

APPENDIX C

OTHER PLANNING DOCUMENTS

Jenkins County Emergency Management Agency Emergency Operations Plan

Plan Approved:
15-OCT-08

Revised:
25-JUN-13

RECORD OF REVISIONS

Date	Author	Section	Detail
06-25-2013 09:20:30	Jenkins	ESF 15	
06-25-2013 09:19:03	Jenkins	ESF 14	
06-25-2013 09:17:36	Jenkins	ESF 13	
06-25-2013 09:08:19	Jenkins	ESF 12	
06-25-2013 09:07:03	Jenkins	ESF 11	
06-25-2013 09:05:20	Jenkins	ESF 10	
06-25-2013 09:03:45	Jenkins	ESF 9	
06-25-2013 09:02:16	Jenkins	ESF 8	
06-25-2013 09:00:38	Jenkins	ESF 7	
06-25-2013 08:59:21	Jenkins	ESF 6	
06-25-2013 08:57:48	Jenkins	ESF 5	
06-25-2013 08:56:29	Jenkins	ESF 4	
06-25-2013 08:54:49	Jenkins	ESF 3	
06-25-2013 08:53:30	Jenkins	ESF 2	
06-25-2013 08:51:57	Jenkins	ESF 1	
06-23-2013 08:34:28	Jenkins	Agencies	
06-23-2013 08:33:18	Jenkins	Agencies	
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10-15-2008 08:23:44	Cray	ESF 5	
10-15-2008 08:23:09	Cray	ESF 8	
10-15-2008 08:22:35	Cray	ESF 10	
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10-15-2008 08:21:19	Cray	ESF 13	
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05-25-2007 01:26:29	Jenkins	Esf6	
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Distribution List

Agency	Number of Copies
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City of Millen	1
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City of Millen Public Works Department	1
City of Millen Utilities Department	1
Jenkins County 911	1
Jenkins County Board of Commissioners	1
Jenkins County Coroner	0
Jenkins County DeFACS	1
Jenkins County EMA	0
Jenkins County Emergency Management Agency	1
Jenkins County Emergency Medical Services	1
Jenkins County Extension Service	1
Jenkins County Health Department	1
Jenkins County Memorial Hospital	1
Jenkins County Road Department	1
Jenkins County Sheriff's Department	1
Millen Police Department	1
Millen/Jenkins County Fire-Rescue	1
North Jenkins VFD	0
Planter's Electric	1
South Jenkins VFD	0

Jenkins County
EMERGENCY OPERATIONS PLAN

Local Resolution

Record of Revisions

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PREFACE

This Emergency Operations Plan (EOP) describes the management and coordination of resources and personnel during periods of major emergency. This comprehensive local emergency operations plan is developed to ensure mitigation and preparedness, appropriate response and timely recovery from natural and man made hazards which may affect residents of Jenkins County.

This plan supersedes the Emergency Operations Plan dated from old eLEOP. It incorporates guidance from the Georgia Emergency Management Agency (GEMA) as well as lessons learned from disasters and emergencies that have threatened Jenkins County. The Plan will be updated at the latest, every four years. The plan:

- Defines emergency response in compliance with the State-mandated Emergency Operations Plan process.
- Establishes emergency response policies that provide Departments and Agencies with guidance for the coordination and direction of municipal plans and procedures.
- Provides a basis for unified training and response exercises.

The plan consists of the following components:

- The Basic Plan describes the structure and processes comprising a county approach to incident management designed to integrate the efforts of municipal governments, the private sector, and non-governmental organizations. The Basic Plan includes the: purpose, situation, assumptions, concept of operations, organization, assignment of responsibilities, administration, logistics, planning and operational activities.
- Appendices provide other relevant supporting information, including terms, definitions, and authorities.
- Emergency Support Function Annexes detail the missions, policies, structures, and responsibilities of County agencies for coordinating resource and programmatic support to municipalities during Incidents of Critical Significance.
- Support Annexes prescribe guidance and describe functional processes and administrative requirements necessary to ensure efficient and effective implementation of incident management objectives.
- Incident Annexes address contingency or hazard situations requiring specialized application of the EOP. The Incident Annexes describe the missions, policies, responsibilities, and coordination processes that govern the interaction of public and private entities engaged in incident management and emergency response operations across a spectrum of potential hazards. Due to security precautions and changing nature of their operational procedures, these Annexes, their supporting plans, and operational supplements are published separately.

The following is a summary of the 15 Emergency Support Functions:

1. *Transportation*: Support and assist municipal, county, private sector, and voluntary organizations requiring transportation for an actual or potential Incident of Critical Significance.
2. *Communications*: Ensures the provision of communications support to municipal, county, and private-sector response efforts during an Incident of Critical Significance.
3. *Public Works and Engineering*: Coordinates and organizes the capabilities and resources of the municipal and county governments to facilitate the delivery of services, technical assistance, engineering expertise, construction management, and other support to prevent, prepare for, respond to, and/or recover from an Incident of Critical Significance.
4. *Firefighting*: Enable the detection and suppression of wild-land, rural, and urban fires resulting from, or occurring coincidentally with an Incident of Critical Significance.
5. *Emergency Management Services*: Responsible for supporting overall activities of the County Government for County incident management.
6. *Mass Care, Housing and Human Services*: Supports County-wide, municipal, and non-governmental organization efforts to address non-medical mass care, housing, and human services needs of individuals and/or families impacted by Incidents of Critical Significance.
7. *Resource Support*: Supports volunteer services, County agencies, and municipal governments tracking, providing, and/or requiring resource support before, during, and/or after Incidents of Critical Significance.
8. *Public Health and Medical Services*: Provide the mechanism for coordinated County assistance to supplement municipal resources in response to public health and medical care needs (to include veterinary and/or animal health issues when appropriate) for potential or actual Incidents of Critical Significance and/or during a developing potential health and medical situation.
9. *Search and Rescue*: Rapidly deploy components of the National US Response System to provide specialized life-saving assistance to municipal authorities during an Incident of Critical Significance.
10. *Hazardous Materials*: Coordinate County support in response to an actual or potential discharge and/or uncontrolled release of oil or hazardous materials during Incidents of Critical Significance.
11. *Agriculture and Natural Resources*: supports County and authorities and other agency efforts to address: Provision of nutrition assistance; control and eradication of an outbreak of a highly contagious or economically devastating animal/zoonotic

disease; assurance of food safety and food security and; protection of natural and cultural resources and historic properties.

12. *Energy*: Restore damaged energy systems and components during a potential of actual Incident of Critical Significance.
13. *Public Safety and Security Services*: Integrates County public safety and security capabilities and resources to support the full range of incident management activities associated with potential or actual Incidents of Critical Significance.
14. *Long Term Recovery and Mitigation*: Provides a framework for County Government support to municipal governments, nongovernmental organizations, and the private sector designed to enable community recovery from the long-term consequences of an Incident of Critical Significance.
15. *External Affairs*: Ensures that sufficient County assets are deployed to the field during a potential or actual Incident of Critical Significance to provide accurate, coordinated, and timely information to affected audiences, including governments, media, the private sector, and the populace.



Georgia Emergency Operation Plan




2017

Approval and Implementation

The Georgia Emergency Management and Homeland Security Agency maintains the Georgia Emergency Operations Plan and presents the plan to the Governor for adoption once every four years, at a minimum.

The Georgia Emergency Operations Plan was developed by the Georgia Emergency Management and Homeland Security Agency, in coordination with other state agencies, non-governmental organizations and private sector partners and is aligned with the National Incident Management System as well as the National Response Framework and the National Disaster Recovery Framework. In addition, Georgia Emergency Management and Homeland Security Agency modified the Georgia Emergency Operations Plan, its appendices, Emergency Support Function Annexes and Support and Hazard Specific Annexes incorporate lessons learned from exercises, training, incidents and events.

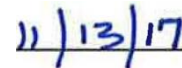
This plan supersedes the Georgia Emergency Operation Plan dated January 2013.



Homer Bryson

Director

Georgia Emergency Management and
Homeland Security Agency



Date

Executive Summary

Georgia is vulnerable to a variety of hazards as identified in the State's Hazard Mitigation Strategy Plan. Thus the Georgia Emergency Operations Plan is written for the entire State Disaster Response Team, to include, but not limited to: all executives, state emergency management personnel, Private-Sector Partners, Non-Governmental Organization partners, local emergency managers, faith-based organizations and any other individuals or organizations expected to support disaster response efforts through emergency management functions.

This Plan is intended to clarify expectations for an effective response by state and local officials in support of responders in the field which can save lives, protect property, and more quickly restore essential services.

This document represents decades of planning and coordination between local, state, federal and non-governmental partners operating within or supporting the State of Georgia and is intended to ensure seamless integration of federal and state resources when necessary.

This Plan is consistent with the National Response Framework and supports the local emergency operations plans for all 159 counties within the State.

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Hazard Risk Analyses Supplement to the Jenkins County Joint Hazard Mitigation Plan



Carl Vinson
Institute of Government
UNIVERSITY OF GEORGIA

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Introduction

The Federal Disaster Mitigation Act of 2000 (DMA2K) requires state, local, and tribal governments to develop and maintain a mitigation plan to be eligible for certain federal disaster assistance and hazard mitigation funding programs.

Mitigation seeks to reduce a hazard’s impacts, which may include loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on a sound risk assessment that quantifies the potential losses of a disaster by assessing the vulnerability of buildings, infrastructure, and people.

In recognition of the importance of planning in mitigation activities, FEMA Hazus-MH, a powerful disaster risk assessment tool based on geographic information systems (GIS). This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses.

In 2018, the Georgia Department of Emergency Management partnered with the Carl Vinson Institute of Government at the University of Georgia to develop a detailed risk assessment focused on defining hurricane, riverine flood, and tornado risks in Jenkins County, Georgia. This assessment identifies the characteristics and potential consequences of the disaster, how much of the community could be affected by the disaster, and the impact on community assets.

Risk Assessment Process Overview

Hazus-MH Version 2.2 SP1 was used to perform the analyses for Jenkins County. The Hazus-MH application includes default data for every county in the US. This Hazus-MH data was derived from a variety of national sources and in some cases the data are also several years old. Whenever possible, using local provided data is preferred. Jenkins County provided building inventory information from the county’s property tax assessment system. This section describes the changes made to the default Hazus-MH inventory and the modeling parameters used for each scenario.

County Inventory Changes

The default Hazus-MH site-specific point inventory was updated using data compiled from the Georgia Emergency Management Agency (GEMA). The default Hazus-MH aggregate inventory (General Building Stock) was also updated prior to running the scenarios. Reported losses reflect the updated data sets.

General Building Stock Updates

General Building Stock (GBS) is an inventory category that consists of aggregated data (grouped by census geography — tract or block). Hazus-MH generates a combination of site-specific and aggregated loss estimates based on the given analysis and user input.

The GBS records for Jenkins County were replaced with data derived from parcel and property assessment data obtained from Jenkins County. The county provided property assessment data was current as of December 2018 and the parcel data current as of December 2018. Records without improvements were deleted. The parcel boundaries were converted to parcel points located in the centroids of each parcel boundary; then, each parcel point was linked to an assessor record based upon matching parcel numbers. The parcel assessor match-rate for Jenkins

County is 99.5%. The generated building inventory represents the approximate locations (within a parcel) of structures. The building inventory was aggregated by census block. Both the tract and block tables were updated. Table 1 shows the results of the changes to the GBS tables by occupancy class.

Table 1: GBS Building Exposure Updates by Occupancy Class*

General Occupancy	Default Hazus-MH Count	Updated Count	Default Hazus-MH Exposure	Updated Exposure
Agricultural	42	0	\$10,030,000	\$0
Commercial	154	51	\$76,661,000	\$8,912,000
Education	8	0	\$9,932,000	\$0
Government	8	10	\$4,102,000	\$9,988,000
Industrial	45	35	\$47,148,000	\$47,621,000
Religious	32	2	\$19,447,000	\$222,000
Residential	4,152	3,743	\$515,891,000	\$351,068,000
Total	4,441	3,841	\$683,211,000	\$417,811,000

*The exposure values represent the total number and replacement cost for all Jenkins County Buildings

For Jenkins County, the updated GBS was used to calculate hurricane wind losses. The flood losses and tornado losses were calculated from building inventory modeled in Hazus-MH as User-Defined Facility

(UDF)¹, or site-specific points. Figure 1 shows the distribution of buildings as points based on the county provided data.

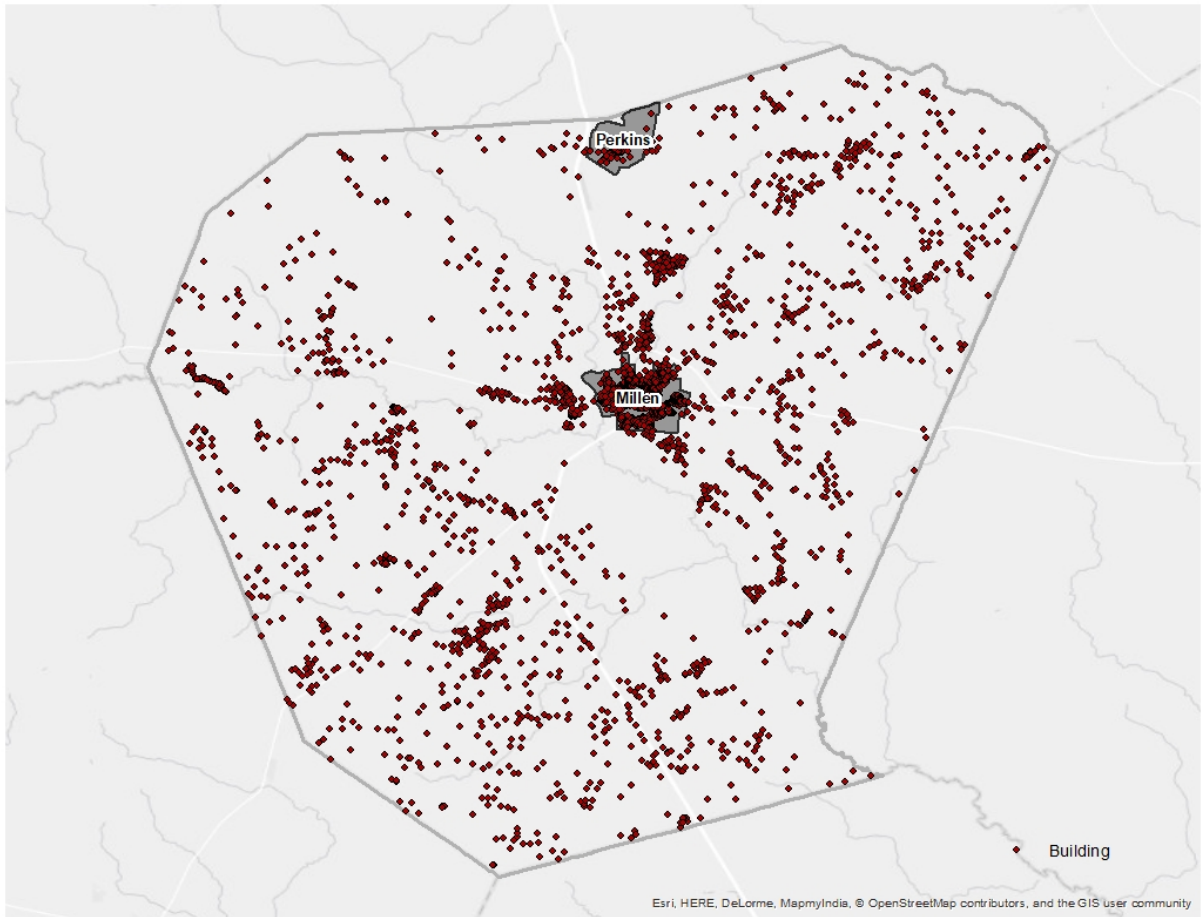


Figure 1: Jenkins County Overview

Essential Facility Updates

The default Hazus-MH essential facility data was updated to reflect improved information available in the Georgia Mitigation Information System (GMIS) as of October 2018. For these risk analyses, only GMIS data for buildings that Hazus-MH classified as Essential Facilities was integrated into Hazus-MH because the application provides specialized reports for these five facilities. Essential Facility inventory was updated for the analysis conducted for this report. The following table summarizes the counts and exposures, where available, by Essential Facility classification of the updated data.

Essential facilities include:

- Care facilities
- EOCs
- Fire stations
- Police stations
- Schools

¹ The UDF inventory category in Hazus-MH allows the user to enter site-specific data in place of GBS data.

Table 2: Updated Essential Facilities

Classification	Updated Count	Updated Exposure
Millen		
EOC	1	\$880,000
Care	1	\$1,125,000
Fire	2	\$5,850,000
Police	2	\$3,061,000
School	3	\$24,000,000
Total	9	\$34,916,000
Perkins		
EOC	0	\$0
Care	0	\$0
Fire	1	\$80,000
Police	0	\$0
School	0	\$0
Total	1	\$80,000
Unincorporated Areas of Jenkins County		
EOC	0	\$0
Care	0	\$0
Fire	4	\$422,000
Police	0	\$0
School	0	\$0
Total	4	\$422,000

Assumptions and Exceptions

Hazus-MH loss estimates may be impacted by certain assumptions and process variances made in this risk assessment.

- The Jenkins County analysis used Hazus-MH Version 2.2 SP1, which was released by FEMA in May 2015.
- County provided parcel and property assessment data may not fully reflect all buildings in the county. For example, some counties do not report not-for-profit buildings such as government buildings, schools and churches in their property assessment data. This data was used to update the General Building Stock as well as the User Defined Facilities applied in this risk assessment.
- Georgia statute requires that the Assessor's Office assign a code to all of the buildings on a parcel based on the buildings primary use. If there is a residential or a commercial structure on a parcel and there are also agricultural buildings on the same parcel Hazus-MH looks at the residential and commercial "primary" structures first and then combines the value of all

secondary structures on that parcel with the value of the primary structure. The values and building counts are still accurate but secondary structures are accounted for under the same classification as the primary structure. Because of this workflow, the only time that a parcel would show a value for an agricultural building is when there are no residential or commercial structures on the parcel thus making the agricultural building the primary structure. This is the reason that agricultural building counts and total values seem low or are nonexistent.

- GBS updates from assessor data will skew loss calculations. The following attributes were defaulted or calculated:
 - Foundation Type was set from Occupancy Class
 - First Floor Height was set from Foundation Type
 - Content Cost was calculated from Replacement Cost
- It is assumed that the buildings are located at the centroid of the parcel.
- The essential facilities extracted from the GMIS were only used in the portion of the analysis designated as essential facility damage. They were not used in the update of the General Building Stock or the User Defined Facility inventory.

The hazard models included in this risk assessment included:

- Hurricane assessment which was comprised of a wind only damage assessment.
- Flood assessment based on the 1% annual chance event that includes riverine assessments.
- Tornado assessment based on GIS modeling.

Hurricane Risk Assessment

Hazard Definition

The National Hurricane Center describes a hurricane as a tropical cyclone in which the maximum sustained wind is, at minimum, 74 miles per hour (mph)². The term hurricane is used for Northern Hemisphere tropical cyclones east of the International Dateline to the Greenwich Meridian. The term typhoon is used for Pacific tropical cyclones north of the Equator west of the International Dateline. Hurricanes in the Atlantic Ocean, Gulf of Mexico, and Caribbean form between June and November with the peak of hurricane season occurring in the middle of September. Hurricane intensities are measured using the Saffir-Simpson Hurricane Wind Scale (Table 3). This scale is a 1 to 5 categorization based on the hurricane's intensity at the indicated time.

Hurricanes bring a complex set of impacts. The winds from a hurricane produce a rise in the water level at landfall called storm surge. Storm surges produce coastal flooding effects that can be as damaging as the hurricane's winds. Hurricanes bring very intense inland riverine flooding. Hurricanes can also produce tornadoes that can add to the wind damages inland. In this risk assessment, only hurricane winds, and coastal storm surge are considered.

Table 3: Saffir-Simpson Hurricane Wind Scale

Category	Wind Speed (mph)	Damage
1	74 - 95	Very dangerous winds will produce some damage
2	96 - 110	Extremely dangerous winds will cause extensive damage
3	111 - 130	Devastating damage will occur
4	131 - 155	Catastrophic damage will occur
5	> 155	Catastrophic damage will occur

The National Oceanic and Atmospheric Administration's National Hurricane Center created the HURDAT database, which contains all of the tracks of tropical systems since the mid-1800s. This database was used to document the number of tropical systems that have affected Jenkins County by creating a 20-mile buffer around the county to include storms that didn't make direct landfall in Jenkins County but impacted the county. Note that the storms listed contain the peak sustained winds, maximum pressure and maximum attained storm strength for the entire storm duration. Since 1851, Jenkins County has had 31 tropical systems within 20 miles of its county borders (Table 4).

Table 4: Tropical Systems affecting Jenkins County³

YEAR	DATE RANGE	NAME	MAX WIND(Knots)	MAX PRESSURE	MAX CAT
1851	August 16-27	UNNAMED	100	0	H2

² National Hurricane Center (2011). "Glossary of NHC Terms." National Oceanic and Atmospheric Administration. <http://www.nhc.noaa.gov/aboutgloss.shtml#h>. Retrieved 2012-23-02.

³ Atlantic Oceanic and Meteorological Laboratory (2012). "Data Center." National Oceanic and Atmospheric Administration. http://www.aoml.noaa.gov/hrd/data_sub/re_anal.html. Retrieved 7-20-2015.

YEAR	DATE RANGE	NAME	MAX WIND(Knots)	MAX PRESSURE	MAX CAT
1852	October 06-11	UNNAMED	90	0	H1
1854	September 07-12	UNNAMED	110	950	H2
1856	August 25 - September 03	UNNAMED	100	969	H2
1877	September 21 - October 05	UNNAMED	100	0	H2
1884	September 10-20	UNNAMED	80	988	H1
1885	October 10-14	UNNAMED	60	0	TD
1886	June 27 - July 02	UNNAMED	85	0	H1
1887	October 09-22	UNNAMED	75	0	H1
1898	August 30 - September 01	UNNAMED	75	0	H1
1901	September 09-19	UNNAMED	70	0	TD
1902	June 12-17	UNNAMED	50	0	TD
1904	October 31 - November 06	UNNAMED	45	0	TD
1909	June 26 - July 04	UNNAMED	45	0	TD
1911	August 23-31	UNNAMED	85	972	H1
1915	July 31 - August 05	UNNAMED	65	1003	TD
1929	September 19 - October 05	UNNAMED	135	986	H4
1935	August 29 - September 10	UNNAMED	160	996	H5
1940	August 05-14	UNNAMED	85	1008	H1
1941	October 03-13	UNNAMED	105	1004	H2
1946	October 05-14	UNNAMED	85	993	H1
1956	September 20 - October 03	FLOSSY	80	1011	H1
1964	August 20 - September 05	CLEO	135	1003	H4
1964	August 28 - September 16	DORA	115	998	H3
1968	June 01-13	ABBY	65	1005	TD
1985	November 15-23	KATE	105	1006	H2
1986	August 13-30	CHARLEY	70	1015	TD
1995	June 03-11	ALLISON	65	1005	TD
1998	August 31 - September 08	EARL	85	1005	H1
2003	July 25-27	UNNAMED	30	1022	TD
2006	June 10-19	ALBERTO	60	1004	TD

Category Definitions:

TS – Tropical storm

TD – Tropical depression

H1 – Category 1 (same format for H2, H3, and H4)

E – Extra-tropical cyclone

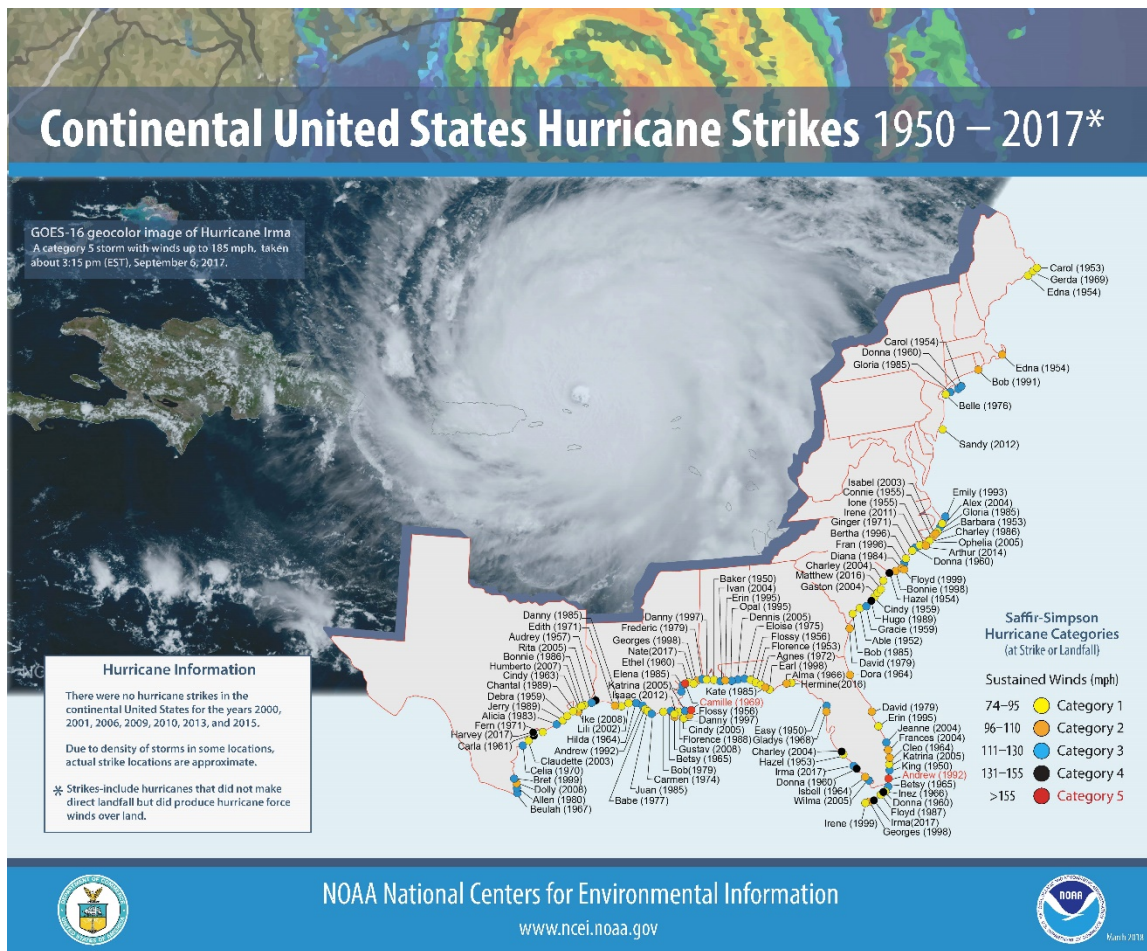


Figure 2: Continental United States Hurricane Strikes: 1950 to 2017⁴

Probabilistic Hurricane Scenario

The following probabilistic wind damage risk assessment modeled a Category 1 storm with maximum winds of 84 mph.

Wind Damage Assessment

Separate analyses were performed to determine wind and hurricane storm surge related flood losses. This section describes the wind-based losses to Jenkins County. Wind losses were determined from probabilistic models run for the Category 1 storm which equates to the 1% chance storm event. Figure 3 shows wind speeds for the modeled Tropical Storm.

⁴ Source: NOAA National Centers for Environmental Information

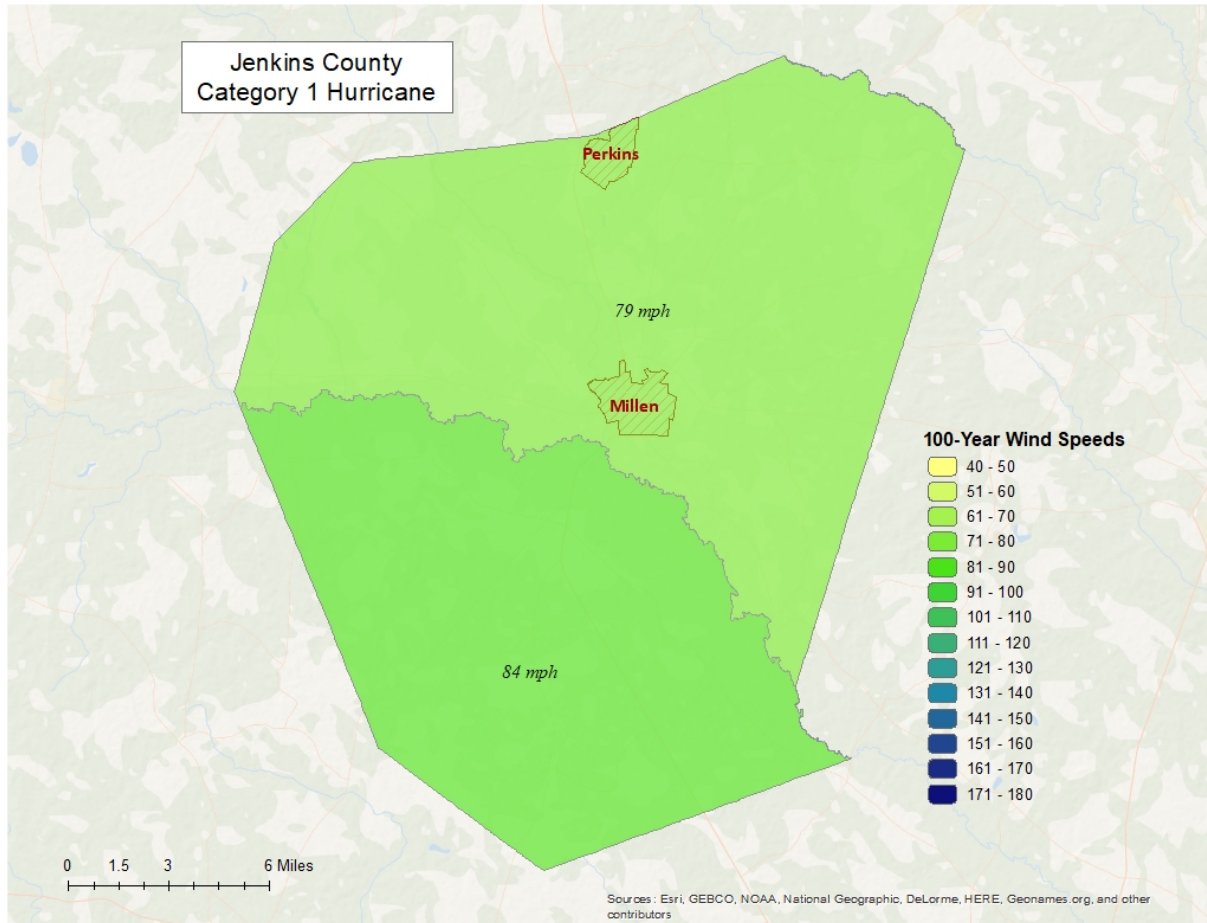


Figure 3: Wind Speeds by Storm Category

Wind-Related Building Damages

Buildings in Jenkins County are vulnerable to storm events, and the cost to rebuild may have significant consequences to the community. The following table shows a summary of the results of wind-related building damage in Jenkins County for the Category 1 (100 Year Event) storm. The loss ratio expresses building losses as a percentage of total building replacement cost in the county. Figure 4 illustrates the building loss ratios of the modeled Category 1 storm.

Table 5: Hurricane Wind Building Damage

Classification	Number of Buildings Damaged	Total Building Damage	Total Economic Loss ⁵	Loss Ratio
Category 1 Storm	62	\$1,312,780	\$1,770,940	0.31%

⁵ Includes property damage (infrastructure, contents, and inventory) as well as business interruption losses.

Note that wind damaged buildings are not reported by jurisdiction. This is due to the fact that census tract boundaries – upon which hurricane building losses are based – do not closely coincide with jurisdiction boundaries.

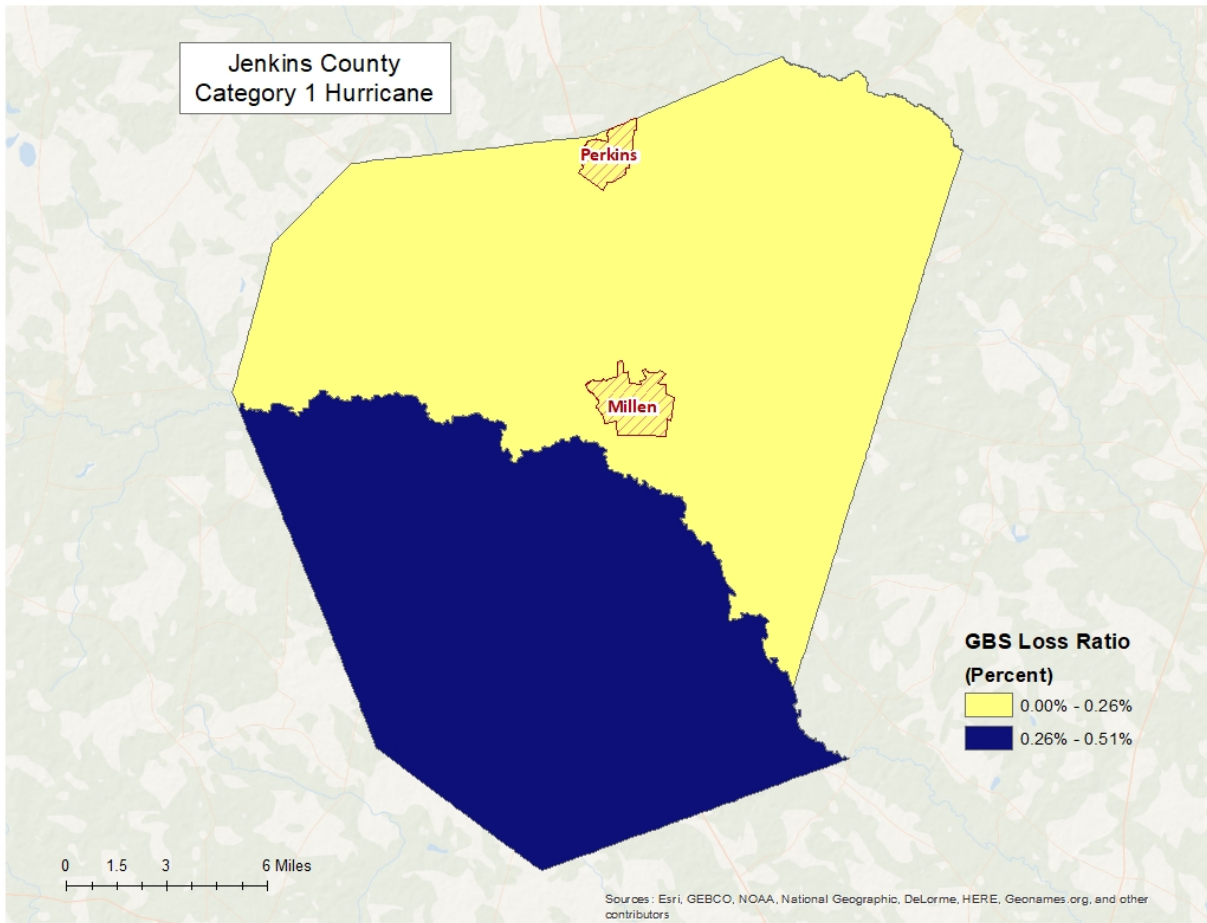


Figure 4: Hurricane Wind Building Loss Ratios

Essential Facility Losses

Essential facilities are also vulnerable to storm events, and the potential loss of functionality may have significant consequences to the community. Hazus-MH identified the essential facilities that may be moderately or severely damaged by winds. The results are compiled in Table 6.

Table 6: Wind-Damaged Essential Facility Losses

There are 14 essential facilities in Jenkins County.

Classification	Number
EOCs	1
Fire Stations	7
Care Facilities	1
Police Stations	2
Schools	3

Classification	Facilities At Least Moderately Damaged > 50%	Facilities Completely Damaged > 50%	Facilities with Expected Loss of Use (< 1 day)
Category 1	0	0	14

Shelter Requirements

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

Table 7: Displaced Households and People

Classification	# of Displaced Households	# of People Needing Short-Term Shelter
Category 1	0	0

Debris Generated from Hurricane Wind

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

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

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

Table 8: Wind-Related Debris Weight (Tons)

Classification	Brick, Wood, and Other	Reinforced Concrete and Steel	Eligible Tree Debris	Other Tree Debris	Total
Category 1	144	0	2,150	57,097	59,391

Figure 5 shows the distribution of all wind related debris resulting from a Category 1 Hurricane. Each dot represents 20 tons of debris within the census tract in which it is located. The dots are randomly distributed within each census tract and therefore do not represent the specific location of debris sites.

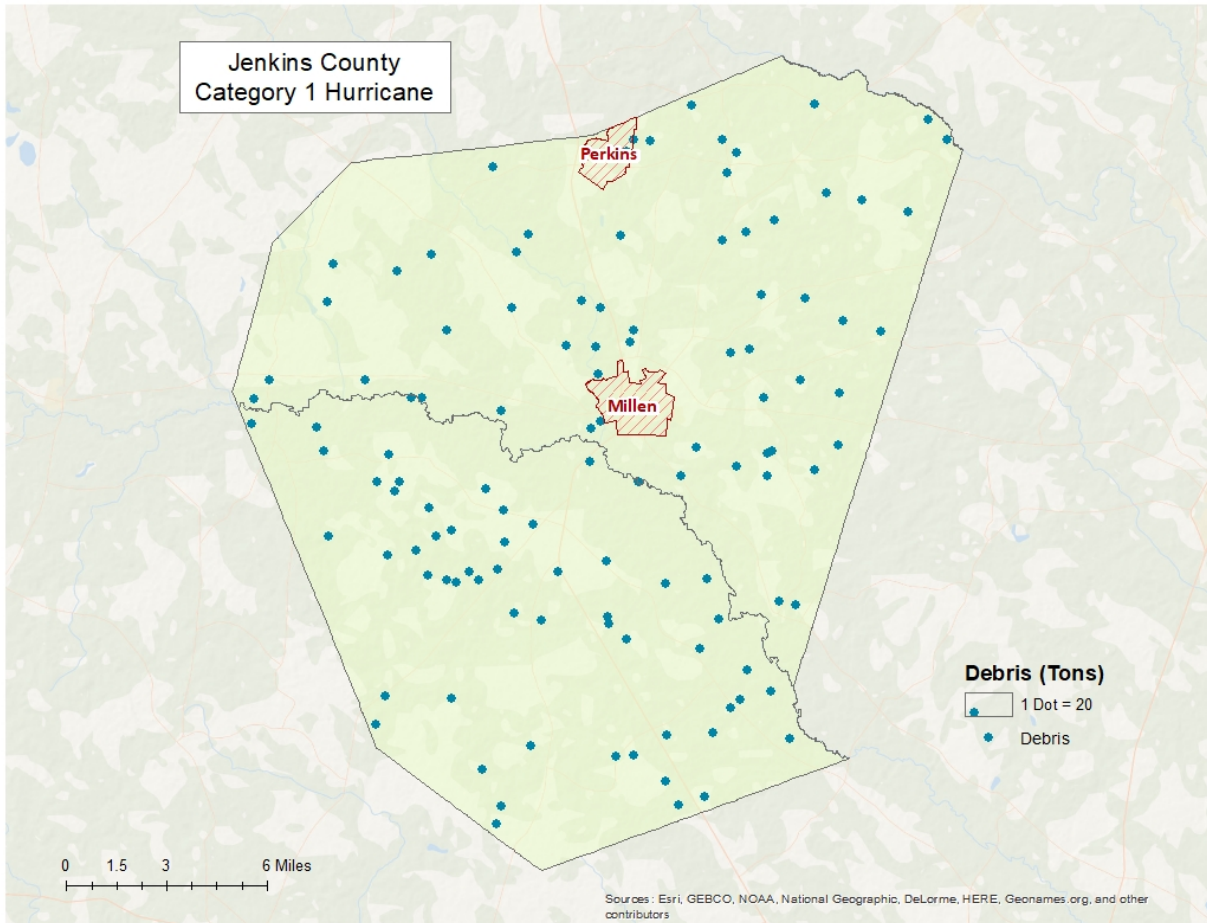


Figure 5: Wind-Related Debris Weight (Tons)

Flood Risk Assessment

Hazard Definition

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Floods can be classified as one of three types: upstream floods, downstream floods, or coastal floods.

Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe in the local areas in which they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at any time of the year in Georgia, but they are most common in the spring and summer months.

Downstream floods, also called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and time of the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage.

Coastal floods occurring on the Atlantic and Gulf coasts may be related to hurricanes or other combined offshore, nearshore, and shoreline processes. The effects of these complex interrelationships vary significantly across coastal settings, leading to challenges in the determination of the base (1-percent-annual-chance) flood for hazard mapping purposes. Land area covered by floodwaters of the base flood is identified as a Special Flood Hazard Area (SFHA).

The SFHA is the area where the National Flood Insurance Program's (NFIP) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The owner of a structure in a high-risk area must carry flood insurance, if the owner carries a mortgage from a federally regulated or insured lender or servicer.

The Jenkins County flood risk assessment analyzed at risk structures in the SFHA.

The following probabilistic risk assessment involves an analysis of a 1% annual chance riverine flood event (100-Year Flood) and a 1% annual chance coastal flood.

Riverine 1% Flood Scenario

Riverine losses were determined from the 1% flood boundaries downloaded from the FEMA Flood Map Service Center in December 2018. The flood boundaries were overlaid with the USGS 10 meter DEM

using the Hazus-MH Enhanced Quick Look tool to generate riverine depth grids. The riverine flood depth grid was then imported into Hazus-MH to calculate the riverine flood loss estimates. Figure 6 illustrates the riverine inundation boundary associated with the 1% annual chance.

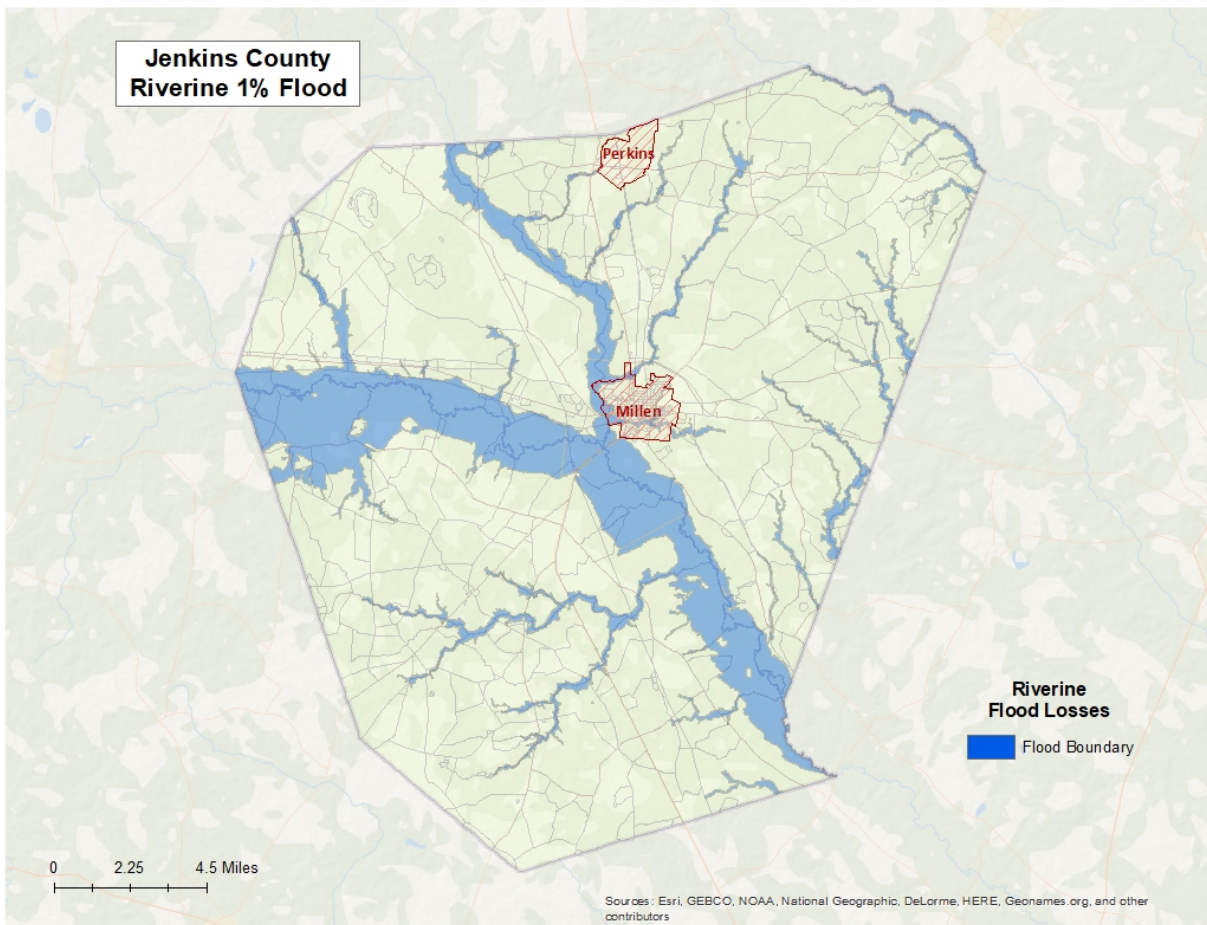


Figure 6: Riverine 1% Flood Inundation

Riverine 1% Flood Building Damages

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

Table 9: Jenkins County Riverine 1% Building Losses

Occupancy	Total Buildings in the Jurisdiction	Total Buildings Damaged in the Jurisdiction	Total Building Exposure in the Jurisdiction	Total Losses to Buildings in the Jurisdiction	Loss Ratio of Exposed Buildings to Damaged Buildings in the Jurisdiction
Millen					
Residential	1,242	74	\$128,349,501	\$939,939	0.73%
Industrial	15	1	\$8,685,308	\$133	0.00%
Commercial	44	2	\$8,763,820	\$4,437	0.05%
Unincorporated					
Residential	2,451	179	\$218,670,952	\$2,069,545	0.95%
County Total					
	3,752	256	\$364,469,581	\$3,014,054	

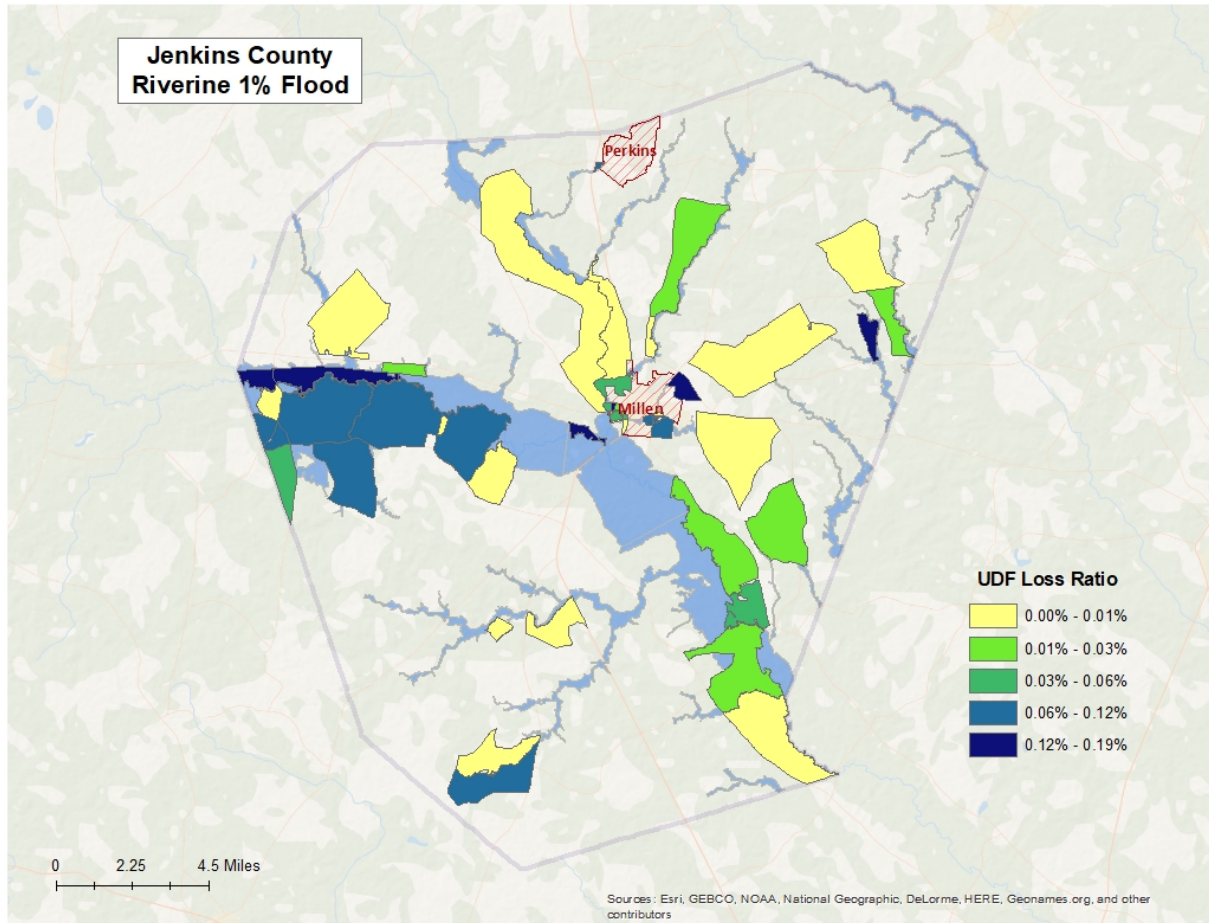


Figure 7: Jenkins County Potential Loss Ratios of Total Building Exposure to Losses Sustained to Buildings from the 1% Riverine Flood by 2010 Census Block

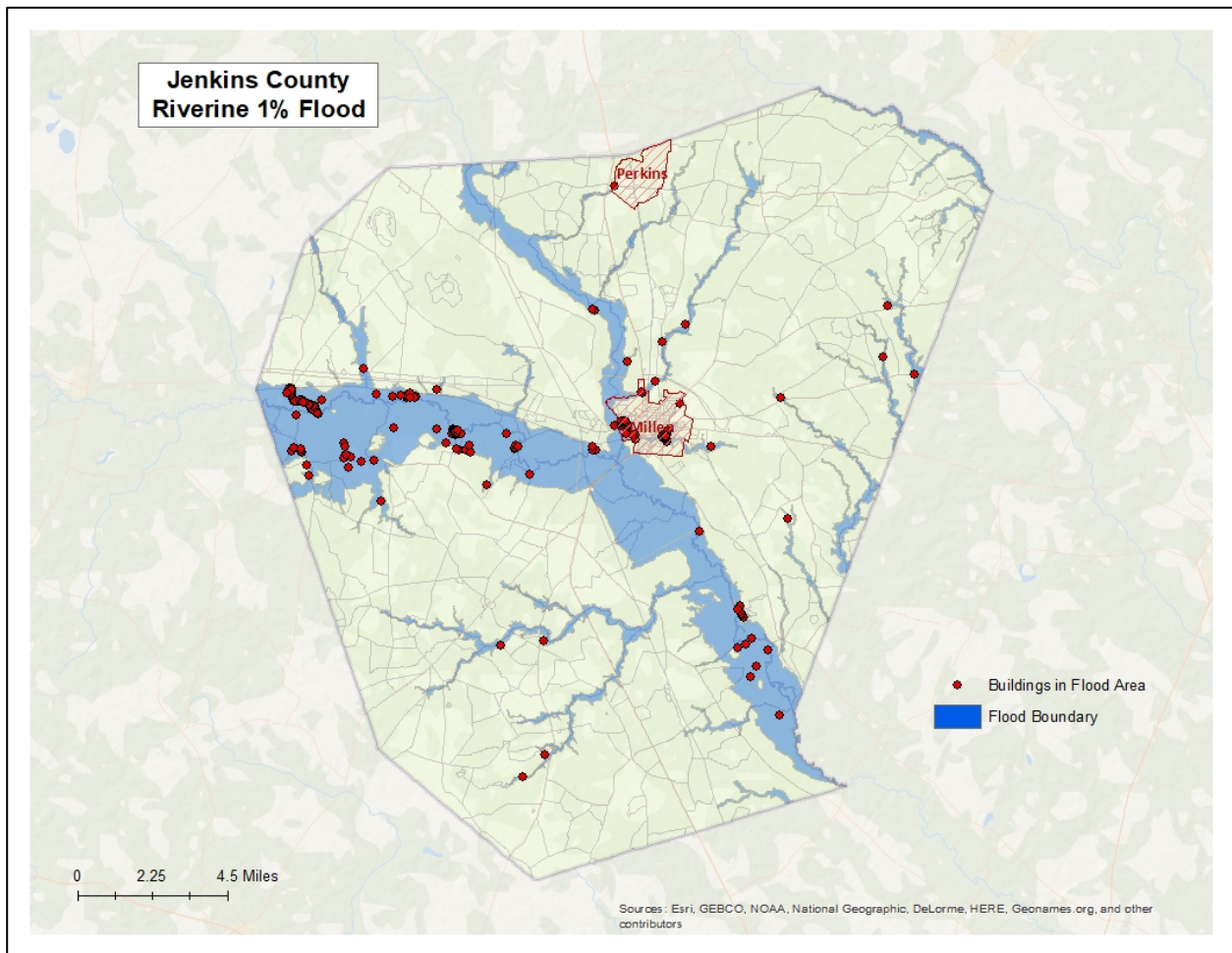


Figure 8: Jenkins County Damaged Buildings in Riverine Floodplain (1% Flood)

Riverine 1% Flood Essential Facility Losses

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

Riverine 1% Flood Shelter Requirements

Hazus-MH estimates that the number of households that are expected to be displaced from their homes due to riverine flooding and the associated potential evacuation. The model estimates 244 households might be displaced due to the flood. Displacement includes households evacuated within or very near to the inundated area. Displaced households represent 731 individuals, of which 349 may require short term publicly provided shelter. The results are mapped in Figure 9.

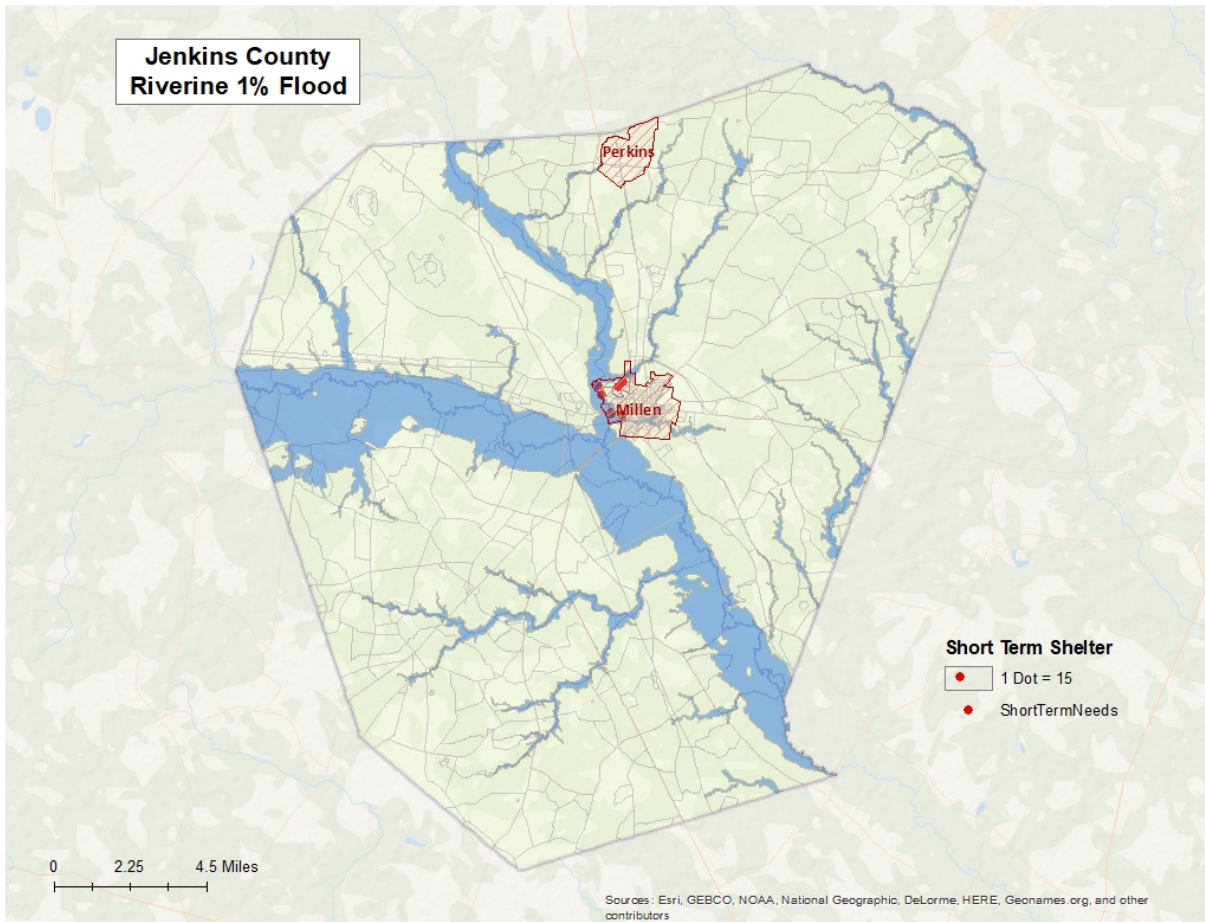


Figure 9: Riverine 1% Estimated Flood Shelter Requirements

Riverine 1% Flood Debris

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

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

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

The analysis estimates that an approximate total of 1,407 tons of debris might be generated: 1) Finishes- 706 tons; 2) Structural – 215 tons; and 3) Foundations- 486 tons. The results are mapped in Figure 10.

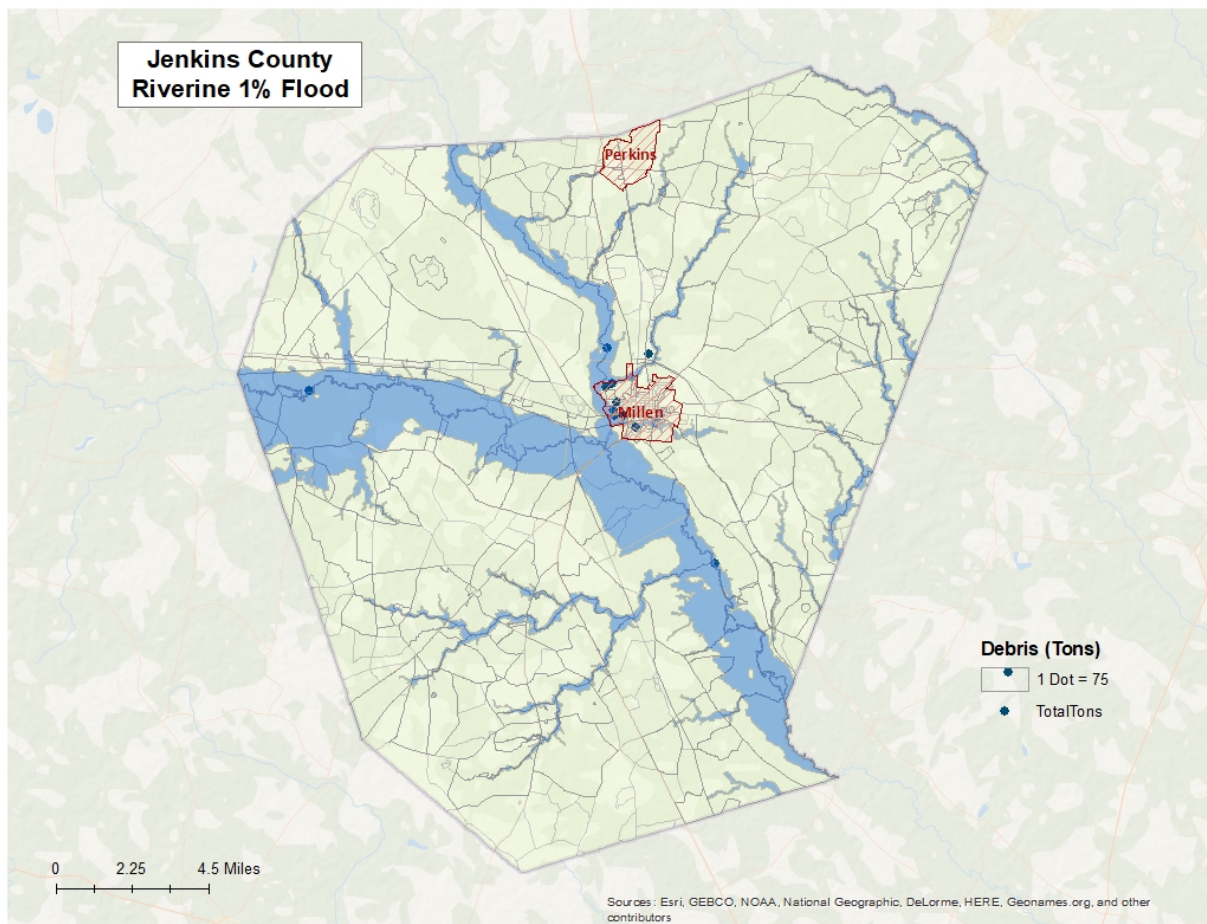


Figure 10: Riverine 1% Flood Debris Weight (Tons)

Tornado Risk Assessment

Hazard Definition

Tornadoes pose a great risk to the state of Georgia and its citizens. Tornadoes can occur at any time during the day or night. They can also happen during any month of the year. The unpredictability of tornadoes makes them one of Georgia's most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 miles per hour, but higher and lower values can occur. A wind velocity of 200 miles per hour will result in a wind pressure of 102.4 pounds per square foot of surface area—a load that exceeds the tolerance limits of most buildings. Considering these factors, it is easy to understand why tornadoes can be so devastating for the communities they hit.

Tornadoes are defined as violently-rotating columns of air extending from thunderstorms and cyclonic events. Funnel clouds are rotating columns of air not in contact with the ground; however, the violently-rotating column of air can reach the ground very quickly and become a tornado. If the funnel cloud picks up and blows debris, it has reached the ground and is a tornado.

Tornadoes are classified according to the Fujita tornado intensity scale. Originally introduced in 1971, the scale was modified in 2006 to better define the damage and estimated wind scale. The Enhanced Fujita Scale ranges from low intensity EF0 with effective wind speeds of 65 to 85 miles per hour, to EF5 tornadoes with effective wind speeds of over 200 miles per hour. The Enhanced Fujita intensity scale is included in Table 10.

Table 10: Enhanced Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
EF0 <i>Gale</i>	65-85 mph	6-17 yards	0.3-0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
EF1 <i>Moderate</i>	86-110 mph	18-55 yards	1.0-3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
EF2 <i>Significant</i>	111-135 mph	56-175 yards	3.2-9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
EF3 <i>Severe</i>	136-165 mph	176-566 yards	10-31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
EF4 <i>Devastating</i>	166-200 mph	0.3-0.9 miles	32-99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
EF5 <i>Incredible</i>	> 200 mph	1.0-3.1 miles	100-315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Source: <http://www.srh.noaa.gov>

Hypothetical Tornado Scenario

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

Table 11: Tornado Path Widths and Damage Curves

Fujita Scale	Path Width (feet)	Maximum Expected Damage
EF-5	2,400	100%
EF-4	1,800	100%
EF-3	1,200	80%
EF-2	600	50%
EF-1	300	10%
EF-0	300	0%

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path, with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map, the process is modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 11 describes the zone analysis.

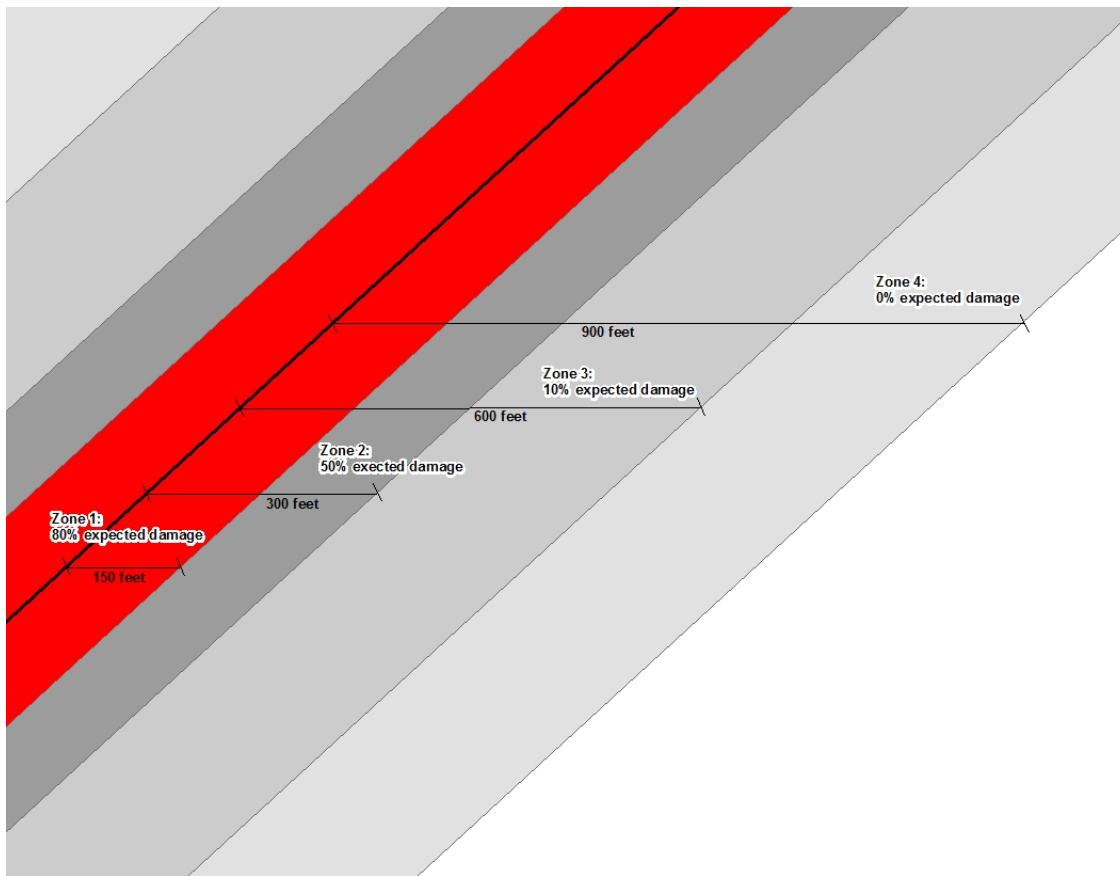


Figure 11: EF Scale Tornado Zones

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

Table 12: EF3 Tornado Zones and Damage Curves

Zone	Buffer (feet)	Damage Curve
1	0-150	80%
2	150-300	50%
3	300-600	10%
4	600-900	0%

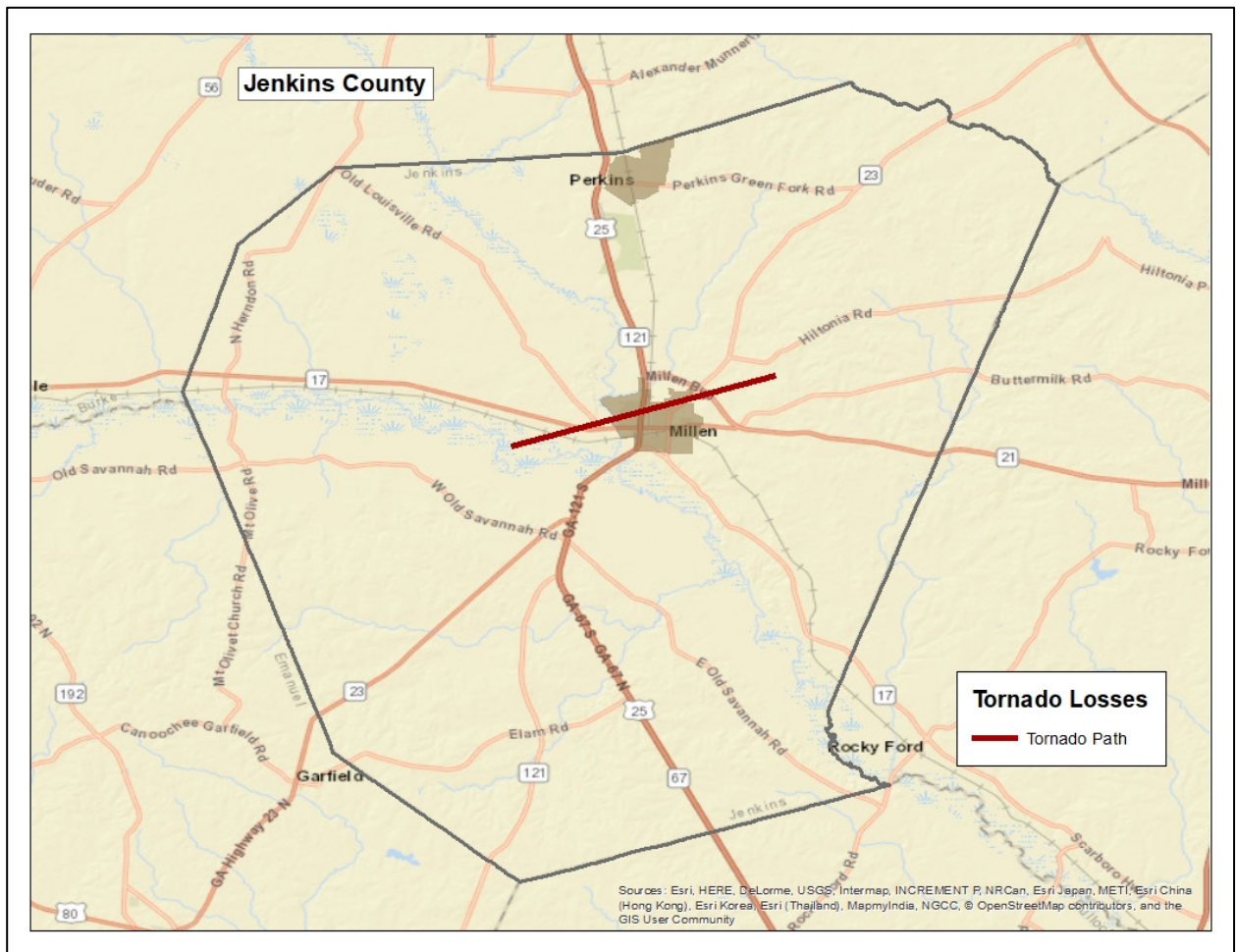


Figure 12: Hypothetical EF3 Tornado Path in Jenkins County

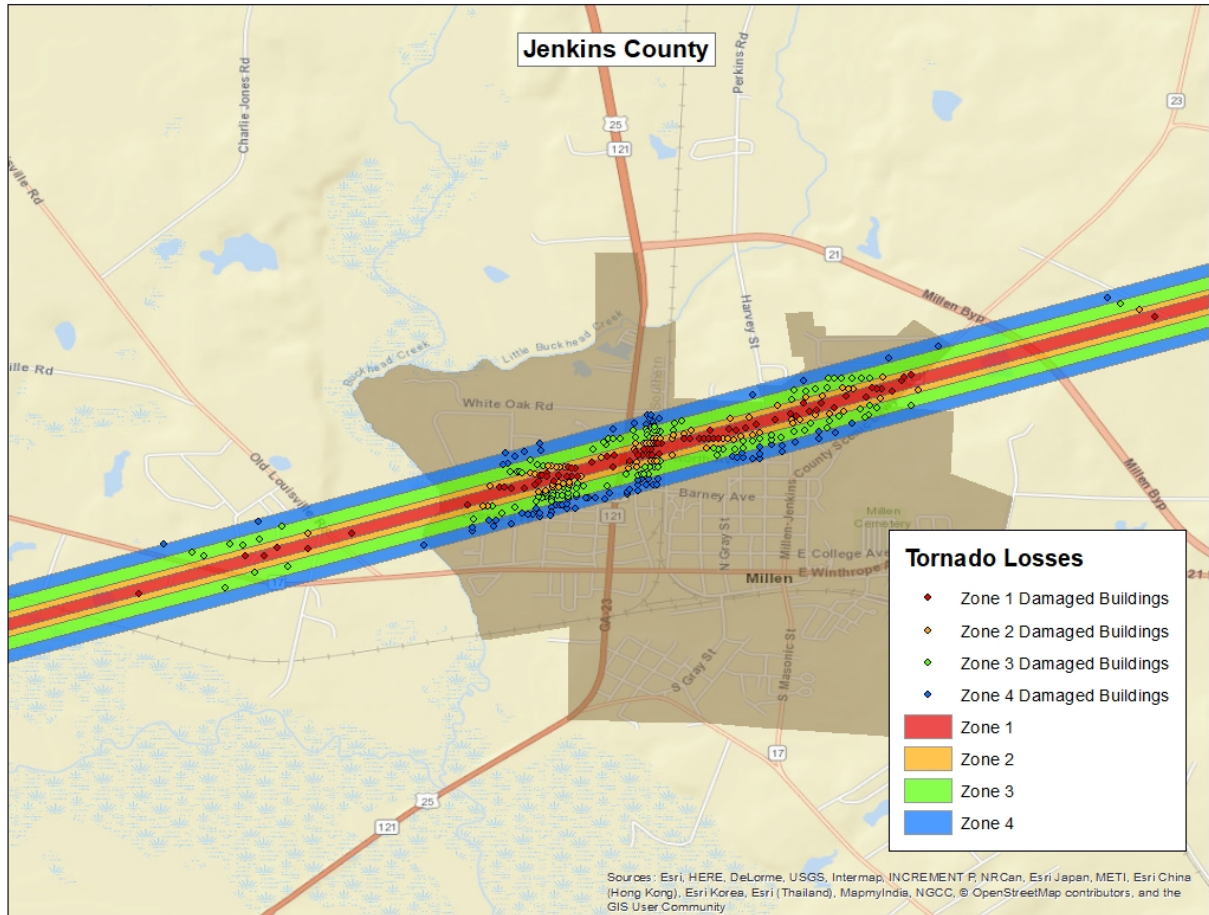


Figure 13: Modeled EF3 Tornado Damage Buffers in Jenkins County

EF3 Tornado Building Damages

The analysis estimated that approximately 373 buildings could be damaged, with estimated building losses of \$13 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels provided by Jenkins County that were joined with Assessor records showing estimated property replacement costs. The Assessor records often do not distinguish parcels by occupancy class if the parcels are not taxable and thus the number of buildings and replacement costs may be underestimated. The results of the analysis are depicted in Table 13.

Table 13: Estimated Building Losses by Occupancy Type

Occupancy	Buildings Damaged	Building Losses
Residential	367	\$12,506,986
Commercial	5	\$83,279
Industrial	1	\$0
Total	373	\$12,590,265

EF3 Tornado Essential Facility Damage

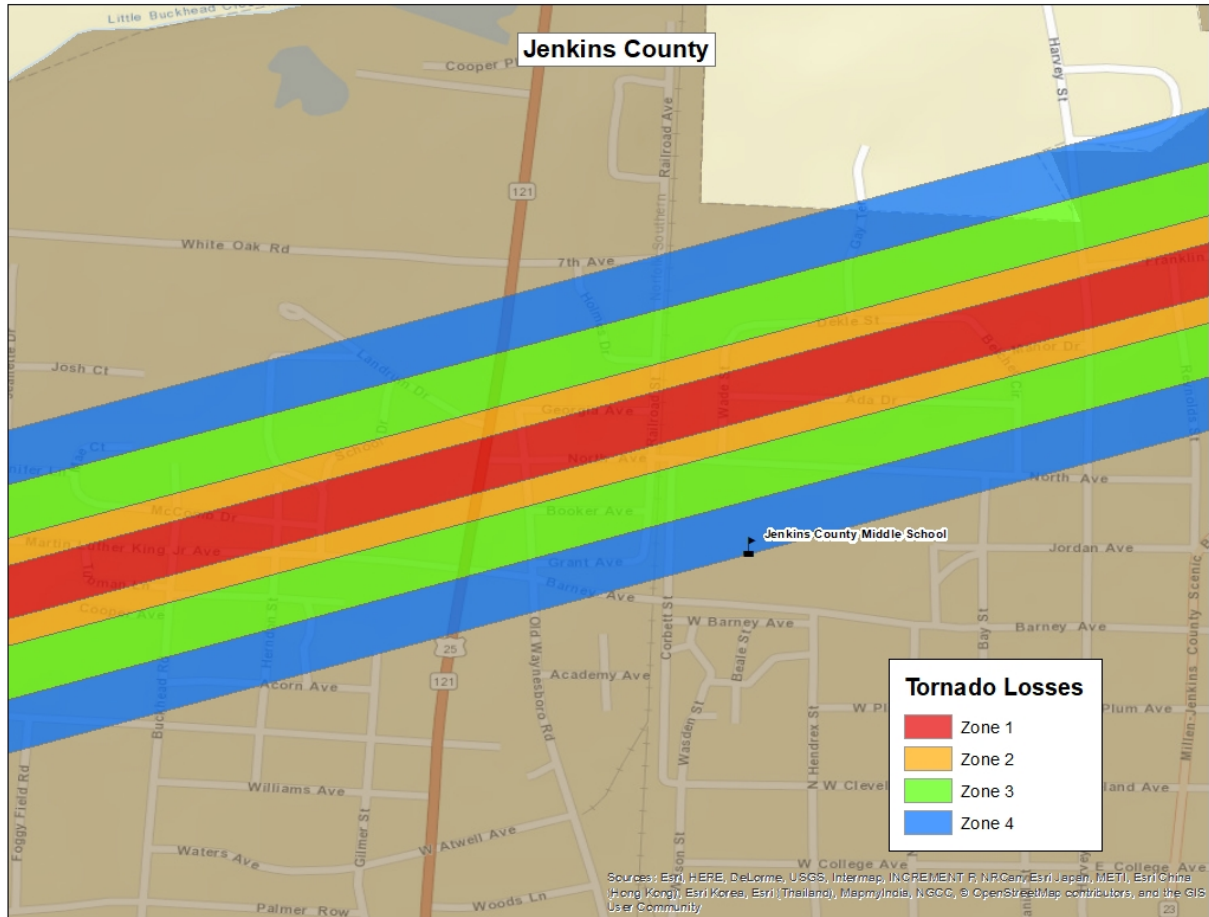
There was one essential facility located in the tornado path – one school. Table 14 outlines the specific facility and the amount of damage under the scenario.

Table 14: Estimated Essential Facilities Damaged

Facility	Amount of Damage
Jenkins County Middle School	Minor Damage

According to the Georgia Department of Education, Jenkins County Middle School’s enrollment was approximately 270 students as of October 2018. Depending on the time of day, a tornado strike as depicted in this scenario could result in significant injury and loss of life. In addition, arrangements would have to be made for the continued education of the students in another location.

The location of the damaged Essential Facility is mapped in Figure 14.



Exceptions Report

Hazus Version 2.2 SP1 was used to perform the loss estimates for Jenkins County, Georgia. Changes made to the default Hazus-MH inventory and the modeling parameters used to setup the hazard scenarios are described within this document.

Reported losses reflect the updated data sets. Steps, algorithms and assumptions used during the data update process are documented in the project workflow named PDM_GA_Workflow.doc.

Statewide Inventory Changes

The default Hazus-MH Essential Facility inventory was updated for the entire state prior to running the hazard scenarios for Jenkins County.

Updates to the Critical Facility data used in GMIS were provided by Jenkins County in October 2018. These updates were applied by The Carl Vinson Institute of Government at the University of Georgia. Table 15 summarizes the difference between the original Hazus-MH default data and the updated data for Jenkins County.

Table 15: Essential Facility Updates

Site Class	Feature Class	Default Replacement Cost	Default Count	Updated Replacement Cost	Updated Count
EF	Care	\$3,000,000	4	\$1,125,000	1
EF	EOC	\$880,000	1	\$880,000	1
EF	Fire	\$6,072,000	7	\$6,352,000	7
EF	Police	\$650,000	2	\$3,061,000	2
EF	School	\$27,925,000	7	\$24,000,000	3

County Inventory Changes

The GBS records for Jenkins County were replaced with data derived from parcel and property assessment data obtained from Jenkins County. The county provided property assessment data was current as of December 2018 and the parcel data current as of December 2018.

General Building Stock Updates

The parcel boundaries and assessor records were obtained from Jenkins County. Records without improvements were deleted. The parcel boundaries were converted to parcel points located in the centroids of each parcel boundary. Each parcel point was linked to an assessor record based upon matching parcel numbers. The generated Building Inventory represents the approximate locations (within a parcel) of building exposure. The Building Inventory was aggregated by Census Block and imported into Hazus-MH using the Hazus-MH Comprehensive Data Management System (CDMS). Both the 2010 Census Tract and Census Block tables were updated.

The match between parcel records and assessor records was based upon a common Parcel ID. For this type of project, unless the hit rate is better than 85%, the records are not used to update the default aggregate inventory in Hazus-MH. The Parcel-Assessor hit rate for Jenkins County was 99.5%.

Adjustments were made to records when primary fields did not have a value. In these cases, default values were applied to the fields. Table 16 outlines the adjustments made to Jenkins County records.

Table 16: Building Inventory Default Adjustment Rates

Type of Adjustment	Building Count	Percentage
Area Unknown	388	10%
Construction Unknown	498	13%
Condition Unknown	162	4%
Foundation Unknown	505	13%
Year Built Unknown	70	2%
Total Buildings	3,969	8%

Approximately 8% of the CAMA values were either missing (<Null> or '0'), did not match CAMA domains or were unusable ('Unknown', 'Other', 'Pending'). These were replaced with 'best available' values. Missing YearBuilt values were populated from average values per Census Block. Missing Condition, Construction and Foundation values were populated with the highest-frequency CAMA values per Occupancy Class. Missing Area values were populated with the average CAMA values per Occupancy Class.

The resulting Building Inventory was used to populate the Hazus-MH General Building Stock and User Defined Facility tables. The updated General Building Stock was used to calculate flood and tornado losses. Changes to the building counts and exposure that were modeled in Jenkins County are sorted by General Occupancy in Table 1 at the beginning of this report. If replacements cost or building value were not present for a given record in the Assessor data, replacement costs were calculated from the Building Area (sqft) multiplied by the Hazus-MH RS Means (\$/sqft) values for each Occupancy Class.

Differences between the default and updated data are due to various factors. The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings and the building replacement costs for government, religious/non-profit, and education may be underestimated.

User Defined Facilities

Building Inventory was used to create Hazus-MH User Defined Facility (UDF) inventory for flood modeling. Hazus-MH flood loss estimates are based upon the UDF point data. Buildings within the flood boundary were imported into Hazus-MH as User Defined Facilities and modeled as points.

Table 17: User Defined Facility Exposure

Class	Hazus-MH Feature	Counts	Exposure
BI	Building Exposure	3,841	\$417,823,581
Riverine UDF	Structures Inside 1% Annual Chance Riverine Flood Area	261	\$17,878,942

Assumptions

- Flood analysis was performed on Building Inventory. Building Inventory within the flood boundary was imported as User Defined Facilities. The point locations are parcel centroid accuracy.
- The analysis is restricted to the county boundary. Events that occur near the county boundary do not contain loss estimates from adjacent counties.
- The following attributes were defaulted or calculated:
First Floor Height was set from Foundation Type
Content Cost was calculated from Building Cost

FLOOD INSURANCE STUDY



JENKINS COUNTY, GEORGIA AND INCORPORATED AREAS

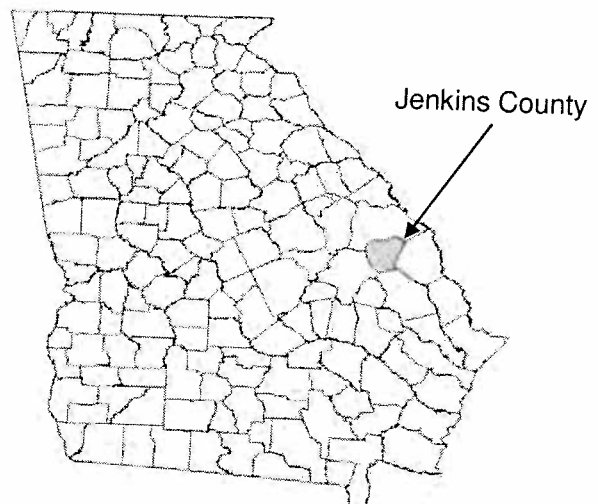
Community Name

JENKINS COUNTY
(UNINCORPORATED AREAS)
MILLEN, CITY OF

Community Number

130118

130119



Revised: August 5, 2010



Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
13165CV000A

**NOTICE TO
FLOOD INSURANCE STUDY USERS**

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Initial Countywide FIS Effective Date: September 29, 1989

Revised Dates: August 5, 2010

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EXHIBITS

Exhibit 1 - Flood Profiles

Buckhead Creek	Panels	01P-04P
Little Buckhead Creek	Panels	05P-06P
Ogeechee River	Panel	07P
The Canal	Panels	08P-10P

Exhibit 2 - Flood Insurance Rate Map Index Flood Insurance Rate Map

FLOOD INSURANCE STUDY JENKINS COUNTY, GEORGIA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Jenkins County, including the City of Millen and the unincorporated areas of Jenkins County (referred to collectively herein as Jenkins County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

September 29, 1989 Initial Countywide FIS Report

For the initial September 29, 1989, countywide FIS report (FEMA, 1989), the hydrologic and hydraulic analyses were performed by Mayes, Sudderth, & Etheredge, Inc. for FEMA, under Contract No. EMA-86-C-0111. The work was completed in November 1987.

This Countywide FIS Report

For this revision, Ogeechee River, Buckhead Creek, Little Buckhead Creek, and The Canal were redelineated by Post, Buckley, Schuh, and Jernigan, Inc. (PBS&J) for the Georgia Department of Natural Resources (DNR), under contract No. EMA-2008-CA-5870. The work was completed in July 2009.

Base map information shown on the Flood Insurance Rate Map (FIRM) was derived from the National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000, from aerial photography dated 2007 or later. The projection used in the preparation of this map is State Plane Georgia East, and the horizontal datum used is North American Datum of 1983 (NAD83).

1.3 Coordination

September 29, 1989

Initial Countywide FIS Report

An initial meeting is held with representatives from FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied or restudied. A final meeting is held with representatives from FEMA, the community, and the study contractor to review the results of the study.

<u>Community</u>	<u>FIS Date</u>	<u>Initial Meeting</u>	<u>Final Meeting</u>
Jenkins County	September 29, 1989	January 22, 1986	November 1, 1988

This Countywide FIS Report

For this revision, the initial meeting was held on July 9, 2008, and attended by representatives of Georgia DNR, Jenkins County, and URS.

The results of the study were reviewed at the final meeting held on October 7, 2009, and attended by representatives of PBS&J, FEMA, Georgia DNR, and the communities. All problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Jenkins County, Georgia, including the incorporated community of Millen. The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through June 2009.

The following streams were studied by detailed methods in this FIS report:

Buckhead Creek	Ogeechee River
Little Buckhead Creek	The Canal

The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

For this countywide revision, reaches of streams that have been studied by detailed methods were selected for redelineation based on more recent topography. The streams and reaches that were redelineated in this revision are shown in Table 1.

Table 1 - Redelineated Streams

<u>Stream</u>	<u>Reach Description</u>
Buckhead Creek	From confluence with Ogeechee River to approximately 19,000 feet upstream of confluence with Ogeechee River.
Little Buckhead Creek	From confluence with Buckhead Creek to approximately 8,778 feet upstream of confluence with Buckhead Creek.
Ogeechee River	From the Jenkins County boundary to a point 32,740 feet upstream of the Jenkins County boundary.
The Canal	From the confluence with Buckhead Creek to approximately 16,250 feet above the confluence with Buckhead Creek.

The vertical datum was converted from the National Geodetic Vertical Datum of 1929 (NGVD) to the North American Vertical Datum of 1988 (NAVD). The projection used in the preparation of this map is State Plane Georgia East. In addition, the Transverse Mercator, State Plane coordinates, previously referenced to the North American Datum of 1927 (NAD27), are now referenced to the NAD83.

Approximate analyses were used to study those areas having low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed to by FEMA and Jenkins County.

2.2 Community Description

Jenkins County, which is located in eastern Georgia, is bordered on the north by Burke County, on the east by Screven County, on the south by Bulloch County, and on the west by Emanuel County.

According to the 2000 Census, the population of Jenkins County was 8,575. The county has a total land area of approximately 350 square miles (U.S. Census Bureau, 2009).

Jenkins County, the 138th county formed in Georgia, was created in 1905 from territory then belonging to the counties of Bulloch, Burke, Emanuel and Screven. The county was named for Governor Charles J. Jenkins. The City of Millen is the County Seat (Georgia, State of, 2009).

The average high temperature, 92 degrees Fahrenheit (°F), occurs in July. The average low temperature is 58°F and occurs in January. Jenkins County receives an average of 43.9 inches of rainfall per year (The Weather Channel, 2009).

2.3 Principal Flood Problems

The worst recorded flooding in Jenkins County occurred between September 25 and October 3, 1929, as a result of two heavy thunderstorms that passed through the area within a period of ten days. The first storm, which occurred September 25-27, 1929, was prolonged and intense. The second storm was the result of a tropical hurricane that passed around the Florida peninsula, turned northwest, and moved inland near the City of Pensacola, Florida on September 30. It moved northeast across northern Florida and southeastern Georgia and then up the Atlantic coast.

Based on recent flood-related state and federal disaster declarations, Jenkins County has experienced flooding associated with severe storms, hurricanes, torrential downpours, severe thunderstorms, flash floods, and river flooding (Georgia Emergency Management Agency, 2009).

2.4 Flood Protection Measures

Flood protection measures in Jenkins County consist of manmade drainage channels and maintenance programs to keep the culverts and ditches clear of debris. Those measures would have a negligible effect on a major event such as the 1-percent-annual chance flood.

3.0 **ENGINEERING METHODS**

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data

required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

September 29, 1989

Initial Countywide Analyses

Hydrologic analyses of the ungaged streams (Buckhead Creek, Little Buckhead Creek, and The Canal) were based on the U.S. Geological Survey (USGS) regional regression equations relating discharge to drainage area for natural streams in various physiographic provinces in Georgia (USGS, 1979). The regional regression equations were determined by synthesizing 75 years of flood record from short- and long-term streamflow and rainfall data, applying the log-Pearson Type III distribution with regional skew coefficients (WRC, 1976), and regionalizing using multiple regression techniques.

Because the watersheds of the studied streams were developed to varying extents, the equations were adjusted to account for urbanization using the USGS methodology. The modification involves determining an urbanization factor which defines urbanization as a function of the percentage of impervious watershed area and percentage of watershed area served by storm sewers. For the streams studied, the urbanization factor ranged from 1.0 to 1.3 (FEMA, 1989).

Floodflow frequency data for the Ogeechee River was based on a statistical analyses performed by the USGS. Flows were estimated applying the log-Pearson Type III distribution (Water Resources Council, 1979). Data for the stream segment upstream of U.S. Highway 25 was developed from 19 years of flow records from USGS gauge station no. 02201500. Downstream of U.S.

Highway 25, the data were developed from 60 years of flow records from the USGS gauge station no. 02202000.

This Countywide FIS Report

Discharges for approximate analysis streams were estimated using the published USGS regional regression equations for rural areas in Georgia (Stamey and Hess, 1993). Regression equations estimate the peak discharges for ungauged streams based on characteristics of nearby gauged streams. Drainage areas were developed from USGS 30-meter Digital Elevation Models (DEMs).

Peak discharge-drainage area relationships for each flooding source studied in detail are shown in Table 2.

Table 2 - Summary of Discharges

<u>Flooding Source and Location</u>	<u>Drainage Area (square miles)</u>	<u>Peak Discharges (cubic feet per second)</u>			
		<u>10-Percent- Annual-Chance</u>	<u>2-Percent- Annual-Chance</u>	<u>1-Percent- Annual-Chance</u>	<u>0.2-Percent- Annual-Chance</u>
BUCKHEAD CREEK					
At confluence of Ogeechee River	288.2	6,189	10,036	12,268	17,800
Just upstream of Norfolk Southern Railway	277.7	6,019	9,772	11,950	17,200
Just upstream of Little Buckhead Creek	246.9	5,609	9,095	11,109	17,000
LITTLE BUCKHEAD CREEK					
At confluence with Buckhead Creek	29.4	1,609	2,550	3,084	4,290
Just upstream of Harvey Street	27.5	1,529	2,429	2,905	4,180
OGEECHEE RIVER					
Approximately 4,752 feet downstream of U.S. Highway 25	1,824	28,646	35,523	40,845	53,579
Just downstream of U.S. Highway 25	1,810	28,481	33,963	36,412	42,444
THE CANAL					
At confluence with Buckhead Creek	10.1	985	1,499	1,753	2,300
Just upstream of State Highway 17	7.5	738	1,147	1,349	2,860
Just upstream of Statesboro Road/U.S. Highway 25	3.8	474	738	865	1,215

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the

FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data Table in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

September 29, 1989

Initial Countywide Analyses

Cross-section data for the backwater analyses of the streams studied in detail were obtained using data from USGS topographic maps (USGS, various dates) and field surveys. Elevation data and structural geometry for culverts and bridges were obtained from field survey or the Georgia Department of Transportation.

Starting water-surface elevations for all studied streams were calculated using the slope-area method. Water-surface elevations of floods of the selected recurrence intervals were computed using the HEC-2 step backwater computer program (HEC, 1984).

This Countywide Analyses

For the streams newly studied by approximate methods, cross section data was obtained from the USGS 10-meter DEMs. Hydraulically significant roads were modeled as bridges, with opening data gathered from available inventory data or approximated from the imagery. Top of road elevations were estimated from the best available topography. The studied streams were modeled using HEC-RAS version 4.0 (HEC, 2008).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2).

Channel roughness factors (Mannings "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the stream channels and overbank areas. The Manning's "n" values for detailed studied streams in Jenkins County are listed below.

Manning's "n" Values

<u>Stream</u>	<u>Channel "n"</u>	<u>Overbank "n"</u>
Buckhead Creek	0.020-0.055	0.005-0.110
Little Buckhead Creek	0.020-0.055	0.005-0.110
Ogeechee River	0.020-0.055	0.005-0.110
The Canal	0.020-0.055	0.005-0.110

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was NGVD. With the finalization of NAVD, many FIS reports and FIRMs are being prepared using NAVD as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD. Structure and ground elevations in the community must, therefore, be referenced to NAVD. It is important to note that adjacent communities may be referenced to NGVD. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities. Some of the data used in this study were taken from the prior effective FIS reports and adjusted to NAVD. The average conversion factor that was used to convert the data in this FIS report to NAVD was calculated using the National Geodetic Survey's (NGS) VERTCON online utility (NGS, 2009). The data points used to determine the conversion are listed in Table 3.

Table 3- Vertical Datum Conversion

<u>Quad Name</u>	<u>Corner</u>	<u>Latitude</u>	<u>Longitude</u>	Conversion from NGVD29 to NAVD88 (feet)
Scotts Corner	SE	32.875	-82.125	-0.689
Bellevue	SE	32.875	-82.000	-0.741
Perkins	SE	32.875	-81.875	-0.778
Sardis	SE	32.875	-81.750	-0.778
Midville	SE	32.750	-82.125	-0.679
Birdsville	SE	32.750	-82.000	-0.705
Millen	SE	32.750	-81.875	-0.784
Garfield	SE	32.625	-82.000	-0.732
Four Points	SE	32.625	-81.875	-0.771
Average:				-0.740

For additional information regarding conversion between NGVD and NAVD, visit the NGS website at www.ngs.noaa.gov, or contact the NGS at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance (100-year) flood elevations and delineations of the 1- and 0.2-percent-annual-chance (500-year) floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data Table, and Summary of Stillwater Elevations Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community.

For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevation of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

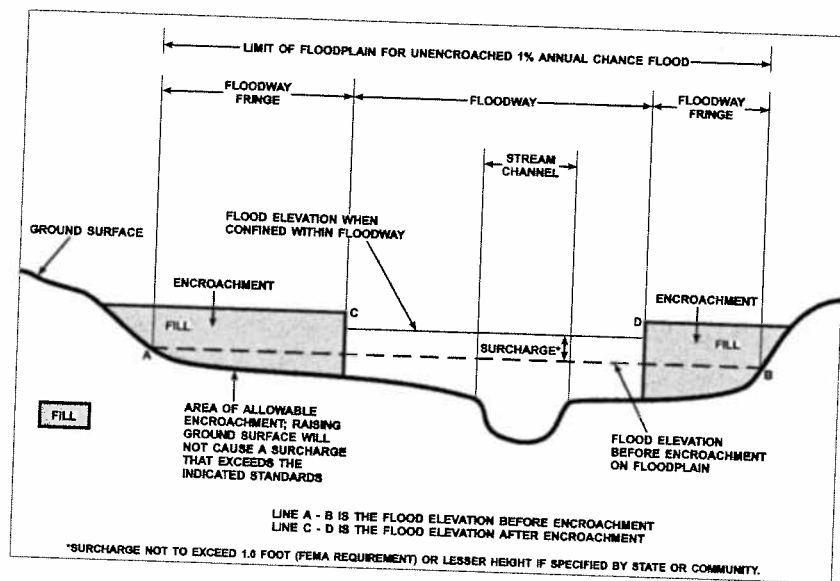


Figure 1 - Floodway Schematic

No floodways were computed for Jenkins County.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide FIRM presents flooding information for the entire geographic area of Jenkins County. Previously, FIRMs were prepared for each incorporated community and

the unincorporated areas of the County identified as flood-prone. Historical data relating to the maps prepared for each community are presented in Table 4.

7.0 OTHER STUDIES

This report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, Koger Center – Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341.

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COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE	FIRM EFFECTIVE DATE	FIRM REVISION DATE
Jenkins County (Unincorporated Areas)	February 3, 1978	None	September 29, 1989	None
Millen, City of	April 12, 1974	February 6, 1976 April 11, 1980	May 1, 1987	None

FEDERAL EMERGENCY MANAGEMENT AGENCY

JENKINS COUNTY, GA AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

TABLE 4

U.S. Geological Survey, Floods in Georgia, Magnitude and Frequency, Water Resources Investigations, McGlone Price, U.S. Department of the Interior, 1979.

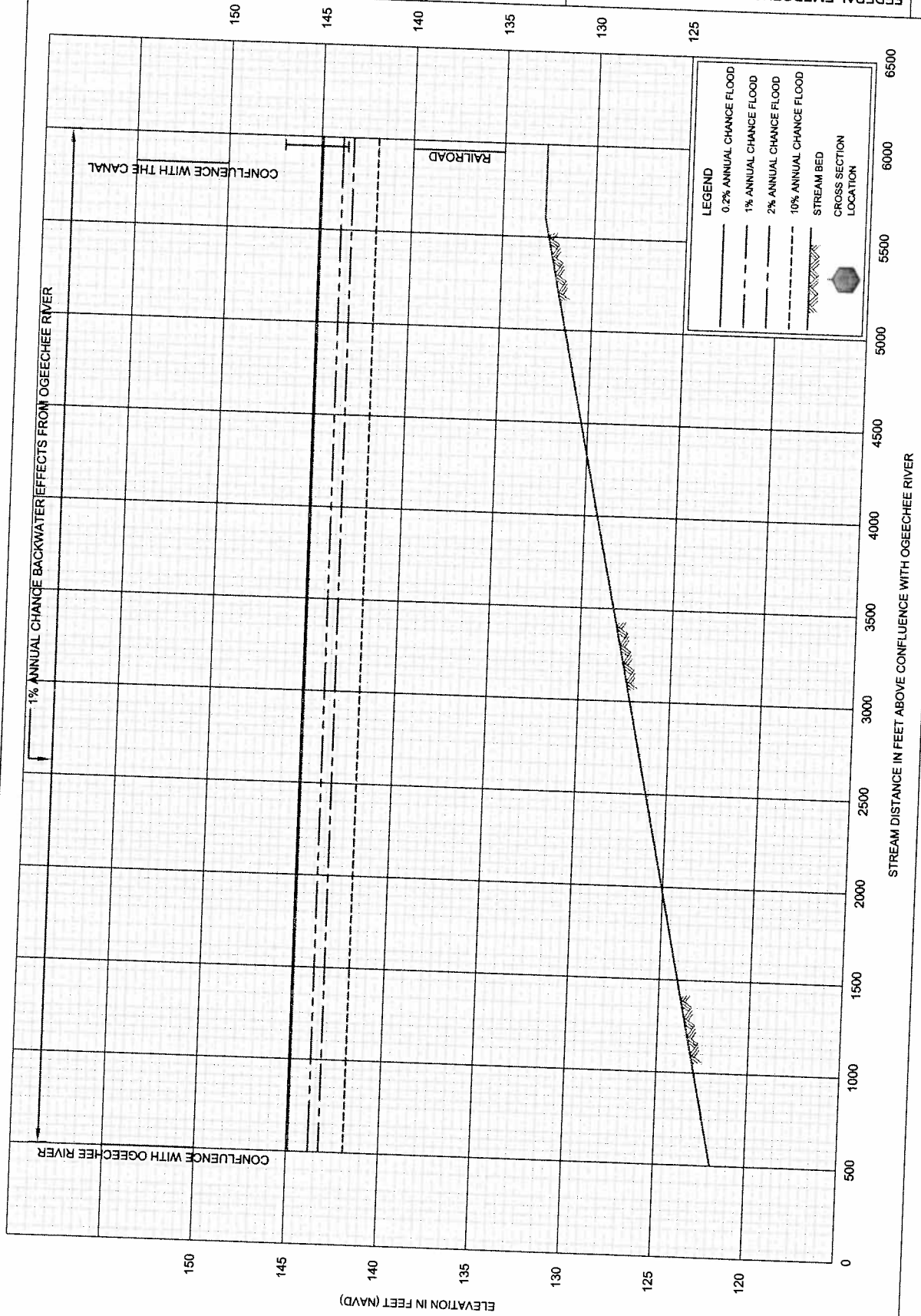
U.S. Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 Feet: Scotts Corner, Georgia 1974; Bellevue, Georgia, 1974; Perkins, Georgia, 1976; Sardis, Georgia, 1974; Midville, Georgia, 1974; Birdsville, Georgia, 1974; Millen, Georgia, 1975; Bay Branch, Georgia, 1975; Canoochee, Georgia, 1971; Garfield, Georgia, 1971; Four Points, Georgia, 1975; Rocky Ford, Georgia, 1975; Twin City, SE, Georgia, 1971; Portal, Georgia, 1975; various dates.

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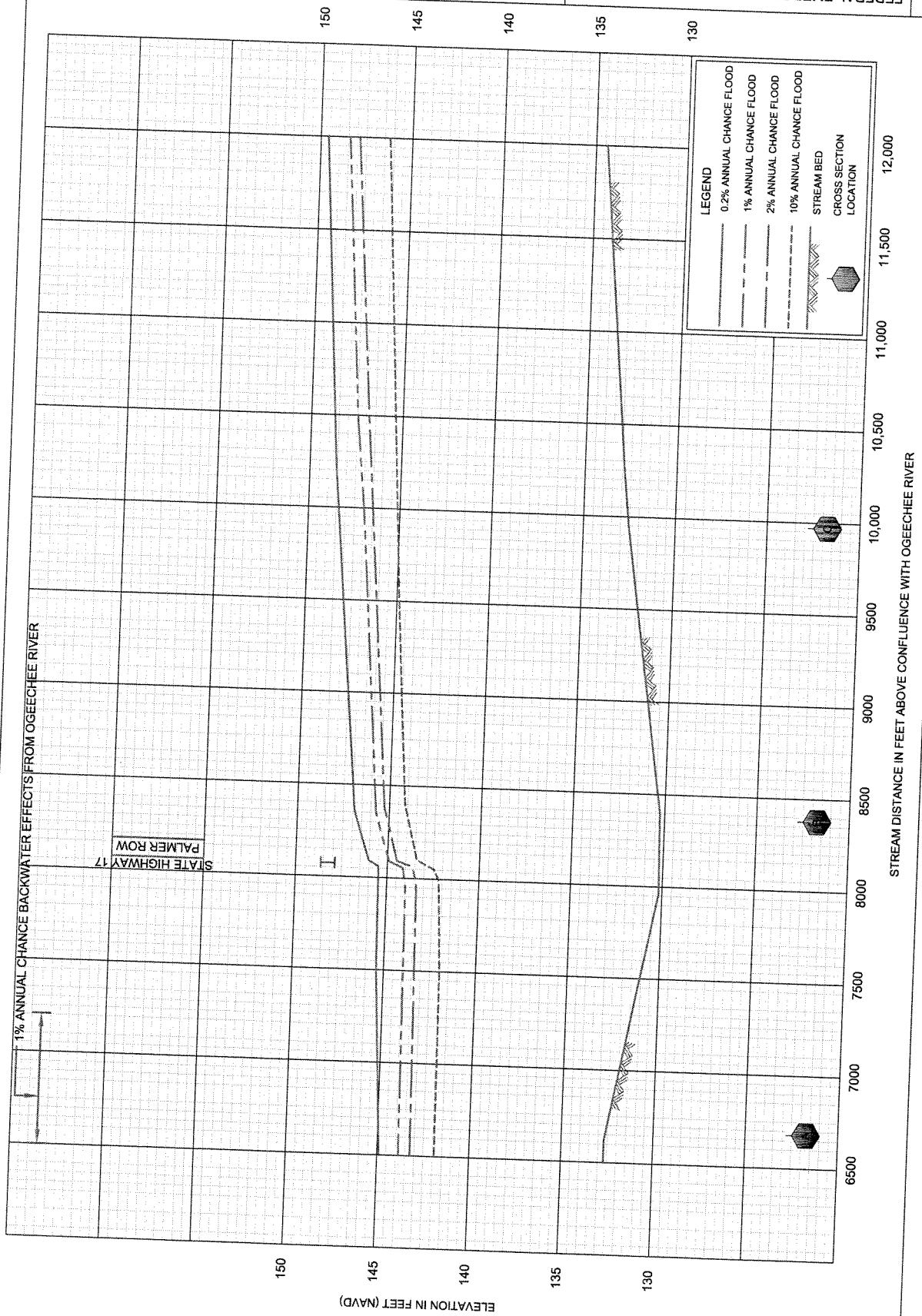
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JENKINS COUNTY, GA
AND INCORPORATED AREAS

FLOOD PROFILES
BUCKHEAD CREEK



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JENKINS COUNTY, GA
AND INCORPORATED AREAS

FLOOD PROFILES
BUCKHEAD CREEK



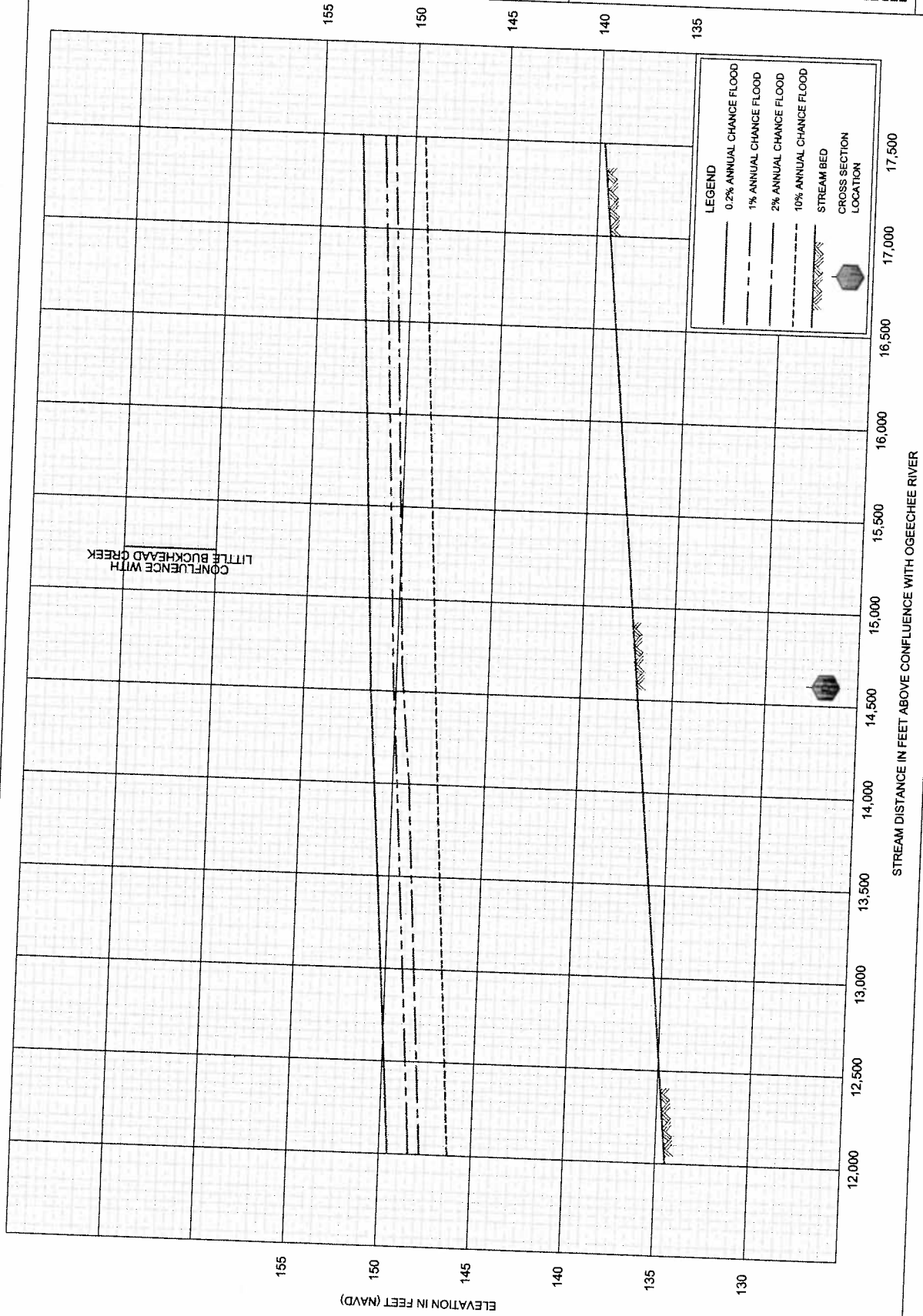
LEGEND

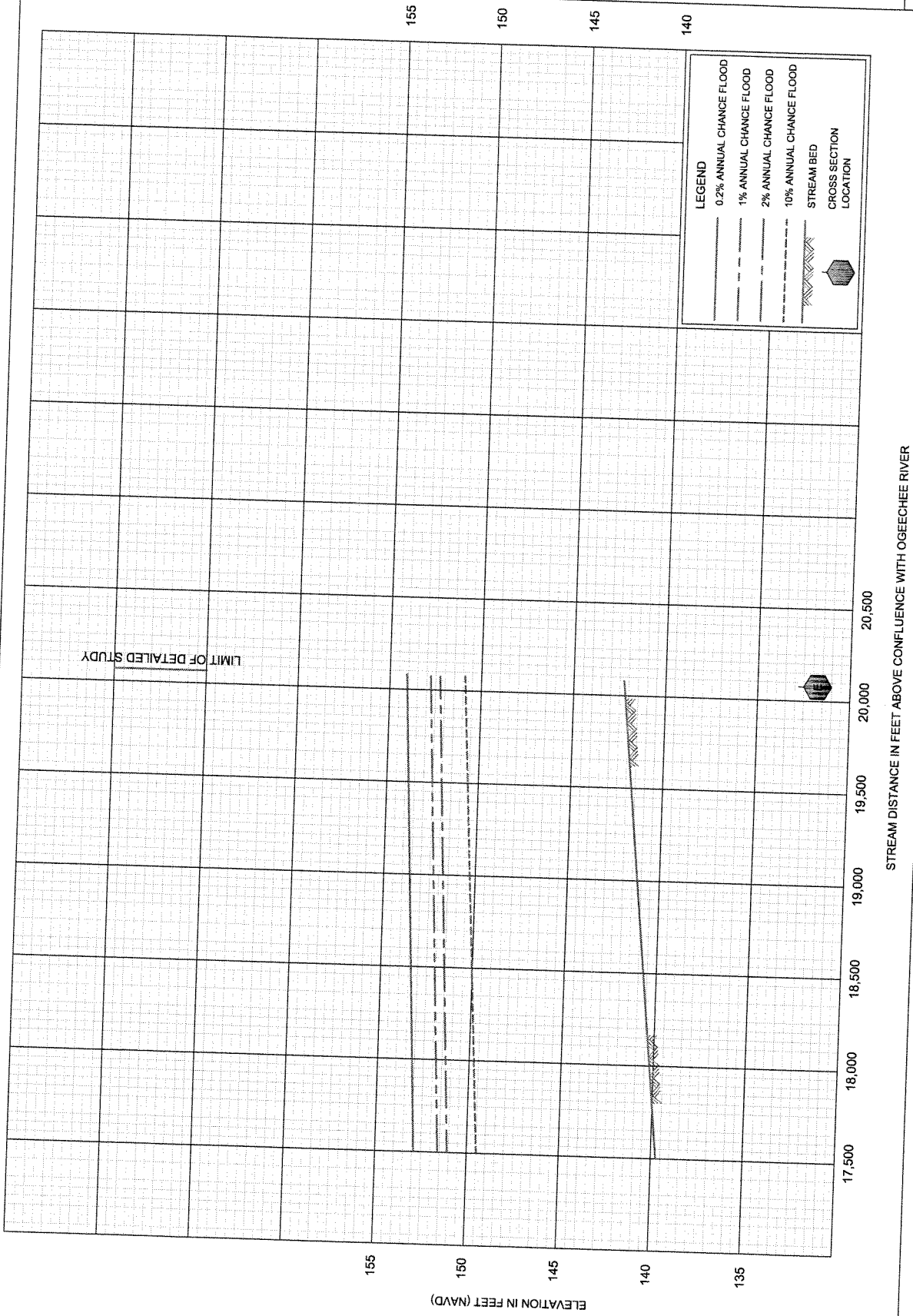
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

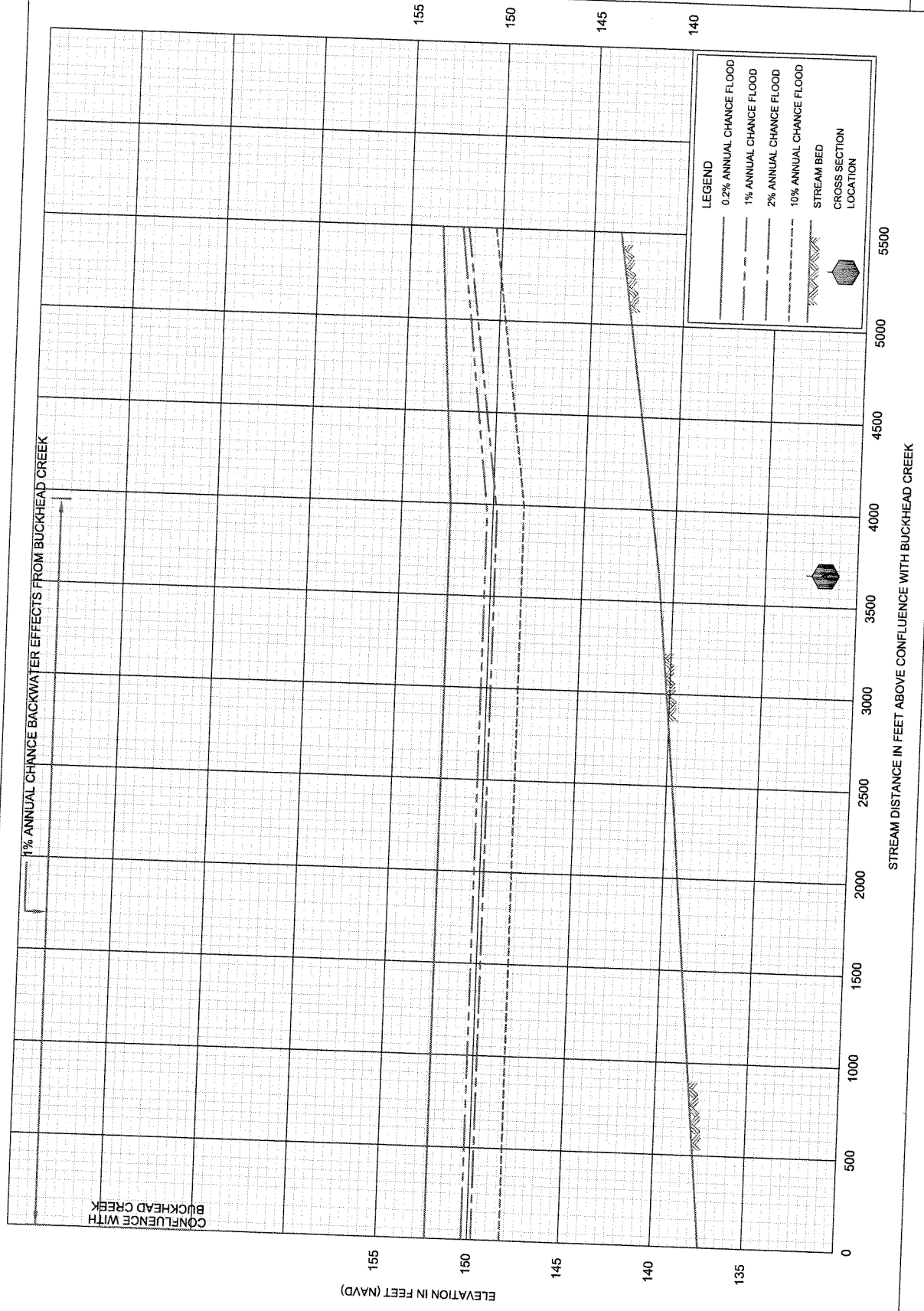
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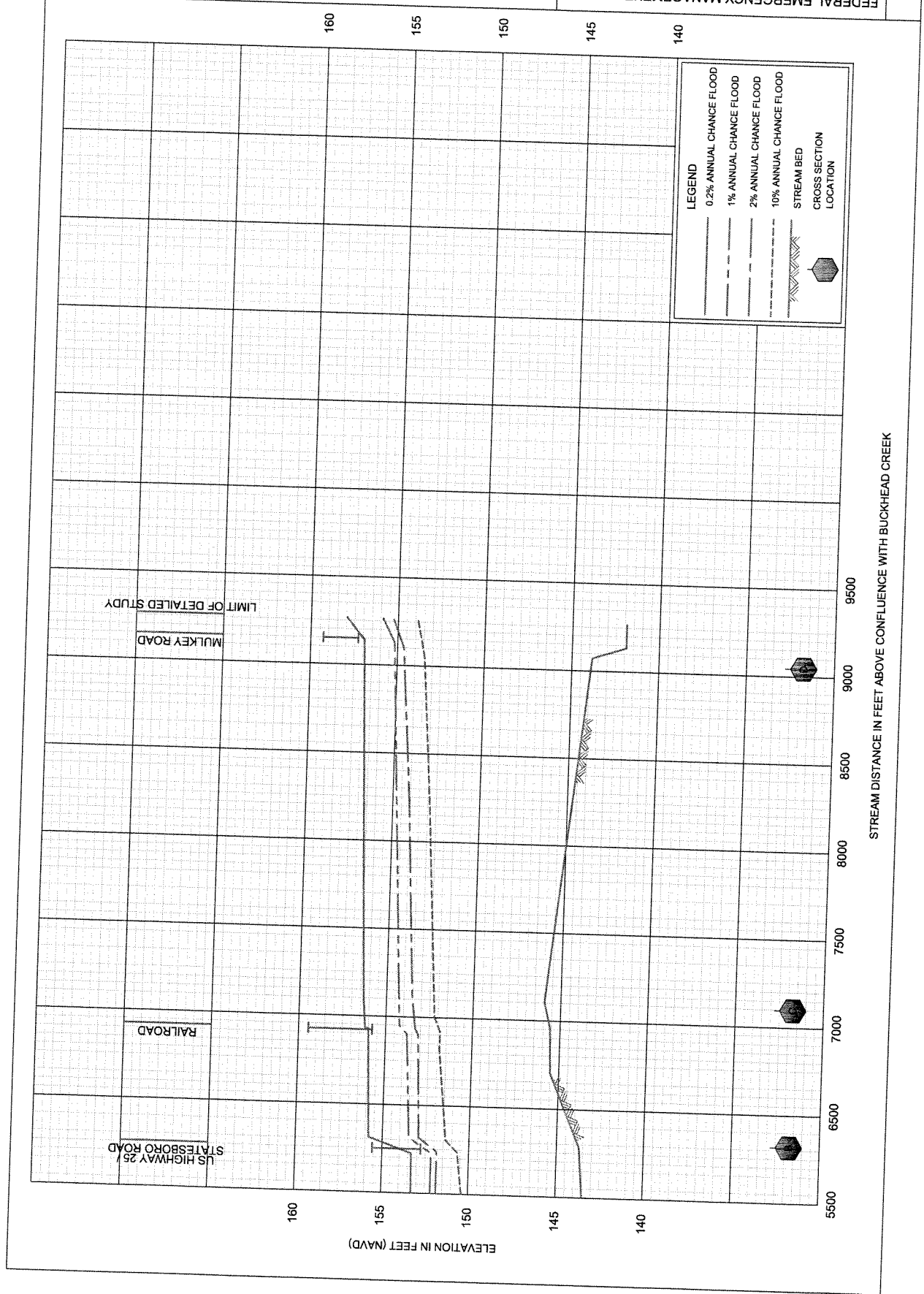
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JENKINS COUNTY, GA
AND INCORPORATED AREAS

FLOOD PROFILES
BUCKHEAD CREEK



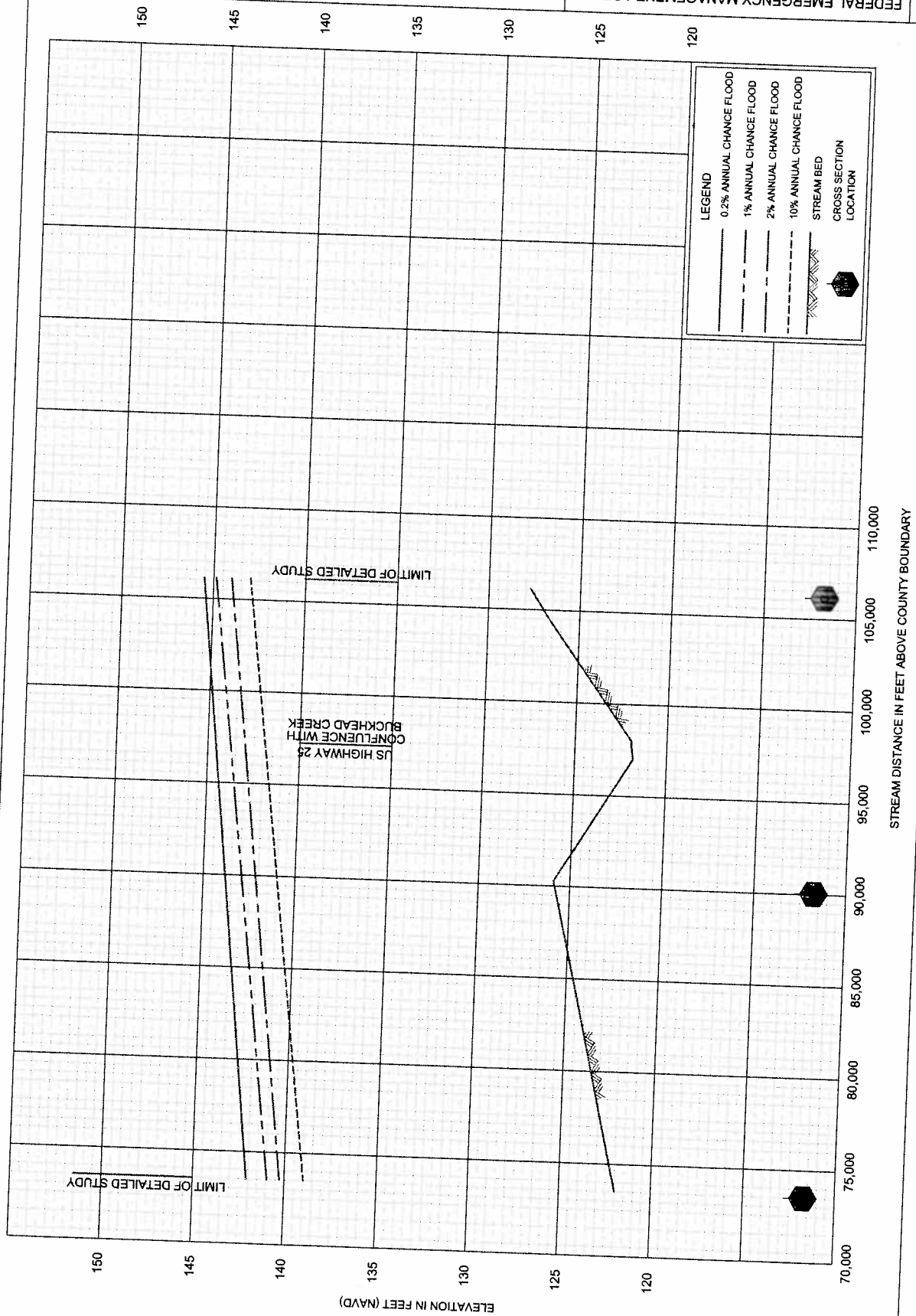


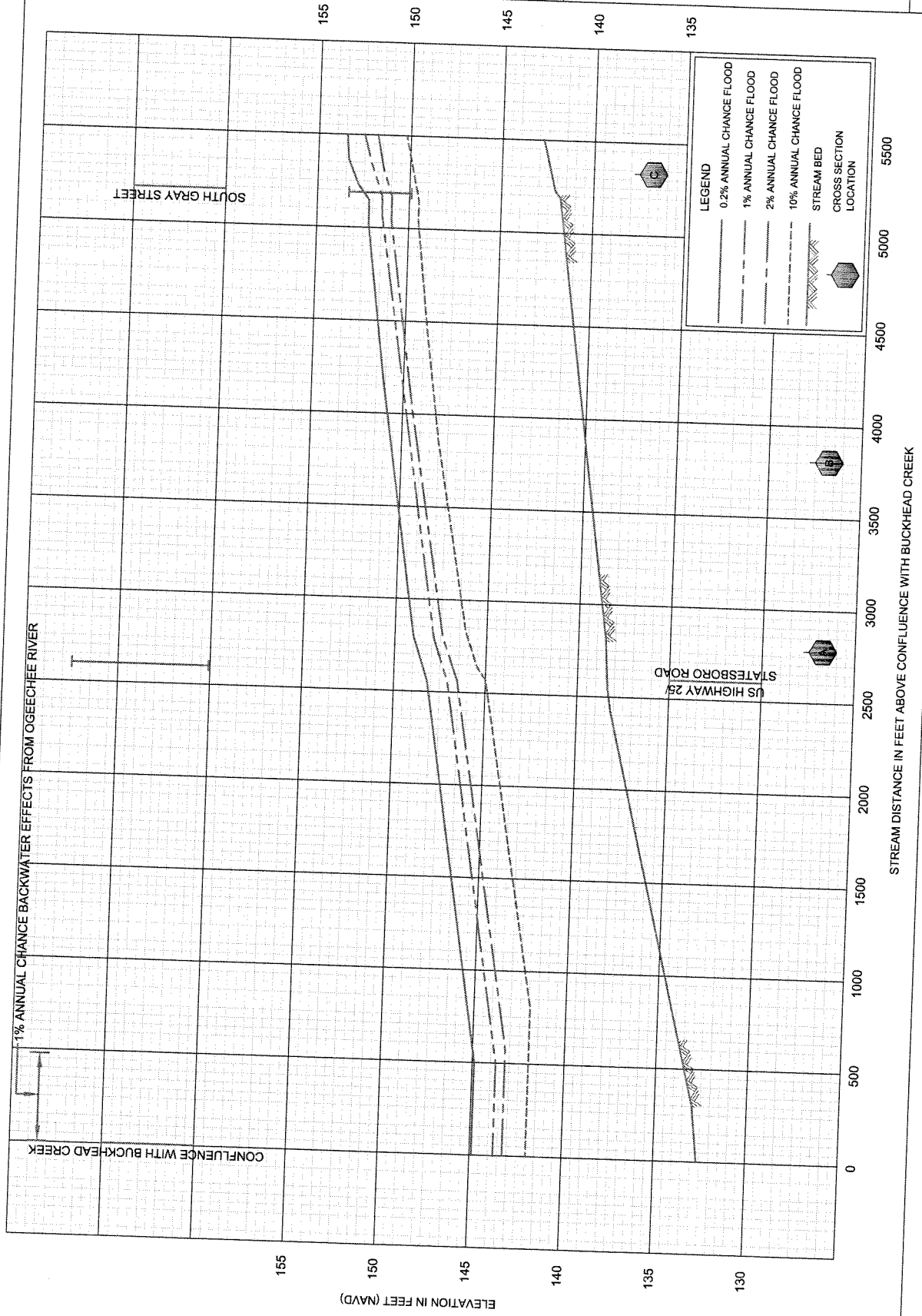




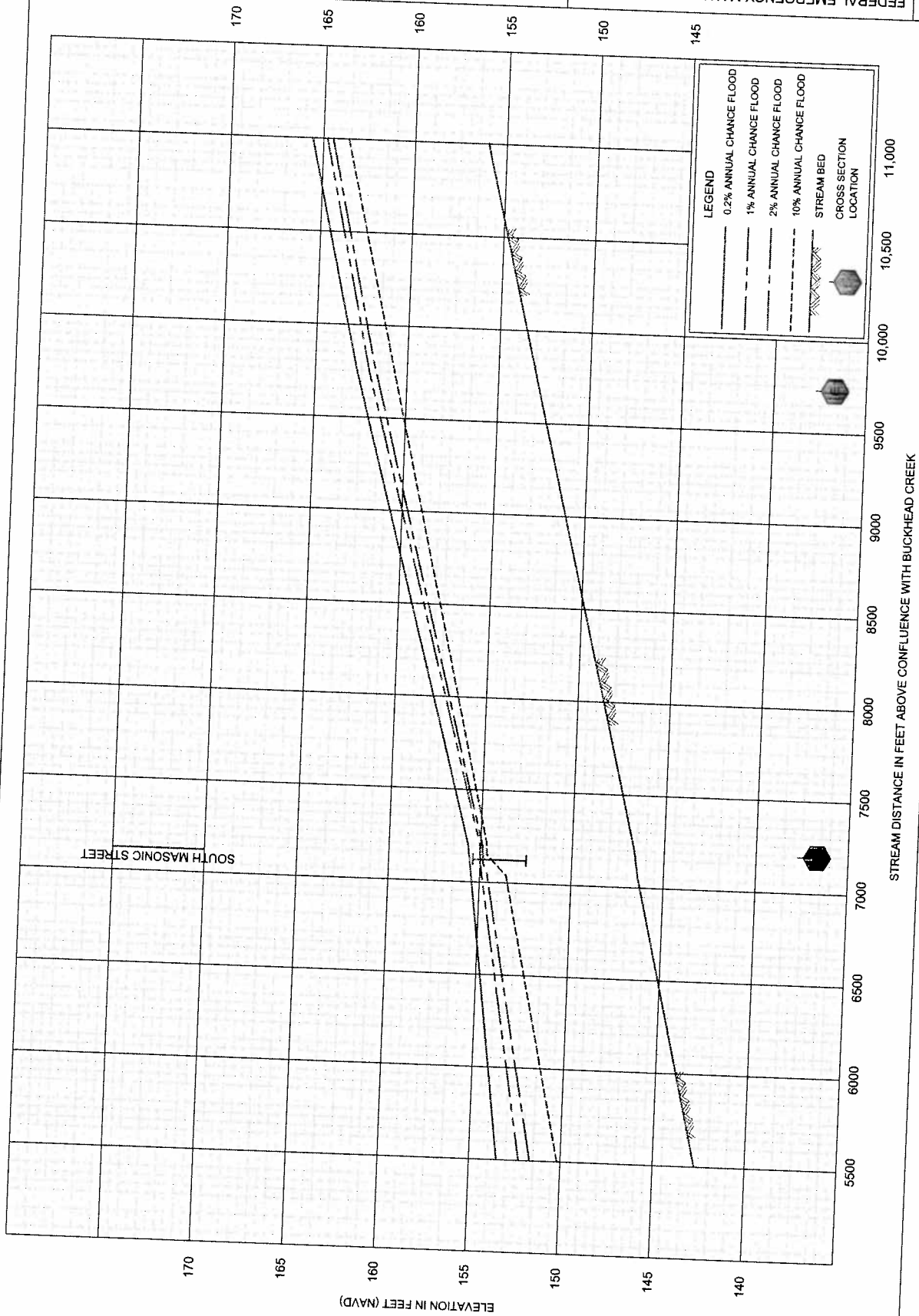
FEDERAL EMERGENCY MANAGEMENT AGENCY
JENKINS COUNTY, GA
AND INCORPORATED AREAS

FLOOD PROFILES
OGEECHEE RIVER



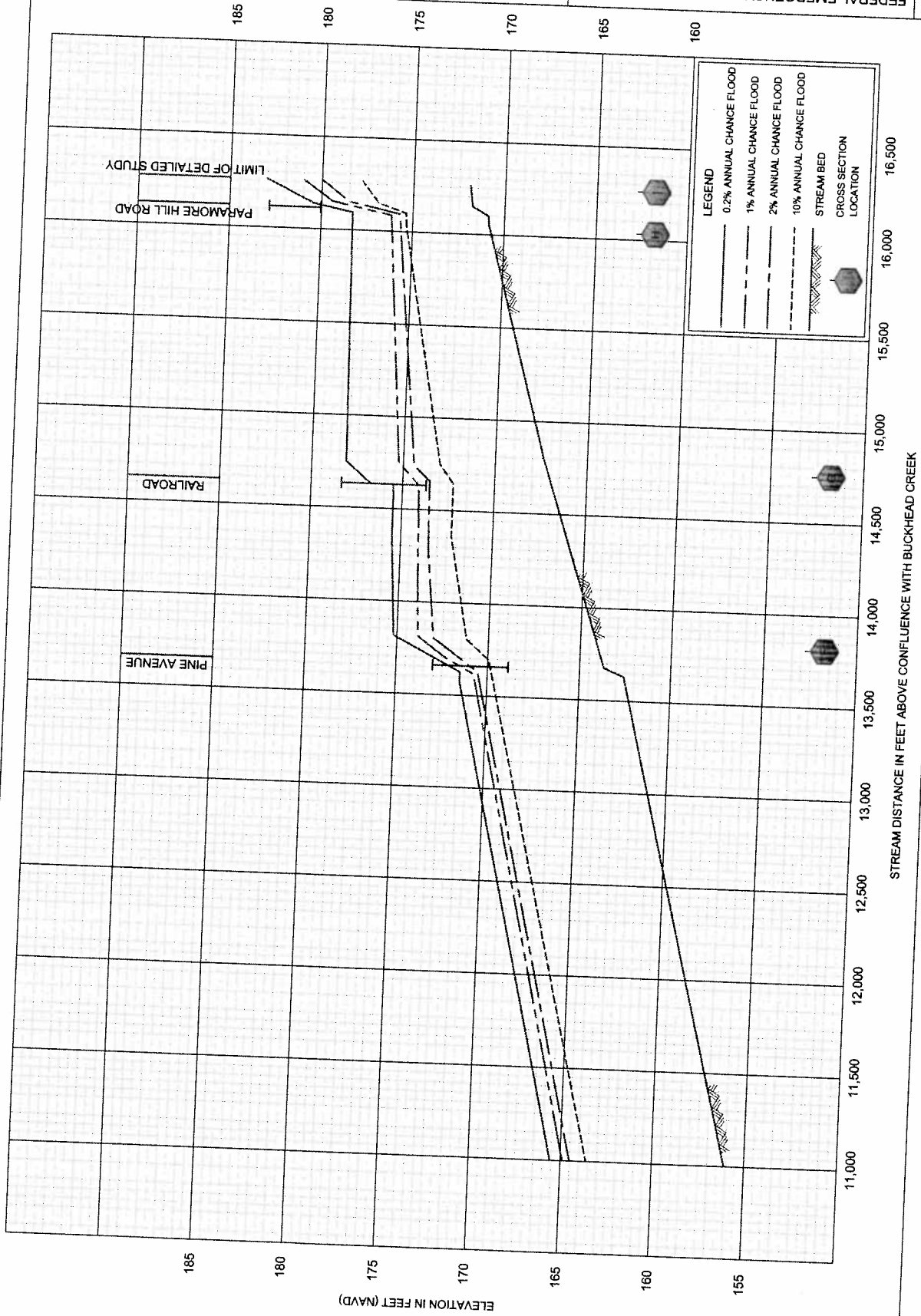


FLOOD PROFILES
THE CANAL



FEDERAL EMERGENCY MANAGEMENT AGENCY
JENKINS COUNTY, GA
AND INCORPORATED AREAS

FLOOD PROFILES
THE CANAL





A Program of the Georgia Forestry Commission
with support from the U.S. Forest Service

Community Wildfire Protection Plan

An Action Plan for Wildfire Mitigation and Conservation of Natural Resources

Jenkins County, Georgia



M A Y 2 0 1 9

Prepared by;
Rick Lane, Chief Ranger, Jenkins County
Will Fell, CWPP Specialist (Initial plan 2012)
Beryl Budd, Wildfire Prevention Specialist (Revised plan 2019)

Georgia Forestry Commission
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The following report is a collaborative effort among various entities; the representatives listed below comprise the core decision-making team responsible for this report and mutually agree on the plan's contents:

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PLAN CONTENTS

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Appended Documents:

Jenkins County Southern Wildfire Risk Assessment Summary Report

Jenkins County Wildfire Pre-suppression Plan

NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas.

Preface

The extreme weather conditions that are conducive to wildfire disasters (usually a combination of extended drought, low relative humidity and high winds) can occur in this area of Georgia as infrequently as every 10-15 years. This is not a regular event, but as the number of homes that have been built in or adjacent to forested or wildland areas increases, it can turn a wildfire under these weather conditions into a major disaster. Wildfires move fast and can quickly overwhelm the resources of even the best equipped fire department. Advance planning can save lives, homes and businesses.

This Community Wildfire Protection Plan (CWPP) includes a locally assessed evaluation of the wildland urban interface areas of the county, looking at the critical issues regarding access to these areas, risk to properties from general issues such as building characteristics and “fire wise” practices and response from local firefighting resources. It further incorporates a locally devised action plan to mitigate these risks and hazards through planning, education and other avenues that may become available to address the increasing threat of wildland fire. The CWPP does not obligate the county financially in any way, but instead lays a foundation for improved emergency response if and when grant funding is available to the county.

The Plan is provided at no cost to the county and can be very important for county applications for hazard mitigation grant funds through the National Fire Plan, FEMA mitigation grants and Homeland Security. Under the Healthy Forest Restoration Act (HFRA) of 2003, communities (counties) that seek grants from the federal government for hazardous fuels reduction work are required to prepare a Community Wildfire Protection Plan.

This plan will:

- Enhance public safety
- Raise public awareness of wildfire hazards and risks
- Educate homeowners on how to reduce home ignitability
- Build and improve collaboration at multiple levels

The public does not have to fall victim to this type of disaster. Homes and communities can be designed, built and maintained to withstand a wildfire even in the absence of fire equipment and firefighters on the scene. It takes planning and commitment at the local level before the wildfire disaster occurs and that is what the Community Wildfire Protection Plan is all about.

I. OBJECTIVES

The mission of the following report is to set clear priorities for the implementation of wildfire mitigation in Jenkins County. The plan includes prioritized recommendations for the appropriate types and methods of fuel reduction and structure ignitability reduction that will protect this community and its essential infrastructure. It also includes a plan for wildfire suppression. Specifically, the plan includes community-centered actions that will:

- Educate citizens on wildfire, its risks, and ways to protect lives and properties,
- Support fire rescue and suppression entities,
- Focus on collaborative decision-making and citizen participation,
- Develop and implement effective mitigation strategies, and
- Develop and implement effective community ordinances and codes.

II. COMMUNITY COLLABORATION

The core team convened on October 11th 2011 to assess risks and develop the Community Wildfire Protection Plan. The group is comprised of representatives from local government, local fire authorities, and the state agency responsible for forest management. Below are the groups included in the task force:

Millen Jenkins County Fire Department
Georgia Forestry Commission

It was decided to conduct community assessments on the basis of individual fire districts in the county. The various fire departments in the county assessed their districts and reconvened on November 8th 2011 for the purpose of completing the following:

Risk Assessment	Assessed wildfire hazard risks and prioritized mitigation actions.
Fuels Reduction	Identified strategies for coordinating fuels treatment projects.
Structure Ignitability	Identified strategies for reducing the ignitability of structures within the Wildland interface.
Emergency Management	Forged relationships among local government and fire districts and developed/refined a pre-suppression plan.
Education and Outreach	Developed strategies for increasing citizen awareness and action and to conduct homeowner and community leader workshops.

III. COMMUNITY & WILDFIRE HISTORY



Jenkins County, located in the southeastern part of the state, is Georgia's 140th county and has an area of 350 square miles. It was created by an act of the state legislature on August 17, 1905, from parts of Bulloch, Burke, Emanuel, and Screven counties. The original name proposed for the new county was Dixie, but it was ultimately decided to name the county in honor of Charles Jones Jenkins, a judge and Reconstruction-era governor of the state.

Millen is the county seat of Jenkins County and is also the reason for its existence. The town had been split between Burke and Screven counties. Residents of this small town had grown weary of its precarious location near the corner of four very large counties because of the impact it had on jurisdictional issues and the distance to the various county seats, which averaged twenty miles.



In 1903 the Millen News Publishing Company was created. The newspaper it published became a mouthpiece for the growing sentiment to create a new county for Millen. In 1905 donations were gathered to send several citizens to Atlanta to petition the legislature for a new county. In August of that year the legislature listened to their pleas, and Jenkins County was created.

Past and present photo of courthouse in Millen

Jenkins County contains several historically significant places. Big Buckhead Baptist Church, named for the stream that flows nearby, was constituted in 1787 and is one of the oldest Baptist churches in the state. Four different structures have housed the church on its present site. The church that stands today was constructed in 1830.

The tiny community of Birdsville is the site of an antebellum manor known as the Birdsville Plantation. It sits on a plot that was originally part of a 500-acre land grant to Francis Jones by the governor and council of Georgia before the Revolutionary War (1775-83). When Jones died in 1774, his two sons, Francis and James, inherited the land, which became a thriving plantation. In turn James's son Phillip inherited the property and began construction on the plantation house. Phillip's grandson William Beeman completed the construction in 1847, and the house still stands, though it bears the scars of bullet holes left by the passing army of Union general William T. Sherman.

Another point of interest is Magnolia Springs State Park. The park covers 1,071 acres and contains a clear spring that puts out 7 million gallons of water a day. During the Civil War (1861-65) the area served as a prison camp called Fort Lawton. It was chosen for this purpose because of the readily available supply of water from the springs. The earthen bulwarks of the prison camp are still visible in the park today. The park also contains many recreational opportunities, as well as the Bo Ginn National Fish Hatchery and Aquarium.

According to the 2010 census, the population of Jenkins County is 8,340, a decrease from the 2000 population of 8,575. The county remains mostly rural, with many residents working in agriculture and agribusiness. The major crops are cotton, peanuts, wheat, rye, corn, soybeans, and timber.

Wildfire History

Jenkins County located in southeast Georgia, is still almost 65% forested, despite an agricultural presence scattered throughout the county. Perhaps with the exception of the large blocks of woodlands in the areas along the Ogeechee River, there are homes and communities scattered throughout the county. The risks and hazards from the wildland urban interface are fairly general and substantial throughout the county even on the edges of the incorporated city of Millen.

Jenkins County is protected by the Millen Jenkins County Fire Department with a full time station in Millen along with six volunteer departments located throughout the county. The Georgia Forestry Commission maintains a county protection unit located three miles south of Millen on Hwy 17 to respond to wildfires throughout the county. The city of Millen is serviced by a pressurized water system with hydrants available.

Over the past 55 years, Jenkins County has averaged 62 reported wildland fires per year, burning an average of 387 acres per year. Using more recent figures over the past 20 years, this number has reduced significantly to an average of 50 fires per year burning on average 194 acres annually. The occurrence of these fires during this later period shows a pronounced peak during the months of January, February and March accounting for 48% of the annual fires and 62% of the average acreage burned. There is a significant decrease during the remainder of the year, particularly during the fall months.

Over the past 10 years, FY2008-FY2017, the leading causes of these fires, was debris burning and arson causing 45% and 18% respectively of the fires and 48% and 35% respectively of the acres burned. Another significant cause was machine use accounting for 11% of the fires and 6% of the acreage burned. Over the past ten years records show that over 26% of the debris fires originated from residential burning.

Georgia Forestry Commission Wildfire Records show that in the past five years, FY2014-FY2018, 5 homes have been damaged or lost by wildfire in Jenkins County resulting in estimated loss of \$271,000 along with 2 outbuildings valued at \$4,500. According to reports during this period 16 other homes have been directly or indirectly threatened by these fires. Additionally 2 vehicles valued at \$4,500 and 1 other pieces of mechanized equipment valued at \$10,000 were lost. Agricultural crop damage from these wildfires caused a \$1000 in losses. This is a significant loss of non-timber property attributed to wildfires in Jenkins County.

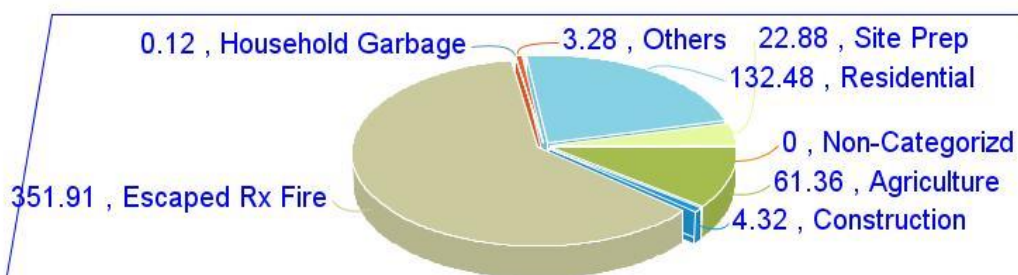
County = Jenkins	Cause	Fires	Acres	Fires 5 Yr Avg	Acres 5 Yr Avg
Campfire	Campfire	0	0.00	0.20	0.06
Debris: Ag Fields, Pastures, Orchards, Etc	Debris: Ag Fields, Pastures, Orchards, Etc	0	0.00	0.60	3.94
Debris: Construction Land Clearing	Debris: Construction Land Clearing	1	4.10	0.40	0.84
Debris: Escaped Prescribed Burn	Debris: Escaped Prescribed Burn	10	66.55	7.40	50.59
Debris: Household Garbage	Debris: Household Garbage	2	16.25	0.60	3.27
Debris: Other	Debris: Other	0	0.00	0.20	0.04
Debris: Residential, Leafpiles, Yard, Etc	Debris: Residential, Leafpiles, Yard, Etc	2	8.25	3.00	10.77
Debris: Site Prep - Forestry Related	Debris: Site Prep - Forestry Related	2	2.30	0.80	0.54
Incendiary	Incendiary	6	83.82	3.20	35.73
Lightning	Lightning	1	0.65	0.80	0.17
Machine Use	Machine Use	2	1.36	1.20	2.56
Miscellaneous: Other	Miscellaneous: Other	1	0.77	1.00	2.24
Miscellaneous: Power lines/Electric fences	Miscellaneous: Power lines/Electric fences	0	0.00	0.60	0.21
Miscellaneous: Structure/Vehicle Fires	Miscellaneous: Structure/Vehicle Fires	3	1.50	1.40	1.11
Miscellaneous: Woodstove Ashes	Miscellaneous: Woodstove Ashes	1	0.56	0.40	0.19
Smoking	Smoking	0	0.00	0.20	0.13
Undetermined	Undetermined	0	0.00	2.40	7.22
Totals for County: Jenkins Year: 2018		31	186.11	24.40	119.60

Acreage Burned /Number of Fires For Jenkins County For FY 2008-2017				
Year	Acreage Burned	Number of Fires	Average Size	Statewide Average Size
2008	84.39	30	2.81	4.56
2009	97.99	37	2.65	3.90
2010	20.98	8	2.62	3.93
2011	340.66	39	8.73	17.56
2012	127.50	35	3.64	5.08
2013	122.90	23	5.34	4.53
2014	120.57	19	6.35	5.02
2015	40.66	19	2.14	4.42
2016	85.75	17	5.04	6.29
2017	164.92	36	4.58	11.60

Acreage Burned /Number of Fires by Fire Cause For Jenkins County For FY 2008-2017		
Fire Cause	Acreage Burned	Number of Fires
Campfire	7.62	4
Children	4.60	2
Debris Burning	576.35	118
Incendiary	422.73	48
Lightning	54.55	19
Machine Use	67.53	30
Miscellaneous	33.41	27
Railroad	0.00	0
Smoking	1.34	2
Undetermined	38.19	13
Total	1,206.32	263

Acreage Burned /Number of Fires by Debris-Burning Sub-cause For Jenkins County For FY 2008-2017		
Debris Burning Sub-Cause	Acreage Burned	Number of Fires
Non-Categorized	0.00	0
Agriculture	61.36	12
Construction	4.32	5
Escaped Rx Fire	351.91	53
Household Garbage	0.12	1
Others	3.28	4
Residential	132.48	31
Site Prep	22.88	12
Total	576.35	118

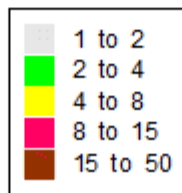
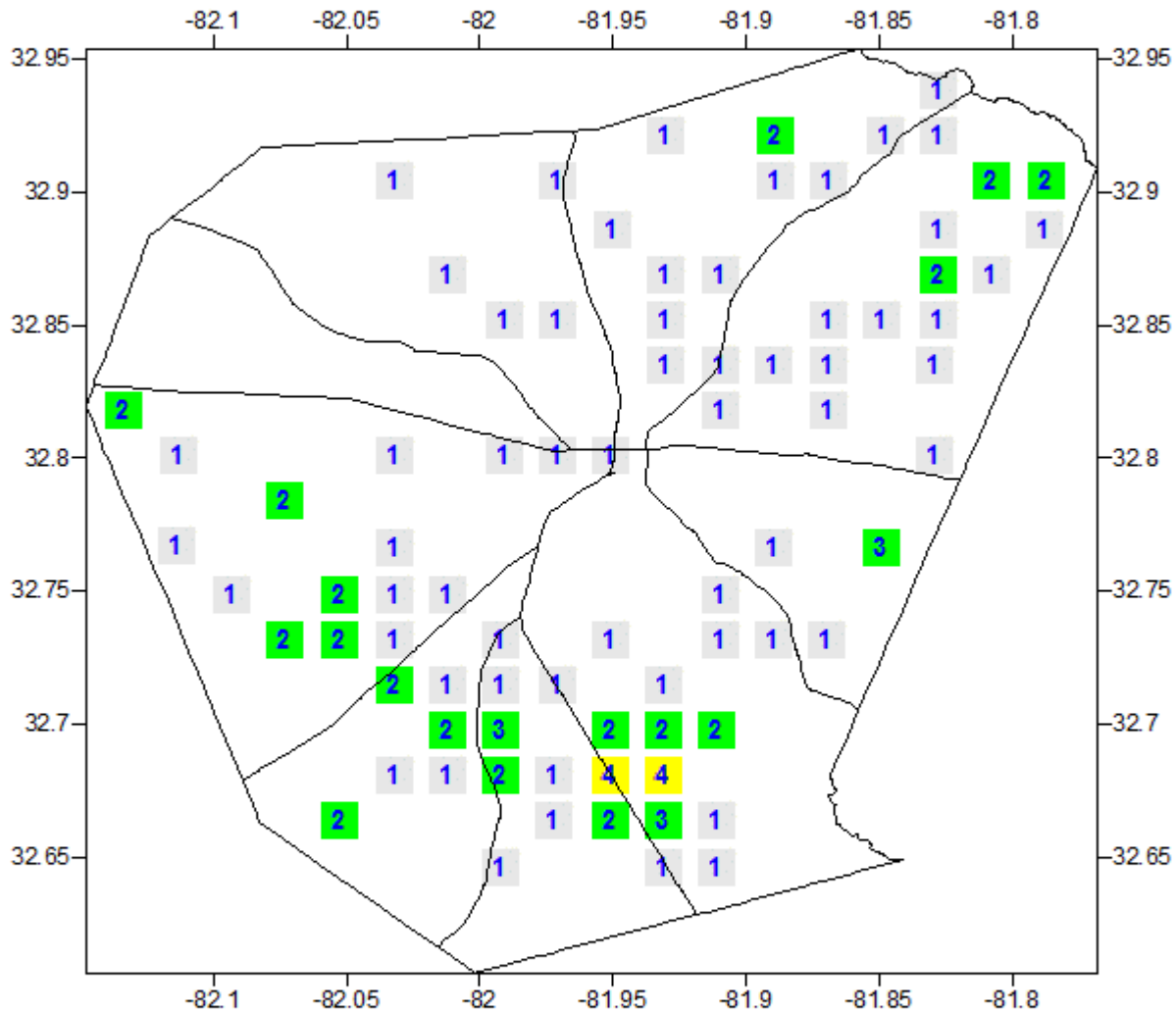
Acreage Burned By Debris Burning Sub Cause For Jenkins County For FY 2008-2017



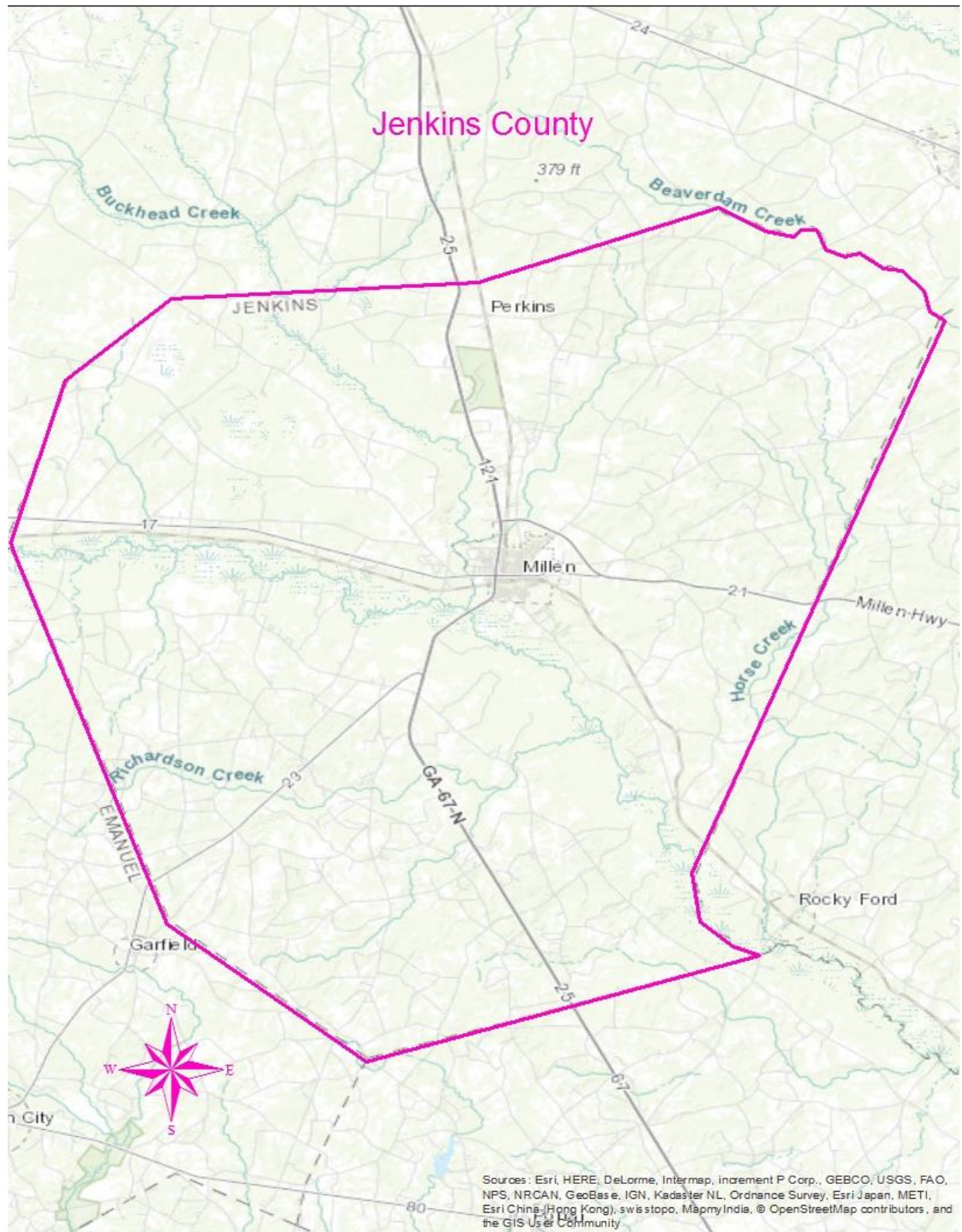
Fire Cause

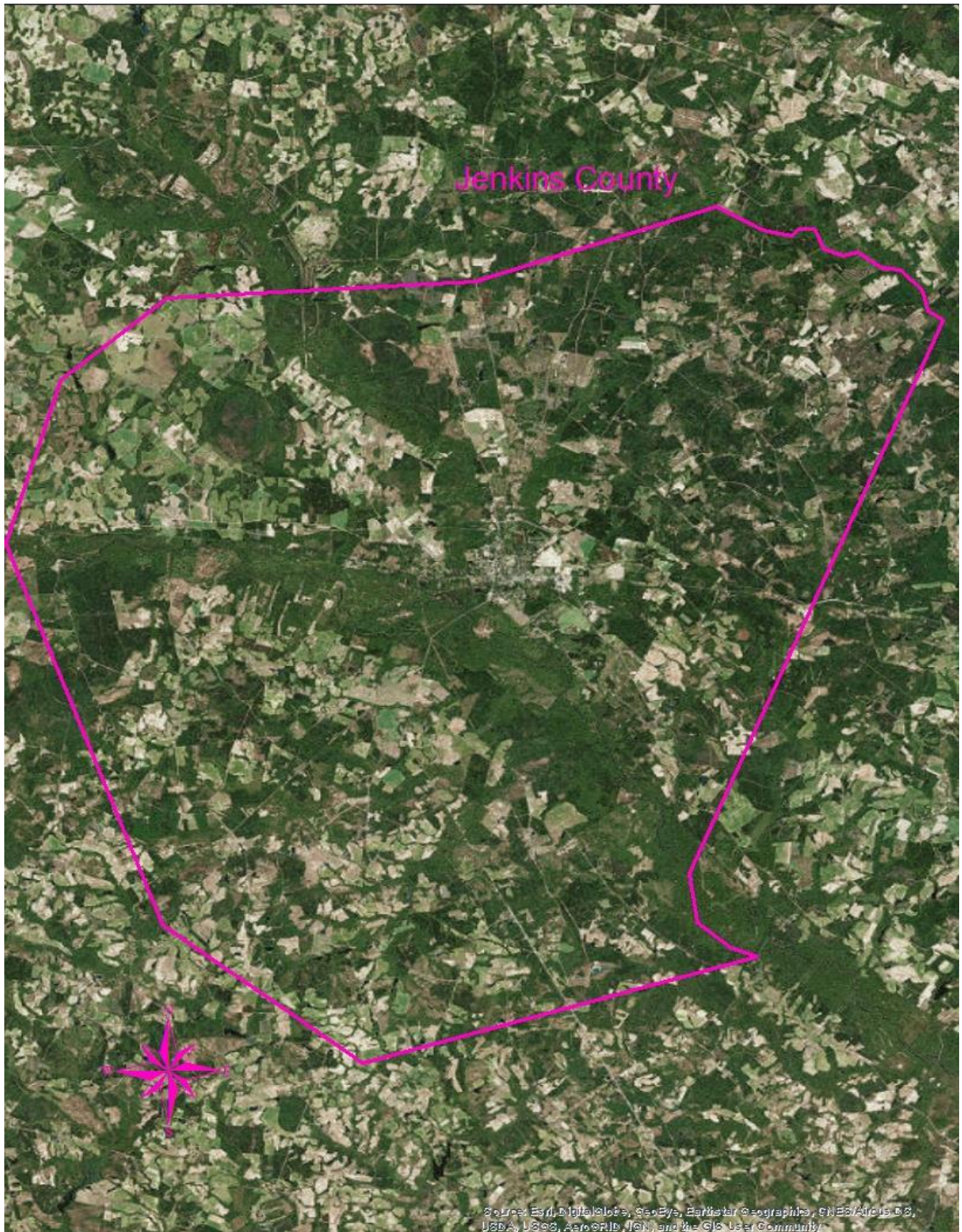


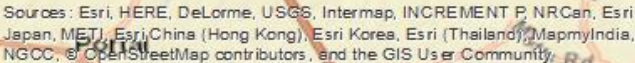
Fire Occurrence Map for Jenkins County for Fiscal Year 2012-2016



IV. COMMUNITY BASE MAPS







V. COMMUNITY WILDFIRE RISK ASSESSMENT

The Wildland-Urban Interface

There are many definitions of the Wildland-Urban Interface (WUI), however from a fire management perspective it is commonly defined as an area where structures and other human development meet or intermingles 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.

1. **“Boundary” wildland-urban interface** is characterized by areas of development where homes, especially new subdivisions, press against 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 predominately 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.

Wildland Urban Interface Hazards

Firefighters in the wildland urban interface may encounter hazards other than the fire itself, such as hazardous materials, utility lines and poor access.

Hazardous Materials

- Common chemicals used around the home may be a direct hazard to firefighters from a flammability, explosion potential and/or vapors or off gassing. Such chemicals include paint, varnish and other flammable liquids, fertilizer, pesticides, cleansers, aerosol cans, fireworks, batteries and ammunition. In addition, some common household products such as plastics may give off very toxic fumes when they burn. Stay out of smoke from burning structures and any unknown sources such as trash piles.

Illicit Activities

- Marijuana plantations or drug production labs may be found in the wildland urban interface areas. Extremely hazardous materials such as propane tanks and flammable/toxic chemicals may be encountered.

Propane Tanks

- Both large (household size) and small (gas grill size) liquefied propane gas (LPG) tanks can present hazards to firefighters, including explosion.

Utility Lines

- Utility Lines may be located above and below ground and may be cut or damaged by tools or equipment. Don't spray water on utility lines or boxes.

Septic Tanks and Fields

- Below ground structures may not be readily apparent and may not support the weight of engines or other equipment.

New Construction Materials

- Many new construction materials have comparatively low melting points and may "off-gas" extremely hazardous vapors. Plastic decking materials that resemble wood are becoming more common and may begin softening and losing structural strength at 180 degrees F, though they normally do not sustain combustion once direct flame is removed. However if they continue to burn they exhibit the characteristics of flammable liquids.

Pets and Livestock

- Pets and livestock may be left when residents evacuate and will likely be highly stressed making them more inclined to bite and kick. Firefighters should not put themselves at risk to rescue pets or livestock.

Evacuation Occurring

- Firefighters may be taking structural protect actions while evacuations of residents are occurring. Be very cautious of people driving erratically. Distraught residents may refuse to leave their property and firefighters may need to disengage from fighting fire to contact law enforcement officers for assistance. In most jurisdictions firefighters do not have the authority to force evacuations. Firefighters should not put themselves at risk trying to protect someone who will not evacuate!

Limited Access

- Narrow one-lane roads with no turn around room, inadequate or poorly maintained bridges and culverts are frequently found in wildland urban interface areas. Access should be sized up and an evacuation plan for all emergency personnel should be developed.



Wildland Urban Interface (WUI) is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels.

The wildland fire risk assessments conducted in 2011 by the Jenkins County Fire Departments returned a number of communities in the moderate to high range. The risk assessment instrument used to evaluate wildfire hazards to Jenkins County's WUI was the Hazard and Wildfire Risk Assessment Checklist. The instrument takes into consideration accessibility, vegetation (based on fuel models), roofing assembly, building construction, and availability of fire protection resources, placement of gas and electric utilities, and additional rating factors. The following factors contributed to the wildfire hazard scores for Jenkins County:

- Unpaved roads and private driveways
- Narrow roads without drivable shoulders
- Lack of uniform address signs
- Deadend roads without "turnarounds"
- Minimal defensible space around structures
- Homes with wooden siding
- Unmarked septic tanks in yards
- Lack of pressurized or non-pressurized water systems available
- Large, adjacent areas of forest or wildlands
- Heavy fuel buildup in adjacent wildlands
- Undeveloped lots comprising half the total lots in many rural communities.
- High occurrence of wildfires in the several locations
- Lack of homeowner or community organizations

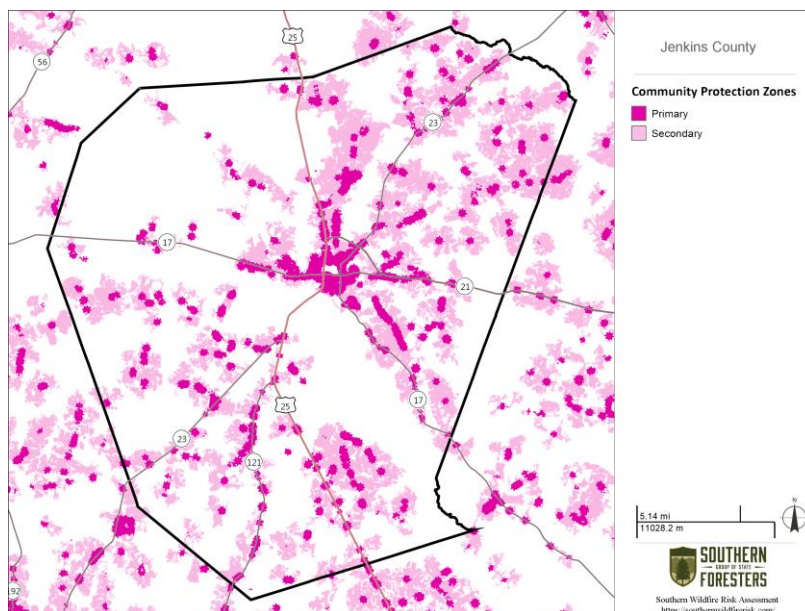
Summary of Jenkins County Assessments

Fire District	Community Access	Surrounding Vegetation	Bldg Construction	Fire Protection	Utilities	Add. Factors	Score	Hazard Rating
Millen Jenkins South	7	15	8	5	7	11	53	Moderate
Jenkins St 5 South	16	15	10	17	7	16	81	High
Jenkins St 6 North	9	20	10	17	6	16	78	High
Jenkins	8	20	10	15	5	14	72	Moderate

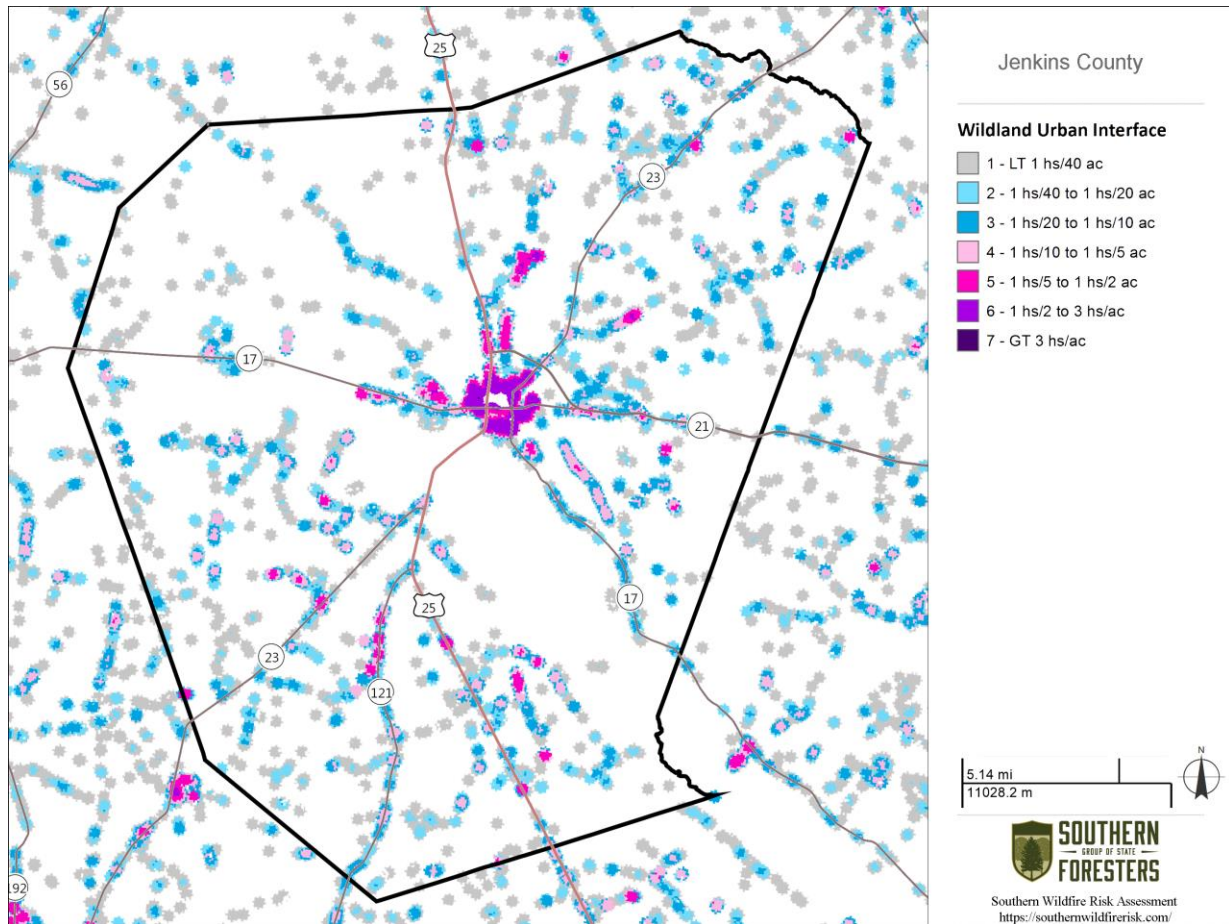
VI. SOUTHERN WILDFIRE RISK ASSESSMENT & RISK HAZARD MAPS

The Southern Wildfire Risk Assessment tool, developed by the Southern Group of State Foresters, was released to the public in July 2014. This tool allows users of the Professional Viewer application of the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP) to define a specific project area and summarize wildfire related information for this area. A detailed risk summary report is generated using a set of predefined map products developed by the Southern Wildfire Risk Assessment project which have been summarized explicitly for the user defined project area. A risk assessment summary was generated for Jenkins County. The SouthWRAP (SWRA) products included in this report are designed to provide the information needed to support the following key priorities:

- Identify areas that are most prone to wildfire.
- Identify areas that may require additional tactical planning, specifically related to mitigation projects and Community Wildfire Protection Planning.
- Provide the information necessary to justify resource, budget and funding requests.
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries.
- Define wildland communities and identify the risk to those communities.
- Increase communication and outreach with local residents and the public to create awareness and address community priorities and needs.
- Plan for response and suppression resource needs.
- Plan and prioritize hazardous fuel treatment.

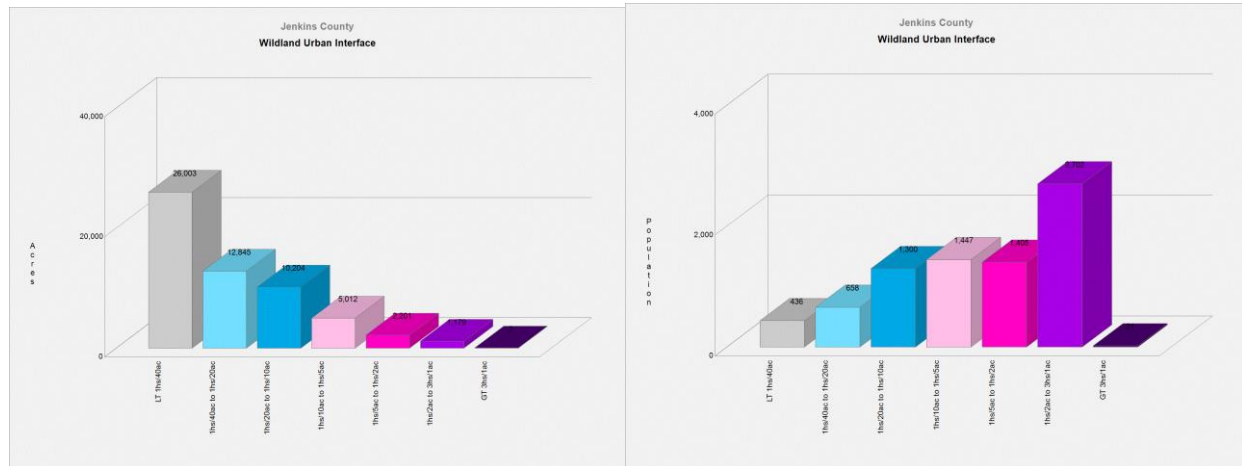


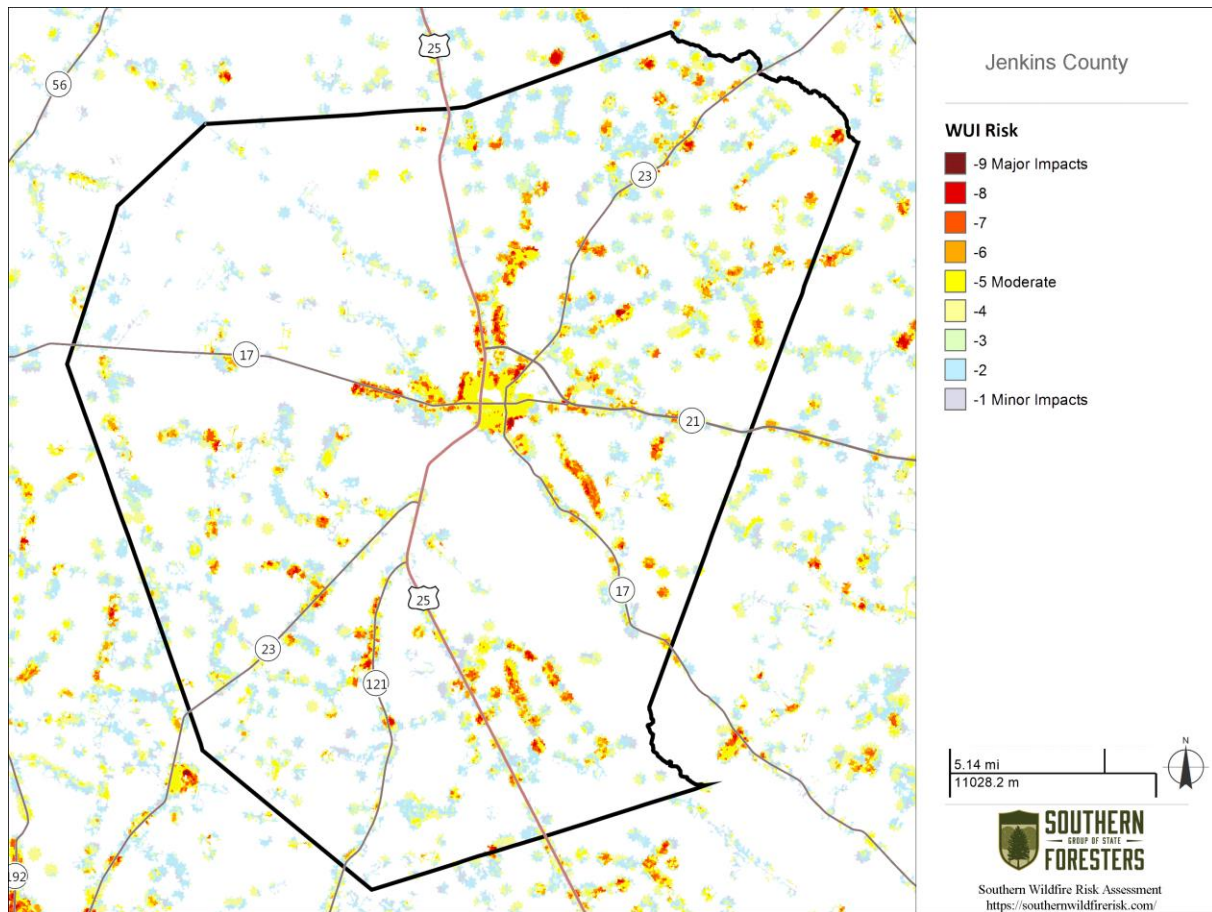
Community Protection Zones map from the Jenkins County SWRA



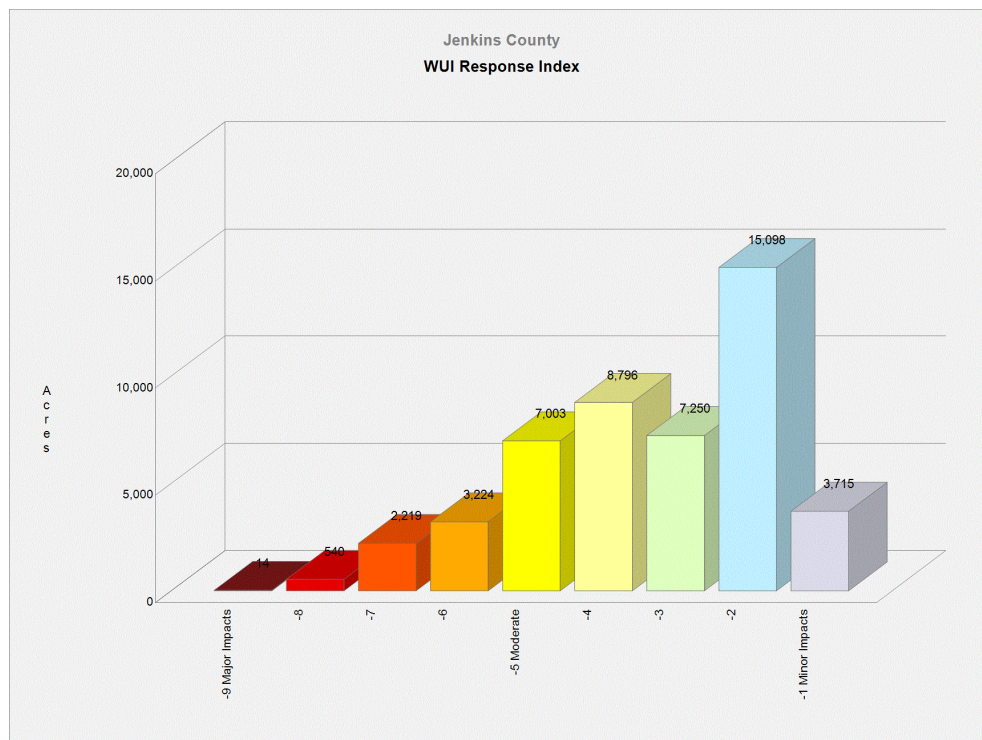
Above: Wildland Urban Interface (WUI) map

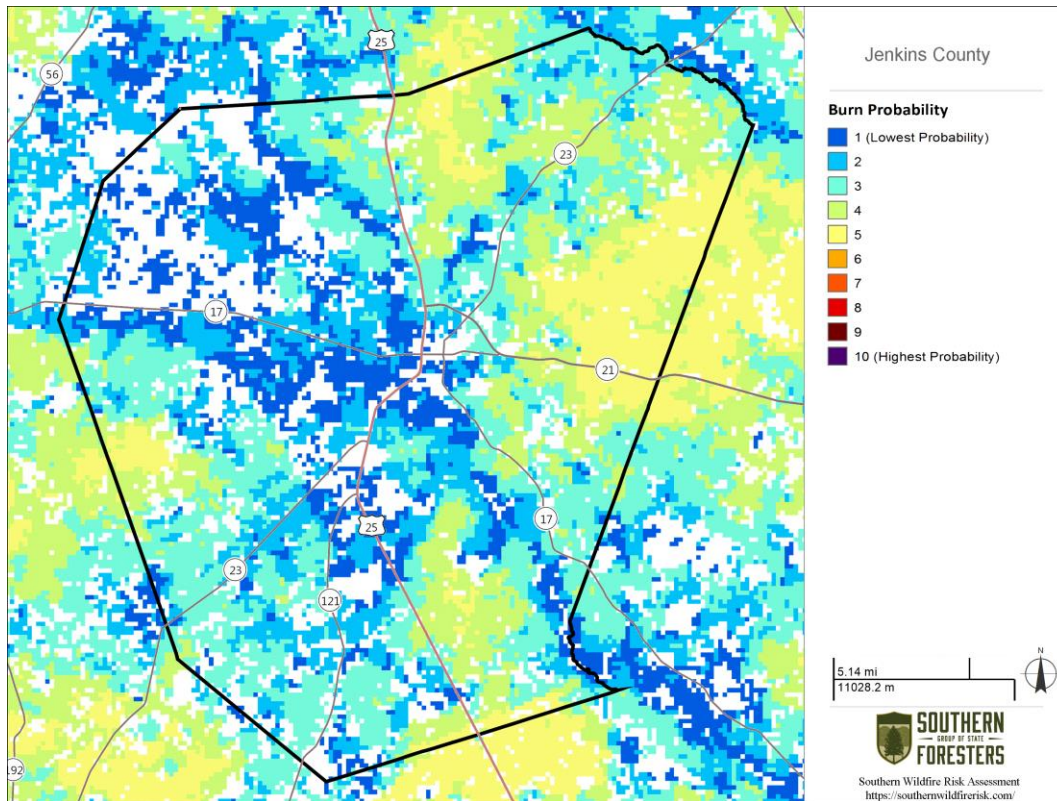
Below: WUI Acres (left) WUI Population (right)



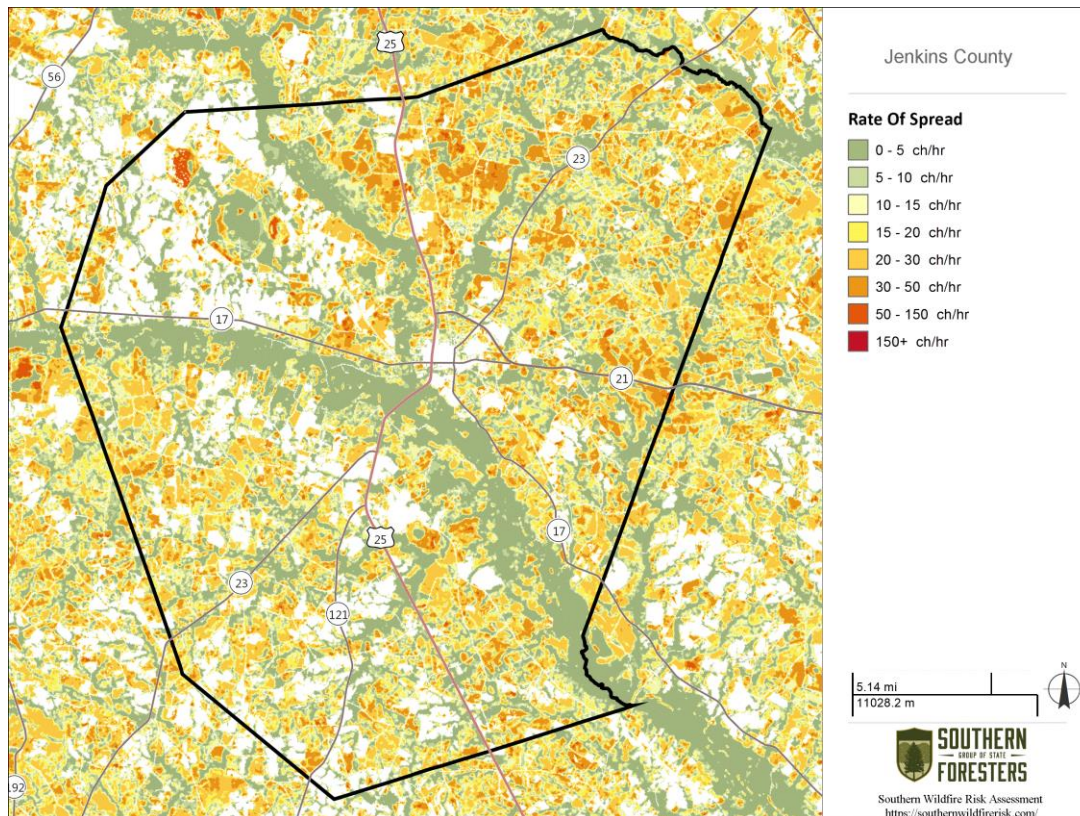


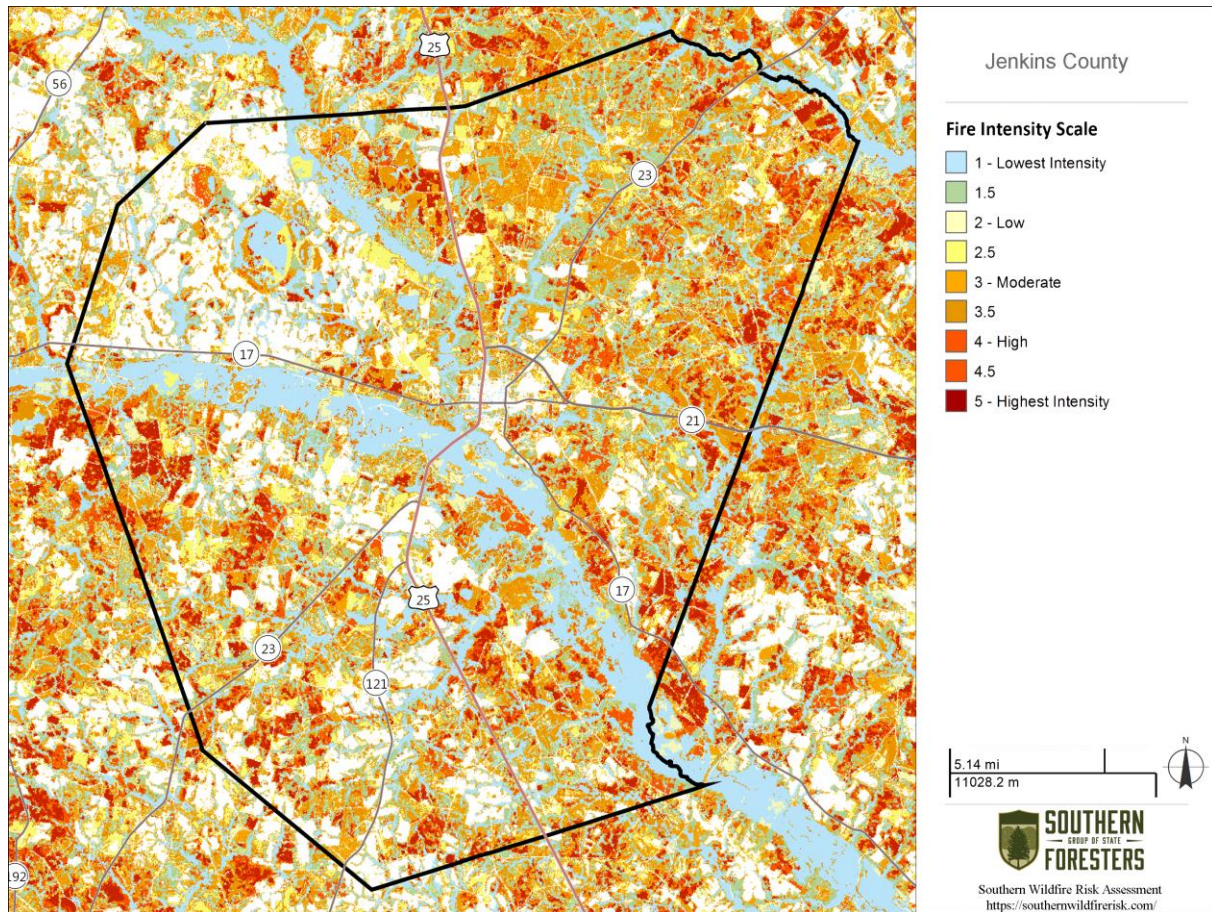
Above: Fire Intensity Scale map Below: Fire Intensity Scale Acres



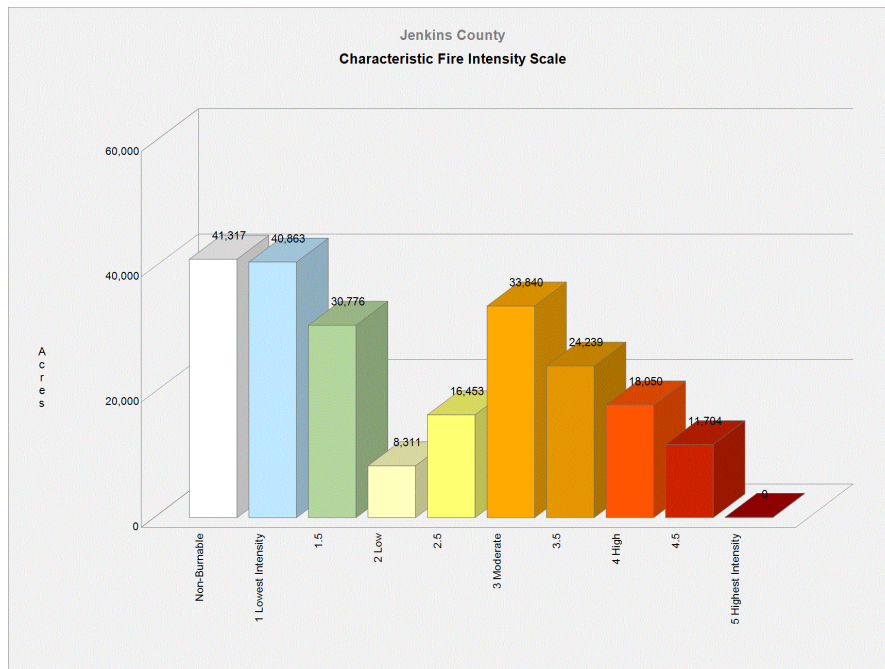


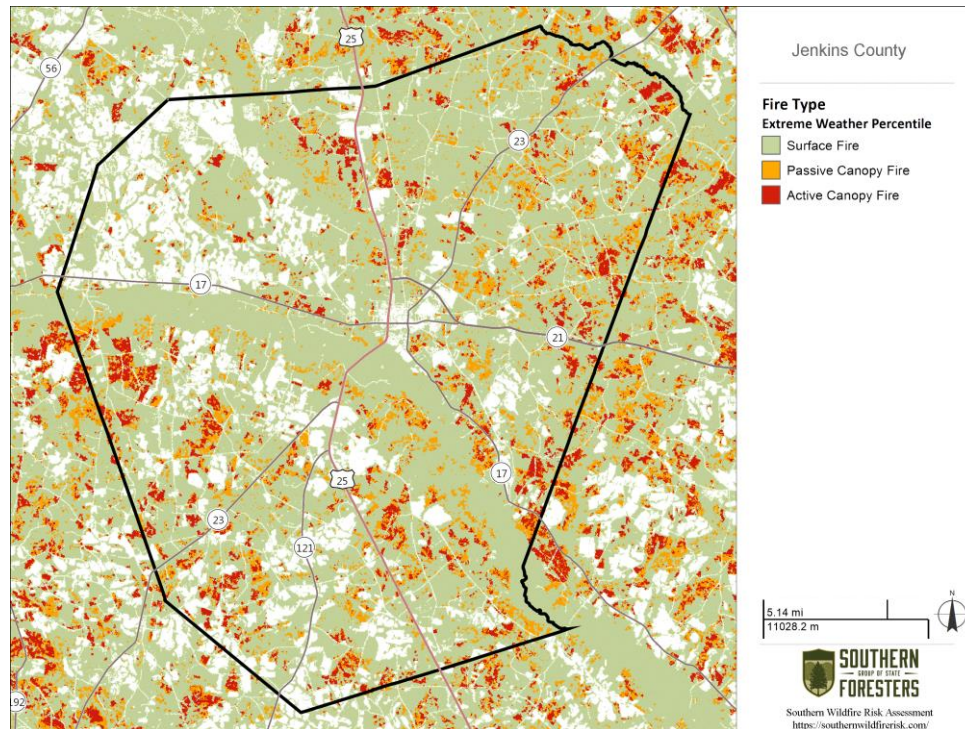
Above: Burn Probability map Below: Rate of Spread map





Above: Fire Intensity Scale map Below: Fire Intensity Scale Acres





Above: Fire Type Map

Surface Fire

A fire that spreads through surface fuel without consuming any overlying canopy fuel. Surface fuels include grass, timber litter, shrub/brush, slash and other dead or live vegetation within about 6 feet of the ground.



Passive Canopy Fire

A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods (Scott & Reinhardt, 2001).



Active Canopy Fire

A crown fire in which the entire fuel complex (canopy) is involved in flame, but the crowning phase remains dependent on heat released from surface fuel for continued spread (Scott & Reinhardt, 2001).



VII. PRIORITIZED MITIGATION RECOMMENDATIONS

Executive Summary

As Southeast Georgia continues to see increased growth from other areas seeking less crowded and warmer climates, new development will occur more frequently on forest and wildland areas. Jenkins County will have an opportunity to significantly influence the wildland fire safety of new developments. It is important that new development be planned and constructed to provide for public safety in the event of a wildland fire emergency.

Over the past 20 years, much has been learned about how and why homes burn during wildland fire emergencies. Perhaps most importantly, case histories and research have shown that even in the most severe circumstances, wildland fire disasters can be avoided. Homes can be designed, built and maintained to withstand a wildfire even in the absence of fire services on the scene. The national Firewise Communities program is a national awareness initiative to help people understand that they don't have to be victims in a wildfire emergency. The National Fire Protection Association has produced two standards for reference: NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire. 2008 Edition and NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas.

When new developments are built in the Wildland/Urban Interface, a number of public safety challenges may be created for the local fire services: (1) the water supply in the immediate areas may be inadequate for fire suppression; (2) if the Development is in an outlying area, there may be a longer response time for emergency services; (3) in a wildfire emergency, the access road(s) may need to simultaneously support evacuation of residents and the arrival of emergency vehicles; and (4) when wildland fire disasters strike, many structures may be involved simultaneously, quickly exceeding the capability of even the best equipped fire departments.

In 2012 the International Code Council developed the International Wildland Urban Interface Code (IWUIC). The code is endorsed by NFPA (National Fire Protection Association) and the Georgia Legislature adopted the code in 2014 for use by Georgia Counties to help reduce risk in the WUI. Counties can utilize this code as a model to develop their own county building and zoning regulations.

The following recommendations were developed by the Jenkins County CWPP Core team as a result of surveying and assessing fuels and structures and by conducting meetings and interviews with county and city officials. A priority order was determined based on which mitigation projects would best reduce the hazard of wildfire in the assessment area.

Proposed Community Hazard and Structural Ignitability Reduction Priorities

Primary Protection for Community and Its Essential Infrastructure		
Treatment Area	Treatment Types	Treatment Method(s)
1. All Structures	Create minimum of 30-feet of defensible space**	Trim shrubs and vines to 30 feet from structures, trim overhanging limbs, replace flammable plants near homes with less flammable varieties, remove vegetation around chimneys.
2. Applicable Structures	Reduce structural ignitability**	Clean flammable vegetative material from roofs and gutters, store firewood appropriately, install skirting around raised structures, store water hoses for ready access, and replace pine straw and mulch around plantings with less flammable landscaping materials.
3. Driveway Access	Right of Way Clearance	Maintain vertical and horizontal clearance for emergency equipment. See that adequate lengths of culverts are installed to allow emergency vehicle access.
4. Road Access	Identify needed road improvements	As roads are upgraded, widen to minimum standards with at least 50 foot diameter cul de sacs or turn arounds. Particular attention needs to be paid to housing authority properties to add emergency access. Replace bridge at Herndon, limits access to west Jenkins.
5. Codes and Ordinances	Examine existing codes and ordinances. Utilize the International Wildland Urban Interface Code IWUIC	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 Review the need for subdivision and development ordinances for public safety concerns. Enforce uniform addressing ordinance.

Proposed Community Wildland Fuel Reduction Priorities		
Treatment Area	Treatment Types	Treatment Method(s)
1. Adjacent WUI Lands	Reduce hazardous fuels	Encourage prescribed burning for private landowners and industrial timberlands particularly adjacent to residential areas. Seek grant for mowing or prescribed burning in WUI areas.
2. Existing Fire Lines	Reduce hazardous fuels	Clean and re-harrow existing lines.
Proposed Improved Community Wildland Fire Response Priorities		
1. Water Sources	Dry Hydrants & Dip Sites	Inspect, maintain and improve access to existing dry hydrants. Add signage along road to mark the hydrants. Locate additional dry hydrants as needed. Need improved drafting equipment and turbo draft pumps and hose. GFC to locate and pre-clear additional helicopter dip sites for fire emergencies.
2. Fire Stations	Equipment	Wildland hand tools. Lightweight Wildland PPE Gear.
3. Water Handling	Tankers	Investigate need for additional tankers for rural stations.
4. Road Names	Road Signage	Improved Road Signage at Crossroads. “Dead End” or “No Outlet” Tags on Road Signs
5. Personnel	Training	Obtain Wildland Fire Suppression training for Fire Personnel. Ready Set Go training
**Actions to be taken by homeowners and community stakeholders		

Proposed Education and Outreach Priorities

1. Conduct “How to Have a Firewise Home” Workshop for Jenkins County Residents
<p>Set up and conduct a workshop for homeowners that teach the principles of making homes and properties safe from wildfire. Topics for discussion include defensible space, landscaping, building construction, etc. Workshop will be scheduled for evenings or weekends when most homeowners are available and advertised through local media outlets. Target local schools, community groups and local senior centers.</p> <p>Distribute materials promoting firewise practices and planning through local community and governmental meetings.</p>
2. Conduct “Firewise” Workshop for Community Leaders
<p>Arrange for GFC Firewise program to work with local community leaders and governmental officials on the importance of “Firewise Planning” in developing ordinances and codes as the county as the need arises. Identify “Communities at Risk” within the county for possible firewise community recognition.</p>
3. Spring Clean-up Event (National Wildfire Preparedness Day – 1 st Saturday in May)
<p>Conduct clean-up event every spring involving the Georgia Forestry Commission, Jenkins County Fire Departments and community residents. Set up information table with educational materials and refreshments. Initiate the event with a morning briefing by GFC Firewise coordinator and local fire officials detailing plans for the day and safety precautions. Activities to include the following:</p> <ul style="list-style-type: none"> • Clean flammable vegetative material from roofs and gutters • Trim shrubs and vines to 30 feet away from structures • Trim overhanging limbs • Clean hazardous or flammable debris from adjacent properties <p>Celebrate the work with a community cookout, with Community officials, GFC and Jenkins County Fire Departments discussing and commending the work accomplished.</p>
4. Informational Packets
<p>Develop and distribute informational packets to be distributed by building permit office, realtors and insurance agents. Included in the packets are the following:</p> <ul style="list-style-type: none"> • Be Firewise Around Your Home • Firewise Guide to Landscape and Construction • Firewise Communities USA Brochures • Ready Set Go information • Fire Adapted Community information

5. Wildfire Protection Display

Create and exhibit a display for the general public at local events as the Fall Festival. Display can be independent or combined with the Georgia Forestry Commission display.

Hold Open House at individual Fire Stations to promote Community Firewise Safety and develop community support and understanding of local fire departments and current issues.

6. Media

Invite the local news media to community “Firewise” functions for news coverage and regularly submit press releases documenting wildfire risk improvements in Jenkins County.

Utilize TV, radio, cable access, and social media for outreach.



Prescribed burning of woodlands is the best management practice to reduce hazardous fuel accumulation. The Georgia Forestry Commission can provide a prescribed burning plan, establish fire breaks, and can also provide equipment standby and assist with burning when personnel are available. Forestry consultants and contractors can also provide this service.

Mastication equipment, such as pictured on right, can be very effective in mowing or mulching understory fuels to reduce wildfire hazard. This management practice is practical for areas near homes where prescribed burning may not be possible. This type of service is available from a private contractor.



VIII. ACTION PLAN

Roles and Responsibilities

The following roles and responsibilities have been developed to implement the action plan:

Role	Responsibility
Hazardous Fuels and Structural Ignitability Reduction	
Jenkins County WUI Fire Council	Create this informal team or council comprised of residents, GFC officials, Millen Jenkins County Fire Department officials, a representative from the city and county governments along with the county EMA Director. Meet periodically to review progress towards mitigation goals, appoint and delegate special activities, work with federal, state, and local officials to assess progress and develop future goals and action plans. Work with residents to implement projects and firewise activities.
Key Messages to focus on	<ol style="list-style-type: none"> 1 Defensible Space and Firewise Landscaping 2 Debris Burning Safety 3 Firewise information for homeowners 4 Prescribed burning benefits
Communications objectives	<ol style="list-style-type: none"> 1 Create public awareness for fire danger and defensible space issues 2 Identify most significant human cause fire issues 3 Enlist public support to help prevent these causes 4 Encourage people to employ fire prevention and defensible spaces in their communities.
Target Audiences	<ol style="list-style-type: none"> 1 Homeowners 2 Forest Landowners and users 3 Civic Groups 4 School Groups
Methods	<ol style="list-style-type: none"> 1 News Releases 2 Radio and TV PSA's for area stations and cable access channels 3 Personal Contacts and social media 4 Key messages and prevention tips 5 Visuals such as signs, brochures and posters

Spring Clean-up Day (National Wildfire Preparedness Day – 1 st Saturday in May)	
Event Coordinator	Coordinate day's events and schedule, catering for cookout, guest attendance, and moderate activities the day of the event.
Event Treasurer	Collect funds from residents to cover food, equipment rentals, and supplies.
Publicity Coordinator	Advertise event through neighborhood newsletter, letters to officials, and public service announcements (PSAs) for local media outlets. Publicize post-event through local paper and radio PSAs.
Work Supervisor	Develop volunteer labor force of community residents; develop labor/advisory force from Georgia Forestry Commission, Millen Jenkins County Fire Departments and Emergency Management Agency. Procure needed equipment and supplies. In cooperation with local city and county officials, develop safety protocol. Supervise work and monitor activities for safety the day of the event.

Funding Needs

The following funding is needed to implement the action plan:

Project	Estimated Cost	Potential Funding Source(s)
1. Create a minimum of 30 feet of defensible space around structures	Varies	Residents will supply labor and fund required work on their own properties.
2. Reduce structural ignitability by cleaning flammable vegetation from roofs and gutters; appropriately storing firewood, installing skirting around raised structures, storing water hoses for ready access, replacing pine needles and mulch around plantings with less flammable material.	Varies	Residents will supply labor and fund required work on their own properties.
3. Amend codes and ordinances to provide better driveway access, increased visibility of house numbers, properly stored firewood, minimum defensible space brush clearance, required Class A roofing materials and skirting around raised structures, planned maintenance of community lots.	No Cost	To be adopted by city and county governments.
4. Spring Cleanup Day	Varies	Community Business Donations.
5. Fuel Reduction Activities	\$35/acre	FEMA & USFS Grants

Assessment Strategy

To accurately assess progress and effectiveness for the action plan, the Jenkins County WUI Fire Council will implement the following:

- Annual wildfire risk assessment will be conducted to re-assess wildfire hazards and prioritize needed actions.
- Mitigation efforts that are recurring (such as mowing, burning, and clearing of defensible space) will be incorporated into an annual renewal of the original action plan.
- Mitigation efforts that could not be funded in the requested year will be incorporated into the annual renewal of the original action plan.
- Continuing educational and outreach programs will be conducted and assessed for effectiveness. Workshops will be evaluated based on attendance and post surveys that are distributed by mail 1 month and 6 months following workshop date.
- The Jenkins County WUI Council will publish an annual report detailing mitigation projects initiated and completed, progress for ongoing actions, funds received, funds spent, and in-kind services utilized. The report will include a “state of the community” section that critically evaluates mitigation progress and identifies areas for improvement. Recommendations will be incorporated into the annual renewal of the action plan.
- An annual survey will be distributed to residents soliciting information on individual mitigation efforts on their own property (e.g., defensible space). Responses will be tallied and reviewed at the next Jenkins County WUI Council meeting. Needed actions will be discussed and delegated.

This plan should become a working document that is shared by local, state, and federal agencies that will use it to accomplish common goals. An agreed-upon schedule for meeting to review accomplishments, solve problems, and plan for the future should extend beyond the scope of this plan. Without this follow up this plan will have limited value.

IX. MITIGATION ASSISTANCE & GRANT FUNDING

Community Protection Grant: US Forest Service sponsored prescribed fire program.

Communities with “at-risk” properties that lie within ten miles of a National Forest, National Park Service or Bureau of Land Management tracts may apply with the Georgia Forestry Commission to have their land prescribe burned free-of-charge. Forest mastication, where it is practical with Georgia Forestry Commission equipment, is also available under this grant program.

FEMA Mitigation Policy MRR-2-08-01: through GEMA – Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM).

1. To provide technical and financial assistance to local governments to assist in the implementation of long term, cost effective hazard mitigation accomplishments.
2. This policy addresses wildfire mitigation for the purpose of reducing the threat to all-risk structures through creating defensible space, structural protection through the application of ignition resistant construction and limited hazardous fuel reduction to protect life and property.
3. With a completed registered plan (addendum to the State Plan) counties can apply for pre-mitigation funding. They will also be eligible for HMGP funding if the county is declared under a wildfire disaster.

Georgia Forestry Commission: Plowing and prescribed burning assistance, as well as forest mastication, can be obtained from the GFC as a low-cost option for mitigation efforts.

The Georgia Forestry Commission Firewise Community Mitigation Assistance Grants – Nationally recognized Firewise Communities can receive up to \$5000 grants to help address potential wildfire risk reduction projects. Grant submission can be made through local Georgia Forestry Commission offices or your Regional Wildfire Prevention Specialist.

The International Association of Fire Chiefs (IAFC) and American International Group, Inc. (AIG) offer grants to assist local fire departments in establishing or enhancing their community fuels mitigation programs while educating members of the community about community wildfire readiness and encouraging personal action.

X. GLOSSARY

Community-At-Risk – A group of two or more structures whose proximity to forested or wildland areas places homes and residents at some degree of risk.

Critical Facilities – Buildings, structures or other parts of the community infrastructure that require special protection from an approaching wildfire.

CWPP – The Community Wildfire Protection Plan.

Defensible Space – The immediate landscaped area around a structure (usually a minimum of 30 ft.) kept “lean, clean and green” to prevent an approaching wildfire from igniting the structure.

Dry Hydrant - A non-pressurized pipe system permanently installed in existing lakes, ponds and streams that provides a suction supply of water to a fire department tank truck.

FEMA – The Federal Emergency Management Agency whose mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

Fire Adapted Community – A community fully prepared for its wildfire risk by taking actions to address safety, homes, neighborhoods, businesses and infrastructure, forest, parks, open spaces, and other community assets.

Firewise Program – A national initiative with a purpose to reduce structural losses from wildland fires.

Firewise Community/USA – A national recognition program for communities that take action to protect themselves from wildland fire. To qualify a community must have a wildfire risk assessment by the Georgia Forestry Commission, develop a mitigation action plan, have an annual firewise mitigation/education event, have dedicated firewise leadership, and complete the certification application.

Fuels – All combustible materials within the wildland/urban interface or intermix including, but not limited to, vegetation and structures.

Fuel Modification – Any manipulation or removal of fuels to reduce the likelihood of ignition or the resistance to fire control.

Hazard & Wildfire Risk Assessment – An evaluation to determine an area’s (community’s) potential to be impacted by an approaching wildland fire.

Healthy Forests Initiative - *Launched in August 2002 by President Bush (following passage of the Healthy Forests Restoration Act by Congress) with the intent to reduce the risks severe wildfires pose to people, communities, and the environment.*

Home Ignition Zone (Structure Ignition Zone) - *Treatment area for wildfire protection. The “zone” includes the structure(s) and their immediate surroundings from 0-200 ft.*

Mitigation – *An action that moderates the severity of a fire hazard or risk.*

National Fire Plan – *National initiative, passed by Congress in the year 2000, following a landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future.*

National Fire Protection Association (NFPA) - *An international nonprofit organization established in 1896, whose mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education.*

National Wildfire Preparedness Day – *Started in 2014 by the National Fire Protection Association as a day for communities to work together to prepare for the approaching wildfire season. It is held annually on the first Saturday in May.*

Prescribed Burning (prescribed fire) – *The use of planned fire that is deliberately set under specific fuel and weather condition to accomplish a variety of management objectives and is under control until it burns out or is extinguished.*

Ready, Set, Go - *A program fire services use to help homeowners understand wildfire preparedness, awareness, and planning procedures for evacuation.*

Southern Group of State Foresters – *Organization whose members are the agency heads of the forestry agencies of the 13 southern states, Puerto Rico and the Virgin Islands.*

Stakeholders– *Individuals, groups, organizations, businesses or others who have an interest in wildland fire protection and may wish to review and/or contribute to the CWPP content.*

Wildfire or Wildland Fire – *An unplanned and uncontrolled fire spreading through vegetative fuels.*

Wildland/Urban Interface - *The presence of structures in locations in which the authority having jurisdiction (AHJ) determines that topographical features, vegetation, fuel types, local weather conditions and prevailing winds result in the potential for ignition of the structures within the area from flames and firebrands from a wildland fire (NFPA 1144, 2008).*

XI. SOURCES OF INFORMATION

Publications/Brochures/Websites:

- FIREWISE materials can be ordered at www.firewise.org
- Georgia Forestry Commission www.georgiafirewise.org
- Examples of successful wildfire mitigation programs can be viewed at the website for National Database of State and Local wildfire Hazard Mitigation Programs sponsored by the U.S. Forest Service and the Southern Group of State Foresters www.wildfireprograms.com
- Information about a variety of interface issues (including wildfire) can be found at the USFS website for Interface South: www.interfacesouth.org
- Information on codes and standards for emergency services including wildfire can be found at www.nfpa.org
- Information on FEMA Assistance to Firefighters Grants (AFG) can be found at www.firegrantsupport.com
- Information on National Fire Plan grants can be found at <http://www.federalgrantswire.com/national-fire-plan--rural-fire-assistance.html>
- Southern Wildfire Risk Assessment website SouthWRAP www.SouthernWildfireRisk.com
- Fire Adapted Communities www.fireadapted.org
- Ready, Set, Go www.wildlandfirersg.org
- National Wildfire Preparedness Day www.wildfireprepdoy.org

Appended Documents:

Jenkins County Southern Wildfire Risk Assessment Summary Report (SWRA)

Jenkins County Wildfire assessment scoresheets

All files that make up this plan are available in an electronic format from the Georgia Forestry Commission.

GEORGIA FORESTRY
COMMISSION



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and education in the protection and conservation of
Georgia's forest resources.*

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TIMBER IMPACT ASSESSMENT

Georgia Ice Storm, February 11-13, 2014

By: James Johnson, Chip Bates & Gary White, Georgia Forestry Commission
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BACKGROUND

A winter storm impacted multiple southern states and more than 90 Georgia counties experienced some form of winter precipitation, beginning February 11th and lasting through the 13th. Northern tier counties recorded snowfalls of up to 13" (Rabun County), and although some timber / tree impacts occurred in this "snow zone," they were not widespread or considered severe.

During the storm, ice accumulation was measured from between a tenth of an inch and one inch (or possibly higher) in a zone from roughly north metro Atlanta to Augusta in northern Georgia, and from Macon to Sylvania in central Georgia. Because ice is much heavier than snow, widespread tree damage occurred, resulting in power disruption to nearly a million customers.

Governor Deal declared a state of emergency on Monday, February 10th, and a presidential declaration of emergency was issued as the storm hit the state. The map below depicts this zone (Figure 1).

The National Weather Service provided estimates of ice accumulations, and this information, coupled with field observation reports, helped define the area surveyed by the Georgia Forestry Commission for timber impact accounts. Small amounts of ice are known to affect trees, and higher amounts (especially exceeding three-fourths of an inch) can cause serious damage to certain timber types and age classes.

Another factor that affects tree damage is wind. Once ice accumulations peaked, a cold front moved through the state. Although wind speed varied, some areas reported winds of up to 35mph. Even minor winds during ice-loading can break or uproot trees. These occurrences were a major factor in the timber / tree damage associated with this storm, and may account for some of the variability detected.

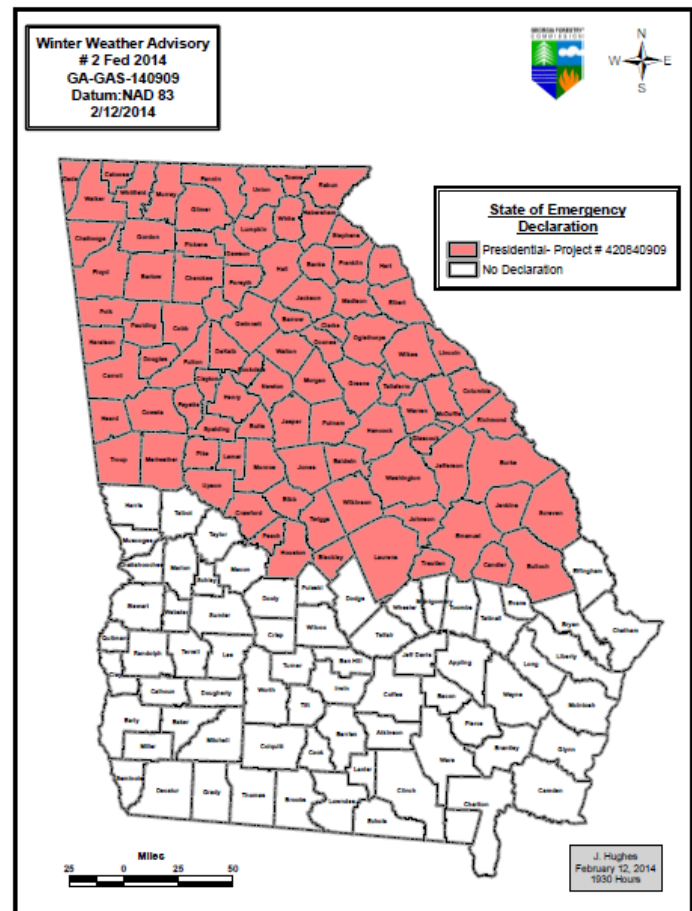


Figure 1: Counties included in the presidential declaration zone

OBSERVATIONS

A team of Georgia Forestry Commission foresters surveyed the zone believed to have endured the greatest impacts to our forests, and developed the map below. Please note that damage was observed beyond these counties, but it tended to be less intense than those shown by the map's shaded areas. Some of the highlighted counties had tremendous variations in the amount of damage observed. In addition, timber damage evaluation surveys were separated into rough categories of damage (at the county level), isolated timber stands within counties in the two lesser categories may have severe damage, and stands in the severe counties may only have minor damage. The variability of damage to similar stands even a few miles apart was extreme, so managers should carefully evaluate timber throughout this broad region.

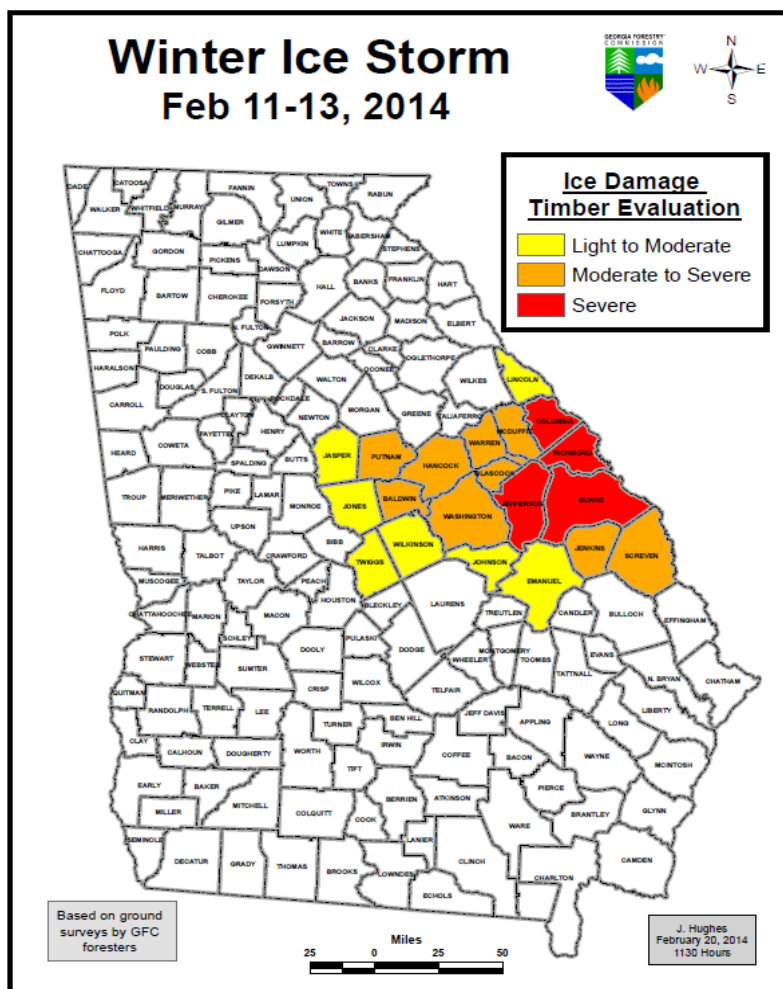


Figure 2: Counties with widespread Ice Damage

This survey examined landscape-level impacts and classifies them accordingly.

The categories of damage are based upon field observations about:

- Occurrence (frequency) of damage within a county.
- Levels of damage within two types of pine that were most frequently damaged (young pine stands, and pine stands on which a first-thinning had recently occurred.)

Ice Damage Intensity:

Light to moderate damage – Only branches and limbs broken from the tree, with minor damage to the overall stand and trees bent less than 45 degrees. No salvage operation will be necessary and the stand should recover with no additional management requirements, though long term yields will likely be impacted.

Moderate to severe damage – Branches and limbs broken from the trees with damage to the overall stand. More than 25% of stems broken and a salvage operation should be considered to minimize losses and remove trees that likely will not survive.

Severe damage – More than 30% of stems broken, tops broken out across the stand, limbs stripped, and trees bent more than 45 degrees. A salvage operation must be considered and a clearcut may be the prudent management decision.

Ice damage was not detected on most timber types but was concentrated on two types of pine: recently thinned pine stands, and younger stands less than 25 feet in height.

Recently thinned pine stands: These are primarily pine plantations that were thinned for the *first time* within the past several years. Trees adjust to the amount of space and competition within a stand, and those that have been thinned for the first time are adjusting to reduced protection from neighboring trees and are growing in diameter, which strengthens the main stem. They also respond by accelerating root growth which helps anchor the tree and aids in the increased moisture uptake needed to support larger live crowns. Depending on residual stand-density after thinning, it takes trees about five years to fully respond to the increased growing space. In the meantime, they are more prone to wind (and ice) damage.

These stands were particularly hard hit, which is unfortunate for landowners who have invested 15 to 20-plus years of growth getting their trees to this size. First-thinnings typically remove lower value wood (such as pulpwood / fuel wood), with the objective of allowing the residual stand to produce higher value products (such as sawtimber, plywood, and poles). From an investment standpoint, timber growth following a first thinning maximizes profits, so salvaging an ice-damaged stand is a devastating blow to expected returns.



Photo (left) – Twenty-one year old loblolly stand in Burke County; suffered over 30% stem breakage.

Thinning likely occurred two years ago.



Photo (right) – Nineteen year old loblolly stand in Jefferson County; suffered almost 50% stem breakage.

Thinning occurred within the past year.

Numerous older pine stands that had been thinned twice (or more) were also examined. Although some had damage, most would be considered minor, with many not requiring a salvage operation. The damage in these stands tended to be uprooted trees rather than stem breakage. This type of wind throw (tree that is completely uprooted) in older stands seemed prevalent throughout the region.

Landowners and managers of storm-damaged stands are highly encouraged to read and understand the implications of ice on different types of stands. Web links which provide detailed guidance are provided on the last page of this document.

Young pine stands: Pine plantations (of most species) that were 25 feet and taller - and *had never been thinned* - seemed to weather this ice storm well. The ability of dense stands to provide tree-to-tree support and prevent winds from uprooting individual trees was a big factor in these stands' withstanding minimal damage. Younger (and shorter) stands, however, didn't fare as well. One of the critical factors seemed to be that the trees still had many live branches almost to ground level, which likely accumulated so much ice that breaking points were reached for limbs and main stems.

Young stands of about six feet in height also seemed to fair well. Some of these have many bent stems (with some breakage), but young trees tend to correct this problem.

Some younger loblolly stands were damaged (especially in the counties noted as "Severe" on the map on page 2), but more damage occurred on longleaf and slash pine. Longleaf stands suffered the worst damage with stem and limb breakage but no stands seen were completely leveled. The resiliency of nature can be surprising, and the fate of these stands will become evident over the next few years. When tops break out, a lateral branch will assume dominance and there will be variation in long-term stem straightness.

Careful examination will be needed to determine the amount of permanent problems this storm has inflicted on each stand. Re-evaluation after the next growing season should give managers a better perspective on what lies ahead.



Photo (Left) – Five year old slash pine stand in Burke County showing many bent and leaning trees, with some breakage. Note the many leaning trees with limb breakage.

Photo (Right) – Nine year old longleaf pine stand in Burke County showing top and limb breakage. Note the many tops broken and some limb breakage.



EXTENT OF DAMAGE

GFC foresters evaluated the counties noted on the previous map and developed estimates of damage based upon a combination of this field work combined with a geospatial analysis of this region. These estimates do not include areas outside this zone, nor do they include hardwood, which was also impacted. Most hardwood damage consisted of limb and top breakage with most trees retaining enough live branches to support survival. Damage can be expected in the growth form of these trees and possibly in sluggish growth rates.

For pine type timber, an estimated 70,000+ acres were impacted, valued in excess of \$65 million. The majority of these acres (61,000+) were in the recently thinned pine category. This estimate doesn't include damage outside of the zone shown on the map (page 2), and it does not account for hardwood damage acreages or values, so it should be considered conservative. Some of the merchantable pine will likely be salvaged, which could reduce the damage estimate somewhat. However, the values used were based upon landowners intending to grow these stands for at least 30 years, with the growing objective of solid wood products (sawtimber, plywood, and poles). So even if salvage occurs, part of the "loss" is in the future growth of these higher value products.

RECOMMENDATIONS

With the wide range of damage inflicted by this ice storm, there will likely be three distinct categories by which landowners make their evaluations:

- 1) Light damage or losses that may not warrant a salvage operation. This could include merchantable stands (trees are large enough to sell), which simply don't have enough timber damage to warrant a commercial harvest, or pre-merchantable stands where there is a good chance they will recover over time.
- 2) Stands with significant damage, mandating a salvage operation to recoup whatever value can be obtained from the stand. This might include a complete harvest for widespread damage, or a partial harvest of damaged timber to provide a commercial harvest.
- 3) Situations falling between the two scenarios above, in which a good bit of the timber is damaged but there might be enough timber to leave growing. In these cases, landowners are encouraged to use the services of a professional forester to help make the best decision for the situation. Immediately following a storm, it is difficult for landowners to accurately gauge how well a stand may recover, or to measure the amount of timber that could be allowed to remain for future growth and income.

For landowners facing a complete harvest to salvage their damaged timber, please consider reforesting the area. The Farm Service Agency has a cost share program that can assist with site preparation and planting costs called the Emergency Forest Restoration Program (EFRP). Apply at your local office.

*Special thanks to other GFC foresters who helped develop this information:
Jeff Kastle, Chris Thompson, Chris Howell, Chris Barnes, Jeremy Hughes and Charles Bailey*

URBAN TREE ASSESSMENTS

Georgia Forestry Commission certified arborist/foresters surveyed damage and storm-generated tree debris left to be removed from urban and rural communities. Survey results showed counties that experienced the most damage to their rural stands also suffered the most damage to their urban trees. The highest amount of damage, as one might expect, was found in Burke County.

Neighborhoods with large pine trees experienced the most loss, with the bulk of damage to branches and tree tops which were broken by the weight of ice. Additionally, "leaf on" trees, such as magnolia and cherry laurel, and old water oaks with structural issues, made up a large component of community forest tree failure. Crews observed very few trees that were completely destroyed or uprooted by the storm.

Much debris remains to be cut and stacked by homeowners and tree care companies before its removal from community rights-of-way can begin. Many trees that have lost more than 50% of their limbs, and trees that have been uprooted or split so that heartwood of the main trunk is evident, will need to be removed. Otherwise, impacted trees will require pruning, with particular attention being paid to higher risk trees with "hangers" (limbs broken, but not yet detached) and split limbs (see photo below). This will likely increase beyond initial assessments the total biomass that will eventually be collected.



Although the tree at left suffered minor ice damage, notice the branches that are broken and still hanging in the tree. These could impact the structure, the vehicle or humans. These "hangers" should be removed.

The pine tree at right lost half of the living portion of its crown and pruning is needed to remove branch stubs.



Special thanks to GFC foresters who helped with field work: Gary White, Joe Burgess, Joan Scales, Mark McClellan, Jeremy Hughes, Keith Murphy, Chris Howell and also Mark Millirons.

These resources can help forest landowners learn more about options and considerations for situations in which trees have been damaged by winter weather:

TIMBERLAND WIND / ICE DAMAGE:

How to Evaluate and Manage Storm-Damaged Forest Areas:

http://www.fs.fed.us/r8/foresthealth/pubs/storm_damage/contents.html

Evaluating wind / ice damage stands:

http://www.forestry.uga.edu/outreach/pubs/pdf/forestry/assessing_tornado_damaged_forest_stands_5-30-08_1.pdf

Wind Wood Utilization (this has numerous documents and links that are beneficial):

<http://www.windwoodutilization.org/salvage.asp>

URBAN AND HAZARD TREE SAFETY:

<http://www.gatrees.org/community-forests/management/trees-storm-safety/>

Excellent site for Storm Damage...with an Urban Forestry angle:

<http://hort.ifas.ufl.edu/treesandhurricanes/>

TAXES:

National Timber Tax website (Master Index has good list of subject areas):

<http://www.timbertax.org/>

TIMBER SALES:

General information:

<http://www.gatrees.org/forest-management/private-forest-management/timber-selling/>

Landowners are encouraged to utilize professional foresters and arborists to help with decisions about timber management or potentially hazardous trees around homes and urban environments. Seeking independent advice is a sound way to reduce hasty judgments and insure all available options are considered.

CSRA REGIONAL PLAN 2035

REGIONAL ASSESSMENT COMMUNITY PARTICIPATION PLAN REGIONAL AGENDA



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CSRA REGIONAL PLAN 2035

Regional Assessment

Section 1: INTRODUCTION

1.1 Regional Plan Overview

The CSRA Regional Plan 2035 (hereinafter ‘the Plan’) is the long-range plan for the management of the region’s projected growth by local governments and the CSRA Regional Commission. The Plan’s horizon is twenty years but will be updated in ten years to address changing regional conditions. The process is divided into three distinct parts, per the *Regional Planning Requirements* established by the Georgia Department of Community Affairs (DCA):

- Regional Assessment: Identification and analysis of existing conditions using available data
- Stakeholder Involvement Program: Strategy for public participation in the development of the Regional Agenda
- Regional Agenda: Regional vision and implementation program

The resulting analysis will assess the state of the region’s socioeconomic, land use, and environmental opportunities and threats. The CSRA’s vision and goals, together with an appraisal of the region, will set the strategic direction for the regional agenda. The regional agenda establishes program priorities for implementation.

This document contains the Regional Assessment and the Stakeholder Involvement Program, which will set the stage for the development of the Regional Agenda.

1.2 Regional Assessment Overview

This Regional Assessment includes a thorough analysis of issues and opportunities backed by extensive data gathering and analysis. It contains a map of Projected Development Patterns and an assessment of Areas Requiring Special Attention, which includes a range of categories, such as areas where rapid development is occurring or where infill or redevelopment is desirable. Finally, it includes an assessment of the region’s development patterns in light of the state’s Quality Community Objectives.

1.3 Stakeholder Involvement Program

This program outlines the process for participation by stakeholders in the creation of the Regional Agenda. It identifies stakeholders, outlines participation techniques and includes a schedule for the completion of the Regional Agenda.

1.4 Regional Agenda

The Regional Agenda is the culmination of the planning process. It will include a vision of the CSRA’s future, along with an implementation program for how to get there.

1.5 How to Use This Plan

The CSRA Regional Plan is intended to serve as a reference and implementation point for potential users. A number of companion planning documents should be used in conjunction with the Regional Plan. These include:

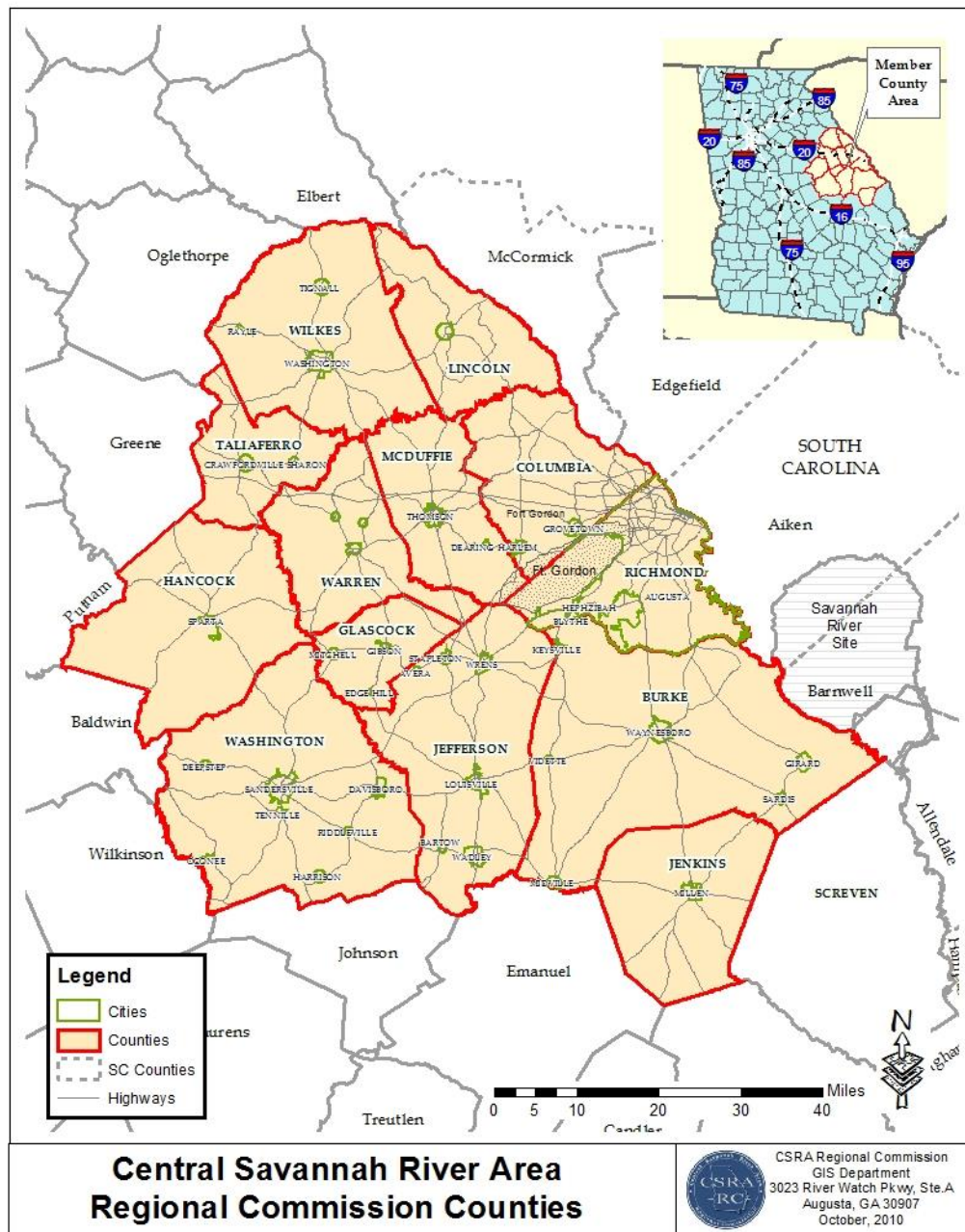
- CSRA Comprehensive Economic Development Strategy
- Augusta Area Diversification Initiative
- Fort Gordon Joint Land Use Study
- CSRA Regionally Important Resources Plan
- County and City Comprehensive Plans

- Statewide Plans

1.6 The Central Savannah River Area

The Central Savannah River Area (CSRA) encompasses an area nearly 6,500 square miles — the largest political region in the state. Located in the east-central Georgia, along the Savannah River, the CSRA includes 13 counties: Burke, Columbia, Glascock, Hancock, Jefferson, Jenkins, Lincoln, McDuffie, Richmond, Taliaferro, Warren, Washington, and Wilkes (Figure 1). The largest city in the CSRA is Augusta – the economic core of the region.

Figure 1: CSRA Location Map



1.6 About the CSRA Regional Commission

The CSRA Regional Commission (CSRA RC) serves thirteen counties and 41 municipalities in east-central Georgia, providing services in the areas of planning and land-use development, grant writing and administration, economic development, historic preservation, and geographic information systems development and implementation to member jurisdictions.

Additionally, the CSRA RC serves as the state-designated Area Agency on Aging (AAA) for the region. In this capacity, the CSRA RC works with local providers to ensure that services for the elderly are provided and monitored. By utilizing pass-through funds from state and federal sources, the Commission's AAA serves as a gateway for programs and resources aimed at helping senior citizens improve the quality of their lives during their retirement years.

The CSRA RC is also the parent company of the CSRA Business Lending. CSRA Business Lending makes loans to small and start-up businesses for the purposes of creating jobs and economic development opportunities within its service area.

Section 2: POTENTIAL REGIONAL ISSUES AND OPPORTUNITIES

2. Potential Issues and Opportunities

This section provides an objective, professional analysis (not based on public or stakeholder input) of the region. This section, presented in divisions relating to classical planning analysis areas such as housing and transportation, presents a preliminary catalog of potential focal points to be examined during the development of Plan.

The Georgia Department of Community Affairs (DCA) publishes a list of typical issues and opportunities as part of the *State Planning Goals and Objectives*. This list, in addition to an evaluation for the region's consistency with the DCA's *Quality Community Objectives*, was used as the starting point for developing the Potential Issues and Opportunities list (please refer to the Appendix of this document for an assessment of the region based on these objectives). Further issues and opportunities were identified as part of a thorough analysis of regional datasets and regional development patterns. The issues and opportunities compiled in this Regional Assessment are preliminary in nature; they will be reexamined and a final list will be assembled as part of the Regional Agenda planning process.

2.1 Population

The population growth illustrated in historical trends is expected to continue over the twenty-year period. However, this growth is not uniform across the CSRA.

- By 2035, the 13-county region's population is projected at 575,304, an increase of approximately 26.5 percent over the 2010 population and 67.4 percent from 1980. This increase will have implications for housing, jobs, transportation, land use, environmental resources, and infrastructure.
- While the urbanized area (Augusta-Richmond and Columbia Counties) has enjoyed population growth, the rural areas continue to lag. Eight of eleven rural counties lost population since the last census. What little population growth is occurring in rural areas is further away from incorporated municipalities, where infrastructure is already established. Should this trend continue, county governments will have to pay more to extend and maintain public services in these areas.
- Household incomes continue to lag the state average. Most concerning, nearly a third of CSRA households are at income levels near or below the poverty line.
- The CSRA is aging rapidly. The proportion of residents 45 years and older has increased 10 percent since 1990, while the proportion of residents under 29 years declined by 8 percent. Needs associated with an aging population (affordable housing, transportation, and medical services) are anticipated to increase over the next twenty years.

Detailed data on population can be found on pages 21 through 25.

2.2 Housing

State Planning Housing Goal: *To ensure that all residents of the state have access to adequate and affordable housing.*

The CSRA's housing stock is both a strength and weakness for residents.

- The region's housing stock contains a good balance of owner and rental units (55 percent and 30 percent respectively).
- Housing stocks are plentiful in the urbanized area but inadequate in rural counties. Although the official vacancy rate stands at 15 percent, over a third of vacant units are unavailable for purchase or rent. Another 17.2 percent of the region's housing is valued at less than \$50,000, an indicator of poor housing conditions.
- Median (\$99,937) and average (\$127,997) housing values are among the lowest in the state and nation. Low housing costs are a major reason for the CSRA's low cost of living, and a major strength for new residents and business attraction.
- While affordable housing values are a benefit for the region, sprawl threatens county budgets by requiring public services further away from established municipalities. Sprawl also makes it more likely that transportation costs will increase for residents as they have to commute farther to work.

Detailed data on housing can be found on pages 25 through 27.

2.3 Economic Development

State Planning Economic Development Goal: *To achieve a growing and balanced economy, consistent with the prudent management of the state's resources, that equitably benefits all segments of the population.*

The CSRA region's economy is diverse, and communities typically make concerted efforts to attract new business. However, coordinated economic development planning and promotion could be strengthened, both on a region-wide scale and between proximately-located communities.

- The CSRA RC serves as the region's Economic Development District in coordination with the U.S. Economic Development Administration (EDA), and encourages cooperation between local government officials, community-based organizations, and the private sector. Per EDA requirements, the CSRA RC developed a Comprehensive Economic Development Strategy (CEDS) in 2011.
- The CSRA's job base has shifted significantly in the last two decades. The service sector now accounts for 60 percent of all CSRA jobs, an increase of 20 percent since 1990. The goods-producing sector has declined from 35 percent in 1990 to less than 15 percent of employment today.

- The region's jobs balance is heavily slanted towards the urbanized area. Augusta-Richmond and Columbia Counties account for 78 percent of the CSRA's 233,147 jobs. The urbanized area also accounted for over 90 percent of job growth since 1990. Seven of 11 rural CSRA counties have fewer jobs today than they did in 1990. This corresponds to trends in population, which saw eight of those counties lose residents since 2000.
- Unemployment levels in the CSRA's rural counties have been chronic during the last decade. All rural counties have unemployment rates above the state average (9.7 percent). Three counties (Hancock, Jenkins, and Warren) have unemployment rates of 17 percent or higher. All rural counties meet the criteria of Economically Distressed Areas, according to the federal Public Works and Economic Development Act. The rapid increase in rural unemployment was caused by the closure of major manufacturing employers, which had sustained local economies.
- The CSRA lags behind the state in educational performance, raising concerns about workforce readiness in the new service economy. CSRA scores on the Scholastic Aptitude Test, Georgia High School Graduations Tests, and End-of-Course Assessments all fall below the state average.

Detailed data on economic development can be found on pages 27 through 50.

2.4 Land Use

State Planning Land Use and Transportation Goal: *To ensure the coordination of land use planning and transportation planning throughout the state in support of efficient growth and development patterns that will promote sustainable economic development, protection of natural and cultural resources and provision of adequate and affordable housing.*

The CSRA is a primarily rural region, with an urban core in the Augusta-Richmond County and Columbia County area. Approximately 88 percent of the region's land area is rural.

- The vast majority of the region's housing and commercial growth has occurred in the urbanized area. This corresponds to population trends, which saw the two urban counties gain 35,509 residents since 2000, while the 11 rural counties saw a net gain of only 433 people. Even that figure masks population decline in much of the area. In fact, eight counties - Hancock, Jefferson, Jenkins, Lincoln, Taliaferro, Warren, Washington and Wilkes - combined to lose 2,550 residents since 2000.
- The growth effect that has occurred in the last three decades (development away from established municipalities) resulted in sprawl beyond cities and city centers.
- While cities and downtown areas still have the largest densities, this is quickly eroding as residents locate into unincorporated areas. Revitalization efforts are critical in stemming city population decline.
- If the trend of growth in unincorporated areas continues, this will result in the region's county governments incurring additional costs of providing public infrastructure (such as water & sewer lines, parks, libraries, etc.) further away from established population centers.

Detailed data on land use can be found on pages 50 through 52.

2.5 Transportation and Community Facilities

State Planning Community Facilities and Services Goal: *To ensure the provision of community facilities and services throughout the state to support efficient growth and development patterns that will protect and enhance the quality of life of Georgia's residents.*

The region's physical infrastructure is extensive and diverse, featuring state and federal highways, hospitals, facilities to manage solid waste and wastewater, and other resources. Most community facilities are locally operated and maintained.

- The CSRA has a small network of interstates and four-lane U.S. highways that provide east-west and north-south access to regional and national markets. Interstates 20 and 520, as well as U.S. 1 and U.S. 25 link the CSRA's major cities to each other as well as to the state's major cities, such as Atlanta, Macon, and Savannah (Figure 25). However, the highway system does not fully meet needs throughout the region. Combined, the interstates and U.S. 1 and U.S. 25 serve only portions of the CSRA, leaving large areas in the northern and southern part of the region without adequate highway infrastructure.
- While the transportation system serves automobiles relatively well, it is less friendly to other users. Many streets are designed only with vehicle traffic in mind, making them unsafe or unpleasant for pedestrians and cyclists. Moreover, development patterns in many cases continue to separate uses and rely on arterial roads to make connections. These two factors limit mobility for many residents and contribute to inactivity and growing obesity levels for children and adults in the region.
- The region's two primary rail freight carriers: Norfolk Southern and CSX Rail Service carry among the lowest volumes of rail freight in the state. Only Augusta-Richmond and Warren Counties have direct connections to major rail freight hubs in Atlanta and Macon.
- Augusta Regional Airport provides regularly-scheduled commercial flights. The airport currently has 21 daily departures and 22 daily arrivals to three major hubs (Atlanta, Charlotte and Dallas) from three carriers (Delta, U.S. Air and American). In calendar year 2010, the annual passenger volume at the Augusta airport was 246,587, compared to 198,489 (24.2 percent increase) in 2009. Between 2005 and 2010, Augusta Regional's growth rate was 57.9 percent, making it one of the fastest growing small commercial services airports in the nation. Air freight information is unavailable.
- Fixed-route public transit in the CSRA is limited to Augusta-Richmond County. Augusta Public Transit operates nine routes from Monday through Saturday, with daily ridership averaging approximately 3,000. The rest of the CSRA is served with demand-response service.
- Most areas of the CSRA outside of the urbanized parts of Columbia and Augusta-Richmond Counties lag in both choice and quality of broadband service. Most of these areas are not served by any land broadband service provider, making slower satellite internet service the only option. The CSRA RC considers broadband the region's top infrastructure priority and has been aggressively pursuing state and federal funding to remedy this deficiency by extending broadband infrastructure to areas of the region that currently lack it.

- Local community facilities such as parks, water and sewage services, public water, libraries, and medical facilities, are mostly located within incorporated municipalities. Access to some public facilities, however, remains a concern as rural county populations are widely dispersed.

Detailed data on transportation and community facilities can be found on pages 52 through 58.

2.6 Natural and Environmental Resources

State Planning Natural and Cultural Resources Goal: To conserve and protect the environmental, natural and cultural resources of Georgia's communities, regions and the state.

The CSRA contains a wealth of natural and environmental resources that provide the region with numerous social, economic, and environmental benefits. However, these same resources are in need of protection if they are to continue providing these benefits.

- Timber resources account for 2.3 million acres in the CSRA, and are a major driver of the region's forest products industry.
- Kaolin, a type of clay, is the major mineral extracted in the region, providing substantial employment in Jefferson and Washington counties. This sector is under pressure from South American kaolin, which is now being exported around the world.
- Farmland accounts for 22.1 percent of the CSRA's land mass, and sustains approximately 5 percent of the region's employment. The number of farms in the region today is less than half the number of farms in operation in 1982, highlighting a trend towards large, industrial-scale farming.
- The CSRA contains a number of protected watershed areas in Lincoln, Wilkes, McDuffie, Warren, Burke, and Augusta-Richmond counties. The region's watersheds will need to be monitored to ensure future development does not render them vulnerable.
- The region's river basins and major lakes ensure adequate water supplies. However, continued growth of the urbanized area and out-of-region impacts over the next twenty years will place pressure on these supplies, as well as pollution threats from growth.
- The CSRA has a rich history and counts no less than 184 properties and districts listed in the National Register of Historic Places, including National Historic Landmarks, State Historic Parks and Sites. Most of these resources, however, lack preservation plans.

Detailed data on natural and environmental resources can be found on page 58 through 73.

2.7 Intergovernmental Coordination

State Planning Intergovernmental Coordination Goal: To ensure the coordination of local planning efforts with other local service providers and authorities, with neighboring communities and with state and regional plans and programs.

The CSRA RC, founded in 1962, offers member governments avenues to coordinate planning, economic development, workforce development, and aging services. Other instances of intergovernmental coordination takes place between municipalities within a given county, between counties, from region to region, and with state and federal government agencies.

- The CSRA RC Area Agency on Aging provides consolidated services for seniors (including transportation) for the CSRA.
- The CSRA RC serves as the Economic Development District for the region.
- The CSRA RC serves as the coordinating mechanism for CSRA Unified Development Council (UDC). The UDC is a project-oriented volunteer organization comprised of economic, industrial, and regional development organizations, as well as service and educational institutions representing the entire CSRA. The UDC serves as the marketing arm for the CSRA.
- The CSRA RC serves as the coordinating mechanism for CSRA Unified Development Authority (UDA). The UDA promotes the economic development of the CSRA and encourages cooperation among economic development organizations within the member counties.
- The CSRA RC reviews and comments on applications for federal and state grant, loan, and permit assistance submitted by local governments and other applicants within the region. This is known as the Georgia Intergovernmental Consultation Process (Executive Order 12372), and is intended to offer comment on a proposed project's consistency with local and regional comprehensive plans.
- The CSRA RC develops and maintains the CSRA Regionally Important Resources Plan and the CSRA Comprehensive Economic Development Strategy.