# APPENDIX C

# OTHER PLANNING DOCUMENTS

# McDuffie County Emergency Management Agency

# Emergency Operations Plan

Plan Approved:
12-APR-16

Revised:
12-APR-16

## CLERK'S CERTIFICATE

I, Natalie Morris, County Clerk of the Board of Commissioners of McDuffie County Georgia, DO HEREBY CERTIFY that the foregoing pages of typewritten matter constitute a true and correct copy of an Ordinance, Emergency Management, adopted by the Board of Commissioners on its second and final reading at a regular meeting of the Board of Commissioners duly held on this 10th day of September, 1992 both of which meetings were open to the public and at which a quorum was present and acting throughout, and that the original of said document appears of record in the Ordinance Book of the Board.

Given under my hand and seal of the Board, this 31st day of March 2016.


NATALIE MORRIS
COUNTY CLERK,
BOARD OF COMMISSIONERS
OF MCDUFFIE COUNTY, GEORGIA

## Distribution List

| Agency | Number of Copies |
|---|---|
| American Red Cross | 1 |
| City of Thomson | 1 |
| Dearing Fire Department | 1 |
| Georgia Forestry Commission (McDuffie Unit) | 1 |
| Kilpatrick Baptist Association | 1 |
| McDuffie County | 2 |
| McDuffie County 911 Communications | 1 |
| McDuffie County Board of Education | 10 |
| McDuffie County Buildings and Grounds | 1 |
| McDuffie County Coroner | 1 |
| McDuffie County DFCS | 1 |
| McDuffie County EMA | 1 |
| McDuffie County Extension Service | 1 |
| McDuffie County Health Department | 1 |
| McDuffie County Road Department | 1 |
| McDuffie County Sheriff's Department | 3 |
| McDuffie Fire And Emergency Medical Services | 6 |
| Thomson Fire Department | 2 |
| Thomson Gas Dept. | 1 |
| Thomson Police Department | 2 |
| Thomson Public Works | 3 |
| Thomson-McDuffie Animal Shelter | 1 |
| Thomson-McDuffie County Planning Board | 1 |
| Thomson-McDuffie County Recreation Department | 1 |
| Thomson-McDuffie Information Technology Dept. | 1 |
| Thomson-McDuffie Water Sewer Dept. (maintenance) | 1 |
| Thomson-McDuffie Water Sewer Dept.(water tx) | 2 |
| Town of Dearing | 3 |
| University Hospital McDuffie | 3 |

McDuffie County
EMERGENCY OPERATIONS PLAN

Local Resolution

Record of Revisions

Distribution List

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# BASIC PLAN

## I. INTRODUCTION

### Summary

This plan establishes a framework for emergency management planning and response to: prevent emergency situations; reduce vulnerability during disasters; establish capabilities to protect residents from effects of crisis; respond effectively and efficiently to actual emergencies; and provide for rapid recovery from any emergency or disaster affecting the local jurisdiction and McDuffie County.

This Emergency Operations Plan (EOP) is predicated on the National Incident Management System (NIMS) which integrates the capabilities and resources of various municipal jurisdictions, incident management and emergency response disciplines, nongovernmental organizations (NGOs), and the private sector into a cohesive, coordinated, and seamless framework for incident management. The EOP, using the NIMS, is an all-hazards plan that provides the structure and mechanisms for policy and operational coordination for incident management. Consistent with the model provided in the NIMS, the EOP can be partially or fully implemented in the context of a threat, anticipation of a significant event, or the response to a significant event. Selective implementation through the activation of one or more of the systems components allows maximum flexibility in meeting the unique operational and information-sharing requirements of the situation at hand and enabling effective interaction between various entities. The EOP, as the core operational plan for incident management, establishes county-level coordinating structures, processes, and protocols that will be incorporated into certain existing interagency incident- or hazard-specific plans (such as the Hurricane Plan) that is designed to implement specific statutory authorities and responsibilities of various departments and agencies in particular contingency.

### Purpose

The purpose of the EOP is to establish a comprehensive, countywide, all-hazards approach to incident management across a spectrum of activities including prevention, preparedness, response, and recovery. The EOP incorporates best practices and procedures from various incident management disciplines - homeland security, emergency management, law enforcement, firefighting, hazardous materials response, public works, public health, emergency medical services, and responder and recovery worker health and safety - and integrates them into a unified coordinating structure. The EOP provides the framework for interaction with municipal governments; the private sector; and NGOs in the context of incident prevention, preparedness, response, and recovery activities. It describes capabilities and resources and establishes responsibilities, operational processes, and protocols to help protect from natural and manmade hazards; save lives; protect public health, safety, property, and the environment; and reduce adverse psychological consequences and disruptions. Finally, the EOP serves as the foundation for the development of detailed supplemental plans and procedures to effectively and efficiently implement incident management activities and assistance in the context of specific types of incidents.

**The EOP, using the NIMS, establishes mechanisms to:**

- Maximize the integration of incident-related prevention, preparedness, response, and recovery activities;
- Improve coordination and integration of County, municipal, private-sector, and nongovernmental organization partners;
- Maximize efficient utilization of resources needed for effective incident management and Critical Infrastructure/Key Resources protection and restoration;
- Improve incident management communications and increase situational awareness across jurisdictions and between the public and private sectors;
- Facilitate emergency mutual aid and emergency support to municipal governments;
- Provide a proactive and integrated response to catastrophic events; and
- Address linkages to other incident management and emergency response plans developed for specific types of incidents or hazards.

A number of plans are linked to the EOP in the context of disasters or emergencies, but remain as stand-alone documents in that they also provide detailed protocols for responding to routine incidents that normally are managed by County agencies without the need for supplemental coordination. The EOP also incorporates other existing emergency response and incident management plans (with appropriate modifications and revisions) as integrated components, operational supplements, or supporting tactical plans.

**This plan consists of the following components:**

**Scope and Applicability**

The EOP covers the full range of complex and constantly changing requirements in anticipation of or in response to threats or acts of terrorism, major disasters, and other emergencies. The EOP also provides the basis to initiate long-term community recovery and mitigation activities.

The EOP establishes interagency and multi-jurisdictional mechanisms for involvement in and coordination of, incident management operations.

This plan distinguishes between incidents that require County coordination, termed disasters or emergencies, and the majority of incidents that are handled by responsible jurisdictions or agencies through other established authorities and existing plans.

**In addition, the EOP:**

- Recognizes and incorporates the various jurisdictional and functional authorities of departments and agencies; municipal governments; and private-sector organizations in incident management.

- Details the specific incident management roles and responsibilities of the departments and agencies involved in incident management as defined in relevant statutes and directives.

- Establishes the multi-agency organizational structures and processes required to implement the authorities, roles, and responsibilities for incident management.

This plan is applicable to all departments and agencies that may be requested to provide assistance or conduct operations in the context of actual or potential disasters or emergencies.

Disasters or emergencies are high-impact events that require a coordinated and effective response by an appropriate combination of County, municipal, private-sector, and nongovernmental entities in order to save lives, minimize damage, and provide the basis for long-term community recovery and mitigation activities.

**Key Concepts**

This section summarizes key concepts that are reflected throughout the EOP.

- Systematic and coordinated incident management, including protocols for:
    - Coordinated action;
    - Alert and notification;
    - Mobilization of County resources to augment existing municipal capabilities;
    - Operating under differing threats or threat levels; and
    - Integration of crisis and consequence management functions.

- Proactive notification and deployment of resources in anticipation of or in response to catastrophic events in coordination and collaboration with municipal governments and private entities when possible.

- Organizing interagency efforts to minimize damage, restore impacted areas to pre-incident conditions if feasible, and/or implement programs to mitigate vulnerability to future events.

- Coordinating worker safety and health, private-sector involvement, and other activities that are common to the majority of incidents (see Support Annexes).

- Organizing ESFs to facilitate the delivery of critical resources, assets, and assistance. Departments and agencies are assigned to lead or support ESFs based on authorities, resources, and capabilities.

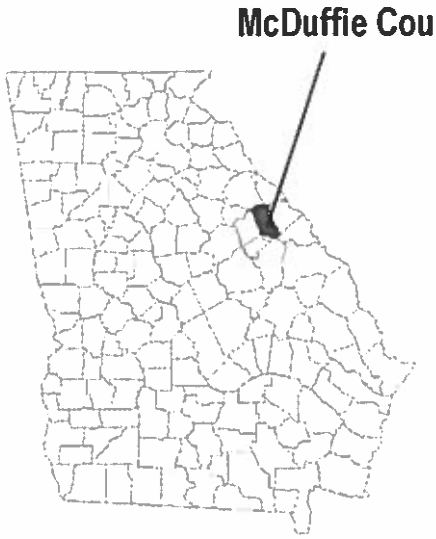
- Providing mechanisms for vertical and horizontal coordination, communications, and information sharing in response to threats or incidents. These mechanisms

facilitate coordination among municipal entities and the County Government, as well as between the public and private sectors.

- Facilitating support to County departments and agencies acting under the requesting department or agencys own authorities.
- Developing detailed supplemental operations, tactical, and hazard-specific contingency plans and procedures.
- Providing the basis for coordination of interdepartmental and municipal planning, training, exercising, assessment, coordination, and information exchange.

# FLOOD INSURANCE STUDY

# MCDUFFIE COUNTY, GEORGIA
## AND INCORPORATED AREAS




| COMMUNITY NAME | COMMUNITY NUMBER |
|---|---|
| DEARING, TOWN OF* | 130356 |
| MCDUFFIE COUNTY (UNINCORPORATED AREAS) | 130357 |
| THOMSON, CITY OF | 130230 |

*Non-floodprone community

EFFECTIVE:
SEPTEMBER 29, 2010

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
13189CV000A

# 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, 2010

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FLOOD INSURANCE STUDY
MCDUFFIE 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 McDuffie County, including the City of Thomson; the Town of Dearing; and the unincorporated areas of McDuffie County (referred to collectively herein as McDuffie 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.

Please note that the Town of Dearing has no mapped flood hazard areas.

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 created 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.

No previous FIS reports were prepared for the City of Thomson, the Town of Dearing, and the unincorporated areas of McDuffie County.

The hydrologic and hydraulic analyses for the detailed study stream, Boggy Gut Creek, came from the Columbia County Letter of Map Revision (LOMR), case number 07-04-4973P, dated March 19, 2008 (FEMA, 2008).

The hydrologic and hydraulic analyses for the approximate study were performed by Dewberry & Davis LLC, for FEMA, under Contract No. EMA-2008-CA-5870. This work was completed in June 2009.

Base map information shown on the FIRM was derived from digital orthoimagery produced at a scale of 1:20,000, from National Agriculture Imagery Program dated 2007. The projection used in the preparation of this map is Georgia State Plane West FIPS Zone 1002 (feet), and the horizontal datum used is North American Datum 1983, GRS80 spheroid.

### 1.3 Coordination

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.

The initial meeting was held on July 9, 2008, and attended by representatives of FEMA, the Georgia Department of Natural Resources, and the study contractor.

The results of the study were reviewed at the final meeting held on August 18, 2009, and attended by representatives of Georgia Department of Natural Resources – Environmental Protection Division, McDuffie County, the City of Thomson, the Town of Dearing, FEMA, and the study contractor. 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 McDuffie County, Georgia, including the incorporated communities listed in Section 1.1. 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 July 2008.

For this countywide FIS, the FIS report and FIRM are in countywide format, and the flooding information for the entire county, including both incorporated and unincorporated areas, is shown. Also, the vertical datum is North American Vertical Datum of 1988 (NAVD 88). In addition, the Transverse Mercator projection, State Plane coordinates are referenced to the North American Datum of 1983.

Boggy Gut Creek is studied by detailed methods in this FIS report. The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

All or portions of numerous flooding sources in the county were studied by approximate methods. 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 upon by FEMA and McDuffie County.

### 2.2 Community Description

McDuffie County, encompassing approximately 260 square miles, is located in eastern Georgia, approximately 125 miles east of the City of Atlanta. The county is bordered on the north by Wilkes and Lincoln Counties; on the south by Richmond and Jefferson Counties; on the east by Columbia County; and on the west by Warren County. Major transportation routes that serve McDuffie County include Interstate 20, U.S. Highways 78, 221, and 278, and State Highways 17 and 43.

According to the U.S. Census Bureau, in 2008 the population estimate for McDuffie County was 21,756 (U.S. Census Bureau, 2009).

McDuffie County's moderate climate consists of mild winters and warm summers. The annual rainfall averages approximately 50 inches. The wettest month is March while the driest months are September and October (National Weather Service, 2009).

### 2.3 Principal Flood Problems

The low-lying areas of the county adjacent to the major streams are subject to the periodic flooding that accompanies major storms.

### 2.4 Flood Protection Measures

No major structural flood protection measures exist or are planned for McDuffie County.

## 3.0 ENGINEERING METHODS

For the flooding sources studied in the county, 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 will be amended periodically to reflect future changes.

## 3.1 Hydrologic Analyses

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

For the hydrologic analyses of Boggy Gut Creek see the Columbia County LOMR, case number 07-04-4973P, dated March 19, 2008 (FEMA, 2008).

Peak discharge-drainage area relationships for Boggy Gut Creek studied in detail are shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

| FLOODING SOURCE AND LOCATION | DRAINAGE AREA (sq. miles) | PEAK DISCHARGES (cubic feet per second) 10-PERCENT ANNUAL CHANCE | 2-PERCENT ANNUAL CHANCE | 1-PERCENT ANNUAL CHANCE | 0.2-PERCENT ANNUAL CHANCE |
|---|---|---|---|---|---|
| BOGGY GUT CREEK | | | | | |
| Approximately 2.39 miles upstream of Harlem Wrens Road | 0.53 | * | * | 541 | * |

*Data not available

Discharges for approximate studies were developed using regression equations for rural areas in Georgia contained in the USGS report and available USGS gage record data (where applicable) (Stamey and Hess, 1993). Drainage areas were developed from USGS 10-meter Digital Elevation Models (DEMs) (USGS, 2009).

## 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 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.

For the hydraulic analyses of Boggy Gut Creek see the Columbia County LOMR, case number 07-04-4973P, dated March 19, 2008 (FEMA, 2008).

For the streams studied by approximate methods, cross section data was obtained from the USGS 10-meter DEMs (USGS, 2009). Hydraulically significant roads were modeled as bridges, with opening data approximated 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 (Hydrologic Engineering Center, March 2008).

Floodplains of the approximate studies streams were delineated using the computer 1-percent annual chance water-surface elevations and the USGS 10-meter DEMs (USGS, 2009).

All qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for bench marks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their Web site at http://www.ngs.noaa.gov.

It is important to note that 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 this FIS and FIRM. Interested individuals may contact FEMA to access this data.

### 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 National Geodetic Vertical Datum 1929 (NGVD 29). With the finalization of NAVD 88, many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NGVD 29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

For additional information regarding conversion between NGVD 29 and NAVD 88, visit the National Geodetic Survey website at http://www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

## 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, although none were mapped for this study.

For Boggy Gut Creek, studied by detailed methods the boundaries were obtained from the McDuffie County LOMR, case number 07-04-4973P, dated December 31, 2007 (FEMA, 2007).

For the streams studied by approximate methods the boundaries were delineated using the USGS 10-meter DEMs (USGS, 2009).

The 1-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).

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.

No floodways have been computed for McDuffie 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 rate 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 base flood elevations or average depths. Insurance agents use the zones and base flood elevations 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-percent-annual-chance floodplain.

The current FIRM presents flooding information for the entire geographic area of McDuffie 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 2, "Community Map History".

## 7.0 OTHER STUDIES

Information pertaining to flood hazards for each jurisdiction within McDuffie County has been compiled into this FIS. This FIS 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.

## 9.0 BIBLIOGRAPHY AND REFERENCES


Federal Emergency Management Agency. (March 19, 2008). Letter of Map Revision, Columbia County, Georgia, Case No. 07-04-4973P.

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U.S. Census Bureau. (Accessed June 11, 2009). 2008 Population Estimate – http://www.census.gov/.

U.S. Geological Survey. (Download March 2009). Seamless Data Distribution System – 10 meter Digital Elevation Model, http://seamless.usgs.gov/.

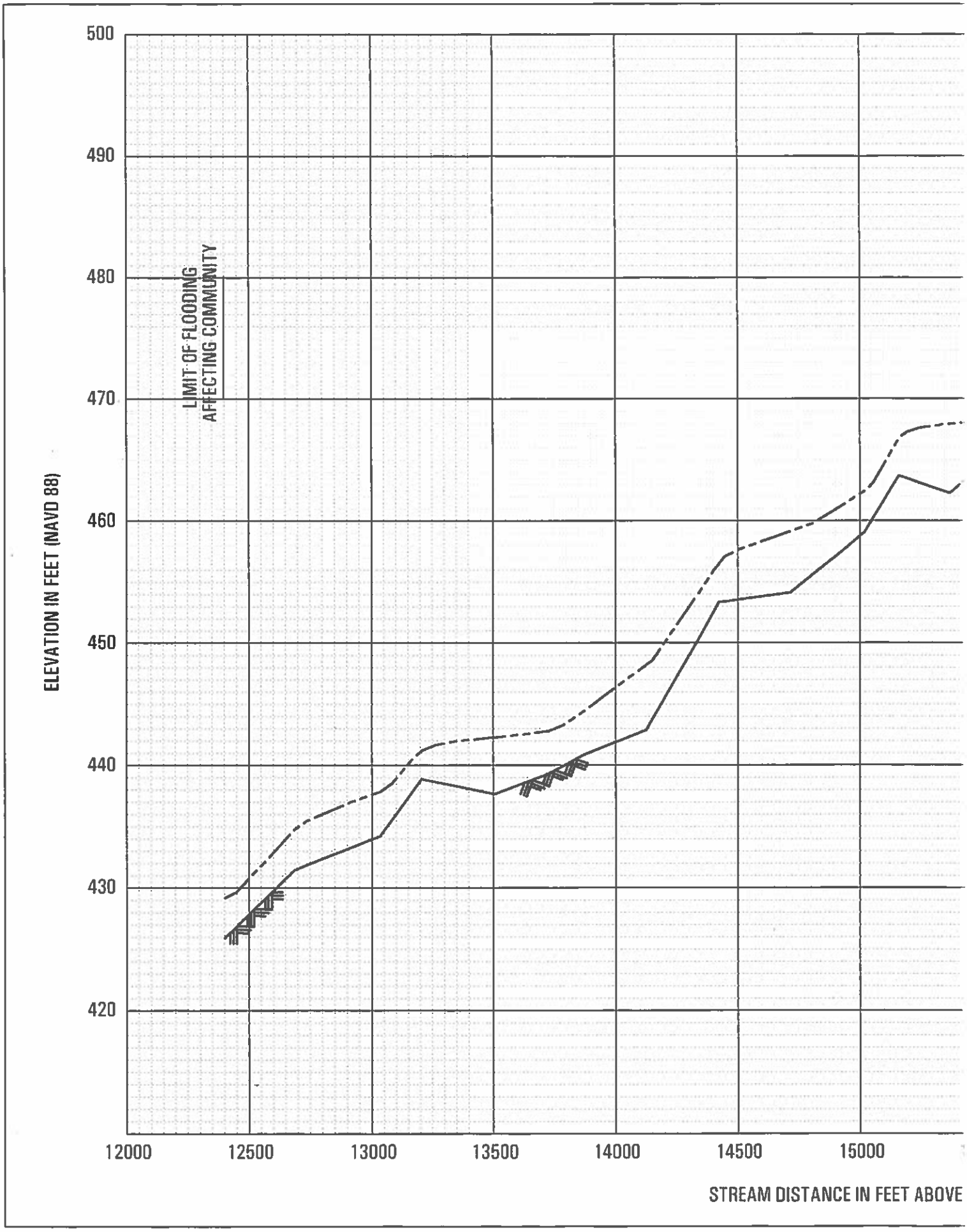
| ΓY | INITIAL IDENTIFICATION | FLOOD HAZARD BOUNDARY MAP REVISIONS DATE | FIRM EFFECTIVE DATE | FIRM REVISIONS DATE |
|---|---|---|---|---|
| | March 26, 1976 | None | October 1, 2004 | |
| | September 29, 2010 | None | September 29, 2010 | |

ıunity

Y MANAGEMENT AGENCY

**COUNTY, GA**
**ORATED AREAS**

# COMMUNITY MAP HISTORY


500
490
480
470
460
450
440
430
420
ELEVATION IN FEET (NAVD 88)
LIMIT OF FLOODING
AFFECTING COMMUNITY
12000
12500
13000
13500
14000
14500
15000
STREAM DISTANCE IN FEET ABOVE

# 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.

11/13/17

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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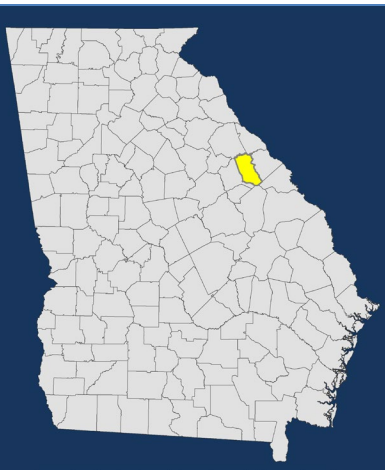

# Hazard Risk Analyses
# Supplement to the McDuffie County Joint Hazard Mitigation Plan

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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 2020, 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 McDuffie 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 McDuffie 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. McDuffie 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 McDuffie County were replaced with data derived from parcel and property assessment data obtained from McDuffie County. The county provided property assessment data was current as of November 2020 and the parcel data current as of October 2020. 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 McDuffie County is 99.4%. 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 | 26 | 1 | $6,295,000 | $38,000 |
| Commercial | 514 | 557 | $234,374,000 | $107,394,000 |
| Education | 11 | 9 | $19,395,000 | $20,780,000 |
| Government | 13 | 27 | $7,638,000 | $22,808,000 |
| Industrial | 149 | 156 | $88,867,000 | $54,084,000 |
| Religious | 67 | 50 | $44,474,000 | $15,218,000 |
| Residential | 8,619 | 9,931 | $1,329,029,000 | $1,210,712,000 |
| **Total** | **9,399** | **10,731** | **$1,730,072,000** | **$1,431,034,000** |

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

For McDuffie 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.

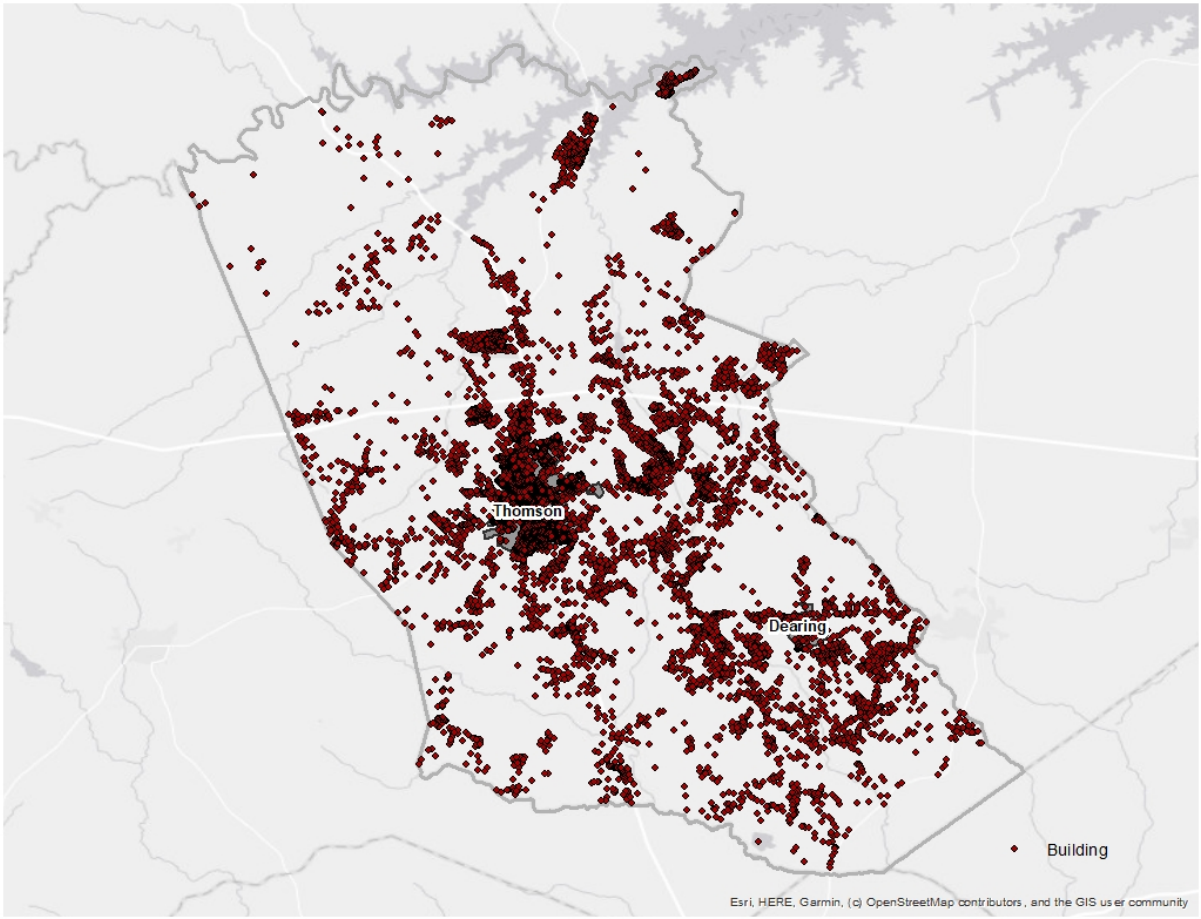


Figure 1: McDuffie County Overview

## 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 November 2020. 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 |
|---|---|---|
| **Dearing** | | |
| EOC | 0 | $0 |
| Care | 0 | $0 |
| Fire | 1 | $350,000 |
| Police | 1 | $250,000 |
| School | 1 | $4,500,000 |
| Total | 3 | $5,100,000 |
| | | |
| **Thomson** | | |
| EOC | 0 | $0 |
| Care | 1 | $600,000 |
| Fire | 1 | $200,000 |
| Police | 3 | $10,532,000 |
| School | 4 | $27,750,000 |
| Total | 9 | $39,082,000 |
| | | |
| **Unincorporated Areas of McDuffie County** | | |
| EOC | 1 | $1,500,000 |
| Care | 1 | $11,852,000 |
| Fire | 5 | $539,000 |
| Police | 0 | $0 |
| School | 1 | $8,500,000 |
| Total | 8 | $22,391,000 |

# Assumptions and Exceptions

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

- The McDuffie 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 McDuffie County by creating a 20-mile buffer around the county to include storms that didn't make direct landfall in McDuffie 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 1852, McDuffie County has had 21 tropical systems within 20 miles of its county borders (Table 4).

Table 4: Tropical Systems affecting McDuffie County[3]

| YEAR | DATE RANGE | NAME | MAX WIND(Knots) | MAX PRESSURE | MAX CAT |
|---|---|---|---|---|---|
| 1852 | August 19-30 | UNNAMED | 115 | 961 | H3 |

[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 |
|---|---|---|---|---|---|
| 1886 | June 17-24 | UNNAMED | 98 | 0 | H2 |
| 1887 | October 09-22 | UNNAMED | 86 | 0 | H1 |
| 1889 | September 12-26 | UNNAMED | 109 | 0 | H2 |
| 1893 | September 27 - October 05 | UNNAMED | 132 | 948 | H4 |
| 1903 | September 09-16 | UNNAMED | 92 | 988 | H1 |
| 1928 | August 03-13 | UNNAMED | 104 | 977 | H2 |
| 1933 | August 31 - September 07 | UNNAMED | 138 | 948 | H4 |
| 1947 | October 05-09 | UNNAMED | 58 | 0 | TS |
| 1949 | August 23 - September 01 | UNNAMED | 132 | 1002 | H4 |
| 1959 | May 28 - June 02 | ARLENE | 63 | 1002 | TS |
| 1964 | August 20 - September 11 | CLEO | 150 | 1007 | H4 |
| 1965 | June 13-20 | UNNAMED | 58 | 1007 | TS |
| 1968 | June 01-13 | ABBY | 75 | 1005 | H1 |
| 1972 | June 14-23 | AGNES | 86 | 1001 | H1 |
| 1990 | October 09-13 | MARCO | 63 | 1007 | TS |
| 1995 | August 22-28 | JERRY | 40 | 1010 | TS |
| 2000 | September 15-25 | HELENE | 69 | 1012 | TS |
| 2001 | June 05-19 | ALLISON | 58 | 1012 | TS |
| 2004 | September 13-29 | JEANNE | 121 | 1010 | H3 |
| 2018 | October 06-15 | MICHAEL | 161 | 1006 | H5 |

Category Definitions:

TS – Tropical storm

TD – Tropical depression

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

E – Extra-tropical cyclone

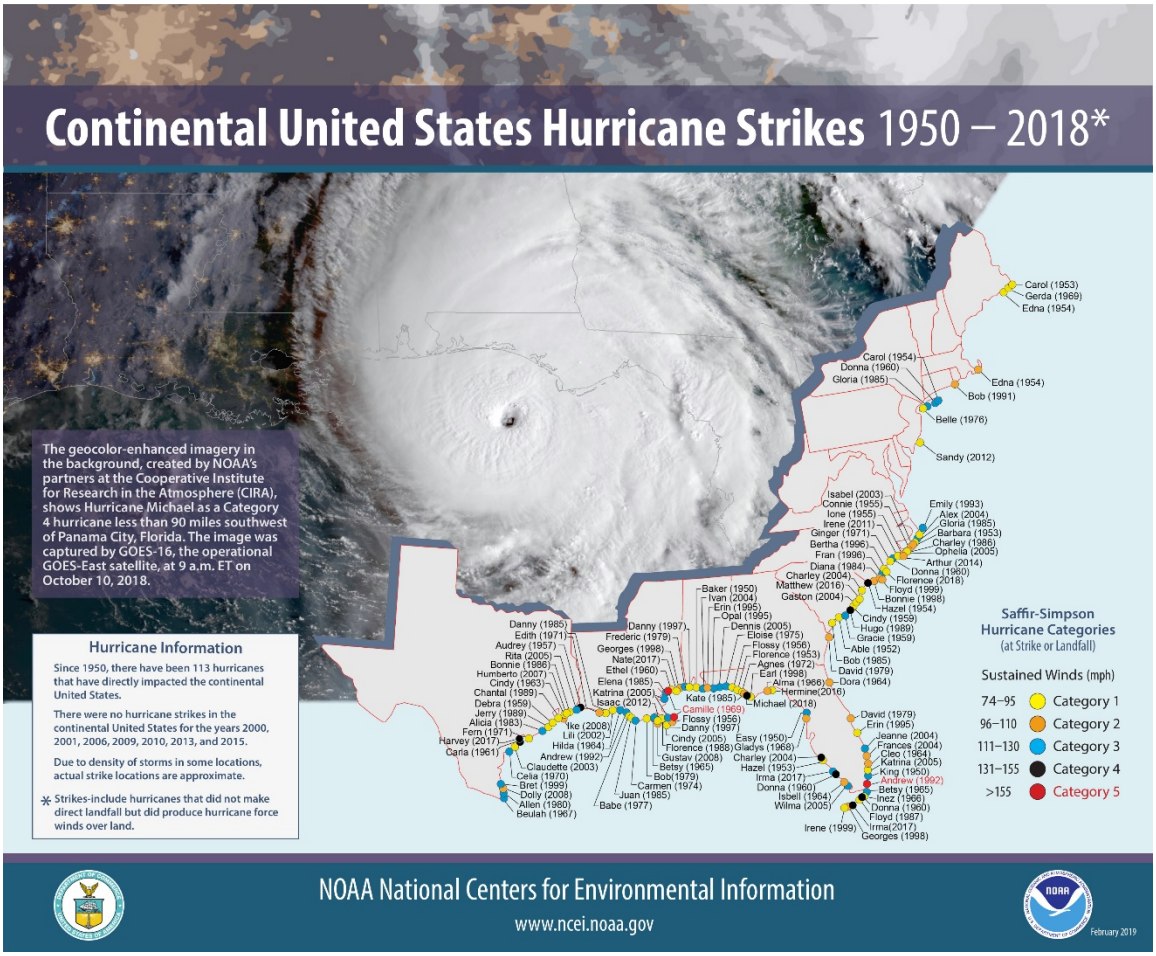


Figure 2: Continental United States Hurricane Strikes: 1950 to 2018[4]

# Probabilistic Hurricane Scenario

The following probabilistic wind damage risk assessment modeled a Category 1 Storm with maximum winds of 75 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 McDuffie County. Wind losses were determined from probabilistic models run for the Category 1 Storm which equates to the 1% chance storm event. Figure 3 shows wind speeds for the modeled Category 1 Storm.

[4] Source: NOAA National Centers for Environmental Information

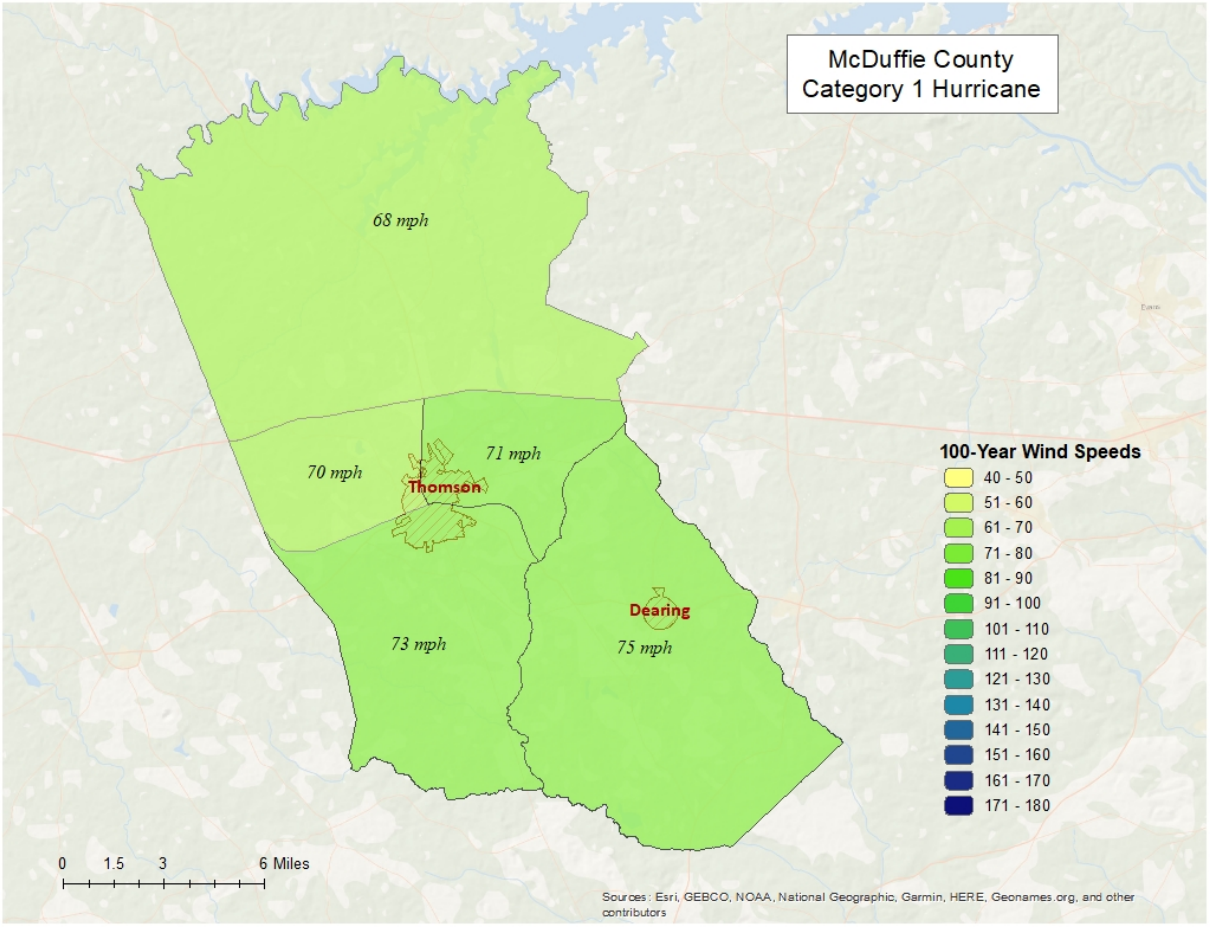


Figure 3: Wind Speeds by Storm Category

## Wind-Related Building Damages

Buildings in McDuffie 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 McDuffie County for the Category 1 Storm (100 Year Event). 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 | 39 | $1,633,560 | $2,198,730 | 0.11% |

[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.

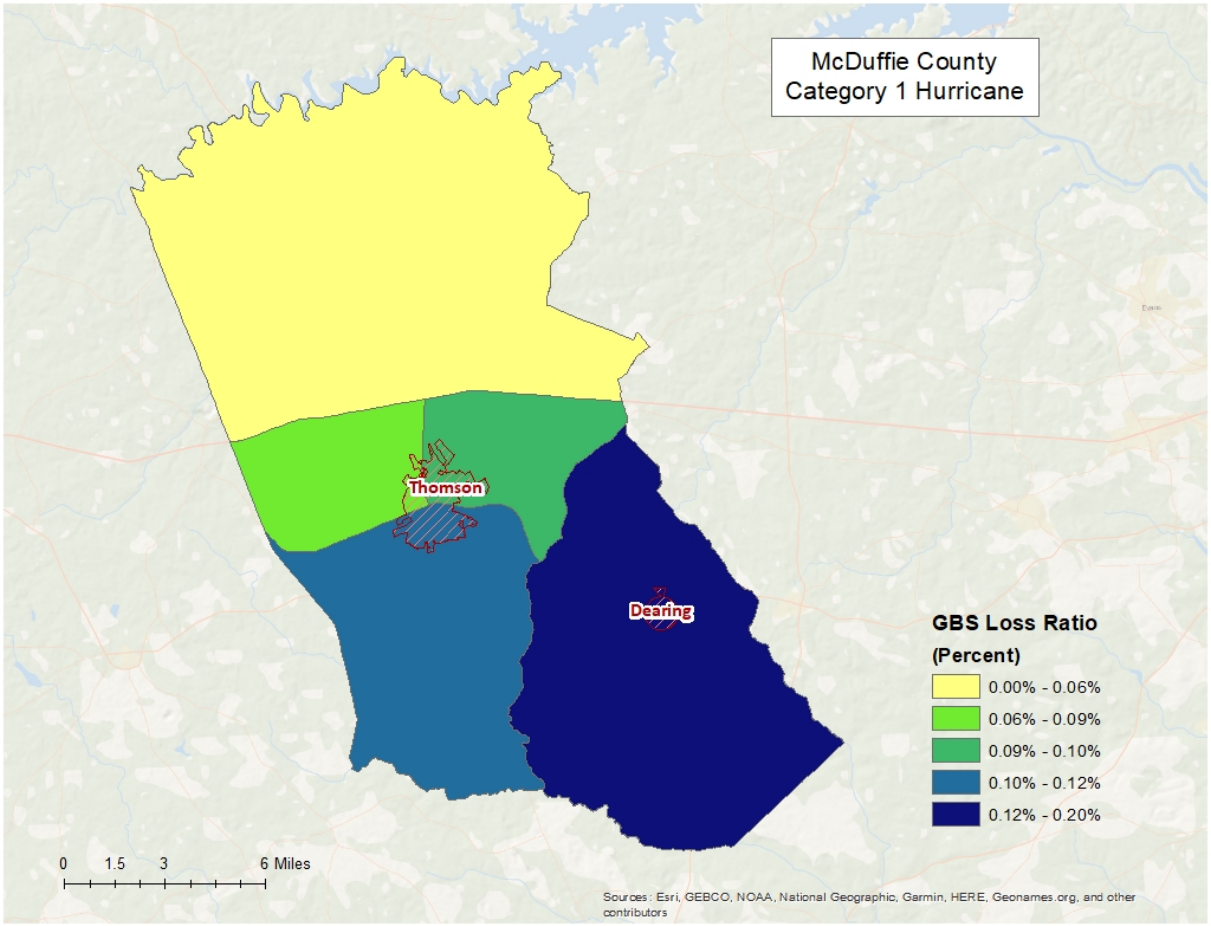


Figure 4: Hurricane Wind Building Loss Ratios

## 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.

There are 20 essential facilities in McDuffie County.

| Classification | Number |
|---|---|
| EOCs | 1 |
| Fire Stations | 7 |
| Care Facilities | 2 |
| Police Stations | 4 |
| Schools | 6 |

Table 6: Wind-Damaged Essential Facility Losses

| Classification | Facilities At Least Moderately Damaged > 50% | Facilities Completely Damaged > 50% | Facilities with Expected Loss of Use (< 1 day) |
|---|---|---|---|
| Category 1 | 0 | 0 | 20 |

## 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 McDuffie County is a Category One Storm, 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 | 132 | 0 | 1,080 | 15,962 | 17,174 |

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

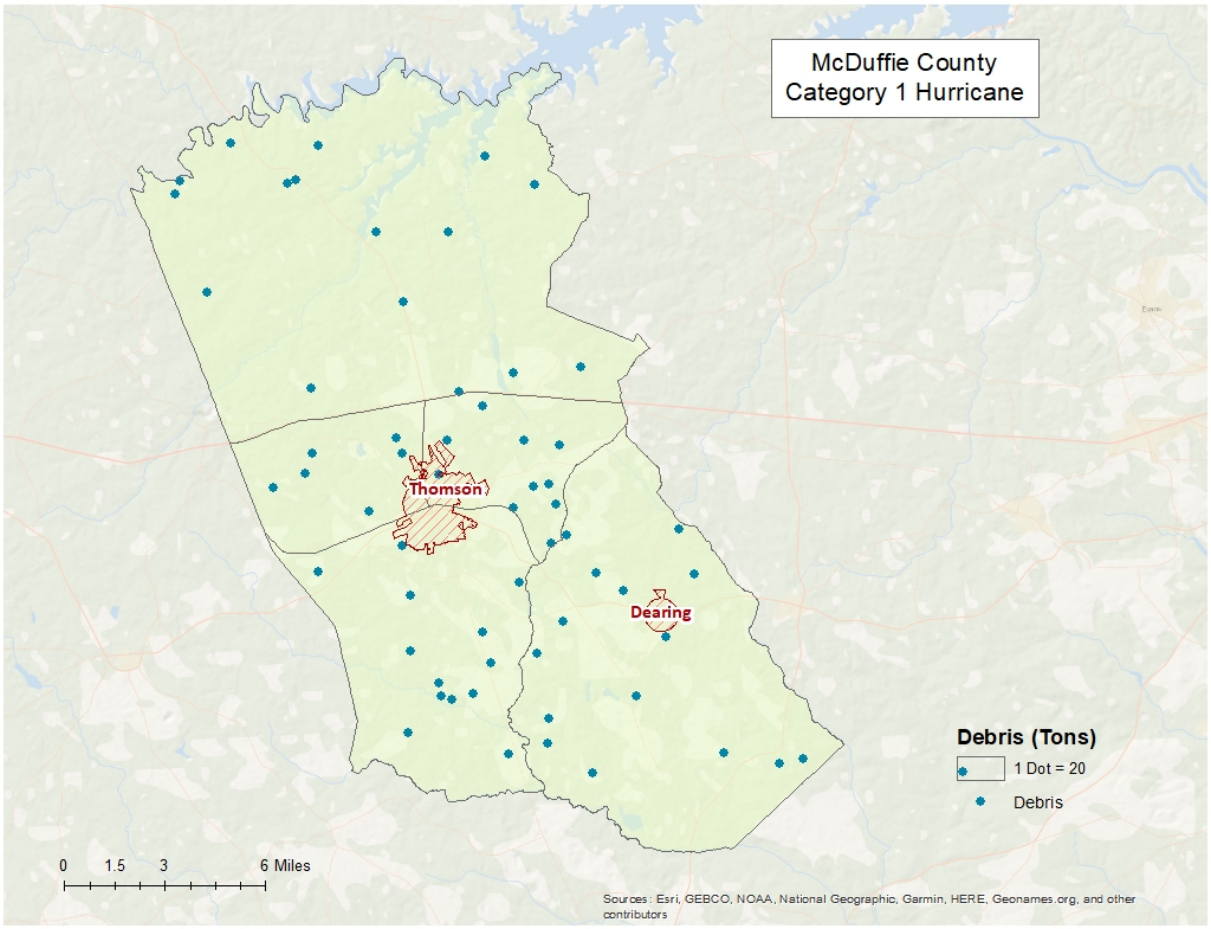


Figure 5: Wind-Related Debris Weight (Tons)

# 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 McDuffie County flood risk assessment analyzed at risk structures in the 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 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 2020. 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.

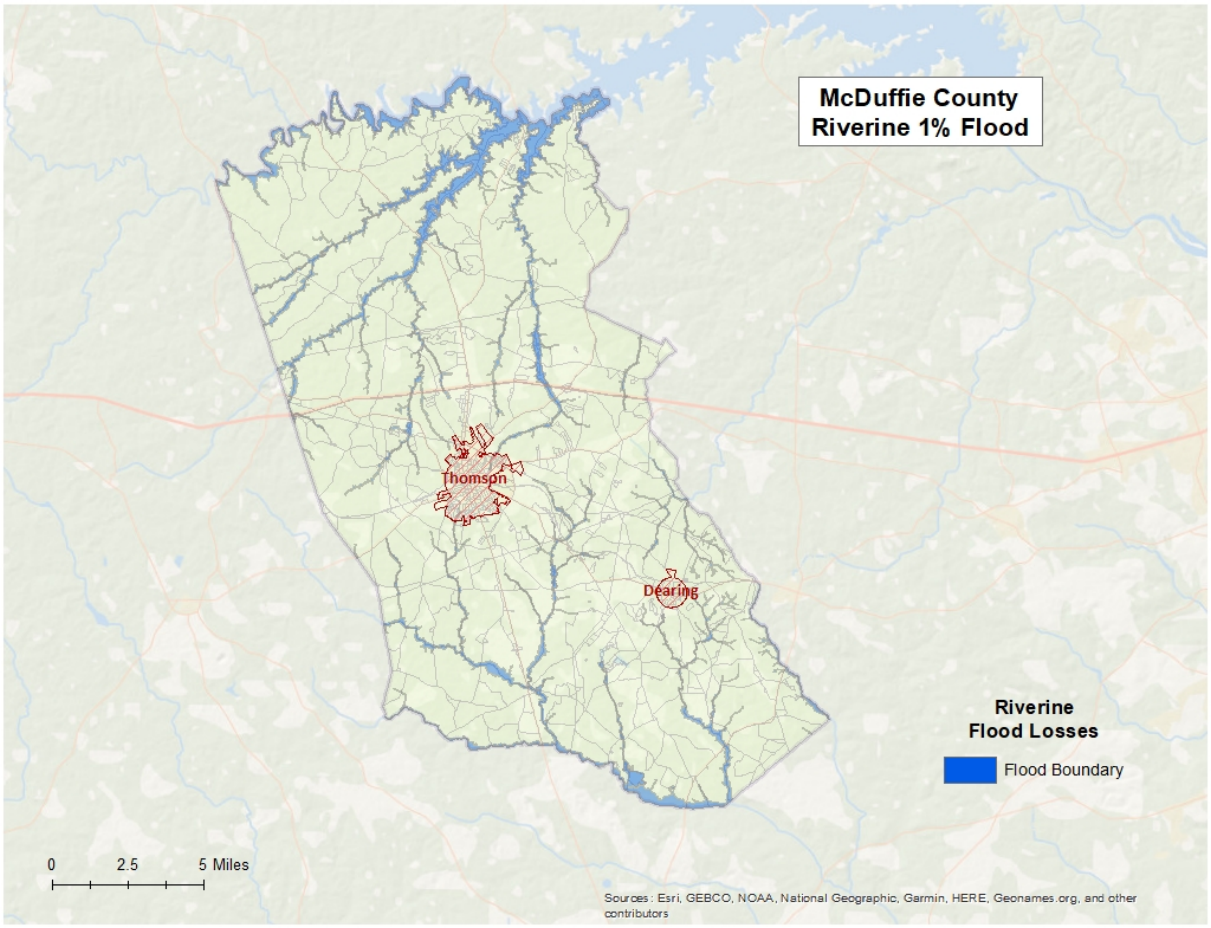


Figure 6: Riverine 1% Flood Inundation

## Riverine 1% Flood Building Damages

Buildings in McDuffie 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 McDuffie 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: McDuffie 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 |
|---|---|---|---|---|---|
| **Thomson** | | | | | |
| Residential | 2,378 | 1 | $345,065,144 | $22,953 | 0.01% |
| | | | | | |
| **Unincorporated** | | | | | |
| Residential | 7,290 | 47 | $834,412,443 | $1,605,829 | 0.19% |
| | | | | | |
| **County Total** | | | | | |
| | **9,668** | **48** | **$1,179,477,587** | **$1,628,782** | |

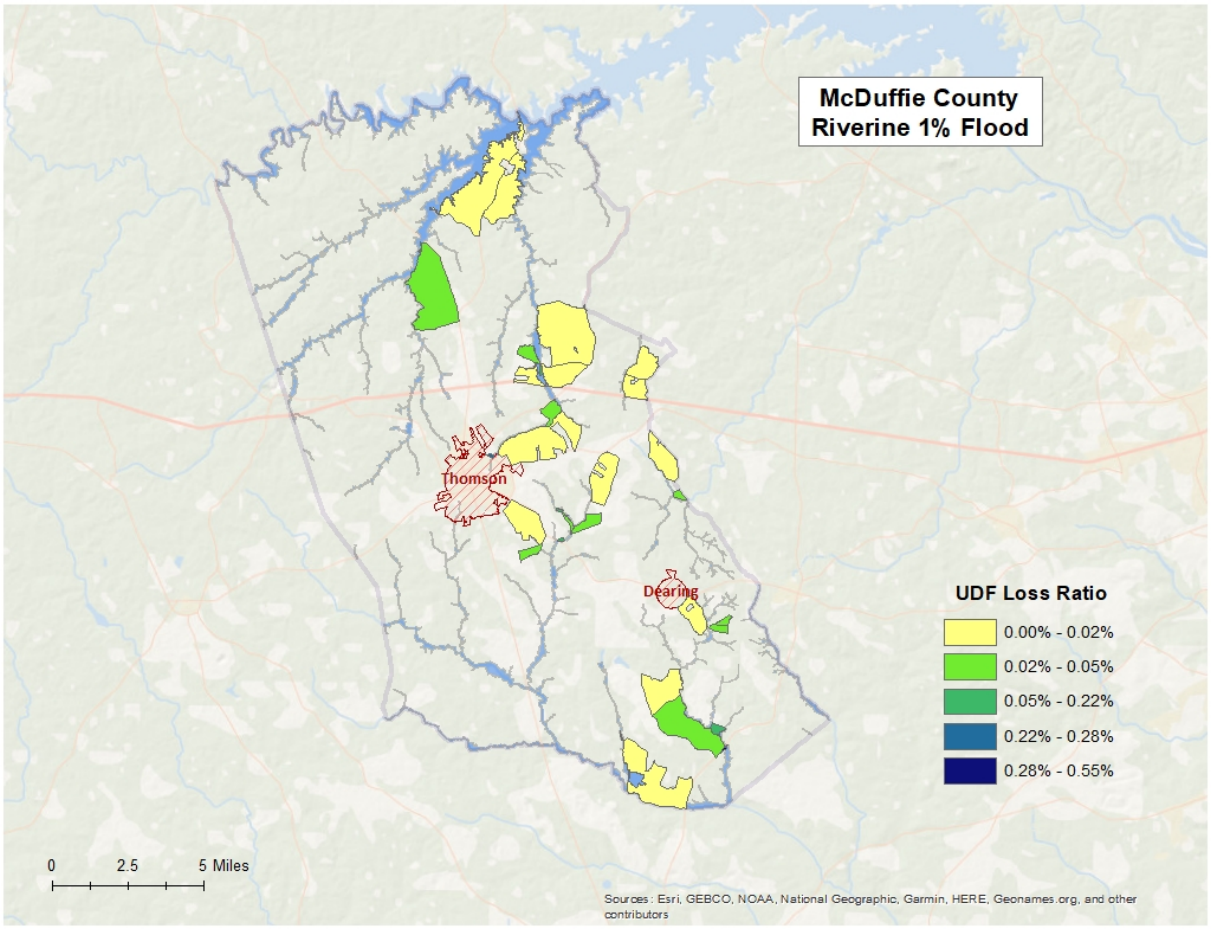


Figure 7: McDuffie County Potential Loss Ratios of Total Building Exposure to Losses Sustained to Buildings from the 1% Riverine Flood by 2010 Census Block

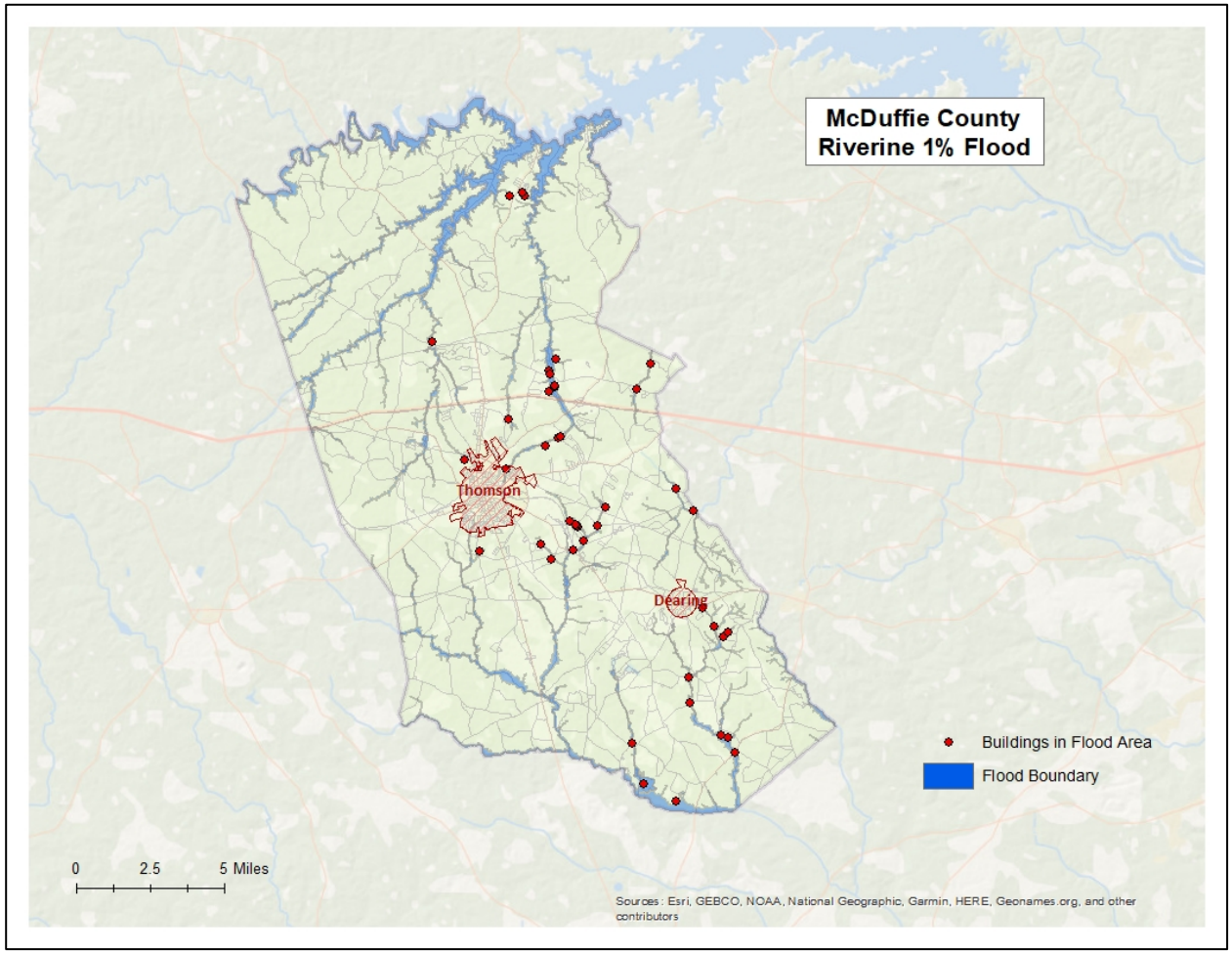


Figure 8: McDuffie County Damaged Buildings in Riverine Floodplain (1% Flood)

## 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 McDuffie 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 149 households might be displaced due to the flood. Displacement includes households evacuated within or very near to the inundated area. Displaced households represent 446 individuals, of which 47 may require short term publicly provided shelter. The results are mapped in Figure 9.

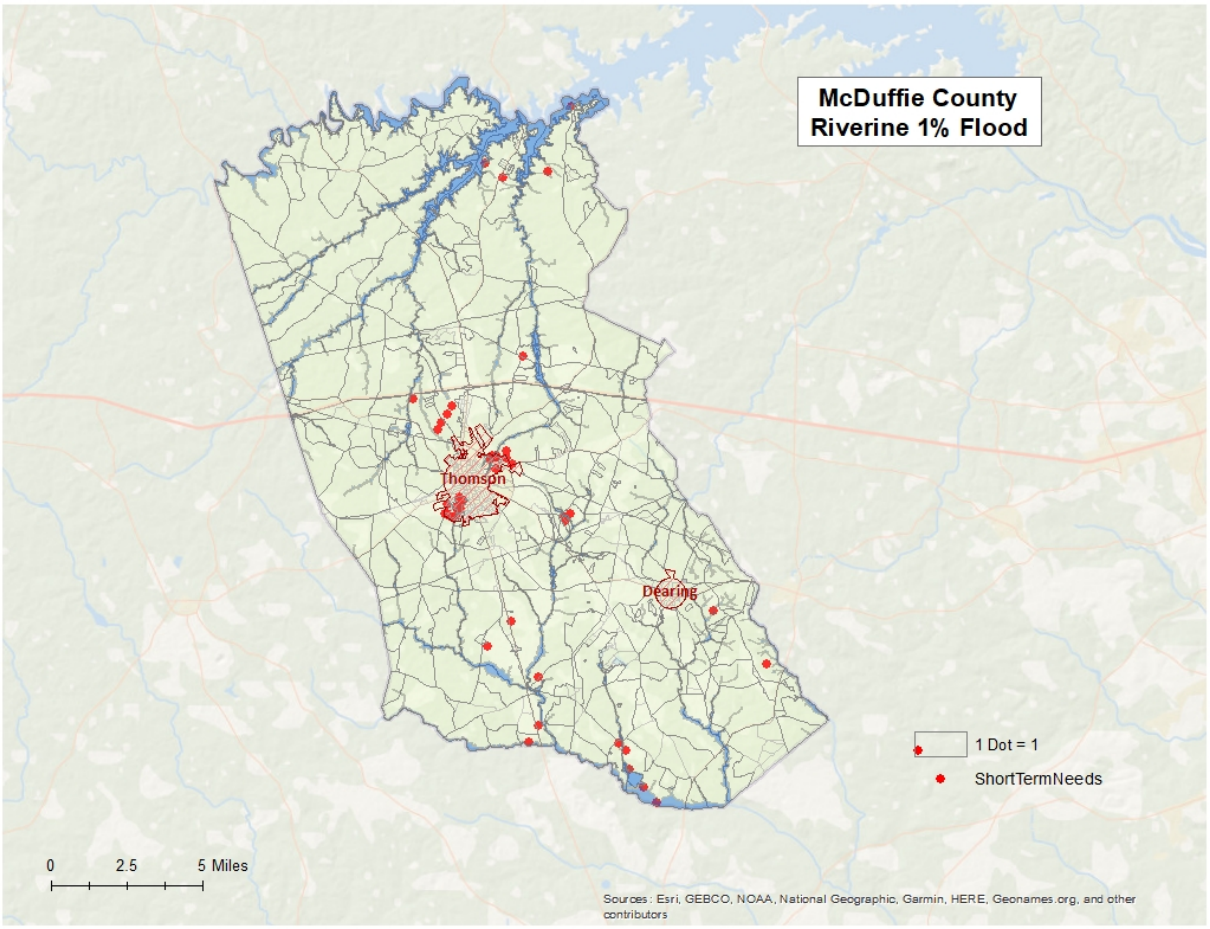


Figure 9: Riverine 1% Estimated Flood Shelter Requirements

## 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 3,306 tons of debris might be generated: 1) Finishes- 1,327 tons; 2) Structural – 737 tons; and 3) Foundations- 1,242 tons. The results are mapped in Figure 10.

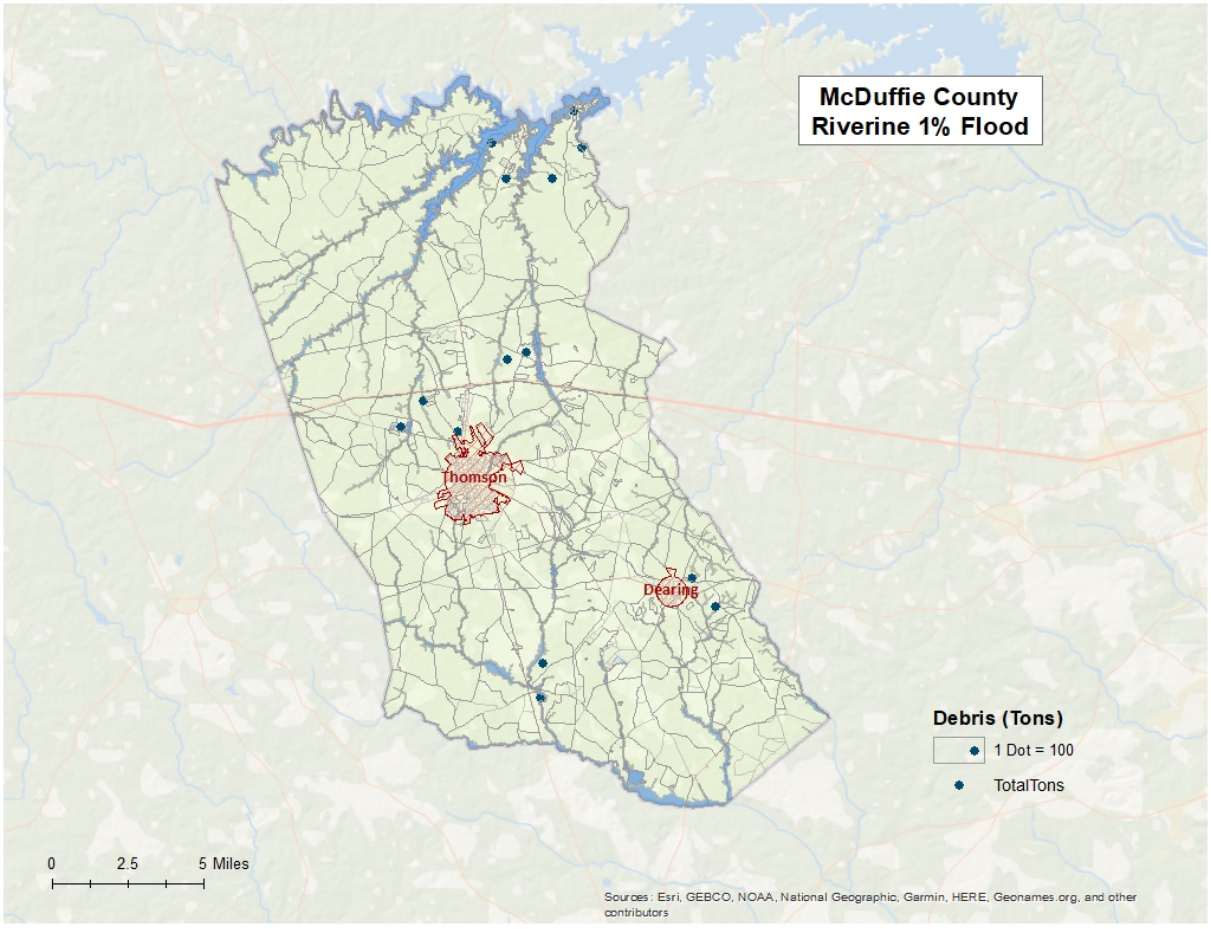


Figure 10: Riverine 1% Flood Debris Weight (Tons)

# 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** *Gale* | 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** Moderate | 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** Significant | 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** Severe | 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** Devastating | 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** Incredible | > 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 Thomson. 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.

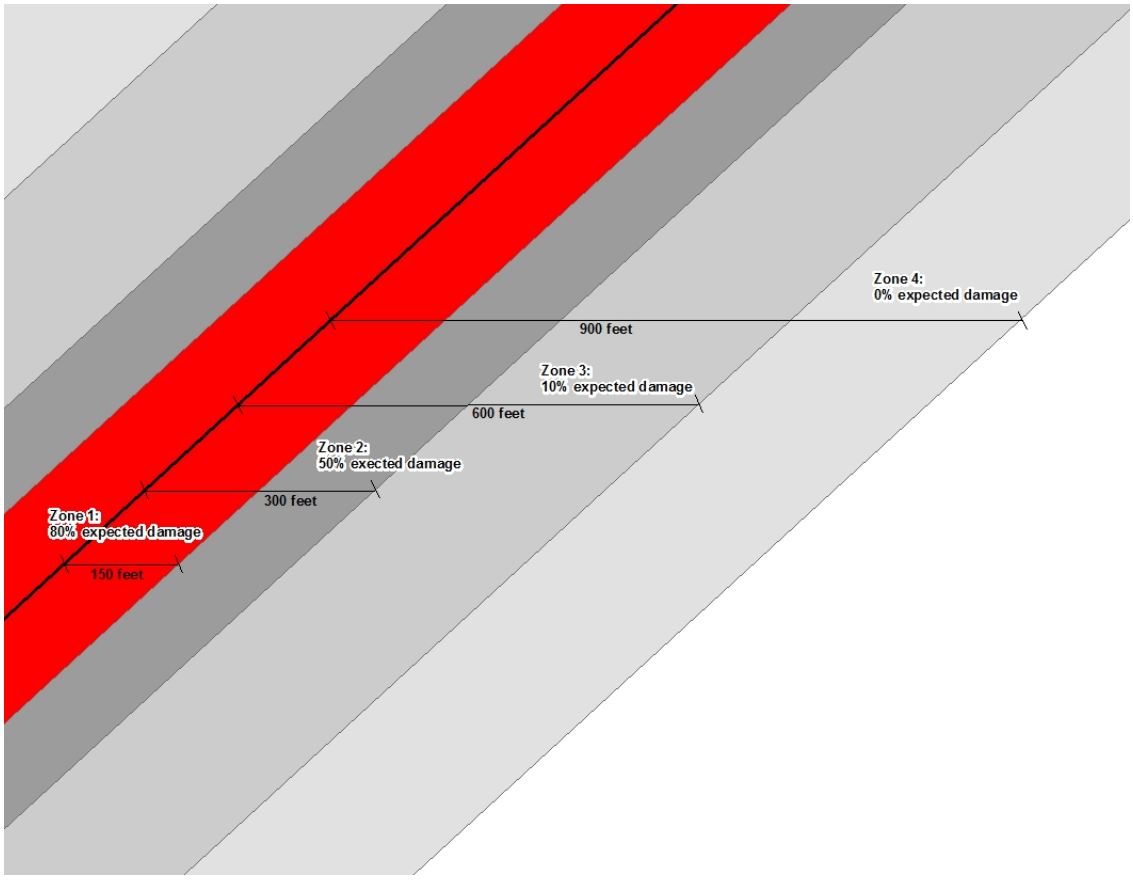


Figure 11: EF Scale Tornado Zones

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% |

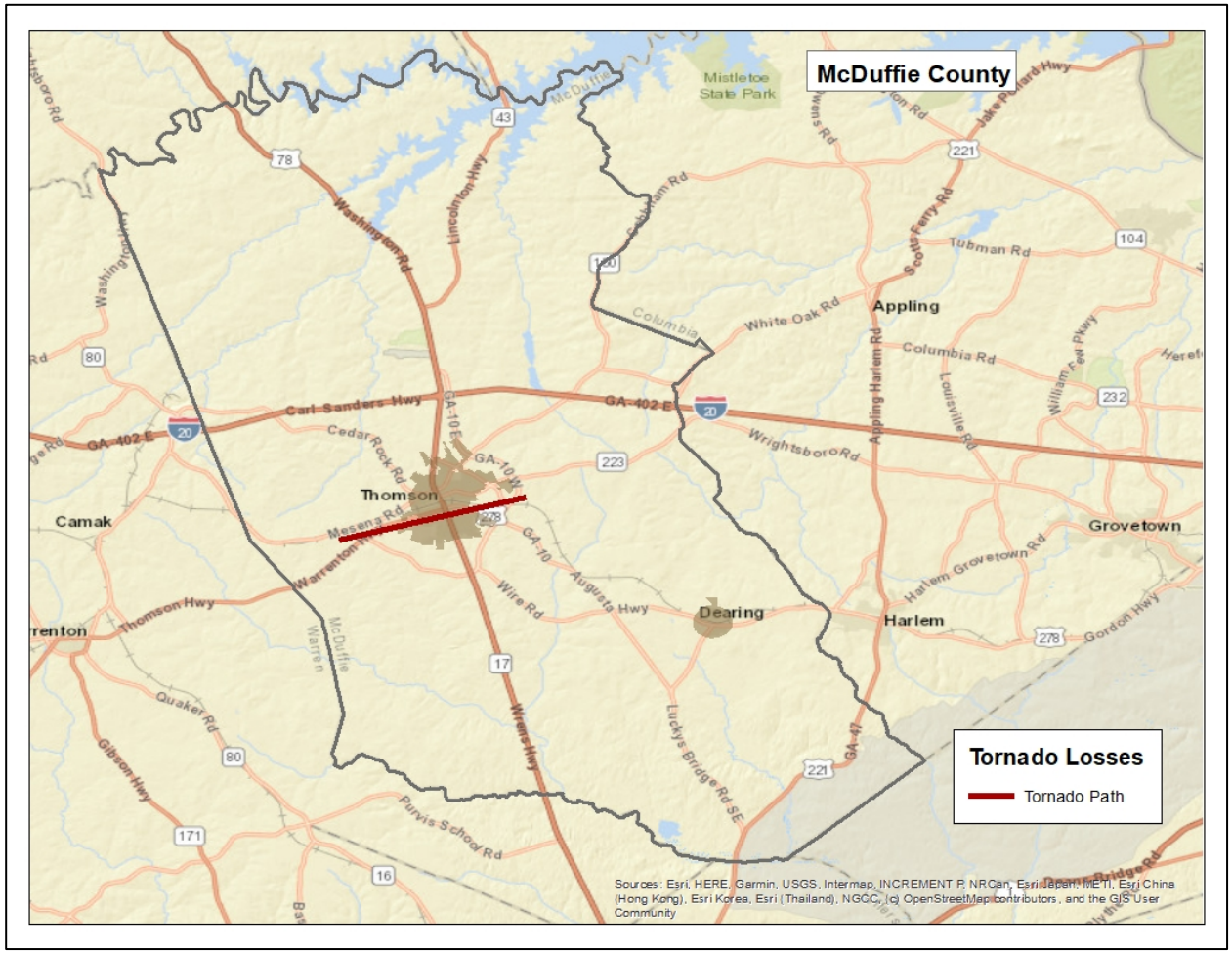


Figure 12: Hypothetical EF3 Tornado Path in McDuffie County

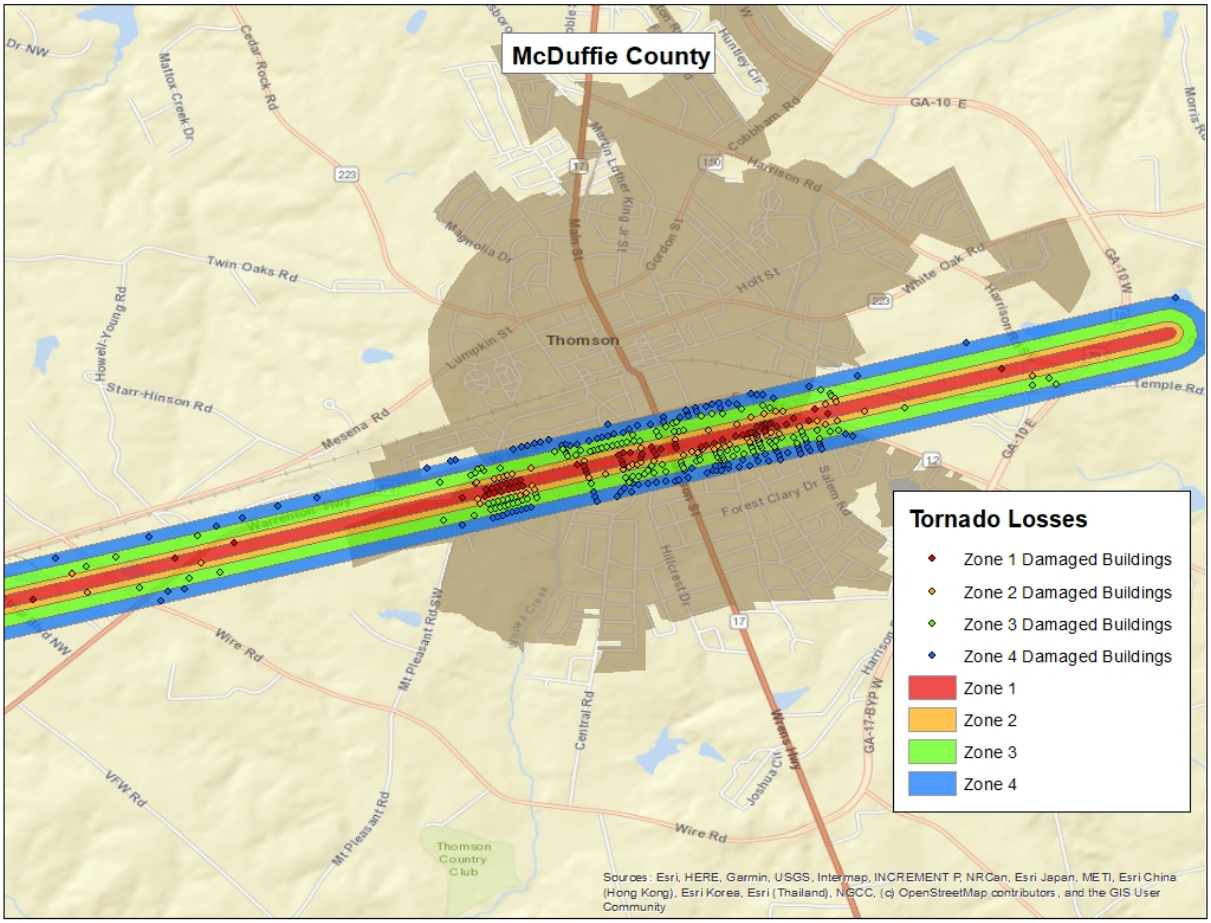


Figure 13: Modeled EF3 Tornado Damage Buffers in McDuffie County

## EF3 Tornado Building Damages

The analysis estimated that approximately 445 buildings could be damaged, with estimated building losses of $33 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 McDuffie 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 | 288 | $10,623,015 |
| Commercial | 104 | $2,379,287 |
| Industrial | 44 | $19,105,980 |
| Religious | 7 | $271,038 |
| Education | 2 | $485,083 |
| **Total** | **445** | **$32,864,403** |

## EF3 Tornado Essential Facility Damage

There were two essential facilities located in the tornado path – two schools. Table 14 outlines the specific facilities and the amount of damage under the scenario.

Table 14: Estimated Essential Facilities Damaged

| Facility | Amount of Damage |
|---|---|
| Thomson Elementary School | Major Damage |
| J. A. Maxwell Elementary School | Minor Damage |

According to the Georgia Department of Education, Thomson Elementary School's enrollment was approximately 327 students and J. A. Maxwell Elementary School's enrollment was approximately 457 students as of October 2020. 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.

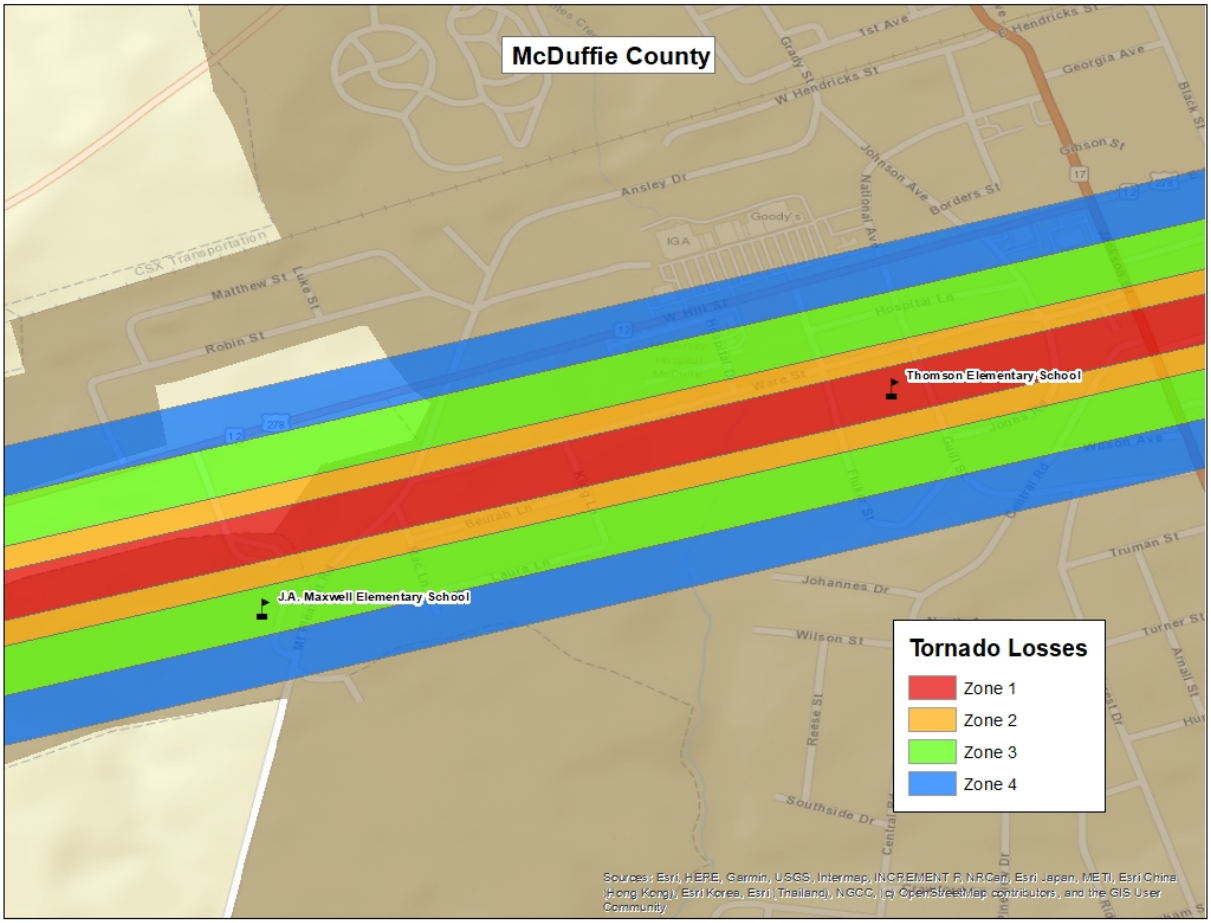


Figure 14: Modeled Essential Facility Damage in McDuffie County

# Exceptions Report

Hazus Version 2.2 SP1 was used to perform the loss estimates for McDuffie 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 McDuffie County.

Updates to the Critical Facility data used in GMIS were provided by McDuffie County in November 2020. 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 McDuffie County.

Table 15: Essential Facility Updates

| Site Class | Feature Class | Default Replacement Cost | Default Count | Updated Replacement Cost | Updated Count |
|---|---|---|---|---|---|
| EF | Care | $21,230,000 | 3 | $12,452,000 | 2 |
| EF | EOC | $1,760,000 | 2 | $1,500,000 | 1 |
| EF | Fire | $3,710,000 | 9 | $1,089,000 | 7 |
| EF | Police | $1,685,000 | 4 | $10,782,000 | 4 |
| EF | School | $50,150,000 | 8 | $40,750,000 | 6 |

## County Inventory Changes

The GBS records for McDuffie County were replaced with data derived from parcel and property assessment data obtained from McDuffie County. The county provided property assessment data was current as of November 2020 and the parcel data current as of October 2020.

### General Building Stock Updates

The parcel boundaries and assessor records were obtained from McDuffie 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 McDuffie County was 99.4%.

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 McDuffie County records.

Table 16: Building Inventory Default Adjustment Rates

| Type of Adjustment | Building Count | Percentage |
|---|---|---|
| Area Unknown | 708 | 7% |
| Construction Unknown | 742 | 7% |
| Condition Unknown | 679 | 6% |
| Foundation Unknown | 721 | 7% |
| Year Built Unknown | 1,811 | 17% |
| **Total Buildings** | **10,737** | **9%** |

Approximately 9% 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 McDuffie 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 | 10,731 | $1,431,076,384 |
| Riverine UDF | Structures Inside 1% Annual Chance Riverine Flood Area | 61 | $7,312,708 |

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

GEORGIA FORESTRY COMMISSION

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*

## McDuffie County

**June 26, 2010**

Prepared by;
Hal Sharpe, Chief Ranger Warren-McDuffie Counties
Will Fell CWPP Specialist
Georgia Forestry Commission
2088 Warrenton Hwy
Thomson, GA 30824

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

# I. OBJECTIVES

The mission of the following report is to set clear priorities for the implementation of wildfire mitigation in McDuffie 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

An initial meeting was held on May 11th 2009 attended by the following core planning team;

| | |
|---|---|
| Will Fell | GFC CWPP Specialist |
| Hal Sharpe | GFC Chief Ranger McDuffie Warren Counties |
| Bruce Tanner | Fire Chief McDuffie County Fire Department/EMA Director |
| Don Norton | McDuffie County Manager |
| Rick Sewell | Thomson Fire Chief |
| Stephen Sewell | Asst Fire Chief McDuffie County |

After an initial discussion of the processes and goals we hope to accomplish with this report, it was decided that we would assess general areas within the wildland urban interface in the two incorporated cities and the county. At the completion of this we would reconvene and discuss and evaluate the completed county wildfire risk assessment. It was further decided that we would provide for mitigation recommendations for McDuffie County. The chiefs of the various county fire departments completed the assessments and we reconvened on June 29th 2009 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 BACKGROUND AND EXISTING SITUATION

## Background

McDuffie County is located on the geological fall line in east central Georgia along the Savannah River basin, thirty-five miles west of Augusta. The county, carved from Warren and Columbia counties in late 1870 by an act of the Georgia General Assembly, was named for George McDuffie, a native Georgian and distinguished lawyer, statesman, governor, and U.S. senator of South Carolina. Although relatively small (260 square miles) and postbellum in its formation, McDuffie County boasts a sizeable colonial and political heritage that predates the county's official inception by at least a century.

## Early History

In 1767 royal governor James Wright granted to Quakers from Pennsylvania and North Carolina 12,000 acres of land along the present northern boundaries of McDuffie County. Three years later, the town of Wrightsborough was formally established and named in honor of the governor. Wright intended the settlement to be a buffer zone between the Creek and Cherokee Indians and the growing settlement of St. Paul Parish (present-day Augusta). It suffered accordingly. Indian hostilities, the American Revolution (1775-83), and the expansion of slavery all threatened the physical and economic safety of the neutral Quaker township. By 1800 most of its original families had relocated to the Midwest. Wrightsborough existed as a settlement into the twentieth century, if in name only, as its remaining inhabitants gradually assimilated into the religious, social, and civic norms of the predominantly Scots-Irish region.

## Economy and Natural Resources

Traveling through Wrightsborough in the colonial period, Quaker naturalist William Bartram observed that the terrain was "chiefly a plain of high forests, savannas, and cane swamps," and its soil "a deep, rich, dark mould, on a deep stratum of redish brown tenacious clay." In fact, the area that became McDuffie County boasted natural resources and a wealthy agricultural heritage that defined its economic and political life until fairly recently. Gold, discovered along the Little River in the early nineteenth century, provided one of the area's first industries. It was cotton, however, that created the bulk of McDuffie County's wealth during that century. The county's geographic location placed it among the most productive cotton land in the state, and slave culture and cotton production flourished. By 1880, 64 percent of the county's 9,449 residents were African American.

While agrarian culture has changed radically since 1950, historical and natural resources continue to define twenty-first-century McDuffie County. Recreation and tourism are prominent factors in the contemporary economic and cultural life of the county, as are the kaolin and timber industries.

## People and Places

The county's political tradition reflects its agrarian roots. Inheriting the passion, political philosophy, and agrarian advocacy of George McDuffie and nearby political heroes Robert Toombs and Alexander Stephens, U.S. senator Thomas E. Watson is remembered as McDuffie County's most prominent statesman. Born in 1856, the "Sage of Hickory Hill" or "Sage of McDuffie County" earned fame at the bar and became an eloquent national advocate for the embattled farmer and common man during the New South period. Other notable McDuffie County statesmen and jurists include Augustus Wright and Randall Evans Jr., a judge for Georgia's court of appeals.

Heritage tourism is fueled by the county's abundant historical sites, which include Hickory Hill (Watson's home in Thomson), the Wrightsboro Historic District, Wrightsboro Church, and the Rock House. Wrightsboro Church, dating to 1810, stands on the site of the old Quaker meetinghouse. Near the Wrightsboro community is the Rock House, a stone farmhouse built in 1785. The Rock House is thought to be the oldest dwelling in Georgia with its original architecture intact.

According to the 2000 U.S. census, McDuffie County's population is 21,231 (60.8 percent white, 37.5 percent black, and 1.3 percent Hispanic). There are two incorporated cities in the county, Thomson and Dearing. Thomson, with a population of 6,828, was incorporated in 1854 and established as the county seat in 1870. Dearing, with a population of 441, was named for William Dearing, a board member of the Georgia Railroad and Banking Company. The town was incorporated in 1910.

Fans of blues music make annual pilgrimages to the Blind Willie McTell Blues Festival, which honors the Thomson native "Blind Willie" McTell. Outdoor sports, including hunting and fishing, attract professional competition and revolve around nearby Clarks Hill Lake and its bordering wildlife management areas. Two local equestrian events, the Belle Meade Hunt and the Pine Top Horse Trials, bring to the county international exposure.

(Courtesy *New Georgia Encyclopedia*)

## Existing Situation

McDuffie County, straddling the fall line just west of the rapidly developing Augusta Metropolitan area, is still largely rural in character outside of Thomson. The county as a whole remains 58% forested. The southern portion of the county, roughly south of Hwy 278, is part of the upper coastal plain and supports some agriculture along with timber and kaolin mining. The northern half of the county located in the fall line sand hills and piedmont region is still largely forested and is seeing residential development spreading out from the traditional population centers. This is particularly true along the reaches of Clarks Hill Lake with many miles of shoreline within the northeast quadrant of the county and on the sand hills east of Thomson as the Augusta metro area spills west.

The main population center and county seat, Thomson sits near the center of the county while the only other incorporated town, Dearing lies to the east. There are several other small communities scattered throughout the county. Like many counties in this area, McDuffie has become increasingly popular to residents from Augusta seeking rural refuge along Interstate 20 building homes among the wildlands, many unfamiliar with the inherent risks of wildfire.

McDuffie County is well protected by a countywide fire department with six stations distributed throughout the county. The Georgia Forestry Commission maintains a unit with wildland fire suppression capability located west of Thomson on Hwy 278 with good access to most of the county.

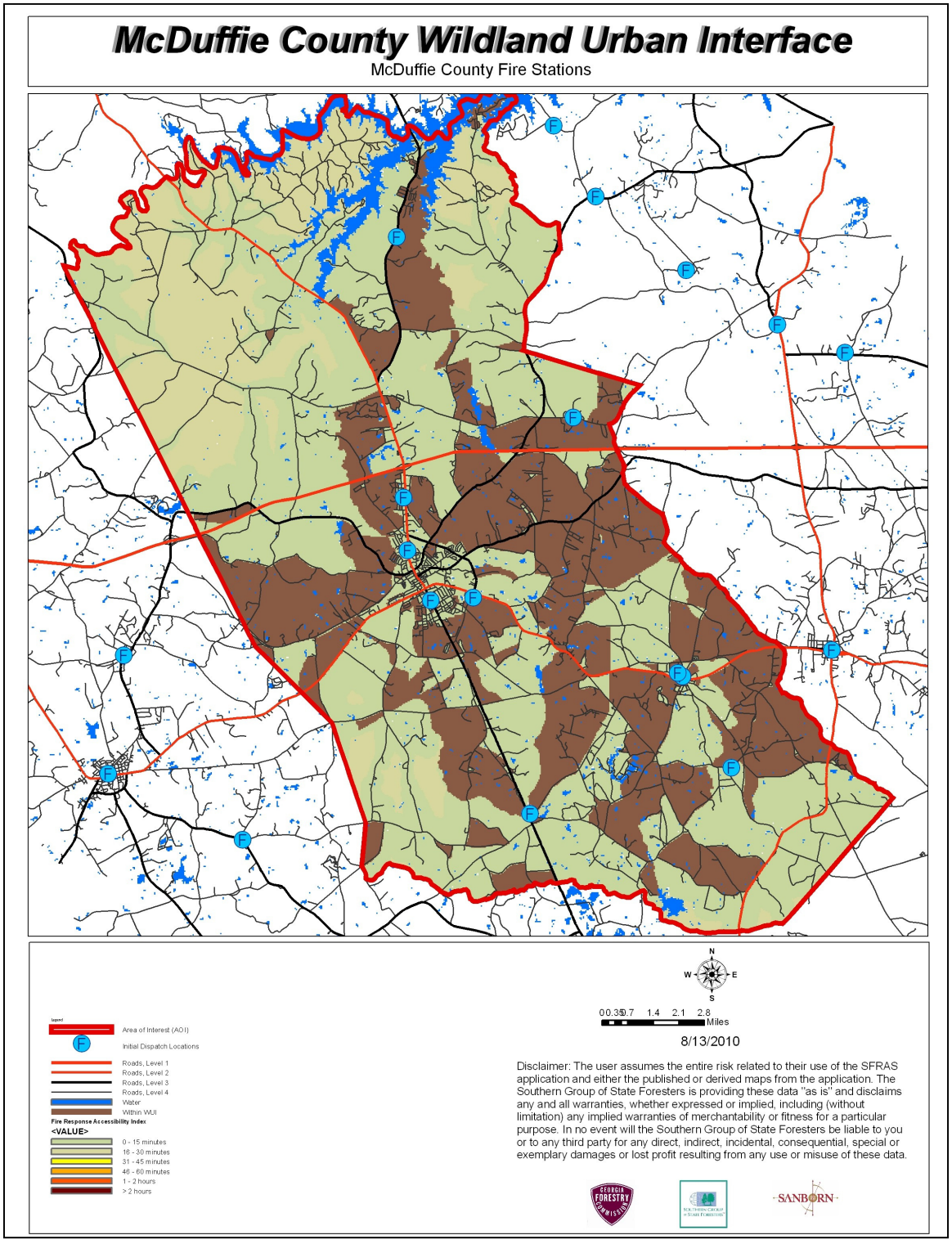
While there are modern pressurized water systems available in the two incorporated cities and much of the area adjacent to Thomson, there is still a significant area outside these regions lacking ready access to hydrants and dependable water sources.

Over the past 50 years, McDuffie County has averaged about 39 reported wildland fires per year with a pronounced peak during the months of February, March and April. These fires have burned an average of 179 acres annually. Of this annual acreage burned, 64% was lost during the above three months. Since the advent of the outdoor burning permit law about 20 years ago, the average numbers of fires have slightly increased, from 39 to 44 per year, but the acres lost have decreased from 179 to 111 annually.

The leading causes of these fires over the past 20 years, was debris burning causing 50% of the fires and 46% of the acres burned. More detailed records over the past six years show that almost half of these debris fires originated from escapes from household or residential debris burning.

Georgia Forestry Commission Wildfire Records show that in the past seven years, 12 homes have been lost or damaged by wildfire in McDuffie County resulting in estimated losses of $318,500 along with eight outbuildings valued at $6,200. According to reports during this period 183 homes have been directly or indirectly threatened by these fires. Additionally 13 vehicles valued at $109,200 and 17 pieces of other mechanized equipment suffered damages estimated at $201,200. This is a significant loss of non timber property attributed to wildfires in McDuffie County.

# IV. COMMUNITY BASE MAP



# 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.
(courtesy *Fire Ecology and Wildfire Mitigation in Florida* 2004)

As it was felt there was considerable variation in risk from the cities of Thomson and Dearing to the rural areas of McDuffie County, it was decided by the CORE assessment team to assess the cities separately from the rural areas of the county.

The wildland fire risk assessments were conducted in 2009 by the McDuffie County, Thomson and Dearing Fire Departments and returned an average score of 73, placing McDuffie County overall in the "Moderate" hazard range. See the assessed factors and the summary of the assessments following.

The risk assessment instrument used to evaluate wildfire hazards to McDuffie County's WUI was the Hazard and Wildfire Risk Assessment Scoresheet. The instrument takes into consideration accessibility, vegetation (based on fuel models), topography, 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 score for McDuffie County:

Cities of Thomson and Dearing (Low to Moderate Risk)

- Long, narrow roads
- Lack of defensible space in wildland interface areas.
- Lack of defensible space in some areas
- High occurrence of wildfires in several locations.
- Closeness of adjacent structures – risk of fire spread from structure to structure

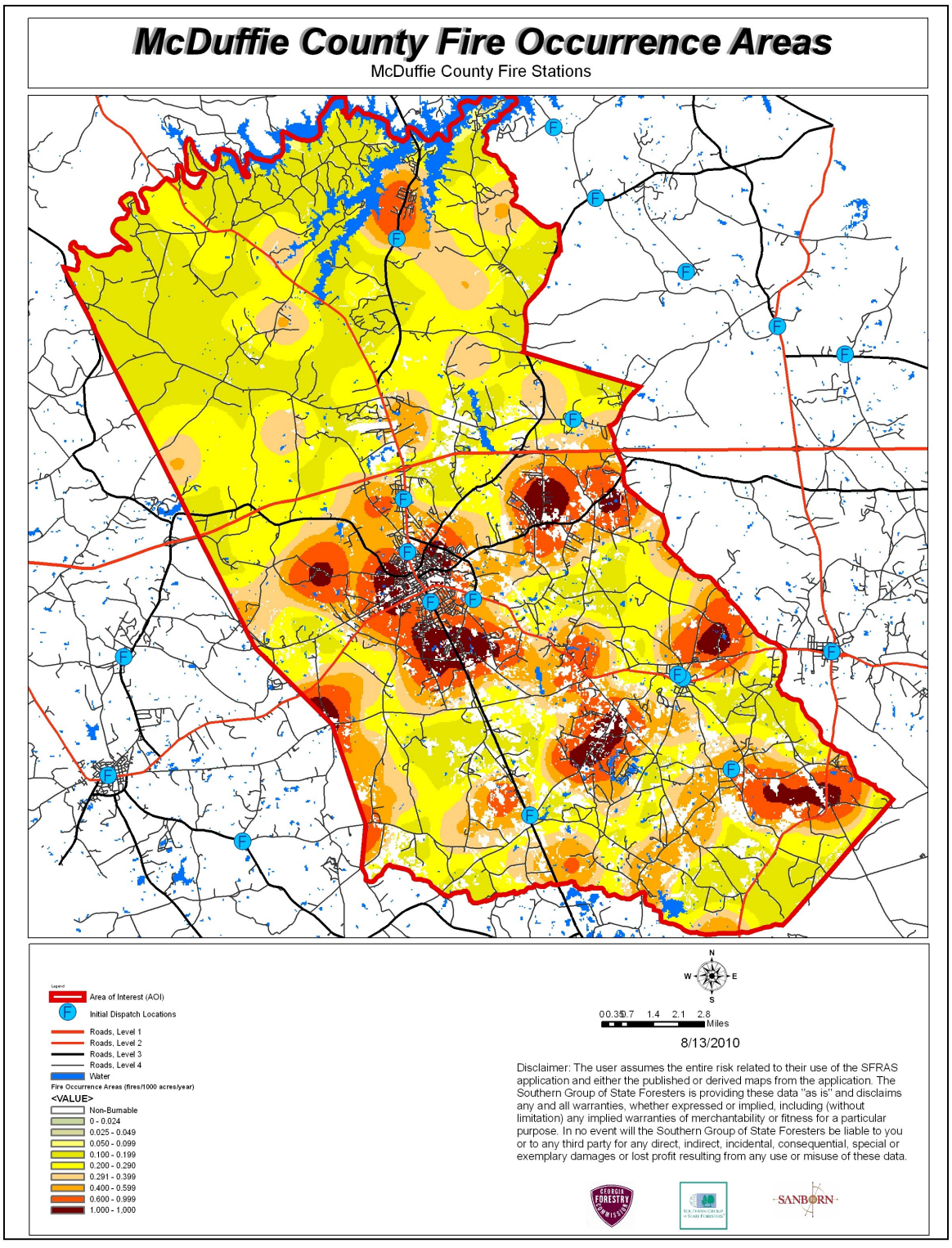
Rural Unincorporated McDuffie County (High Risk)

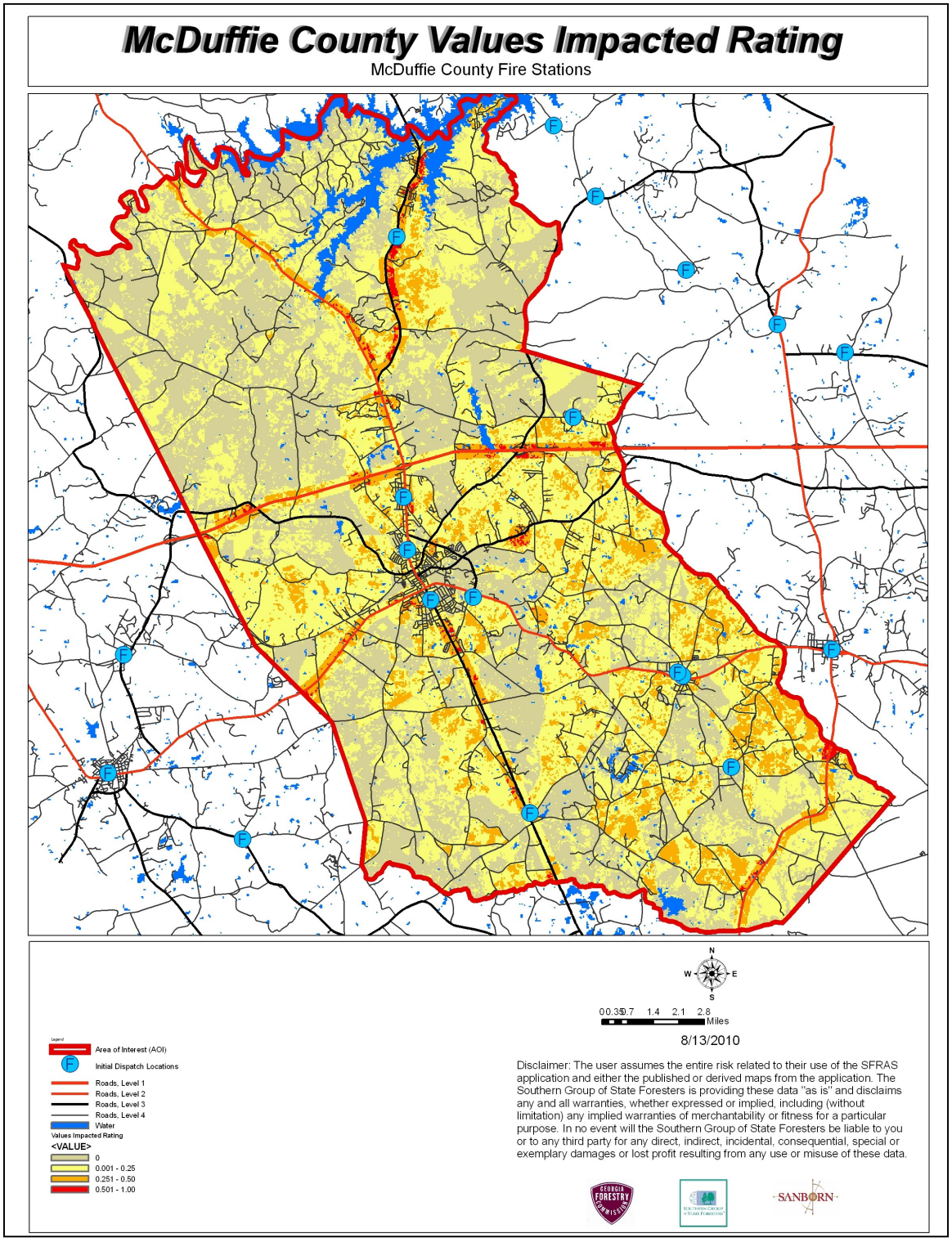
- Distance from staffed fire stations.
- Long narrow driveways inaccessible to equipment.
- Minimal defensible space around structures
- Homes with wooden siding and roofs with heavy accumulations of vegetative debris.
- No pressurized or non-pressurized water systems available off major roads
- Above ground utilities
- Large, adjacent areas of forest or wildlands
- Undeveloped lots comprising half the total lots in many rural communities.
- High occurrence of wildfires in the several locations
- Dead end roads with inadequate turn arounds.

**Hazard and Wildfire Assessment summary;**

| Area | Community Access | Surrounding Vegetation | Building Construction | Fire Protection | Utilities | Additional Factors | Score | Hazard Assessment |
|---|---|---|---|---|---|---|---|---|
| McDuffie | 13 | 30 | 25 | 14 | 6 | 25 | 113 | High |
| Thomson | 11 | 15 | 5 | 2 | 4 | 11 | 48 | Low |
| Dearing | 18 | 15 | 5 | 7 | 4 | 11 | 60 | Moderate |

# VI. COMMUNITY HAZARDS MAPS




McDuffie County Values Impacted Rating
McDuffie County Fire Stations
Area of Interest (AOI)
Initial Dispatch Locations
Roads, Level 1
Roads, Level 2
Roads, Level 3
Roads, Level 4
Water
Values Impacted Rating
<VALUE>
0
0.001 - 0.25
0.251 - 0.50
0.501 - 1.00
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S
0 0.35 0.7 1.4 2.1 2.8
Miles
8/13/2010
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# VII. PRIORITIZED MITIGATION RECOMMENDATIONS

**Executive Summary**

As Georgia continues to see increased growth from other areas seeking less crowded and warmer climes, new development will occur more frequently on forest and wildland areas. The 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.

The following recommendations were developed by the McDuffie 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** | Educate homeowners to 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** | Educate owners to clean flammable vegetative material from roofs and gutters, store firewood appropriately, install skirting around raised structures, store water hoses for ready access, replace pine straw and mulch around plantings with less flammable landscaping materials. |
| 3. Community Clean-up Day | Cutting, mowing, pruning** | Work with Homeowners Associations to encourage to cut, prune, and mow vegetation in shared community spaces where needed. |
| 4. Road Signage | At Replacement | New road signage with minimum 4 inch reflective lettering on non flammable poles. Dead end (no outlet or turn-around) should be prominently tagged. |
| 5. Road Access | Identify needed road improvements | As roads are upgraded, widen to minimum standards with at least 50 foot diameter cul de sacs. |
| 6. Codes and Ordinances | Examine existing codes and ordinances. | 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<br>As zoning, planning and subdivision ordinances are updated include fire department and emergency services input in the design of these. |

| | | |
|---|---|---|
| **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 |
| 2. Corps of Engineers Lands | Assess need for fuel treatments | Work with CoE land management to assess the need for fuel reduction activities adjacent to residential areas on the lake. |
| 3. Existing Fire Lines | Reduce hazardous fuels | Clean and re-harrow existing lines. |
| **Proposed Improved Community Wildland Fire Response Priorities** | | |
| 1. Water Sources | Dry Hydrants | Inspect, maintain and improve access to existing dry hydrants. Add signage along road to mark the hydrants |
| 2. Water Supply | County Water System | Add additional water lines and pressurized hydrants to existing system in areas of developement. |
| 3. Fire Stations | Equipment | Wildland hand tools. Lightweight Wildland PPE Gear. Larger capacity hose. Investigate need for "brush" trucks and tankers. |
| 4. Personnel | Training | Obtain Wildland Fire Suppression training for Fire Personnel. |
| **Actions to be taken by homeowners and community stakeholders | | |

## Proposed Education and Outreach Priorities

| 1. Conduct "How to Have a Firewise Home" Workshop for McDuffie County Residents |
|---|
| 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.<br><br>Distribute materials promoting firewise practices and planning through local community and governmental meetings. |
| 2. Conduct "Firewise" Workshop for Community Leaders |
| 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. |
| 3. Spring Clean-up Event |
| Conduct clean-up event every spring involving the Georgia Forestry Commission, McDuffie 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:<br>• Clean flammable vegetative material from roofs and gutters<br>• Trim shrubs and vines to 30 feet away from structures<br>• Trim overhanging limbs<br>• Clean hazardous or flammable debris from adjacent properties<br><br>Celebrate the work with a community cookout, with Community officials, GFC and McDuffie County Fire Departments discussing and commending the work accomplished. |

| 4. Informational Packets |
| --- |
| Develop and distribute informational packets to be distributed by permitting authorities, code enforcement, realtors, libraries, tax assessors office and insurance agents. Included in the packets are the following:<br>• Be Firewise Around Your Home<br>• Firewise Guide to Landscape and Construction<br>• Firewise Communities USA Bookmarks |
| 5. Wildfire Protection Display |
| Create and exhibit a display for the general public at the various fire stations rotating around during fire prevention month. Display can be independent or combined with the Georgia Forestry Commission display. |
| 6. Local Press |
| Invite the Thomson and Augusta news media to community “Firewise” functions for news coverage and regularly submit press releases documenting wildfire risk improvements in McDuffie County. |
| 7. County Festivals |
| Create a Firewise information booth at the various festivals such as the Willie McTell Blues Festival. |

# 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** | |
| McDuffie County Wildland Urban Interface Fire Council | Create this informal team or council comprised of residents, GFC officials, McDuffie County, Thomson and Dearing Fire Department officials, a representative from the cities and county governments and the EMA Director for McDuffie County. 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 | 1 Defensible Space and Firewise Landscaping<br>2 Debris Burning Safety<br>3 Firewise information for homeowners<br>4 Prescribed burning benefits |
| Communications objectives | 1 Create public awareness for fire danger and defensible space issues<br>2 Identify most significant human cause fire issues<br>3 Enlist public support to help prevent these causes<br>4 Encourage people to employ fire prevention and defensible spaces in their communities. |
| Target Audiences | 1 Homeowners<br>2 Forest Landowners and users<br>3 Civic Groups<br>4 School Groups |
| Methods | 1 News Releases<br>2 Personal Contacts<br>3 Key messages and prevention tips<br>4 Visuals such as signs, brochures and posters |

| **Spring Clean-up Day** | |
|---|---|
| Event Coordinator | Coordinate day's events and schedule, catering for cookout, guest attendance, and moderate activities the day of the day of the event. |
| Event Treasurer | Collect funds from residents to cover food, equipment rentals, and supplies. |
| Publicity Coordinator | Advertise event through neighborhood newsletters, 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, McDuffie 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, and using firewise landscaping around homes | 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 as needed. |
| 4. Spring Cleanup Day | Varies | Community Business Donations. |
| 5. Fuel Reduction Activities | $35 / Acre | FEMA & USFS Grants |

POTENTIAL FUNDING SOURCES:
As funding is questionable in these times of tight government budgets and economic uncertainty, unconventional means should be identified whereby the need for funding can be reduced or eliminated.
Publications / Brochures –

- FIREWISE materials are available for cost of shipping only at www.firewise.org.
- Another source of mitigation information can be found at www.nfpa.org.
- Access to reduced cost or free of charge copy services should be sought whereby publications can be reproduced.
- Free of charge public meeting areas should be identified where communities could gather to be educated regarding prevention and firewise principles.

Mitigation –

- Community Protection Grant:
    - USFS sponsored prescribed burn program. Communities with at risk properties that lie within 3 miles of the USFS border may apply with the GFC to have their forest land prescribed burned free of charge.
- FEMA Mitigation Policy MRR-2-08-01: through GEMA - Hazard Mitigation Grant Program (HMGP) and Pre Disaster Mitigation (PDM)
    - To provide technical and financial assistance to local governments to assist in the implementation of long term cost effective hazard mitigation measures.
    - 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 fuels reduction to protect life and property.
    - With a complete and registered plan (addendum to the State plan) counties can apply for pre- mitigation funding. They will also be eligible for HMGP if the county is declared under a wildfire disaster.
- GFC - Plowing and burning assistance can be provided through the Georgia Forestry Commission as a low cost option for mitigation efforts.
- Individual Homeowners –
    - In most cases of structural protection ultimately falls on the responsibility of the community and the homeowner. They will bear the cost; yet they will reap the benefit from properly implemented mitigation efforts.
    - GEMA Grant - PDM (See above)Ultimately it is our goal to help the communities by identifying the communities threatened with a high risk to wildfire and educate those communities on methods to implement on reducing those risks.

## Assessment Strategy

To accurately assess progress and effectiveness for the action plan, the McDuffie 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, 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 McDuffie County WUIFC 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 McDuffie County WUIFC 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


**P. O. Box 819Macon, GA 312021-800-GA-TREESGaTrees.org**

***The Georgia Forestry Commission provides leadership, service, and education in the protection and conservation of Georgia's forest resources.An Equal Opportunity Employer and Service Provider***

# Southern Wildfire Risk Assessment Summary Report

***McDuffie County***

Report was generated using
www.southernwildfirerisk.com

Report version: 4.0

Report generated: 7/7/2021

# Table of Contents

**Hold Control and Click to navigate to the section of your interest.**

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Users should also note that property boundaries included in any product do not represent an on-the-ground survey suitable for legal, engineering, or surveying purposes. They represent only the approximate relative locations.

# Introduction

Welcome to the Southern Wildfire Risk Assessment Summary Report.

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. The report is generated in MS WORD format.

The report has been designed so that information from the report can easily be copied and pasted into other specific plans, reports, or documents depending on user needs. Examples include, but are not limited to, Community Wildfire Protection Plans, Local Fire Plans, Fuels Mitigation Plans, Hazard Mitigation Plans, Homeowner Association Risk Assessments, and Forest Management or Stewardship Plans. Formats and standards for these types of reports vary from state to state across the South, and accordingly SouthWRAP provides the SWRA information in a generic risk report format to facilitate use in any type of external document. The SouthWRAP Risk Summary Report also stands alone as a viable depiction of current wildfire risk conditions for the user defined project area.

SouthWRAP provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in the South.

Results of the assessment can be used to help prioritize areas in the state where mitigation treatments, community interaction and education, or tactical analyses might be necessary to reduce risk from wildfires.

The SouthWRAP 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 programs

To learn more about the SWRA project or to create a custom summary report, go to www.southernwildfirerisk.com.

## Products

Each product in this report is accompanied by a general description, table, chart and/or map. A list of available SouthWRAP products in this report is provided in the following table.

| SouthWRAP Product | Description |
|---|---|
| **Wildland Urban Interface (WUI)** | Depicts where humans and their structures meet or intermix with wildland fuel |
| **WUI Risk Index** | Represents a rating of the potential impact of a wildfire on people and their homes |
| **Community Protection Zones** | Represents those areas designated as primary and secondary priorities for community protection planning |
| **Burn Probability** | Probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts |
| **Characteristic Rate of Spread** | Represents the speed with which a fire moves in a horizontal direction across the landscape |
| **Characteristic Flame Length** | Represents the distance between the tip and base of the flame |
| **Characteristic Fire Intensity Scale** | Quantifies the potential fire intensity for an area by orders of magnitude |
| **Fire Type - Extreme** | Represents the potential fire type (surface or canopy) under extreme percentile weather conditions |
| **Surface Fuels** | Contains the parameters needed to compute surface fire behavior characteristics |
| **Dozer Operability Rating** | Level of difficulty to operate a dozer in an area based on limitations associated with slope and vegetation type |

# Wildland Urban Interface

## Description

The South is one of the fastest growing regions in the nation, with an estimated population growth of 1.5 million people per year. The South also consistently has the highest number of wildfires per year. Population growth is pushing housing developments further into natural and forested areas where most of these wildfires occur. This situation puts many lives and communities at risk each year.

In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI).

The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the **McDuffie County** project area, it is estimated that **21,718** people or **99.2 % percent** of the total project area population (**21,886)** live within the WUI.

**The Wildland Urban Interface (WUI) layer reflects housing density depicting where humans and their structures meet or intermix with wildland fuels.**

WUI housing density is categorized based on the standard Federal Register and U.S. Forest Service SILVIS data set categories, long considered a de facto standard for depicting WUI. However, in the SWRA WUI data the number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements for fire protection planning activities. While units of the actual data set are in *houses per sq. km*., the data is presented as the *number of houses per acre* to aid with interpretation and use by fire planners in the South.

In the past, conventional wildland urban interface data sets, such as USFS SILVIS, have been used to reflect these concerns. However, USFS SILVIS and other existing data sources do not provide the level of detail for defining population living in the wildland as needed by Southern state WUI specialists and local fire protection agencies.

The new SWRA WUI 2012 dataset is derived using advanced modeling techniques based on the SWRA Where People Live (housing density) dataset and 2012 LandScan population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The primary difference between the WPL and WUI is that populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by a wildfire. Simply put, the SWRA WUI is the SWRA WPL data with the urban core areas removed.

Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers. The following table shows the total population for each WUI area within the project area.

**WUI – Population and Acres**

| Housing Density | WUI Population | Percent of WUI Population | WUI Acres | Percent of WUI Acres |
|---|---|---|---|---|
| LT 1hs/40ac | 515 | 2.4 % | 25,377 | 37.9 % |
| 1hs/40ac to 1hs/20ac | 665 | 3.1 % | 10,269 | 15.4 % |
| 1hs/20ac to 1hs/10ac | 1,475 | 6.8 % | 10,702 | 16.0 % |
| 1hs/10ac to 1hs/5ac | 2,716 | 12.5 % | 9,148 | 13.7 % |
| 1hs/5ac to 1hs/2ac | 5,336 | 24.6 % | 7,276 | 10.9 % |
| 1hs/2ac to 3hs/1ac | 10,946 | 50.4 % | 4,098 | 6.1 % |
| GT 3hs/1ac | 65 | 0.3 % | 12 | 0.0 % |
| **Total** | **21,718** | **100.0 %** | 66,882 | 100.0 % |

# WUI Risk Index

## Description

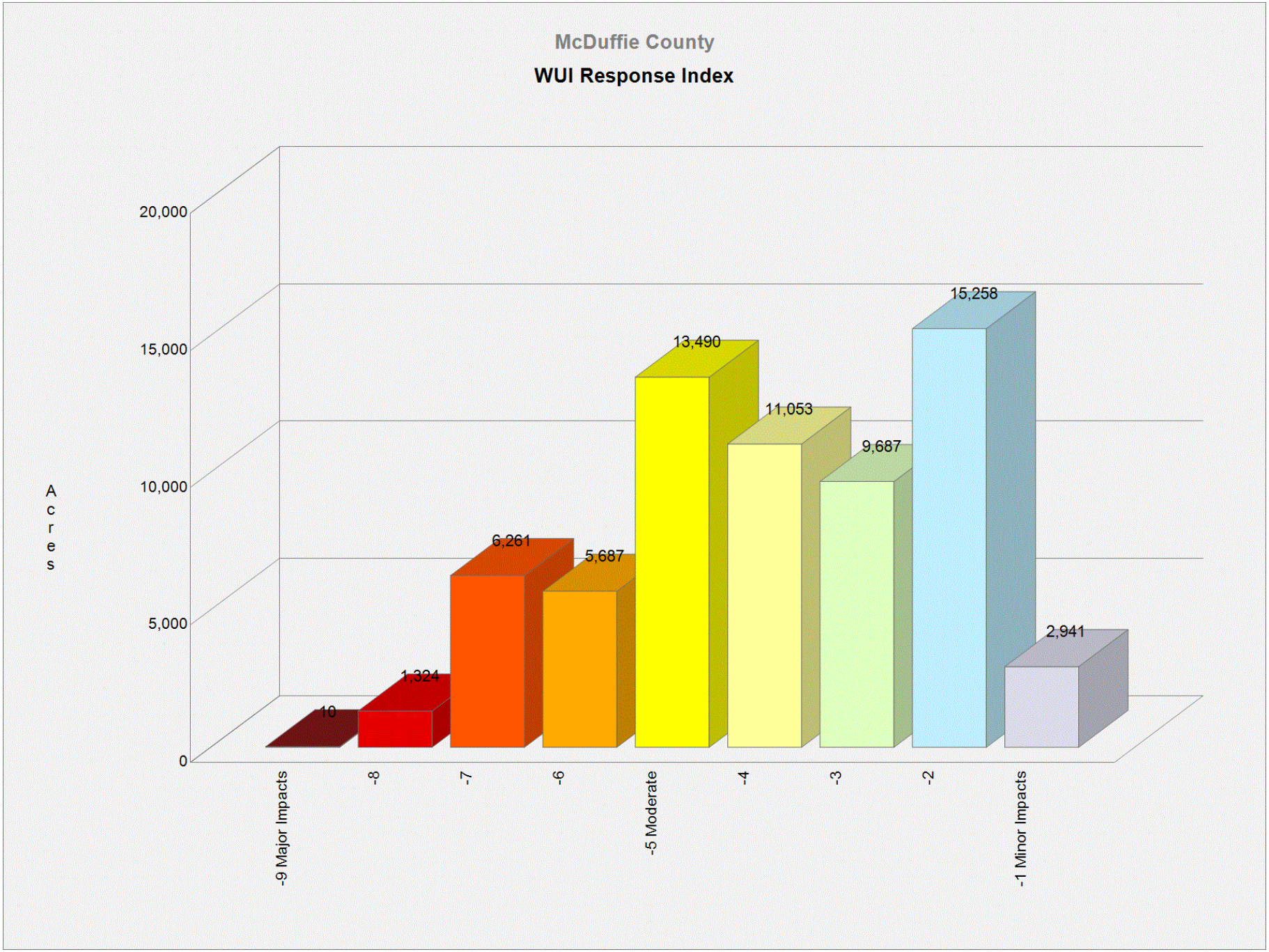
**The Wildland Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes**. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes.

The WUI Risk Rating is derived using a Response Function modeling approach. Response functions are a method of assigning a net change in the value to a *resource* or *asset* based on susceptibility to fire at different intensity levels, such as flame length. The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9 while areas with low housing density and low flame lengths are rated -1.

To calculate the WUI Risk Rating, the WUI housing density data was combined with Flame Length data and response functions were defined to represent potential impacts. The response functions were defined by a team of experts based on values defined by the SWRA Update Project technical team. By combining flame length with the WUI housing density data, you can determine where the greatest potential impact to homes and people is likely to occur.

Fire intensity data is modeled to incorporate penetration into urban fringe areas so that outputs better reflect real world conditions for fire spread and impact in fringe urban interface areas. With this enhancement, houses in urban areas adjacent to wildland fuels are incorporated into the WUI risk modeling. All areas in the South have the WUI Risk Index calculated consistently, which allows for comparison and ordination of areas across the entire region. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers.

| Class | Acres | Percent |
|---|---|---|
| -9 Major Impacts | 10 | 0.0 % |
| -8 | 1,324 | 2.0 % |
| -7 | 6,261 | 9.5 % |
| -6 | 5,687 | 8.7 % |
| -5 Moderate | 13,490 | 20.5 % |
| -4 | 11,053 | 16.8 % |
| -3 | 9,687 | 14.7 % |
| -2 | 15,258 | 23.2 % |
| -1 Minor Impacts | 2,941 | 4.5 % |
| **Total** | **65,711** | **100.0 %** |


McDuffie County
WUI Response Index
Acres
20,000
15,000
10,000
5,000
0
10
1,324
6,261
5,687
13,490
11,053
9,687
15,258
2,941
-9 Major Impacts
-8
-7
-6
-5 Moderate
-4
-3
-2
-1 Minor Impacts

# Community Protection Zones

## Description

**Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities.** CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.

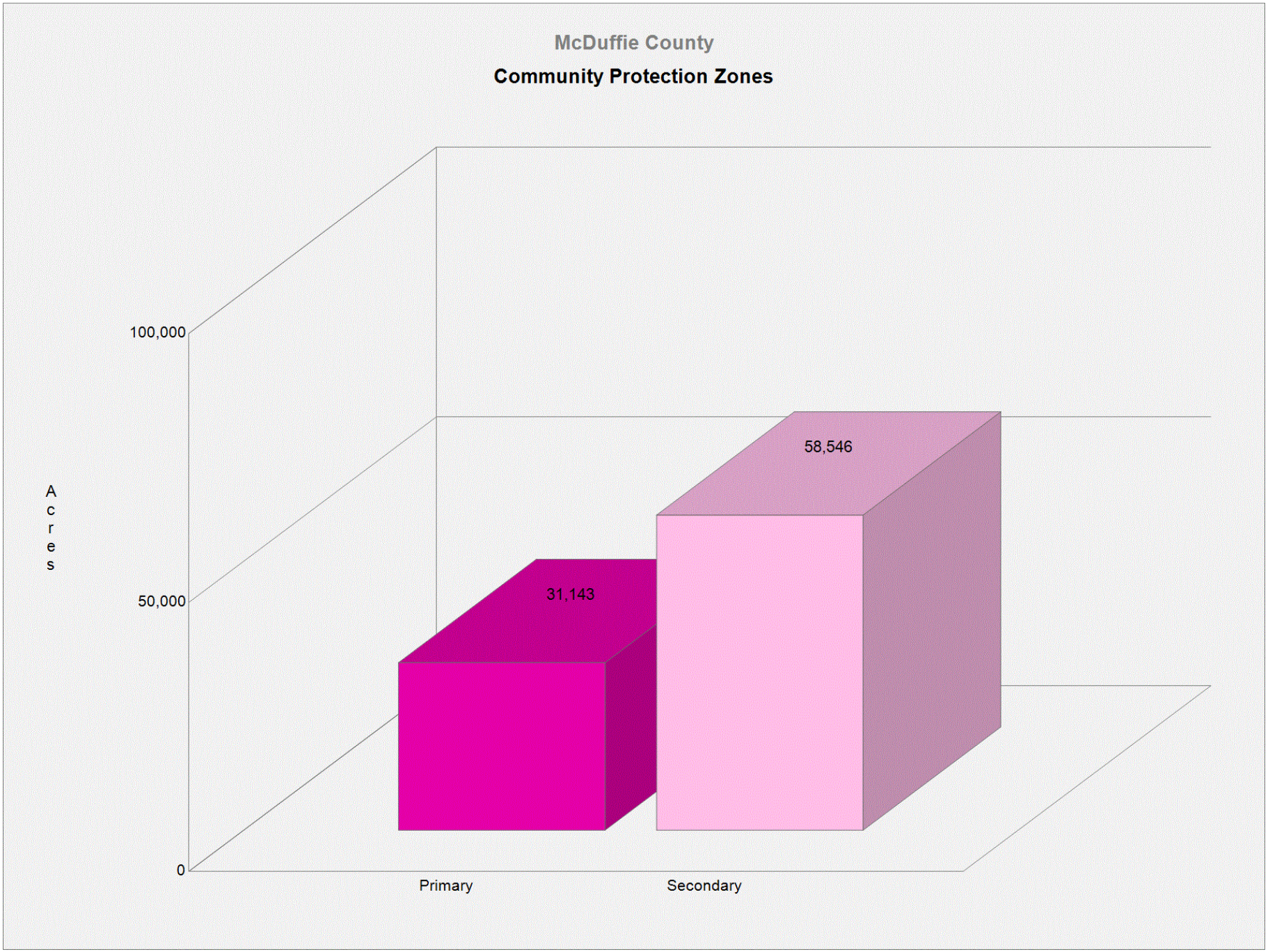
General consensus among fire planners is that for fuel mitigation treatments to be effective in reducing wildfire hazard, they must be conducted within a close distance of a community. In the South, the WUI housing density has been used to reflect populated areas in place of community boundaries (Primary CPZ). This ensures that CPZs reflect where people are living in the wildland, not jurisdictional boundaries.

Secondary CPZs represent a variable width buffer around populated areas that are within a 2-hour fire spread distance. Accordingly, CPZs will extend farther in areas where rates of spread are greater and less in areas where minimal rate of spread potential exists. Secondary CPZ boundaries inherently incorporate fire behavior conditions.

Primary CPZs reflect areas with a predefined housing density, such as greater than 1 house per 20 acres. Secondary CPZs are the areas around Primary CPZs within a 2 hour fire spread distance.

All areas in the South have the CPZs calculated consistently, which allows for comparison and ordination of areas across the entire region. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers.

| Class | Acres | Percent |
|---|---|---|
| Primary | 31,143 | 34.7 % |
| Secondary | 58,546 | 65.3 % |
| **Total** | **89,689** | **100.0 %** |


McDuffie County
Community Protection Zones
100,000
50,000
0
Acres
31,143
58,546
Primary
Secondary

# Burn Probability

## Description

**The Burn Probability (BP) layer depicts the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts.**

Describe in more detail, it is the tendency of any given pixel to burn, given the static landscape conditions depicted by the LANDFIRE Refresh 2008 dataset (as resampled by FPA), contemporary weather and ignition patterns, as well as contemporary fire management policies (entailing considerable fire prevention and suppression efforts).

The BP data does not, and is not intended to, depict fire-return intervals of any vintage, nor do they indicate likely fire footprints or routes of travel. Nothing about the expected shape or size of any actual fire incident can be interpreted from the burn probabilities. Instead, the BP data, in conjunction with the Fire Program Analysts FIL layers, are intended to support an actuarial approach to quantitative wildfire risk analysis (e.g., see Thompson et al. 2011).

Values in the Burn Probability (BP) data layer indicate, for each pixel, the number of times that cell was burned by an FSim-modeled fire, divided by the total number of annual weather scenarios simulated. Burn probability raster data was generated using the large fire simulator - FSim - developed for use in the Fire Program Analysis (FPA) project. FSim uses historical weather data and current landcover data for discrete geographical areas (Fire Planning Units - FPUs) and simulates fires in these FPUs. Using these simulated fires, an overall burn probability and marginal burn probabilities at four fire intensities (flame lengths) are returned by FSim for each 270m pixel in the FPU.

The fire growth simulations, when run repeatedly with different ignition locations and weather streams, generate burn probabilities and fire behavior distributions at each landscape location (i.e., cell or pixel). Results are objectively evaluated through comparison with historical fire patterns and statistics, including the mean annual burn probability and fire size distribution, for each FPU. This evaluation is part of the FSim calibration process for each FPU, whereby simulation inputs are adjusted until the slopes of the historical and modeled fire size distributions are similar and the modeled average burn probability falls within an acceptable range of the historical reference value (i.e., the 95% confidence interval for the mean).

Please refer to the metadata available for this dataset for a detailed description of the data processing methods, assumptions and references that pertain to the development of this data. This information is available from the USFS Missoula Fire Sciences Laboratory.

Please refer to the web site link in the report References to obtain more detailed descriptions of FPA and the related data products such as Burn Probability.

Burn Probability replaces the Wildland Fire Susceptibility Index (WFSI) layer developed in the original SWRA project completed in 2005.

| Class | Acres | Percent |
|---|---|---|
| 1 | 31,362 | 22.1 % |
| 2 | 20,374 | 14.3 % |
| 3 | 20,068 | 14.1 % |
| 4 | 34,064 | 24.0 % |
| 5 | 36,316 | 25.5 % |
| 6 | 0 | 0.0 % |
| 7 | 0 | 0.0 % |
| 8 | 0 | 0.0 % |
| 9 | 0 | 0.0 % |
| 10 | 0 | 0.0 % |
| **Total** | **142,184** | **100.0 %** |

# Fire Behavior

## Description

**Fire behavior is the manner in which a fire reacts to the following environmental influences:**

1. **Fuels**
2. **Weather**
3. **Topography**


Fire behavior characteristics are attributes of wildland fire that pertain to its spread, intensity, and growth. Fire behavior characteristics utilized in the Southern Wildfire Risk Assessment (SWRA) include fire type, rate of spread, flame length and fire intensity scale. These metrics are used to determine the potential fire behavior under different weather scenarios. Areas that exhibit moderate to high fire behavior potential can be identified for mitigation treatments, especially if these areas are in close proximity to homes, business, or other assets.

### Fuels

The SWRA includes composition and characteristics for both surface fuels and canopy fuels. Significant increases in fire behavior will be captured if the fire has the potential to transition from a surface fire to a canopy fire.

Fuel datasets required to compute both surface and canopy fire potential include:

- **Surface Fuels**, generally referred to as fire behavior fuel models, provide the input parameters needed to compute surface fire behavior.
- **Canopy Cover** is the horizontal percentage of the ground surface that is covered by tree crowns. It is used to compute wind reduction factors and shading.
- **Canopy Ceiling Height/Stand Height** is the height above the ground of the highest canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. A good estimate of canopy ceiling height would be the average height of the dominant and co-dominant trees in a stand. It is used for computing wind reduction to midflame height and spotting distances from torching trees (Fire Program Solutions, L.L.C, 2005).
- **Canopy Base Height** is the lowest height above the ground above which here is sufficient canopy fuel to propagate fire vertically (Scott & Reinhardt, 2001). Canopy base height is a property of a plot, stand, or group of trees, not of an individual tree. For fire modeling, canopy base height is an effective value that incorporates ladder fuel, such as tall shrubs and small trees. Canopy base height is used to determine if a surface fire will transition to a canopy fire.
- **Canopy Bulk Density** is the mass of available canopy fuel per unit canopy volume (Scott & Reinhardt, 2001). Canopy bulk density is a bulk property of a stand, plot, or group of trees, not of an individual tree. Canopy bulk density is used to predict whether an active crown fire is possible.

## Weather

Environmental weather parameters needed to compute fire behavior characteristics include 1-hour, 10-hour, and 100-hour timelag fuel moistures, herbaceous fuel moisture, woody fuel moisture, and the 20-foot 10 minute average wind speed. To collect this information, weather influence zones were established across the region. A weather influence zone is an area where for analysis purposes the weather on any given day is considered uniform. Within each weather influence zone, historical daily weather is gathered to compile a weather dataset from which four percentile weather categories are created. The percentile weather categories are intended to represent low, moderate, high, and extreme fire weather days. Fire behavior outputs are computed for each percentile weather category to determine fire potential under different weather scenarios.

The four percentile weather categories include:

- Low Weather Percentile (0 – 15%)
- Moderate Weather Percentile (16 – 90%)
- High Weather Percentile (91 – 97%)
- Extreme Weather Percentile (98 – 100%)

## Topography

Topography datasets required to compute fire behavior characteristics are elevation, slope and aspect.

### FIRE BEHAVIOR CHARACTERISTICS

Fire behavior characteristics provided in this report include:

- **Characteristic Rate of Spread**
- **Characteristic Flame Length**
- **Characteristic Fire Intensity Scale**
- **Fire Type - Extreme**

# Characteristic Rate of Spread

## Description

**Characteristic Rate of Spread is the typical or representative rate of spread of a potential fire based on a weighted average of four percentile weather categories**. Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains per hour (ch/hr) or feet per minute (ft/min). For purposes of the Southern Wildfire Risk Assessment, this measurement represents the maximum rate of spread of the fire front. Rate of Spread is the metric used to derive the Community Protection Zones.

Rate of spread is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

| Rate of Spread | Acres | Percent |
|---|---|---|
| Non-Burnable | 17,376 | 10.2 % |
| 0 - 5 (ch/hr) | 32,634 | 19.2 % |
| 5 - 10 (ch/hr) | 33,386 | 19.6 % |
| 10 – 15 (ch/hr) | 25,282 | 14.8 % |
| 15 - 20 (ch/hr) | 15,595 | 9.2 % |
| 20 - 30 (ch/hr) | 26,504 | 15.6 % |
| 30 - 50 (ch/hr) | 18,027 | 10.6 % |
| 50 - 150 (ch/hr) | 1,570 | 0.9 % |
| 150 + (ch/hr) | 0 | 0.0 % |
| **Total** | **170,374** | **100.0 %** |

# Characteristic Flame Length

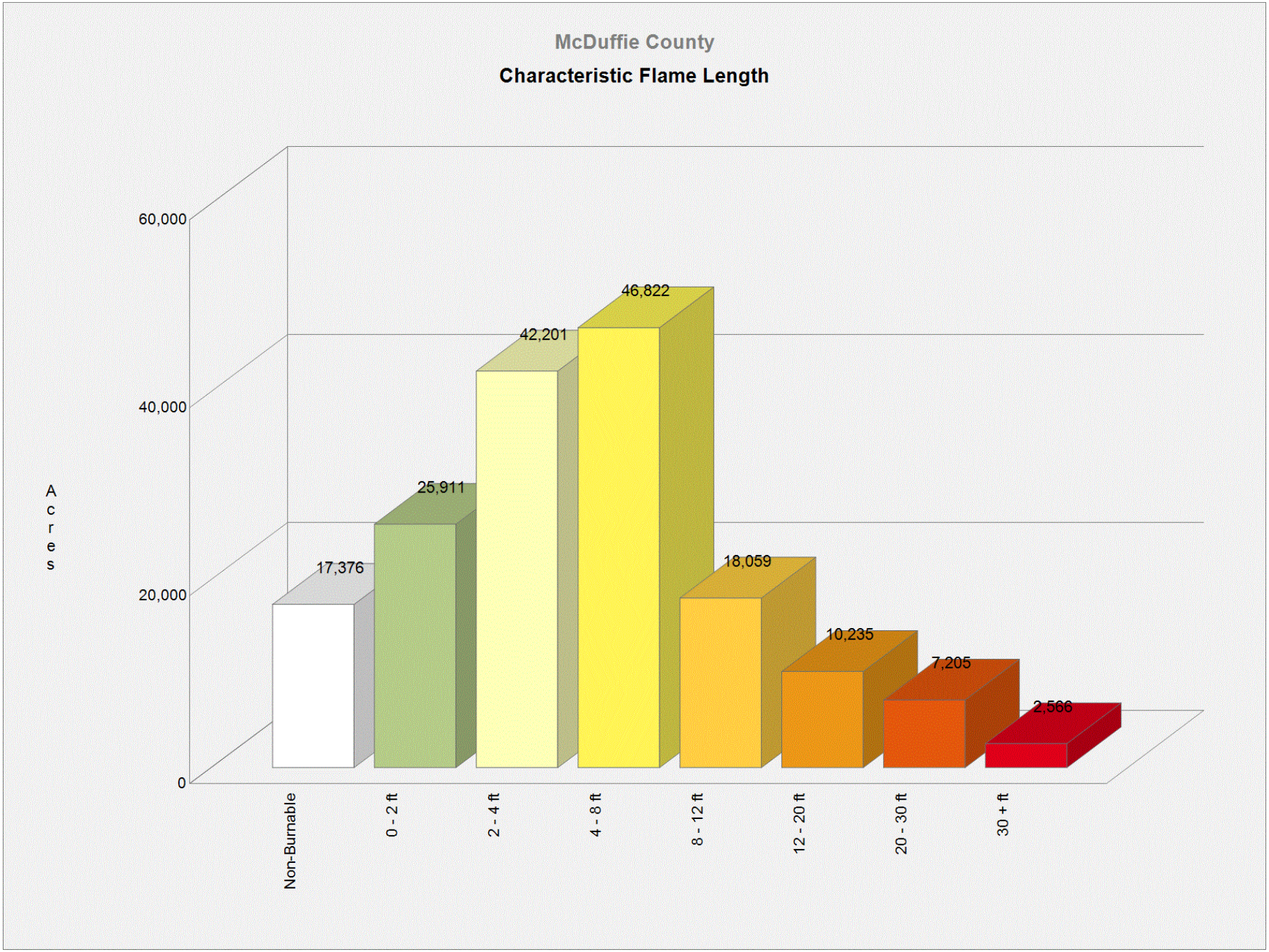
## Description

**Characteristic Flame Length is the typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories**. Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating. Flame length is typically measured in feet (ft). Flame length is the measure of fire intensity used to generate the response index outputs for the SWRA.

Flame length is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

| Flame Length | Acres | Percent |
|---|---|---|
| Non-Burnable | 17,376 | 10.2 % |
| 0 - 2 ft | 25,911 | 15.2 % |
| 2 - 4 ft | 42,201 | 24.8 % |
| 4 - 8 ft | 46,822 | 27.5 % |
| 8 - 12 ft | 18,059 | 10.6 % |
| 12 - 20 ft | 10,235 | 6.0 % |
| 20 - 30 ft | 7,205 | 4.2 % |
| 30 + ft | 2,566 | 1.5 % |
| **Total** | **170,375** | **100.0 %** |


McDuffie County
Characteristic Flame Length
Acres
60,000
40,000
20,000
0
17,376
25,911
42,201
46,822
18,059
10,235
7,205
2,566
Non-Burnable
0 - 2 ft
2 - 4 ft
4 - 8 ft
8 - 12 ft
12 - 20 ft
20 - 30 ft
30 + ft

# Characteristic Fire Intensity Scale

## Description

**Characteristic Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories**. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

- **Class 1, Very Low:**
  Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

- **Class 2, Low:**
  Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

- **Class 3, Moderate:**
  Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

- **Class 4, High:**
  Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

- **Class 5, Very High:**
  Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

For all Southern states, except Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed.

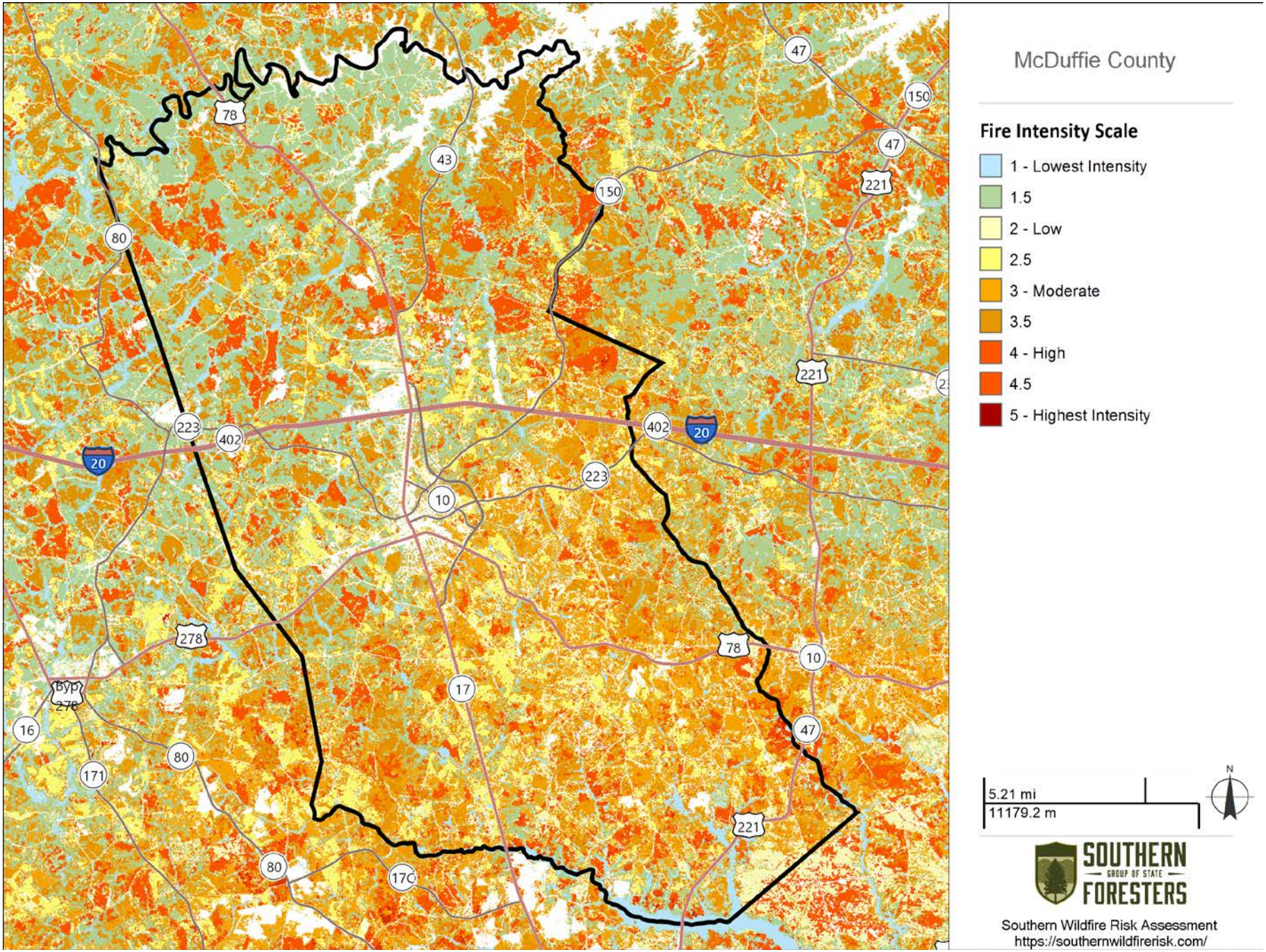
To aid in viewing on the map, FIS is presented in 1/2 class increments. Please consult the SouthWRAP User Manual for a more detailed description of the FIS class descriptions.

Since all areas in the South have fire intensity scale calculated consistently, it allows for comparison and ordination of areas across the entire region.

Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

The fire intensity scale map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

| Class | Acres | Percent |
|---|---|---|
| Non-Burnable | 15,998 | 9.4 % |
| 1 Lowest Intensity | 7,573 | 4.4 % |
| 1.5 | 37,897 | 22.2 % |
| 2 Low | 15,577 | 9.1 % |
| 2.5 | 13,672 | 8.0 % |
| 3 Moderate | 25,446 | 14.9 % |
| 3.5 | 36,078 | 21.2 % |
| 4 High | 17,812 | 10.5 % |
| 4.5 | 322 | 0.2 % |
| 5 Highest Intensity | 0 | 0.0 % |
| **Total** | **170,375** | **100.0 %** |


McDuffie County
Fire Intensity Scale
1 - Lowest Intensity
1.5
2 - Low
2.5
3 - Moderate
3.5
4 - High
4.5
5 - Highest Intensity
5.21 mi
11179.2 m
N
SOUTHERN GROUP OF STATE FORESTERS
Southern Wildfire Risk Assessment
https://southernwildfirerisk.com/

# Fire Type – Extreme

## Description

There are two primary fire types – surface fire and canopy fire. Canopy fire can be further subdivided into passive canopy fire and active canopy fire. A short description of each of these is provided below.

**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).





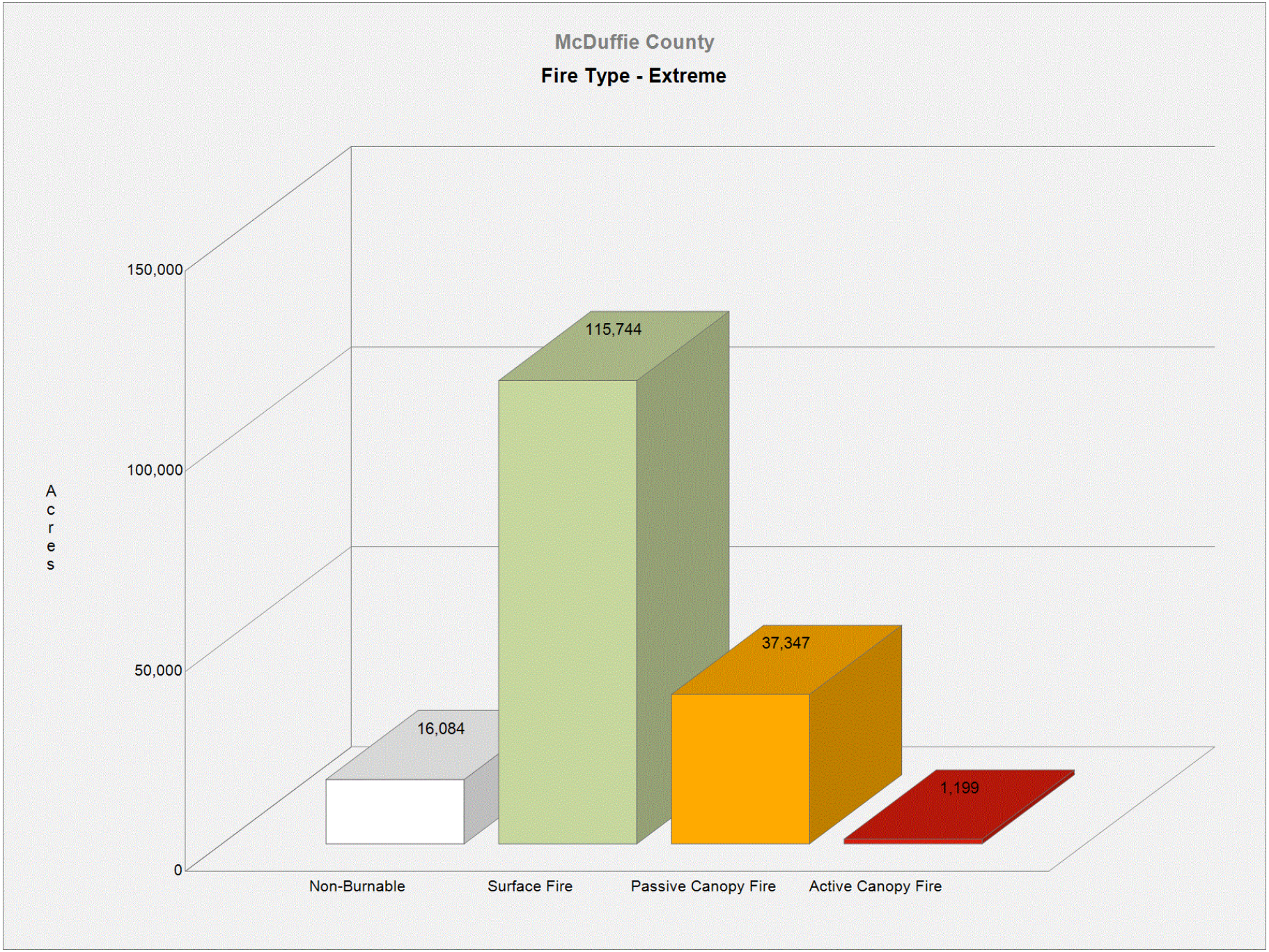

**Fire Type – Extreme represents the potential fire type under the extreme percentile weather category.** The extreme percentile weather category represents the average weather based on the top three percent fire weather days in the analysis period. It is not intended to represent a worst case scenario weather event. Accordingly, the potential fire type is based on fuel conditions, extreme percentile weather, and topography.

Canopy fires are very dangerous, destructive and difficult to control due to their increased fire intensity. From a planning perspective, it is important to identify where these conditions are likely to occur on the landscape so that special preparedness measure can be taken if necessary. The Fire Type – Extreme layer shows the footprint of where these areas are most likely to occur. However, it is important to note that canopy fires are not restricted to these areas. Under the right conditions, it can occur in other canopied areas.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

The fire type - extreme map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

| Fire Type | Acres | Percent |
|---|---|---|
| Non-Burnable | 16,084 | 9.4 % |
| Surface Fire | 115,744 | 67.9 % |
| Passive Canopy | 37,347 | 21.9 % |
| Active Canopy | 1,199 | 0.7 % |
| **Total** | **170,374** | **100.0 %** |


McDuffie County
Fire Type - Extreme
150,000
100,000
50,000
0
Acres
16,084
115,744
37,347
1,199
Non-Burnable
Surface Fire
Passive Canopy Fire
Active Canopy Fire

# Surface Fuels

## Description

**Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, such as rate of spread, flame length, fireline intensity, and other fire behavior metrics.** As the name might suggest, surface fuels only account for the surface fire potential. Canopy fire potential is computed through a separate but linked process. The Southern Wildfire Risk Assessment accounts for both surface and canopy fire potential in the fire behavior outputs.

Surface fuels are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire: 1) grass, 2) shrub/brush, 3) timber litter and 4) slash. There are two standard fire behavior fuel model sets published for use. The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson, 1982) contains 13 fuel models and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott & Burgan 2005) contains 40 fuel models.

The SWRA Surface Fuels have been updated to use the FBPS 2005 40 fuel model set from the LANDFIRE 2010 products, supplemented with additional enhancements obtained through calibration workshops with the Southern states. Florida uses FBPS 1982 fuel models derived based on spectral classification of Landsat Thematic Mapper (TM) satellite imagery derived as part of the Florida Forest Service fuels mapping and risk assessment projects. Texas fuels represent 2010 updates conducted as part of a statewide fuels and canopy mapping effort.

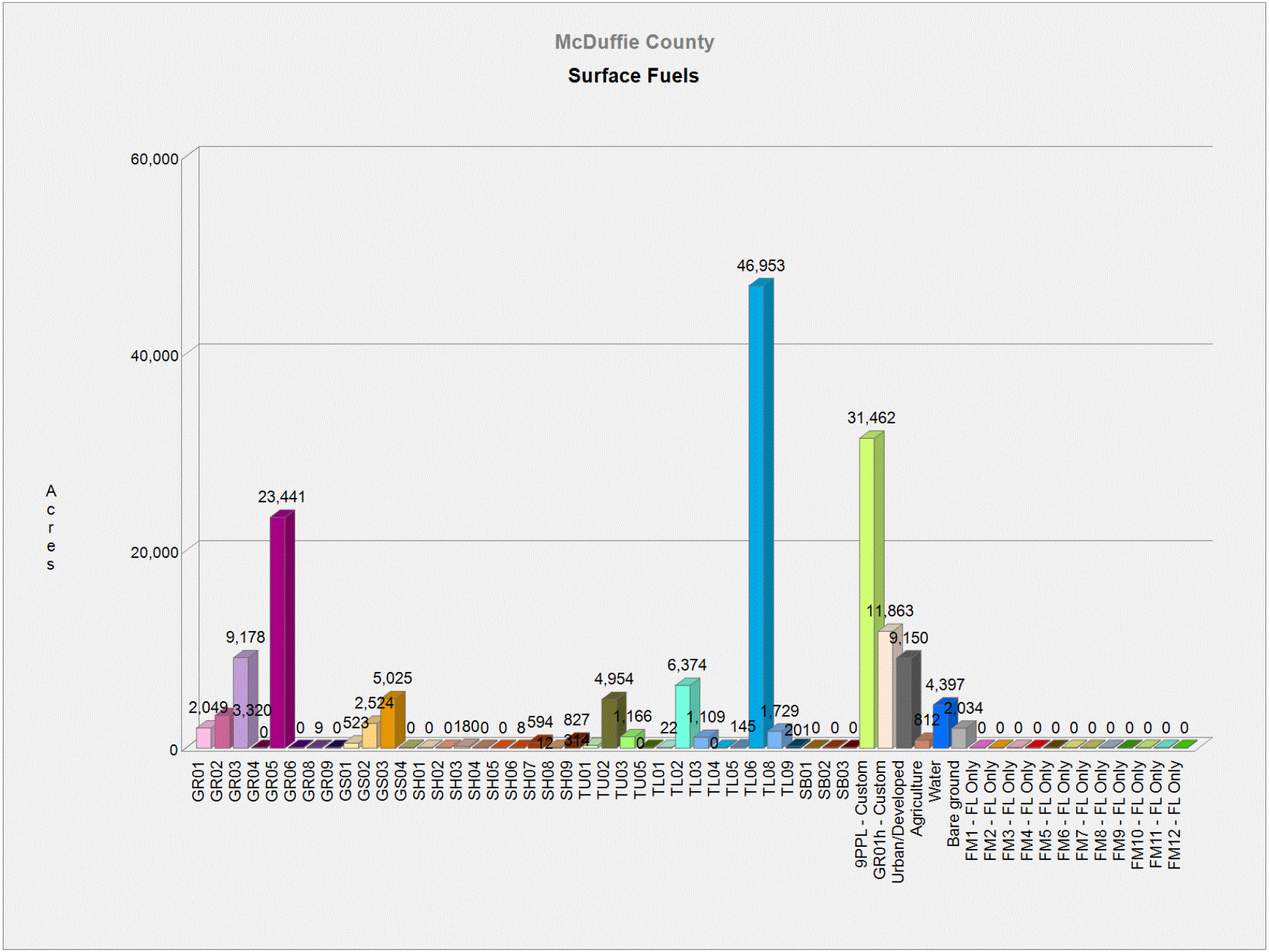
For the remaining 11 Southern states, the recently completed SWRA Update project produced a new surface fuels dataset based on 2010 LANDFIRE products. A detailed fuels calibration process was undertaken that involved collaboration with Southern state fuels and fire behavior specialists supported by federal partner involvement. Workshops were held to review the LANDFIRE fuels product and calibrate the data by modifying specific fuels classes to better reflect local knowledge and input. A key component of this calibration task involved using image processing techniques to better delineate conifer areas, and in particular pine areas (plantations and natural stands). The fuels layer represents 2010 conditions.

| Surface Fuel | FBPS Fuel Model Set | Description | Acres | Percent |
|---|---|---|---|---|
| **Grass Fuels Type Models** (nearly pure grass and/or forb type) | | | | |
| GR01 | 2005 | Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low. | 2,049 | 1.2 % |
| GR02 | 2005 | Moderately coarse continuous grass, average depth about 1 foot. Spread rate high; flame length moderate. | 3,320 | 1.9 % |
| GR03 | 2005 | Very coarse grass, average depth about 2 feet. Spread rate high; flame length moderate. | 9,178 | 5.4 % |
| GR04 | 2005 | Moderately coarse continuous grass, average depth about 2 feet. Spread rate very high; flame length high. | 0 | 0.0 % |
| GR05 | 2005 | Dense, coarse grass, average depth about 1 to 2 feet. Spread rate very high; flame length high. | 23,441 | 13.8 % |
| GR06 | 2005 | Dryland grass about 1 to 2 feet tall. Spread rate very high; flame length very high. | 0 | 0.0 % |
| GR08 | 2005 | Heavy, coarse, continuous grass 3 to 5 feet tall. Spread rate very high; flame length very high. | 9 | 0.0 % |
| GR09 | 2005 | Very heavy, coarse, continuous grass 5 to 8 feet tall. Spread rate extreme; flame length extreme. | 0 | 0.0 % |
| **Grass-Shrub Fuels Type Models** (mixture of grass and shrub, up to 50 percent shrub coverage) | | | | |
| GS01 | 2005 | Shrubs are about 1 foot high, low grass load. Spread rate moderate; flame length low. | 523 | 0.3 % |
| GS02 | 2005 | Shrubs are 1 to 3 feet high, moderate grass load. Spread rate high; flame length moderate. | 2,524 | 1.5 % |
| GS03 | 2005 | Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate high; flame length moderate. | 5,025 | 2.9 % |
| GS04 | 2005 | Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high. | 0 | 0.0 % |
| **Shrub Fuel Type Models** (Shrubs cover at least 50 percent of the site, grass sparse to nonexistent) | | | | |
| SH01 | 2005 | Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low; flame length very low. | 0 | 0.0 % |
| SH02 | 2005 | Moderate fuel load (higher than SH01), depth about 1 foot, no grass fuel present. Spread rate low; flame length low. | 0 | 0.0 % |
| SH03 | 2005 | Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate low; flame length low. | 180 | 0.1 % |
| SH04 | 2005 | Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate high; flame length moderate. | 0 | 0.0 % |

| Surface Fuel | FBPS Fuel Model Set | Description | Acres | Percent |
|---|---|---|---|---|
| SH05 | 2005 | Heavy shrub load, depth 4 to 6 feet. Spread rate very high; flame length very high. | 0 | 0.0 % |
| SH06 | 2005 | Dense shrubs, little or no herb fuel, depth about 2 feet. Spread rate high; flame length high. | 8 | 0.0 % |
| SH07 | 2005 | Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than SH05, but flame length similar. Spread rate high; flame length very high. | 594 | 0.3 % |
| SH08 | 2005 | Dense shrubs, little or no herb fuel, depth about 3 feet. Spread rates high; flame length high. | 12 | 0.0 % |
| SH09 | 2005 | Dense, finely branched shrubs with significant fine dead fuel, about 4 to 6 feet tall; some herbaceous fuel may be present. Spread rate high, flame length very high. | 827 | 0.5 % |
| **Timber-Understory Fuel Type Models** (Grass or shrubs mixed with litter from forest canopy) | | | | |
| TU01 | 2005 | Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low. | 314 | 0.2 % |
| TU02 | 2005 | Fuelbed is moderate litter load with shrub component. Spread rate moderate; flame length low. | 4,954 | 2.9 % |
| TU03 | 2005 | Fuelbed is moderate litter load with grass and shrub components. Spread rate high; flame length moderate. | 1,166 | 0.7 % |
| TU05 | 2005 | Fuelbed is high load conifer litter with shrub understory. Spread rate moderate; flame length moderate. | 0 | 0.0 % |
| **Timber Litter Fuel Type Models** (dead and down woody fuel litter beneath a forest canopy) | | | | |
| TL01 | 2005 | Light to moderate load, fuels 1 to 2 inches deep. Spread rate very low; flame length very low. | 22 | 0.0 % |
| TL02 | 2005 | Low load, compact. Spread rate very low; flame length very low. | 6,374 | 3.7 % |
| TL03 | 2005 | Moderate load conifer litter. Spread rate very low; flame length low. | 1,109 | 0.7 % |
| TL04 | 2005 | Moderate load, includes small diameter downed logs. Spread rate low; flame length low. | 0 | 0.0 % |
| TL05 | 2005 | High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low. | 145 | 0.1 % |
| TL06 | 2005 | Moderate load, less compact. Spread rate moderate; flame length low. | 46,953 | 27.6 % |
| TL08 | 2005 | Moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low. | 1,729 | 1.0 % |

| Surface Fuel | FBPS Fuel Model Set | Description | Acres | Percent |
|---|---|---|---|---|
| TL09 | 2005 | Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate. | 201 | 0.1 % |
| **Slash-Blowdown Fuel Type Models** (activity fuel/slash or debris from wind damage) | | | | |
| SB01 | 2005 | Low load activity fuel. Spread rate moderate; flame length low. | 0 | 0.0 % |
| SB02 | 2005 | Moderate load activity or low load blowdown. Spread rate moderate; flame length moderate. | 0 | 0.0 % |
| SB03 | 2005 | High load activity fuel or moderate load blowdown. Spread rate high; flame length high. | 0 | 0.0 % |
| **Custom Fuel Type Models (all states except Florida)** | | | | |
| 9PPL | Custom | Long-needle (pine litter, plantations) with a high load | 31,462 | 18.5 % |
| GR01h | Custom | Pasture and hayland | 11,863 | 7.0 % |
| **Non-burnable Fuel Type Models** (insufficient wildland fuel to carry a wildland fire under any condition) | | | | |
| NB01 | 2005 | Urban or suburban development; insufficient wildland fuel to carry wildland fire. Includes roads. | 9,150 | 5.4 % |
| NB03 | 2005 | Agricultural field, maintained in nonburnable condition. | 812 | 0.5 % |
| NB08 | 2005 | Open water | 4,397 | 2.6 % |
| NB09 | 2005 | Bare ground | 2,034 | 1.2 % |
| **1982 Fire Behavior Prediction System – ONLY USED FOR FLORIDA ASSESSMENT** | | | | |
| FM 1 | 1982 | Short grass | 0 | 0.0 % |
| FM 2 | 1982 | Timber grass and understory | 0 | 0.0 % |
| FM 3 | 1982 | Tall grass | 0 | 0.0 % |
| FM 4 | 1982 | Chaparral | 0 | 0.0 % |

| Surface Fuel | FBPS Fuel Model Set | Description | Acres | Percent |
|---|---|---|---|---|
| FM 5 | 1982 | Brush | 0 | 0.0 % |
| FM 6 | 1982 | Dormant brush | 0 | 0.0 % |
| FM 7 | 1982 | Southern rough | 0 | 0.0 % |
| FM 8 | 1982 | Compact timber litter | 0 | 0.0 % |
| FM 9 | 1982 | Hardwood litter | 0 | 0.0 % |
| FM 10 | 1982 | Timber (understory) | 0 | 0.0 % |
| FM 11 | 1982 | Light logging slash | 0 | 0.0 % |
| FM 12 | 1982 | Medium logging slash | 0 | 0.0 % |
| | | | **170,375** | **100.0 %** |


McDuffie County
Surface Fuels
Acres
60,000
40,000
20,000
0
2,049
3,320
9,178
0
23,441
0
9
0
523
2,524
5,025
0
0
0
180
0
0
8
594
12
827
314
4,954
1,166
0
22
6,374
1,109
0
145
46,953
1,729
201
0
0
0
31,462
11,863
9,150
812
4,397
2,034
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GR01
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GS04
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SH04
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SH06
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SH08
SH09
TU01
TU02
TU03
TU05
TL01
TL02
TL03
TL04
TL05
TL06
TL08
TL09
SB01
SB02
SB03
9PPL - Custom
GR01h - Custom
Urban/Developed
Agriculture
Water
Bare ground
FM1 - FL Only
FM2 - FL Only
FM3 - FL Only
FM4 - FL Only
FM5 - FL Only
FM6 - FL Only
FM7 - FL Only
FM8 - FL Only
FM9 - FL Only
FM10 - FL Only
FM11 - FL Only
FM12 - FL Only

# Dozer Operability Rating

## Description

**The Dozer Operability Rating (DOR) expresses how difficult it is to operate a dozer in an area based on limitations associated with slope and vegetation/fuel type.** Using the fireline production rates published in the NWCG Fireline Handbook 3 (PMS 410-1) as a guide, operability values were assigned to a matrix based on 6 slope classes and 10 vegetation/fuels classes. The possible values range from 1 to 9, with 1 representing no limitations and 9 being inoperable.

| Class | Acres | Percent |
|---|---|---|
| 1 (No Expected Limitations) | 30,915 | 18.6 % |
| 2 (Slight) | 9,897 | 6.0 % |
| 3 (Slight to Moderate) | 13,181 | 7.9 % |
| 4 (Moderate) | 86,676 | 52.2 % |
| 5 (Moderate to Significant) | 22,325 | 13.5 % |
| 6 (Significant) | 116 | 0.1 % |
| 7 (Significant to Severe) | 0 | 0.0 % |
| 8 (Severe) | 2,846 | 1.7 % |
| 9 (Inoperable) | 0 | 0.0 % |
| **Total** | **165,956** | **100.0 %** |

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More information about the Fire Program Analysis project is available from http://www.forestsandrangelands.gov/WFIT/applications/FPA/index.shtml

More information about the Oak Ridge National Laboratory LandScan data is available from http://web.ornl.gov/sci/landscan/landscan_documentation.shtml

More information about the U.S. Forest Service SILVIS data is available from http://silvis.forest.wisc.edu/maps/wui_main

# TIMBER IMPACT ASSESSMENT

## Georgia Ice Storm, February 11-13, 2014

By: James Johnson, Chip Bates & Gary White, Georgia Forestry Commission
(jjohnson@gfc.state.ga.us; cbates@gfc.state.ga.us ; gwhite@gfc.state.ga.us)

## 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*).

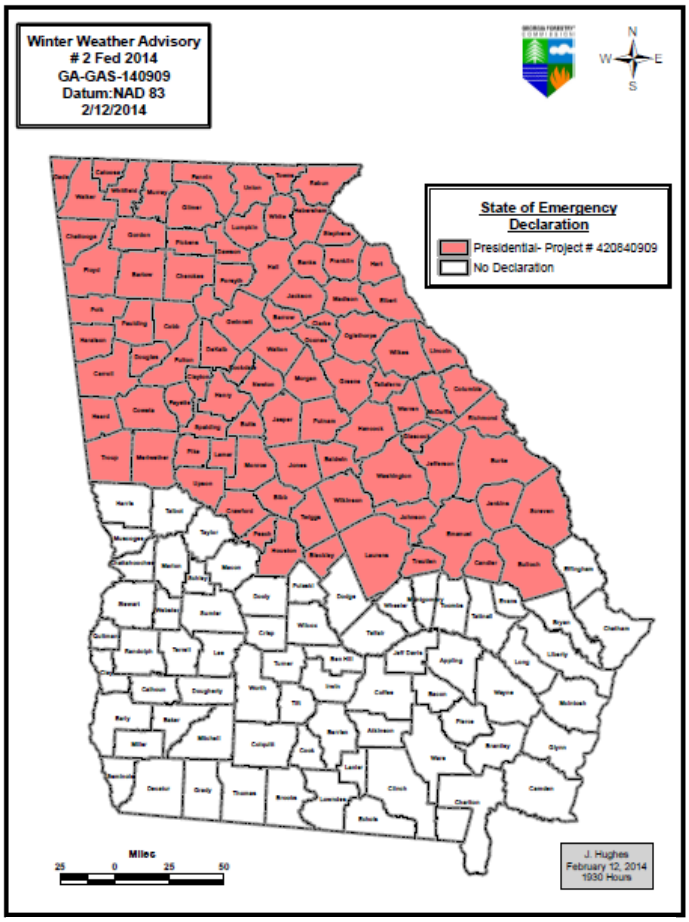



*Figure 1: Counties included in the presidential declaration zone*

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.

## 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 mangers should carefully evaluate timber throughout this broad region.

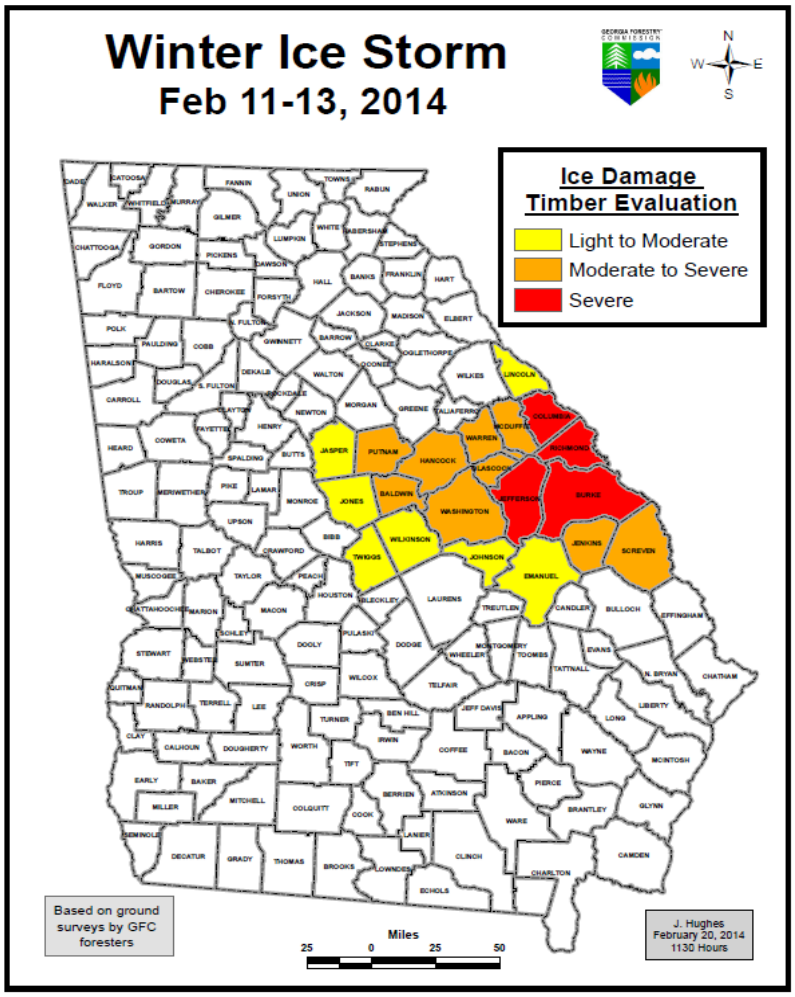



*Figure 2: Counties with widespread Ice Damage*

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_stands5-30-08_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/

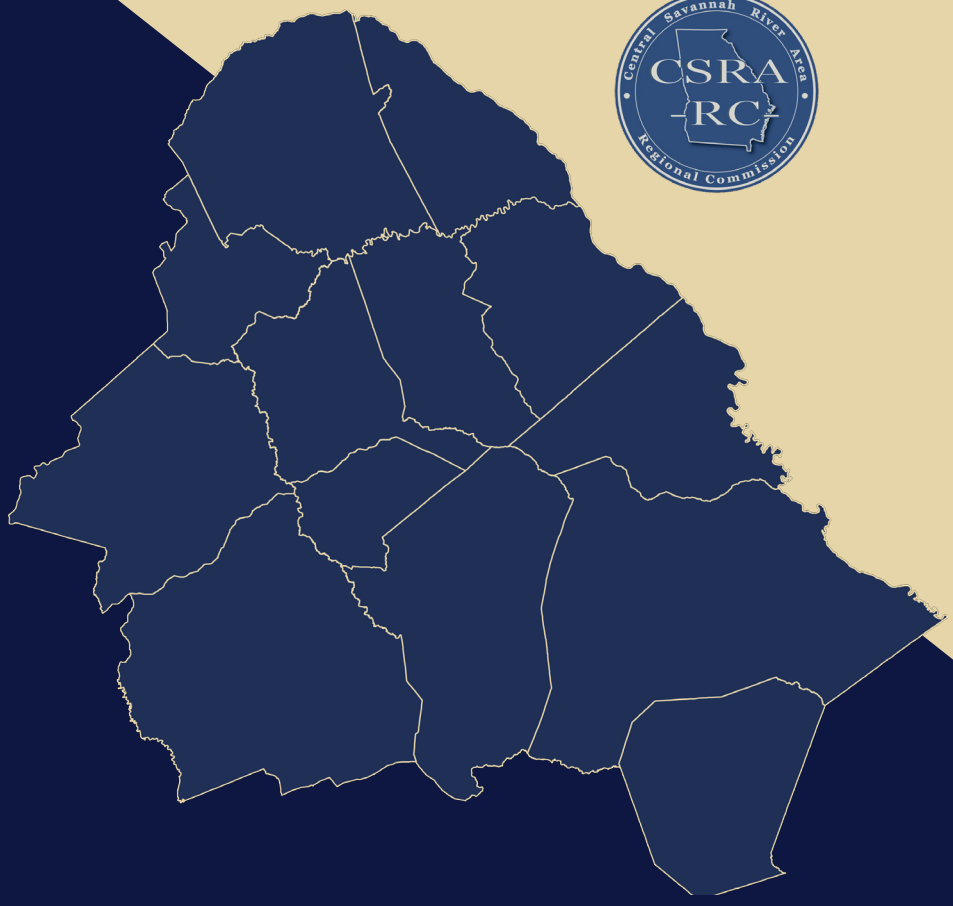
### *TIMBER SALES:*

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 2040



***OUR COUNTIES***

**BURKE**
**COLUMBIA**
**GLASCOCK**
**HANCOCK**
**JEFFERSON**
**JENKINS**
**LINCOLN**
**MCDUFFIE**
**AUGUSTA-RICHMOND**
**TALIAFERRO**
**WARREN**
**WASHINGTON**
**WILKES**

Prepared in 2018

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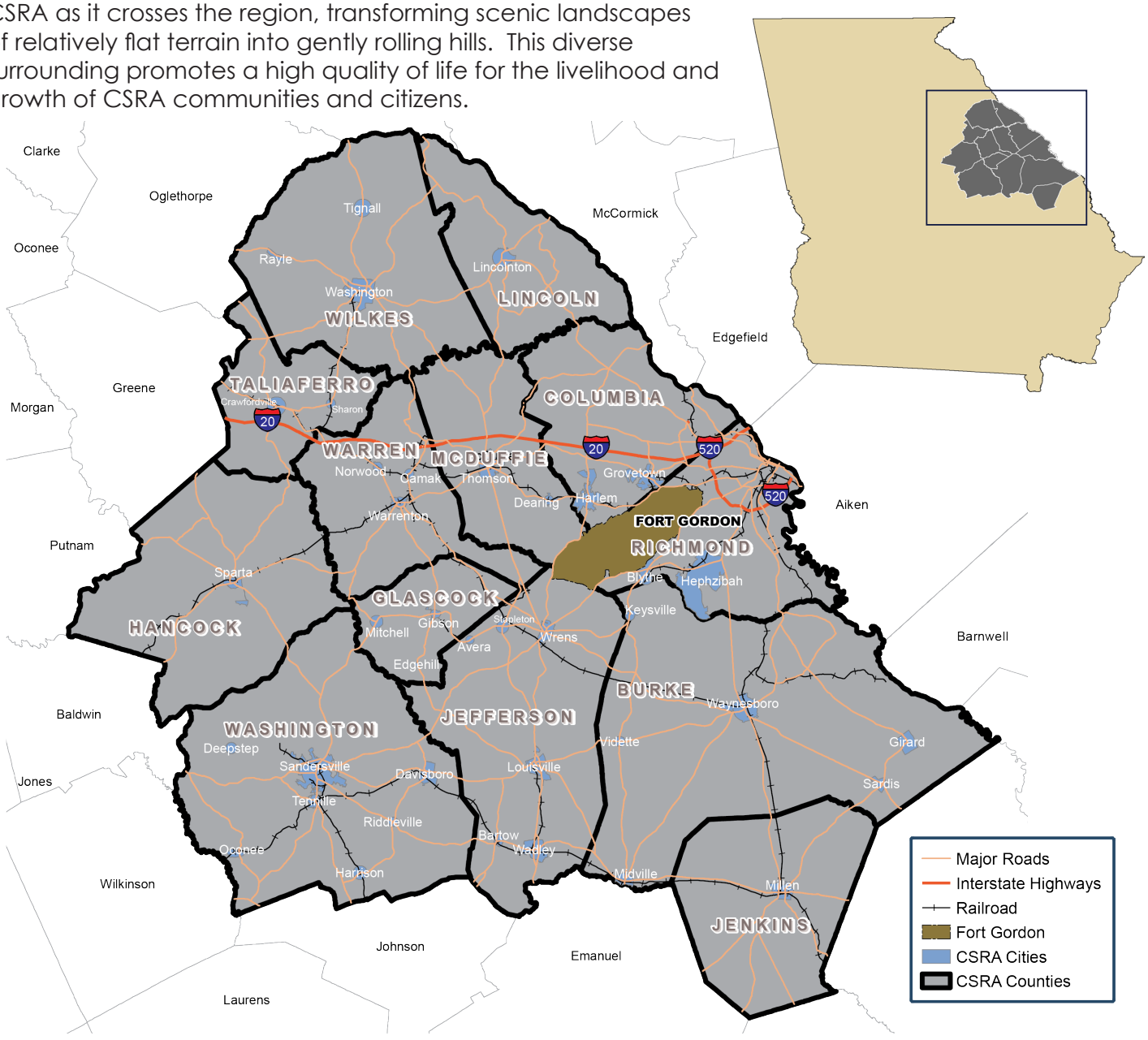
# EXECUTIVE SUMMARY

CSRA REGIONAL PLAN

## *Regional Overview*

The Central Savannah River Area (CSRA) is bordered on the eastern side by the Savannah River and anchored by the city of Augusta at the heart of east-central Georgia. The Savannah River provides recreation and tourism for the CSRA border counties. Five counties in Georgia and two in South Carolina form a metropolitan cluster and regional core that leads out to the surrounding rural areas of the region. To the north, west, and south of the urban core, the rural CSRA is occupied by a lush agricultural belt where food and service crops are produced in the rich soil and livestock are nurtured for sale at market. The fall line of the ancient seashore helps define the geography of the CSRA as it crosses the region, transforming scenic landscapes of relatively flat terrain into gently rolling hills. This diverse surrounding promotes a high quality of life for the livelihood and growth of CSRA communities and citizens.



The CSRA region encompasses an area of nearly 6,500 square miles, with 465,126 residents according to the U.S. Census Bureau's 2015 American Community Survey. Located in east-central Georgia along the Savannah River, the CSRA region includes 13 counties: Burke, Columbia, Glascock, Hancock, Jefferson, Jenkins, Lincoln, McDuffie, Richmond, Taliaferro, Warren, Washington, and Wilkes. The largest city in the CSRA is Augusta – a major component of the economic core of the region. The Augusta-Richmond County, GA-SC Metropolitan Statistical Area (MSA) includes Richmond, Columbia, Burke, Lincoln and McDuffie counties in Georgia and Aiken and Edgefield counties in South Carolina.

This region represents both urban and rural interests - with two urban counties holding over 300,000 residents combined, and the balance of the region's counties containing anywhere from just over 1,700 residents to about 24,000. Augusta-Richmond and Columbia counties were the nexus of over 90 percent of regional population growth (81,745 residents) between 1990 and 2015. As urban areas have grown, some rural areas have experienced decline. These shifts in population affect the overall resident quality of life, including availability of basic services like high-speed internet and health care, affordable housing, and daily work commutes. The state of Georgia's recently updated Achieving Connectivity Everywhere (ACE) Act will require all communities to think outside the box and plan for broadband (aka highspeed internet) deployment throughout their jurisdictions. Improving broadband access for the region will help our healthcare, public safety and educational institutions provide better service, enable individual connectivity, and greatly improve the accessibility of commerce to other parts of the state and nation.

One emerging regional development factor is the planned growth at Fort Gordon, slated to bring several thousand soldiers and associated contractors to the region over the next several years through the U.S. Army Cyber Center of Excellence. This growth will directly affect the counties adjacent to Fort Gordon and will likely have extended effects across the region as these new residents search for housing, recreation, and retail opportunities and require local public services. To address impacts of land use and encroachment on Fort missions, McDuffie, Augusta-Richmond, Columbia, Burke and Jefferson Counties are participating in a Joint Land Use Study (JLUS). Some recommendations from the forthcoming final JLUS report are included in this document as implementation activities.

While Fort Gordon has a measurable impact on the regional economy, it is not the only player. Another major growth industry for this region is energy. This includes is Plant Vogtle, a nuclear power plant that is expanding with the construction of two core reactors. This multi-billion dollar construction project has affected favorably the economy of several neighboring counties and created a need for housing, community facilities, land use controls, transportation improvements, and intergovernmental cooperation.

Another major sector in the region is healthcare. Indeed, this region boasts 10 hospitals and an expanding network of prompt care centers. The Medical College of Georgia at Augusta University is also located in this region; health professionals are trained here to be care providers at all levels, from doctors to certified nursing and occupational health assistants. In this region, some larger, urban hospitals have increased capacity; while some rural hospitals have closed or are struggling.

The CSRA contains a wealth of natural, cultural and environmental resources that provide the region with numerous social, economic, and environmental benefits. The rural portions of the region have some of the most beautiful and interesting natural and cultural resources. These less densely populated small towns, counties, and agricultural areas can both promote and protect critical resources and sectors like farming through agritourism and heritage tourism. This may enable them to achieve a higher quality of life through an expanded economy and increased public access to resources. With that said, whether urban or rural, our natural and cultural resources are in need of protection if we want to contiue reaping their benefits. For example, the region's watersheds will need to be monitored to ensure future development does not render them vulnerable. Additionally, many of the nearly 200 federal and state designated historic districts and sites lack preservation plans or protection ordinances, and this can be remedied.

Although the urban and rural areas sometimes choose to address challenges differently, many basic community needs are the same, and cities and counties must work together to find common solutions. One of the biggest successes for the region's transportation planning and intergovernmental coordination was the passage of the Transportation Investment Act (TIA) in 2012. This approved a 10-year, one percent (1%) sales tax to fund regional and local transportation improvements such as replacing bridges, widening roads and adding sidewalks. This funding reatly enhances the CSRA region's transportation network and creates jobs for contractors, surveyors, and an ever expanding workforce.

## *CSRA Regional Commission Responsibilities*

The CSRA Regional Commission (CSRA RC) is based in Augusta, GA and serves the previously mentioned thirteen counties along with 41 municipalities, 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 is the home of the Area Agency on Aging (AAA) for the region and serves the 13 counties in the region as well as Screven County. In this capacity, the CSRA RC works with local providers to ensure that services for seniors 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 aging residents improve the quality of their lives before and during their retirement years.

The CSRA RC is also the parent company of 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.

## CSRA Regional Vision

The vision of the Central Savannah River Area is to remain a place that reflects the best of what the United States has to offer – a place where residents innovate and create and where commerce thrives; a place where residents are healthy and active because their surroundings encourage physical fitness; and, fundamentally, a place full of natural and man-made beauty, where residents take pride in and draw sustenance from their everyday surroundings.

## What's the Regional Plan?

The CSRA Regional Plan (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 as needed to address changing regional conditions. The CSRA Regional Commission Council, supported by CSRA RC staff, undertook the process of a full update of its regional plan. The regional vision statement included herein encompasses the best of the committee's and the public's input for the present and future development of the CSRA region. A regional Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis, resident comments, and online survey results were utilized in defining regional goals, priority needs and opportunities, and an implementation plan. Feedback mechanisms for the Plan included public hearings and listening sessions. Goals and needs were developed and categorized by the following subject areas: economic development, natural and cultural resources, community facilities and services, housing, land Use and transportation, and Intergovernmental coordination. The CSRA's vision and goals, together with an appraisal of socioeconomic, land use, and environmental opportunities and threats, set the strategic direction for the regional work program. The regional work program then defines priorities and timing for implementation.

### *The Plan document is divided into four (4) sections:*

**Regional Goals** - This section looks at the future of the region and lays out a road map for it. The goals section includes supporting policies that operate as guidance for decision-makers. It is supported by SWOT analysis, community survey, and other data gathered to inform the plan creation (included in the appendices). The "Regional Goals" section includes maps that depict future development and descriptions of desired development patterns.

**Regional Needs and Opportunities** - This section examines areas in which needs exist, as well as strengths that can be built on for the future. Every item designated as a priority in this section is tied to an implementation strategy and action items in the implementation program.

**Implementation Program** - This section includes concrete strategies and actions aimed at realizing the vision and addressing the priority regional needs and opportunities.

**Appendices** - This section contains data tables, acronym explanations and other information and analysis used in the formulation of the three plan components mentioned above.

## *Stakeholder Involvement Summary*

Public involvement was the key to learning what regional needs were to be addressed. During the process, the RC gathered information and comments from stakeholders and the public through multiple events such as public hearings, steering committee input, listening sessions, an online survey, and social media. CSRA RC staff created a dedicated space on the CSRA RC website to serve as a portal for information about the plan. Stakeholder feedback was used directly in plan development, from the SWOT analysis to the specific implementation measures that form our regional work program.

**Our involvement process included the following engagement activities:**

- Identified key stakeholders in addition to the general public, designating CSRA RC's Council as the plan's Steering Committee and RC staff as a Technical Advisory Group
- Held two public hearings and three community listening sessions
- Partnered with the Augusta Food Oasis for two (of the three previously mentioned) listening sessions to inform residents about both the Regional Plan overall and more specifically regional food access, which had emerged as a topic of importance.
- Published an online survey to gather additional resident input, with links provided on the RC website, social media, and emails
- Provided a dedicated space on the CSRA RC website to serve as a portal for information about the plan
- Distributed information at RC partner events
- Utilized social media to post information on agency Facebook and Twitter pages
- Created an informational lobby display for the RC office entrance area, along with handouts for citizens with general plan information

# Regional Goals and Priorities

**Economic Development Goal** – to cultivate and maintain a vibrant, diversified economy that expands job opportunities in the region, develops a qualified workforce, supports downtowns as multi-use destinations, and improves the quality of life for all residents

- Create and promote agricultural, natural, and heritage tourism opportunities and assets
- Increase job opportunities through business expansion, attraction and retention

**Natural and Cultural Resources Goal** – to protect and preserve natural, environmental and cultural resources in the region from development pressure, build a network of connected communities, and highlight our historic resources and natural assets

- Protect natural resources and historic properties

**Community Facilities and Services Goal** – to provide community facilities and services throughout the region that encourage appropriate development and more walkable, mixed use communities that enhance the overall quality of life for all residents

- Improve and expand infrastructure across region, including water and sewer expansion, flood and drainage improvements, sidewalk construction, and increased broadband access
- Increase access to healthy, affordable food
- Provide resources for residents that allow them to choose whether to age in place or move into housing developments or care facilities for older adults

**Housing Goal** – to provide a range of housing types and choices, available in urban and rural areas, that is safe and physically and economically accessible to all residents

- Rehabilitation, redevelopment, or removal of vacant and/or dilapidated structures
- Additional housing supply and variety

**Land Use and Transportation Goal** - to effectively utilize existing infrastructure to ensure the coordination of land use and transportation planning in support of improved resident quality of life, including provisions for pedestrians, trails and bicycles, housing, access to recreation and green space, and protected natural and historic areas

- Improvement and repair of roads and bridges, including increased street connectivity
- Reduce, eliminate, or prevent encroachment on Fort Gordon military installation

**Intergovernmental Coordination Goal –** to create a culture of collaborative planning and government decision-making, wherein communities join together to define commonalities and development strategies that benefit multiple jurisdictions to further effective growth, increase access to resources, generate cost savings, and promote healthy, active residents

- Examine the possibility of regional code enforcement through the RC

# *Actions to be Pursued*

The following are some key strategies and actions the Regional Commission, in partnership with local governments and other agencies, will be undertaking over the next five (5) years. Additional strategies and actions are located in the "Implementation Program" portion of this document. These strategies and implementation items are considered the CSRA region's important steps towards growing and developing this area with cooperation and inclusiveness for a better quality of life for citizens, business and industry in the region's cities and counties.

**STRATEGY**: Provide support to local organizations/agencies currently engaged in agritourism and/or heritage tourism and coordinate with local governments to choose target areas for promotion
**ACTION** Utilize GIS to create thematic or location-based story maps in different counties or groups of counties that highlight unique assets

**STRATEGY**: Review and update important city/county documents
**ACTION**: Survey HPCs to pinpoint weaknesses in existing historic preservation ordinances

**STRATEGY**: Maintain existing infrastructure and secure funding for new infrastructure as needed
**ACTION**: Create service area maps to support current SDS documents

**STRATEGY**: Examine and update local land use polices as they relate to community food systems
**ACTION**: Create and distribute resident fact sheets/guides for doing specific things like having raised beds, composting, or keeping chickens in counties with zoning

**STRATEGY**: Educate the public and local government officials on what is currently available and what's missing in our regional food system
**ACTION**: Create a regional map of farmer's markets, community/school gardens, etc

**STRATEGY**: Increase the number of GICH communities
**ACTION**: Assist communities with the creation or update of housing inventories and action plans

**STRATEGY**: Increase the capacity of the CSRA Aging Network to meet the needs of caregivers
**ACTION**: Increase senior caregiver training through seminars, webinars, social, print and broadcast media and care consultation

**STRATEGY**: Implement the 2018 Joint Land Use Study recommendations
**ACTION**: Host the inaugural meeting between Fort personnel and local governments to review development projects and activities and assess challenges