens on the pre-disaster mitigation of wildfire and use; and develop school-based programs to educate children.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

*Objective #3:* Implement priorities, projects and recommendations contained in GA Forestry Commission’s “Community Wildfire Protection Plan”.

Action Step #1: Trim shrubs and vines to 30 feet from structures, trim overhanging limbs, replace flammable plants near homes with less flammable varieties, and remove vegetation around chimneys.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts. & Public Works Depts.
<b>Anticipated Cost</b>	\$35.00 per acre
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-FEMA/GEMA, GA Forestry, USFS
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Clean flammable vegetative material from roofs and gutters, store firewood appropriately, install skirting around raised structures, store water hoses for easy access, and replace pine straw and mulch around plantings with less flammable landscaping materials.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts. & Public Works Depts.
<b>Anticipated Cost</b>	\$35.00 an acre
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-FEMA/GEMA, GA Forestry, USFS
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3: Cut, prune, and mow vegetation in shared community spaces.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts. & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #4: Install new road signage with reflective lettering on non-flammable poles that meets all the minimum requirements of the MUTCD. Dead ends (no outlet or turnaround) should be prominently tagged.

<b>Responsible Department</b>	Ware County/City of Waycross Road Depts., Building Inspection Depts. & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #5: As roads are upgraded, widen to minimum standards with a minimum 50-foot radius for cul-de-sacs.

<b>Responsible Department</b>	Ware County/City of Waycross Road Depts., Building Inspection Depts. & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #6: Work with developers to identify and create alternative access and exit routes for subdivisions and communities with only one way in and out.

<b>Responsible Department</b>	Ware County Planning & Code, Ware County/City of Waycross Road Depts., Building Inspection Depts. & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #7: Amend and enforce existing building codes as they relate to skirting, propane tank locations, public nuisances (trash/debris on property), property address marking standards, and other relevant concerns; at such time as the development of zoning, planning, and subdivision ordinances become practicable, include fire department and emergency services input in the design of these.

<b>Responsible Department</b>	Ware County Planning & Code, Ware County/City of Waycross Building Inspection Depts. & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #8 (formerly #25): Create a Ware County WUI Fire Council to Accurately Assess Community Wildfire Protection Plan Progress and Effectiveness and Implement Programs & Projects.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, GA Forestry
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #9: On adjacent WUI Lands, encourage prescribed burning for private landowners and industrial timberlands particularly adjacent to residential areas.

<b>Responsible Department</b>	Ware County/City of Waycross Fire Depts., Building Inspection Depts. & Public Works Depts.
<b>Anticipated Cost</b>	\$35.00 an acre
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA, GA Forestry, USFS
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #10: On adjacent USF&W lands, work with USF&W land management to undertake fuel reduction strategies on Okefenokee NWR lands adjacent to WUI areas.

<b>Responsible Department</b>	Ware County Fire Depts., Building Inspection Dept. & Public Works Dept.
<b>Anticipated Cost</b>	\$35.00 an acre
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-FEMA/GEMA, GA Forestry, USFS, USF & W
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #11: On adjacent GFC & WMA lands, work with GFC & DNR land management to incorporate regular prescribed burning on State managed lands adjacent to identified WUI areas.

<b>Responsible Department</b>	Ware County Fire Depts., Building Inspection Dept. & Public Works Dept.
<b>Anticipated Cost</b>	\$35.00 an acre
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-FEMA/GEMA, GA Forestry, USFS, GA DNR
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #12: Encourage railroads to better maintain their ROW eliminating brush and grass through herbicide and mowing. Maintain firebreaks along ROW adjacent to residential areas.

<b>Responsible Department</b>	Ware County/City of Waycross Fire Depts., Building Inspection Depts. & Public Works Depts.
<b>Anticipated Cost</b>	\$35.00 an acre
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-FEMA/GEMA, GA Forestry, USFS
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #13: Encourage private landowners to clean and re-harrow existing fire lines.

<b>Responsible Department</b>	Ware County/City of Waycross Fire Depts., Building Inspection Depts. & Public Works Depts.
<b>Anticipated Cost</b>	\$35.00 an acre
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-FEMA/GEMA, GA Forestry, USFS
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #14: Inspect, maintain, and improve access to existing dry hydrants. Add signage along roads to mark the hydrants.

<b>Responsible Department</b>	Ware County EMA, Ware County Fire Dept., Road Dept. & Public Works Dept.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #15: Investigate need for Brush Trucks at selected stations.

<b>Responsible Department</b>	Ware County EMA, Ware County Fire Dept.
<b>Anticipated Cost</b>	\$80,000.00 each truck
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #16: Ensure all fire stations and firefighters are equipped with wildland hand tools and lightweight wildland PPE gear.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	\$50,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DHS FEMA/GEMA, AFG & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #17: Obtain mobile and fixed generators (including transfer switches) to provide back-up power where needed.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	\$500,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #18: Obtain Wildland Fire Suppression Training for Fire Personnel.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	\$80,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA AFG, GA Forestry, USFS, USF&W & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #19: Conduct “How to Have a Firewise Home” Workshop for Ware County/City of Waycross Residents.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA, GA Forestry
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.



Action Step #20: Conduct “Firewise” Workshop for Ware County/City of Waycross Community Leaders.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA, GA Forestry
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #21: Conduct a Spring Clean-up Event Every Spring.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts., Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, GA Forestry
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #22: Develop and distribute Firewise informational packets realtors & insurance agents.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA, GA Forestry
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #23: Create and Exhibit a Wildfire Protection Display for the general public during several festivals in the county. The display can be independent or combined with the Georgia Forestry Commission display.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, GA Forestry
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #24: Invite the Waycross News Media and area TV and Radio to community “Firewise” Functions for news coverage and regularly submit press releases documenting wildfire risk improvements in Ware County.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #25: Construct overpass to/from the Jamestown community in conjunction with Perimeter Road project, in order to speed evacuation if needed.

<b>Responsible Department</b>	GDOT, CSX, Ware County, City of Waycross
<b>Anticipated Cost</b>	\$15,000,000.00
<b>Existing &amp; Potential Funding Sources</b>	GDOT, CSX, Ware County, City of Waycross, State & Federal Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	New

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

#### **F. Completed And Deleted Action Steps:**

##### Objective 1

- Action Step #5 (“Plan to make modifications to existing Ware County and City of Waycross Fire Stations as needed”) has been completed.
- Action Step #9 (“Plan to acquire property and construct new City of Waycross Fire Stations”) has been completed.

##### Objective 2

- None

##### Objective 3

- Action Step #8 (“Consider the ‘adoption by reference’ of NFPA 1144 Standard for Reducing Structural Ignition Hazards from Wildland Fire and NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas”) has been discontinued because it is covered by other ongoing Action Steps.

#### **G. Unchanged Action Steps:**

##### Objective 1

- Action Step #1
- Action Step #2
- Action Step #3
- Action Step #4
- Action Step #6
- Action Step #7
- Action Step #8

##### Objective 2

- Action Step #1
- Action Step #2

### Objective 3

- Action Step #1
- Action Step #2
- Action Step #3
- Action Step #4
- Action Step #5
- Action Step #6
- Action Step #7
- Action Step #9
- Action Step #10
- Action Step #11
- Action Step #12
- Action Step #13
- Action Step #14
- Action Step #15
- Action Step #16
- Action Step #17
- Action Step #18
- Action Step #19
- Action Step #20
- Action Step #21
- Action Step #22
- Action Step #23
- Action Step #24
- Action Step #25 (renumbered to #8)

## **Section II. Drought**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, drought may cause substantial economic, property, and personal damage in Ware County and the City of Waycross, particularly by increasing the likelihood of wildfires but also in the form of water shortages and crop damage. Its effects can be long-term, with the damage increasing as time goes by. The Ware County HMPUC believes that, due to the damage drought can cause, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce the impact of drought on Ware County and the City of Waycross.

### **B. Identification and Analysis of Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include maintenance of infrastructure, such as water and sewer lines, to maintain the water supply and mitigate post-drought flooding risk.

Non-structural options include distributing literature related to best management practices and encouraging the use of surface water.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. The Community Wildfire Protection Plan outlines strategies for mitigating wildfire damage in the community.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage.

Worksheet #4-STAPLEE Criteria was completed for each Action Step. Please see worksheets contained in Appendix D Section I.

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

#### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

### **C. Drought – Mitigation Strategy and Recommendation:**

***Goal #1: Prevent or reduce damage caused by Drought in Ware County and in the City of Waycross.***

***Objective #1:*** Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Drought.

Action Step #1: Seek input from State and Federal agencies to enact procedures during Drought to limit water usage in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA , Ware County Planning & Code
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Replace antiquated water & sewer lines and equipment prone to failure in unincorporated Ware County and in the City of Waycross through CDBG grant funds and other funds when available.

<b>Responsible Department</b>	Ware County Commission, City of Waycross City Commission, Waycross Water & Sewer Dept., Satilla Regional Water & Sewer Authority
<b>Anticipated Cost</b>	\$500,000.00 each project
<b>Existing &amp; Potential Funding Sources</b>	General Funds, GA DCA CDBG, USDA & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3: Work with the County Extension Agent to distribute literature related to best management practices in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #4: Promote increased usage of surface water and surface artesian flow for irrigation instead of well systems in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

**F. Completed And Deleted Action Steps:**

Objective 1

- None

**G. Unchanged Action Steps:**

Objective 1

- Action Step #1
- Action Step #2
- Action Step #3
- Action Step #4



## **Section III. Thunderstorms and Wind**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, thunderstorms and wind may cause substantial damage to life, property, and the economy in Ware County and the City of Waycross. Thunderstorms and wind are unpredictable and could happen at any place and at any time in Ware County and the City of Waycross. Because these storms may be extremely violent and cause great damage, the HMPUC believes that the comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce the threat of thunderstorm and wind damage in Ware County and the City of Waycross.

### **B. Identification and Analysis of the Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include wind retrofitting of critical facilities and obtaining generators.

Non-structural options include increasing public awareness of shelter locations and sources of emergency warning information and dissemination of other information to the public.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage, especially with regard to the wind retrofitting of historic buildings.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

#### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

### **C. Thunderstorms & Wind – Mitigation Strategy and Recommendation**

*Goal #1:* Prevent or reduce damage caused by Thunderstorms and Winds in Ware County and in the City of Waycross.

*Objective #1:* Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Thunderstorms and Winds.

Action Step #1: Increase public awareness of weather radios, shelters, emergency procedures, and the use of a local radio station as the emergency broadcast system station in Ware County and in the City of Waycross through public safety announcements, publications, and other means.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Plan to wind retrofit Critical Facilities, e.g., with storm windows, ballistic film, storm shutters, and/or hurricane doors, as funds become available to do so.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	\$1,000,000.00 each project
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3: Disseminate information to the public concerning wind ratings and champion new construction being built to those minimum wind standards, and champion the wind retrofitting of existing buildings in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County Planning & Code, City of Waycross Building Inspection Dept.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #4: Obtain mobile and fixed generators (including transfer switches) to provide back-up power where needed.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	\$500,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

**F. Completed And Deleted Action Steps:**

Objective 1

- None

**G. Unchanged Action Steps:**

Objective 1

- Action Step #1
- Action Step #2
- Action Step #3

**H. Revised Action Steps:**

- Action Step #4 (revised to include portable generators and transfer switches)

## **Section IV. Flood**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, flooding may cause substantial damage to life, property, and the economy in Ware County and the City of Waycross. Floods are unpredictable and could happen at any time in any flood-prone area.

Many of these major flooding areas are located on or adjacent to the Satilla River and numerous other creeks and streams. Several areas of Ware County and the City of Waycross are subject to flooding, especially in areas around drainage canals and areas where improved stormwater infrastructure is needed. Flooding regularly occurs in certain areas due to rainfall and other factors. Due to these facts, the Ware County HMPUC believes that the comprehensive range of Mitigation Goals, Objectives, and Action Steps listed below should be implemented to reduce the threat of flood damage in Ware County and the City of Waycross.

### **B. Identification and Analysis of the Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include upgrading drainage facilities, preserving wetland areas, and improving flood protection at water facilities.

Non-structural options include analysis of properties affected by flooding to determine mitigation options, and continued compliance with NFIP.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

The river corridors are protected to the 100 year floodplain and up to 25 feet from the rested edge of the river through zoning. Wetland areas are protected by COE permits. Soil and Sedimentation Control Ordinances are in effect.

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. Ware County and the City of Waycross participate in the National Flood Insurance Program.

Ware County and the City of Waycross do not participate in the Community Rating System (CRS) program. As of 2016, they were not eligible according to FEMA (<http://www.fema.gov/library/viewRecord.do?id=3629>).

All jurisdictions (within the boundaries of their budgets) have the ability to expand and improve their existing policies and programs as evidenced by the new and existing goals, objectives, and action steps included in this plan.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on

the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

There are 12 Critical Facilities that appear in the floodplain, according to GMIS. The GMIS report lists 3 Repetitive Loss Properties in the community. One is in Ware County and two are in the City of Waycross.

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

#### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

### **C. Flood – Mitigation Strategy and Recommendation:**

*Goal #1:* Prevent or reduce damage caused by Floods in Ware County and in the City of Waycross.

*Objective #1:* Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Floods.

Action Step #1: Conduct storm-water drainage replacement, repair & cleaning and maintain canals in Ware County and in the City of Waycross. This will include the following projects:

- 1200 and 1300 Blocks Mary Street - Frequent Street Flooding for Short Durations
- 1300 Block E. L. Saunders Dr - Routine Sink Holes on 72-inch Deteriorated Metal Storm Drain Pipe through Private Property
- 1400 Block Isabella St - Roadway Flooding
- 2700 Block Alice St - Occasional Flooding on Private Properties (Downstream Drainage through Private Properties)
- 501 West Oneida St - Deteriorated Pipe Along Roadway
- 800 Block L Street - Roadway Flooding
- Ava St, Harrison St, Satilla Blvd - Occasional Heavy Flooding
- Bailey St & Thomas St - Frequent Flooding
- Baker Street from Ann Street to Jewel St - Deteriorated 36" Metal Pipe
- Blackshear Ave near Dorothy St - Undersized Pipe Crossing
- Brunel St from Kollock St to Chandler St - Roadway Flooding
- Brunel St from Reynolds St to Chandler St - Undersized Terra Cotta Pipe with Root Intrusion. Frequent Street Flooding.
- Cactus St near Hatcher Point Rd (Outside City) - Roadway and Private Property Flooding

- Cactus Street (Lane) Outside City Limits - Occasional Intense Flooding
- Canal St and Division St - Occasional Intense Flooding
- Carswell Ave between Crawford St and Clinton St - Frequent Flooding
- Carswell Ave near Clinton St - Roadway Flooding
- Carver St & Walter St - Frequent Flooding
- Cedar St & Toomer St - Roadway and Private Property Flooding
- Cedar St and Summit St near Toomer St - Occasional Flooding of Street and Private Property
- Central Ave near St Catherine's Dr - Double 36" Pipe Crossing and Headwall Deteriorated
- City Blvd near Mt Pleasant Rd - Triple 36" Pipe Crossing and Headwall Deteriorated
- Cleo St & Izlar St - Roadway Flooding
- Colley St and Thomas St Crossings - Undersized Pipe, Shallow Drainage Channel
- Daniel St Crossing - Undersized Pipe
- Daniel St near Louise St - Undersized Pipe Crossing
- Dewey St near College St - Pavement Settlement, Undersized Culvert, Need Concrete Box Culvert and/or Retention
- Hamilton Ave & Littleton St - Double 48-inch Pipes Deteriorated and Undersized (Need Concrete Box Culvert)
- Hertson Dr & Sunnyside Dr - Roadway Flooding Adjacent to Private Property with Elevation Below Roadway
- Hunter St & Brad St - Private Property Flooding and Downstream Drainage through Private Properties
- Isabella St near Nicholls St - Private Property Flooding and Downstream Drainage through Private Properties
- Isabella Street crossing Nicholls St through Park - Pipe Running through Private Property and Pipe in Park Deteriorated (Frequent Flooding of Canal in Park)
- Lee Ave, Fireman St, Gilmore St - Private Property Flooding and Downstream Drainage through Private Properties
- Mary St at Park - Canal Flooding inside Park
- Mary St near Crawford St - Roadway Flooding
- Memorial Dr near Ambrose St - Occasional Intense Flooding
- MLK Dr Crossing - Undersized Pipe
- MLK Dr near Louise St - Undersized Pipe Crossing
- MLK Dr to Quarterman St - Potential Retention Site
- MLK Dr to Quarterman St (Parallel to Colley St) - Potential Storm Water Retention Site
- MLK Dr to Quarterman St (Parallel to Colley St) - Storm Drain Pipe Showing Signs of Deterioration
- MLK Dr to Quarterman St. – 60-inch pipe showing signs of deterioration
- Moody St & Spence St - Roadway Flooding
- Oak St to Long Bewick St - Elevation Reversed and Pipe Deteriorated on Private Property
- Ossie Davis Pkwy between Bailey St & Colley St - Roadway and Private Property Flooding
- Ossie Davis Pkwy Crossing - Occasional Flooding
- Patterson St & Thomas St - Frequent Flooding
- Rhoda St near Washington Ave - Frequent Roadway flooding

- Ricardo St - Occasional Canal Flooding onto Private Properties near Homes
- Riverside Ave near Blackshear Ave - Pipe Crossing Deteriorating, Need Concrete Box Culvert
- St Mary's Dr near Florence St - Occasional Heavy Flooding
- Ware St & Carswell Ave - Roadway Flooding
- West Oneida St - Deteriorated Metal Pipe

<b>Responsible Department</b>	Ware County Public Works, City of Waycross Community Development & Public Works Depts.
<b>Anticipated Cost</b>	\$500,000.00 - \$2,000,000 each project
<b>Existing &amp; Potential Funding Sources</b>	General Funds, HUD CDBG & SPLOST
<b>Jurisdiction</b>	Ware County/City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Plan and implement flood and drainage projects in Waycross on Harrison Street (by Ava), Albany Ave., Lee Avenue Railroad Underpass, Memorial Drive Railroad Underpass, on Gilmore Street, Brunel Street, Hamilton Street, Isabella/Folks/Mary Street Park Area, and other flood-prone areas.

<b>Responsible Department</b>	City of Waycross Community Development & Public Works Depts.
<b>Anticipated Cost</b>	\$500,000.00 each project
<b>Existing &amp; Potential Funding Sources</b>	General Funds, HUD CDBG, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Completed: Carswell Street at Railroad Underpass project completed. Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3: Plan and implement flood and drainage projects in Ware County, including Buck Corbitt Road, Mill Creek Road, Twelve Mile Post Road, Duncan Bridge Road, and other flood-prone areas.

<b>Responsible Department</b>	Ware County Public Works Depts.
<b>Anticipated Cost</b>	\$500,000.00 each project



<b>Existing &amp; Potential Funding Sources</b>	General Funds, HUD CDBG, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #4: Attempt to take precautions at water facilities in unincorporated Ware County and in the City of Waycross to insure flood protection, as funds become available to do so.

<b>Responsible Department</b>	Satilla Regional Water & Sewer Authority, City of Waycross Water Dept.
<b>Anticipated Cost</b>	\$500,000.00 each project
<b>Existing &amp; Potential Funding Sources</b>	General Funds, HUD CDBG, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #5: Work to preserve wetland areas in Ware County and the City of Waycross to assure that excess water can be captured.

<b>Responsible Department</b>	Ware County Public Works Dept., City of Waycross Community Development & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, HUD CDBG, DOHS-GEMA/FEMA
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #6: After flood events or other hazard events in Ware County and the City of Waycross, attempt to perform analysis on properties affected to determine if events have occurred in the past and attempt to mitigate, raise levels above 100 year flood plain, or purchase, if necessary.

<b>Responsible Department</b>	Ware County EMA, Ware County Public Works Dept., City of Waycross Community Development & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, HUD CDBG, DOHS-GEMA/FEMA
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #7: Continue compliance with NFIP through review, adoption and updates to flood protection ordinances and maps, and work towards database to record depth of flooding in order to determine extent and possible damage.

<b>Responsible Department</b>	Ware County EMA, Ware County Public Works Dept., City of Waycross Community Development & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #8 (New): Construct new regional retention/detention ponds where needed

<b>Responsible Department</b>	Ware County & City of Waycross Public Works & Engineering Depts.
<b>Anticipated Cost</b>	\$1,000,000
<b>Existing &amp; Potential Funding Sources</b>	General Funds, Grants, Local/State/Federal
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy.**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

#### **F. Completed And Deleted Action Steps:**

##### Objective 1

- None

#### **G. Unchanged Action Steps:**

##### Objective 1

- Action Step #1
- Action Step #2
- Action Step #3
- Action Step #4
- Action Step #5
- Action Step #6
- Action Step #7

#### **H. New Action Steps:**

- Action Step #8

## **Section V. Extreme Heat**

### **A. Brief Narrative of Community Mitigation Goals:**

As previously indicated in Chapter 2, Extreme Heat may cause substantial damage to life, property, and the economy in Ware County and in the City of Waycross. Extreme Heat is usually somewhat predictable, and warnings can be issued for Extreme Heat events (heat waves). Events are usually countywide and can happen at any time, especially during the period surrounding the summer months.

Extreme Heat may cause substantial problems, including injury and death among residents, especially among those who are not adequately prepared for heat waves (those without air conditioning in their homes) and among the very old and very young. The Ware County HMPUC believes that, due to the fact that these Extreme Heat has the potential to cause great damage, this comprehensive range of Mitigation Goals, Objectives, Tasks and Action Steps (contained in Section C below) should be implemented to reduce the threat of Extreme Heat damage in Ware County and the City of Waycross.

### **B. Identification and Analysis of the Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include designating certain locations as emergency shelters and setting up cooling stations.

Non-structural options include identifying locations for cooling stations and promoting the use of emergency shelters.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. The Community Wildfire Protection Plan outlines strategies for mitigating wildfire damage in the community.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

## **C. Extreme Heat – Mitigation Strategy and Recommendation:**

Goal #1: Prevent or reduce damage caused by Extreme Heat in Ware County and in the City of Waycross.

Objective #1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, and eliminate injury or death residents due to Extreme Heat.

Action Step #1: Identify locations for cooling stations and help set up & promote them during periods of Extreme Heat.

<b>Responsible Department</b>	Ware County EMA, Ware County Public Works Dept., City of Waycross Community Development & Public Works Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Continue to identify and designate emergency shelters in consultation with appropriate organizations (Red Cross, Senior Citizen Centers, hospitals, churches, health department, etc.), and promote their use during extreme heat events.

<b>Responsible Department</b>	Ware County EMA, Ware County Public Health Dept.
<b>Anticipated Cost</b>	Staff Time/\$2,500 per location/event
<b>Existing &amp; Potential Funding Sources</b>	Public Health, State funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

#### **F. Completed And Deleted Action Steps:**

##### Objective 1

- None

#### **G. Unchanged Action Steps:**

##### Objective 1

- Action Step #1
- Action Step #2

## **Section VI. Tornado**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, tornadoes may cause substantial damage to life, property, and the economy in Ware County and the City of Waycross. Tornadoes are unpredictable and could happen at any place and at any time. The Ware County HMPUC believes that, because these tornadoes may be extremely powerful and cause great damage, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce the threat of tornado damage in Ware County and the City of Waycross.

### **B. Identification and Analysis of Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include ensuring adequate tie-downs on manufactured homes, and acquiring generators.

Non-structural options include educating the public about shelters and weather alert systems, and developing a system for notifying and checking on at-risk residents.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage, especially with regard to the wind retrofitting of historic buildings.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

#### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

### **C. Tornado – Mitigation Strategy and Recommendation:**

***Goal #1: Prevent or reduce damage caused by Tornadoes in Ware County and in the City of Waycross.***

Objective #1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Tornadoes.

Action Step #1: Use building inspection program to inspect for adequate tie-downs on manufactured housing in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County Planning & Code, Ware County/City of Waycross Building Inspection Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Plan for pre-disaster mitigation in Tornado & other hazard seasons by preparing public service announcements, brochures and solicit business participation in distributing information.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.



Action Step #3: Promote identification and designation of safe shelter rooms if available in Critical Facilities.

<b>Responsible Department</b>	Ware County EMA, Ware County Planning & Code, City of Waycross Community Development Dept.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #4: Obtain mobile and fixed generators (including transfer switches) to provide back-up power where needed.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Fire Depts.
<b>Anticipated Cost</b>	\$500,000 each
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

**F. Completed And Deleted Action Steps:**

Objective 1

- None

**G. Unchanged Action Steps:**

Objective 1

- Action Step #1
- Action Step #2
- Action Step #3

**H. Revised Action Steps:**

- Action Step #4 (revised to include portable generators and transfer switches)

## **Section VII. Hail**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, hail may cause substantial economic, property, and personal damage in Ware County and the City of Waycross. Hail is unpredictable and could happen at any place and at any time. The Ware County HMPUC believes that, due to the damage hail may cause, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce the threat of hail damage in Ware County and the City of Waycross.

### **B. Identification and Analysis of Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include installation of storm windows or ballistic film on critical facilities.

Non-structural options include encouraging the public to include hail damage in their insurance coverage and to store vehicles and other equipment in covered locations.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

#### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

### **C. Hail – Mitigation Strategy and Recommendation**

#### ***Goal #1: Prevent or reduce damage caused by Hail in Ware County and in the City of Waycross.***

Objective #1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Hail.

Action Step #1: Install storm windows, ballistic film, storm shutters, and/or hurricane doors on new and existing Critical Facilities and encourage their installation on new and existing private buildings in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA, Ware County Planning & Code, City of Waycross Community Development Dept., Ware County/City of Waycross Public Works Depts.
<b>Anticipated Cost</b>	\$125,000.00 per building
<b>Existing &amp; Potential Funding Sources</b>	General Funds & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Encourage the public to include hail damage under insurance coverage and store equipment and vehicles under shelters in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA, City of Waycross
<b>Anticipated Cost</b>	Staff time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

#### **F. Completed And Deleted Action Steps:**

- None

#### **G. Unchanged Action Steps:**

- Action Step #1
- Action Step #2

## **Section VIII. Hurricanes/Tropical Storms**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, hurricanes/tropical storms may cause substantial damage to life, property, and the economy in Ware County and the City of Waycross. They are usually accompanied by some advanced notice, giving the community time to prepare and/or evacuate. The Ware County HMPUC believes that, because these hurricanes/tropical storms have the potential to cause great damage, injury, and loss of life, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce the threat of hurricane/tropical storm damage in the community.

### **B. Identification and Analysis of Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include encouraging the design of new educational facilities to the level that they could be used as public shelters; acquiring additional road signage and electronic message boards; and improving unsafe roads for evacuation purposes.

Non-structural options include educating the public about procedures necessary during hurricanes and tropical storms, upgrading 911 capabilities, and purchasing communications equipment.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage, especially with regard to the wind retrofitting of historic buildings.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

## 5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

### **C. Hurricane/Tropical Storm – Mitigation Strategy and Recommendation**

***Goal #1: Prevent or reduce damage caused by Hurricanes/Tropical Storms in Ware County and in the City of Waycross.***

Objective #1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, and the public, due to Hurricanes/Tropical Storms.

Action Step #1: Encourage the design of new educational facilities to the level that they could be used as public shelters for emergency purposes; test current shelters and educational facilities for safety and effectiveness in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA, Ware County BOE, Ware County Planning & Code, City of Waycross Community Development Dept.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA, Red Cross
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Work with GDOT to improve unsafe roads in Ware County and the City of Waycross that already are, or could be, evacuation routes.

<b>Responsible Department</b>	Ware County/City of Waycross Road Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds, GDOT, FHWA, SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3 Designate and attempt to supply new Red Cross Shelters and maintain an operating Red Cross office in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	\$100,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA, Red Cross
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Objective #2: Advise the public of health & safety precautions and procedures necessary during Hurricanes/Tropical Storms and other events and on pre-disaster mitigation, in general, in Ware County and in the City of Waycross.

Action Step #1: Acquire and distribute literature from state agencies regarding disaster health & safety issues in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Work with GDOT to acquire additional road signage for emergency traffic circulation and publish most efficient routes in advance.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Road Depts.
<b>Anticipated Cost</b>	\$20,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.



Action Step #3: Distribute information concerning pre-disaster mitigation to area news markets and by speaking at schools and civic clubs in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #4: Order electronic message boards for emergency purposes & evacuations.

<b>Responsible Department</b>	Ware County EMA, Ware County/City of Waycross Road Depts.
<b>Anticipated Cost</b>	\$32,000.00 each
<b>Existing &amp; Potential Funding Sources</b>	General Funds & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	6 acquired; more needed. Ongoing – Extended beyond 5-year time period due to importance.

Action Step #5 (new): Acquire portable 80-foot communications tower

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	\$60,000
<b>Existing &amp; Potential Funding Sources</b>	General Funds, Grants
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

Action Step #6 (new): Acquire 2 portable restroom/shower trailers

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	\$60,000
<b>Existing &amp; Potential Funding Sources</b>	General Funds, Grants
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

Action Step #7 (new): Acquire portable walk-in cooler

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	\$50,000
<b>Existing &amp; Potential Funding Sources</b>	General Funds, Grants
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

Objective #3: Ensure reliable electrical power and communications efficiency at Critical Facilities and among agencies during Hurricanes/Tropical Storms and other events in Ware County and the City of Waycross.

Action Step #1: Purchase portable and fixed generators and trailers (including transfer switches) for use at Critical Facilities (serving entire populations) and pre-wire Critical Facilities for generator use in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA
<b>Anticipated Cost</b>	\$500,000 each
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA, Red Cross & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Purchase communications equipment (radios, pagers, batteries and chargers) that have multi-channel capabilities and store them at certain Critical Facilities in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County EMA, Ware County Sheriff's Dept., Ware County EMS, Waycross Police Dept.
<b>Anticipated Cost</b>	\$125,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3: Purchase and install VHF networking system between City and County services.

<b>Responsible Department</b>	Ware County EMA, Ware County Sheriff's Dept., Ware County EMS, Waycross Police Dept.
<b>Anticipated Cost</b>	\$1,500,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, DOHS-GEMA/FEMA & SPLOST
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #4: Continue and expand Emergency Notification System

<b>Responsible Department</b>	Ware County EMA, Public Safety depts.
<b>Anticipated Cost</b>	\$20,000.00 per year
<b>Existing &amp; Potential Funding Sources</b>	General Funds, Grants, Local/State/Federal
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	New

Action Step #5: Construct overpass to/from the Jamestown community in conjunction with Perimeter Road project, in order to speed evacuation if needed.

<b>Responsible Department</b>	GDOT, CSX, Ware County, City of Waycross
<b>Anticipated Cost</b>	\$15,000,000.00
<b>Existing &amp; Potential Funding Sources</b>	GDOT, CSX, Ware County, City of Waycross, State & Federal Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

Action Step #6: Upgrade/enhance 911 capabilities to the most current technology.

<b>Responsible Department</b>	EMA, Ware County, City of Waycross
<b>Anticipated Cost</b>	\$500,000.00
<b>Existing &amp; Potential Funding Sources</b>	General Funds, Grants, Local/State/Federal
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	New

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

**F. Completed And Deleted Action Steps:**

Objective 1

- None

Objective 2

- None

Objective 3

- None

**G. Unchanged Action Steps:**

Objective 1

- Action Step #1
- Action Step #2
- Action Step #3

Objective 2

- Action Step #1
- Action Step #2
- Action Step #3
- Action Step #4

Objective 3

- Action Step #1
- Action Step #2
- Action Step #3

**H. New Action Steps:**

Objective 2

- Action Step #5
- Action Step #6
- Action Step #7

Objective 3

- Action Step #4
- Action Step #5
- Action Step #6
-

## **Section IX. Severe Winter Storm**

### **A. Community Mitigation Goals**

As previously indicated in Chapter 2, severe winter storms may cause substantial economic, property, and personal damage in Ware County and the City of Waycross. Severe winter storms are usually predictable ahead of time, but they can happen in any part of Ware County and the City of Waycross during the period surrounding the winter months.

Severe winter storms may cause substantial problems. Ware County and the City of Waycross do not have the specialized equipment used during severe winter storms that most northern counties and cities possess. The Ware County HMPUC believes that, due to the damage these severe winter storms have the potential to cause, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce the threat of severe winter storm damage in Ware County and the City of Waycross.

### **B. Identification and Analysis of Comprehensive Range of Mitigation Options**

#### **1. Structural and Non-Structural Mitigation:**

Structural options in this plan include wrapping exposed pipes and adding insulation at critical facilities, championing new construction being built to appropriate low temperature ratings, and championing existing buildings being retrofitted.

Non-structural options include disseminating information to the public concerning severe winter storms and maintaining temperatures over 32 degrees during freezes in government facilities.

#### **2. Existing Policies, Regulations, Ordinances and Land Use:**

Ware County and the City of Waycross currently operate in compliance with the standards of the 2012 International Building Code. Both jurisdictions have building inspection programs and zoning ordinances. Both jurisdictions are served by the joint Waycross-Ware County Planning Commission. No other trends regarding the relationship between land use/development and this hazard have been identified at this time.

#### **3. Community Values, Historic and Special Considerations:**

Ware County and the City of Waycross have two historic districts (Downtown Waycross Historic District and Waycross Historic District) and several other properties that are on the National Register of Historic Places, including the U.S. Post Office and Courthouse, Lott Cemetery, the First African Baptist Church and Parsonage, and the Obediah Barber Homestead. There are historic and special considerations that pose significant challenges with regard to mitigating damage, especially with regard to the wind retrofitting of historic buildings.

Worksheet #4: STAPLEE Criteria was completed for each Action Step (see Appendix D Section I).

#### **4. New Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

#### **5. Existing Buildings and Infrastructure:**

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

### **C. Severe Winter Storm – Mitigation Strategy and Recommendation:**

***Goal #1: Prevent or reduce damage caused by Severe Winter Storms in Ware County and the City of Waycross.***

Objective #1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Severe Winter Storms.

Action Step #1: Continue the policy of wrapping exposed piping with insulation and installing new insulation layers at critical facilities in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County City of Waycross Public Works Depts.
<b>Anticipated Cost</b>	\$5,000.00 a year
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	High
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #2: Maintain temperatures above 32 degrees to prevent freezing in government owned occupied and unoccupied structures in Ware County and the City of Waycross.

<b>Responsible Department</b>	Ware County City of Waycross Public Works Depts.
<b>Anticipated Cost</b>	\$15,000.00 a year
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

Action Step #3: Disseminate information to the public concerning Severe Winter Storms, champion new construction being built to appropriate low temperature ratings and existing buildings being retrofitted in Ware County and in the City of Waycross.

<b>Responsible Department</b>	Ware County Planning & Code, Ware County/City of Waycross Building Inspection Depts.
<b>Anticipated Cost</b>	Staff Time
<b>Existing &amp; Potential Funding Sources</b>	General Funds
<b>Jurisdiction</b>	Ware County, City of Waycross
<b>Timeframe</b>	2018-2023
<b>Priority</b>	Medium
<b>Status</b>	Ongoing – Extended beyond 5-year time period due to importance.

#### **D. Special Multi-Jurisdictional Strategy and Considerations:**

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

#### **E. Local Public Information and Awareness Strategy:**

All sections of the Plan shall be monitored and evaluated annually by the Ware County EMA. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (TV, Web Site, Local Newspaper, City Council Meetings, County Commission meetings, City Commission meetings, social media, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

#### **F. Completed And Deleted Action Steps:**

- None

#### **G. Unchanged Action Steps:**

- Action Step #1
- Action Step #2
- Action Step #3



## **Chapter 5.**

### **Local Technological/Man-Made Hazard**

### **Mitigation Goals and Objectives**

Summary of changes:

- This is the first Ware County and City of Waycross Hazard Mitigation Plan Update to include this chapter.

#### **I. Public Health Emergency**

##### **A. Community Mitigation Goals**

The goal of this plan is to reduce the potential loss of life, health, and productivity that may arise from a public health emergency.

##### **B. Identification & Analysis of Range of Mitigation Options**

1. **Structural and non-structural** – The non-structural mitigation options for mitigating this hazard include improving educational and awareness activities to increase the public’s knowledge of the danger and actions to take when they occur. Increase mosquito control efforts, including public awareness with regard to the hazards posed by standing water in containers, tires, etc., is a non-structural option that could help to reduce the likelihood of a severe mosquito-borne illness outbreak.
2. **Existing policies, regulations, ordinances and land use** – As required by Georgia law, Ware County, and the City of Waycross have each adopted comprehensive plans in accordance with the Minimum Planning Standards promulgated by the Georgia Department of Community Affairs. State and federal laws and regulations are applicable with regard to matters of public health.
3. **Community values, historic & special considerations** – none identified.
4. **New buildings and Infrastructure** – The risk from a public health emergency is mainly to the residents of Ware County and not to buildings and infrastructure. Therefore, the mitigation strategy and recommendations that follow include action steps designed to protect the health and safety of the general public, rather than new buildings and infrastructure.
5. **Existing Buildings and Infrastructure** – As noted above, the risk from a public health emergency is mainly to the residents of Ware County and not to buildings and infrastructure.

##### **C. Mitigation Strategy and Recommendation**

1. **Mitigation Goal** – Protect the population of Ware County from the effects of a public health emergency.

Action Step	Responsible Department	Est. Cost	Funding Sources	Jurisdiction	Timeframe	Priority	Status
<b>Objective #1 - Secure external sources of funding and training to help prepare for and respond to events.</b>							
Increase Immunization education, prevention and pre-planning efforts, particularly for the homeless and low-income individuals in the community, and host flu shot and other immunization clinics.	Health Department	\$100,000	General Funds, GEMA, FEMA, Health Department	Ware County and City of Waycross	2018-2023	High	New
Identify vulnerable populations (homeless, migrants, low income, etc.) and identify community groups to work with in order to reach and educate these populations effectively regarding health issues.	EMA, Health Department	Staff time	General Funds, GEMA, FEMA	Ware County and City of Waycross	2018-2023	High	New
Develop plan to identify community locations to obtain and distribute Water, Food, Ice, Tarps, medical countermeasures, etc.	EMA	Staff time	General Funds, GEMA	Ware County and City of Waycross	2018-2023	Medium	New
Develop Local Emergency Planning Committee	EMA	Staff time	General Funds	Ware County and City of Waycross	2018-2023	Medium	New
Approach large businesses about working with the EMA on developing public health emergency plans.	Health Dept.	Staff time	General Funds	Ware County and City of Waycross	2018-2023	Medium	New

#### **D. Special Multi-Jurisdictional Strategy and Considerations**

All of Ware County and the City of Waycross could be significantly affected by a public health emergency. There are no special considerations with regard to jurisdictional differences. The Action Steps above are to be implemented county-wide and there is no difference in strategy between jurisdictions.

#### **E. Local public information and awareness strategy**

The Public Information Officers within each jurisdiction will continue to assist with the public education and awareness aspects of this plan. By utilizing available resources, such as television, radio, newsprint, government websites, and mass communication technology (social media, telephone, email), etc., they will be able to keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

#### **F. Completed and deleted action steps**

None (action steps are new as of the 2018 plan update).

#### **G. Unchanged action steps**

None (action steps are new as of the 2018 plan update).

## **II. CBRNE**

### **A. Community Mitigation Goals**

Much of the existing mitigative technology and equipment employed during CBRNE incidents is portable and cost-prohibitive for medium to small communities. For these reasons it is important that the community not only develop local capacity as appropriate, but coordinate capacity-building with other communities to share the associated expenses among a larger user base.

### **B. Identification and Analysis of Range of Mitigation Options**

- 1. Structural and Non-structural** – Although structural and non-structural options are available, structural measures are primarily private sector options while non-structural mitigation options are the public sector’s primary option. The type and mobility of most measures available to the public sector classifies them as non-structural.
- 2. Existing Policies, Regulations, Ordinances and Land Use** – Very little in the way of existing policies and regulations could be identified which affects hazardous materials handling by the private sector. Local entities are required to file Material Safety Data Sheets with the host jurisdiction informing local officials of the types of hazardous chemicals on site. The community does have traffic laws which, when rigidly enforced, are a mitigation tool. Most commercial carriers including railroads employ hazardous materials routing software, but any such transport is usually not shared with the jurisdiction they traverse.
- 3. Community Values, Historic and Special Considerations** – Quality of life is a primary concern to residents, and the threats posed by hazardous materials compromise, and if serious enough, jeopardize local conditions.
- 4. New Buildings and Infrastructure** -- Any new buildings and infrastructure should be built with man-made/technological hazards mitigation incorporated in the design. The mitigative actions for man-made/technological hazards include maintaining contact with other state and local emergency agencies to share expertise on handling man-made/technological hazard events.
- 5. Existing Buildings and Infrastructure** -- Any existing buildings and infrastructure should be improved with technological hazards mitigation incorporated into any renovations. The mitigative actions for technological hazards include maintaining contact with other state and local emergency agencies to share expertise on handling technological hazard events.

## **C. Mitigation Strategy and Recommendation**

### **1. Mitigation Goal #1 - Be prepared to respond appropriately to any foreseeable CBRNE hazard event.**

<b>Action Step</b>	<b>Responsible Department</b>	<b>Est. Cost</b>	<b>Funding Sources</b>	<b>Jurisdiction</b>	<b>Timeframe</b>	<b>Priority</b>	<b>Status</b>
<b>Objective #1 - Secure external sources of funding and training to help prepare for and respond to events.</b>							
Network with emergency personnel staff at state and federal levels to help identify the “full range” of CBRNE risks and local needs in preparation for the availability of outside funding.	EMA	Staff Time	Annual Budget	All Jurisdictions	2018-2023	Medium	NEW
Submit competitive applications to fund equipment/training needs when potential funding sources are identified in Ware County	EMA	Staff Time	Annual Budget	All Jurisdictions	2018-2023	Medium	NEW
Develop a relationship with owners of hazardous materials storage (tires etc.) to educate/encourage them to develop a plan for hazardous events.	EMA	Staff Time	Annual Budget	All Jurisdictions	2018-2023	High	NEW
Annually review & update mutual aid agreements with neighboring jurisdictions	EMA	Staff Time	Annual Budget	All Jurisdictions	2018-2023	High	NEW
Provide first responders, fire, EMS and law enforcement with the equipment needed to prepare for and respond to events	EMA, Fire, Law Enforcement, EMS	\$1 M a year	DOJ, GEMA, FEMA	All Jurisdictions	2018-2023	High	NEW

## **D. Special Multi-Jurisdictional Strategy**

These action steps are applicable communitywide but are needed especially where most development occurs and where transportation networks, such as major highways and railroads, intersect.

#### **E. Public Information and Awareness**

The Public Information Officers within each jurisdiction will continue to assist with the public education and awareness aspects of this plan. By utilizing available resources, such as television, radio, newsprint, government websites, and mass communication technology (social media, telephone, email), etc., they will be able to keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

#### **F. Completed and deleted action steps**

None (action steps are new as of the 2018 plan update).

#### **G. Unchanged action steps**

None (action steps are new as of the 2018 plan update).

## **Chapter 6:** **Executing The Plan**

### **Summary of changes:**

- Revised and updated language.

## **Section I.** **Implementation of the Action Plan**

### **A. Administrative Actions**

The meetings, planning process, prioritizing, etc. of the Ware County HMPUC have been overseen by the Ware County Emergency Management Agency. The Southern Georgia Regional Commission contracted with the Ware County Commission to administer and facilitate the planning process. The Ware County Commission and the City of Waycross will adopt the Plan (on approval by GEMA and FEMA) by the resolution(s) contained in Appendix E.

### **B. Authority and Responsibility**

The Ware County Commission and the City of Waycross have authorized the submission of this Plan to both GEMA and FEMA for approval.

As determined by the Ware County Commission, the City of Waycross, and the Ware County HMPUC, the Ware County EMA Director will be responsible for this Plan and its continued usage as a planning document. The EMA Director will oversee implementation, monitoring, and updates for both jurisdictions (Ware County and the City of Waycross). The respective jurisdictions will be responsible for the implementation of the specific mitigation activities proposed in this plan.

### **C. Prioritization**

#### **1. Methodology for Prioritization**

In prioritizing the implementing of action steps identified in this plan, those hazards deemed to pose the greatest threat will be given the primary consideration. In prioritizing the implementation feasibility of the action steps and projects, local governments will take into consideration the additional factors of cost and time. Those activities requiring little cost and staff time to implement will be given highest implementation priority. Those steps requiring additional funding for equipment or staff time beyond the normal budgets of the communities will be incorporated into the budget process when possible based on the cost-benefit analysis described below.

#### **2. Use of Cost Benefit Analysis**

The data provided in Worksheet #3 will be utilized to quantify the number of persons and/or property at risk from each hazard. Combined with the criteria in Worksheet #4, this will allow local governments to assess the potential value of at-risk properties and the resulting benefits from the proposed action steps.

In prioritizing projects, the local governments will also utilize cost benefit analysis (CBA) to evaluate the feasibility of a major project. CBA is a well-established method for quantitatively comparing the benefits and costs of mitigation projects. The end result is a Benefit-Cost Ratio (BCR), which is derived from a project's total net present value of benefits divided by the total project cost estimate, which must include all documented project and maintenance costs. The benefits of mitigation projects are avoided damages, disruptions, losses, and casualties. Examples of common benefits include avoided or reduced damages to buildings, contents or infrastructure; economic impacts of loss of function of buildings; displacement costs for temporary quarters; loss of public services; loss of net business income; economic impacts of loss of function of infrastructure; road or bridge closures; loss of utility services; and deaths and injuries.

### **3. Use of Other Calculations**

Availability of potential funding sources, overall feasibility, measurable milestones, multiple objectives, both public and political support for the proposed actions, and the STAPLEE criteria were additional calculations performed.

### **4. Use of Other Review Structure**

In addition to the cost benefit analysis, other factors that may affect the prioritization of projects include the availability of special tax, grant and/or loan funds which become available on a limited basis to finance implementation, such as SPLOST funds or FEMA Pre-Disaster Mitigation Program funds.

## **D. Incorporation of Local PDM Plan Into Other Plans/Planning Measures**

This Plan will be reviewed by Ware County and the City of Waycross. The requirements of this Hazard Mitigation Plan will be taken into consideration and will be incorporated into Comprehensive Plans, Five Year Short-Term Work Program, Capital Improvement Plans, Local Emergency Operations Plans, and all other such Plans as appropriate.

The previous Ware County and City of Waycross Hazard Mitigation Plan was used as a basis for the present update. The HMPUC reviewed all the individual parts of the prior plan and updated these elements through open discussion in which updates were noted by SGRC staff, who then used notes from the workshops to update the new Hazard Mitigation Plan document.

Once this plan is approved, it will be used by the consultants and planning committees responsible for the update process for the County and City Comprehensive Plans, Short-Term Work Programs, and all other plans that could incorporate the requirements of this plan.

To facilitate inclusion of this Plan, the Ware County Commission and the City of Waycross will provide a copy of this Plan to the persons and/or committees responsible for writing and updating plans.



## **Section II.**

### **Evaluation and Monitoring**

#### **A. Method**

The Ware County EMA Director will be charged with ensuring that this plan is monitored and periodically updated in subsequent years. The method that the Waycross-Ware County EMA will use to monitor the plan and evaluate implementation progress will be the following:

- The Ware County EMA will conduct quarterly telephone interviews with the various local governments and area agencies in order to chart their plan progress.
- The EMA Director will hold formal public meetings at least once a year to monitor the progress of the plan implementation and allow the public a forum for expressing concerns, opinions, and ideas.
- Throughout the year, a series of informal meetings will be held in which various aspects of the plan, including monitoring and evaluation, are discussed.

#### **B. Criteria Used To Monitor and Evaluate the Plan**

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property.

## **Section III.**

### **Plan Update and Maintenance**

#### **A. Public Involvement**

Because the Hazard Mitigation Plan is intended to help ensure a safe and livable environment for all Ware County and City of Waycross residents, it is imperative that public involvement be an integral part of the planning process.

Since adoption of the original Ware County Pre-Disaster Mitigation Plan, citizens have been kept involved and apprised of plan progress through such forums as regularly scheduled Commissioner meetings, public hearings, and applicable newspaper coverage. This same level of public education and awareness and citizen involvement will continue over the next five years until the next required update of the Hazard Mitigation Plan. When specific issues dictate, public hearings will be conducted, and all other community planning efforts (Comprehensive Plan, Regional Plan, etc.) will afford citizens the opportunity to participate in and comment on the need to incorporate hazard mitigation initiatives.

To facilitate the goal of continued public involvement in the planning process, the EMA will assure that the following steps are taken:

- The public will be directly involved in the update and review of the plan as members of the Pre-Disaster Mitigation Planning Committee.

- Copies of the plan will be kept on hand at appropriate agencies throughout Ware County.
- The plan will be available on City, County, and/or Regional Commission websites, and will contain an e-mail address and phone number the public can use for submitting comments and concerns about the plan.
- A public meeting will be held annually to provide the public with a forum for expressing concerns, opinions, and ideas. The EMA will set meeting schedules and dates and use County resources to publicize and host this meeting.

## **B. Timeframe**

Pursuant to the requirements set forth in the Disaster Mitigation Act of 2000, the community is again required to update and evaluate the plan no more than five years after its adoption. At least one year prior to the end of the required five-year update period, the EMA Director will begin the planning process for a new update to this plan. This will consist of establishing a new planning committee that will be tasked with completing the update following the same process used for this update.

No later than the conclusion of the five-year period following approval of the plan update, the Ware County EMA Director shall submit a revised Hazard Mitigation Plan to GEMA for its approval. It is important to note that the plan update process, as established by the planning committee, is subject to change, depending upon subsequent regulations and/or requirements set forth by GEMA and FEMA.

## **Chapter 7:** **Conclusion**

### Summary of changes:

- Revised and updated language.

Ware County and the City of Waycross have suffered considerable damage in the past from natural hazards. Planning ahead and undertaking structural and nonstructural action steps before a disaster occurs can save lives and property. This philosophy has been the driving force behind the preparation of the Ware County Hazard Mitigation Plan.

Education of the population and enhanced warning can decrease the vulnerability of the county's citizens and visitors. Continued and improved public information and communication with the population are important parts of this plan. Because of this planning process, Ware County and City of Waycross officials have gained a better understanding of the natural and man-made hazards affecting our community.

As a result of the planning process described in Chapter 1 and the hazard, risk, and vulnerability assessment in Chapter 2, Ware County and the City of Waycross have a realistic perspective on the hazards to which the community is exposed. With the mitigation strategy outlined in Chapter 4, and the implementation plan included in Chapter 6, the local leaders have an "action plan" to follow when allocating resources to reduce their community's vulnerability to such hazards.

## **References**

- Ware County Board of Tax Assessors (<http://www.qpublic.net/ga/ware/>)
- City of Waycross (<http://www.waycrossga.com/>)
- Ware County (<http://www.warecounty.com/>)
- Federal Emergency Management Agency ([www.fema.gov](http://www.fema.gov))
- FEMA National Flood Insurance Program Community Status Book  
(<https://www.fema.gov/national-flood-insurance-program-community-status-book>)
- Georgia Emergency Management Agency, Georgia Mitigation Information System  
(<https://apps.itos.uga.edu/GEMA.GMIS/>)
- Georgia Emergency Management and Homeland Security Agency (<http://www.gema.ga.gov/>)
- Georgia Forestry Commission ([www.gatrees.org](http://www.gatrees.org))
- National Oceanic and Atmospheric Administration, National Climatic Data Center, Storm Events Database (<http://www.ncdc.noaa.gov/stormevents/>)
- Southern Georgia Regional Commission ([www.sgrc.us](http://www.sgrc.us))
- U.S. Drought Monitor (<http://droughtmonitor.unl.edu/>)
- United States Census Bureau ([www.census.gov](http://www.census.gov))

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- 4a. Drought – UNL Drought Monitor data
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6. Hurricane/Tropical Storm – NCDC data
7. Hail – NCDC data
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II. Critical Facilities Inventory

**Appendix G. HAZUS Report**