Bullock County, Alabama
Hazard Mitigation Plan

A Multi-Jurisdictional Plan
2020

JURISDICTIONS:
BULLOCK COUNTY
TOWN OF MIDWAY
CITY OF UNION SPRINGS

SCADC
SOUTH CENTRAL ALABAMA
DEVELOPMENT COMMISSION

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List of Acronyms

ABFE	Advisory Base Flood Elevation
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADR	Alternative Dispute Resolution
AEMA	Alabama Emergency Management Agency
ALDOT	Alabama Department of Transportation
ASCE	American Society of Civil Engineers
BCA	Benefit-Cost Analysis BCR Benefit-Cost Ratio
BFE	Base Flood Elevation
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CBRA	Coastal Barrier Resource Act
CBRS	Coastal Barrier Resource System
CDBG	Community Development Block Grant
CFDA	Catalog of Federal Domestic Assistance
CFR	Code of Federal Regulations
CRS	Community Rating System
DHS	Department of Homeland Security
DMA	Disaster Mitigation Act of 2000
DOB	Duplication of Benefits
DOI	Department of the Interior
DOP	Duplication of Programs
DOT	U.S. Department of Transportation
EHP	Environmental Planning and Historic Preservation
EO	Executive Order
EOC	Emergency Operations Center
EMA	Emergency Management Agency
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIMA	Flood Insurance and Mitigation Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FY	Fiscal Year
GAR	Governor's Authorized Representative
GIS	Geographic Information System GSTF Greatest Savings to the Fund
Hazus	Hazards United States
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
IBC	International Building Code
ICC	Increased Cost of Compliance
IRS	Internal Revenue Service
ITP	Independent Third Party
LEPC	Local Emergency Planning Committee
NAP	Non-Insured Crop Disaster Assistance Program
NCEI	National Centers for Environmental Information
NEMIS	National Emergency Management Information System
NEPA	National Environmental Policy Act
NFIA	National Flood Insurance Act
NFIF	National Flood Insurance Fund
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OPA	Otherwise Protected Area
PARS	Payment and Reporting System
PDM	Pre-Disaster Mitigation
PNP	Private Non-profit
POC	Point of Contact
POP	Period of Performance
SBA	Small Business Administration
SCADC	South Central Alabama Development Commission
SEI	Structural Engineering Institute
SF	Standard Form
SFHA	Special Flood Hazard Area
SFM	Strategic Funds Management
SHMO	State Hazard Mitigation Officer
SOW	Scope of Work
SRIA	Sandy Recovery Improvement Act of 2013 Stafford Act Robert T. Stafford Disaster Relief and Emergency Assistance Act
TB	Technical Bulletin
URA	Uniform Relocation Assistance and Real Property Acquisition Act of 1970
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFA	U.S. Fire Administration
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WUI	Wildland-Urban Interface

SECTION 1: INTRODUCTION

Section Contents

1.1 Plan Scope
1.2 Authority
1.3 Purpose
1.4 Funding

1.1 Plan Scope and Funding

The Bullock County Multi-Jurisdictional Hazard Mitigation Plan is a plan that details the multitude of hazards that affect the jurisdictions located within Bullock County, Alabama. Jurisdictions included are Bullock County, the Town of Midway, and the City of Union Springs. The Bullock County 2020 Multi-Jurisdictional Hazard Mitigation Plan is an update to the Bullock County Hazard Mitigation Plan adopted in 2013. This plan fulfills the requirements set forth by the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 requires counties to formulate a hazard mitigation plan to be eligible for mitigation grants made available by the Federal Emergency Management Agency (FEMA). The Bullock County Multi-Jurisdictional Hazard Mitigation Plan compiles information for each jurisdiction in Bullock County and documents the incorporation of hazard mitigation objectives.

1.2 Authority

Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (public Law 93-228, as amended), Title 44 Code of Federal Regulations, as amended by Part 201 of the Disaster Mitigation Act of 2000 requires that all state and local governments develop a hazard mitigation plan as a condition of receiving federal disaster assistance. These plans should be approved by FEMA and updated every five years.

1.3 Purpose

The Bullock County Multi-Jurisdictional Hazard Mitigation Plan is an effort to evaluate and identify all prioritized hazards which may affect Bullock County and the jurisdictions located therein. The purpose of the Plan is to rationalize the process of identifying and implementing appropriate hazard mitigation actions to address the prioritized hazards in Bullock County. The document includes a detailed characterization of natural hazards countywide; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the county's mitigation activities, and a detailed plan for implementing and monitoring the required aspects of the plan. This plan is only one of many steps that the jurisdictions in Bullock County will take to protect the welfare of residents by achieving a safer environment that minimizes the risk of disaster impacts to the extent possible.

1.4 Funding

The first draft of what is now the 2020 Bullock County Hazard Mitigation Plan was prepared in-house in 2018 with no additional funding other than the staff support of the Bullock County Emergency Management Agency through the Bullock County Commission. The second draft of the 2020 Bullock County Hazard Mitigation Plan was prepared with the assistance of the South Central Alabama Development Commission (SCADC) with funding made available through a Fiscal Year 2019 Emergency Management Performance Grant (EMPG).

SECTION 2: HAZARD MITIGATION PLANNING PROCESS

Section Contents

2.1 Federal Requirements
2.2 Hazard Mitigation Planning Process
2.3 Multi-Jurisdictional Plan Participation
2.4 Public and Other Stakeholder Involvement
2.5 Integration with Existing Plans
2.6 Multi-Jurisdictional Plan Adoption

2.1 Federal Requirements

The Bullock County Multi-Jurisdictional Hazard Mitigation Plan planning process section of the plan addresses requirements of 44 CFR Section 201.6(c)(1) through Section 201.6(c)(3) by outlining the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. Section 7 of the Bullock County Multi-Jurisdictional Hazard Mitigation Plan addresses 44 CFR Section 201.6(c)(4)(i) and Section 201.6(c)(4)(iii) regarding the plan maintenance, monitoring, review, and update process. The Bullock County Multi-Jurisdictional Hazard Mitigation Plan was developed through interaction between the Bullock County Emergency Management Agency, the AEMA Division D Coordinator, the South Central Alabama Development Commission (SCADC), representatives of each jurisdiction in Bullock County, and hazard mitigation stakeholders. Individual representatives are identified in Figure 2.1. Together, the representatives of these organization comprised the Bullock County Multi-Jurisdictional Hazard Mitigation Planning Committee.

2.2 Hazard Mitigation Planning Process

The planning process for the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan has been fragmented due to changes in leadership in the Bullock County Emergency Management Director position. The 2013 Bullock County Hazard Mitigation Plan called for the Hazard Mitigation Planning Committee (HMPC) to reconvene on an annual basis to review the plan. Mr. Roderick Clark, a former Bullock County EMA Director, left his position in June 2017. An interim EMA Director from Bullock County's Engineering Department held the position until Mr. Joshua Powell was hired as the Bullock County EMA Director in February of 2018. In 2020, Mr. Powell resigned, and Mr. Ray Scott was hired as the Bullock County EMA Director in June of 2020.

During his tenure as EMA Director, Mr. Powell worked with the AEMA Division D Coordinator to review the 2013 Bullock County Hazard Mitigation Plan and prepare a draft 2018 Hazard Mitigation Plan that was submitted to AEMA for review in September 2019. On July 6, 2020, the draft 2018 Bullock County Hazard Mitigation Plan was returned by FEMA as "unapproved". By that time, however, the EMA Director position had transitioned to Mr. Ray Scott. Mr. Scott requested the assistance of the SCADC to update and revise the 2018 draft plan as noted by AEMA and FEMA in the **Local Mitigation Plan Review Tool.** The following is a description of the Bullock County Hazard Mitigation Planning Process from 2018 through 2020, as can be best ascertained due to the changes in the Bullock County EMA Director position.

<u>2018 to 2020</u>

In 2018, Mr. Powell met with the HMPC members once he was hired to discuss any mitigation projects that were ongoing, completed, or should be included in the revised hazard mitigation plan of 2018. It is clear that at least one public meeting was held on March 12, 2018 at 10:30 a.m. in the basement of Bullock County's Courthouse in the County Commission Chambers located at 217 N. Prairie Street, Union Springs, AL 36089. This meeting was to address the public input and the draft plan revision. Minutes of the March 12, 2018 meeting are included in Appendix 8.2: Public Participation Documentation. Notification of the March 12, 2018 meeting was posted at the Bullock County Courthouse. No private citizens attended. A questionnaire that was made available at the public meeting was also placed at the Bullock County EMA Office. There are no records of any questionnaires being completed and returned to the Bullock County EMA Office.

The first step of the hazard mitigation planning process was to perform an analysis of the 2013 Plan. BCEMA reviewed each section comparing it to the AEMA's revised plan. In developing the initial risk assessment for the 2018 hazard mitigation plan, the HMPC initially considered 19 hazards countywide based on primary research. Through a rating system, the HMPC reduced the list to the five most significant hazards that create risks for the county: wildfires, drought, thunderstorm/high wind events, tornados, and winter storm/snow/ice events. For each of these hazards, the detailed risk assessments were performed that included calculations of future expected damages expressed in dollars. From the results of the risk assessment, the HMPC developed a mitigation strategy composed of actions identified by the BCEMA, HMPC agencies, and the existing local plan.

A second meeting was planned to address final plan revisions after AEMA/FEMA review, with the plan being approved pending adoption. The second meeting was intended to provide an overview of the Bullock County Multi-Hazard Mitigation Plan revision and to discuss the county commission's and local participating jurisdictions' adoption by resolution of the revised plan.

2020

Unfortunately, the draft 2018 hazard mitigation plan was not approved pending adoption; Mr. Powell resigned his position; and Mr. Scott, with the assistance of the South Central Alabama Development Commission, spearheaded the revisions to the draft 2018 hazard mitigation plan which would become this document that is now known as the draft 2020 Bullock County Hazard Mitigation Plan. Rather than holding additional meetings given the limitations of public meetings due to the Coronavirus pandemic, each jurisdiction was contacted by phone to review revisions and obtain additional suggestions for inclusion in the revised plan. The 2020 Bullock County Hazard Mitigation Plan was then emailed to all HMPC representatives, as well as to the EMA Directors of surrounding counties, for review and comment. The 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan was re-submitted to AEMA and FEMA for review in May 2021.

2.3 Multi-Jurisdictional Plan Participation

The Bullock County Hazard Mitigation Planning Committee was developed and is comprised of representatives from all participating jurisdictions and other members as noted in Figure 2.1. (Jurisdiction representatives are highlighted in light blue.) This committee facilitated development and revisions of this plan. The Bullock County Hazard Mitigation Planning Committee members serve for the five-year planning cycle of the Bullock County Multi-Jurisdictional Hazards Mitigation Plan. The Bullock County Hazard Mitigation Planning Committee mission statement is as follows:

To develop and oversee a comprehensive natural hazard mitigation planning process that:

- Facilitates coordination among local, state, and federal agencies
- Monitors and evaluates the potential risks of hazards to life and property
- Actively mobilizes all available community resources and measures to mitigate the threats of hazards
- Implements programmed actions with specific results

Each eligible local jurisdiction in Bullock County provided sufficient participation in the development of the regional hazard mitigation plan. Local jurisdictions within Bullock County

participated according to a list of requirements and guidelines that must be adhered to by each committee member in order for them to remain a part of the multi-jurisdictional plan. Each committee member stated they fully understand and will abide by the guidelines set forth by the Bullock County EMA. The requirements/guidelines are as follows:

- Attendance by them, or a representative, at each of the HMPC meetings
- If unable to attend a meeting, follow up by communicating with the Bullock County EMA through personal visits, phone calls, correspondence, email or fax
- Timely submission of information necessary for the draft plan
- Full cooperation among the members of each municipality with the Bullock County EMA and the consultant

Figure 2.1: Hazard Mitigation Jurisdiction and Stakeholder Participation
Note: former members are in parentheses

Name	Title/Position	Agency/Organization	Attended Meetings	Personal Conversation or Email	Returned Survey or Written Comments
Jurisdiction Representatives					
Ray Scott (Joshua Powell)	EMA Director	Bullock County EMA	X	X	TBD
Alonza Ellis	Chairman	Bullock County Commission	X	X	TBD
Jason DeShazo	County Engineer	Bullock County Roads and Bridges	X	X	TBD
Mildred Whittington	Mayor	Mayor of Midway		X	TBD
Ronald Felder (Sharon Dean)	Police Chief	Union Springs Police Department	X	X	TBD
Rob Cameron (Duane Anderson)	Fire Chief	Union Springs Volunteer Fire Department	X	X	TBD
Hazard Mitigation Stakeholders					
Rob Cameron	Fire Chief	Bullock County Association of Volunteer Fire Departments		X	TBD
Johnny Adams	Commissioner	Bullock County Commission	X	X	TBD
Don Larkins	Commissioner	Bullock County Commission	X	X	TBD
John McGowan	Commissioner	Bullock County Commission	X	X	TBD
Solomon Marlow	Commissioner	Bullock County Commission		X	TBD
Carla Elston	Coordinator	Bullock County Cooperative Extension Office		X	TBD
Tracy Larkins	Director	Bullock County Department of Human Resources		X	TBD
David Padgett	Director	Bullock County Economic Development Authority		X	TBD
Raymond Rodgers	Sheriff	Bullock County EMA/ Homeland Security POC		X	TBD
Connie King	Area Administrator	Bullock County Health Department		X	TBD

Ron Smith	Citizen	Bullock County Private Citizens		X	TBD
Christopher Blair	Superintendent	Bullock County Schools		X	TBD
Raymond Rogers	Sheriff	Bullock County Sheriff's Office	X	X	TBD
Brad May	Owner	May's Distributing Company		X	TBD
John DeBlock	Meteorologist	National Weather Service – Birmingham Office		X	TBD
Hubert (B) Ansley	Chief, Emergency Management Branch	United States Army Corps of Engineers		X	TBD
Tracy Delaney	SCADC Planner	Alabama Associations of Regional Councils		X	TBD
Monique Smith	Division D Coordinator	Alabama Emergency Management Agency		X	TBD
Mark Richardson	Forestry Specialist	Alabama Forestry Commission		X	TBD

As shown by the list of members in **Figure 2.1**, the county's HMPC is representative of those organizations and agencies in Bullock County area concerned with natural hazards and hazard mitigation. The HMPC worked to engage the public for participation and support to identify the natural hazards that pose a threat to their communities, provide information about the past hazardous events, identify the assets and potential losses in their communities, and identify the past and future mitigation measures throughout the county.

2.4 Public and Other Stakeholder Involvement

Beyond the involvement and participation of the Bullock County HMPC members, there were a number of other agencies and organizations that helped provide information regarding hazard profiles, vulnerability assessments, potential losses, land use and development trends and mapping data. Bullock County EMA, and later, SCADC coordinated with local agencies to gather information that could be incorporated into the hazard mitigation plan. BCEMA provided the local HMPC representatives with a questionnaire in order to determine local capabilities, hazards, risks, and mitigation goals and actions. The 2018 draft plan states that all county jurisdictions were contacted and several responded, however, there is no record in the Bullock County EMA Office of completed questionnaires.

Various meetings and phone calls took place; and e-mails were sent to the following agencies requesting their input and cooperation. These agencies helped provide information about hazard profiles, vulnerabilities assessment, potential losses, land use and development trends and mapping data.

Federal Agencies:

- Federal Emergency Management Agency HAZUS 2009
- National Weather Service – Mobile Office
- United States Geological Survey - Alabama District
- United States Army Corps of Engineers
- United States Department of Agriculture
-

State Agencies:

- Alabama Emergency Management Agency

- Geological Survey of Alabama
- Alabama Forestry Commission
- ADECA

Local Agencies:
- Bullock County EMA

In addition, opportunity was provided for neighboring counites and other interested parties to participate in the hazard mitigation planning process through the review and comment of the final draft of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan.

2.5 Integration with Existing Plans

Existing state and local plans were reviewed for their applicability to the hazard mitigation plan and to determine additional means of coordinated implementation. The results were utilized as the basis for the countywide hazard identification and risk analysis, as well as the development of the countywide mitigation goals, strategy, and actions. This ensured that the county plan was reflective of additional local plans. A list and explanation of each of the existing plans that were reviewed and incorporated in the revision of the Bullock County Multi-Jurisdictional Hazard Mitigation Plan follows:

- **Alabama State Hazard Mitigation Plan, July 2018:**
  The State Hazard Mitigation Plan was consulted to assist with consistency of information within the regional plan, including items within the Risk Assessment and local capabilities.
- **Alabama Drought Management Plan (2018 Update)**
  The Alabama Drought Management Plan was studied to provide background information of drought impacts on the planning area.
- **South Central Alabama Comprehensive Economic Development Strategy (CEDS)**
  The SCADC Comprehensive Economic Development Strategy, or CEDS, was consulted to ensure the Hazard Mitigation Plan is consistent with the economic development strategy for the 7-county economic development district (EDD). Each economic development district is required to develop a new CEDS every five years that provides an overview of the region's economy and to outline a development strategy, as well as associated projects, that will increase the overall economy and quality of life in the region. Each CEDS is then updated annually with an annual report. The other counties included in the South Central Alabama EDD are Butler County, Crenshaw County, Lowndes County, Macon County, Montgomery County, and Pike County.
- **Bullock County Natural Hazard Mitigation Plan of 2013**
  The 2013 hazard mitigation plan was reviewed to determine what issues remain relevant to the current conditions of Bullock County as well as to identify which mitigation strategies have been implemented and which still need to be addressed.
- **Bullock County EMA Emergency Operations Plan**
  Bullock County has an Emergency Operations Plan (EOP) that is utilized in an emergency situation. The plans summarize various hazards and provide direction for emergency personnel in disaster situations. These plans complement the hazard mitigation plan, but do not necessarily cover the same material.

- **Transportation Plans**
  Existing transportation plans are critical in hazard mitigation to determine the best way to mobilize people in an evacuation situation or to mobilize vehicles and/or equipment in other emergencies. Transportation plans that were reviewed included the following:
    - South Central Alabama Rural Transportation Planning Organization Programs and Plans
    - South Central Alabama Human Services Coordinated Transportation Plan
    - Bullock County Road Maintenance Plans
    - Union Springs Major Street Plan
- **Local Growth and Development Plans and Regulations:**
  A review of local long-range growth and development plans, infrastructure plans, economic development plans, and development regulations helped determine growth patterns that will have an impact on hazard mitigation or may be impacted by the potential for natural hazard events.
    - Water System Plans/Water Supply Improvements/Extensions
    - Dixie Electric Emergency Plans
    - Aging Program Plans
    - Union Springs Comprehensive Plan
    - Union Springs Subdivision Regulations
    - Union Springs Zoning Ordinance

Unfortunately, there has been very little planning activity that has occurred in Bullock County, Midway or Union Springs since the last Bullock County Hazard Mitigation Plan was adopted in 2013. The Union Springs Comprehensive Plan, Subdivision Regulations, Zoning Ordinance and Major Street Plan, that were completed in 2013, did include strategies to keep existing undeveloped flood plain areas free from future development. In recent years, the City of Union Springs has also included resolution to drainage issues in a number of residential areas that are prone to flooding in their community development program. In fact, the City of Union Springs has applied for, and been awarded, four to five Community Development Block Grants that address a combination of water, sewer and drainage improvements in the last ten years. Bullock County continues to address road improvements with a limited budget on a case by case basis with the most urgent improvements taking priority. The continued road improvements most often coincide with areas that have been worn down through the erosion from flooding and/or flash flooding. And finally, the South Central Alabama Human Services Coordinated Transportation Plan addresses the needs of those persons without access to vehicular transportation in emergency events.

2.6 Multi-Jurisdictional Plan Adoption

Each participating jurisdiction will have the opportunity to adopt the Bullock County Multi-Jurisdictional Hazard Mitigation Plan when it is deemed “approvable pending adoption” by the Federal Emergency Management Agency (FEMA). Eligible jurisdictions include Bullock County, Midway and Union Springs. (Draft) Resolutions for each participating jurisdiction are provided in the appendices of this document in Section 8.3.

SECTION 3: BULLOCK COUNTY PROFILE

Section Contents

3.1 Background
3.2 Demographics
3.3 Business and Industry
3.4 Infrastructure
3.5 Land Use and Development Trends

3.1 Background

The planning area for the Bullock County Multi-Jurisdictional Hazard Mitigation Plan includes Bullock County, the Town of Midway, and the City of Union Springs. Bullock County is located within the Alabama Emergency Management Agency (AEMA) Division D, which is one of seven emergency management divisions within the state. AEMA Division D is located in eastern Alabama (Figure 2.1) and is comprised of the following twelve counties: Autauga, Bullock, Chambers, Chilton, Coosa, Elmore, Lee, Lowndes, Macon, Montgomery, Russell, Tallapoosa and the jurisdictions in those counties.

Figure 3.1: AEMA Division D

Bullock County is 625 square miles in size and is located in the East Gulf Coastal Plain physiographic region. Though the designation of a plain commonly refers to a flat landscape, much of the region consists of a mixture of rounded hills and cuestas (a ridge with steep slopes on one side and gentle slopes on the other), with floodplains along the rivers and streams of the area. Bullock County is dissected by the Chunnennuggee Ridge, forming the boundary between the Black Prairie District in the northern half of the county and the Chunnennuggee Hills District, which covers the southern half. The Black Prairie District is formed on underlying chalk rocks that are easily dissolved by surface and groundwater. The land overlying the Mooreville Chalk is low and rolling and is characterized by thick black topsoil and vegetation typical of a prairie ecosystem. The land area consists of a network of low hills and irregular ridges that have narrow, v-shaped valleys. The Chunnennuggee Hills District is formed on sands and sandstones. This portion of the county consists of rolling hills that are dissected by dendritic drainage pattern. These sandy areas are plateaulike upland flats that have steep, short side slopes. Elevation in Bullock County ranges from approximately 240 feet above sea level Line Creek in the northern part of the county at the Bullock/Macon County border to 620 feet above sea level at High Ridge in the southwestern part of the county. Elevations of 550 feet above sea level are also found in the central part of the county, southeast of Union Springs.

Bullock County drains to four separate river basins. Line Creek, Bughall Creek and their tributaries drain the area north of the Chunnennuggee Ridge to the Tallapoosa River. Both the Conecuh and Pea Rivers begin in Bullock County. The Conecuh River begins in the Union Springs area and flows southwest draining the southwestern part of the county. The Pea River begins in the Three Notch community between Union Springs and Midway and also flows southwest draining the southeastern part of the county to the Choctawhatchee River Basin. The far eastern part of Bullock County is drained by smaller streams that flow into the Chattahoochee River Basin.

3.2 Demographics

According to the 2010 decennial census, the total population of Bullock County was 10,914 persons, which was a 6.8 percent decrease from the 2000 population of 11,714 persons. Census Population Estimates for 2019 (as of April 1, 2020) indicate that the Bullock County population has decreased another 7.4 percent to 10,101 persons. Therefore, Bullock County has suffered a population loss of approximately 1,613 persons, or 13.8 percent, in just under 20 years while the state's population has increased 10.3 percent in the same time frame. Population decline has occurred throughout the county, although the City of Union Springs has experienced the greatest decrease between 2010 and 2019, at -11.4 percent. The unincorporated portion of Bullock County has suffered the least population decline since 2010, at -4.7 percent. The recent population history for each jurisdiction in Bullock County is shown in Figure 3.2.

Only a small portion of the total area of Bullock County is located within an incorporated municipality. The City of Union Springs is the largest municipality in the county and encompasses 6.69 square miles, which is equivalent to 1.1 percent of the total area of the county. Of the total 2019 estimated population, however, more than one-third, at 33.9 percent, live within the corporate boundaries of Union Springs. The Town of Midway, at 3.31 square miles in size, encompasses 0.5 percent of the county's total land area and is home to 4.6 percent of the total 2019 population. The unincorporated part of Bullock County is 615.14 square miles in size, which 98.4 percent of the county's total land area. Of the total 2019 estimated population in Bullock County, 6,225 persons, or 61.6 percent, live in the unincorporated portion of the county. The total area and population density for 2010 and 2019 for Bullock County, the Town of Midway, the City of Union Springs, and the unincorporated portion of the county is provided in Figure 3.3.

Figure 3.2: Population Change from 2010 to 2019

Location	2010 Census	Estimate Base	2010 Estimate	2019 Estimate	Change from 2010 to 2019	
					Number	Percent
Alabama	4,779,736	4,780,125	4,785,437	4,903,185	117,748	2.5%
Bullock County	10,914	10,911	10,876	10,101	-775	-7.1%
Midway town	499	499	497	466	-31	-6.2%
Union Springs city	3,980	3,864	3,848	3,410	-438	-11.4%
Balance of Bullock County	6,435	6,548	6,531	6,225	-306	-4.7%

Source: University of Alabama Culverhouse College of Business, Center for Business and Economic Research; Cities and Towns Population Estimates by County, 2010 to 2019; Alabama Demographics - Center for Business And Economic Research (ua.edu)

Figure 3.3: Population Density, 2010 and 2019

Location	Total Area	2010 Population	2010 Population Density	2019 Population Estimate	2019 Population Density
Alabama	52,420.00	4,779,736	91.18153	4,903,185	93.54
Bullock County	625.14	10,914	17.4584	10,101	16.16
Town of Midway	3.31	499	150.7968	466	140.82
City of Union Springs	6.69	3,980	594.9412	3,410	509.74
Balance of Bullock County	615.14	6,435.00	10.46096	6,225	10.12

Source: University of Alabama Culverhouse College of Business, Center for Business and Economic Research; Cities and Towns Population Estimates by County, 2010 to 2019; Land and Water Area, Latitude and Longitude, Population, and Housing Units for Alabama Counties, 2010; and Land and Water Area, Latitude and Longitude, Population, and Housing Units for Alabama Places, 2010;

The population of Bullock County is 54.4 percent male and 45.6 percent female. The male population ratio is higher than that of the national or state ratios. The male ratio is highest in the unincorporated part of Bullock County, at 55.3 percent, and lowest in the Town of Midway, at 48.3 percent. Midway's male to female ratio is more in line with that of the state and nation. The median age of the Bullock County population, at 40.2 years old, is also higher than the median age of the nation, at 38.1, and the state, at 39.0. Median age in Midway, at 36.2, and Union Springs, at 31.5, however, is lower than that of the county, state and nation. For sake of comparison, the population has been divided into three age categories: under 18, age 18 to 64 years, and age 65 and older. The Under 18 and Age 65 and Older age groups would be considered dependent population groups while the Age 18 to 64 Years would be considered the working age population. As seen in Figure 3.4, the age group ratios for all of Bullock County are similar to that of the state and nation. The portion of the population that Age 18 and Under is 20.8 percent in Bullock County, as compared to 22.5 percent for the state and 22.6 percent for the nation. Likewise, the 65 and Older age group comprises 16.0 percent of the population in Bullock County, 16.5 percent in the state and 15.6 percent in the nation. The percentage of working age population, from 18 to 64 Years, is slightly higher in Bullock County, at 63.2 percent, as compared to 61.0 percent in the state and 61.7 percent in the nation. The percentage of working age population from age 18 to 64 years old, is highest in Midway, at 66.5 percent, as compared to Bullock County, at 63.2 percent. The percentage of the population that is working age is lowest in the unincorporated area of Bullock County, at 62.7 percent. As would be expected, the Town of Midway has the lowest elderly population (65 years and older), at 11.9 percent and the unincorporated area has the highest elderly percentage, at 17.1 percent.

While the sex and age demographics for Bullock County are slightly different from those of the state and nation, the racial demographics are vastly different. Bullock County has a majority minority population, as seen in Figure 3.5. The African-American, or black, population comprises 74.8 percent of the total population in Bullock County, as opposed to 26.6 percent in the state and 12.7 percent in the nation. The percentage of African American population is highest in the municipalities, with Midway at 96.2 percent, and Union Springs at 92.1 percent. The unincorporated portion of Bullock County has an African American population of 62.4 percent. This population of Bullock County that is of Hispanic or Latino origin, at 2.6 percent, is lower than that of the state, at 4.3 percent, and much lower than the nation, at 18.0 percent.

Figure 3.4: Bullock County Population by Sex and Age, 2019

Location	Total Population	Male	Female	Under 18	18 to 64	65 & Older	Median Age
United States	324,697,795	49.2%	50.8%	22.6%	61.7%	15.6%	38.1
Alabama	4,876,250	48.4%	51.6%	22.5%	61.0%	16.5%	39.0
Bullock County	10,248	54.4%	45.6%	20.8%	63.2%	16.0%	40.2
Town of Midway	683	48.3%	51.7%	21.7%	66.5%	11.9%	36.2
City of Union Springs	3,514	54.0%	46.0%	21.6%	63.4%	15.0%	31.5
Unincorp Bullock County	6,051	55.3%	44.7%	20.2%	62.7%	17.1%	N/A
Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table DP05: Demographic and Housing Estimates.							

Figure 3.5: Bullock County Population by Race and Hispanic Origin, 2019

Race	United States	Alabama	Bullock County	Town of Midway	City of Union Springs	Unincorp Bullock County
Total Population	324,697,795	4,876,250	10,248	683	3,514	6051
White	72.5%	68.1%	21.9%	3.8%	7.7%	32.2%
Black or African American	12.7%	26.6%	74.8%	96.2%	92.1%	62.4%
American Indian or Alaskan Native	0.8%	0.5%	0.0%	0.0%	0.0%	0.0%
Asian	5.5%	1.4%	0.5%	0.0%	0.3%	0.7%
Native Hawaiian or Other Pacific Islander	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Some Other Race	4.9%	1.4%	2.0%	0.0%	0.0%	3.5%
Two or More Races	3.3%	1.9%	0.8%	0.0%	0.0%	1.3%
Hispanic or Latino	18.0%	4.3%	2.6%	0.0%	0.9%	3.8%
Not Hispanic / Latino	82.0%	95.7%	97.4%	100.0%	99.1%	96.2%
Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table DP05: Demographic and Housing Estimates.						

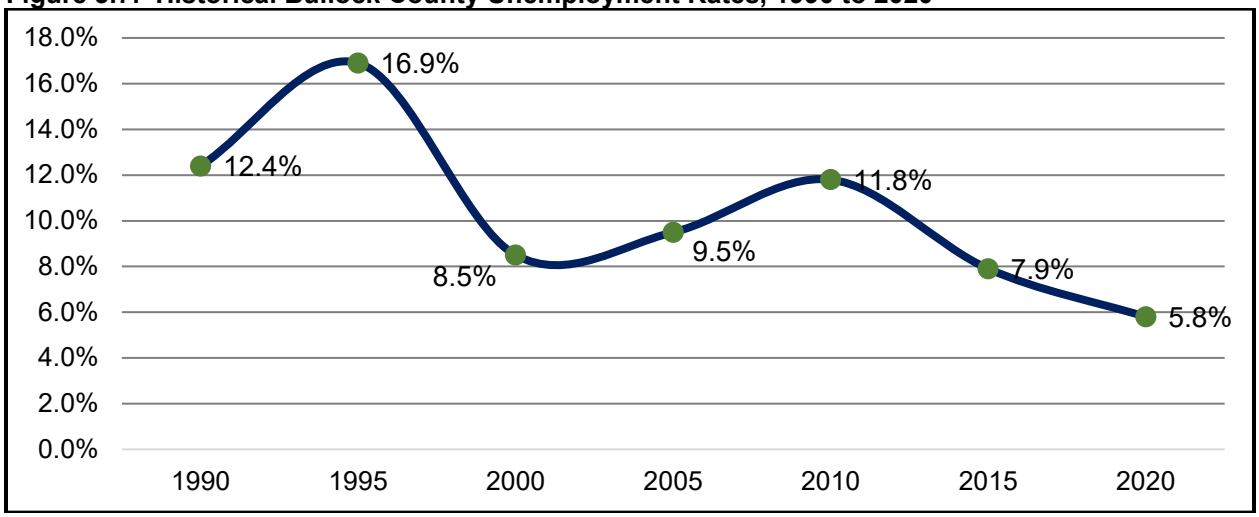
More than one-fourth of the Bullock County population that is age 25 and older, at 25.3 percent, did not graduate from high school, as compared to 13.8 percent for the state, and 12.0 percent for the nation. The percentages of population with less than a high school education are highest in Union Springs, at 38.3 percent, followed by Midway, at 26.4 percent. In contrast, the percentage of the population with a graduate or professional degree is also highest in Union Springs, at 5.6 percent, followed by Bullock County, at 4.6 percent; however, these percentages are much lower than those of the state, at 9.5 percent with a graduate or professional degree, and 12.4 percent for the nation. Due to the lower education levels, Bullock County has historically had a high unemployment rate, often more than 10 percent, as shown in Figure 3.7. Over the last 30 years, unemployment was highest in Bullock County in 1995, at 16.9 percent, and in 2010, at 11.8 percent. The U.S. Census 2015-2019 American Community Survey 5-Year Survey reports that Bullock County had a 3.9 percent unemployment rate, as compared to 5.9 percent for the state and 5.3 percent for the nation. Even with the low unemployment rate for the county, the Town of Midway maintains a high unemployment rate of 15.9 percent, with 42 of the Town's 264 workers being unemployed.

Figure 3.6: Educational Attainment, 2019

	United States	Alabama	Bullock County	Town of Midway	City of Union Springs	Unincorp Bullock County
Population 25 Years and Older	220,622,076	3,320,877	7,101	503	2,269	4,329
Less than High School Graduate	12.0%	13.8%	25.3%	26.4%	38.3%	18.4%
High School Graduate (includes equivalency)	27.0%	30.9%	40.4%	41.0%	29.7%	45.9%
Some College or Associate's Degree	28.8%	29.9%	22.3%	25.2%	21.0%	22.6%
Bachelor's Degree	19.8%	15.9%	7.4%	3.2%	5.4%	8.9%
Graduate or Professional Degree	12.4%	9.5%	4.6%	4.2%	5.6%	4.1%

Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table S0601: Selected Characteristics of Total and Native Born Populations in the United States.

Figure 3.7: Historical Bullock County Unemployment Rates, 1990 to 2020



Source: U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Data by County, Annual Averages, Local Area Unemployment Statistics Home Page (bls.gov)

Figure 3.8: Employment Status, 2019

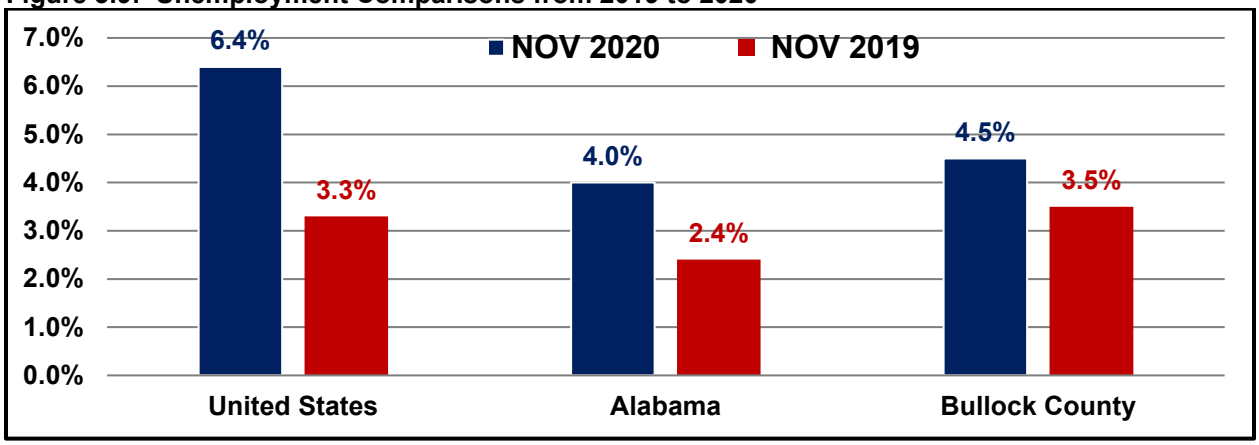
Location	Population 16 Years and Over	Armed Forces	Civilian Labor Force	Of Civilian Labor Force		Not in Labor Force
				Employed	Unemployed	
United States	259,662,880	0.4%	63.0%	59.6%	**5.3%**	36.6%
Alabama	3,907,144	0.3%	57.1%	53.7%	**5.9%**	42.6%
Bullock County	8,375	0.0%	53.6%	51.6%	**3.9%**	46.4%
Town of Midway	549	0.0%	48.1%	40.4%	**15.9%**	51.9%
City of Union Springs	2,821	0.0%	49.7%	48.2%	**3.0%**	50.3%
Unincorp. Bullock County	5,005	0.0%	56.5%	96.8%	**3.2%**	43.5%

Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table DP03: Selected Economic Characteristics

According to the Alabama Department of Labor, which maintains unemployment data in cooperation with the U.S. Department of Labor, Bureau of Labor Statistics, unemployment in Bullock County was 4.5 percent in November 2020, up from 3.5 percent in November 2019. In comparison as shown in Figure 3.9, the State of Alabama's unemployment rate was 4.0 percent in November 2020, an increase from 2.4 percent in November 2019; and the national unemployment rate was 6.4 percent in November 2020, an increase from 3.3 percent in the previous year.

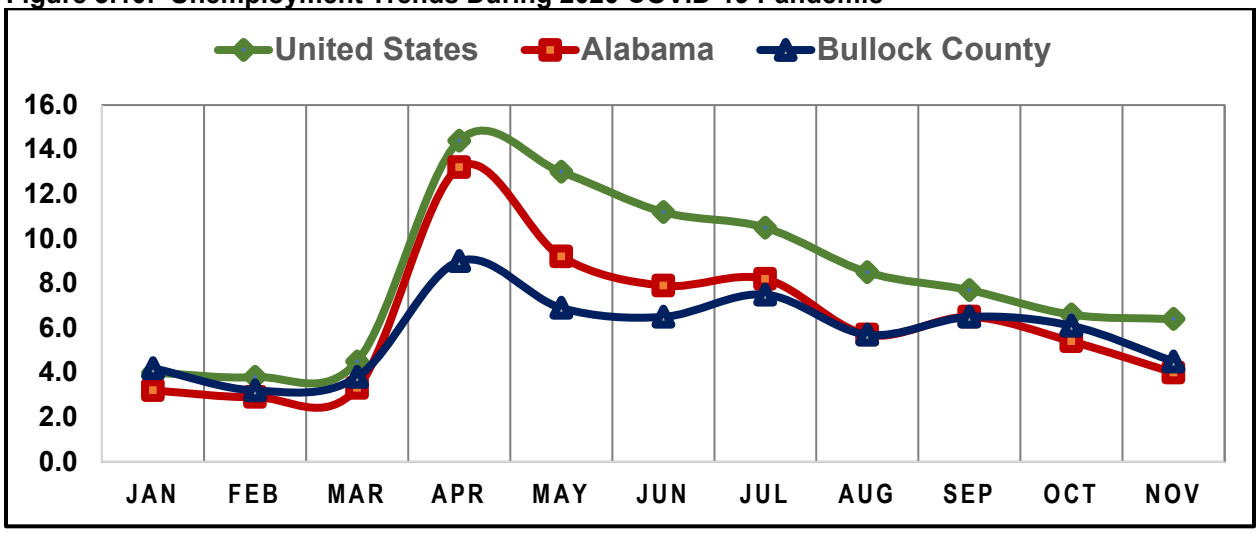
During the COVID-19 pandemic in 2020, unemployment rates rose at the national, state and county levels, as shown in Figure 3.10. Unemployment was highest in Bullock County in April 2020, at 9.0 percent. Local unemployment stayed above 6.0 percent until November 2020. Still unemployment in Bullock County did not climb nearly as high as the federal and state unemployment rates. The federal unemployment rate reached 14.4 percent and the state rate was 13.2 in April 2020. As businesses have opened back up, unemployment rates have declined but have not returned to pre-pandemic economic conditions.

Figure 3.9: Unemployment Comparisons from 2019 to 2020



Source: Alabama Department of Labor, http://www2.labor.alabama.gov/LAUS/
Estimates prepared in cooperation with the Bureau of Labor Statistics, based on 2019 benchmark.

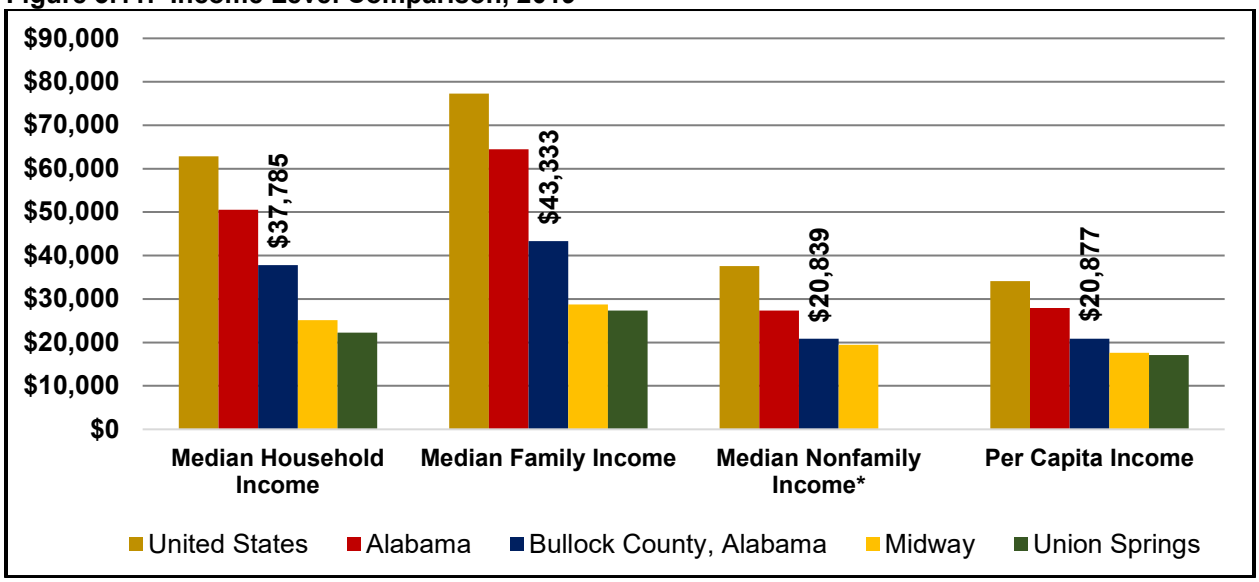
Figure 3.10: Unemployment Trends During 2020 COVID-19 Pandemic



Source: Alabama Department of Labor, http://www2.labor.alabama.gov/LAUS/
Estimates prepared in cooperation with the Bureau of Labor Statistics, based on 2019 benchmark.

Income levels in Bullock County are consistently lower than those of the state and nation, but higher than those of the county's municipalities of Midway and Union Springs. The median household income in Bullock County, at $37,785, is only 60.1 percent of that of the nation, and 74.8 percent of that of the state. The median family income in Bullock County, at $43,333, is only 56.1 percent of that of the nation, and 67.3 percent of that of the state. And, the per capita income of Bullock County, at $20,877, is only 61.2 percent of the nation's, and 74.8 percent of the state's. As would be expected given the lower income levels, the poverty rate in Bullock County is more than twice as much of that of the nation and state in almost every category. The poverty rate in Bullock County for all people, is 28.9 percent, which is 2.2 times as high as that of the nation, at 13.4 percent, and 1.7 times as high as the state's, at 16.7 percent. Poverty rates are highest among those households with children under the age of 18, as seen in Figure 3.12, often being more than twice that of households without children in the same category.

Figure 3.11: Income Level Comparison, 2019



Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table DP03: Selected Economic Characteristics
**Median Nonfamily Income is not available for the City of Union Springs*

Figure 3.12: Poverty Status Comparison, 2019

	United States	Alabama	Bullock County
All families	9.5%	12.3%	25.7%
With related children under 18	15.1%	20.0%	40.0%
Married couple families	4.8%	5.4%	14.1%
With related children under 18	6.6%	7.6%	28.1%
Families with female householder, no spouse present	26.5%	33.6%	50.1%
With related children under 18	36.1%	45.2%	68.0%
All people	13.4%	16.7%	28.9%
Under 18 years	18.5%	23.9%	53.6%
18 to 64 years	12.6%	15.9%	23.9%
65 years and over	9.3%	10.2%	15.9%
Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table DP03: Selected Economic Characteristics			

According to the 2019 ACS 5-Year Estimates, there are 4,557 housing units in Bullock County. Of the total housing units, 22.7 percent are vacant, which is a higher vacancy rate than that of the state, at 17.2 percent, and the nation, at 12.1 percent. As shown in Figure 3.13, housing vacancy is highest in the Town of Midway, at 24.8 percent, and in the unincorporated part of the county, at 24.2 percent. Of the occupied housing units in Bullock County, 71.1 percent are owner-occupied and 28.9 percent are renter-occupied. Owner-occupancy is higher in Bullock County than in the state, at 68.8 percent, and the nation, 64.0 percent. Within Bullock County, owner-occupancy is highest in the unincorporated part of the county, at 85.5 percent, and lowest in the City of Union Springs, at 52.8 percent. The average median housing value of owner-occupied housing in the region is $70,300, which is 49.3 percent of the state's median value, at $142,700 and only 32.3% of the nation's, at $217,500. Median housing value is even lower in the municipalities of Bullock County, at $42,100 in the Town of Midway, and $69,600 in the City of Union Springs.

Of the total housing units in Bullock County, 52.0 percent are single units, 10.6 percent are multi-family with two or more units, and 37.4 percent are mobile homes. In comparison, only 13.2 percent of the state's housing and 6.2 percent of the nation's housing is a mobile home. The unincorporated part of Bullock County has the highest percentage of mobile homes, at 52.6 percent, while Union Springs has the lowest percentage, at 13.8 percent. Of the state's total housing stock, 45.2 percent was built prior to 1980 and is now more than 40 years old, as compared to 40.4 percent of Bullock County's housing stock. Union Springs has the highest percentage of aging housing stock in the county, at 55.6 percent, and the unincorporated part of the county has the lowest percentage, at 29.4 percent.

Figure 3.13: Housing Occupancy and Tenure, 2019

	United States	Alabama	Bullock County	Town of Midway	City of Union Springs	Unincorp. Bullock County
Total housing units	137,428,986	2,255,026	4,557	371	1,695	2,491
Occupied housing units	120,756,048	1,867,893	3,521	279	1,353	1,889
Owner Occupied	64.0%	68.8%	71.1%	62.7%	52.8%	85.5%
Renter Occupied	36.0%	31.2%	28.9%	37.3%	47.2%	14.5%
Vacant housing units	16,672,938	387,133	1,036	92	342	602
Vacancy Rate	12.1%	17.2%	22.7%	24.8%	20.2%	24.2%
Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table DP04: Selected Housing Characteristics						

Figure 3.14: Housing Type and Age, 2019

	Total Housing Units	Single Units	Multi-Units	Mobile Home	Boat, RV, Van	Built Prior to 1980
United States	137,428,986	67.4%	26.3%	6.2%	0.1%	53.6%
Alabama	2,255,026	70.2%	16.5%	13.2%	0.1%	45.2%
Bullock County	4,557	52.0%	10.6%	37.4%	0.0%	40.4%
Town of Midway	371	35.0%	21.6%	43.4%	0.0%	44.2%
City of Union Springs	1,695	62.8%	23.4%	13.8%	0.0%	55.6%
Unincorporated Bullock County	2,491	47.2%	0.2%	52.6%	0.0%	29.4%
Source: US Bureau of Census, 2019 ACS 5-Year Survey, Table DP04: Selected Housing Characteristics						

3.3 Business and Industry

Bullock County has a variety of industrial and commercial stakeholders. The 2019 American Community Survey data reports that Bullock County has a civilian labor force of 4,319 persons, of which the majority, at 36.3 percent, are employed in manufacturing, followed by education, health care and social services, at 15.5 percent, and public administration, at 10.5 percent. The occupation with the largest percentage of workers is production, transportation and material moving, at 32.9 percent, followed by management, business, science and arts occupations, at 20.5 percent. The great majority of the labor force, at 73.8 percent, are private wage and salary workers. It is estimated that 68.2 percent of the households in Bullock County have earnings and the mean earnings is $54,454, as of 2019.

The 2018 County Business Patterns, from the U.S. Census Annual Economic Surveys Program, estimates that there are a total of 110 business establishments in Bullock County employing 2,070 workers, with a combined annual payroll of more than $67 million. Just over half of the businesses, at 50.9 percent, are very small with less than five employees; and 96.4 percent of the businesses have less than 50 employees. The limited number of manufacturing and construction industries employ the greatest percentage of workers, at approximately 35.9 percent. Of the remaining workers, 21.1 percent are employed in the agriculture, forestry, fishing and hunting industry; 19.9 percent are employed in the healthcare and social assistance industry; and 11.5 percent are employed in retail trade. The remaining industrial sectors employ less than 4.0 percent each, or 11.5 percent combined. The largest employers in Bullock County are listed in Figure 3.15 below. These industries are susceptible to the same natural hazards as the remainder of the county, e.g. high wind events and potential flooding; however, they also bring the added risk of large concentrations of persons at any given time as well as the economic impact of industry loss or shut-down. Losing any industry is directly related to the size/type of business and the duration/severity of the loss.

Figure 3.15: Largest Employers in Bullock County

	Employer Name	Industry	Number of Employees
1	Wayne Farms	Poultry Processing	900
2	Bonnie Plant Farms	Crop Production	400
3	Bullock Correctional Facility	Prison	200 to 245
4	Southern Springs Health Care	Healthcare	145
5	Bullock County Board of Education	Education	105
6	Bullock County Hospital	Healthcare	100
7	Bullock County Nursing Home	Healthcare	100 to 249
8	Wayne Farms	Poultry Growers	90
9	Union Springs Telephone Company	Communications	86
10	Dixie Electric Cooperative	Utilities	50 to 75
11	G. P. Thompson Enterprises	Movers	50

3.4 Infrastructure

Transportation:

Located east central Alabama, Bullock County is bordered by Macon County to the north, Russell County to the northeast, Barbour County to the southeast, Pike County to the southwest, and Montgomery County to the west. Bullock County encompasses 625.14 square miles and is home

to two municipalities: Union Springs and Midway. Union Springs, the county seat, is located in the north central part of the county while Midway is located in the southeast part of the county. Bullock County is bisected by U.S. Highways 29 and 82. U.S. Highway 82 crosses the central part of the county from east to west and U.S. Highway 29 runs north to south, also in the central part of the county. Bullock County is also accessed by four state highways. Alabama Highway 51 runs south from U.S. Highway 82 in Midway to Barbour County. Alabama Highway 110 runs southeast from Montgomery County to intersect with U.S. Highway 82 just west of Union Springs. Alabama Highway 223 runs southwest from U.S. Highway 82 in Union Springs to Pike County. And, Alabama Highway 239 runs southwest from U.S. Highway 82 near the Aberfoil community to Barbour County. These state and federal highways provide convenient access to Montgomery, Auburn/Opelika, Eufaula, and Troy areas, with each being less than a one hour drive. Also, Bullock County maintains approximately 375 miles of roadway, of which approximately 310 miles, or 82.7 percent, are paved and 65 miles, or 17.3 percent, are unpaved. None of the unpaved roads are major arterials or collectors. It is reported, however, that many of the county roadways are in fair to poor condition.

Greyhound Bus Lines does offer transportation service to Union Springs; however, there is no other public transit available. There is no longer any rail service in Bullock County. Rail service is available, however, in nearby Montgomery, Alabama and Columbus, Georgia. A local airport, Franklin Field, is located six miles west of Union Springs on Alabama Highway 110. Franklin Field recently underwent a $4 million expansion to extend the paved and lighted runway to 5,000 feet to accommodate accept corporate jets and small commercial passenger aircraft and to add additional hangers. Further, Montgomery Regional Airport (Dannelly Field) is located 50 miles to the northwest on the west side of Montgomery.

Utilities:

Public water in Bullock County is provided by four water systems, two of which are municipal systems: Midway and Union Springs. The unincorporated sections of Bullock County are served by the remaining two water systems: Mount Andrew Water Authority and the South Bullock County Water Authority (SBCWA). The Mount Andrew Water Authority, based in Barbour County, serves about 270 customers located in southeastern Bullock County. SBCWA serves approximately 2,850 customers, of which 75 are commercial meters. All residents of Bullock County have access to public water. Currently, the SBCWA water supply comes from five wells. SBCWA has a combined storage capacity of 950,000 gallons utilizing five water storage tanks located in Peachburg, Aberfoil, Webster, High Ridge, and Simmsville. Three of the tanks are stand pipe tanks, while the Aberfoil and Simmsville tanks are elevated tanks. The system's total storage capacity is adequate to meet both the average daily demand of 558,904 gallons per day (GDP) and peak demand of 821,918 GPD. The SBCWA distribution system consists of approximately 600 miles of water mains and lines throughout the county. The system uses 8-inch lines from the water tanks to connect primarily to 6-inch water mains, which connect to 4-inch, 3-inch, 2.5-inch and 2-inch distribution and service lines. The SBCWA system also includes the maintenance of approximately 140 fire hydrants located throughout the unincorporated part of the county.

The Utilities Board of the City of Union Springs provides public water service to approximately 1,450 residential and 145 commercial customers. The average demand is 1.2 million gallons per day (GPD), with a peak demand of 2.3 million GPD. The city obtains water from four wells which

have a combined capacity of just over 2.5 million GPD and a pumping capacity of 1,870 gallons per minute. The quality of water provided is considered good and does not show signs of high levels of contaminants. The Utilities Board has four elevated tanks that provide storage for the system. The four tanks have a combined storage capacity of 1.5 million gallons, are in excellent condition and are maintained and serviced regularly. The distribution system is comprised of approximately 170,000 linear feet of water service lines. Approximately 38 percent of the water lines are characterized as undersized, meaning that these lines are less than 6 inches in diameter. Existing problems associated with the distribution system includes water pressure and leakage in older lines.

The Town of Midway owns and operates a water system that serves all households in town and several outside town limits. Midway uses two meters to sell approximately 45,500 gallons per day (GPD) to the Mount Andrews Water Authority. The average water production of the system is 116 gallons per minute (gpm)with a peak average production of 149 gpm. The town's wells, therefore, operate at 18.7 percent of capacity on average demand and 24.0 percent of capacity at peak demand. The average daily production of the water system is 167,034 GPD. Using the Alabama Department of Emergency Management (ADEM) minimum standard of maintaining one day's supply equivalent to the average daily demand of the system, Midway's water system averages 1.5 days of supply and is therefore considered adequate.

Public sanitary sewer service is only available through the county's two municipal systems which do not serve areas outside their corporate boundaries. Therefore, there is no public sewer service in the unincorporated areas of the Bullock County. Those households without sewer most often utilize some form of onsite sanitary disposal system, such as septic tanks. It is estimated that approximately 2.7 percent of the households in Bullock County that are not on managed sewer systems have improper onsite disposal, which equates to about 70 households with either failing septic systems or no onsite sewage disposal. County officials state that households without septic systems is a more frequent issue than failing septic systems. The low population density in rural Bullock County makes a countywide public sewage system unattainable due to the cost and technology required.

The Utilities Board of the City of Union Springs provides sanitary sewer service to approximately 1,200 residential customers and 200 commercial customers, which includes all residents of the city. The collection and treatment capabilities of the system are provided by two treatment plants serving different parts of the city and are operated independent of one another. Plant No. 1 is a 750,000 million gallon per day (MGD) trickling filter plant that is currently treating 400,000 gallons per day (GPD) of effluent, which is about 53 percent of the plant's total capacity. Constructed in 1959, Plant No. 1 serves the northern two-thirds of Union Springs. Built in 1969, Plant No. 2 is a 1.5 MGD active sludge plant operating at 63 percent of its total capacity. Plant No. 2 was upgraded to include new clarifiers and an equalization basin to better accommodate the wastewater generated from the Wayne Farms poultry processing plant, one of the city's largest employers. These improvements are expected to provide treatment to future Wayne Farms expansions, as well as future commercial and industrial growth within the plant's service area.

The Town of Midway also operates a public sanitary sewer disposal system that includes approximately 40,139 linear feet of collection line, 140 manholes, 257 service wyes, 36,600 linear

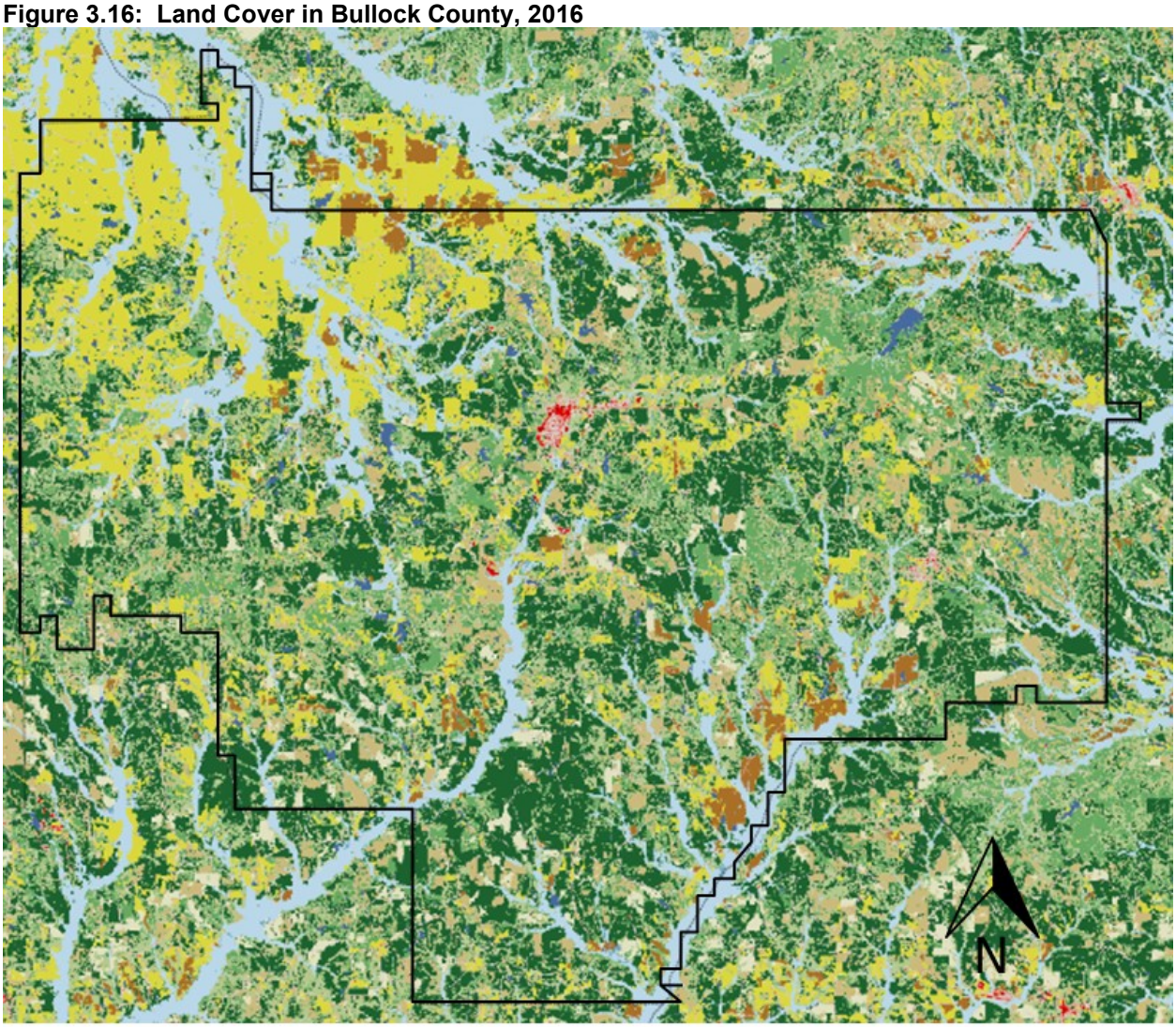
feet of force main, seven pump stations, a sewage treatment plant and sprayfield. The system serves approximately 302 housing units and 12 non-residential sites. The system collects sewage waste and pumps it to a treatment plant located west of Midway. The treatment plant is a three-cell sewage lagoon with a design capacity of 600,000 GPD. The plant discharges treated effluent into the Pea River at its juncture with Caney Branch.

Electrical service is provided throughout Bullock County by either the Alabama Power Company or Dixie Electric Cooperative. Power service is considered to be in good condition and fully meets the needs of Bullock County residents. Natural gas is supplied in Union Springs by the Union Springs Utility Board. Communications service is provided by the Union Springs Telephone Company, which is a privately-owned utility, serving more than 1,800 customers throughout the county. Besides telephone service, the Union Springs Telephone Company provides DSL internet, fiber optics internet and mobile phone services.

3.5 Land Use and Development Trends

Bullock County is a rural county where the predominant land uses are deciduous and evergreen forest, crop production, and pasture. Commercial-type development is primarily limited to the City of Union Springs, and to a much lesser degree, the Town of Midway, as shown in Figure 3.16. Further, all jurisdictions in Bullock County have suffered population loss over the last 20 years. Because of Bullock county's continuing population decline, there has been no incentive for any large scale private development in the last 20 years, as seen in Figure 3.17. What changes in land use that have occurred have been agricultural in nature or timber-related.

Figure 3.16: Land Cover in Bullock County, 2016

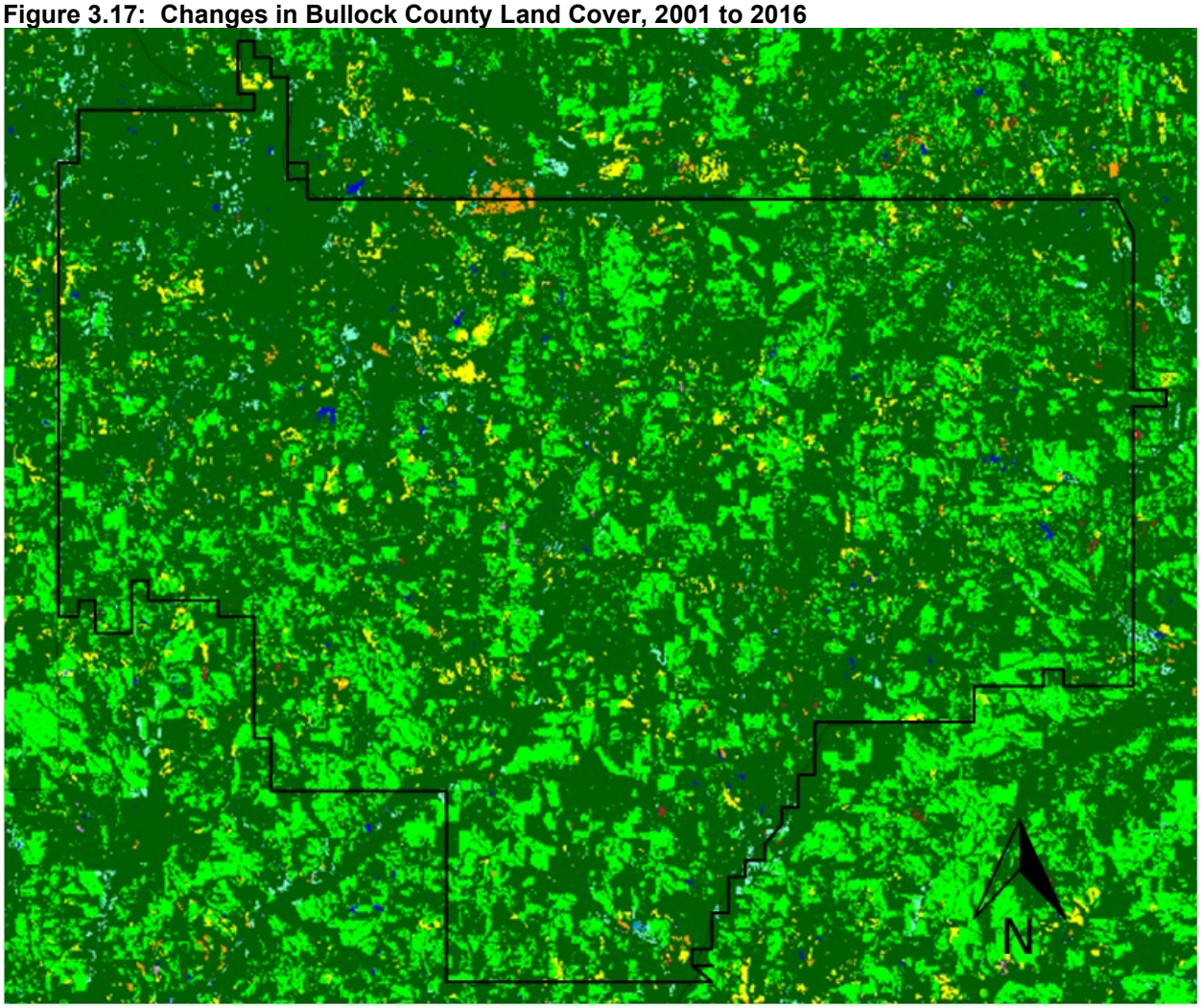


BULLOCK COUNTY LAND COVER 2016

- Open Water (11)
- Perennial Ice/Snow/ (12)
- Developed, Open Space (21)
- Developed, Low Intensity (22)
- Developed, Medium Intensity (23)
- Developed, High Intensity (24)
- Barren Land (Rock/Sand/Clay) (31)
- Unconsolidated Shore (32)
- Deciduous Forest (41)
- Evergreen Forest (42)
- Mixed Forest (43)
- Dwarf Scrub(AK only) (51)
- Shrub/Scrub (52)
- Grasslands/Herbaceous (71)
- Sedge/Herbaceous(AK only) (72)
- Lichens (Ak only) (73)
- Moss (AK only) (74)
- Pasture/Hay (81)
- Cultivated Crops (82)
- Woody Wetlands (90)
- Emergent Herbaceous Wetlands (95)

Source: National Land Cover Database, Multi-Resolution Land Characteristics Consortium, https://www.mrlc.gov/viewer

Figure 3.17: Changes in Bullock County Land Cover, 2001 to 2016



NLCD Land Cover Change Index
2001 to 2016

- No change (1)
- water change (2)
- urban change (3)
- wetland within class change (4)
- herbacous wetland change (5)
- ag hay/pasture change (6)
- cultivated crop change (7)
- hay/pasture change (8)
- persistent grass and shrub change (9)
- barren change (10)
- forest-theme change (11)
- woody wetland change (12)

Source: National Land Cover Database, Multi-Resolution Land Characteristics Consortium, https://www.mrlc.gov/viewer

SECTION 4: HAZARD PROFILES

Section Contents

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4.1 Hazard Overview

In the initial phase of the planning process, the HMPC (Hazard Mitigation Planning Committee) considered 19 natural hazards and the risks they create for the citizens of Bullock County. In 2008, the committee eliminated five hazards (avalanche, coastal erosion, tsunami, earthquake, and volcano) due to a lack of applicability in Bullock County. The remaining hazards were dam failure, drought and extreme heat, expansive soils/land subsidence, flood, hurricane/tropical storm, landslide, winter storm, tornado, wildfire, and hail and severe thunderstorm/lightning/ windstorm. This list was approved by both the HMPC/LEPC and the BCEMA in 2008, 2013 and again in 2018. These hazards were initially selected for inclusion in the 2013 plan revision by the BCEMA, and the list was later reviewed, revised, and approved by the HMPC/LEPC in its initial planning meeting on March 12, 2018 in Union Springs, Alabama. At that time, the HMPC/LEPC determined that hazardous materials and manmade hazards would not be considered a part of the scope of this update. Below is a table that displays each natural hazard, whether or not the hazard is a risk to Bullock County, the source of risk information, and how the hazard correlates with Bullock County and the AEMA Division D Region. The hazard identification shown in Figure 4.1 outlines the 13 hazards that will be addressed in this 2020 version of the Bullock County Hazard Mitigation Plan Update. Many hazards are multi-faceted and interrelated; therefore, some, such as high winds and thunderstorms, are grouped together due to their impacts and mitigation strategies being similar.

Figure 4.1: Potential Hazards and Data Sources Per Hazard

Natural Hazard	Risk	Source	Correlation with Bullock County
Avalanche	No	• US Forest Service National Avalanche Center *http://www.fsavalanche.org/*	No risk of avalanche events in Alabama
Coastal Erosion	No	• FEMA for Flood Risk Analysis and Mapping: Coastal Erosion, February 2018 *fema.gov*	Bullock County is an inland area
Dam Failure	Yes	• USACE National Inventory of Dams, Interactive Map and Charts *nid.sec.usace.army.mil*	Flooding concerns downstream from dams
Drought and Extreme Heat	Yes	• United States Drought Monitor *droughtmonitor.unl.edu* • NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents* • National Weather Service, Heat Index *w2.weather.gov/safety/heat* • NOAA National Centers for Environmental Information, Climate at a Glance *ncdc.noaa.gov/cag*	Historic incidents with damage
Earthquake	Yes	• Geological Survey of Alabama, Geologic Investigations Program, Geological Hazards *gsa.state.al.us/gsa/geologic/hazards/earthquakes* • USGS Earthquake Hazards Program *earthquake.usgs.gov/earthquakes/* • FEMA Earthquake Hazard Maps *fema.gov/emergency-managers/risk-management/earthquake/hazard-maps*	Proximity to Southeast US seismic zones

Natural Hazard	Risk	Source	Correlation with Bullock County
Flooding	Yes	• NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents* • ADECA Office of Water Resources, Alabama Flood Risk Information System *alabamaflood.com*	Historic events with damage; Identified flood hazard areas
Hail	Yes	• NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents*	Historic events
High Winds, Thunderstorms, Severe Storms	Yes	• NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents*	Historic events with damage
Hurricanes, Tropical Storms, Tropical Depressions	Yes	• NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents* • NOAA National Ocean Service *oceanservice.noaa.gov/hazards/hurricanes* • NOAA National Hurricane Center, National Hurricane Center Data Archive *http://www.nhc.noaa.gov/data/#tcr*	Historic events with damage
Landslides	Yes	• USGS Landslides Hazards Program *usgs.gov/natural-hazards/landslide-hazards* • Geological Survey of Alabama, Geologic Hazards, Landslides *gsa.state.al.us/gsa/geologichazards*	Areas susceptible to landslides
Land Subsidence/ Sinkholes	Yes	• Geological Survey of Alabama, Geologic Hazards, Sinkholes *gsa.state.al.us/gsa/geologichazards*	Areas susceptible to land subsidence / sinkholes
Lightning	Yes	• NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents*	Previous events in county
Tornadoes	Yes	• NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents*	Historic events with damage
Tsunami	No	• USGS Pacific Coastal and Marine Science Center *usgs.gov/centers/pcmsc/science/hazards*	Bullock County is an inland area in southeastern US
Volcano	No	• USGS Science Explorer, Natural Hazards, Volcanoes *usgs.gov/science/science-explorer,Natural+Hazards*	No active volcano sites near Bullock County
Wildfire	Yes	• Alabama Forestry Commission *Forestry.alabama.gov/Pages/Fire/Totals.aspx*	Historic incidents with damage, Susceptible areas
Winter / Ice Storms	Yes	• NOAA National Centers for Environmental Information, Storm Events Database *ncdc.noaa.gov/stormevents*	Historic events with damage

A review of FEMA's historical disaster declarations in Alabama indicates that Bullock County has been included in 23 disaster declarations since 1953, as compared to a total of 96 total declarations in the State of Alabama. Federal declarations that included Bullock County are listed in Figure 4.2.

Figure 4.2: Summary of Bullock County Disaster Declarations, 1953 to 2020

Declaration Number	Date	Incident Type	Declaration Title	Individual/Household Assistance	Individual Assistance	Public Assistance	Hazard Mitigation Assistance
DR-458-AL	3/14/1975	Flood	Severe Storms & Flooding	N	Y	Y	N
DR-488-AL	10/2/1975	Severe Storm(s)	Severe Storms, Tornadoes & Flooding	N	Y	Y	N
EM-3045-AL	7/20/1977	Drought	Drought	N	N	Y	N
DR-861-AL	3/21/1990	Severe Storm(s)	Severe Storms, Tornadoes & Flooding	N	Y	Y	N
EM-3096-AL	3/15/1993	Snow	Severe Snowfall, Winter Storm	N	N	Y	N
DR-1070-AL	10/4/1995	Hurricane	Hurricane Opal	N	Y	Y	N
DR-1466-AL	5/12/2003	Severe Storm(s)	Severe Storms, Tornadoes & Flooding	Y	Y	N	Y
DR-1549-AL	9/15/2004	Hurricane	Hurricane Ivan	Y	Y	Y	Y
DR-1593-AL	7/10/2005	Hurricane	Hurricane Dennis	N	N	Y	Y
EM-3237-AL	9/10/2005	Hurricane	Hurricane Katrina Evacuation	N	N	Y	N
EM-3292-AL	8/30/2008	Hurricane	Hurricane Gustav	N	N	Y	N
DR-1835-AL	4/28/2009	Severe Storm(s)	Severe Storms, Flooding, Tornadoes & Straight-Line Winds	N	N	Y	Y
DR-1842-AL	6/3/2009	Severe Storm(s)	Severe Storms, Tornadoes, Flooding & Straight-Line Winds	Y	N	Y	Y
EM-3319-AL	4/27/2011	Severe Storm(s)	Severe Storms, Tornadoes, and Straight-Line Winds	N	N	Y	N
DR-1971-AL	4/28/2011	Severe Storm(s)	Severe Storms, Tornadoes, Straight-Line Winds and Flooding	N	N	Y	Y
DR-4176-AL	5/2/2014	Severe Storm(s)	Severe Storms, Tornadoes, Straight-Line Winds and Flooding	N	N	Y	Y
DR-4251-AL	1/21/2016	Severe Storm(s)	Severe Storms, Tornadoes, Straight-Line Winds and Flooding	N	N	Y	Y
EM-3389-AL	9/11/2017	Hurricane	Hurricane Irma	N	N	Y	N
EM-3394-AL	10/8/2017	Hurricane	Hurricane Nate	N	N	Y	N
EM-3407-AL	10/12/2018	Hurricane	Hurricane Michael	N	N	Y	N
EM-3472-AL	3/13/2020	Biological	COVID-19	N	N	Y	N
DR-4503-AL	3/29/2020	Biological	COVID-19 Pandemic	Y	N	Y	N
EM-3545-AL	9/14/2020	Hurricane	Hurricane Sally	N	N	Y	N

Source: FEMA, Reports and Data, OpenFEMA Dataset: Disaster Declarations Summaries - v2 | FEMA.gov

Of the total federal declarations in the county, nine declarations were severe storm events that included tornadoes, straight-line winds, and flooding; and another nine declarations were hurricane events. Of the remaining declarations, two were biological related to the COVID-19 pandemic, one each was for drought, flooding and snow/winter storm.

When a federally declared disaster occurs, the State of Alabama and affected local jurisdictions are eligible to apply for federal reimbursement for debris removal, emergency services, and critical facility repair/replacement. Funding is also made available for hazard mitigation grants that allow for the implementation of mitigation projects that are listed in this plan. Public assistance was provided in all but one declaration; individual and households assistance was provided in four declarations; and individual assistance was provided in six declaration events. Although the amount of monetary assistance is not available for all disaster declarations, existing records indicate that more than $8 billion in individual assistance and more than $501 million in public assistance has been provided for disaster declarations that included Bullock County.

NOAA's National Centers for Environmental Information (NCEI) provides historic storm event data from January 1, 1950 to present day. This database was a primary source for storm event data for the hazard profiles and risk analysis. The database includes data drought, excessive heat, flooding, high wind events, wildfires, and winter/ice storm events. It does not provide data for dam failures, earthquakes, landslides, or land subsidence/sinkholes. Figure 4.3 provides a summary of storm events over the last 70 years in Bullock County. Past storm events are investigated more thoroughly for each hazard in the following hazard profile sections.

Figure 4.3: Summary of Bullock County Storm Events by Jurisdiction, 1950 to 2020

Location	Number of Events	Number of Deaths	Number of Injuries	Property Damage	Crop Damage
Countywide	122	0	3	$3,148,000	$1,085,000
Unincorporated Bullock County	51	0	0	$521,000	$0
Town of Midway	9	0	0	$148,000	$0
City of Union Springs	23	0	0	$164,000	$9,000
Total	205	0	3	$3,981,000	$1,094,000

Source: NOAA National Centers for Environmental Information, Storm Events Database
https://www.ncdc.noaa.gov/stormevents

The following sections provide a profile of each of the 13 hazards that have been identified as having had or have the potential to impact Bullock County and the jurisdictions located therein. Each hazard profile includes the following:

Description Includes general definitions and descriptions of the hazard, it characteristics and potential effects.

Location Provides information on the geographic area, or areas, within Bullock County that may be susceptible to hazard occurrences. Locations affected are described regionally unless a specific jurisdiction has different risks, which is further explained.

Extent Provides information on the potential strength or magnitude of the hazard.

Previous Occurrences Provides information on the history of previous hazard events in the planning area, including their impacts.

Probability of Future Events Describes the likelihood of future hazard events in Bullock County based on the information provided including previous occurrences and other risk factors. Many hazards may affect the county, while other hazards are more localized due to specific factors. Probability is described as a percentage of risk that the event will occur in the future. The probability (%) that an identified hazard will occur on an annual basis was determined using the following formula:

$$\frac{\textit{Number of historical events}}{\textit{by the number of years in reporting period}} = \textit{Probability of Future Annual Event Occurrences}$$

Because of the lack of comprehensive quantitative data on many of the hazards, the impact of, or susceptibility to, future damage will be noted by categories of High, Medium, Low or Very Low as described below:

High:	Probable major damage in a 1-10 Year Period
Medium:	Probable major damage in a 10-50 Year Period
Low:	Probable major damage in a 100 Year Period
Very Low:	No probable major damage in a 100 Year Period

4.2 DAM FAILURE

Description.
A dam is a "barrier across flowing water that obstructs, directs or slows down the flow, often creating a reservoir, lake or impoundments". Most dams have a section that is called a spillway or a weir that water may flow through or over either intermittently or continuously. Dam failure occurs when the structural dam no longer creates a sound barrier to the flowing water. Dam failure can occur with little to no warning. Further, dam failure does not always occur during a storm event. Dam failure can result in flash flooding or severe inundation depending on the severity of the dam failure. Breaching can occur very quickly after the beginning of a storm event or can occur over an extended period of time up to a couple of weeks after a storm event from increased water pressure on the dam structure. Flooding can also occur from if a dam operator releases excess water downstream to relieve the water pressure on a dam.

Location.
There are 51 dams in Bullock County according to the U.S. Army Corps of Engineers (USACE) National Dam Inventory (NID). All dams are privately owned except for three dams that are owned by the Bullock County Commission. The three publicly-owned dams are watershed sites located in the same general vicinity in the southwest part of the county, but on the different streams: East Creek, Mountain Creek and Bughall Creek. All of the dams in the county are earth dams, with an average age of 52 years. None of the dams in the county are regulated by either the State of Alabama or any federal agency, and none of the dams are used for hydropower purposes. A list of the known existing dams is provided below, and their location is shown in Figure 4.5.

Figure 4.4: Bullock County Dams

NID ID	DAM NAME	OWNERSHIP	YEAR COMPLETED	DAM LENGTH (feet)	NID DAM HEIGHT (feet)	NID STORAGE (acre feet)	NID HAZARD RATING
AL00187	TROY ROD AND GUN CLUB	PRIVATE	1958	950	18	129	L
AL00253	OLD TOWN CREEK W/S DAM SITE 37	PRIVATE	1974	2380	20	1741	L
AL00254	OLD TOWN CREEK W/S DAM SITE 32	PRIVATE	1974	1575	34	6543	S
AL00255	OLD TOWN CREEK W/S DAM SITE 31	PRIVATE	1974	1922	20	2510	L
AL00256	OLD TOWN CREEK W/S DAM SITE 25	BULLOCK CO. COMMISSION	1973	1750	32	2270	L
AL00257	OLD TOWN CREEK W/S DAM SITE 24	BULLOCK CO. COMMISSION	1973	1980	36	3050	L
AL00258	OLD TOWN CREEK W/S DAM SITE 26	BULLOCK CO. COMMISSION	1973	2498	35	3215	L
AL00259	JIM MITCHELL	PRIVATE	1972	1600	14	130	L
AL00260	GIBSON	PRIVATE	1956	760	15	130	L
AL00261	COLLEY POND	PRIVATE	1946	450	36	196	S
AL00262	MAYTAG LAKE NO 1	PRIVATE	1930	575	20	160	S
AL00263	RUTLAND POND	PRIVATE	1955	560	12	56	L
AL00264	HOBBIE LEE	PRIVATE	1947	500	13	75	L
AL00265	WHITE OAK NO 1	PRIVATE	1946	510	19	102	L

NID ID	DAM NAME	OWNERSHIP	YEAR COMPLETED	DAM LENGTH (feet)	NID DAM HEIGHT (feet)	NID STORAGE (acre feet)	NID HAZARD RATING
AL00266	SMUTEYE POND	PRIVATE	1947	415	13	72	L
AL00267	ENON POND NO 1	PRIVATE	1960	530	18	109	L
AL00268	FORRER NO 1	PRIVATE	1969	779	20	90	L
AL00269	PAULK POND	PRIVATE	1979	400	20	135	L
AL00270	MCGHEE POND	PRIVATE	1960	850	15	150	L
AL00273	BARNETT POND	PRIVATE	1941	575	15	50	L
AL00274	SEHOY	PRIVATE	1956	600	12	50	S
AL00275	VARNER LAKE	PRIVATE	1954	700	16	160	L
AL00276	GREEN	PRIVATE	1954	910	22	137	L
AL00277	SORRELL	PRIVATE	1940	400	20	94	L
AL00278	BEAR POND	PRIVATE	1956	560	24	106	L
AL00280	FORRER NO 2	PRIVATE	1969	729	17	117	L
AL00281	WHITE OAK NO 2	PRIVATE	1946	515	19	134	L
AL00282	MAYTAG NO 2	PRIVATE	1972	725	14	137	L
AL00283	ENON NO 2	PRIVATE	1946	620	36	224	L
AL01891	HENDERSON LAKE DAM	PRIVATE	1965	400	18	50	S
AL01892	C F GREEN LAKE DAM	PRIVATE	1968	400	15	56	S
AL01893	O H WILLIAMS LAKE DAM	PRIVATE			0	0	S
AL01894	SCHORR LAKE DAM	PRIVATE	1972	500	20	61	L
AL01895	MCCLEAN LAKE DAM	PRIVATE	1970	300	18	54	L
AL01896	HOFF POND DAM	PRIVATE	1968	500	18	50	L
AL01897	SEHOY PLANTATION LAKE DAM	PRIVATE	1974	2400	44	10443	S
AL01898	GEORGE TURNIPSEED	PRIVATE	1977	475	20	141	L
AL01899	BOB WEHLE	PRIVATE	1973	525	18	135	L
AL01900	LAKE VANN DAM	PRIVATE	1975	2100	27	1500	S
AL01991	BEAR BROTHERS	PRIVATE	1956	700	16	97	L
AL01992	CHARLIE TRUSSELL	PRIVATE	1978	350	17	71	L
AL01993	KING LAKE	PRIVATE	1983	650	21	613	L
AL01994	OLD TOWN CREEK W/S DAM SITE 22	PRIVATE	1975	3240	24	3293	L
AL01995	OLD TOWN CREEK W/S DAM SITE 29	PRIVATE	1975	2000	24	3930	L
AL01996	OLD TOWN CREEK W/S DAM SITE 28	PRIVATE	1975	2340	21	5370	L
AL01997	PINKSTON POND	PRIVATE	1955	600	14	100	L
AL01998	THOMAS DAM	PRIVATE	1969	425	17	63	L
AL02334	DAVID TUTT	PRIVATE	1986	650	17.4	330	L
AL02367	DAVID TUTT	PRIVATE	1988	750	24	510	L
AL02471	W A CUTHEN	PRIVATE	1993	300	16.5	143	L
AL02587	STONE PROPERTIES	PRIVATE	2002	690	17	86.24	L

Source: US Army Corps of Engineers, National Inventory of Dams, Downloads (Public)
Downloads (Public) (army.mil)

Extent.
The potential extent of dam failure may be classified by their "hazard potential". The "hazard potential" for dams indicates the probable damage that would occur if the dam failed, in regard to human life and property damage. The Federal Guidelines for Dam Safety presents three classifications for Dam Hazard Potential:

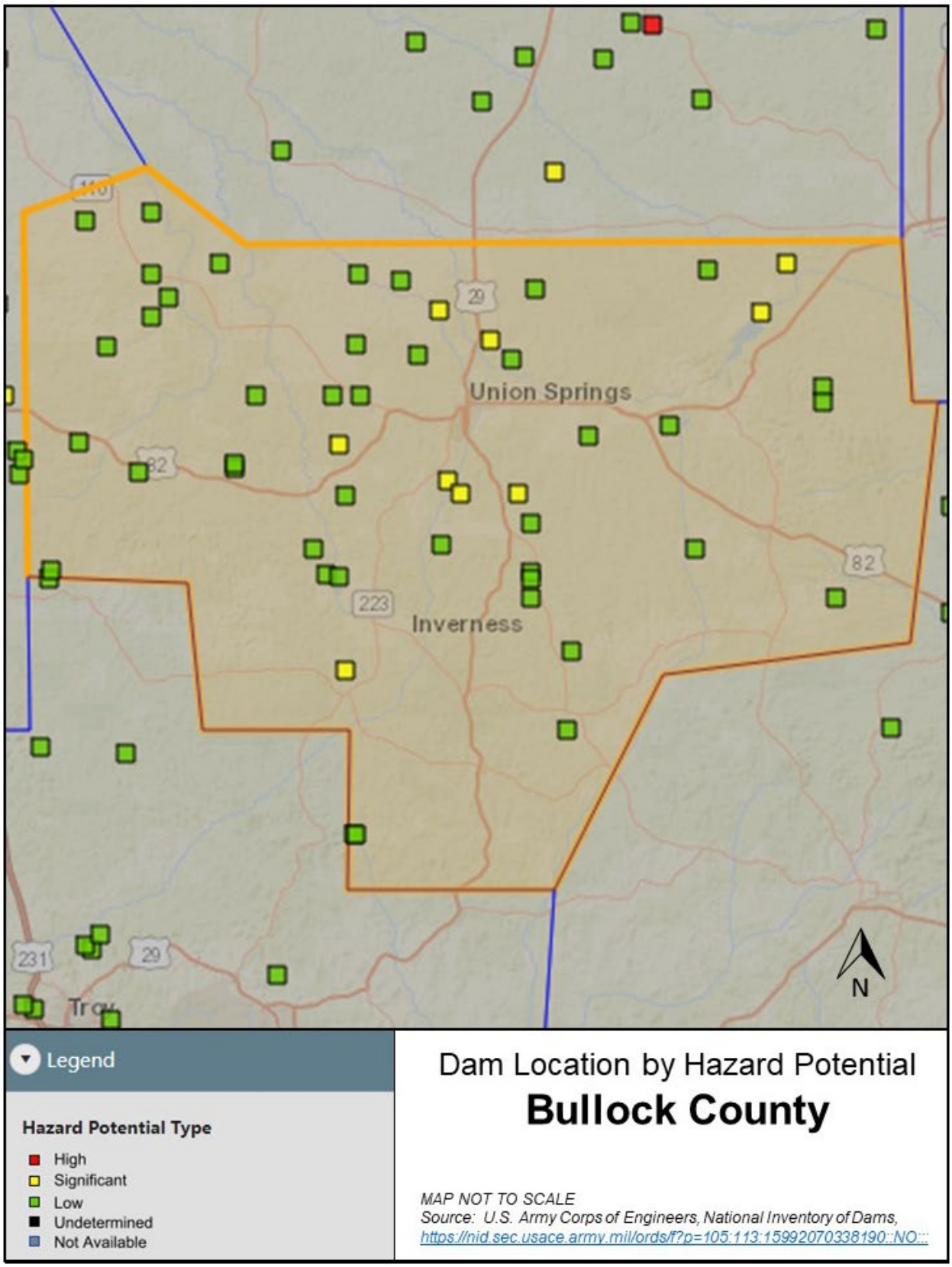
High:	Loss of human life is likely if the dam fails
Significant:	No probable loss of human life but can cause economic loss, environmental damage, disruption of essential services/utilities, or impact other concerns
Low:	Failure or mis-operation will result in no probable loss of human life and low economic and/or environmental loss.

As shown in the Bullock County Dam Location Map, there are nine dams in the county that are rated as having a significant hazard potential, while the remaining 42 dams are rated as having a low hazard potential. None of the dams are rated as being a high hazard potential. Of the nine dams having a significant hazard potential rating, none are located within a municipal jurisdiction. Two are located north of Union Springs and three are located south of Union Springs. The remaining four are located in sparsely populated rural areas. Of these nine dams, the tallest is 44 feet high with storage of 10,443 acre feet. This is the Sehoy Plantation Lake Dam located on Cowikee Creek off of Alabama Highway 51 in northeast Bullock County. There are three other dams with a height greater than 25 feet that have a significant hazard potential rating. These include the following: Colley Pond Dam, at 36 feet with 196 acre feet of storage; Old Town Creek Watershed Dam Site 32, at 34 feet with 6,543 acre feet of storage; and Lake Vann Dam, at 27 feet with 1,500 acre feet of storage.

Localized studies of the NID data conducted by the Alabama Office of Water Resources (OWR) have shown that many NID points are not spatially accurate and do not represent the potential hazards with the particular dams. There are also private dams in many areas that are not necessarily known by local authorities. In 2008, the OWR began the process of developing a dam inventory, which will include classifying hazard potential. However, the OWR inventory has not been completed at this time.

Historical Occurrences.
There is no record of dam failure in Bullock County, nor do any of the historical flooding event reports available through NOAA's National Centers for Environmental Information Storm Event Database cite dam failure as a contributing factor. Further, these is no local knowledge or hearsay regarding past dam failures. It is likely that the lack of reporting requirements may impact the number of known local dam failures if they were not of major significance.

Figure 4.5: Bullock County Dams by Location and Hazard Potential



Probability of Future Events.
Because of dated and incomplete information pertaining to dam classification in Alabama, it is difficult to ascertain which dams are more susceptible to failure than others. Bullock County has experienced no reported dam failures (0) in the last 21 years and hazard mitigation planning participants and local officials feel that dam failure is an unlikely occurrence. Therefore, the probability of future events is **0.0 percent**. As shown in Figure 4.6, the impact of a future dam failure for all jurisdictions in Bullock County is considered to be **Low** since flooding as a result of dam failure would most likely be localized in an undeveloped area. There is no change in the probability of future dam failure since the last update of the Bullock County Hazard Mitigation Plan in 2013 and the draft plan in 2018.

Figure 4.6: Dam Failure Summary and Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	0 Events	0 Events	0 Events	0 Events
Extent	0	0	0	0
Probability of Future Events	0%	0%	0%	0%
Damage Per Event	$0	$0	$0	$0
Impact of Future Events	Very Low	Very Low	Very Low	Very Low

Bullock County experienced 3 flood events in a 5 year period resulting in a less than 50% (0.33) probability that a flood event will occur on an annual basis. The total amount of damages for the 3 flood events was $120,000 with 3 flood events causing damage resulting in an estimated $55,000 of expected annual damages from future events.

4.3 DROUGHT AND EXTREME HEAT

Description.
Drought is a complex natural hazard and is a normal part of virtually every climate on the planet, including areas of both high and low normal rainfalls. Drought is the result of a natural decline in the expected precipitation over an extended period of time, typically one or more seasons in length. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity. The Alabama State Hazard Mitigation Plan (published July 18, 2018) states, "Although there is no single, concise definition of a drought, droughts can be grouped into four general types." The four types of drought are shown in Figure 4.7.

Figure 4.7: Types of Drought

Drought Type	Description/Definition
Meteorological	Defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount basedon monthly, seasonal, or annual time scales.
Hydrological	Related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural	Defined principally in terms of soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic	Associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of a weather-related supply shortfall. This type of drought may also be called a water management drought.

Source: State Hazard Mitigation Plan, State of Alabama; July 18, 2018. https://alabamaema.files.wordpress.com/2018/11/state-of-alabama_state-hazard-mitigation-plan-2018-update_final_07182018.pdf

There may also be an event called a water management drought. A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. Due to its multidimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering of effects of an event after its apparent end. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast with other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by many governments.

Droughts may cause a shortage of water for human and industrial consumption, hydroelectric power, recreation, and navigation. Water quality may also decline, and the number and severity of wildfires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and higher unemployment.

Extreme heat is defined as a period of high heat and humidity with temperatures above 90 degrees for at least two to three days. A heat wave is an extended period of extreme heat and is often accompanied by high humidity. Heat stress can be indexed by combining the effects of temperature

and humidity. The index estimates the relationship between dry bulb temperatures (at different humidity) and the skin's resistance to heat and moisture transfer. The higher the temperature or humidity, the higher the apparent temperature. These abnormally high temperatures can disproportionately affect the elderly, very young, and those with health concerns if exposed to the conditions, especially those without effective climate control systems. In addition to affecting people, severe heat places significant stress on plants and animals. The effects of severe heat on agricultural products, such as cotton, may include reduced yields and even loss of crops. Similarly, cows may become overheated, leading to reduced milk production and other problems.

Location.
All of Bullock County is susceptible to drought and extreme heat due to its location in the southeastern United States, which is prone to unpredictable precipitation patterns including extended periods of below-average rainfall. Temperatures of 90 degrees or more are regularly observed in the summer months, with 100-degree temperatures being possible. These conditions can be dangerous and even life-threatening for humans who do not take the proper precautions. Throughout the planning area, extreme heat tends to occur in conjunction with drought conditions.

Extent.
According to the U.S. Drought Monitor, located at the National Drought Mitigation Center at the University of Nebraska-Lincoln, no two states experience the same set of impacts during a drought. Therefore, tables were developed with drought impacts that have been reported in each state, for each U.S. Drought Monitor (USDM) category, during the onset of a major drought. For extent of drought, the U.S. Drought Monitor classifies drought in five levels of severity, based on multiple indicators including soil moisture, streamflow levels, precipitation levels, and local observations. These classifications for Alabama, ranging from D0 to D4, are listed in Figure 4.8.

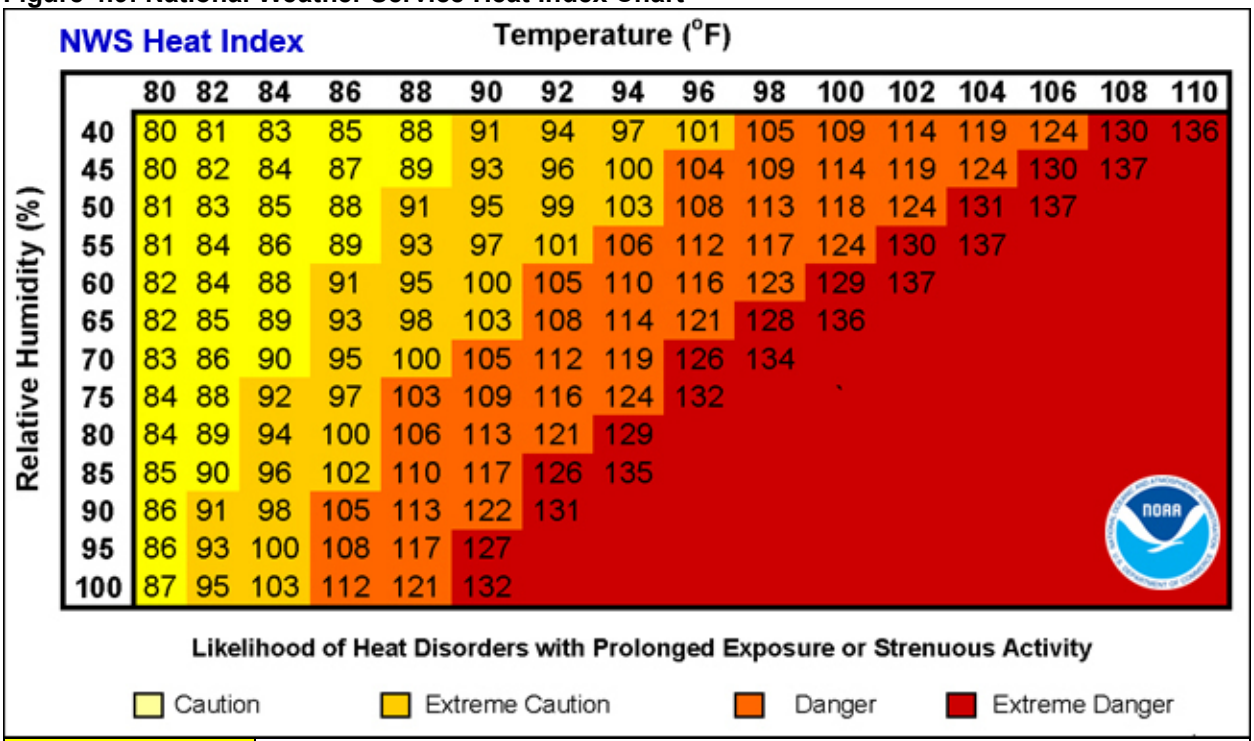
Figure 4.8: Drought Monitor Classification Scheme for Alabama

Category	Impact
D0 Abnormally Dry	• Forage crops and pasture are stressed; producers feed livestock early • Ground is hard • Agriculture ponds and creeks begin to decline
D1 Moderate Drought	• Cash crop growth and yield are low • National forests implement campfire and firework bans • Streams and ponds are low • Fire activity increases
D2 Severe Drought	• Crops are damaged, especially dryland corn • Burn bans begin • Large cracks appear in foundations of homes • Large surface water levels drop; agricultural ponds, streams have dried up • Saltwater intrusion occurs in rivers and bays; saltwater wildlife migrates upstream • Hydroelectric power decreases; navigation is limited
D3 Extreme Drought	• Soybean pods shatter • Large-scale hay shortages occur; producers sell livestock • Wildfire count and fire danger continue to increase • Landscape growth is stunted, needs irrigation; Christmas tree growth is stunted • Ground has noticeable cracks; road damage has occurred • Low flow in rivers and lakes affects recreation • Water mains break daily in large municipalities; water conservation is implemented • Air quality is poor

Category	Impact
D4 Exceptional Drought	• Trees and shrubs are defoliated; grass is brown; landscaping projects are delayed • Wildfire count is very high • Lakes are extremely low; large municipalities implement water restrictions; water prices increase

The extent of extreme heat can be quantified in terms of the heat index which is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature. As an example, if the air temperature is 96°F and the relative humidity is 65 percent, the heat index, or how hot it feels, is 121°F. The National Weather Service provides a heat index chart, shown in Figure 4.9, that enables calculation of the heat index depending on local temperatures and humidity. The heat index is color-coded and categorized into four levels of danger: caution, extreme caution, danger and extreme danger. The danger levels are also defined in Figure 4.9. The National Weather Service will initiate alert procedures when the heat index is expected to exceed 105°F to 110°F for at least two consecutive days. Extreme heat can endanger the health of persons living and working within Bullock County and can also threaten economical damage by resulting in crop losses.

Figure 4.9: National Weather Service Heat Index Chart



80°-89°	Fatigue is possible with prolonged exposure and/or physical activity.
90°-104°	Sunstroke, heat cramps and heat exhaustion are possible with prolonged exposure and/or physical activity.
105°-129°	Sunstroke, heat cramps and heat exhaustion are likely. Heat stroke is possible with prolonged exposure and/or physical activity.
130°+	Heatstroke/sunstroke is highly likely with continued exposure.

Source: NOAA, National Weather Service. https://www.weather.gov/safety/heat-index

Health conditions that result from extreme heat range from mild to severe. These conditions include sunburn, heat cramps, heat exhaustion, heat syncope, and heat stroke, as described below:

- Heatstroke is considered a medical emergency and is often fatal. It exists when body temperature rises above 104°F because of environmental temperatures. Patients may be delirious, stuporous, or comatose. The death to care ratio in reported cases averages about 15 percent.
- Heat Exhaustion is much less severe than heatstroke. The body temperature may be normal or slightly elevated. A person suffering from heat exhaustion may complain of dizziness, weakness or fatigue. The primary cause of heat exhaustion is fluid and electrolyte imbalance. The normalization of fluids will typically alleviate the situation.
- Heat Syncope is typically associated with exercise by people who are not acclimated to exercise. The symptom is a sudden loss of consciousness. Consciousness returns promptly when the person lies down. The cause is primarily associated with circulatory instability as a result of heat. The condition typically causes little or no harm to the individual.
- Heat Cramps are typically a problem for individuals who exercise outdoors but are unaccustomed to heat. Similar to heat exhaustion it is thought to be a result of a mild imbalance of fluids and electrolytes.

According to the U.S. Drought Monitor, Bullock County has experienced abnormally dry to moderate and severe drought conditions with regularity over the last 20 years. Figure 4.10, shows the most severe drought conditions in Bullock County between 2000 and 2020 while Figure 4.11 provides a timeline of the extent and severity of drought conditions in Bullock County in the same time frame. The county has suffered D4 Exceptional Drought conditions on two occasions from July through September 2000 and from August through December 2007. Additionally, Bullock County has experienced D3 Extreme Drought conditions in 2000, 2006, 2008, 2011, 2012 and 2016. Since Bullock County has significant agricultural uses that are adversely affected by drought conditions, drought and extreme heat are potentially serious economic threats to the county. Drought can also be a contributing factor to wildfires in the county's forested areas.

Figure 4.10: U.S. Drought Monitor Conditions, 2000, 2007, 2011 and 2016

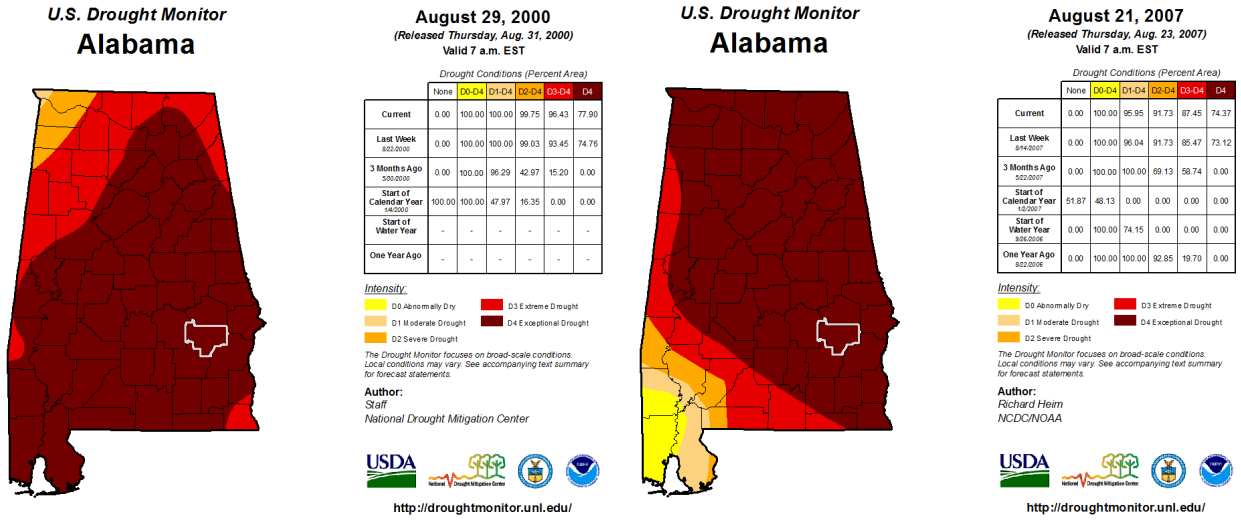
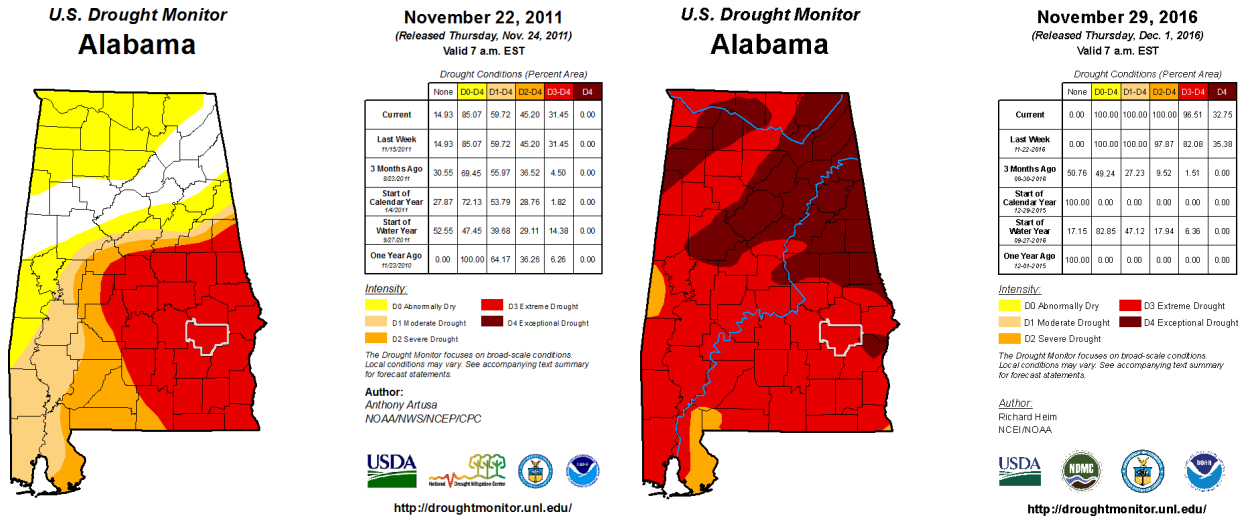
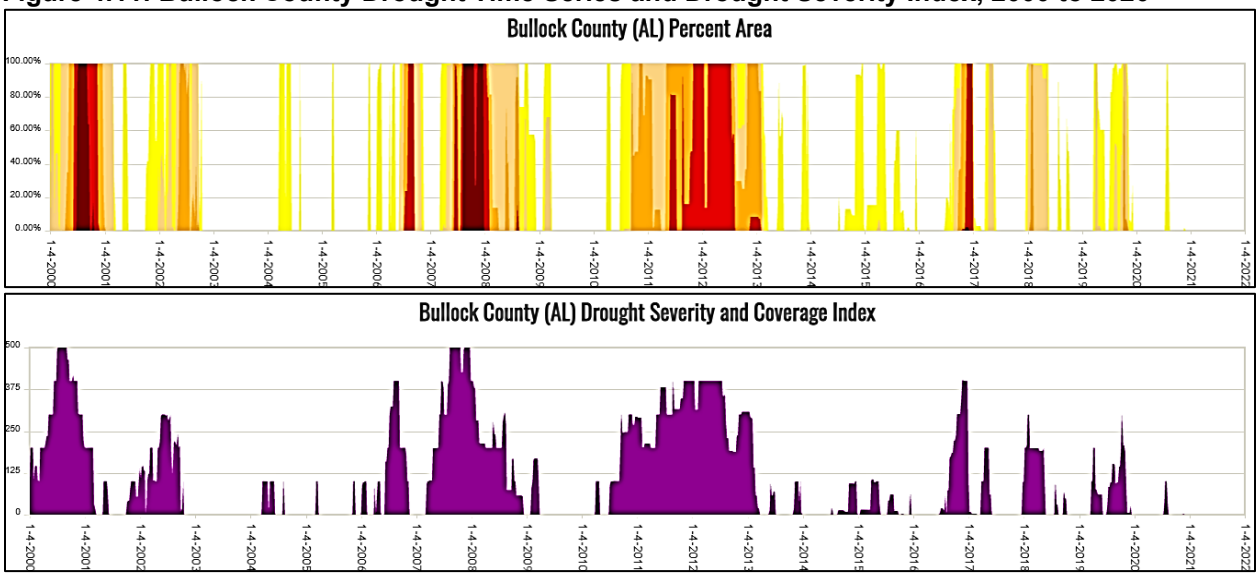


Figure 4.10: National Weather Service Heat Index Chart, continued



Source: U.S. Drought Monitor, https://droughtmonitor.unl.edu/Maps/MapArchive.aspx

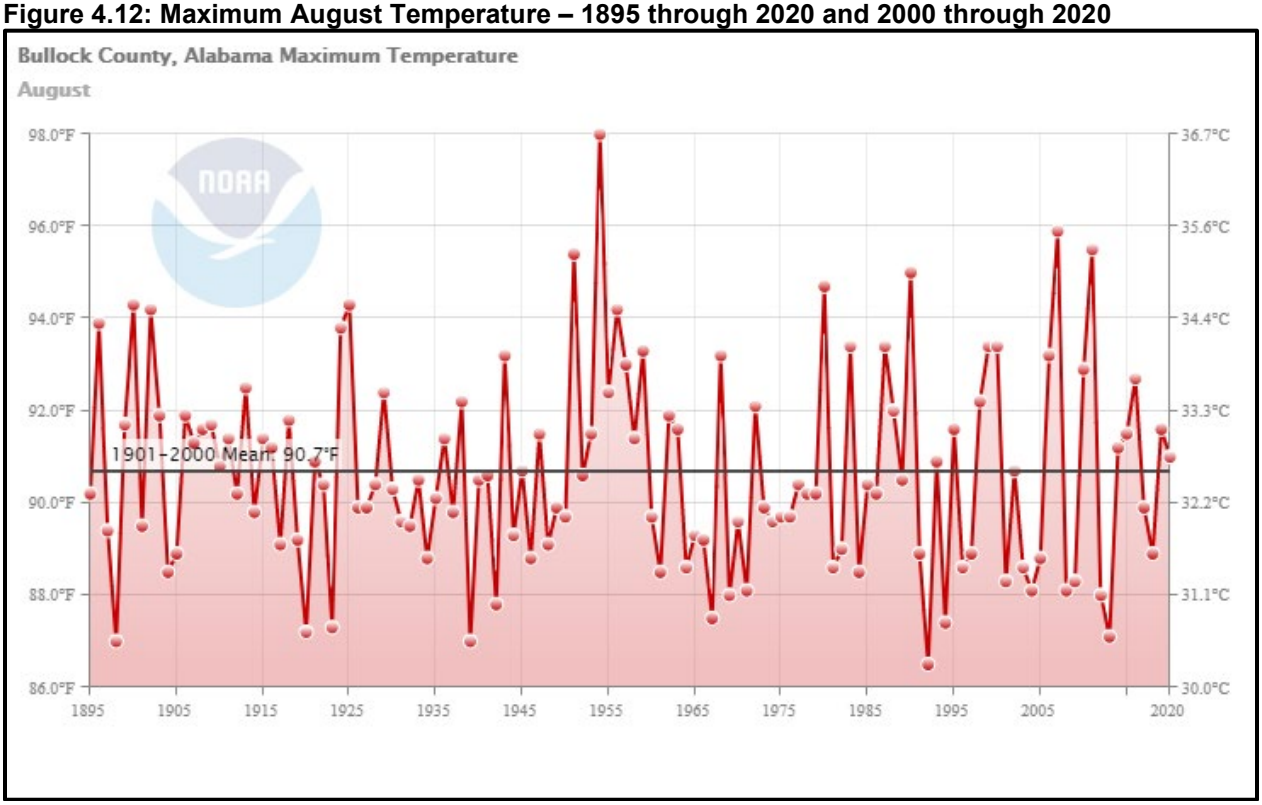
Figure 4.11: Bullock County Drought Time Series and Drought Severity Index, 2000 to 2020

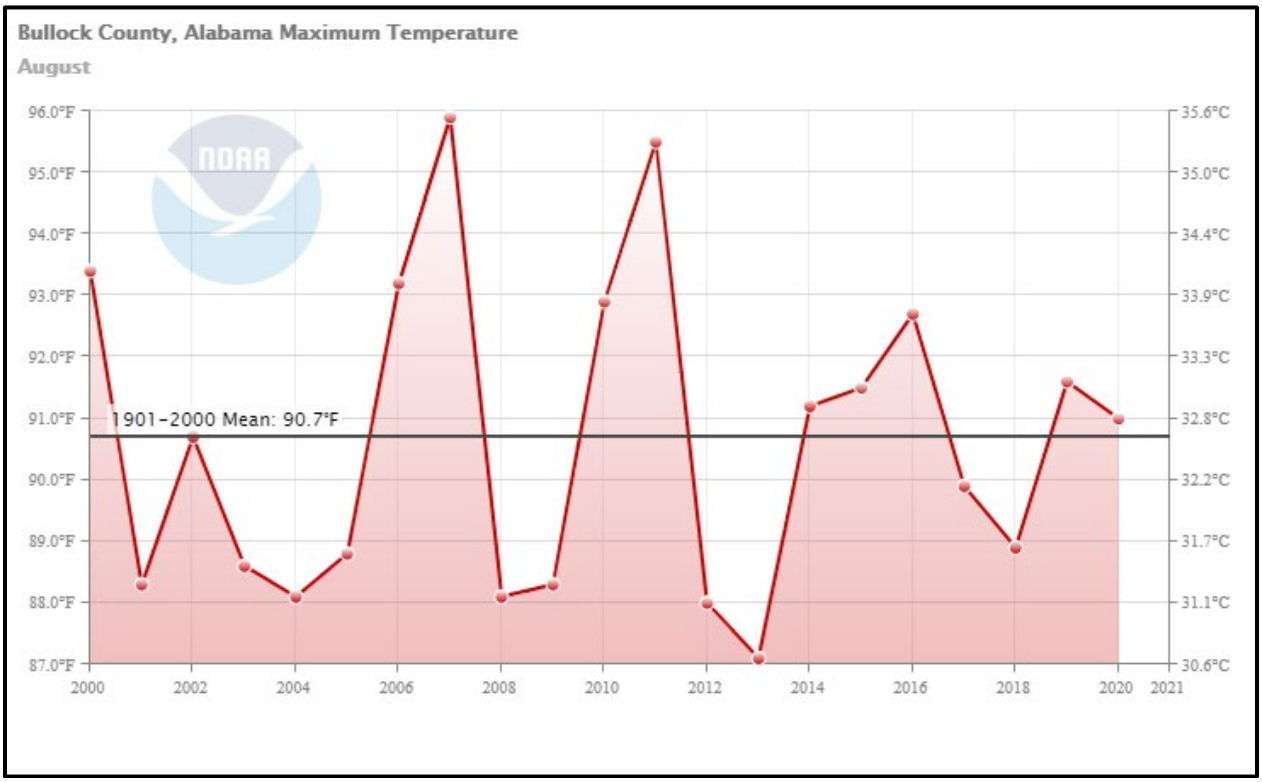


Source: U.S. Drought Monitor, https://droughtmonitor.unl.edu/Data/Timeseries.aspx

August is the generally the hottest month in Bullock County. According to the NCEI Climate at a Glance data, Bullock County had its highest recorded temperature in August of 1954, at 98.0°F. In the last 21 years from 2000 through 2020, the hottest temperatures occurred in July 2000 at 96.2°F, August 2007 at 95.9°F, and in August 2011 at 95.5°F. A heat index value for these temperature dates is not available. If a moderate relative humidity of 65% is applied, however, any temperature above 92.0°F would result in a heat index in the danger zone, and temperatures of 98.0°F and above would be in the extreme danger zone.

Figure 4.12: Maximum August Temperature – 1895 through 2020 and 2000 through 2020





NOAA National Centers for Environmental information, Climate at a Glance: County Time Series. https://www.ncdc.noaa.gov/cag/

Event notes in the NCEI Storm Events Database report that in August 2007, Bullock County was included in a 35-county heat wave that saw temperatures above 105.0°F up to 109.0°F. As a result of the multiple county event, 11 people died due to heat-related illness and 408 people required medical treatment due to the heat. In June 2012, Bullock County was included in a heat wave event that lasted through early July and affected 39 counties. According to the database report, afternoon highs rose to 100.0°F or greater. With a moist airmass in place, heat index values reached over 105.0°F degrees in many places. Two fatalities resulted from heat stress due to the above normal heat conditions, and 19 heat-related illnesses we4re reported to the Alabama Department of Public Heath during the heat wave. In July 2012, Bullock County again had unseasonably warm weather and record setting temperatures that began in June and extended into early July. Temperatures were over 100.0°F with heat indexes over 105.0°F. The 2012 heatwave impacted 38 counties and resulted in one death and 47 heat-related illnesses.

Historical Occurrences.

On July 20, 1977, FEMA announced an emergency declaration for drought covering the State of Alabama (EM-3045-AL), including Bullock County. Public assistance was provided to local governments; however the declaration was not eligible for individual assistance. Quantification of drought occurrences are not easily classified, due to those conditions providing differing effects based on reliance on agricultural, hydrological, or socioeconomic concerns. Therefore, the NOAA National Centers for Environmental Information (NCEI) and the U.S. Drought Monitor were utilized to obtain data for drought and extreme heat events from January 1, 2000 through December 31, 2020. NCEI data indicates that there were a total of 50 drought and heat events affecting Bullock County in the 21-year time period, of which 47 events were drought and three events were heat. None of the events, however, resulted in death, injury, property damage or crop damage, as shown in Figure 4.13.

Figure 4.13: Drought and Heat Events, 2000 through 2020

Location	Date	Event Type	Mag	Deaths	Injuries	Property Damage	Crop Damage
Countywide	7/11/2006	Drought		0	0	$0	$0
Countywide	8/1/2006	Drought		0	0	$0	$0
Countywide	9/1/2006	Drought		0	0	$0	$0
Countywide	6/5/2007	Drought		0	0	$0	$0
Countywide	7/1/2007	Drought		0	0	$0	$0
Countywide	8/1/2007	Drought		0	0	$0	$0
Countywide	8/8/2007	Heat		0	0	$0	$0
Countywide	9/1/2007	Drought		0	0	$0	$0
Countywide	10/1/2007	Drought		0	0	$0	$0
Countywide	11/1/2007	Drought		0	0	$0	$0
Countywide	12/1/2007	Drought		0	0	$0	$0
Countywide	1/1/2008	Drought		0	0	$0	$0
Countywide	2/1/2008	Drought		0	0	$0	$0
Countywide	3/1/2008	Drought		0	0	$0	$0
Countywide	4/1/2008	Drought		0	0	$0	$0

Countywide	7/29/2008	Drought		0	0	$0	$0
Countywide	8/1/2008	Drought		0	0	$0	$0
Countywide	1/1/2011	Drought		0	0	$0	$0
Countywide	2/1/2011	Drought		0	0	$0	$0
Countywide	3/1/2011	Drought		0	0	$0	$0
Countywide	4/5/2011	Drought		0	0	$0	$0
Countywide	5/10/2011	Drought		0	0	$0	$0
Countywide	6/1/2011	Drought		0	0	$0	$0
Countywide	7/1/2011	Drought		0	0	$0	$0
Countywide	8/1/2011	Drought		0	0	$0	$0
Countywide	9/1/2011	Drought		0	0	$0	$0
Countywide	10/1/2011	Drought		0	0	$0	$0
Countywide	11/1/2011	Drought		0	0	$0	$0
Countywide	11/1/2011	Drought		0	0	$0	$0
Countywide	12/1/2011	Drought		0	0	$0	$0
Countywide	1/1/2012	Drought		0	0	$0	$0
Countywide	2/1/2012	Drought		0	0	$0	$0
Countywide	3/1/2012	Drought		0	0	$0	$0
Countywide	4/1/2012	Drought		0	0	$0	$0
Countywide	5/1/2012	Drought		0	0	$0	$0
Countywide	6/1/2012	Drought		0	0	$0	$0
Countywide	6/30/2012	Heat		0	0	$0	$0
Countywide	7/1/2012	Drought		0	0	$0	$0
Countywide	7/1/2012	Heat		0	0	$0	$0
Countywide	8/1/2012	Drought		0	0	$0	$0
Countywide	9/1/2012	Drought		0	0	$0	$0
Countywide	10/1/2012	Drought		0	0	$0	$0
Countywide	11/1/2012	Drought		0	0	$0	$0
Countywide	12/1/2012	Drought		0	0	$0	$0
Countywide	1/1/2013	Drought		0	0	$0	$0
Countywide	2/1/2013	Drought		0	0	$0	$0
Countywide	10/18/2016	Drought		0	0	$0	$0
Countywide	11/1/2016	Drought		0	0	$0	$0
Countywide	12/1/2016	Drought		0	0	$0	$0
Countywide	1/1/2017	Drought		0	0	$0	$0
Countywide	1/23/2018	Drought		0	0	$0	$0
Countywide	2/1/2018	Drought		0	0	$0	$0

Source: NOAA, National Centers for Environmental Information, Storm Events Database.
https://www.ncdc.noaa.gov/stormevents

Probability of Future Events.

Normally in Bullock County, rainfall occurs consistently throughout the year, but there are occasions that drought conditions will occur. This type of hazard can affect Bullock County's agricultural uses and contribute to wildfire incidents. Extreme heat and drought conditions can potentially affect the entire county by stressing citizens and the municipal and agricultural water supply. Bullock County experienced 50 drought and heat events in a 21-year period resulting in a greater than 100% (2.4) probability that a drought event will occur on an annual basis. The total amount of damages for the 50 drought events was $0 with no drought events causing damage resulting in an estimated $0 of expected annual damages from future events. Although the probability of future events of drought and extreme heat in Bullock County is relatively high, most jurisdictions can manage mild cases of drought and heat waves, rendering minor impacts most of the time. Therefore, the likelihood of probability for impactful drought and extreme heat events for the county and all jurisdictions is **Medium**, with probable major damage in a 10 to 50-year period. There is no change in the probability of a drought and/or extreme heat hazard event since the last update of the Bullock County Hazard Mitigation Plan in 2013 and the draft plan in 2018.

Figure 4.14: Drought and Heat Summary and Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	50 Events	50 Events	50 Events	50 Events
Drought Extent/ Extreme Heat Extent	D4 Drought/ Extreme Danger @105°F	D4 Drought/ Extreme Danger @105°F	D4 Drought/ Extreme Danger @105°F	D4 Drought/ Extreme Danger @105°F
Probability of Future Events	100%	100%	100%	100%
Damage Per Event	$0	$0	$0	$0
Impact of Future Events	Medium	Medium	Medium	Medium

4.4 EARTHQUAKE

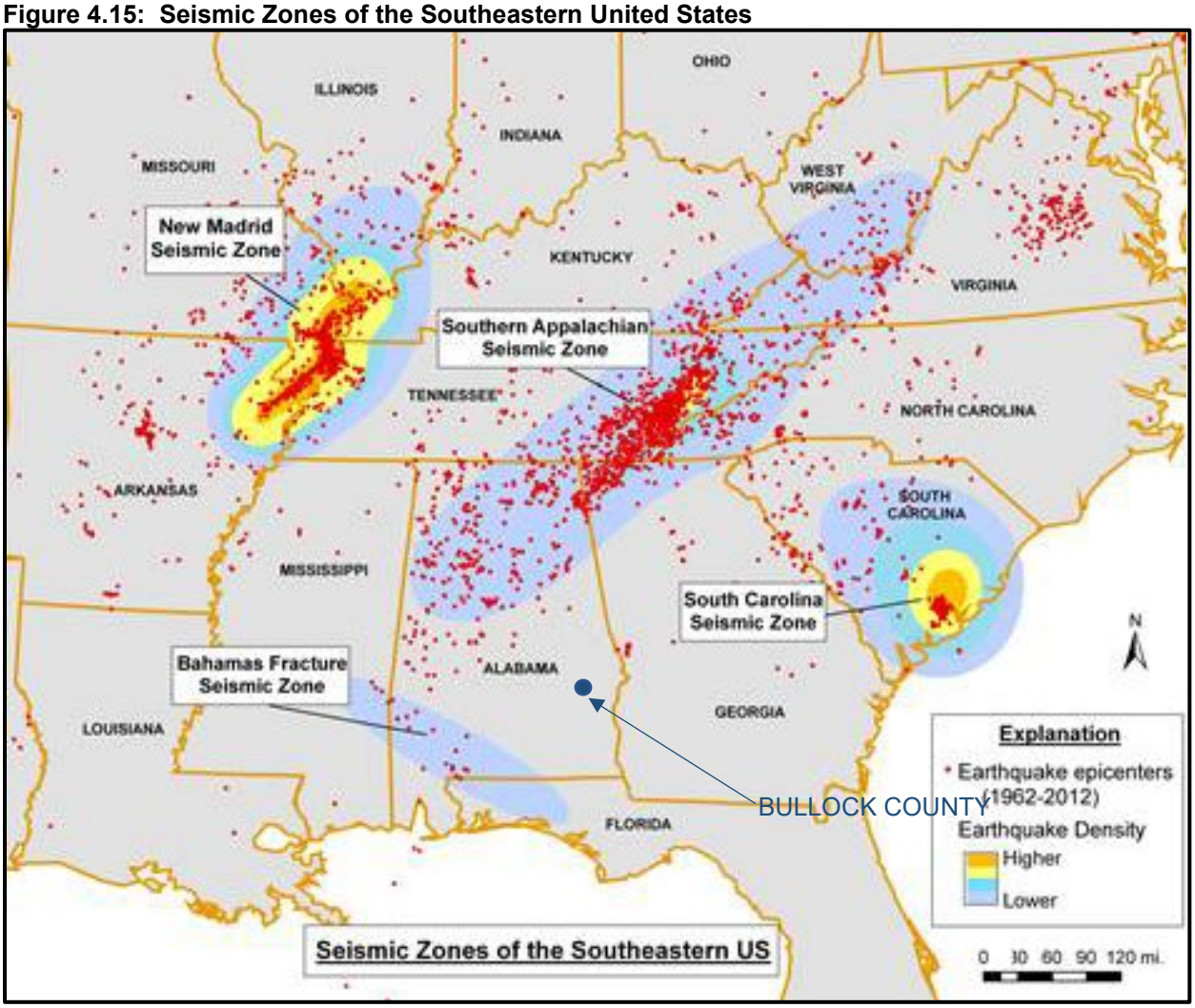
Description.
An earthquake is ground shaking caused by a sudden movement of rock in the earth's crust. Such movements occur along faults, which are thin zones of crushed rock separating blocks of crust. When one block suddenly slips and moves relative to another along a fault, the energy released creates vibrations called seismic waves that radiate up through the crust to the earth's surface, causing the ground to shake. Earthquakes may last only a few seconds or may continue for up to several minutes. They can occur at any time of the day or night and at any time of the year. They are caused by stress that builds up over time as blocks of crust attempt to move but are held in place by friction along a fault. (The earth's crust is divided into large plates that continually move over, under, alongside or apart from one another atop the partly molten outer layer of the earth's core.) When the pressure to move becomes stronger than the friction holding them together, adjoining blocks of crust can suddenly slip, rupturing the fault and creating an earthquake. Earthquakes have little to no warning, and they can cause property damage on the surface and subsurface by destroying buildings, utility lines, communications, and infrastructure. Secondary hazards include surface faulting, sinkholes, and landslides. While most earthquakes occur near the edges of the tectonic plates, earthquakes may also occur at the interior of plates.

The vibration or shaking of the ground during an earthquake is described by ground motion. The severity of ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. Ground motion causes waves in the earth's interior, also known as seismic waves, and along the earth's surface, known as surface waves. The following are the two kinds of seismic waves:

- P (primary) waves are longitudinal or compression waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel (vertical motion), with particle motion in the same direction as wave travel. They move through the earth at approximately 15,000 miles per hour.
- S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side-to-side (horizontal motion) due to particle motion at right angles to the direction of wave travel. Unreinforced buildings are more easily damaged by S waves. There are also two kinds of surface waves, Raleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

Location.
Although earthquakes are common in the eastern United States and even in Alabama, there has been no report of earthquake activity in Bullock County. Two sources were consulted regarding the location of earthquake hazards in Bullock County: the Geological Survey of Alabama (GSA) and the US Geological Survey (USGS). According to the GSA, the four zones of frequent earthquake activity affecting Alabama, as shown in Figure 4.15, are the New Madrid Seismic Zone, the Southern Appalachian Seismic Zone, the South Carolina Seismic Zone, and the Bahamas Fracture Seismic Zone. GSA further states that most of the earthquakes experienced in Alabama are associated with the Southern Appalachian Seismic that runs along the Appalachian Mountains from the northeastern corner into the central part of the state and the Bahamas Fracture Seismic Zone in southern Alabama. The Seismic Zones of the Southeastern United States Map indicates that Bullock County is located in an area outside of any of the four seismic zones.

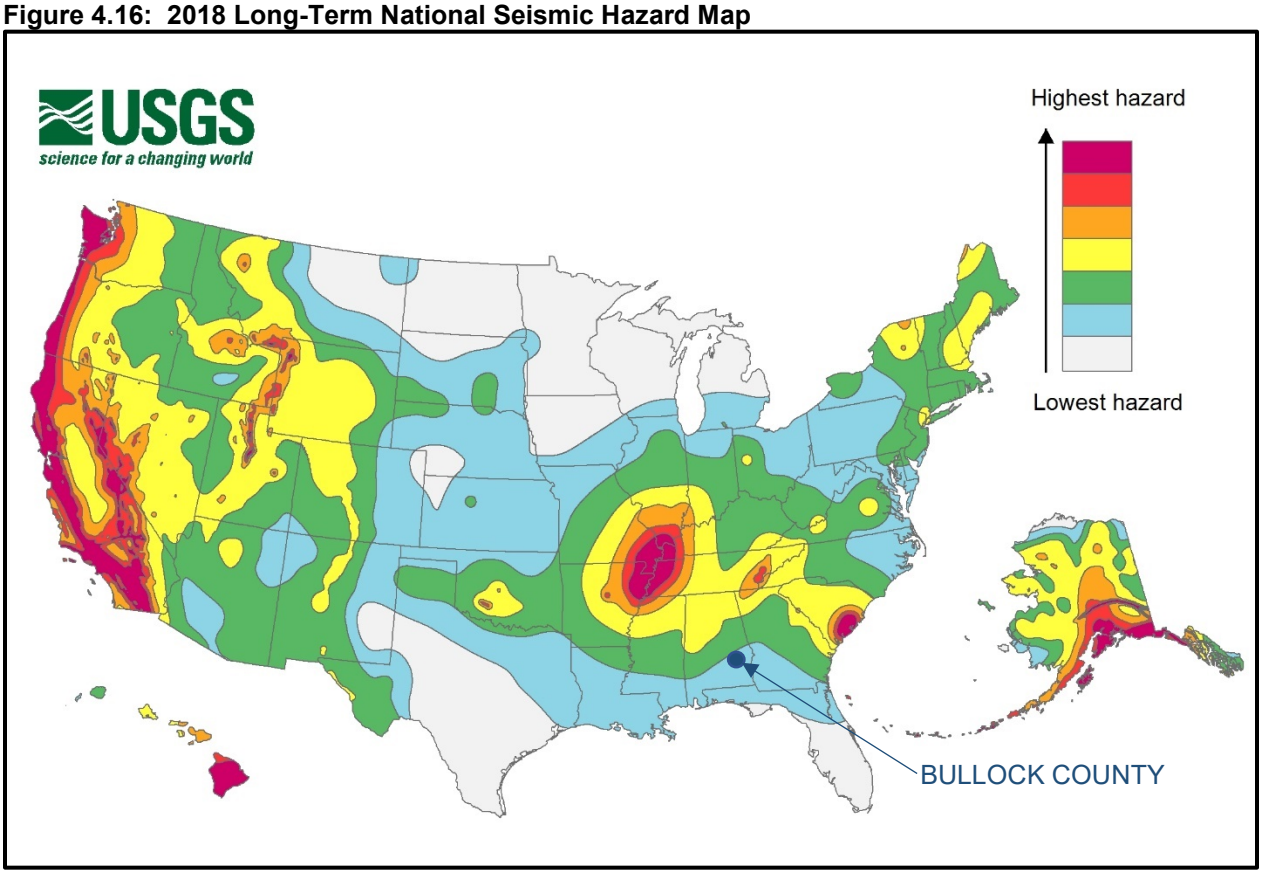
Figure 4.15: Seismic Zones of the Southeastern United States



Source: Geological Survey of Alabama, Geological Hazards.
https://gsa.state.al.us/gsa/geologic/hazards/earthquakes/alquakes

The 2018 Long-Term National Seismic Hazard Map (Figure 4.16), available through USGS, shows peak ground accelerations have a 2 percent probability of being exceeded in 50 years, for a firm rock site. USGS states, "The map is based on the most recent USGS models for the conterminous U.S. (2018), Hawaii (1998), and Alaska (2007). The models are based on seismicity and fault-slip rates and take into account the frequency of earthquakes of various magnitudes." USGS further states that locally, the hazard may be greater than shown in the long-term seismic hazard map, because site geology may amplify ground motions. Given the location of Bullock County in relation to seismic zones and probable seismic hazard areas shown in the two aforementioned maps, it becomes apparent that Bullock County is not at risk from an earthquake event; however, there remains the potential of minor effects from seismic activity in other Alabama locations.

Figure 4.16: 2018 Long-Term National Seismic Hazard Map



Source: US Geological Survey (USGS), Earthquake Hazards Program.
https://www.usgs.gov/media/images/2018-long-term-national-seismic-hazard-map

Extent.

A major earthquake in Bullock County could result in great loss of life and property damage in the billions of dollars. Adding to the danger is the fact that structures in the area were not built to withstand earthquake shaking. Construction of many buildings on steep slopes susceptible to landslides and in karst terrains susceptible to sinkholes will be a major contributing factor to damage from future earthquakes in the county.

According to the USGS Earthquake Hazard Program, earthquakes are measured using two types of measurements: magnitude and intensity. The magnitude is a number that characterizes the relative size of an earthquake. Magnitude is based on measurement of the maximum motion recorded by a seismograph. Several scales have been defined, but the most commonly used are (1) local magnitude (ML), commonly referred to as "Richter magnitude", (2) surface-wave magnitude (Ms), (3) body-wave magnitude (Mb), and (4) moment magnitude (Mw). The most accurate of the four scales is the moment magnitude (Mw) scale, which is based on the concept of seismic moment and is uniformly applicable to all sizes of earthquakes. Magnitude is the most common measure for an earthquake's size and is the same number no matter where it is located and regardless of what the earthquake's shaking feels like at any given location.

Intensity is a measure of the shaking and damage caused by the earthquake. The intensity value changes from one location to another, based on the proximity of the earthquake. Earthquake

intensity is a Roman numeral describing the severity of an earthquake in terms of its effects on the earth's surface and on humans and their structures. One of the most commonly used scales to measure intensity in the United States, and the one that will be used in this plan, is the Modified Mercalli scale, which is shown and explained in Figure 4.17. The Modified Mercalli Intensity Scale has measurements from I to XII, with it being hardly felt, if at all, and XII being total destruction of the surface. Using an abbreviated version of the Modified Mercalli scale, FEMA provides seismic design category map for low rise structures on sites with average soil conditions. The Seismic Design Categories Map for the Eastern United States, shown in Figure 4.19 with category definitions provided in Figure 4.18, indicates that Bullock County is in Category A, which has a very small probability of experiencing damaging earthquake effects.

Figure 4.17: Modified Mercalli Intensity Scale

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: USGS, Natural Hazards Program, Earthquake Hazards. The Modified Mercalli Intensity Scale (usgs.gov)

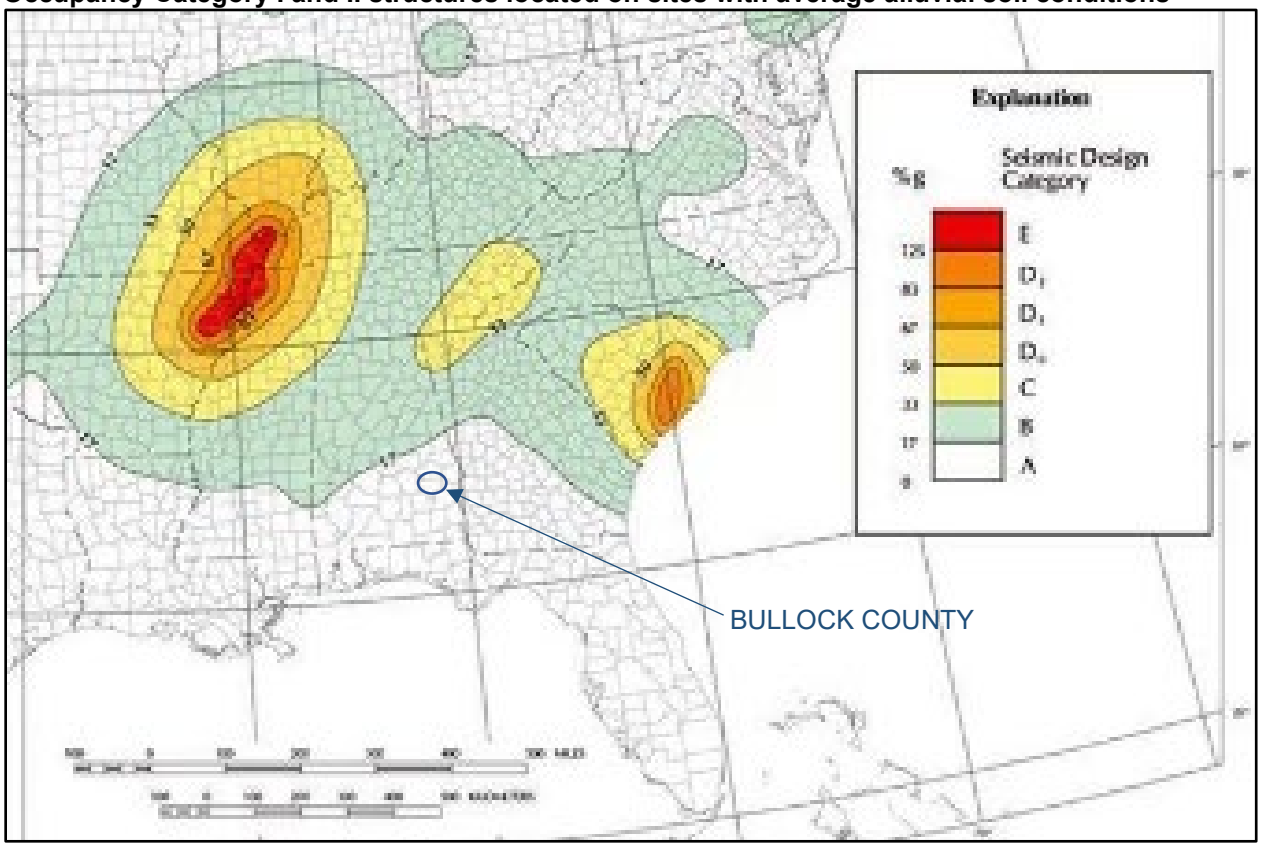
Figure 4.18: Seismic Design Categories (SDC) Map Definitions

SDC	Map Color	Earthquake Hazard	Potential Effects of Shaking*
A	White	Very small probability of experiencing damaging earthquake effects.	
B	Gray	Could experience shaking of moderate intensity.	Moderate shaking—Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
C	Yellow	Could experience strong shaking.	Strong shaking—Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built structures.
D0	Light Brown	Could experience very strong shaking (the darker the color, the stronger the shaking).	Very strong shaking—Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with
D1	Darker Brown		
D2	Darkest Brown		

			partial collapse. Damage great in poorly built structures.
E	Red	Near major active faults capable of producing the most intense shaking.	Strongest shaking—Damage considerable in specially designed structures; frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. Shaking intense enough to completely destroy buildings.
* Abbreviated descriptions from The Modified Mercalli Intensity Scale.			

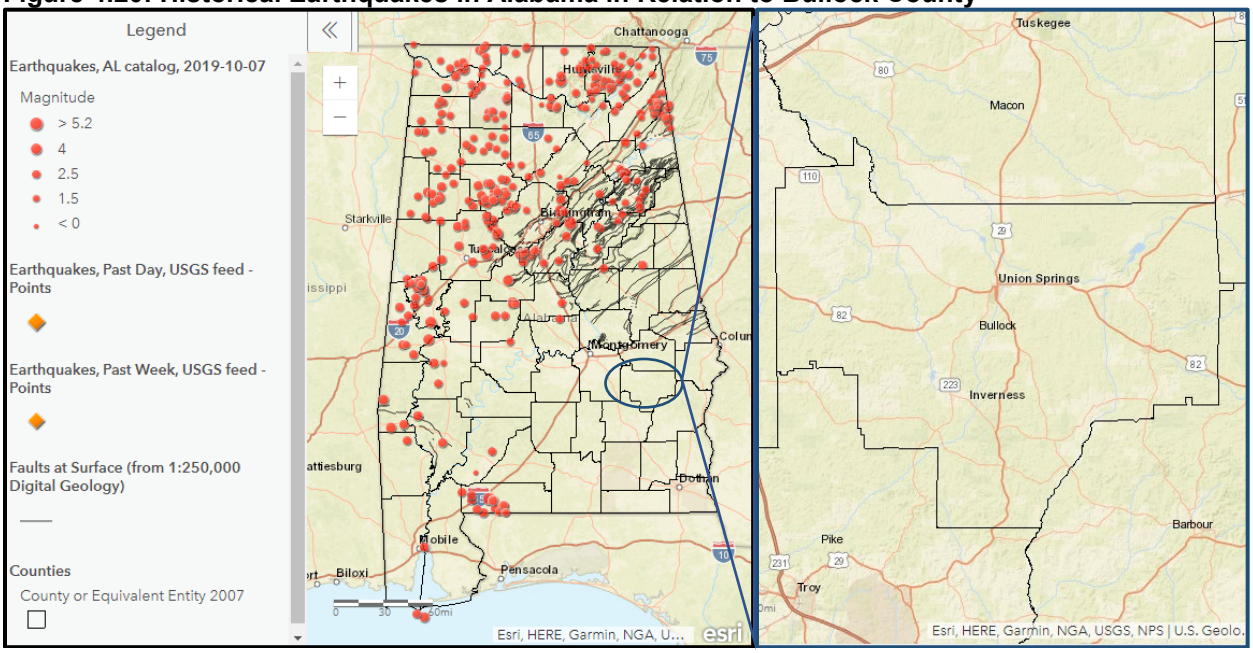
Source: FEMA, Earthquake Hazard Maps. https://www.fema.gov/earthquake-hazard-maps

Figure 4.19: Seismic Design Categories (SDC) Map of the Eastern United States for low-rise Occupancy Category I and II structures located on sites with average alluvial soil conditions



Source: FEMA, Earthquake Hazard Maps. https://www.fema.gov/earthquake-hazard-maps

Figure 4.20: Historical Earthquakes in Alabama in Relation to Bullock County



Source: Geological Survey of Alabama, Geological Hazards.
https://gsa.state.al.us/gsa/geologic/hazards/earthquakes/alquakes

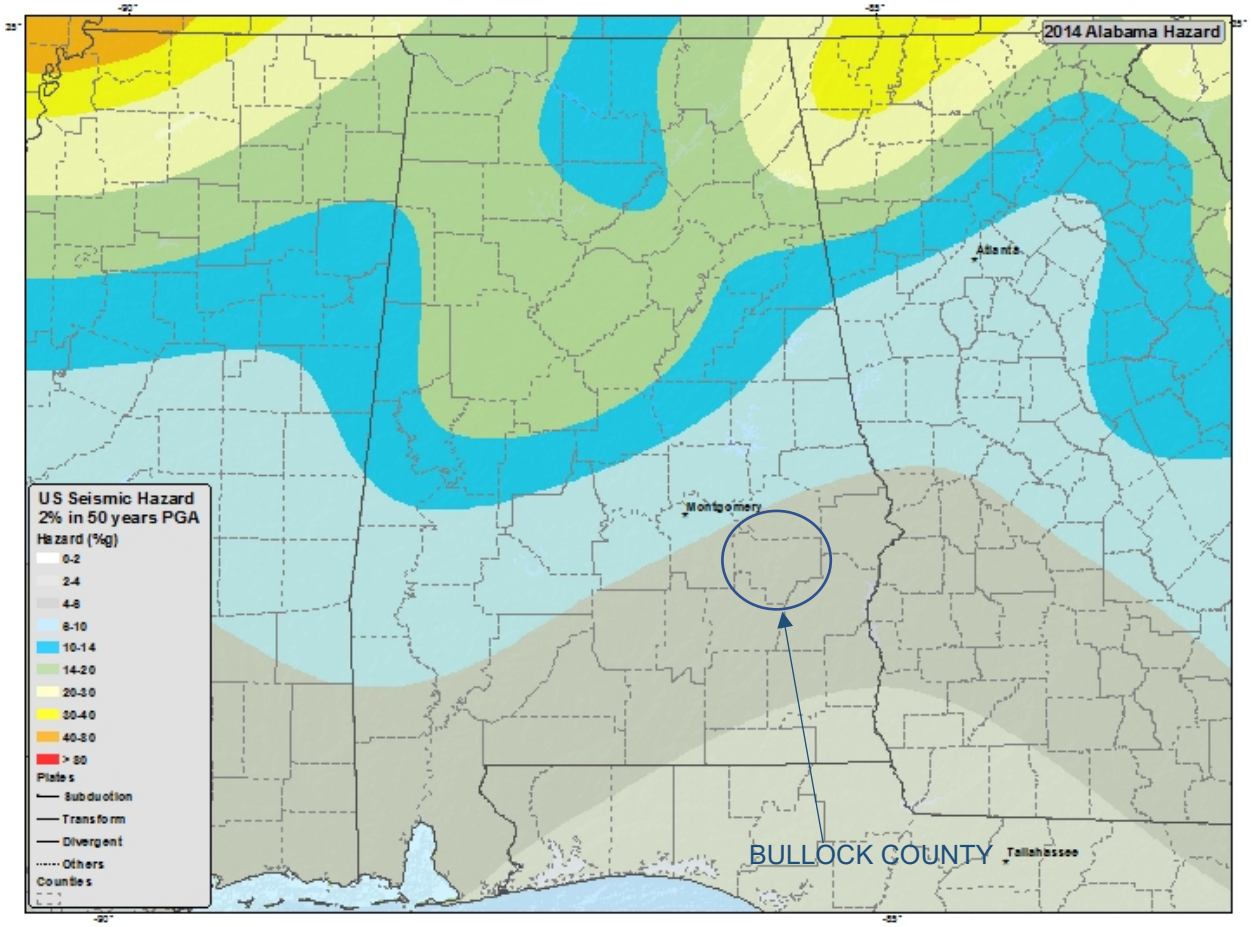
Historical Occurrences.

It is locally assumed that there has been no recent or past earthquake activity in the Bullock County area. Both the US Geological Survey and the Geological Survey of Alabama maintain catalogs of earthquake events affecting Alabama that date back to 1886. FEMA also provides a map by state of all earthquake events from 1900 to present, which is shown in Figure 4.20 on the previous page. A review of both past event catalogs, along with the map of past earthquakes in relation to Bullock County, confirms that there are no historical occurrences of earthquakes in the county.

Probability of Future Events.

Given Bullock County's location outside of seismic zone activity and history of no past earthquakes, the probability of future earthquake events in the county is **0.0 percent**. Figure 4.21 provides a seismic hazard map available from USGS. These maps display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments, and other public policy. For Bullock County and its jurisdictions, the earthquake peak ground acceleration (PGA) that has a 2 percent chance of being exceeded in 50 years has a value between 4 and 8%g, and is considered **Very Low**. There is no change in the probability of future earthquake since the last update of the Bullock County Hazard Mitigation Plan in 2013 and the draft plan in 2018.

Figure 4.21: 2014 Seismic Hazard Map of Alabama



Source: US Geological Survey (USGS), Earthquake Hazards Program.
https://www.usgs.gov/media/images/2014-seismic-hazard-map-alabama

Figure 4.22: Earthquake Summary and Probability by Jurisdiction

Jurisdiction	Historical Events	Maximum Extent	Probability of Future Events
Bullock County	0 Events	None	Very Low
Unincorporated Bullock County	0 Events	None	Very Low
Town of Midway	0 Events	None	Very Low
City of Union Springs	0 Events	None	Very Low

4.5 FLOODING

Description.
Flooding is considered the most frequent and costly natural hazard in the United States. A flood, or flooding, is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land or two or more properties are inundated by water or mudflow. Flooding can also be described as the accumulation of water within a water body (e.g., stream, river, lake, or reservoir) and the overflow of excess water onto adjacent floodplains. Floodplains are usually lowlands adjacent to water bodies that are subject to recurring floods. Conditions that can result in a flood include, but are not limited to, hurricanes, overtopped levees, outdated or clogged drainage systems, and rapid accumulation of rainfall. Floods are natural events that are considered hazards only when people and property are affected, making them one of the most common hazards. Most floods fall into one of three major categories: (1) Riverine Flooding; (2) Coastal Flooding; or (3) Shallow Flooding.

The most common kind of flooding event is riverine flooding, also known as overbank flooding. Riverine flooding also includes flash flooding, riverine erosion, ice jams, and dam failures. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions, to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. In steep valleys, flooding is usually rapid and deep, but of short duration, while flooding in flat areas is typically slow, relatively shallow, and may last for long periods of time. While Bullock County is not highly susceptible to severe inundation of riverside flood waters which impacts low lying agricultural areas, it is susceptible to the rapid occurrence of localized flash floods and flooding in areas that make parts of the county inaccessible by road and interrupt the delivery of services and the ability to respond in an emergency and in localized conditions in more urban development in Union Springs and Midway due to storm drainage limitations.

Flash floods involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain. Dam failure and ice jams may also lead to flash flooding. Alluvial fan floods occur in the deposits of rock and soil that have eroded from mountainsides and accumulated on valley floors in the pattern of a fan. Alluvial fan floods often cause greater damage than overbank flooding due to the high velocity of the flow, amount of debris, and broad area affected. Human activities may exacerbate flooding and erosion on alluvial fans via increased velocity along roadway acting as temporary drainage channels or changes to natural drainage channels from fill, grading, and structures. Ice jam floods are primarily a function of the weather and are most likely to occur where the channel slope naturally decreases, culverts freeze solid, reservoir headwaters, natural channel constructions (e.g., bends and bridges), and along shallows. Dam-break floods may occur due to structural failures (e.g., progressive erosion), overtopping or breach from flooding, or earthquakes.

Bullock County is not susceptible to coastal storm flooding and coastal erosion due to the county's location more than 200 miles away from Alabama's Gulf Coast. Bullock County is susceptible to

shallow flooding which occurs in flat areas where a lack of channels prevents water from draining easily. Shallow flood problems include flooding and drainage issues related to land development, including sheet flow, ponding, and urban drainage. Sheet flow occurs where there are inadequate drainage channels and floodwater spreads out over a large area at a somewhat uniform depth. Sheet flows occur after an intense or prolonged rainfall during which the rain cannot soak into the ground. During sheet flow, the floodwaters move downhill and cover a wide area. In some flat areas, runoff collects in depressions and cannot drain out, creating a ponding effect. Ponding floodwaters do not move or flow away. Floodwaters will remain in the temporary ponds until they infiltrate into the soil, evaporate or are pumped out. An urban drainage system is generally made up of the ditches, storm sewers, retention ponds and other facilities constructed to store runoff or carry it to a receiving stream, lake or the ocean. Other man-made features in such a system include yards and swales that collect runoff and direct it to the sewers and ditches. When larger storms overload an urban drainage system, the result is backed-up sewers and overloaded ditches that produce shallow flooding.

Location.

The Office of Water Resources, located within the Alabama Department of Economic and Community Affairs, maintains the Alabama Flood Risk Information System (FRIS) which provides floodplain maps for Alabama communities. The following information was compiled from the Alabama FRIS and the Bullock County Flood Insurance Study. Flood hazard maps have been created to show different degrees of risk for each community. Flood Insurance Rate Maps (FIRM), effective 2009, have been developed for all of Bullock County. Detailed FIRMs are available for portions of Union Springs. A detailed study has not been conducted for the Town of Midway. Figure 4.24 shows the location of the currently mapped flood hazard areas in Bullock County; and Figures 4.25 through 4.26 provide a detailed view of flood hazard areas in the more populated parts of the county found in Midway and Union Springs. Based on a review of the FRIS maps, and the associated Flood Insurance Rate Maps (FIRM) for more detailed areas, flooding in Bullock County is most likely to be in the riverine category in a floodplain associated with one of four river systems: the Conecuh River, Pea River, Cowikee Creek, a tributary to the Chattahoochee River, and tributaries to the Tallapoosa River, including Cubahatchee Creek, Line Creek, and Old Town Creek.

Most of the floodplain areas in Bullock County tend to be narrow and linear in nature, following stream beds and to some degree larger tributaries of the rivers, streams and creeks previously listed, and are designated as Zone A. In general, floodplains in most of the county measure less than one-half mile in width. More expansive floodplain areas, however, are found in the northwest and northeast parts of the county. In the northwest, floodplains along Line Creek, Bughall Creek, Old Town Creek, and Cubahatchee Creek range in size from 1 mile to 2.2 miles in width. Along Cowikee Creek in the northeast part of the county, floodplains range from 0.75 miles to 1.5 miles in width.

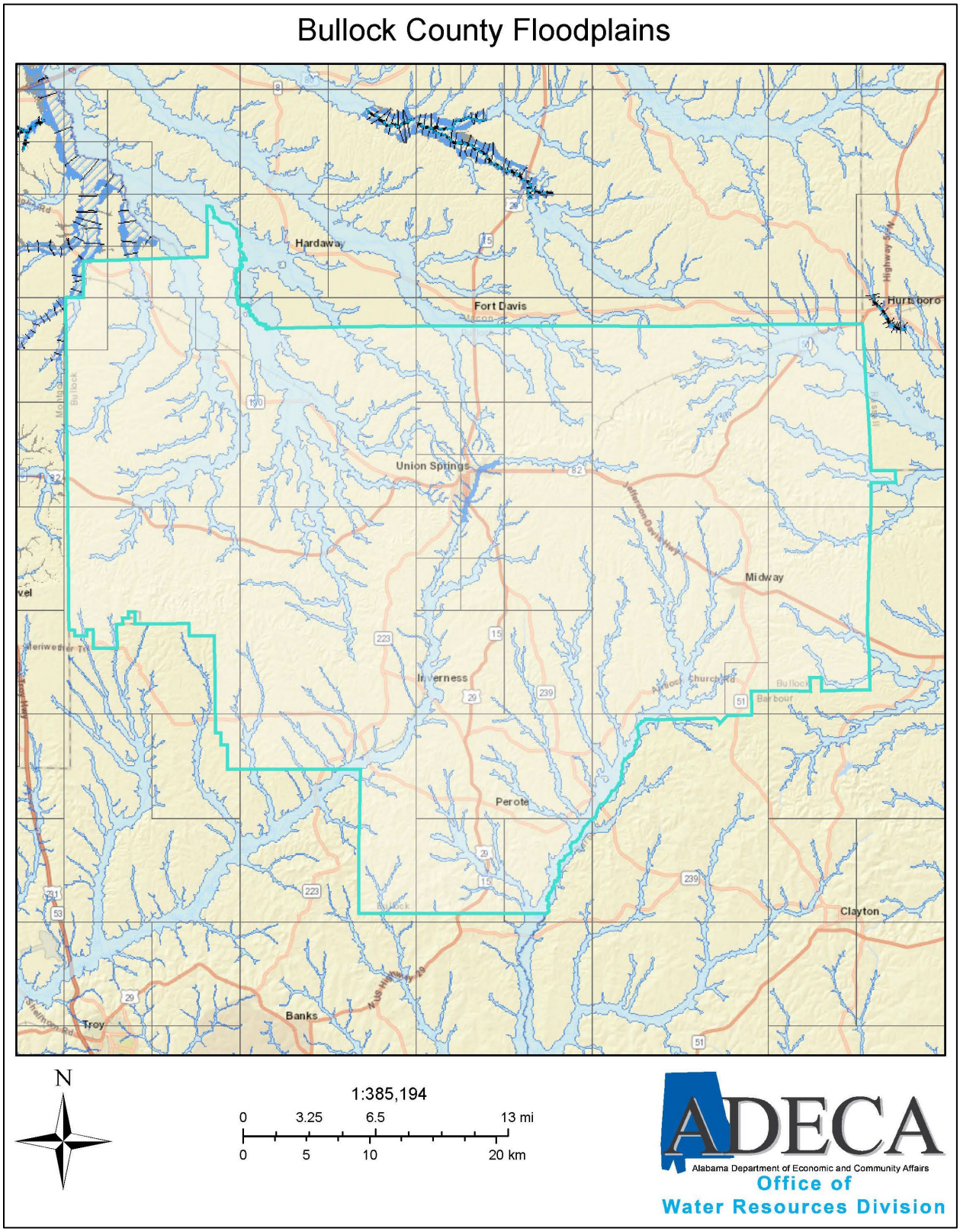
A detailed flood study has not been conducted for the Town of Midway. As seen in Figure 4.24, the Johnson Creek floodplain lies along Midway's west corporate boundary and is designated as Zone A, with one-percent annual chance flood. Additionally, the tip of a floodplain associated with Johnson Creek Tributary 2 crosses the Town's southern boundary which is also designated as Zone A. No base flood elevations have been developed for either of the two floodplain areas. The water

surface elevation ranges from approximately 435 feet at the southwest corner of the town boundary to 454 feet at the northern town boundary.

Old Town Creek and the Conecuh River flow through the east-central part of the City of Union Springs. These waterbodies flow south, crossing U.S. Highway 82, then lying east of Martin Luther King Blvd., before crossing U.S. Highway 29 (S. Prairie Street) in the southern part of the city. Detailed FIRM maps with base flood elevations have been developed for the Conecuh River and Old Town Creek as they lie within the corporate boundaries of Union Springs. Detailed FIRM maps with base flood elevations have also been developed for Slaughter Creek which lies in the west part of the city, south of U.S. Highway 82 and west of Alabama Highway 223 (Sardis Road). In the northern part of Union Springs, there are small, linear floodplains associated with Cubahatchee Creek, Old Town Creek, Williams Creek, along with several smaller streams and tributaries.

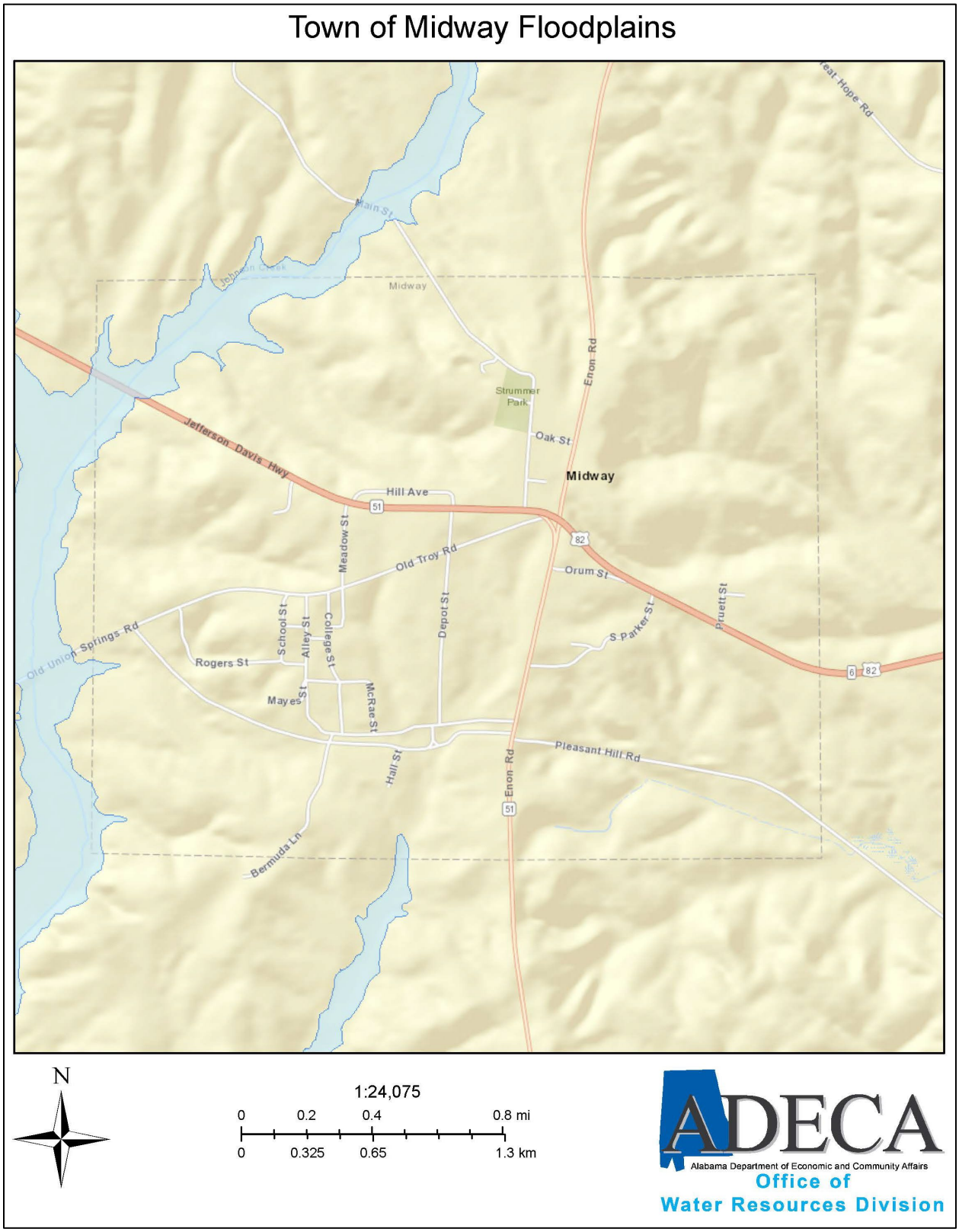
Along with the riverine flooding potential, there have been reports of flash flooding due to heavy rains in various locations throughout Bullock County. According to the National Centers for Environmental Information Storm Database, most flooding events have occurred on secondary roads in the unincorporated parts of the county because of heavy rains; however, state and federal highways have also become impassable for a short period of time because of flash flooding. The City of Union Springs has struggled to make improvements to drainage infrastructure to lessen the impact of flash flooding in the Peachburg Road / Conecuh Avenue East area from Old Town Creek in the northwestern part of the city, and in the smaller lot residential area generally bounded by Blackmon Street to the north, S. Martin Luther King Blvd. to the east, Minnie Avenue West to the south, and Alabama Highway 223 to the west.

Figure 4.23: Floodplains in Bullock County



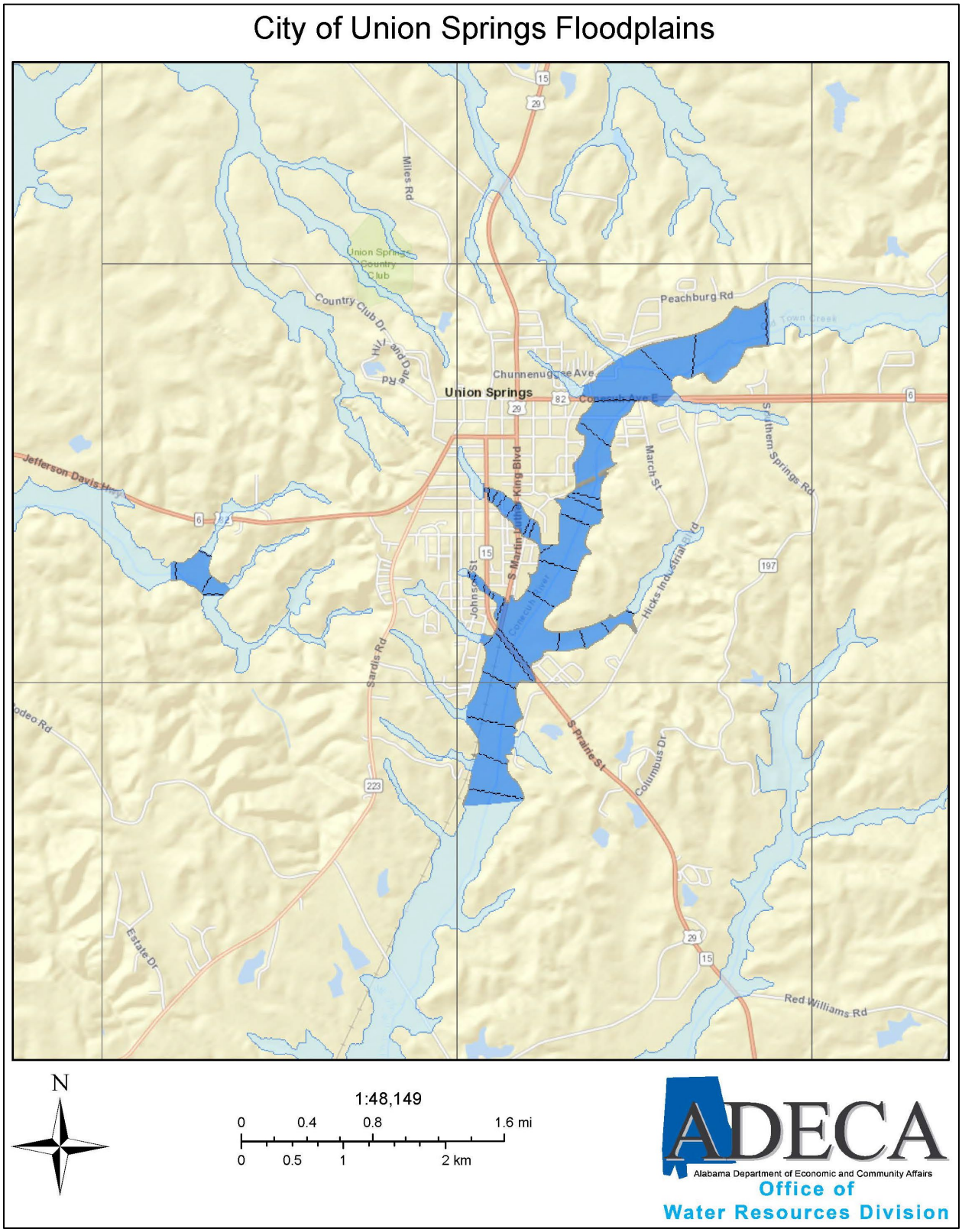
Source: Alabama Department of Community and Economic Development, Office of Water Resources, Flood Risk Information System. https://alabamaflood.com/map

Figure 4.24: Floodplains in the Town of Midway



Source: Alabama Department of Community and Economic Development, Office of Water Resources, Flood Risk Information System. https://alabamaflood.com/map

Figure 4.25: Floodplains in the City of Union Springs



Source: Alabama Department of Community and Economic Development, Office of Water Resources, Flood Risk Information System. https://alabamaflood.com/map

Extent.

The severity of a riverine flood event is typically dependent on several factors, including drainage basin topography, recent precipitation and weather occurrences, and land surface. Periodic riverine flooding on adjacent lands is a natural occurrence. The most common method used to express flood frequency is a percent chance of occurrence in a given year, or annual probability within a FEMA identified floodplain. A 100-year flood event has a one percent (1%) chance of occurring in any year within that floodplain. However, these type floods can occur multiple times during a 100-year period. Within the floodplain, a flood event can be expected to inundate the area with several feet of water, which varies across the region, but can be upwards of almost two feet above flood stage as noted by the highest recorded floods described at multiple points in the region. The extent of a flash flooding event varies greatly depending on the local geography and rainfall intensity and duration. Normally the extent of flash flooding is not as widespread as a riverine flooding event but is more variable due to the lack of advance warning before the occurrence of flooded streets and property damage that may occur during these events.

The magnitude of flooding events is not available through the National Centers for Environmental Information and there are no local official records of flooding magnitude available. There are local verbal reports of flash flooding throughout the county and in Union Springs; again however, estimated depth of flooding is not available. The *Union Springs Herald* has, however, reported on flooding events in past years that include pictures making it possible to unofficially estimate flooding depth as shown in the photographs and descriptions below.

The *Union Springs Herald* reported on August 21, 2013 that heavy rains caused overflow in Bullock County. U.S Highway 29 (left) was closed due to water crossing the roadway and a large log floating onto the highway. County Road 22 (right) was also closed due to water crossing the roadway. Flood extent in both pictures appears to be less than one foot.

On July 23, 2014, the *Union Springs Herald* reported that heavy rains caused flooding in the Prairie Street South and Baskin Street areas of Union Springs on Saturday, July 19, 2014. A house was flooded and a car stalled in the flood waters. The water marks on the house appear to be about two feet high. A police officer waded through the flood water to assist passengers out safely.

Since there are no official flood depth reports available, the 2009 Flood Insurance Study (FIS) for Bullock County was used to determine the extent for flooding in Bullock County. The study states that largest flooding source in the county is the Conecuh River, which is a 231-mile long coastal river with headwaters beginning in Bullock County near Union Springs. Regarding principal flood problems, the 2009 FIS states the following:

> *A record of historical flooding could not be established as no known information has been collected to date. Information gathered from area residents and a review of newspaper articles that extend back over a 60-year period indicate that the potential for flooding in the city is great enough to pose a threat to the welfare of many of the city's residents. Accounts of past floods by local residents were varied and no high water marks could be verified…..The extent of the flood hazard problem has not been determined, and development has taken place in the floodplain.*

Detailed FIRM maps have been developed for the Conecuh River, Old Town Creek, and Slaughter Creek in Union Springs. These are the only detailed FIRM maps in the county, and therefore, are what were used to determine the extent of flooding in Bullock County. Figure 4.26 provides an overview of selected locations from the 2009 flood profiles.

Figure 4.26: Bullock County Flood Insurance Study Cross Section Flood Extent

Waterbody	Location	BFE*	1.0% Annual Chance Flood
Conecuh River	US Highway 29 (confluence of Trib. #2)	462 ft	11.0 ft
Conecuh River	Confluence of Tributary #3	469 ft	9.0 ft
Conecuh River	Hardaway Avenue	472 ft	8.0 ft
Conecuh River	US Highway 82 (confluence with Old Town Creek)	474 ft	8.0 ft
Conecuh River, Trib. No. 1	Confluence with Conecuh River	467 ft	10.5 ft
Conecuh River, Trib. No. 1	Limit of Detailed Study Area	472 ft	5.0 ft
Conecuh River, Trib. No. 2	Confluence with Conecuh River	470 ft	11.0 ft
Conecuh River, Trib. No. 2	Martin Luther King Blvd.	474 ft	8.0 ft
Conecuh River, Trib. No. 2	South Prairie Street	480 ft	4.0 ft
Conecuh River, Trib. No. 2	Johnson Street	481 ft	4.0 ft
Conecuh River, Trib. No. 3	Confluence with Conecuh River	469 ft	10.0 ft
Conecuh River, Trib. No. 2	Parker Street / Martin Luther King Blvd	471 ft	13.5 ft
Conecuh River, Trib. No. 2	Powell Street	480 ft	8.0 ft
Conecuh River, Trib. No. 2	South Prairie Street	480 ft	6.0 ft
Old Town Creek	Confluence with Conecuh River	478 ft	8.0 ft
Slaughter Creek	Confluence with Slaughter Creek Trib. #1	362 ft	15.0 ft
Slaughter Creek	Limit of Detailed Study Area (west corp. boundary)	358 ft	11.0 ft
**BFE = Base Flood Elevation*			

Source: Flood Insurance Study; Bullock County, Alabama, and Incorporated Areas.
Effective Date: September 11, 2009.

Historical Occurrences.
Per National Centers for Environmental Information data, there were seven flash flood events in Bullock County from 2000 through 2020 that resulted in $120,000 in property damage with fatalities, injuries or crop damage. Of the flooding events, one event was countywide as a result of storms associated Hurricane Ivan. It was estimated that there were three to three inches of rain that flooded a few roads in western Bullock County. Four flash flood events occurred in the unincorporated parts of Bullock County, and one flash flood event each in Midway and Union Springs. Figure 4.27 provides a profile of flooding events in Bullock County, as available from the National Centers for Environmental Information.

Most recently, Bullock County was included in a federal emergency declaration, EM-3545, which was a result of Tropical Cyclone Sally on September 14-16, 2020. The tropical storm brought six to ten inches of rain, resulting in flooded roadways, including US Highways 29 and 82. In 2015, widespread flash flooding occurred over the southeast portions of Bullock County. Three to four inches of rainfall caused water to flow across roadways and creeks to rise above bank full. Several roads were closed, including US Highway 82 near the Barbour County line. Further, a sinkhole developed on US Highway 29 south of the Perote community, causing traffic to be rerouted. In 2013, widespread flooding occurred across portions of southwestern Bullock County, including the Aberfoil community, as more than four inches of rain fell in just a couple of hours. Impassable roadways included County Roads 22 and 31 and US Highway 29. The Town of Midway suffered flash flooding in 2009 when three to four inches of rain fell in a short period of time which led to flash flooding of several roads in the southeastern portion of Bullock County. Law enforcement reported that a few roads were flooding and temporarily impassable in Union Springs in July 2003. According to data provided by the Alabama Emergency Management Agency, there are no reported instances of repetitive structural loss due to flooding in the county, to date.

Figure 4.27: Flood Events, 2000 through 2020

Location	Date	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Union Springs	7/13/2003	Flash Flood		0	0	$8,000	$0
Countywide	9/16/2004	Flash Flood		0	0	$2,000	$0
Unincorporated	5/7/2009	Flash Flood		0	0	$100,000	$0
Midway	12/14/2009	Flash Flood		0	0	$10,000	$0
Unincorporated	8/14/2013	Flash Flood		0	0	$0	$0
Unincorporated	12/24/2015	Flash Flood		0	0	$0	$0
Unincorporated	9/16/2020	Flash Flood		0	0	$0	$0
Total		7 Events		0	0	$120,000	$0
Jurisdictional Summary: Flooding							
Countywide		1 Event		0	0	$2,000	$0
Midway		1 Event		0	0	$10,000	$0
Union Springs		1 Event		0	0	$8,000	$0
Unincorporated Bullock County		4 Events		0	0	$100,000	$0

Source: NOAA, National Centers for Environmental Information, Storm Events Database.
https://www.ncdc.noaa.gov/stormevents

Probability of Future Events.

Flooding is one of the most common hazards in the United States and kills an average of 150 people a year nationwide. While Bullock County is not overly susceptible to severe inundation of riverine flood waters, it is highly susceptible to the rapid occurrence of flash floods that make parts of the county inaccessible by road and interrupt the delivery of services and the ability to respond in an emergency. The probability for future riverine flood events based on magnitude and using best available data is illustrated in the Flood Hazard Area Maps in Figures 4.23 through 4.25, which indicate the county and jurisdictional areas susceptible to the one-percent annual chance flood (100-year floodplain). Unfortunately, detailed FIRM maps have only been developed for the Union Springs area and there are no local or official records of flood depths during previous flooding events. The probability for future flash flood events is likely to continue to increase, especially in developed areas; however, it is not possible at this time to estimate a maximum extent for future flood events.

Bullock County has experienced seven flash flood events in the last 21 years, which equates to a **33.3 percent** probability of future flooding events. There were no deaths, injuries or crop damage from the flood events. The combined property damage from the seven events was $120,000, or **$17,142.86 per event**. The damage from the events was not equitably spread among the jurisdictions, however. As shown in Figure 4.28, the impact of a future flooding events for all jurisdictions in Bullock County is considered to be **Medium** with probable major damage within a 10 to 50-year period for the unincorporated part of Bullock County; **Low** in the Town of Midway with probable major damage in a 100-year period; and is considered to be **High** with probable major damage in a 1 to 10-year time frame.

Figure 4.28: Flooding Summary and Probability by Jurisdiction

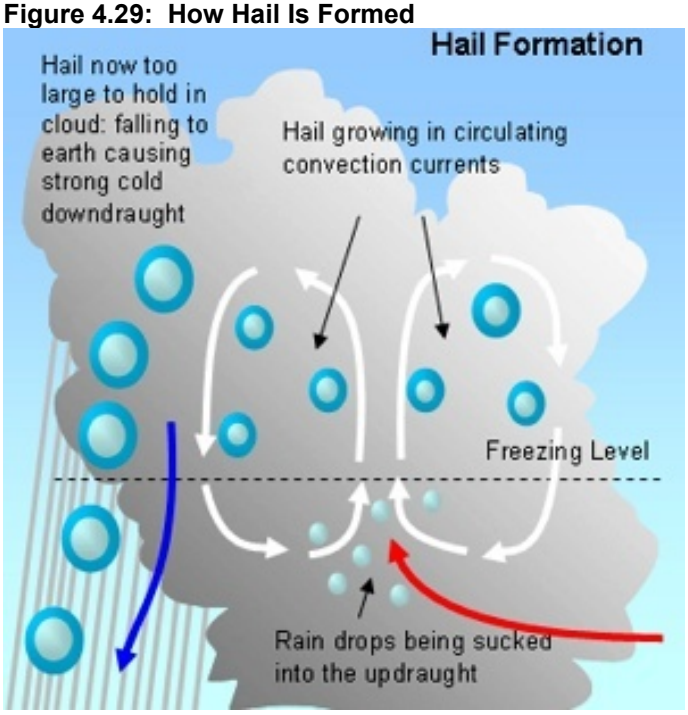
Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	7 Events	4 Events	1 Event	1 Event
Maximum Extent	Unknown	Unknown	Unknown	15 feet
Probability of Future Events	33%	33%	33%	33%
Damage Per Event	$17,143	$25,000	$10,000	$8,000
Impact of Future Events	Medium	Medium	Low	High

4.6 HAIL

Description.

Hail is a form of solid precipitation that forms in strong thunderstorm clouds, particularly those with intense updrafts, high liquid water content, great vertical extent, large water droplets, and where a good portion of the cloud layer is below freezing. Hail is an outgrowth of severe thunderstorms and develops within a low-pressure front as warm air rises rapidly into the upper atmosphere and is subsequently cooled, as shown in Figure 4.29, leading to the formation of ice crystals. These are bounced about by high-velocity updraft winds and accumulate into frozen droplets, falling as precipitation after developing enough weight. Hailstones generally fall at higher speeds as they grow in size, though complicating factors such as melting, friction with air, wind, and interaction with rain and other hailstones can slow their descent through Earth's atmosphere. Severe weather warnings are issued for hail when the stones reach a damaging size, as it can cause serious damage to human-made structures and, most commonly, farmers' crops.

Figure 4.29: How Hail Is Formed



Source: North Carolina Climate Office, North Carolina State University, Severe Weather Hazards. https://climate.ncsu.edu/edu/SevereHazards

Location.

The occurrence of hail has not been isolated to any one part of Bullock County. Since 2000, Bullock County has experienced a total of 15 hail events, of which nine were in the unincorporated part of the county, two were in Midway and four events were in Union Springs.

Extent.

The extent of hail is measured using the TORRO Scale of the Tornado and Storm Research Organization that classifies the intensity of hail into ten categories based on size and probable kinetic energy, as shown in Figure 4.30. Of the 15 hail events in Bullock County, most were in the 0.75-inch to 1.0-inch size range, which would be in the H3-Severe Intensity Category that is likely to damage crops, glass and plastic structures, and to score paint and wood. Two events, however, produced 1.75-inch hail, which is the H5 to H6-Destructive Intensity Categories, which includes the destruction of glass, damage to tiled roofs, significant risk of injuries, and could dent the bodywork of grounded aircraft and cause pitting in brick walls. The combined property damage of hail events between 2000 and 2020 was $14,000, all of which occurred in the unincorporated part of Bullock County. The event with the most damage occurred in 2005 in unincorporated Bullock County with $11,000 in property damage.

Figure 4.30: TORRO Hailstorm Intensity Scale

Intensity Category		Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m^2	Typical Damage Impacts
H0	Hard Hail	5	0-20	No damage
H1	Potentially Damaging	5-**15**	>20	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		Bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-**75**		Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**		(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

*Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed and surface wind speeds) affect severity.

Source: TORRO, The Tornado and Storm Research Organization; http://www.torro.org.uk/hscale.php

Historical Occurrences.

According to the National Centers for Environmental Information, Bullock County experienced 15 hail events between 2000 and 2020. The most destructive hail events, at 1.75-inch hail, both occurred in the unincorporated parts of Bullock County in March 26, 2005 in the Perote community and in April 22, 2005 in the Fitzpatrick community. Also of March 26, 2005, the Shopton area reported 0.75-inch hail. The NCEI data states that a left-moving supercell that moved through Pike, Barbour, and Russell Counties threw hail out of its core across extreme southeastern Bullock County. The hail affected the Smuteye and Pickett communities but mainly fell in rural areas. The largest hail reported was golf ball size; and penny-size hail was reported in and around Shopton.

The most destructive hail event in Midway occurred on January 9, 2000 when nickel-size hail (0.88 inches) was reported on Pine Grove Road near Midway. In Union Springs, the most destructive hail event occurred on July 19, 2003 when a storm with 1-inch hail resulted in trees being knocked down near the intersection of US Highway 82 and Alabama Highway 110 west of Union Springs., with one of the trees falling on a vehicle.

Figure 4.31: Profile of Hail Events in Bullock County

Location	Date	Event Type	Mag (inches)	Deaths	Injuries	Property Damage	Crop Damage
Midway	1/9/2000	Hail	0.88	0	0	$0	$0
Unincorp. Area	4/30/2002	Hail	1	0	0	$2,000	$0
Union Springs	4/30/2002	Hail	1	0	0	$0	$0
Unincorp. Area	4/25/2003	Hail	0.75	0	0	$0	$0
Union Springs	7/13/2003	Hail	0.75	0	0	$0	$0
Union Springs	7/19/2003	Hail	1	0	0	$0	$0
Unincorp. Area	3/26/2005	Hail	1.75	0	0	$11,000	$0
Unincorp. Area	3/26/2005	Hail	0.75	0	0	$0	$0
Unincorp. Area	4/22/2005	Hail	1.75	0	0	$1,000	$0
Midway	12/28/2005	Hail	0.75	0	0	$0	$0
Unincorp. Area	12/28/2005	Hail	0.75	0	0	$0	$0
Union Springs	12/28/2005	Hail	0.75	0	0	$0	$0
Unincorp. Area	8/30/2006	Hail	0.75	0	0	$0	$0
Unincorp. Area	3/26/2011	Hail	0.88	0	0	$0	$0
Unincorp. Area	6/26/2011	Hail	1	0	0	$0	$0
Total Hail Events			15 Events	0	0	$14,000	$0
Jurisdictional Summary: Hail							
Countywide		0 Events	0	0	0	$0	$0
Unincorporated Bullock County		9 Events	1.75	0	0	$14,000	$0
Town of Midway		2 Events	0.88	0	0	$0	$0
City of Union Springs		4 Events	1.0	0	0	$0	$0

Source: NOAA, National Centers for Environmental Information, Storm Events Database.
https://www.ncdc.noaa.gov/stormevents

Probability of Future Events.
Bullock County has experienced 15 hail events in the last 21 years, which equates to a **71.4 percent** probability of future hail events. There were no deaths, injuries or crop damage from the events. The combined property damage from the 15 events was $14,000, or **$933.33 per event**. The damage from the events was not equitably spread among the jurisdictions, however. As shown in Figure 4.32, the impact of future hail events for all jurisdictions in Bullock County is considered to be **High** with probable major damage within a 10-year period throughout Bullock County.

Figure 4.32: Hail Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	15 Events	9 Events	2 Event	4 Event
Maximum Extent	1.75 inches	1.75 inches	0.88 inches	1.0 inches
Probability of Future Events	71.4%	42.9%	9.5%	19.0%
Damage Per Event	$933.33	$1,556	$10,000	$8,000
Impact of Future Events	High	High	High	High

4.7 HIGH WINDS, THUNDERSTORMS, SEVERE STORMS

Description.
Bullock County is highly susceptible to high winds, thunderstorms and severe storms. These types of high wind events may occur any time of year but occur more often in spring, summer, and fall seasons. Thunderstorms are generated by atmospheric imbalance due to the combination of unstable warm air rising rapidly into the atmosphere, sufficient moisture to form clouds and rain, and an upward lift of air currents caused by colliding waterfronts, sea breezes, or mountains. The effects of thunderstorms may impact a small area or multiple jurisdictions. Severe thunderstorms may produce damage equivalent to tornadoes over a larger spatial area. Thunderstorm events may occur year-round, but the peak of severe thunderstorm events is in spring with a smaller peak in fall. Thunderstorms can produce hail, floods, lightning, and tornados. All of these hazards caused by severe storms and thunderstorms, however, are addressed as separate hazard events.

Location.
The occurrence of high winds, thunderstorms and severe storms has not been isolated to any one part of Bullock County. From January 1, 2000 through December 31, 2020 (a 21-year time period), Bullock County experienced 40 high wind, severe storm, and thunderstorm events, according to the National Centers for Environmental Information. Of the 40 events, seven were countywide events, 20 events occurred in the unincorporated part of Bullock County, five events were in Midway, and 8 events were in Union Springs.

Extent.
Severe thunderstorms are defined by the National Weather Service as having one or more of the following: wind speeds of 58 miles per hour or higher, producing hail at least three quarters inch (3/4”) in diameter, or possessing tornadic capabilities. The effects of severe thunderstorms have varying spatial effects throughout an area from widespread to localized impacts. Severe thunderstorms with straight line winds that affect an area can create wind gusts up to the equivalence of an EF1 tornado.

High winds, severe storms, and thunderstorms have been common events for Bullock County and its municipalities in the past and will continue to be so in the future. The most extreme of these events occurred on March 20, 2006 when a countywide thunderstorm and wind event produced the county’s strongest winds with estimated gusts of 75 knots, causing $50,000 in property damage. Reports stated that the storm produced a damage swath that was six miles across at its widest point and 11 miles long, and that approximately 1,000 trees were snapped off about the ground and hundreds of trees were uprooted. Structural damage was limited to one unsecured outbuilding and a tree that fell on a mobile home. The event causing the most damage occurred on September 16, 2004 as the outer rainbands of Hurricane Ivan brought three to five inches of rain to Bullock County with estimated wind gusts of 80 miles per hour (70 knots). This event caused $2.4 million in damage, as homes suffered varying degrees of wind damage and thousands of trees and power lines were snapped off or blown down. The Hurricane Ivan wind event was a countywide event for Bullock County. As stated, both events with the maximum extent for wind speed and damage were countywide events.

In the unincorporated part of Bullock County, the storm with the maximum extent for both wind speed and damage occurred on May 20, 2010 when a thunderstorm produced winds of 70 knots

and resulted in $200,000 in property damage as five mobile homes, four outbuildings, and six quail houses were destroyed, and three mobile homes, two site-built homes, and one care were damaged. The maximum extent in both the Town of Midway and the City of Union Springs is 60 knots. On July 29, 2000, a microburst damaged a quail farm in Midway destroying three quail houses, damaging a tractor, and killing 8,500 quail. On March 13, 2003, a storm in Union Springs was estimated to have 60 knot winds blowing down trees and damaging a building roof and a storage building as well as blowing down trees.

Historical Occurrences.

Between 2000 and 2020, Bullock County has had 40 high wind and storm events, causing $2,895,000 in property damage and $50,000 in crop damage. According to the National Centers for Environmental Information event descriptions, one of the previous events was a heavy rain, one was a high wind, three were strong winds, and the remaining 35 events were thunderstorm and wind events. Bullock County has experienced a total of seven countywide events; unincorporated Bullock County has had 20 events; Midway has had five events; and Union Springs has had eight events. The table in Figure 4.33 provides a list of events over a 21-year time period from January 1, 2000 through December 31, 2020, including the type of event, and a summary of events by jurisdiction, with the extent and total damages.

Figure 4.33: Profile of High Wind, Thunderstorm and Severe Storm Events in Bullock County

Location	Date	Event Type	Mag	Deaths	Injuries	Property Damage	Crop Damage
Midway	7/29/2000	Thunderstorm Wind	60 kts. E	0	0	$125,000	$0
Union Springs	5/11/2001	Thunderstorm Wind	50 kts. E	0	0	$4,000	$0
Countywide	8/6/2001	Heavy Rain		0	0	$0	$0
Midway	1/19/2002	Thunderstorm Wind	55 kts. E	0	0	$6,000	$0
Midway	3/12/2002	Thunderstorm Wind	50 kts. E	0	0	$2,000	$0
Union Springs	8/20/2002	Thunderstorm Wind	50 kts. E	0	0	$5,000	$0
Union Springs	8/20/2002	Thunderstorm Wind	50 kts. E	0	0	$3,000	$0
Union Springs	3/13/2003	Thunderstorm Wind	60 kts. EG	0	0	$18,000	$0
Unincorp. Area	4/24/2003	Thunderstorm Wind	55 kts. EG	0	0	$3,000	$0
Union Springs	7/19/2003	Thunderstorm Wind	50 kts. EG	0	0	$20,000	$0
Unincorp. Area	6/27/2004	Thunderstorm Wind	50 kts. EG	0	0	$2,000	$0
Countywide	9/7/2004	Strong Wind	33 kts. ES	0	0	$1,000	$0
Countywide	9/16/2004	High Wind	70 kts. EG	0	0	$2,400,000	$0
Countywide	4/12/2005	Strong Wind	40 kts. EG	0	0	$1,000	$0
Countywide	4/30/2005	Thunderstorm Wind	52 kts. EG	0	0	$8,000	$0
Unincorp. Area	4/30/2005	Thunderstorm Wind	55 kts. EG	0	0	$20,000	$0
Countywide	3/20/2006	Thunderstorm Wind	75 kts. EG	0	0	$50,000	$0
Unincorp. Area	3/1/2007	Thunderstorm Wind	52 kts. EG	0	0	$5,000	$0
Union Springs	7/10/2007	Thunderstorm Wind	50 kts. EG	0	0	$2,000	$0
Unincorp. Area	2/6/2008	Thunderstorm Wind	50 kts. EG	0	0	$3,000	$0
Unincorp. Area	2/17/2008	Thunderstorm Wind	50 kts. EG	0	0	$5,000	$0
Unincorp. Area	6/15/2008	Thunderstorm Wind	50 kts. EG	0	0	$5,000	$0
Unincorp. Area	6/29/2008	Thunderstorm Wind	50 kts. EG	0	0	$1,000	$0

Unincorp. Area	1/7/2009	Thunderstorm Wind	50 kts. EG	0	0	$1,000	$0
Unincorp. Area	5/20/2010	Thunderstorm Wind	70 kts. EG	0	0	$200,000	$0
Midway	7/1/2011	Thunderstorm Wind	50 kts. EG	0	0	$5,000	$0
Unincorp. Area	12/25/2012	Thunderstorm Wind	60 kts. EG	0	0	$0	$0
Unincorp. Area	4/7/2014	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Unincorp. Area	6/6/2014	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Midway	4/25/2015	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Unincorp. Area	7/15/2015	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Unincorp. Area	7/11/2016	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Unincorp. Area	7/11/2016	Thunderstorm Wind	55 kts. EG	0	0	$0	$0
Unincorp. Area	6/25/2018	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Unincorp. Area	8/7/2019	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Unincorp. Area	8/7/2019	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Unincorp. Area	3/4/2020	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Union Springs	6/28/2020	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Union Springs	7/15/2020	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Countywide	9/16/2020	Strong Wind	39 kts. EG	0	0	$0	$50,000
Total High Wind / Storm Events		**40 Events**		**0**	**0**	**$2,895,000**	**$50,000**
Jurisdictional Summary: High Winds, Severe Storms and Thunderstorms							
Countywide		7 Events	75 kts. EG	0	0	$2,460,000	$50,000
Unincorporated Bullock Co.		20 Events	70 kts. EG	0	0	$245,000	$0
Midway		5 Events	60 kts. E	0	0	$138,000	$0
Union Springs		8 Events	60 kts. EG	0	0	$52,000	$0

Source: NOAA, National Centers for Environmental Information, Storm Events Database.
https://www.ncdc.noaa.gov/stormevents

Probability of Future Events.

Bullock County has experienced 40 high wind, severe storm and thunderstorm events in the last 21 years, which equates to **greater than 100 percent** (1.9) probability that such an event will occur on an annual basis. There were no deaths or injuries from the events. The combined property and crop damage from the events was $2,945,000, or **$73,625 per event**. The damage from the events was not equitably spread among the jurisdictions, however. As shown in Figure 4.32, the impact of future hail events for all jurisdictions in Bullock County is considered to be **High** with probable major damage within a 10-year period throughout Bullock County.

Figure 4.34: High Wind, Severe Storm and Thunderstorm Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	40 Events	20 Events	5 Event	8 Event
Maximum Extent	50 knots	70 knots	60 knots	60 knots
Probability of Future Events	33.3%	95.2%	23.8%	38.1%
Damage Per Event	$73,625	$12,250	$27,600	$6,500
Impact of Future Events	High	High	High	High

4.8 HURRICANES, TROPICAL STORMS, TROPICAL DEPRESSIONS

Description.
Coastal Alabama borders a part of the northern Gulf of Mexico that has a high incidence of tropical depressions, tropical storms and hurricanes that can cause wind and water damage in Bullock County. Tropical storms develop when ocean water is warmer than 80°F, there is low vertical wind shear and an area of low pressure. The storms bring damaging rotating winds up to 70 mph, torrential rain, and flooding. A hurricane is a rotating low-pressure weather system that has organized thunderstorms with constant wind speeds of 74 mph. At the center of a hurricane is an eye, which is a peaceful break from the storm. As a hurricane approaches shores, the sky will darken, winds will pick up, and the water will be pushed inland. Once a hurricane moves onto land it will quickly weaken due to the lack of access to warm water, which is the energy source of the storm.

As defined by FEMA, a tropical cyclone is a generic term for a cyclonic, low-pressure system over tropical or subtropical waters. Hurricanes are intense tropical systems that generate winds in excess of 74 mph. These storms are generally characterized by thunderstorms and defined surface wind circulation. They can produce high winds, heavy rains, erosion, flooding, and spawn tornados. Classifications of tropical cyclones are listed below:

- Tropical Depression: A tropical cyclone with maximum sustained winds of 38 mph (33 knots) or less.
- Tropical Storm: A tropical cyclone with maximum sustained winds of 39-73 mph (34 to 63 knots).
- Hurricane: A tropical cyclone with maximum sustained winds of 74 mph (64 knots) or higher.
- Major Hurricane: A tropical cyclone with maximum sustained winds of 111 mph (96 knots) or higher, corresponding to a Category 3, 4, or 5 on the Saffir-Simpson Hurricane Wind Scale.

Extra-tropical storms generate similar effects but tend to occur in the fall or winter. Because tropical and extratropical cyclones are large, moving storm systems, they can impact not only coastal areas, but inland areas as well. Hurricanes Opal (1995), Ivan (2004), and Katrina (2005) are excellent examples of tropical systems having a large inland impact.

Location.
While Bullock County is not necessarily susceptible to the full effects of a tropical cyclone making landfall along the coast, it is highly susceptible to the other events that occur or spawn off the cyclonic system. Floods caused by the storm's rain can make parts of the county inaccessible by road and interrupt the delivery of services and the ability to respond in an emergency. Tornados spawned off of a hurricane can cause loss of life, injuries, and cause damage to buildings and infrastructure. In this respect, hurricanes pose a threat to all of Bullock County. According to the National Centers for Environmental Information, when a tropical system has occurred in Bullock County it has been a countywide event.

Extent.
The Saffir-Simpson Hurricane Wind Scale is used to categorize tropical storms and hurricanes into five categories based on sustained wind speed. Besides the hurricane categories, there are two additional classifications for tropical depressions and tropical storms before these storms reach hurricane strength. Due to Bullock County's inland location, it is very unlikely that the county will ever experience hurricane force winds greater than a Category 1. Figure 4.35 outlines the Saffir-Simpson Scale categories, wind speeds for each category, and the anticipated damage sustained for each category. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures.

Figure 4.35: Saffir-Simpson Hurricane Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	**Very dangerous winds will produce some damage:** Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branchesof trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/h	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power lossis expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	**Devastating damage will occur:** Well-built framed homes may incur major damageor removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days toweeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most treeswill be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Mostof the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 kt or higher 252 km/h or higher	**Catastrophic damage will occur:** A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles willisolate residential areas. Power outages will last for weeks to possibly months. Mostof the area will be uninhabitable for weeks or months.

Source: NOAA, National Centers for Environmental Information. https://www.nhc.noaa.gov/aboutsshws.php

The maximum extent of tropical cyclone events in the last 21 years in Bullock County occurred September 10-18, 2020 when the impact of Hurricane Sally, a Category 2 storm that made landfall in Gulf Shores, Alabama, brought wind speeds of 90 miles per hour to Bullock County. In 1950,

however, Bullock County had 115 miles per hour winds from Hurricane King, a Category 4 storm that made landfall in Miami, Florida before moving inland across Florida, Georgia, and Alabama. And, in 1975, Hurricane Eloise, a Category 3 storm that made landfall west of Panama City, Florida, brought 110 miles per hour winds to Bullock County. The maximum extent for hurricanes is the same for all jurisdictions in Bullock County.

Historical Occurrences.

Because of its interior location, Bullock County is not especially susceptible to direct tropical or coastal storm events; however, its history documents the fact that the region has experienced tropical cyclones, high winds, tornadoes and related flooding associated with tropical systems. Between 2000 and 2020, the National Centers for Environmental Information reports that six tropical storm and tropical depression events have impacted Bullock County, causing $71,000 in property damage. The NOAA Historical Hurricane Tracks data indicates that Bullock County has experienced the impact of three hurricanes. All events had countywide impact. Details of these events are provided in Figure 4.36 and the hurricane tracks are shown in Figure 4.37. The combined data indicates that Bullock County has been impacted by nine tropical cyclone events since 2000: Allison in 2001, Hanna in 2002, two tropical storms in 2005, tropical depressions in 2008 and 2009, a tropical storm in 2018, and Hurricane Sally and a tropical storm in 2020. As stated previously, the largest hurricane in Bullock County's history was Category 2 Hurricane Sally in 2020, with winds of 90 miles per hour in Bullock County.

Figure 4.36: Profile of Hurricane / Tropical Storm / Tropical Depression Events in Bullock County

National Centers for Environmental Information, Storm Events Database:

Location	Date	Event Type	Mag	Deaths	Injuries	Property Damage	Crop Damage
Countywide	7/10/2005	Tropical Storm	Max 73 mph	0	0	$24,000	$0
Countywide	8/29/2005	Tropical Storm	Max 73 mph	0	0	$40,000	$0
Countywide	8/23/2008	Tropical Depression	Max 38 mph	0	0	$5,000	$0
Countywide	11/9/2009	Tropical Depression	Max 38 mph	0	0	$2,000	$0
Countywide	10/10/2018	Tropical Storm	Max 73 mph	0	0	$0	$0
Countywide	10/29/2020	Tropical Storm	Max 73 mph	0	0	$0	$0

NOAA Historical Hurricane Tracks Data:

Location	Name	Date Range	Max Wind Speed	Min Pressure	Max Category
Countywide	Allison	6/5-19/2001	50	1000	TS
Countywide	Hanna	9/12-15/2002	50	1001	TS
Countywide	Sally (P)	9/10-18/2020	90	967	H2

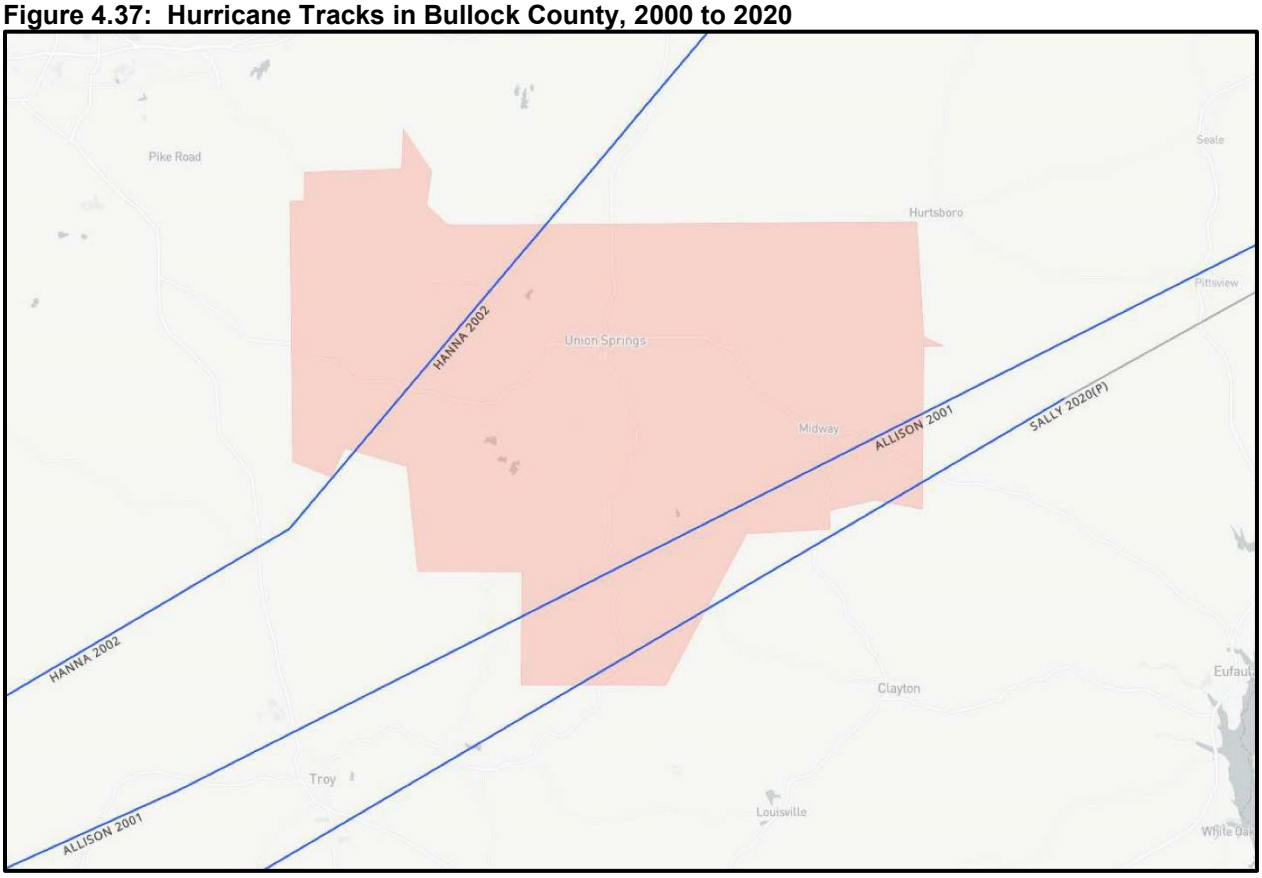
Total Tropical Cyclone Events	6 Events	0 Deaths	0 Injuries	$71,000 Pr Damage	$0 Cr Damage

Bullock County Jurisdictional Summary: Hail

Countywide	6 Events	90 mph	0	0	$71,000	$0
Unincorp. Bullock County	6 Events	90 mph	0	0	$71,000	$0
Town of Midway	6 Events	90 mph	0	0	$71,000	$0
City of Union Springs	6 Events	90 mph	0	0	$71,000	$0

Source: NOAA, National Centers for Environmental Information, Storm Events Database; and NOAA, Historical Hurricane Tracks. https://www.ncdc.noaa.gov/stormevents and https://coast.noaa.gov/hurricanes/#map=4/32/-80

Figure 4.37: Hurricane Tracks in Bullock County, 2000 to 2020



Source: NOAA, Historical Hurricane Tracks, Bullock County, Alabama.
https://coast.noaa.gov/hurricanes/#map=4/32/-80

Probability of Future Events.

Bullock County has experienced 9 hurricane, tropical storm and tropical depression events in the last 21 years, which equates to a **42.9 percent** probability of an annual event. There were no reported deaths, injuries or crop damage from the events. The combined property damage from the nine events was $71,000, or **$7,888.88 per event**. It is likely that the damage per event is event higher since damages were not reported for the three hurricane events listed by the NOAA Historical Hurricane Tracks database. As shown in Figure 4.38, the impact of future hurricane, tropical storm and tropical depression events for all jurisdictions in Bullock County is considered to be **Medium** with probable major damage within a 10 to 50-year period throughout the county.

Figure 4.38: Hurricane, Tropical Storm, Tropical Depression Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	9 Events	9 Events	9 Events	9 Events
Maximum Extent	90 mph	90 mph	90 mph	90 mph
Probability of Future Events	42.9%	42.9%	42.9%	42.9%
Damage Per Event	$7,889	$7,889	$7,889	$7,889
Impact of Future Events	Medium	Medium	Medium	Medium

4.9 LANDSLIDES

Description.
The Geological Survey of Alabama (GSA) defines a landslide as a perceptible downward and outward movement of slope-forming soil, rock, and vegetation under the influence of gravity. In a landslide, masses of rock, earth or debris move down a slope. Debris and mud flows are rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, during heavy rainfall or rapid snowmelt, changing the earth into a flowing river of mud or "slurry." They can flow rapidly, striking with little or no warning at avalanche speeds. They also can travel several miles from their source, growing in size as they pick up trees, boulders, cars and other materials. Landslides can be caused by a variety of factors including earthquakes, storms, volcanic eruptions, fire and by human modification of land. A combination of two or more landslide movements is referred to as a complex movement. Below is a brief discussion of the various types of landslide movements.

- Slides are downward displacements along one or more failure surfaces of soil or rock. The material may be a single intact mass or a number of pieces. The sliding may be rotational (turning about a point) or translational (movement roughly parallel to the failure surface).
- Flows are a form of rapid mass movement by loose soils, rocks, and organic matter, together with air and water that form slurry flowing rapidly downhill. Flows are distinguished from slides by high water content and velocities that resemble those of viscous liquids.
- Lateral spreads are large movements of rock, fine-grained soils (i.e., quick clays), or granular soils, distributed laterally. Liquefaction may occur in loose, granular soils, and can occur spontaneously due to changes in pore-water pressure or due to earthquake vibrations.
- Falls and topples are masses of rocks or material that detach from a steep slope or cliff that free-fall, roll, or bounce. Movements typically are rapid to extremely rapid. Earthquakes commonly trigger rock falls.
- Almost any steep or rugged terrain is susceptible to landslides under the right conditions. The most hazardous areas are steep slopes on ridges, hill, and mountains; incised stream channels; and slopes excavated for buildings and roads. Slide potentials are enhanced where slopes are destabilized by construction or river erosion. Road cuts and other altered or excavated areas are particularly susceptible to landslides and debris flows. Rainfall and seismic shaking by earthquakes or blasting can trigger landslides.
- Debris flows (also referred to as mudslides) generally occur during intense rainfall on water saturated soil. They usually start on steep hillsides as soil slumps or slides that liquefy and accelerate to speeds as great as 35 miles per hour. Multiple debris flows may merge, gain volume, and travel long distances from their source, making areas down slope particularly hazardous. Surface runoff channels along roadways and below culverts are common sites of debris flows and other landslides (USGS, 2000).
- Landslides often occur together with other major natural disasters, such as the following, thereby exacerbating relief and reconstruction efforts:
    - Floods and landslides are closely related and both involve precipitation, runoff, and

ground saturation that may be the result of severe thunderstorms or tropical storms.

- Earthquakes may cause landslides ranging from rock falls and topples, to massive slides and flows.
- Landslides into a reservoir may indirectly compromise dam safety or a landslide may even affect the dam itself.
- Wildfires may remove vegetation from hillsides, significantly increasing runoff and landslide potential.

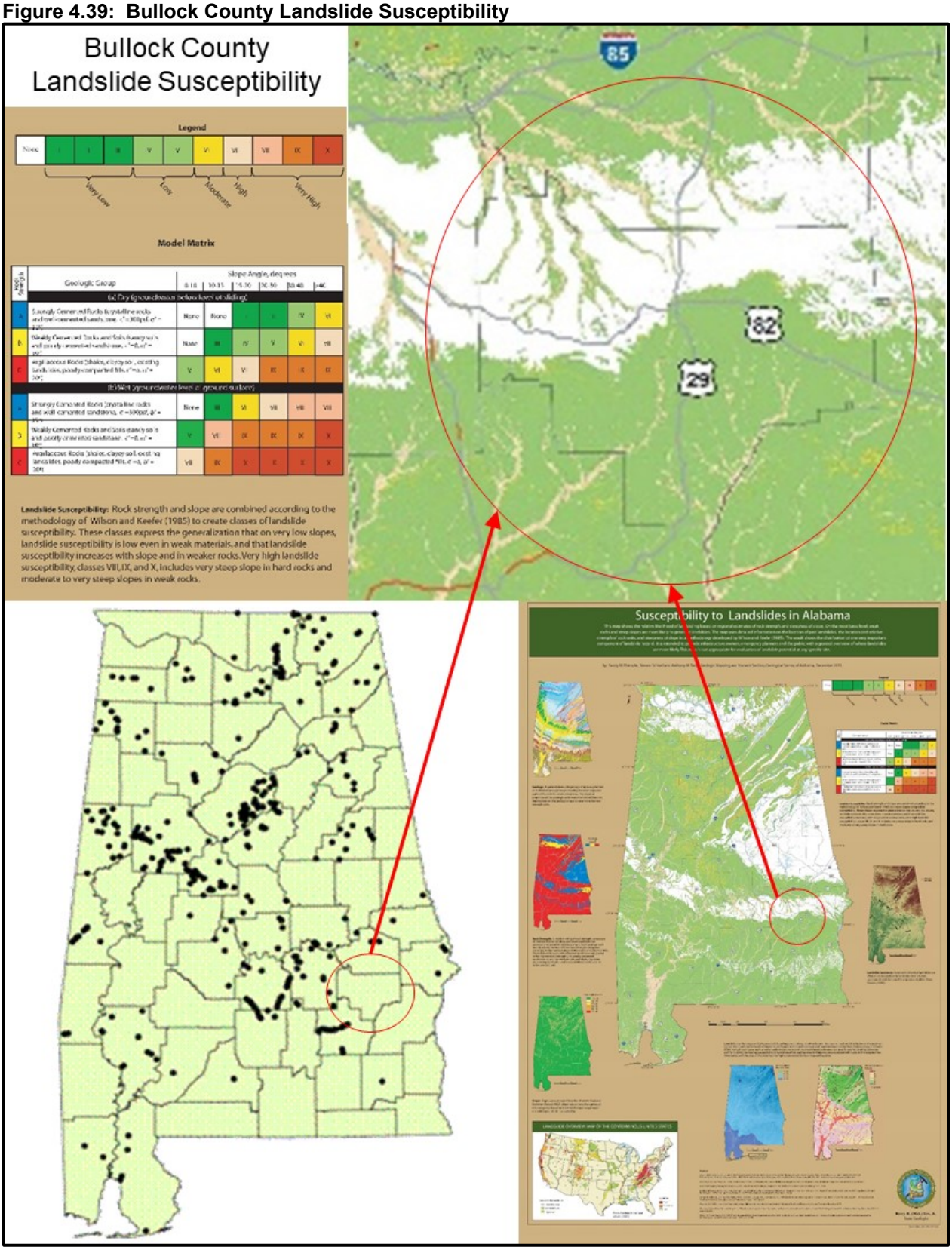
Landslides can occur quickly, often with little notice and the best way to prepare is to stay informed about changes in and around your home that could signal that a landslide is likely to occur.

Location.
As shown in Figure 4.39, the GSA has mapped the State of Alabama to determine areas with high susceptibility for landslides based on geology, rock strength, slope, average precipitation, seismic potential, and historic landslides. The result of overlaying these geologic and natural components is a scale of 11 susceptibility categories from None to X (very high).

The northern part of Bullock County is categorized as None, while the southern two-thirds of the county (generally south of US Highway 82) is categorized as IV-V: Low Susceptibility.

Extent.
There is no magnitude scale for landslides. Therefore, defining the extent of landslides is subjective and difficult to predict. Due to the lack of susceptibility throughout the planning area, the extent of landslide incidents is estimated to be primarily isolated damages to structures and infrastructure.

Figure 4.39: Bullock County Landslide Susceptibility

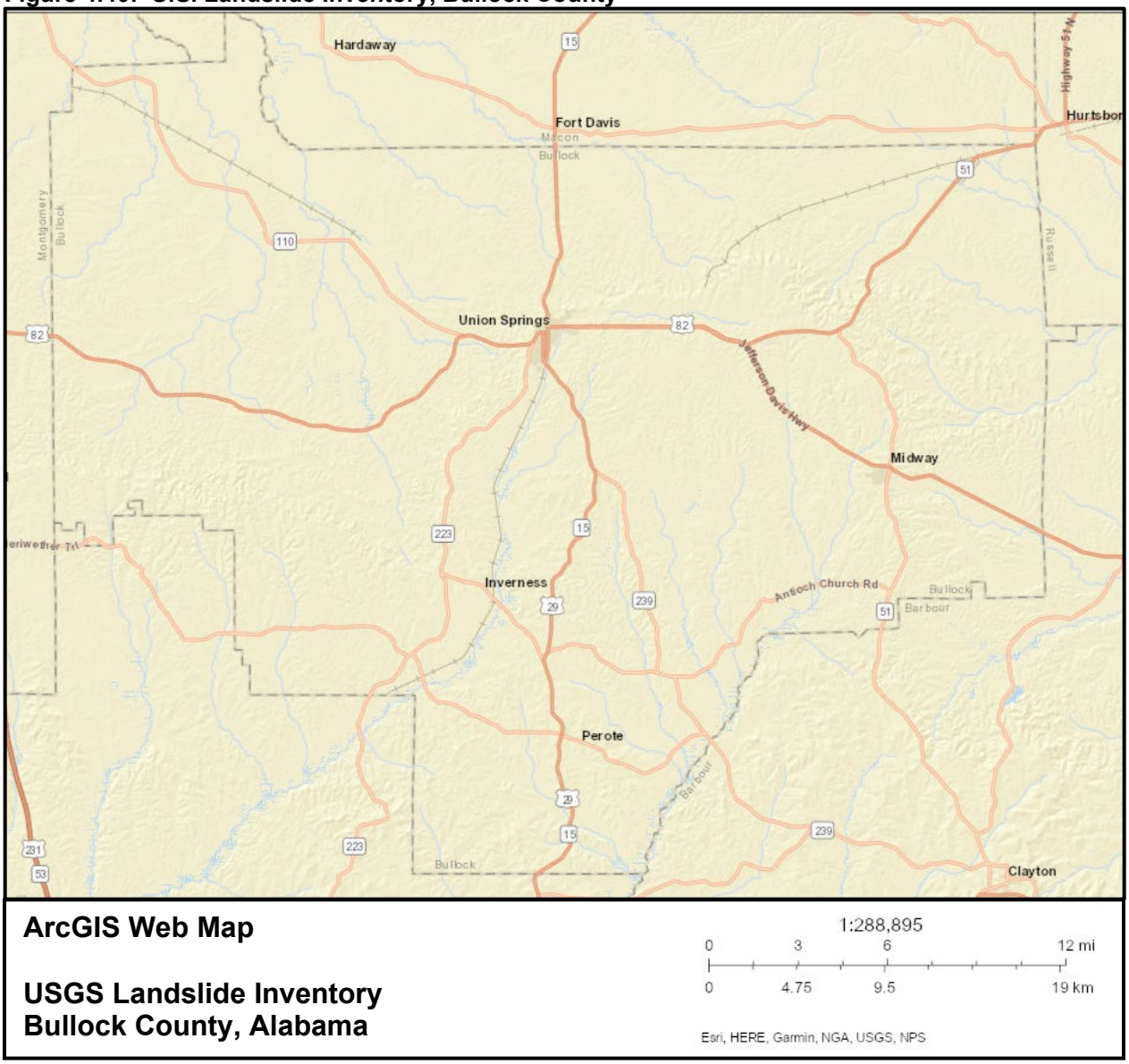


Source: Geological Survey of Alabama. https://www.gsa.state.al.us/gsa/geologic/hazards/landslides

Historical Occurrences.

According to the U.S. Landslide Inventory, available through USGS and shown in Figure 4.40, there have been no landslides that have occurred in Bullock County. Additionally, according to the Alabama State Hazard Mitigation Plan (2018), Alabama does not maintain a statewide real-time or near real-time record or reporting system of landslide events throughout the state. The GSA website, however, includes a photograph of an active landslide in Union Springs in the Historical Alabama Landslides section. The photo and GSA description, shown in Figure 4.41, are from a 2010 landslide. With no history of other landslides or susceptible conditions, the Union Springs landslide is believed to be a localized incident. There are no damage estimates available.

Figure 4.40: U.S. Landslide Inventory, Bullock County



USGS US Landslide Inventory, Bullock County, Alabama.
https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=ae120962f459434b8c904b456c82669d

Figure 4.41: 2010 Union Springs Landslide from GSA Website

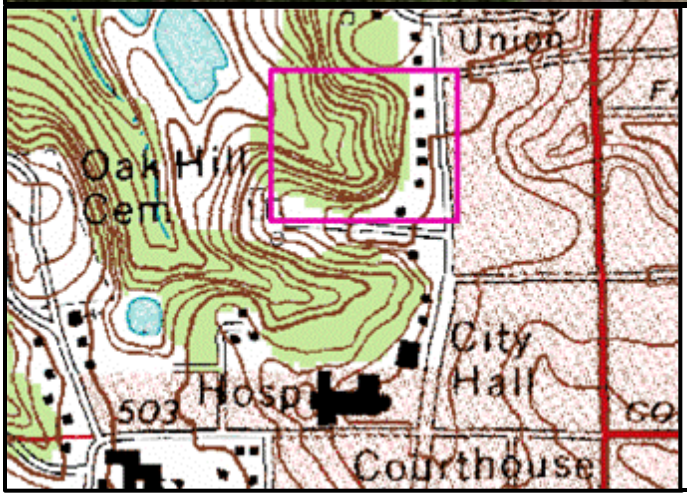


Photo of an active landslide in the backyard of a neighborhood in Union Springs, Bullock County, 2010. Scarp shown clearly in center of photo. The landslide's scarp is in the Cusseta Sand Member of the Ripley Formation. Landslide topography can also be seen on the 1973 Union Springs 7.5-minute topographic map.

Source: Geological Survey of Alabama. https://www.gsa.state.al.us/gsa/geologic/hazards/landslides

Probability of Future Events.

Based on historical information and susceptibility data from the USGS and the GSA, the probability of future landslide events for all jurisdictions in Bullock County, except Union Springs is **Very Low**. The probability for future landslide events in Union Springs, at 4.8 percent, is **Low**, with probable major damage within a 100-year time period. It is anticipated that most future incidents of landslides will be due to human activity and not due to natural events.

Figure 4.42: Landslide Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	1 Events	0 Events	0 Events	1 Event
Maximum Extent	unknown	unknown	unknown	unknown
Probability of Future Events	4.8%	0.0%	0.0%	4.8%
Damage Per Event	$0	$0	$0	unknown
Impact of Future Events	Very Low	Very Low	Very Low	Low

4.10 LAND SUBSIDENCE AND SINKHOLES

Description.
Subsidence is the motion of a surface (usually, the Earth's surface) as it shifts downward relative to a datum such as sea-level. The opposite of subsidence is uplift, which results in an increase in elevation. Subsidence frequently causes major problems in karst terrains, where dissolution of limestone by fluid flow in the subsurface causes the creation of voids (i.e. caves). If the roof of these voids becomes too weak, it can collapse and the overlying rock and earth will fall into the space, causing subsidence at the surface. This type of subsidence can result in sinkholes which can be many hundreds of meters deep. Sinkholes are caused by a loss of support, roof collapse and/or raveling in the ground's surface layers. Loss of support occurs when decreases of groundwater reduce the buoyant support of groundwater cavities. The collapse of the cavity's roof causes a subsurface breach. Raveling is the erosion of unconsolidated sediments and soils moving from one area into another underground gap. A visible sinkhole is created when the collapse of an unsupported cavity results in the magnification of the opening beyond the ability of the covering soil or rock material to bridge the opening.

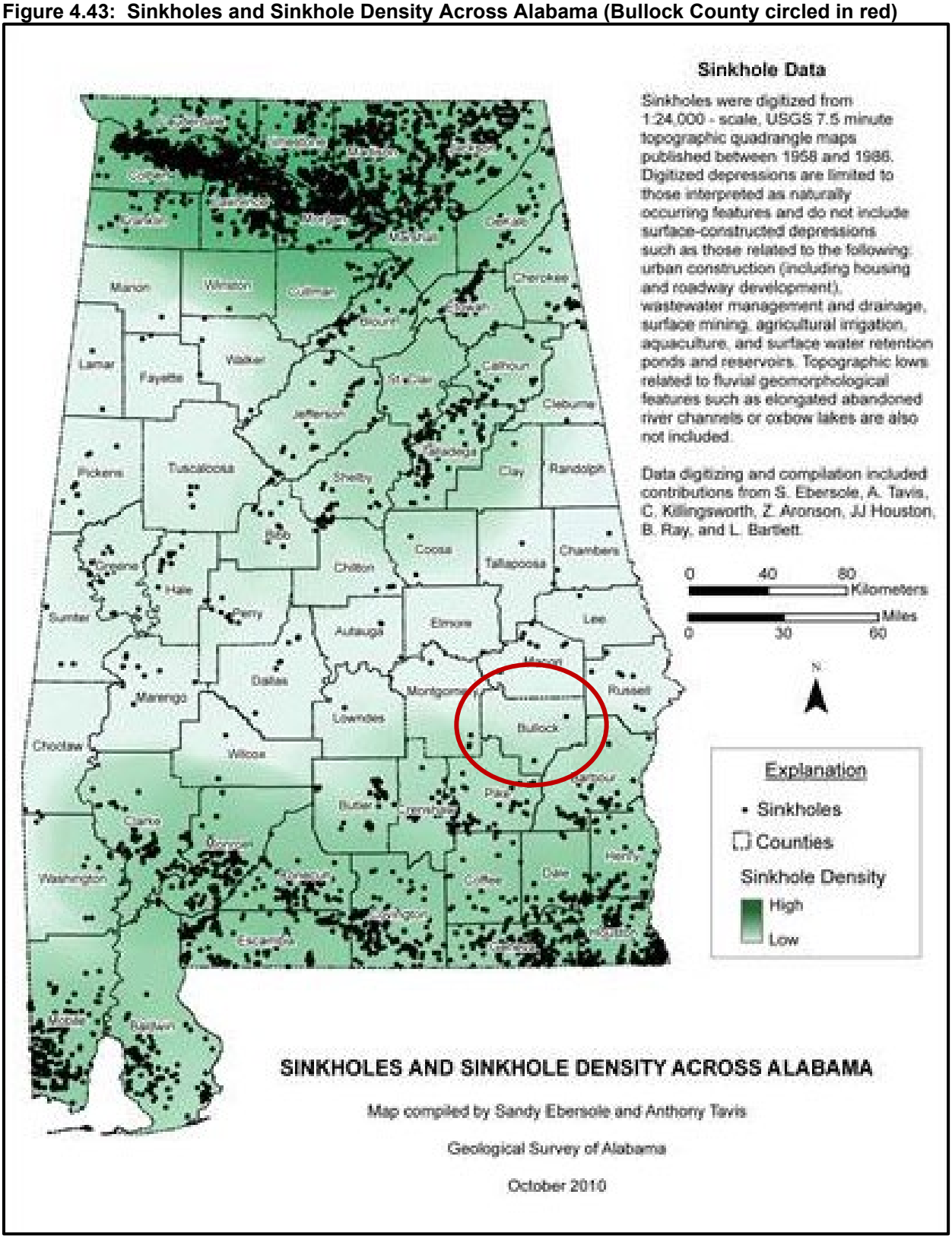
Land subsidence ranges from broad, regional lowering of the land surface to localized collapse. The primary cause of land subsidence is a direct result of human activity often in areas of karsts geology. The human activities that may trigger subsidence include mining and the withdrawal of groundwater and/or petroleum. The most dramatic form of subsidence is the collapse of superficial material into underground voids.

A sinkhole is a natural depression or hole in the surface topography caused by the removal of soil or bedrock, often both, by water. They may be formed gradually or suddenly. Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by circulating ground water. As the rock dissolves, spaces and caverns develop underground. These sinkholes can be dramatic because the surface land usually stays intact until there is not enough support. Then a sudden collapse of the land surface can occur.

Location.
The northern third of Bullock County lies in the Black Prairie District of the East Gulf Coastal Plain physiographic province of Alabama, while the remainder of the county lies in the Chunnenuggee Hills District. As shown in Figure 4.43, the GSA has mapped the State of Alabama to determine areas with sinkholes, sinkhole density and topographic depressions. The GSA map for Bullock County is provided as Figure 4.44. While there are three recognized topographic depressions in Bullock County, the sinkhole density is rated as low. Of the three identified topographic depressions, one is located north of Midway east of the intersection of Alabama Highway 51 and County Road 47; another is located approximately 2.5 miles south of Union Springs just west of the Conecuh River; and the last is located in the Perote Community southwest of the intersection of U.S. Highway 29 and County Road 8. All three locations are in the unincorporated part of Bullock County.

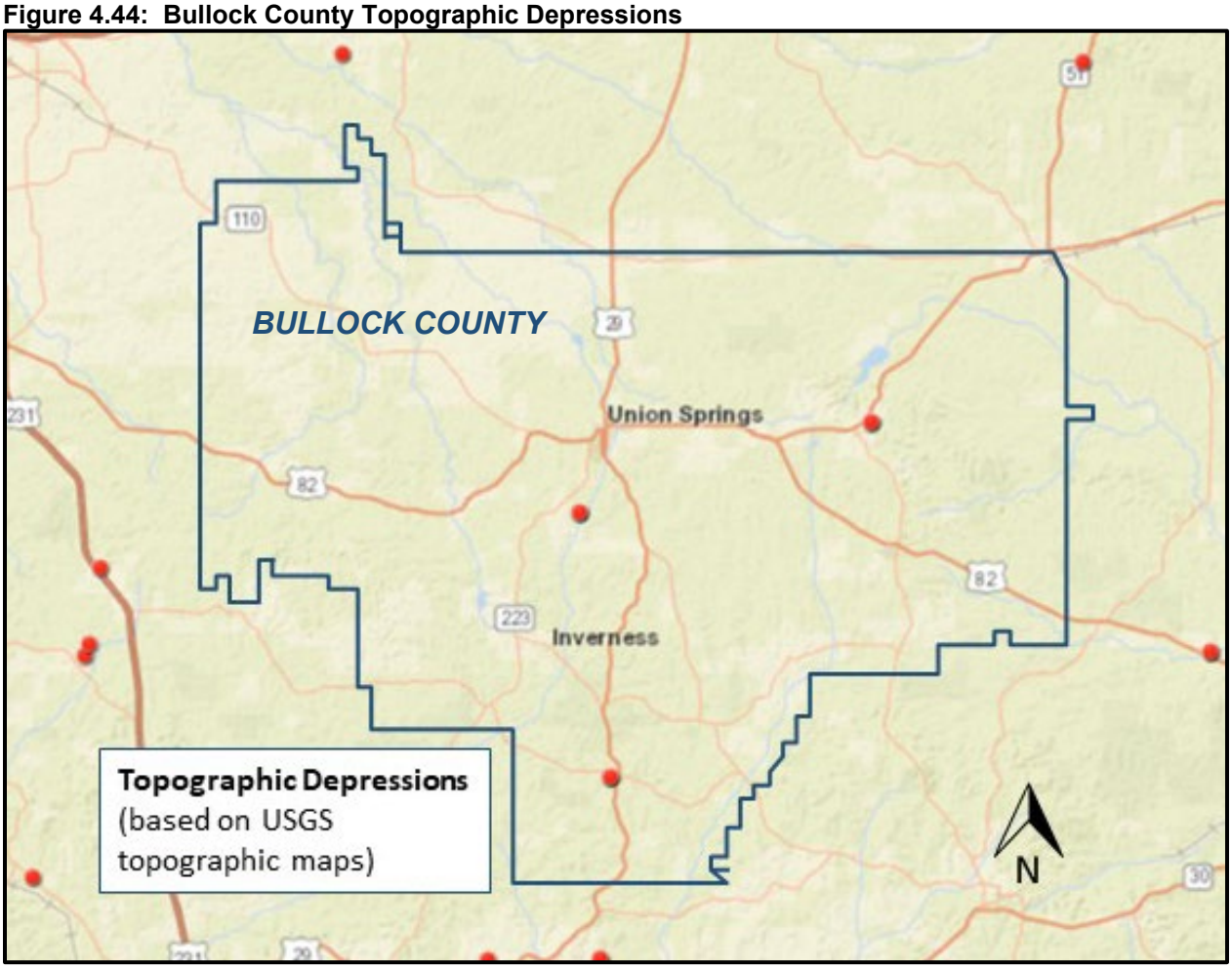
Extent.
There is no magnitude scale for land subsidence or sinkholes. Therefore, defining the extent of these hazards is subjective and difficult to predict. Due to the lack of historical data pertaining to the damage of land subsidence in Bullock County, the extent of land subsidence incidents is estimated to be primarily isolated damages to structures and infrastructure.

Figure 4.43: Sinkholes and Sinkhole Density Across Alabama (Bullock County circled in red)



Source: Geological Survey of Alabama.
https://www.gsa.state.al.us/gsa/geologic/hazards/sinkholes#sinkholesAddInfo

Figure 4.44: Bullock County Topographic Depressions



Source: Geological Survey of Alabama.
https://www.gsa.state.al.us/gsa/geologic/hazards/sinkholes#sinkholesAddInfo

Historical Occurrences.

There is little documentation from the USGS, the Geological Survey of Alabama, or previous local plans regarding historical land subsidence incidents or impacts in Bullock County. The GSA displays areas of topographic depressions mapped from elevations from topographic maps, much of which are presumed natural sinkholes (Figure 4.44). It is believed that each area of land subsidence has been localized and relatively minor in nature. There are no damage estimates available for the recorded incidents. The Union Springs Herald reported a sinkhole on US Highway 29 as a result of heavy rains in December 2015.

The *Union Springs Herald* reported on December 30, 2015 that heavy rains had resulted in a sinkhole on U.S. Highway 29 near the Bullock and Pike County line, pictured to the left.

Probability of Future Events.
Based on historical information and susceptibility data from the USGS and the GSA, the probability of future land subsidence and sinkhole events for all jurisdictions in Bullock County is **Low**. The probability for future landslide events in Union Springs, at 4.8 percent, is **Low**, with probable major damage within a 100-year time period. It is anticipated that most future incidents of landslides will be due to human activity and not due to natural events.

Bullock County has experienced at least one sinkhole event and possibly three, based on the topographic depression map in the last 21 years, which equates to a **14.3 percent** probability of an annual event. There were no reported deaths, injuries, property or crop damage from the events. As shown in Figure 4.38, the impact of future land subsidence and sinkhole events for all jurisdictions in Bullock County is considered to be either **Very Low** or **Low** with probable major damage within a 100-year period throughout the county.

Figure 4.45: Land Subsidence and Sinkhole Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	3 Events	3 Events	0 Events	0 Event
Maximum Extent	unknown	unknown	unknown	unknown
Probability of Future Events	14.3%	14.3%	0.0%	0.0%
Damage Per Event	$0	$0	$0	$0
Impact of Future Events	Very Low	Low	Very Low	Low

4.11 LIGHTNING

Description.
The National Severe Storms Laboratory of NOAA defines lightning as a giant spark of electricity in the atmosphere between clouds, the air, or the ground. In the early stages of development, air acts as an insulator between the positive and negative charges in the cloud and between the cloud and the ground. When the opposite charges build up enough, this insulating capacity of the air breaks down and there is a rapid discharge of electricity that we know as lightning. The flash of lightning temporarily equalizes the charged regions in the atmosphere until the opposite charges build up again. Lightning can occur between opposite charges within the thunderstorm cloud (intra-cloud lightning) or between opposite charges in the cloud and on the ground (cloud-to-ground lightning). Lightning is one of the oldest observed natural phenomena on earth. It can be seen in volcanic eruptions, extremely intense forest fires, surface nuclear detonations, heavy snowstorms, in large hurricanes, and obviously, thunderstorms.

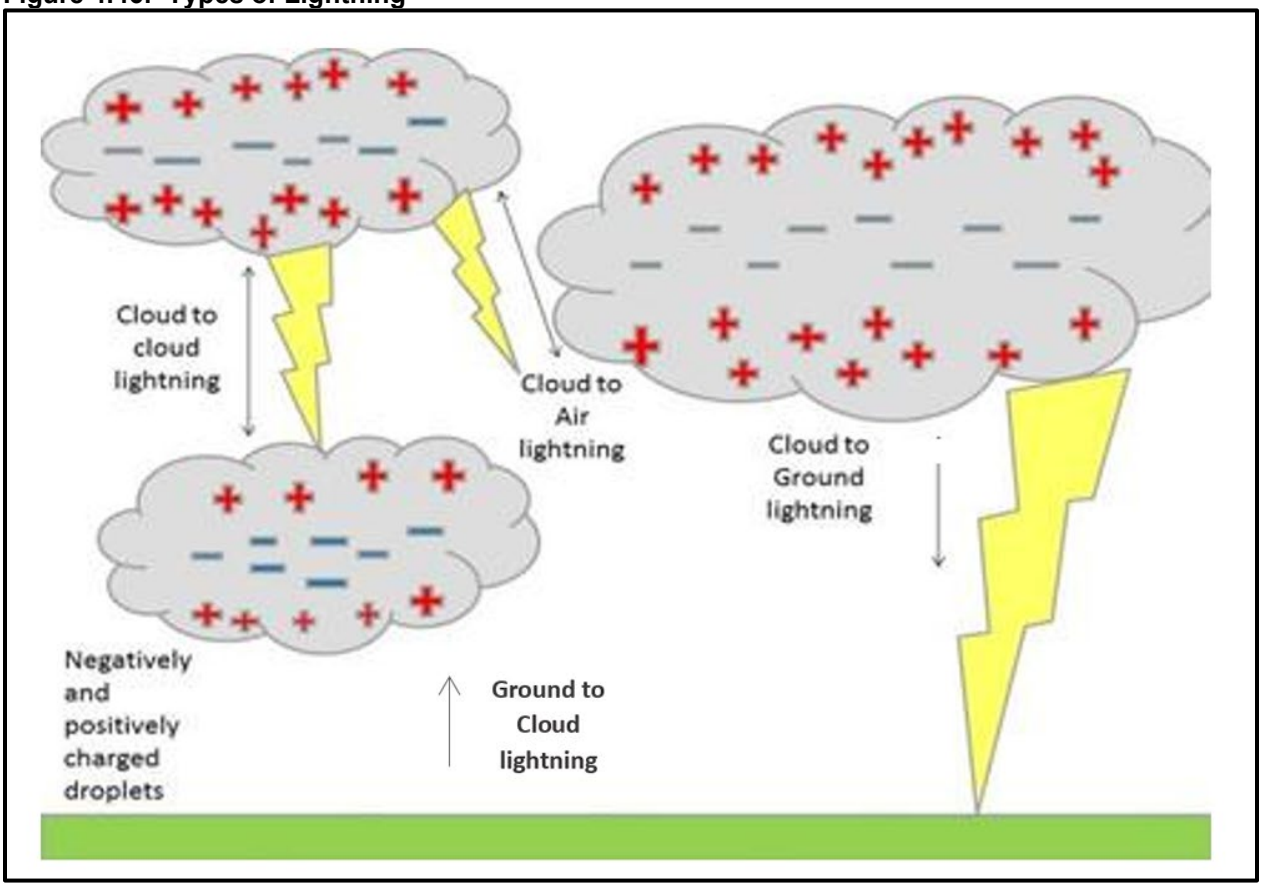
Lightning typically occurs as a by-product of a thunderstorm. The action of rising and descending air in a thunderstorm separates positive and negative charges, with lightning the result of the buildup and discharge of energy between positive and negative charge areas. Water and ice particles may also affect the distribution of the electrical charge. In only a few millionths of a second, the air near a lightning strike is heated to 50,000°F, a temperature hotter than the surface of the sun. Thunder is the result of the very rapid heating and cooling of air near the lightning that causes a shock wave.

The National Severe Storms Laboratory further explains that there are two ways that cloud to ground (CG) lightning flashes can strike ground: naturally downward (those that occur because of normal electrification in the environment), and artificially initiated or triggered upward. Artificially initiated lightning is associated with things like very tall structures, rockets and towers. Triggered lightning starts at the “ground,” which in this case may mean the top of a tower, and travels upward into the cloud, while “natural” lightning starts in the cloud and travels to ground. Upward triggered lightning usually occurs in response to a natural lightning flash, but on rare occasions can be “self-triggered”—usually in winter storms with strong winds. Lightning can also be triggered by aircraft flying through strong electric fields. If the plane is below the cloud, then a CG flash could result.

In the most common type of cloud-to-ground lightning, a channel of negative charge, called a stepped leader, will zigzag downward in roughly 50-yard segments in a forked pattern. This stepped leader is invisible to the human eye, and shoots to the ground in less time than it takes to blink. As it nears the ground, the negatively charged stepped leader causes streamer channels of positive charge to reach upward, normally from taller objects in the area, such as a tree, house, or telephone pole. When the oppositely-charged leader and streamer connect, a powerful electrical current begins flowing. This return stroke current of bright luminosity travels about 60,000 miles per second back towards the cloud. A negative CG flash consists of one or perhaps as many as 20 return strokes. We see lightning flicker when the process rapidly repeats itself several times along the same path. The actual diameter of the lightning channel current is one to two inches, surrounded by a region of charged particles.

The more common cloud-to-ground flash has a negative stepped leader that travels downward through the cloud, followed by an upward traveling return stroke. The net effect of this flash is to lower negative charge from the cloud to the ground so it is commonly referred to as a negative CG (or -CG). Less commonly, a downward traveling positive leader followed by an upward return stroke will lower positive charge to earth, referred to as a positive CG (or +CG). +CG flashes typically have only a single return stroke, and they are more likely than -CGs to have a sustained current flow. Some storms produce more +CGs and, more commonly some more -CGs (and some both) because of the charge distributions within the storms. Storms which produce mostly negative CGs tend to produce CGs earlier in the storm lifecycle and produce significantly more CGs than similar storms which instead produce mostly positive CGs.

Figure 4.46: Types of Lightning



Source: AlabamaWx Weather Blog, The National Severe Storm Laboratory, and The National Weather Service. https://www.alabamawx.com/?p=173831

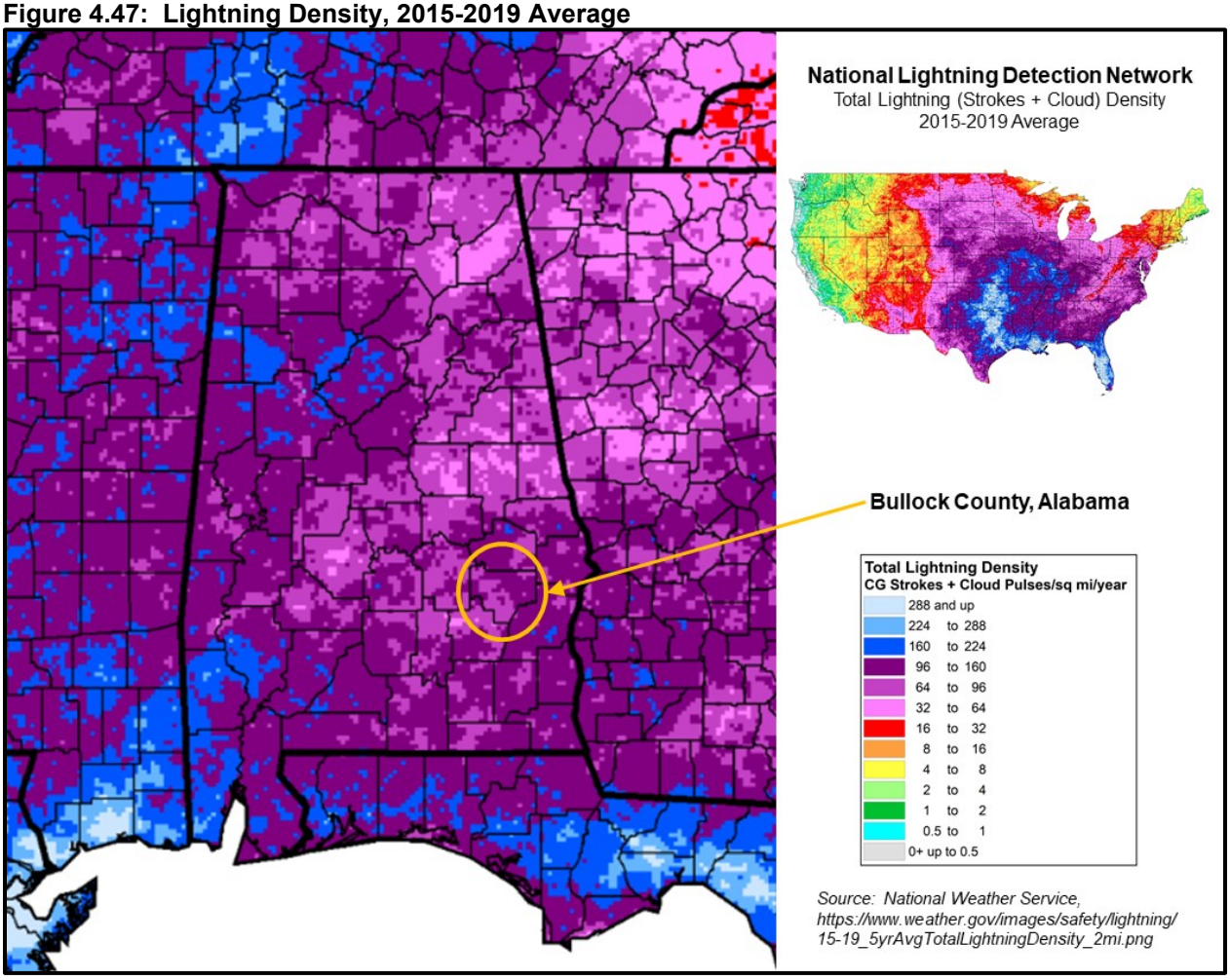
Location.

Just as thunderstorms are not limited to any one part of Bullock County, neither is the occurrence of lightning isolated to any particular area of the county. In fact, it is impossible to have a thunderstorm without lightning. In Section 4.7 of this plan, data from the National Centers for Environmental Information indicated that all jurisdictions within Bullock County had experienced thunderstorms.

Extent.

The extent of lightning is measured as lightning density which is the number of lightning strikes over a given period of time. According to the National Weather Service National Lightning Detection Network Map for the 2015-2019 average, lightning density is the cloud to ground (CG) strokes plus cloud pulses per square mile per year. As shown in Figure 4.47, the northeast part of Bullock County averages 96 to 160 CG Strokes plus Cloud Pulses per square mile per year while the southwestern part of the county averages 64 to 96.

Figure 4.47: Lightning Density, 2015-2019 Average



Historical Occurrences.

According to the National Centers for Environmental Information, there here have been no recorded lightning events in Bullock County between 2000 and 2020. As previously mentioned however, it is impossible to have thunder without lightning; and the NCEI data does report that Bullock County has experienced 40 thunderstorm and wind events during the same time period. See Section 4.7. Of those events, seven were countywide events, 20 thunderstorm events occurred in the unincorporated part of Bullock County, five events occurred in Midway and eight events occurred in Union Springs.

Also, the *Union Springs Herald* has reports of damage from lightning. On August 20, 2015, the newspaper reported that a home on Peachburg Road in Union Springs burned after a thunderstorm, heavily damaging the kitchen area. Further, the newspaper reported that the Town of Midway took action on July 7, 2014 to repair the Enon Road Well Pump that was struck by lightning in June of that year.

A home in Union Springs burns after a thunderstorm and presumed lightning strike.

Source: Union Springs Herald, August 20, 2015.
https://www.unionspringsherald.com/news/article_f39d8554-47a2-11e5-87d3-2ff9a9fb56c2.html

Probability of Future Events.
The probability of a lightning strike causing damage somewhere in Bullock County is high. Because the impacts are so localized, however, the site-specific incidence of a lightning strike occurring is considered very low. No lightning events were reported during the 21-year period of January 1, 2000 through December 31, 2020; however, 40 thunderstorm events were recorded. Due to lack of lightning-specific historical records, it is impossible to determine Bullock County's probability that a lightning event will occur in the future. Figure 4.48 provides an estimate of lightning probability based on thunderstorm events from Section 4.7. Although the likelihood of future lightning events is very high in Bullock County, the impact of future lightning events is considered to be **Medium** with probable major damage in a 10 to 50 year period.

Figure 4.48: Lightning Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	40 Events	20 Events	5 Event	8 Event
Maximum Extent	160 strokes per square mile per year	160 strokes per square mile per year	160 strokes per square mile per year	160 strokes per square mile per year
Probability of Future Events	33.3%	95.2%	23.8%	38.1%
Damage Per Event	unknown	unknown	unknown	unknown
Impact of Future Events	Medium	Medium	Medium	Medium

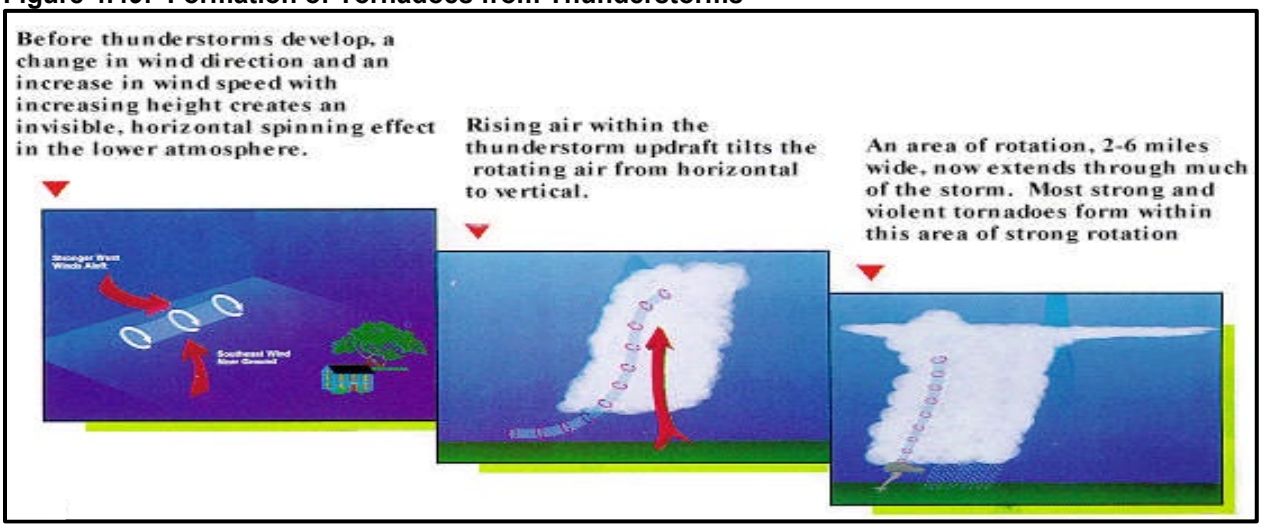
Note: Probability is based on thunderstorm and wind historical event data provided in Section 4.7.

4.12 TORNADOES

Description.

A tornado is a rapidly rotating funnel (or vortex) of air that extends toward the ground from a cumulonimbus cloud. Tornadoes often form in convective cells such as thunderstorms or at the front of hurricanes. Most tornadoes do not touch the ground, but when the lower tip of a tornado touches the earth, it can cause extensive damage. The most violent of tornados are capable of tremendous destruction with wind speeds of 250 miles per hour or more. Damage paths can be in excess of one mile wide and 50 miles long. Tornado season is generally March-August and again in November-December, although tornadoes can occur at any time of the year. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornadoes are the most unpredictable weather event. According to NOAA, 13 minutes is the average amount of time a person has to find a safe place from a tornado. The entire state, including Bullock County, is susceptible to tornadoes. Tornadoes can be assumed to potentially affect any location in the region, due to occurrences being randomly located and the impossibility of predicting specific area of tornado strikes.

Figure 4.49: Formation of Tornadoes from Thunderstorms



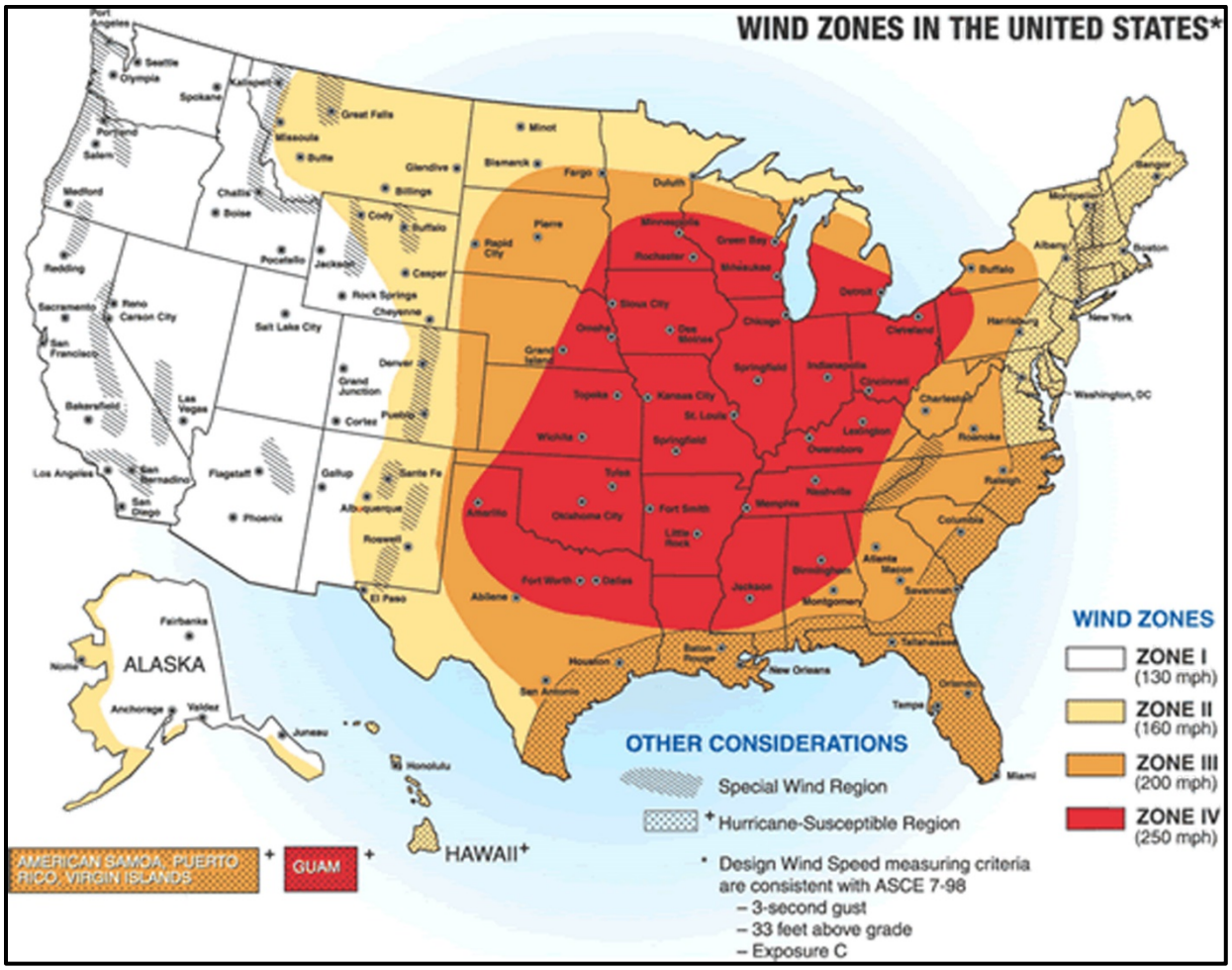
Source: National Weather Service Phoenix

Location.

Tornados are a significant hazard risk for all of Bullock County due to the severity of destruction and the limited warning time for response. Bullock County is located in Wind Zone III, as shown in Figure 4.50: Wind Zones in the United States map, which shows the frequency and strength of extreme windstorms across the U. S. The map is based on 40 years of tornado history and more than 100 years of hurricane history. Zone III has experienced both frequent and strong tornadoes, with wind speeds reaching 200 mile per hour. According to a national map of the number of tornadoes recorded per 1,000 square miles, found in the FEMA publication *Taking Shelter From the Storm: Building a Safe Room Inside Your House*, it is estimated that there are one to five tornadoes per 1,000 square miles in the region in which Bullock County is located.

Tornado paths are not localized and have the potential to affect any portion of the entire county during an event. The tornado track map, shown in Figure 4.52 and discussed in the Historical Occurrences section of this profile, shows that previous tornadoes have not been isolated to any one part of the county. The tornado track map, however, only shows 13 of the 18 tornadoes that have struck Bullock County. Of the 18 events, one was in Midway; one was in Union Springs; and the remaining 16 tornado events were in the unincorporated area of the county. The location of previous occurrences coupled with Bullock County's location in Wind Zone III indicates that all of Bullock County is highly susceptible to tornado hazards.

Table 4.50: Wind Zones in the United States



Source: Federal Emergency Management Agency; Taking Shelter From the Storm: Building a Safe Room Inside Your Home; https://www.fema.gov/pdf/library/ism2_s1.pdf.

Extent.

The extent, or magnitude, of tornadoes are measured using the Enhanced Fujita Scale which assigns a tornado a rating based on estimated wind speeds and related damage. The National Severe Storms Laboratory explains that the rating scale for tornadoes is based entirely on the damage they cause. The damage is used to estimate the wind speed of the tornado. In 2007, the Enhanced Fujita Scale was implemented by the National Weather Service to rate tornadoes in a more consistent and accurate manner. The EF-Scale takes into account more variables than the original Fujita Scale (F-Scale) when assigning a wind speed rating to a tornado, incorporating 28 damage indicators

such as building type, structures and trees. For each damage indicator, there are 8 degrees of damage ranging from the beginning of visible damage to complete destruction of the damage indicator. The original F-scale did not take these details into account. Strong or violent tornadoes, however, can and do occur in areas where minimal damage occurs, leading to a low EF scale rating. Table 4.51 shows the breakdown of the Enhanced Fujita Scale, and shows the extent of damage all jurisdictions can receive.

Table 4.51: Enhanced Fujita Scale

EF-Scale	Class	Wind speed		Description	
		mph	km/h		
EF-0	weak	65-85	105-137	Gale	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1	weak	86-110	138-177	Moderate	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2	strong	111-135	178-217	Significant	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground
EF-3	strong	136-165	218-266	Severe	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF-4	violent	166-200	267-322	Devastating	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF-5	violent	> 200	> 322	Incredible	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Source: National Weather Service. https://www.weather.gov

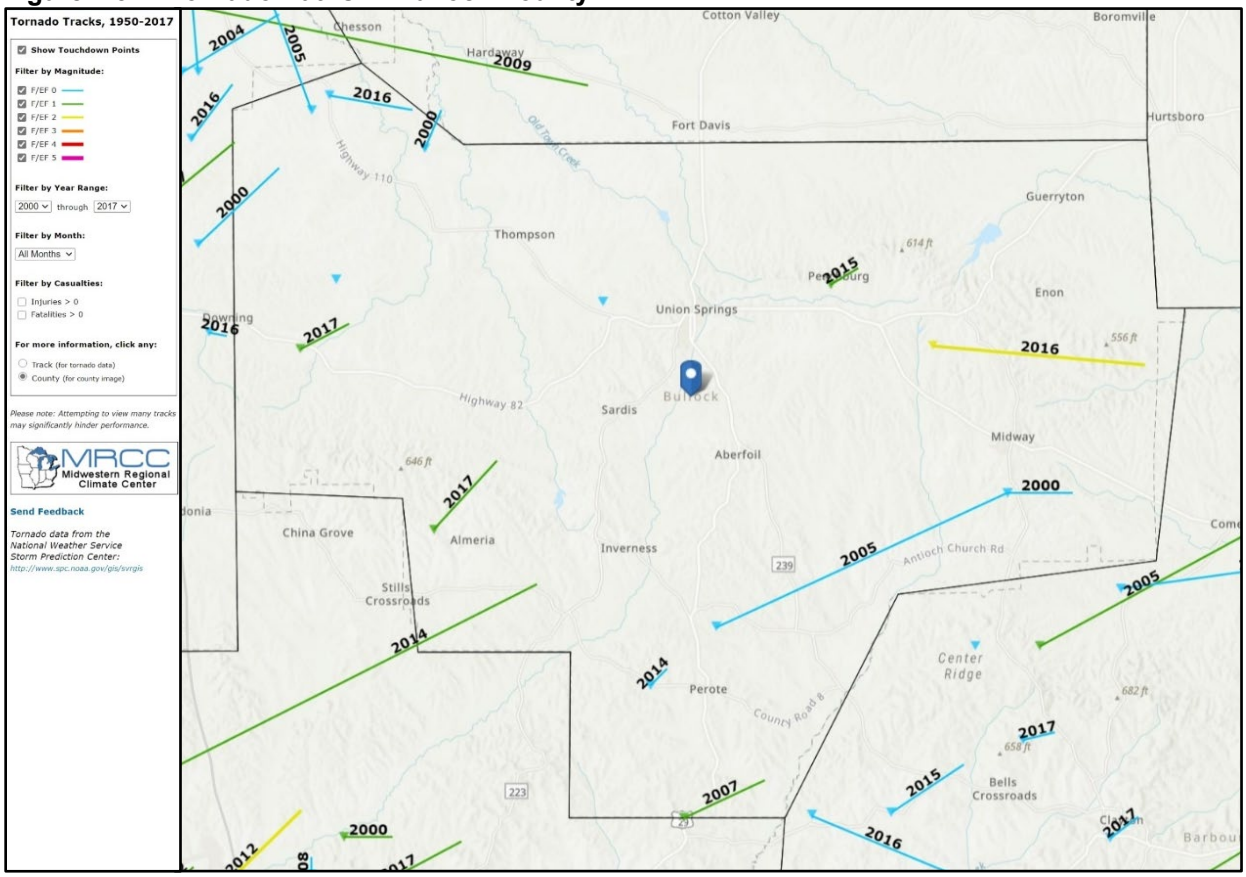
The maximum extent of tornado events in the last 21 years in Bullock County occurred on April 6, 2016 when an EF2 tornado struck the unincorporated Three Notch community in the eastern part of Bullock County. On that same day, and EF0 tornado struck in the unincorporated Mitchell community in the northwest part of the county. There were no deaths or injuries, and no monetary damage was reported in either event. The tornado that caused the most property damage was an F0 tornado with winds at approximately 70 miles per hour that touched down west of the Mitchell community and moved into eastern Montgomery County. The tornado path was 5.94 miles long and 300 yards wide at its widest point, causing $70,000 in property damages in Bullock County.

Historical Occurrences.

In the last 21 years, between January 1, 2000 and December 31, 2020, Bullock County has experienced 18 tornado events. Of these, one tornado occurred in Midway, one occurred in Union Springs, and the 16 remaining tornado events occurred in the unincorporated parts of the county with no pattern to location. The paths of 16 previous tornado events are shown in Figure 4.52 and are profiled in Figure 4.53. Combined, the 18 tornado events resulted in $159,000 in property

damages with no deaths, injuries or crop damage reported. Of the total events, one tornado was an EF2, four tornadoes were rated as EF1, and the remaining 11 tornadoes were F0/EF0.

Figure 4.52: Tornado Paths in Bullock County



Source: University of Illinois at Urbana-Champaign; Midwestern Regional Climate Center; Tornado Tracks Tool. https://mrcc.illinois.edu/gismaps/cntytorn.htm

Figure 4.53: Profile of Tornado Events in Bullock County

Location	Date	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Midway	1/9/2000	Tornado	F0	0	0	$0	$0
Unincorporated Area	2/13/2000	Tornado	F0	0	0	$15,000	$0
Unincorporated Area	2/13/2000	Tornado	F0	0	0	$10,000	$0
Unincorporated Area	4/30/2005	Tornado	F0	0	0	$45,000	$0
Unincorporated Area	8/29/2005	Tornado	F0	0	0	$70,000	$0
Union Springs	8/29/2005	Tornado	F0	0	0	$1,000	$0
Unincorporated Area	4/14/2007	Tornado	EF1	0	0	$10,000	$0
Unincorporated Area	4/10/2009	Tornado	EF0	0	0	$3,000	$0
Unincorporated Area	4/19/2009	Tornado	EF0	0	0	$5,000	$0
Unincorporated Area	5/14/2014	Tornado	EF0	0	0	$0	$0
Unincorporated Area	11/17/2014	Tornado	EF0	0	0	$0	$0
Unincorporated Area	4/19/2015	Tornado	EF1	0	0	$0	$0

Unincorporated Area	4/6/2016	Tornado	EF0	0	0	$0	$0
Unincorporated Area	4/6/2016	Tornado	EF2	0	0	$0	$0
Unincorporated Area	1/2/2017	Tornado	EF1	0	0	$0	$0
Unincorporated Area	1/22/2017	Tornado	EF1	0	0	$0	$0
Unincorporated Area	4/27/2017	Tornado	EF0	0	0	$0	$0
Unincorporated Area	3/3/2019	Tornado	EF0	0	0	$0	$0
Total		**18 Events**		**0**	**0**	**$159,000**	**$0**
Jurisdictional Summary: Tornadoes							
Countywide		0 Events		0	0	$0	$0
Unincorporated Bullock County		16 Events		0	0	$158,000	$0
Midway		1 Event		0	0	$0	$0
Union Springs		1 Event		0	0	$1,000	$0

Source: NOAA, National Centers for Environmental Information, Storm Events Database.
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Tornado&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2000&endDate_mm=12&endDate_dd=31&endDate_yyyy=2020&county=BULLOCK%3A11&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=1%2CALABAMA

Probability of Future Events.
Bullock County has experienced 18 tornado events in 21 years, which equates to an **85.7 percent** probability of an annual event. There were no reported deaths, injuries or crop damage from the events. The combined property damage from the nine events was $159,000, or **$8,833.33 per event**. It is likely that the damage per event is higher since monetary damages were not reported for multiple tornadoes although the event narratives discuss both structural and vegetative damage. As shown in Figure 4.54, the impact of future tornado events for all jurisdictions in Bullock County is considered to be **High** with probable major damage within a 1 to 10-year period throughout the county.

Figure 4.54: Tornado Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	18 Events	16 Events	1 Events	1 Events
Maximum Extent	EF2	EF2	F0	F0
Probability of Future Events	85.7%	76.2%	4.8%	4.8%
Damage Per Event	$8,833	$9875	$0	$1,000
Impact of Future Events	High	High	High	High

4.13 WILDFIRE

Description.
A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may fill the area for miles around. Wildfires can be human-caused through acts such as arson or campfires, or can be caused by natural events such as lightning. Wildfires can be categorized into three types:

- **Wildland fires** occur in very rural areas and are fueled primarily by natural vegetation. In Bullock County, the vast majority of these fires occur on privately owned land. Wildland fire suppression is the responsibility of the State of Alabama, through the Alabama Forestry Commission.
- **Interface fires** occur in areas where homes or other structures are endangered by the wildfires. The fires are fueled by both natural vegetation and man-made structures. These are often referred to as Wild land Urban Interface fires. Interface fire suppression is the responsibility of the Alabama Forestry Commission, working closely with local volunteer fire departments.
- **Firestorms** occur during extreme weather (e.g., high temperatures, low humidity, and high winds) with such intensity that fire suppression is virtually impossible. These events typically burn until the conditions change, or the fuel is exhausted.

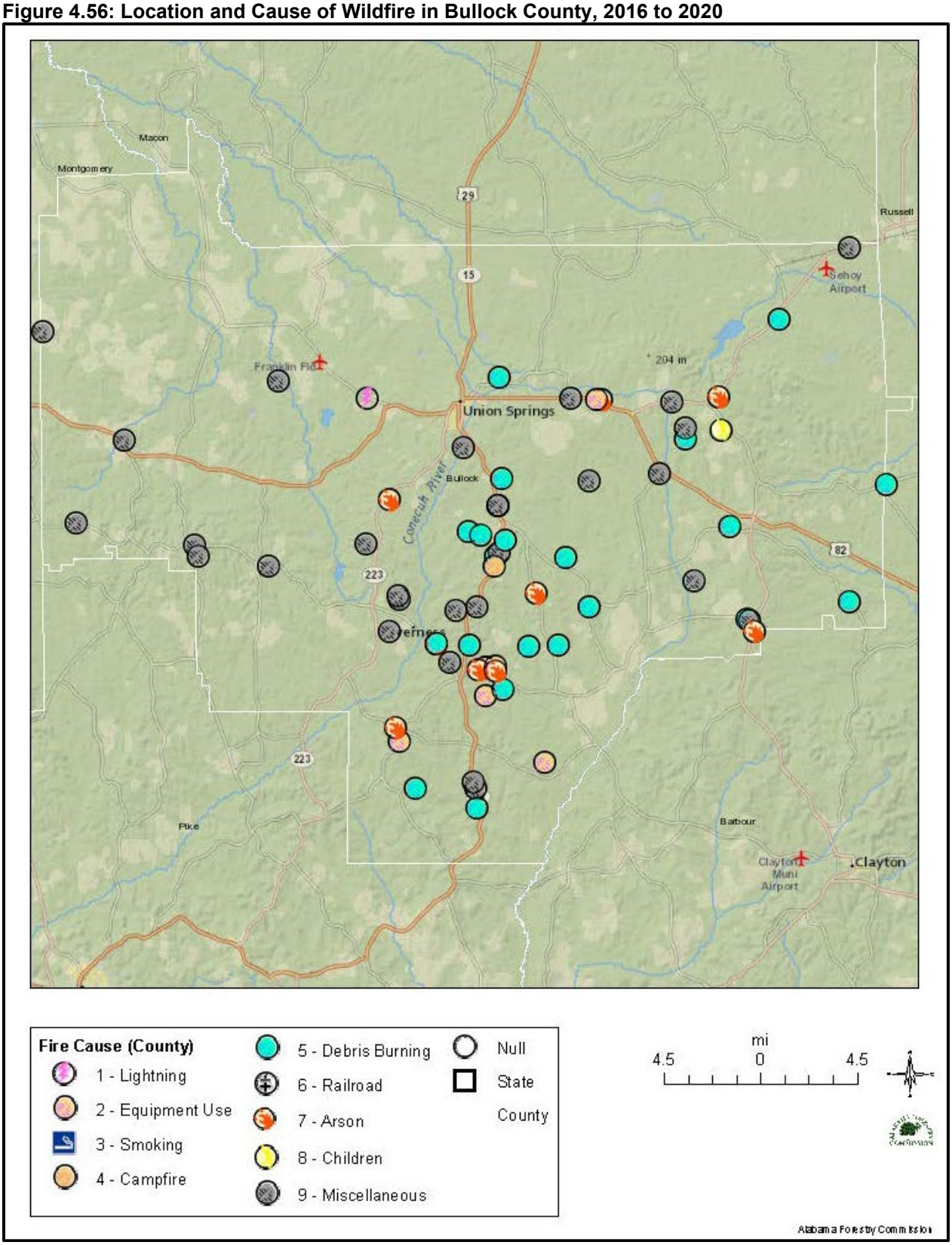
Location.
Wildfire location data was compiled from the Alabama Forestry Commission. The Alabama Forestry Commission data covers the time period from 2007 to 2020 in data tables and 2016 through 2020 in locational maps and tables. Bullock County has experienced 72 wildfires from 2016 through 2020, the majority of which have occurred in the southern part of the county south of US Highway 82, as seen in Figure 4.56. Of the 72 wildfires, one was in Midway and two were in Union Springs, with the remaining 69 wildfires occurring in the unincorporated area of the county. During the 5-year period, there were seven causes of wildfire, with burning debris being the biggest contributor with the highest number of events, at 23 wildfires, and burning the largest amount of land, at 600.15 acres. There does not appear to be any correlation between location and cause of wildfire. Since approximately 81.8 percent of Bullock County is forested land, it is not surprising that wildfire can be prevalent in any part of the county, regardless of cause.

Figure 4.55: Cause of Wildfire in Bullock County, 2016 to 2020

Wildfire Cause	Number of Events	Acres Burned
1-Lightning	1	5.00
2-Equipment Use	5	9.25
4-Campfire	2	18.80
5-Burning Debris	23	600.15
7-Arson	10	336.55
8-Children	1	15.00
9-Miscellaneous	30	351.80
Total Bullock County	**72**	**1,336.55**

Source: Alabama Forestry Commission, 2020
https://gis.forestry.alabama.gov/portal/apps/webappviewer/index.html?id=e11e120b51984c928af6e6d27d261dcf

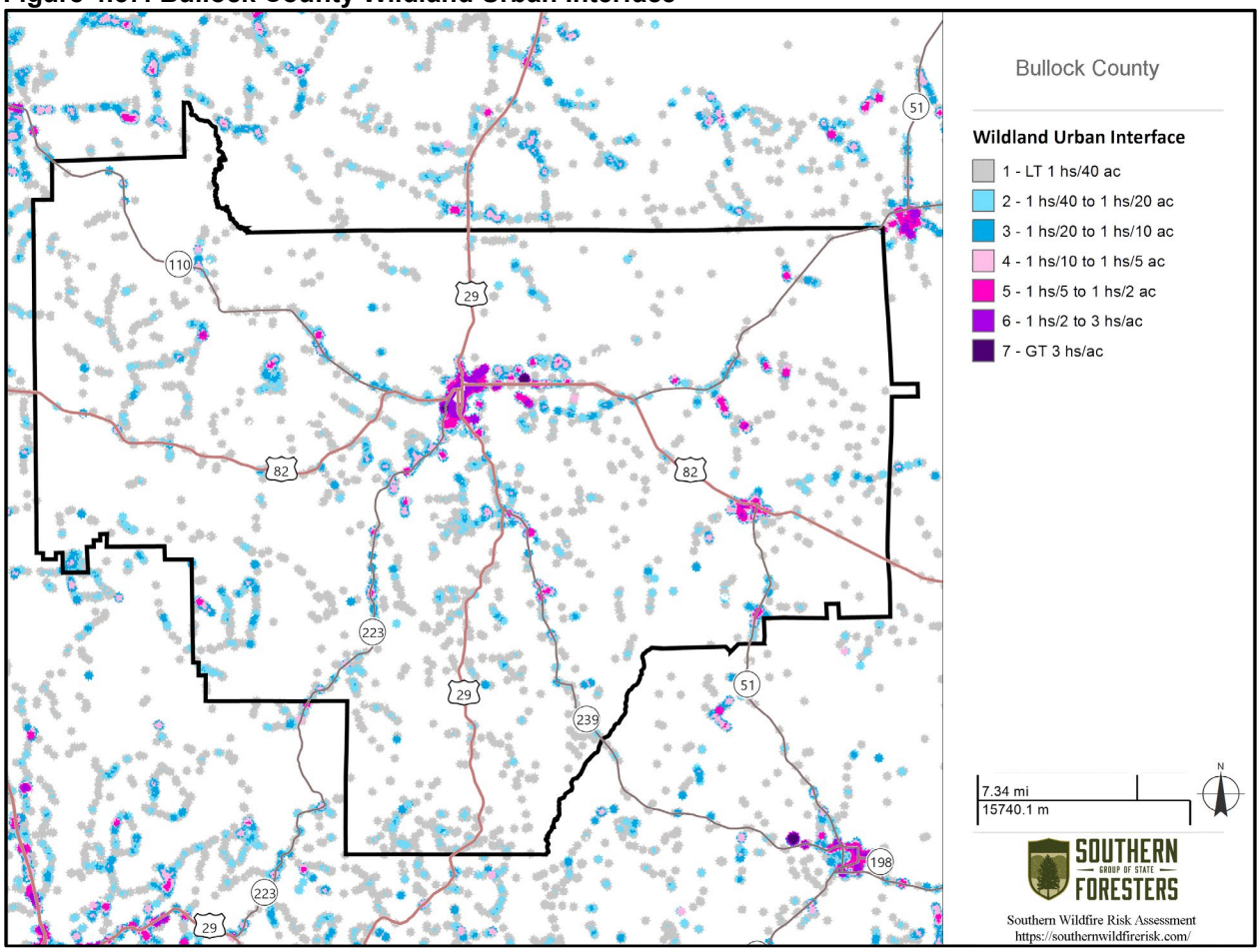
Figure 4.56: Location and Cause of Wildfire in Bullock County, 2016 to 2020



Source: Alabama Forestry Commission, 2020
https://gis.forestry.alabama.gov/portal/apps/webappviewer/index.html?id=e11e120b51984c928af6e6d27d261dcf

A review of maps available from the Southern Group of State Foresters Wildfire Risk Assessment Portal (SWRAP) provides data on potential wildfire locations based on parameters including housing, surface fuels and burn probability, and probable fire characteristics. Of these maps, one is the wildland urban interface (WUI), which is the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. The WUI data combined with the WUI Risk Assessment provides a strong indicator of locational potential for wildfire in Bullock County. The Wildland Urban Interface Risk Assessment provides 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. According to the Bullock County Fire Risk Assessment report, the county is estimated to have a population of 10,693 people, with all residents and all land considered to be within the WUI. Because of the rural nature of Bullock County with population concentrations in Union Springs and Midway, approximately 62.2 percent of the population lives within the three higher density WUI categories (5 through 7) that range from one house per five acres to greater than three houses per one acre. Only 4.7 percent of the land area, however, is located within the higher density categories.

Figure 4.57: Bullock County Wildland Urban Interface



Source: Southern Group of State Foresters Wildfire Risk Assessment, Pike County Fire Risk Assessment Report, 2020. https://www.southernwildfirerisk.com/

Extent.

The magnitude of wildfire events is often classified as total number of acres burned and destructive impacts to people and property, including house fires and casualties. These elements are greatly dependent on other factors, such as weather conditions, available fuel, topography, and existing wildfire mitigation capabilities. The USDA Forest Service utilizes a wildfire classification system that categorizes wildfire by the number of acres burned. In classifying Alabama Forestry Commission data into the USDA Forest Service wildfire classification system, it should be noted that acres burned in smaller wildfires was not recorded until about 2016. Therefore, the average acres burned per fire is not exact; and the fires with no acreage recorded are included the Class A Fire Classification.

With data available from the Alabama Forestry Commission, it is estimated that Bullock County has suffered 234 wildfires between 2007 and 2020 with a total of 3,784.29 acres burned. Therefore, the average wildfire size in Bullock County is 16.17 acres. The largest wildfire in the county occurred in June 2011 with 395 acres burned. In the 14-year period, Bullock County has had one Class E fire, six Class D fires, and 63 Class C fires. The remaining 164 fires were ten acres or less in size.

Figure 4.58: Wildfire Classification System – Bullock County

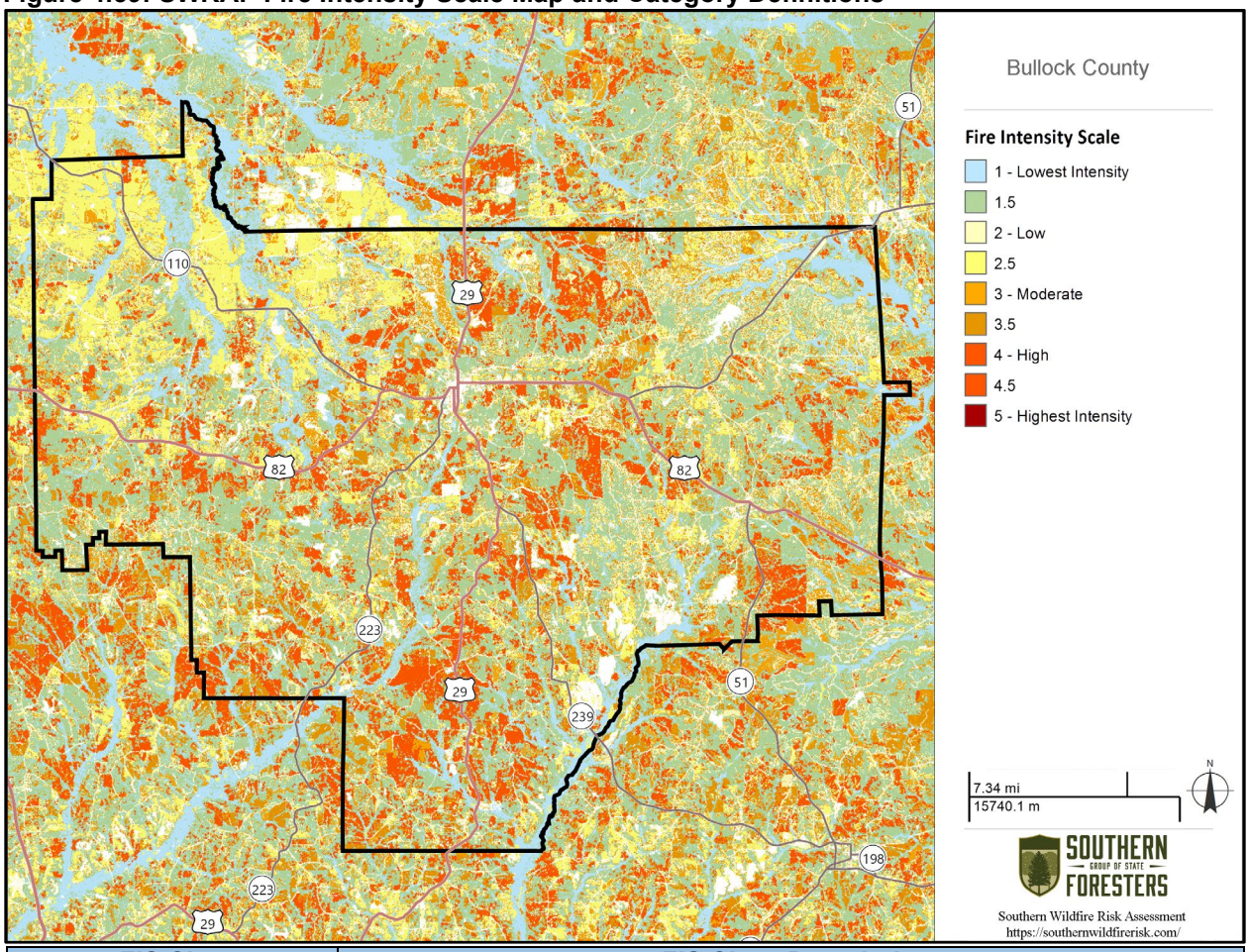
Fire Size (acres)	USDA Forest Service Wildfire Classes	Bullock County Fires	
		Number of Fires per Class	Total Number of Acres Burned per Class
Class A	One-fourth acre or less	43	1.25 acres
Class B	More than one-fourth acre, but less than 10 acres	121	377.84 acres
Class C	10 acres or more, but less than 100 acres	63	1,970.20 acres
Class D	100 acres or more, but less than 300 acres	6	1,040.00 acres
Class E	**300 acres or more, but less than 1,000 acres**	1	395.00 acres
Class F	1,000 acres or more, but less than 5,000 acres	0	0.00 acres
Class G	5,000 acres or more.	0	0.00 acres
Total Bullock County Fires		234	3,784.29 acres

Source: Alabama Forestry Commission, 2020; *https://forestry.alabama.gov/Pages/Fire/Totals.aspx*

Another mechanism to measure wildfire extent is the Fire Intensity Scale (FIS), also available from the SWRAP Bullock County Fire Risk Assessment Report. FIS identifies areas where significant fuel hazards and associated fire behavior potential exist based on a weighted average of four percentile weather categories. FIS consists of five 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. The FIS categories, shown in the map and table in Figure 4.59, provide a standard scale to measure potential wildfire intensity.

According to the SWRAP Bullock County Fire Risk Assessment Report, 13.0 percent of the land is in Category 4: High Intensity, which is the highest wildfire extent for Bullock County. The report indicates that 28.5 percent of the total land area of the county would be considered moderate to high fire intensity, being located in Categories 3 through 4. The remaining 71.5 percent of the county land area is categorized as non-burnable to Category 2.5: Low Intensity. Those land areas categorized as moderate to high intensity are generally located outside the highest density areas of the WUI in Union springs and Midway.

Figure 4.59: SWRAP Fire Intensity Scale Map and Category Definitions



FIS Class	FIS Class Description
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.

Source: Southern Group of State Foresters Wildfire Risk Assessment, Pike County Fire Risk Assessment Report, 2020. https://www.southernwildfirerisk.com/

Historical Occurrences.

The Alabama Forestry Commission has records of wildfires dating back to 2007. Between January 2007 and December 2020, Bullock County experienced 234 wildfires with 3,784.29 acres burned, which equates to 16.17 acres per fire. Of the total wildfires, 164 wildfires (70.1 percent) were under 10 acres in size and burned a combined total of 377.84 acres. The remaining 70 wildfires ranged from 10 acres to 395 acres in size and burned a combined total of 3,405.2 acres. Figure 4.60 provides data on historical wildfire occurrences that were greater than 10 acres in size in Bullock County.

Figure 4.60: Wildfires in Bullock County Larger than 10 Acres, 2007 through 2020

Fire #	Acres	Reported On	Contained On	Controlled On
MGM-20070218-001	40.00	2/18/2007 12:09		2/18/2007 15:09
MGM-20070223-001	15.00	2/23/2007 13:55		2/23/2007 17:00
MGM20071124-002	35.00	11/24/2007 14:40		11/24/2007 16:31
MGM-20080211-010	10.00	2/11/2008 14:11		2/11/2008 15:45
MGM-20080306-006	60.00	3/6/2008 19:30		3/6/2008 21:10
MGM-20080513-002	20.00	5/13/2008 17:02		5/13/2008 19:06
SER-20090306-005	20.00	3/6/2009 15:39		3/6/2009 17:00
SER-20090307-002	14.00	3/7/2009 16:51		3/7/2009 20:01
SER-20090310-003	70.00	3/10/2009 16:38		3/10/2009 17:10
SER-20090311-001	40.00	3/11/2009 13:38		3/11/2009 15:03
SER-20100221-003	50.00	2/21/2010 15:30		2/21/2010 18:30
SER-20100308-005	150.00	3/8/2010 14:35		3/8/2010 17:00
SER-20100308-007	25.00	3/8/2010 19:01		3/8/2010 22:10
SER-20100402-006	20.00	4/2/2010 16:04		4/2/2010 19:15
SER-20100414-002	50.00	4/14/2010 12:45		4/14/2010 16:33
SER-20100811-001	30.00	8/11/2010 14:04		8/11/2010 15:30
SER-20100910-001	30.00	9/10/2010 16:06		9/10/2010 18:29
SER-20100921-003	10.00	9/21/2010 16:20		9/21/2010 18:40
SER-20100923-003	40.00	9/23/2010 13:35		9/23/2010 14:34
SER-20100923-004	15.00	9/23/2010 14:34		9/23/2010 15:58
SER-20101008-005	15.00	10/8/2010 16:26		10/8/2010 17:32
SER-20101020-001	40.00	10/20/2010 13:46		10/20/2010 15:25
SER-20101023-001	79.00	10/23/2010 13:05		10/23/2010 18:59
SER-20101231-002	10.00	12/31/2010 12:55		12/31/2010 15:34
SER-20110129-005	25.00	1/29/2011 14:32		1/29/2011 20:50
SER-20110219-003	80.00	2/19/2011 17:45		2/19/2011 21:11
SER-20110224-001	50.00	2/24/2011 10:19		2/24/2011 13:36
SER-20110224-008	15.00	2/24/2011 16:08		2/24/2011 19:02
SER-20110322-002	30.00	3/21/2011 14:49		3/21/2011 17:00
SER-20110324-002	25.00	3/24/2011 15:35		3/24/2011 19:07
SER-20110421-001	30.00	4/21/2011 12:53		4/21/2011 14:48
SER-20110510-001	45.00	5/10/2011 9:36		5/10/2011 13:00
SER-20110602-002	125.00	6/2/2011 14:31		6/2/2011 17:01
SER-20110612-002	395.00	6/12/2011 14:12		6/12/2011 21:56
SER-20120208-002	190.00	2/8/2012 17:29		2/8/2012 20:49
SER-20120319-005	50.00	3/19/2012 18:45		3/19/2012 19:56
SER-20120320-004	20.00	3/20/2012 14:04		3/20/2012 17:47
SER-20120320-008	10.00	3/20/2012 18:55		3/20/2012 20:55
SER-20121126-004	20.00	11/26/2012 15:55		11/26/2012 19:42
SER-20130316-009	10.00	3/16/2013 15:50		3/16/2013 19:20
SER-20130316-012	30.00	3/16/2013 20:25		3/16/2013 23:55

SER-20130329-005	17.00	3/29/2013 19:15		3/30/2013 19:12
SER-20130903-001	10.00	9/3/2013 12:36		9/3/2013 13:58
SER-20140309-002	59.00	3/9/2014 16:37		3/9/2014 22:59
SER-20150214-005	42.00	2/14/2015 13:06		2/14/2015 18:25
SER-20150214-009	58.00	2/14/2015 15:54		2/15/2015 8:14
20160830-3	11.20	8/30/2016 14:31	8/30/2016 16:32	8/30/2016 18:08
20161013-31	15.00	10/13/2016 15:17	10/13/2016 17:34	10/13/2016 18:32
20161015-16	12.50	10/15/2016 15:02	10/15/2016 18:38	10/15/2016 19:38
20161129-1	10.00	11/29/2016 1:09	11/29/2016 2:32	11/29/2016 2:55
20170320-13	20.00	3/20/2017 13:23	3/20/2017 15:26	3/20/2017 15:27
20170322-18	227.00	3/22/2017 15:47	3/22/2017 21:14	3/22/2017 21:14
20170330-1	10.00	3/30/2017 11:15	3/30/2017 15:08	3/30/2017 15:08
20180107-8	15.00	1/7/2018 15:50	1/7/2018 18:37	1/8/2018 8:21
20180131-18	54.00	1/31/2018 15:09	1/31/2018 19:30	2/1/2018 13:59
20180309-5	11.00	3/9/2018 14:02	3/9/2018 15:50	3/9/2018 15:50
20180414-2	50.00	4/14/2018 11:10	4/14/2018 16:42	4/14/2018 17:04
20190109-4	15.00	1/9/2019 15:28	1/9/2019 17:03	1/9/2019 17:44
20190323-14	60.00	3/23/2019 14:22	3/23/2019 19:59	3/23/2019 20:00
20190324-13	20.00	3/24/2019 14:15	3/24/2019 15:47	3/24/2019 16:33
20190330-23	200.00	3/30/2019 17:30	3/30/2019 20:56	3/30/2019 21:56
20190403-7	41.00	4/3/2019 12:48	4/3/2019 15:16	4/3/2019 16:01
20190906-20	15.00	9/6/2019 18:15	9/7/2019 17:57	9/7/2019 17:58
20190914-16	148.00	9/14/2019 19:24	9/15/2019 12:45	9/15/2019 19:20
20190922-17	20.00	9/22/2019 14:51	9/22/2019 19:54	9/23/2019 9:50
20190927-18	45.50	9/27/2019 19:16	9/28/2019 11:40	9/30/2019 7:50
20191010-1	17.00	10/10/2019 4:58	10/10/2019 9:05	10/11/2019 0:37
20191010-23	92.00	10/10/2019 20:01	10/11/2019 12:17	10/11/2019 12:17
20200301-15	60.00	3/1/2020 16:20	3/1/2020 19:15	3/1/2020 20:02
20200319-4	12.00	3/19/2020 15:02	3/19/2020 17:30	3/19/2020 17:30

Source: Alabama Forestry Commission. https://forestry.alabama.gov/Pages/Fire/Totals.aspx

To determine jurisdictional historical occurrences, information from Figure 4.56: Location and Cause of Wildfire in Bullock County was used, which includes data from the 5-year time period from 2016 through 2020. This data includes 72 wildfires that burned a total of 1,336.55 acres. The fire size ranged from 1/10 of an acre to 227 acres. Of the 72 wildfire events, one wildfire occurred in Midway, with one acre burned due to burning debris; two events occurred in Union Springs, with a total of 150 acres burned from debris burning and miscellaneous events; and the remaining 69 wildfires occurred in the unincorporated portion of the county with a total of 1,185.55 acres burned. Because the 2016 to 2020 data is the only wildfire data available with locational values, it is used to determine wildfire history, vulnerability, and probability by jurisdiction. None of the wildfire data provides information on deaths, injuries, or monetary values on property or crop damage. The wildfire data from 2016 through 2020 is provided in Figure 4.61 below.

Figure 4.61: Wildfires in Bullock County With Cause of Fire, 2016 through 2020

Fire Number	Name	Reported Time	Cause	Acres
20161020-3	ADOT RoW Fire #2	20-Oct-16	9 - Miscellaneous	0.1
20161117-17	Cook Fire	17-Nov-16	5 - Debris Burning	0.1
20161020-10	Cutter Fire	20-Oct-16	2 - Equipment Use	0.2
20180723-1	Blues Old Stand	23-Jul-18	9 - Miscellaneous	0.2
20190708-1	Hwy 82 #2 Fire	8-Jul-19	7 - Arson	0.25
20161009-38	Williams Fire	9-Oct-16	5 - Debris Burning	0.3
20161020-2	ADOT RoW Fire #1	20-Oct-16	9 - Miscellaneous	0.3

Fire Number	Name	Reported Time	Cause	Acres
20161107-15	Sovenson Fire	7-Nov-16	2 - Equipment Use	0.3
20201013-3	Lewis Fire	13-Oct-20	7 - Arson	0.3
20170130-2	Alabama Electric Fire	30-Jan-17	9 - Miscellaneous	0.4
20180315-14	CR 14 Skidder	15-Mar-18	2 - Equipment Use	0.5
20190930-8	Aberfoil Power Line Fire	30-Sep-19	9 - Miscellaneous	0.5
20170130-1	Alabama Electric Fire	30-Jan-17	9 - Miscellaneous	0.7
20190730-3	Sand hill fire	30-Jul-19	5 - Debris Burning	0.75
20170130-3	Alabama Electric Fire	30-Jan-17	9 - Miscellaneous	0.9
20161107-19	Co Rd 14	7-Nov-16	5 - Debris Burning	1
20161121-4	S and M Road	21-Nov-16	7 - Arson	1
20180304-7	D-20180304-44c	4-Mar-18	9 - Miscellaneous	1
20191121-5	Double House	21-Nov-19	5 - Debris Burning	1
20161006-12	Hwy 29 South	6-Oct-16	9 - Miscellaneous	1.1
20161104-15	Car Burner	4-Nov-16	2 - Equipment Use	1.25
20180103-3	Perdue Fire	3-Jan-18	9 - Miscellaneous	1.25
20170322-15	Dixie Electric fire	22-Mar-17	9 - Miscellaneous	2
20190327-7	CR 52	27-Mar-19	9 - Miscellaneous	2
20200315-3	Willow Pond Rd.	15-Mar-20	9 - Miscellaneous	2
20190916-19	Antioch Church Rd.	16-Sep-19	9 - Miscellaneous	2.6
20181008-1	Ellis Circle	8-Oct-18	9 - Miscellaneous	3
20190923-16	CR 142	23-Sep-19	5 - Debris Burning	3
20200330-6	Oak Log	30-Mar-20	9 - Miscellaneous	3
20170331-2	Hurtsboro Fire	31-Mar-17	9 - Miscellaneous	4
20191008-4	CR 154	8-Oct-19	9 - Miscellaneous	4.25
20190914-1	Deer Field fire	14-Sep-19	5 - Debris Burning	4.5
20170320-4	Cox Fire #1	20-Mar-17	7 - Arson	5
20170418-1	Daniel Rd fire	18-Apr-17	5 - Debris Burning	5
20180308-3		8-Mar-18	9 - Miscellaneous	5
20180921-4		21-Sep-18	5 - Debris Burning	5
20190403-21	Lamar Rd. Fire	3-Apr-19	5 - Debris Burning	5
20190801-1	Yellowjacket Fire	31-Jul-19	1 - Lightning	5
20191013-12	Chappell Fire	13-Oct-19	7 - Arson	5
20200508-3	OPER 42	8-May-20	9 - Miscellaneous	5
20170119-3	Ivey Fire	19-Jan-17	9 - Miscellaneous	6
20161015-23	Grill Burner #2 Fire	15-Oct-16	4 - Campfire	6.3
20170319-20	Three Notch Fire	19-Mar-17	9 - Miscellaneous	7
20200506-32	Sparks Fire	6-May-20	2 - Equipment Use	7
20161010-58	Great Hope Fire	10-Oct-16	5 - Debris Burning	7.5
20190920-2	CR 42 Fire	20-Sep-19	7 - Arson	8
20170130-16	Hemlock Fire	30-Jan-17	5 - Debris Burning	9
20170328-2	Intersection of CR 31/CR18 fire	28-Mar-17	9 - Miscellaneous	9
20161129-1	Fuqua Fire	28-Nov-16	7 - Arson	10
20170330-1		30-Mar-17	5 - Debris Burning	10
20180309-5	Sand Hill	9-Mar-18	5 - Debris Burning	11
20200319-4	Longleaf fire	19-Mar-20	5 - Debris Burning	12
20161015-16	Grill Burner Fire	15-Oct-16	4 - Campfire	12.5
20161013-31	Devils Walk'in Stick Fire	13-Oct-16	5 - Debris Burning	15
20180107-8	Fireworks Fire	7-Jan-18	8 - Children	15
20190109-4	Horse Pasture Fire	9-Jan-19	9 - Miscellaneous	15
20190906-20	D-20190906-16a	6-Sep-19	5 - Debris Burning	15
20191010-1	CR 154 #2	9-Oct-19	9 - Miscellaneous	17
20170320-13	Cox Fire #2	20-Mar-17	7 - Arson	20

Fire Number	Name	Reported Time	Cause	Acres
20190324-13	Deputy Sherriff Fire	24-Mar-19	5 - Debris Burning	20
20190922-17	Broken Arrow	22-Sep-19	9 - Miscellaneous	20
20210223-2	Cypress Lane	23-Feb-21	5 - Debris Burning	23
20190403-7	Highway 82 Fire	3-Apr-19	9 - Miscellaneous	41
20190927-18	Clearcut fire	27-Sep-19	9 - Miscellaneous	45.5
20180414-2	Double Creek	14-Apr-18	5 - Debris Burning	50
20180131-18	Soy Bean Fire	31-Jan-18	5 - Debris Burning	54
20190323-14	Still's Cross Roads Fire	23-Mar-19	7 - Arson	60
20200301-15	Sweat Fire	1-Mar-20	9 - Miscellaneous	60
20191010-23	High Fence	10-Oct-19	9 - Miscellaneous	92
20190914-16	Dove Fire	14-Sep-19	5 - Debris Burning	148
20190330-23	Swift/RMS	30-Mar-19	5 - Debris Burning	200
20170322-18	Burnt Car	22-Mar-17	7 - Arson	227

Jurisdictional Summary: Wildfire	Number of Events	Acres Burned
Bullock County, 2007 to 2020	234 events	3,784.29 acres
Bullock County, 2016 to 2020	72 events	1,366.55 acres
Unincorporated Bullock County, 2016 to 2020	69 events	1,185.55 acres
Midway, 2016 to 2020	1 event	1 acre
Union Springs, 2016 to 2020	2 events	150 acres

Source: Alabama Forestry Commission, 2020
https://gis.forestry.alabama.gov/portal/apps/webappviewer/index.html?id=e11e120b51984c928af6e6d27d261dcf

Probability of Future Events.

The Bullock County Fire Risk Assessment Report includes data for Burn Probability which depicts the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts, with a rating from 1 (least burn probability) to 10 (highest burn probability). Of the total area in Bullock County, 98.8 percent is in the Burn Probability Class 1 through 5. Given the relatively low burn probability but the high percentage of the population living in the WUI, the probability for future wildfire occurrences for all jurisdictions in Bullock County would be regarded as **Medium**. Bullock County has experienced 72 wildfire events in five years from 2016 to 2020, which equates to more than **100 percent** probability of an annual event. The combined acreage burned from the 72 events was 1,336.55 acres, or **18.56 acres per event**. As shown in Figure 4.62, the impact of future wildfire events for all jurisdictions in Bullock County is considered to be **Medium** with probable major damage within a 10 to 50-year period throughout the county.

Figure 4.62: Wildfire Probability by Jurisdiction Based on Data from 2016 to 2020

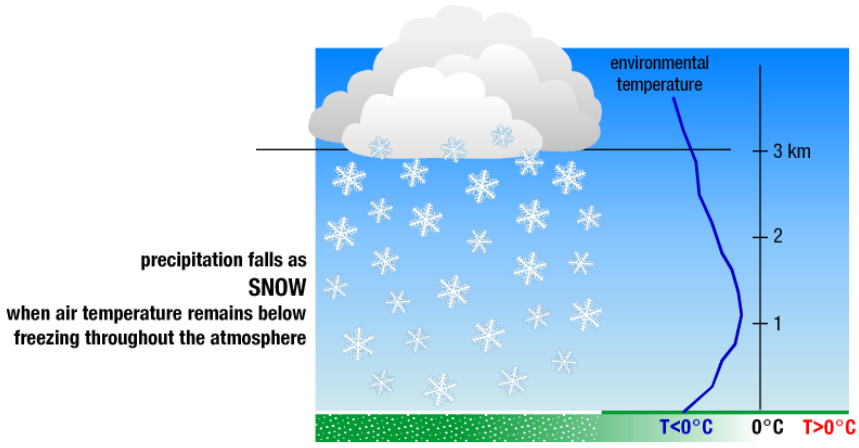
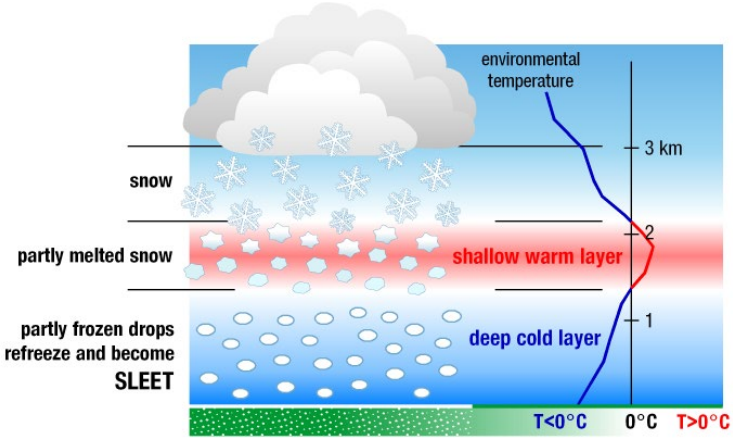
Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	72 Events	69 Events	1 Events	2 Events
Maximum Extent	FIS Cat 4 High	FIS Cat 4 High	FIS Cat 2 Low	FIS Cat 2 Low
Probability of Future Events	>100%	>100%	20%	40.0%
Damage Per Event	18.56 acres	17.18 acres	1 acre	75 acres
Impact of Future Events	Medium	Medium	Medium	Medium

4.14 WINTER / ICE STORMS

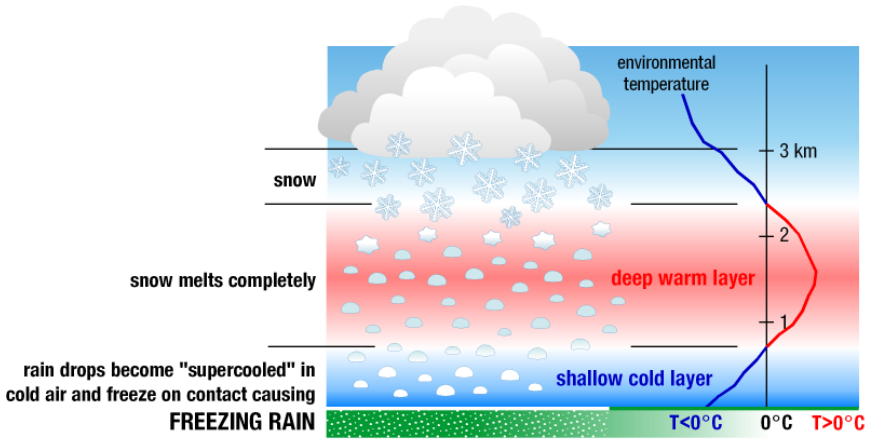
Description.
A winter storm is an event in which the main types of precipitation are snow, sleet or freezing rain. Winter storms vary in size and strength and include heavy snowstorms, blizzards, freezing rain, sleet, ice storms and blowing and drifting snow conditions. As explained by the National Severe Storm Laboratory, the right combination of the following ingredients is necessary for a winter storm to develop that results in one of three primary forms of winter precipitation (Figure 4.63):

- **Cold air.** Below freezing temperatures in the clouds and near the ground are necessary to make snow and/or ice.
- **Lift.** Something to raise the moist air to form the clouds and cause precipitation. An example of lift is warm air colliding with cold air and being forced to rise over the cold dome. The boundary between the warm and cold air masses is called a front. Another example of lift is air flowing up a mountainside.
- **Moisture.** To form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean, is an excellent source of moisture.

Figure 4.63: Types of Winter Precipitation

SNOW: Most precipitation that forms in wintertime clouds starts out as snow because the top layer of the storm is usually cold enough to create snowflakes. Snowflakes are just collections of ice crystals that cling to each other as they fall toward the ground. Precipitation continues to fall as snow when the temperature remains at or below 0°C from the cloud base to the ground.	
SLEET: Sleet occurs when snowflakes only partially melt when they fall through a shallow layer of warm air. These slushy drops refreeze as they next fall through a deep layer of freezing air above the surface, and eventually reach the ground as frozen rain drops that bounce on impact	

FREEZING RAIN:
Freezing rain occurs when snowflakes descend into a warmer layer of air and melt completely. When these liquid water drops fall through another thin layer of freezing air just above the surface, they don't have enough time to refreeze before reaching the ground. Because they are "supercooled," they instantly refreeze upon contact with anything that that is at or below 0°C, creating a glaze of ice on the ground, trees, power lines, or other objects.



A significant accumulation of freezing rain lasting several hours or more is called an ice storm.

Source: National Severe Weather Laboratory. https://www.nssl.noaa.gov/education/svrwx101/winter/types/

Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death. Winter storm occurrences also tend to be very disruptive to transportation and commerce. Trees, cars, roads, and other surfaces develop a coating or glaze of ice, making even small accumulations of ice extremely hazardous to motorists and pedestrians. The most prevalent impacts of heavy accumulations of ice are slippery roads and walkways that lead to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and fallen trees, telephone poles and lines, electrical wires, and communication towers. As a result of severe ice storms, telecommunications and power can be disrupted for days. Such storms can also cause exceptionally high rainfall that persists for days, resulting in heavy flooding.

Location.

Winter storms in Alabama, including Bullock County, are not as severe or common as winter storms in the northern states. Typically, a winter storm in Bullock County consists of freezing rain or a few inches of snow that may or may not be accompanied by frozen roadways. Because Bullock County does not keep much equipment to react to winter weather events, however, the infrequent, and even minor, winter storm and ice events can have a great impact on the county and its residents. The primary impact of past winter storms in Bullock County has been road closures for extended periods of time. When they do occur, winter storms are not isolated to small areas of the county. Instead, all of the county and the surrounding region has been affected by winter storms in the past. Of the five winter/ice storms that have occurred in Bullock County between 2000 and 2020, all events were countywide events and not isolated to any one part of the county.

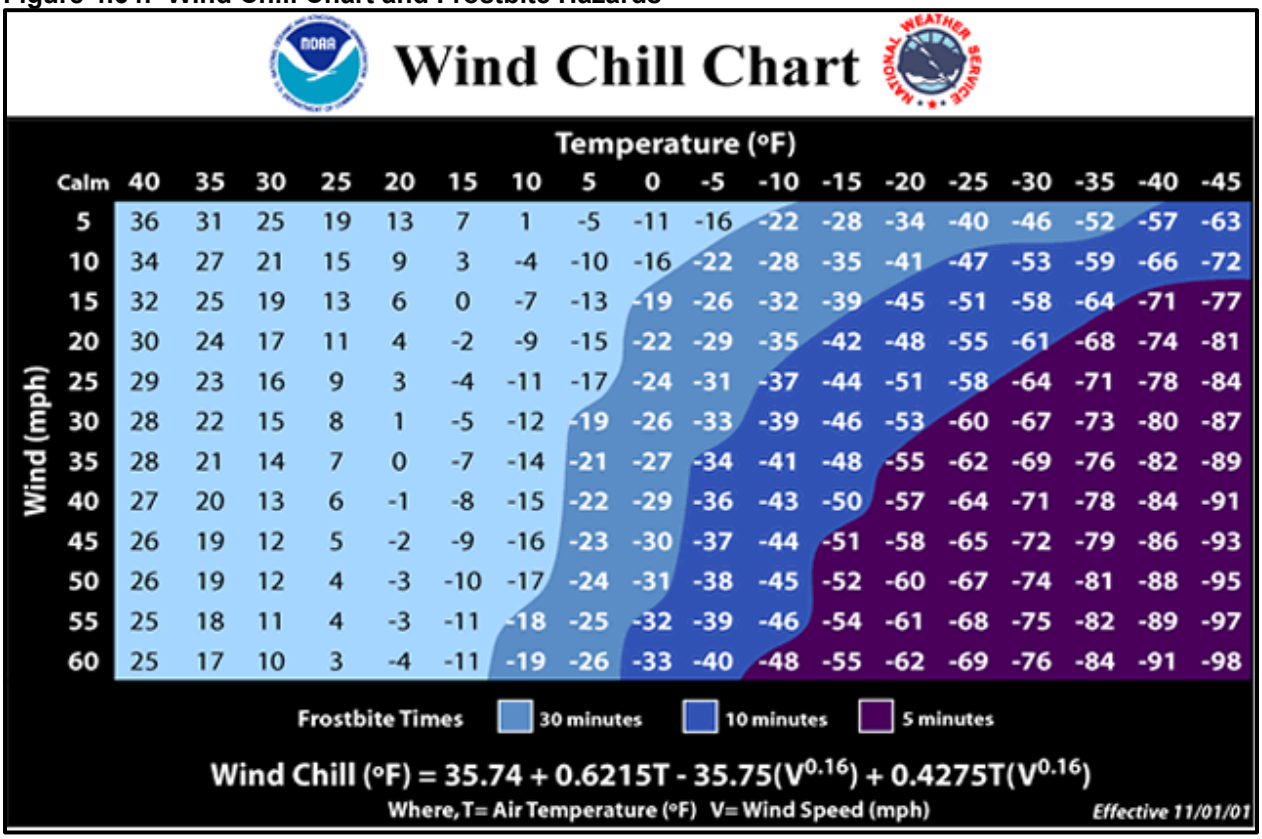
Extent.

The extent of a winter storm varies greatly by location, making it impossible to develop standard extent or magnitude guidelines that can be applied across the nation, as with tornadoes or hurricanes. Therefore, the best measure of the extent of a winter/ice storm is at which point the local weather triggers the regional weather office of the National Weather Service to issue winter storm or ice storm watches, advisories, and warnings. ***The Birmingham Office of the National Weather Service that covers Central Alabama issues winter storm warnings when*** *two or more*

inches of snow, one-half inch or more of sleet, or one-quarter inch or more of freezing rain (or any combination thereof) is anticipated and is expected to be a dangerous threat to life and property. A winter storm warning can also be issued at forecaster discretion when significant impacts are expected, but official warning criteria are not met. A winter storm warning can be issued at any time, typically up to 36 hours in advance, when there is an 80 percent chance or greater that a significant winter-weather event will occur. ***An ice storm warning is issued up to 36 hours before an event if there is an 80 percent chance or greater that freezing rain will accumulate to ¼ inch or more.*** Large amounts of freezing rain can cause tree limbs and power lines to snap, as well as significant travel disruptions. It doesn't take a lot of freezing rain or freezing drizzle to create hazardous driving conditions, even if an ice storm warning is not issued.

In addition to winter/ice storms, extreme cold temperatures can have an impact due to wind chill that can result in frostbite. Wind Chill is the temperature it "feels like" outside and is based on the rate of heat loss from exposed skin caused by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin temperature to drop. Wind Chill does not impact inanimate objects like car radiators and exposed water pipes, because these objects cannot cool below the actual air temperature. A wind chill advisory is issued when wind chill temperatures are potentially hazardous; and a wind chill warning is issued when wind chill temperatures are life threatening. Wind chill advisories and warnings are based on National Weather Service Wind Chill Chart (Figure 4.64) that provides a matrix of both temperatures and wind speeds and indicates at which point hazardous conditions, such as frostbite and hypothermia, might begin.

Figure 4.64: Wind Chill Chart and Frostbite Hazards



Source: NOAA National Weather Service. https://www.weather.gov/safety/cold-wind-chill-chart

In Bullock County, the maximum extent reported for extreme cold and wind chill is 2°F. For winter or ice storms, the maximum extents reported are 3-inches of snow, ½-inch of ice, and 3-inches of sleet. Although a winter or ice storm is not a frequent occurrence in Bullock County, the impact of even a small winter storm can be hugely significant due to the lack of equipment and other resources to handle those conditions. Additionally, winter storms can cause power and communication outages, resulting in loss of heat and closing of businesses. Further, the agricultural economy of the county cannot withstand the extreme temperatures and freezing conditions without financial loss. So, while Bullock County is not highly susceptible to frequent winter or ice storms, the county and its residents are very vulnerable when these events occur.

Historical Occurrences.
Between January 1, 2000 and December 31, 2020, Bullock County has experienced five winter storm of ice storm events, all of which were countywide events affecting all jurisdictions. There were no direct deaths or injuries reported because of the events, although the 2014 winter storm contributed indirectly to the death of one man in a vehicle accident due to icy roads on Bullock County Road 239, south of Union Springs. There was no property or crop damage reported due to the five winter storms.

In January 2003, the coldest temperatures in seven years occurred across much of North and Central Alabama and lasted for about two days. Early morning temperatures ranged from 2 to 10 degrees. The coldest temperatures were measured in outlying areas. Although no new records were established, these temperatures were very cold for the area and many area farmers lost a large part of their strawberry crops.

Moisture increased ahead of a weak storm system on December 15, 2010, across Central Alabama. Temperatures near or below freezing at the surface resulted in widespread freezing rain and sleet beginning around sunrise and lasting through most of the day. Although precipitation was light, ice quickly accumulated on area roadways, causing hazardous driving conditions, numerous vehicle accidents, and road closures. In Bullock County, a period of light freezing rain led to ice accumulation on several area roadways and bridges.

As a low pressure system moved across the northern Gulf of Mexico on January 9, 2011, moisture pushed northward into Central Alabama, interacting with cold air already in place across the area. Light wintry precipitation began to spread into the area during the early afternoon hours on January 9th. Even though amounts were light, accumulations were increasing travel concerns and the risk for vehicle accidents. As the strong storm system neared the area, several bands of wintry precipitation moved northward across the area, sometimes becoming quite heavy, with estimated precipitations rates over 1 inch an hour. Ice accumulations of one quarter inch were reported across Bullock County and several large trees limbs were downed due to ice accumulation.

On Monday, January 27, 2014 a very strong arctic front moved through Central Alabama, bringing extremely cold and dry air to the area. Temperatures across the entire area continued to plummet overnight and Tuesday morning, bottoming out in the teens across the north and 20's across the south. Within the arctic air behind the front, moisture spread northward ahead of an upper level disturbance. A mixture of winter precipitation fell across the area beginning Tuesday morning, January 28th. With low level cold advection and precipitation falling, surface temperatures did not

warm through the morning. Travel conditions quickly deteriorated as snow, sleet and ice began to accumulate. Brief periods of freezing rain resulted in a light glaze of ice on area roadways and bridges Tuesday morning at the onset of precipitation. As precipitation transitioned to all snow, it melted and refroze quickly on area roadways, further deteriorating travel conditions. In many locations across Central Alabama, snow accumulated on top of a layer of ice. Bullock County experienced a mix of winter precipitation with reported snow accumulations between one to two inches. Hazardous road conditions persisted for several days as temperatures remained well below freezing. On Thursday, January 30th, one fatality occurred on Bullock County Road 239, south of Union Springs, due to a vehicle accident on the icy road.

Figure 4.65: Wind Chill Chart and Frostbite Hazards

On February 5, 2014, the *Union Springs Herald* reported that the City of Union Springs had not received more than inch of snow but other parts of the county may have received larger amounts… "The snow fell on top of sleet which caused a serious situation. There were several wrecks but only one fatality. The county closed all county roads except for emergency situations. The roads were not opened for safe traveling until Thursday. Ice remained in spots on some roads as late as Friday morning. Two 18-wheelers jack-knifed blocking Highway 110 and 82. Several vehicles slid off the roadway and into ditches requiring towing. Bullock County is not accustomed to icy weather and has no means to keep the roadways passable. The State Highway Department., Union Springs city crews and law enforcement worked to keep the roads as safe as possible. The bridges were sanded and some roadways had sand sprinkled on them."

Source: Union Springs Herald, February 5, 2014. https://www.unionspringsherald.com/news/article 9d4d4716-8dd1-11e3-b8af-001a4bcf6878.html

On January 16, 2018, a band of light snow moved into Northwest Alabama, and then progressed southward during the afternoon as it trended toward a weakened state. An upstream 500mb trough continued to dig southward, with a lobe of energy and associated swath of higher moisture content that would move across the southern portions of Central Alabama. For these areas, between two and four inches of snow fell during the evening of January 16th and into the early-morning hours of January 17th. Snowfall totals averaged two to three inches across the northern Bullock County. A profile of winter storm and ice events is provided in Figure 4.66.

Figure 4.66: Profile of Winter / Ice Storm Events in Bullock County

Location	Date	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Countywide	1/24/2003	Extreme Cold/Wind Chill	2°F to 10°F	0	0	$0	$0
Countywide	12/15/2010	Winter Weather	Ice	0	0	$0	$0
Countywide	1/9/2011	Ice Storm	2"- 3" Snow 1/4"- 1/2" Ice 1" to 3" Sleet	0	0	$0	$0
Countywide	1/28/2014	Winter Weather	1"- 2" Snow	1	0	$0	$0
Countywide	1/16/2018	Winter Storm	2"- 3" Snow	0	0	$0	$0
Total		**5 Events**		**0**	**0**	**$0**	**$0**
Jurisdictional Summary: Winter / Ice Storms							
Countywide		5 Events	2"- 3" Snow 1/4"- 1/2" Ice 1" to 3" Sleet	0	0	$0	$0
Midway		5 Events		0	0	$0	$0
Union Springs		5 Events		0	0	$0	$0
Unincorporated Area		5 Events		1	0	$0	$0

Source: NOAA, National Centers for Environmental Information, Storm Events Database. https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Avalanche&eventType=%28Z%29+Blizzard&eventType=%28Z%29+Extreme+Cold%2FWind+Chill&eventType=%28Z%29+Freezing+Fog&eventType=%28Z%29+Frost%2FFreeze&eventType=%28Z%29+Ice+Storm&eventType=%28Z%29+Winter+Storm&eventType=%28Z%29+Winter+Weather&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2000&endDate_mm=12&endDate_dd=31&endDate_yyyy=2020&county=BULLOCK%3A11&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=1%2CALABAMA

Probability of Future Events.

Bullock County has experienced five countywide winter/ice storm events in 21 years, which equates to an **23.8 percent** probability of an annual event. There were no reported deaths, injuries, property damage or crop damage that was directly attributable to the events; however, there was one death from an auto accident that was an indirect result of icy roads. With no additional data on local damages, the damage per event is $0.00 per event. As shown in Figure 4.67, the impact of future winter storm and ice storm events for all jurisdictions in Bullock County is considered to be **Low** with probable major damage within a 100-year period throughout the county.

Figure 4.67: Winter/Ice Storm Probability by Jurisdiction

Jurisdiction	Bullock County	Unincorporated Bullock County	Town of Midway	City of Union Springs
Historical Events	5 Events	5 Events	5 Events	5 Events
Maximum Extent	3” Snow ½” Ice	3” Snow ½” Ice	3” Snow ½” Ice	3” Snow ½” Ice
Probability of Future Events	23.8%	23.8%	23.8%	23.8%
Damage Per Event	$0.00	$0.00	$0.00	$0.00
Impact of Future Events	Low	Low	Low	Low

SECTION 5: VULNERABILITY AND RISK ASSESSMENT

Section Contents

5.1 Overview
5.2 Vulnerability
5.3 Probability of Future Occurrence and Loss Estimation
5.4 Total Population and Property Valuation Summary by Jurisdiction
5.5 Critical Facilities/Infrastructure by Jurisdiction
5.6 Hazard Impacts
5.7 Risk Index and Hazard Priorities

5.1 Overview

It should be noted that although the 2013 Bullock County Hazard Mitigation Plan utilized FEMA's HAZUS-MH Program to conduct and a risk and vulnerability assessment, this version of the 2020 Bullock County Hazard Mitigation Plan Update was unable to use the HAZUS-MH software to assist in the vulnerability and risk assessment due to incompatibility with software used by the South Central Alabama Development Commission. The agency intends to continue updating its GIS software in hopes of obtaining compatibility with the HAZUS program.

In the context of hazard mitigation planning, ***Risk*** is defined as the expected future losses to a community, business or county from the effects of natural events. The concept has several other concepts embedded in it. ***Vulnerability*** is the extent to which something is damaged by a hazard. Vulnerability is very often measured using "damage functions." These are based on studies of how buildings perform when they are exposed to hazards. Similar functions are available for infrastructure and other physical assets. Injury and mortality functions (how many people are injured or die during events) are also sometimes used as indicators of vulnerability, but these are generally not as reliable as functions for physical assets because there are many more variables. The Vulnerability and Risk Assessment examines the vulnerability of each jurisdiction in Bullock County to the 13 identified hazards, based on the hazard profiles, then uses quantitative analysis to determine the probability of future occurrences and loss estimates. The risk assessment also reviews population and property values, critical facilities and infrastructure, and potential hazard impacts by jurisdiction. The final part of the assessment is a risk index that assigns a weighted value to probability, impact, location extent, warning time, and duration for each hazard to identify which hazards each jurisdiction is most vulnerable to and to rank, or prioritize, the hazards according to their weighted score.

5.2 Vulnerability

A community's vulnerability to a natural hazard is based largely on the hazard characteristics, location, and previous occurrences. Hazard information provided in the hazard profiles, along with stakeholder personal and professional experiences, internet information, hazard reports, and past occurrences were used to determine the vulnerability of each jurisdiction to a specific hazard. In some instances, such as with drought or winter storms, vulnerability is the same for all jurisdictions across the county. For other hazards, such as flooding or landslides, location is the primary factor in determining the vulnerability of each jurisdiction. The vulnerability assessment that follows outlines each jurisdiction's vulnerability to each hazard.

5.2.1 Dam Failure

A community's vulnerability to dam failure is a function of the probability of failure, the exposure of people and property to the uncontrolled release of water, and the susceptibility of people and property to the hazard. While federally-regulated dams are required to have an Emergency Action Plan to help minimize the impact of dam failure, there are no federally-regulated dams in Bullock County. There are 51 earthen dams in Bullock County, of which nine have a significant risk rating and the remaining 42 dams are rated as having a low hazard potential.

All dams in Bullock County are located in agricultural, forested, or open space areas with a very low population density. Therefore, Midway and Union Springs have no vulnerability to dam failure. The risk of losses from dam failure in the unincorporated part of Bullock County cannot

be calculated based on historic records due to lack of data. It can be safely assumed, however, given the smaller dam sizes, their location in mostly unpopulated areas, and the low hazard ratings, that the vulnerability to dam failure in the unincorporated part of Bullock County is low.

5.2.2 Drought / Extreme Heat

Vulnerability to loss from drought is based on the probability of drought, the exposure of water supplies and economic activities to the hazard, and the susceptibility of water supplies and economic activities to the hazard. Extreme heat, which tends to occur in conjunction with drought, can exacerbate the drought conditions. Those county residents who do not, or cannot, take necessary precautions can be extremely vulnerable to extreme heat that can result sin unburn, heat cramps, heat exhaustion, heat syncope, and even heat stroke. Agriculture is a primary economic industry in Bullock County where the predominant land uses are deciduous and evergreen forest, crop production, and pasture, and 21.1 percent of the working population is employed in the agriculture, forestry, fishing and hunting industry. All four public water systems in Bullock County are reliant on wells for source water. Drought conditions can place the public at risk through water shortages in all jurisdictions in Bullock County.

Although the risk of losses from drought and extreme heat cannot be calculated based on historic records due to the lack of data available, it is clear that all Bullock County residents are vulnerable to both drought and extreme heat. The impacts felt by Bullock County communities could include diminished ground and surface water; loss of crops; decrease in drinking water supply; and water shortages as private and public wells dry up. Drought can lead to stressed public utility systems and major agriculture losses. Even with the available qualitative documentation that shows evidence of drought and extreme heat conditions causing agricultural losses and water quantity issues, it is difficult to define the exact impact from the hazard.

5.2.3 Earthquake

The vulnerability and risk of loss due to seismic movement and earthquakes is minimal in Bullock County due to its location outside of any seismic zones and lack of any previous occurrences in the county or any surrounding county. With no historical event or damage data, it is impossible to calculate potential risk should an earthquake occur in the area. Should an event happen to occur, however, Bullock County is ill-prepared due to building construction methods and the presence of steep slopes and karst terrains that are susceptible to sinkholes.

5.2.4 Flooding

Historical data indicates that Bullock County has experienced seven flooding events in 21 years, with a combined total of $120,000 in damages. All of the flooding events were flash floods. Flooding in Bullock County is generally associated with the Conecuh River, Pea River, Cowikee Creek, a tributary to the Chattahoochee River, and tributaries to the Tallapoosa River, including Cubahatchee Creek, Line Creek, and Old Town Creek. It is estimated that there are 12 to 15 National Flood Insurance Policies in Bullock County, however, this number does not account for those parcels and persons that are vulnerable to flooding but are not a part of the NFIP. According to the Alabama Emergency Management Agency, ***there are no repetitive flood losses*** in Bullock County, the Town of Midway, or the City of Union Springs.

In the unincorporated areas of Bullock County, floodplains are designated as Zone A and most are less than one-half mile wide. In almost all locations, no development in designated floodplain areas

has occurred in the unincorporated areas. Likewise, no development has occurred in the floodplain in the Town of Midway. The population and parcels most vulnerable to flood events are located in the City of Union Springs in floodplains associated with tributaries to the Conecuh River, which flows south from the northeast part of Union Springs east of Martin Luther King Boulevard. Although there are a limited number of structures present, the main channel of the Conecuh River, as it flows through Union Springs, is relatively undeveloped. Smaller tributaries to the Conecuh River, however, flow through several neighborhoods throughout the city. A Flood Inspection Rate Map (FIRM), available through FEMA's National Flood Hazard Layer (NFHL) ArcGIS Viewer, is provided in Figure 5.3 and detailed firmettes of developed areas are provided in Figure 5.2. A visual comparison was made of NFHL-identified properties in floodplains in Union Springs and the same properties and property value data from the Bullock County Revenue Commissioner's Public GIS website. It is estimated that there are a total of 262 properties that are wholly or partially lying within a floodplain in Union Springs, encompassing approximately 721 acres. Of these, 119 parcels, or 45.4 percent, have a structure on the property. As shown in the table in Figure 5.1, development of floodplain properties is highest along the smaller tributaries that flow through neighborhoods before merging into the Conecuh River, with structures on at least 54.6 percent of the properties. Development of floodplain properties is lowest along the main channel of the Conecuh River, where 32.8 percent of the floodplain properties located south of US Highway 82, followed by floodplain properties along Old Town Creek and the Conecuh River, north of US Highway 82. With 119 developed properties in floodplains and an average household size of 2.55 persons, it is estimated that approximately 300 persons are vulnerable to flooding in Union Springs. The total market value of the developed floodplain properties is estimated at $8.3 million.

Figure 5.1: Union Springs Estimated Properties Vulnerable to Flooding

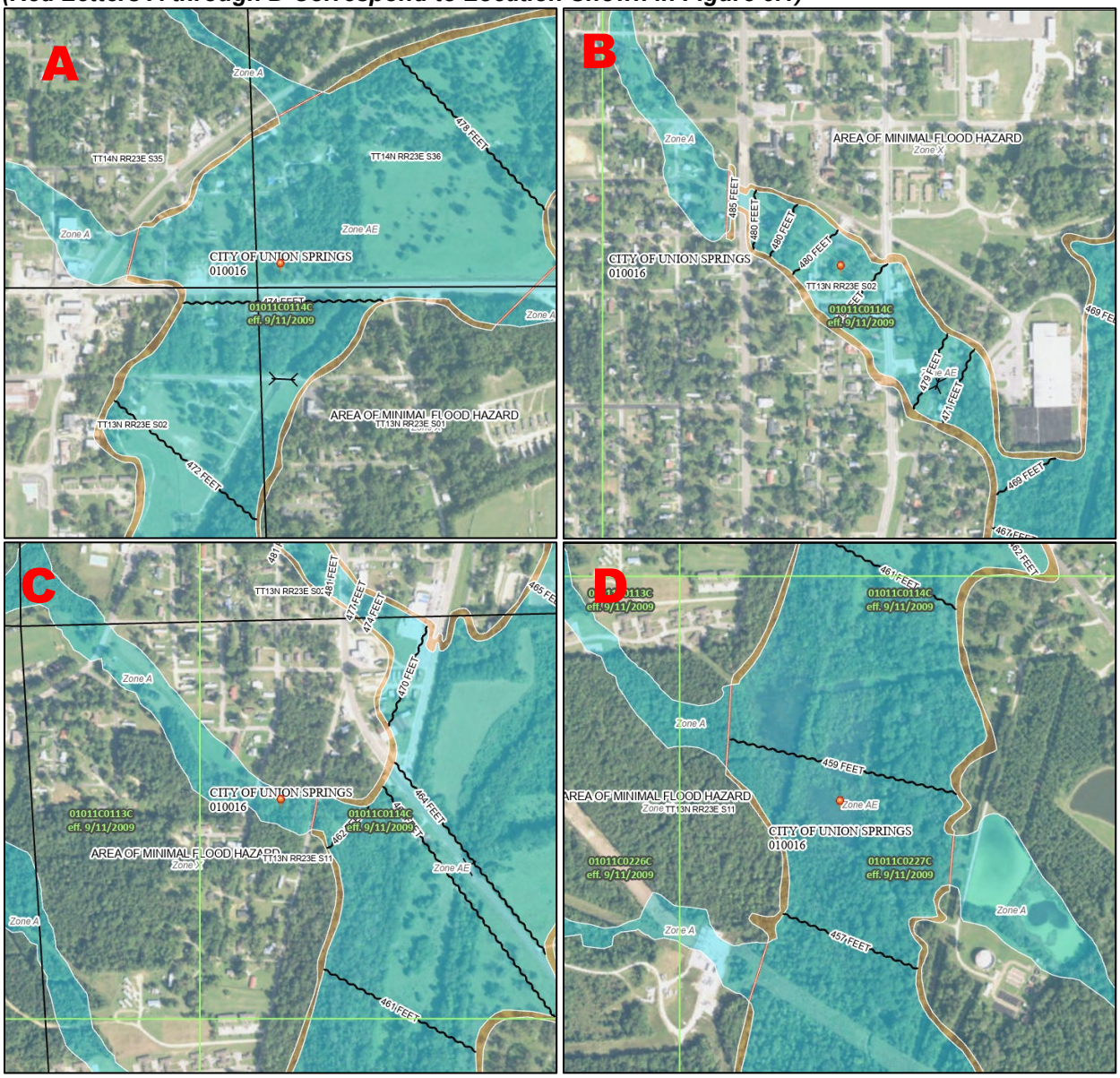
Floodplain Location	Old Town Creek & Conecuh River (north of US 82)	Conecuh Main Channel (south of US 82)	Tributaries to Old Town Creek & Conecuh River	Total
Total Parcels	96	58	108	**262**
Parcels with Structures	41	19	59	**119**
Percent Developed	42.7%	32.8%	54.6%	**45.4%**
Land Value	$877,320	$1,231,010	$819,890	**$2,928,220**
Improvement Value	$2,154,620	$1,755,980	$3,507,960	**$7,418,560**
Market Value of Developed Parcels	$2,434,900	$2,030,830	$3,843,410	**$8,309,140**
Market Value All Parcels	$3,031,940	$2,986,990	$4,327,850	**$10,346,780**
Acres	222.07	368.43	130.45	**720.95**

Source: FEMA, National Flood Hazard Layer (NFHL), NFHL ArcGIS Viewer; and Bullock County, Alabama Public GIS Website. https://www.fema.gov/flood-maps/national-flood-hazard-layer and https://www.alabamagis.com/Bullock/

The majority of the properties in Union Springs that are located within floodplain areas are undeveloped, or small lot commercial or residential land uses. There are, however, a few critical facility properties that would be vulnerable to flooding conditions. Not all of the structures associated with the properties are in the floodplain, but there is potential for flooding on the associated property. These include one sizeable industry that employs approximately 50 persons, two city parks, the Union Springs wastewater treatment plant and the Union Springs landfill. The Union Springs Telephone Company also has structures in floodplain areas, along with an Alabama Power substation. A large portion of the Bullock County High School property is in a floodplain, although the building is not. And last, there are two apartment complexes which have a portion of

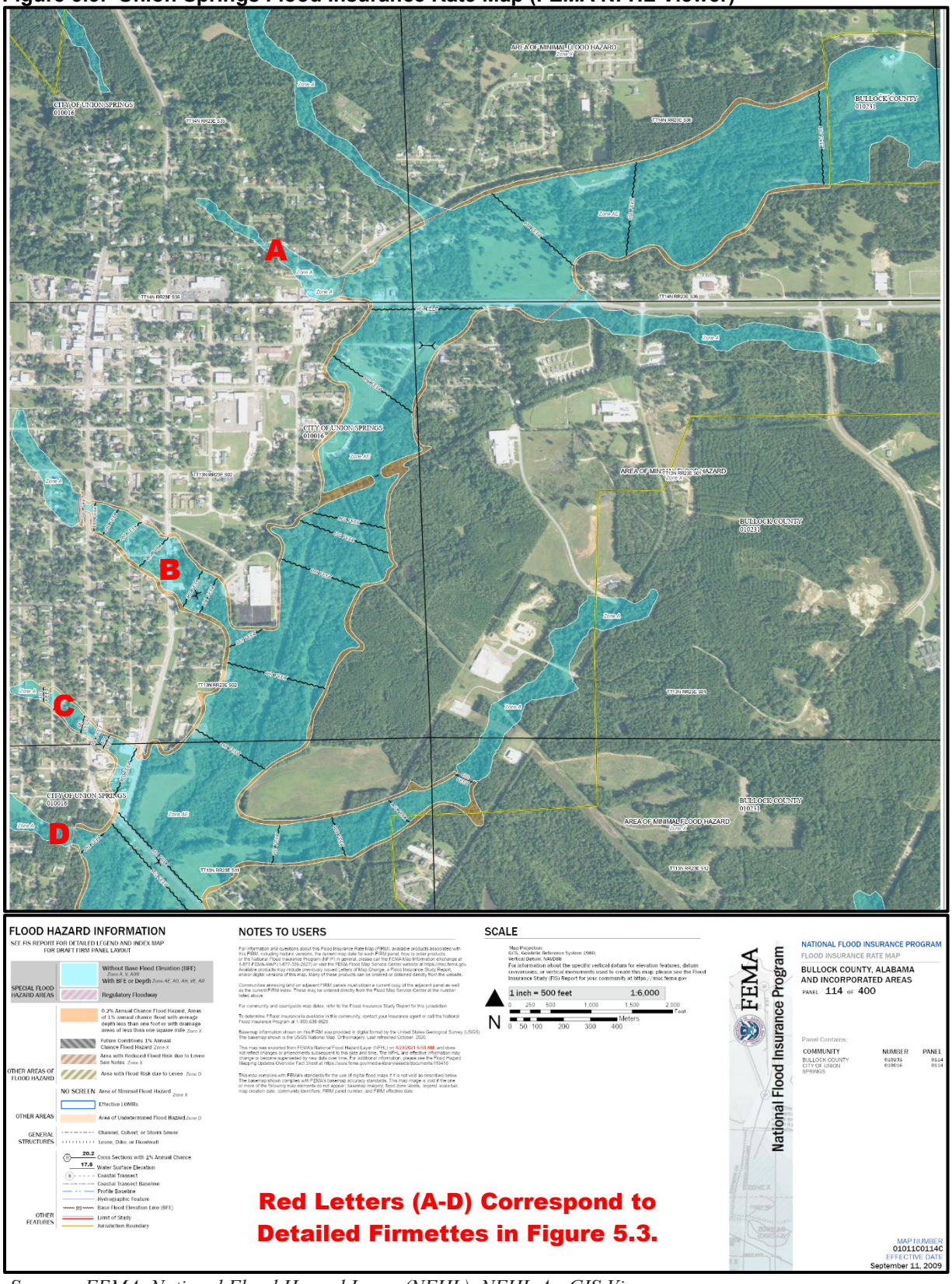
each property in the floodplain. Unfortunately, one is the Union Springs Housing Authority and the other is a low-income subsidized housing complex. These are the properties that will be most vulnerable to flooding conditions. The combined value of these critical facility properties is estimated at $3.5 million.

Figure 5.2: Union Springs Floodplain Properties Shown in Detailed Firmettes
(Red Letters A through D Correspond to Location Shown in Figure 5.1)



Source: FEMA, National Flood Hazard Layer (NFHL), NFHL ArcGIS Viewer.
https://www.fema.gov/flood-maps/national-flood-hazard-layer

Figure 5.3: Union Springs Flood Insurance Rate Map (FEMA NFHL Viewer)



Source: FEMA, National Flood Hazard Layer (NFHL), NFHL ArcGIS Viewer.
https://www.fema.gov/flood-maps/national-flood-hazard-layer

5.2.5 Hail

Hail has the potential to impact all residents of Bullock County, as well as all structures and crops. There is no one part of Bullock County that will less affected than another depending on a storm location. Between 2000 and 2020, Bullock County has experienced 15 hail events, none of which were countywide events. The unincorporated area has had nine hail events; Midway has had two events; and, Union Springs has had four events. Reported damages from hail events totaled $14,000 over the 21-year time span, all of which was in unincorporated Bullock County. The vulnerability to hail is primarily related to personal injury; damaged vehicles and building roofs; crop, livestock and timber damage; and power lines. Hail is generally sporadic and associated with severe storms or tornadoes. Therefore, protection from hail is interconnected with precautions used in the severe storm or tornado events Due to this relationship between the hazards, it is recommended that mitigation strategies for hail be combined with thunderstorm, severe storm and tornado hazards.

5.2.6 High Winds, Thunderstorms, Severe Storms

As with hail, all of Bullock County is susceptible to high winds, thunderstorms, and severe storms. High wind events are a frequent natural disaster in Bullock County, with only wildfires and drought occurring more often. Bullock County has suffered 40 high wind events during the last 21 years that incurred almost $3 million in damages. Thunderstorms are the most frequent of the high wind events, accounting for 35 of the 40 high wind event type events. Of the total high wind events, seven were countywide events; 20 occurred in the unincorporated part of the county; five events were in Midway; and eight events were in Union Springs. The countywide events caused the most damage, at more than $2.4 million.

5.2.7 Hurricanes, Tropical Storms, Tropical Depressions

Because of its interior location, Bullock County and its jurisdiction are not especially susceptible to direct tropical or coastal storm events; however, its history documents the fact that the region has experienced tropical cyclones, high winds, tornadoes and related flooding associated with tropical systems. In fact, Bullock County has experienced nine countywide tropical cyclone events in 21 years, resulting in $71,000 in damages. Damages were likely higher because damages were not reported from three hurricane events. Although the tropical cyclone events are not frequent hazards in Bullock County, the entire county is impacted when an event does occur.

5.2.8 Landslides

The risk of losses from landslides cannot be calculated based on historic records due to lack of data. To date, there is only one known landslide in Bullock County which occurred in Union Springs; however, there is no damage estimate attached to the event. Any landslide occurrence in the region would most likely be minor in impact due to the localized nature of these events.

5.2.9 Land Subsidence and Sinkholes

The risk of losses from land subsidence events, such as sinkholes, cannot be calculated based on historic records due to lack of data. There are three topographic depressions in the unincorporated part of the county and at least one known sinkhole. Since sinkhole events are sporadic and rare, these events can potentially cause damage to life or property on a small scale. Homes, manufactured homes, structures, roads, utilities, persons, livestock /animals, and vehicles in all jurisdictions could be vulnerable to a manmade sinkhole. Due to the lack of data on sinkholes, it is not possible to know how many persons, structures, buildings, and infrastructure are vulnerable

to sinkholes in each jurisdiction. Any land subsidence occurrence in Bullock County would most likely be minor in impact due to the localized nature of these events.

5.2.10 Lightning

Although there are no reported lightning events in Bullock County, thunder cannot occur without lightning and Bullock County has had 40 thunderstorm events that impacted all parts of the county. Therefore, it stands to reason that lightning strikes can also impact all jurisdictions in Bullock County. Vulnerability to lightning is limited to scattered injury or death to persons, and damages to properties such as homes, electronics, structures, and data losses. The following persons, industry, and assets are vulnerable to lightning: elderly persons, children, persons outside during lightning events, power lines, timber/trees, manufactured homes, crops, homes, structures, data not backed up, livestock/animals, electronics plugged into an outlet (computers, household appliances, or data servers), and any person in or on water (pool or boat).

5.2.11 Tornadoes

As with high winds, thunderstorms and lightning, all of Bullock County is vulnerable to tornadoes. In fact, Bullock County has suffered 18 tornado events in 21 years resulting in $159,000 in damages. Of the 18 event, one each was in Midway and Union Springs with the remaining events in the unincorporated part of the county. Although the location of where tornadoes take place is sporadic, losses from these tornado events can impact a wide variety of persons, assets, and infrastructure in each jurisdiction. Vulnerable population groups include those who are dependent on others for assistance, such as children or elderly persons; large concentrations of persons in one place, such large industries, schools, hospitals, or nursing homes; those living in manufactured housing or apartment complexes; as well as persons in vehicles and others without adequate protection. Tornado damage is associated with the high winds that damage power lines, down trees, destroy roofs and can lift unanchored persons, animals/livestock, vehicles, equipment, etc., from the ground. The local economy can also be vulnerable to tornadoes if a jurisdiction is hit hard enough to destroy major retail stores, residential areas, schools, major employers, or utilities. Losing these assets will take a community a year or more to recover and be very costly, which puts a strain on the economy and causes the local jurisdiction to lose tax revenue.

5.2.12 Wildfires

Wildfires are Bullock County's most frequent hazard occurrence, with an average of 14.63 wildfires per year. The impact of most of these wildfires is assumed to have been minor and localized in mostly undeveloped areas. There is no financial loss data available to gauge the true impact of wildfires within the county. While all jurisdictions in Bullock County are vulnerable to wildfires, the unincorporated areas are significantly more vulnerable due to the amount a vegetation and timber property. Historically, wildfires have primarily affected timber resources; however, future development in wildland urban interface areas should be mindful of this potential hazard.

5.2.13 Winter Storms

There is a 23.8 percent chance of a winter storm in Bullock County each year, based on past events of the last 21 years. Winter storms include sleet, snow and ice. There have been no cost estimates reported of damages from winter storms. These events normally have a short duration and have minor impacts. The most vulnerable population group includes those persons without adequate heat resources. Unfortunately, Bullock County is ill-equipped to maintain roads and bridges in the

event of a winter storm; and it is impractical for the county or jurisdictions to purchase the necessary equipment for such a limited use. Instead, road and bridges are treated to minimize icing, warming stations are opened, and residents are advised to stay home as much as possible during these events, which are typically short-lived.

5.3 Probability of Future Occurrence and Loss Estimation

Two formulas were used to determine (1) probability of future occurrences and (2) risk or estimated damages, as shown in Figure 5.4. The probability (%) that an identified hazard will occur on an annual basis was determined by dividing the number of reported events by the number of years in the reporting period. Risk, or estimated damages per event were calculated by dividing the total dollar damage past events have caused by the number of events in the reporting period. It should be noted that most of the reporting time periods are 21 years from January 2000 to December 2020. Data was not available for all hazard types, however, for that same time period. Therefore, the reporting time period for each of the 13 types of hazards included in the future probability and risk calculations is provided in Figure5.5.

Figure 5.4: Hazard Probability and Risk Formulas

Result	Formula
Probability of Future Occurrences	Number of reported events / Number of years in time frame = Probability of A Future Annual Event
Estimated Damages	Total damages for each reported event / Number of events = Damage Expectations Per Damaging Event

Figure 5.5: Reporting Time Period Per Hazard

Hazard	Number of Years in Reporting Period
Dam Failure	Not Available
Drought, Extreme Heat	21 years
Earthquake	21 years
Floods	21 years
Hail	21 years
High Winds, Thunderstorms, Severe Storms	21 years
Hurricanes, Tropical Storms, Tropical Depressions	21 years
Landslides	Not Available
Land Subsidence and Sinkholes	Not Available
Lightning	21 years
Tornadoes	21 years
Wildfire	14 years and 5 years*
Winter Storm, Ice Storm	21 years

Two wildfire estimates are provided. The first one (a) is based on the total number of wildfires over a 14-year time span; however, there is no locational data. The second estimate (b) is for a shorter time span of five years, but does include locational data.

All events combined, there have been 380 hazard occurrences in 21 years in Bullock County with total property and crop damages of $3,309,000. No direct deaths or injuries from hazard events have been reported. Therefore, the probability of future occurrence of a hazard event at some location in the county is 18.1 events per year. The risk, or estimated damages, per event is $8,707.89. The frequency of future events and estimated damages for each jurisdiction for each

hazard is calculated in Figures 5.6 through 5.9. These frequency of future events and estimated damages were calculated from events recorded at different time periods, based on source data. While the probability and risk tables provide a sound estimate, there is no guarantee the recorded level of hazard events will continue into the future at the same rate.

The Bullock County probability and risk analysis indicates that wildfire is anticipated to be the most frequent hazard, with an estimated 16.7 events per year and an estimated loss of 16.17 acres per fire, based on wildfire data from 2007 through 2020, but without locational values. Based on wildfire data from 2016 through 2020 with locational values, the unincorporated part of Bullock County can anticipate 13.8 wildfire events per year with an estimated loss of 17.2 acres per fire. and that it is expected to impact all jurisdictions in the same manner. The Town of Midway and the City of Union Springs are much less vulnerable to wildfire hazard. The annual probability of wildfire in Midway is 20.0 percent with an estimated loss of one acre per fire and the annual probability of wildfire in Union Springs is 40.0 percent with an estimated loss of 75 acres per fire.

Drought is the second most frequent hazard in Bullock County and all jurisdictions therein, with a probability of 2.4 events per year. According to collected data, however, drought and extreme heat have one of the lowest impact rates with no estimated financial loss. Other hazards that are expected to have a significant impact on Bullock County, the Town of Midway and the City of Union Springs are all related to high wind type events, including hail, thunderstorms, severe storms, hurricanes, and tornadoes. As stated, the details for each hazard in each jurisdiction can be found in the tables of Figures 5.6 through 5.9.

Figure 5.6: Bullock County Hazard Probability and Estimated Losses – Countywide

Countywide Hazard Events					
	Type of Event	Previous Events	Probability of Annual Event	Total Past Damages	Est. Risk or Loss Per Event
1	Dam Failure	0	0.0%	$0.00	$0.00
2	Drought and Extreme Heat	50	>100.0% 2.4 events / yr	$0.00	$0.00
3	Earthquake	0	0.0%	$0.00	$0.00
4	Flooding	1	4.8%	$2,000.00	$2,000.00
5	Hail	0	0.0%	$0.00	$0.00
6	High Winds, Thunderstorms, Severe Storms	7	33.3%	$2,460,000.00	$351,428.57
7	Hurricanes, Trop. Storms, Trop. Depressions	9	42.9%	$71,000.00	$7,888.89
8	Landslides	0	0.0%	$0.00	$0.00
9	Land subsidence, Sinkholes	0	0.0%	$0.00	$0.00
10	Lightning	0	0.0%	$0.00	$0.00
11	Tornadoes	0	0.0%	$0.00	$0.00
12a	Wildfire, 2007 to 2020	234	>100% 16.7 events / yr	3,784.29 acres burned	16.17 ac. / fire
12b	Wildfire, 2016 to 2020	0	0.0%	$0.00	#DIV/0!
13	Winter Storm	5	23.8%	$0.00	$0.00
All Countywide Hazard Events		**306**	**>100.0% 14.6 events / yr**	**$2,533,000.00**	**$8,277.78**

Figure 5.7: Unincorporated Bullock County Hazard Probability and Estimated Losses

Unincorporated Bullock County Hazard Events					
Type of Event		Previous Events	Probability of Annual Event	Total Past Damages	Est. Risk or Loss Per Event
1	Dam Failure	0	0.0%	$0.00	$0.00
2	Drought and Extreme Heat	50	>100.0% 2.4 events / year	$0.00	$0.00
3	Earthquake	0	0.0%	$0.00	$0.00
4	Flooding	4	19.0%	$100,000.00	$25,000.00
5	Hail	9	42.9%	$14,000.00	$1,555.56
6	High Winds, Thunderstorms, Severe Storms	20	95.2%	$245,000.00	$12,250.00
7	Hurricanes, Trop. Storms, Trop. Depressions	9	42.9%	$71,000.00	$7,888.89
8	Landslides	0	0.0%	$0.00	$0.00
9	Land subsidence, Sinkholes	3	14.3%	$0.00	$0.00
10	Lightning	0	0.0%	$0.00	$0.00
11	Tornadoes	16	76.2%	$158,000.00	$9,875.00
12a	Wildfire, 2007 to 2020	unknown	unknown	unknown	unknown
12b	Wildfire, 2016 to 2020	69	>100.0% 13.8 events / yr	1,185.55 acres burned	17.18 acres / fire
13	Winter Storm	5	23.8%	$0.00	$0.00
All Unincorporated Bullock County Hazard Events		**185**	**>100.0% 8.81 events / yr**	**$588,000.00**	**$3,178.38**

Figure 5.8: Town of Midway Hazard Probability and Estimated Losses

Town of Midway Hazard Events					
Type of Event		Previous Events	Probability of Annual Event	Total Past Damages	Est. Risk or Loss Per Event
1	Dam Failure	0	0.0%	$0.00	$0.00
2	Drought	50	>100.0% 2.4 events / year	$0.00	$0.00
3	Earthquake	0	0.0%	$0.00	$0.00
4	Flooding	1	4.8%	$10,000.00	$10,000.00
5	Hail	2	9.5%	$0.00	$0.00
6	High Winds, Thunderstorms	5	23.8%	$138,000.00	$27,600.00
7	Hurricanes	9	42.9%	$71,000.00	$7,888.89
8	Landslides	0	0.0%	$0.00	$0.00
9	Land subsidence, Sinkholes	0	0.0%	$0.00	$0.00
10	Lightning	0	0.0%	$0.00	$0.00
11	Tornadoes	1	4.8%	$0.00	$0.00
12a	Wildfire, 2007 to 2020	unknown	unknown	unknown	unknown
12b	Wildfire, 2016 to 2020	1	20.0%	1 acre burned	1 acre per fire
13	Winter Storm	5	23.8%	$0.00	$0.00
All Midway Hazard Events		**74**	**>100% 3.52 events / yr**	**$219,000.00**	**$2,959.46**

Figure 5.9: City of Union Springs Hazard Probability and Estimated Losses

City of Union Springs Hazard Events					
	Type of Event	Previous Events	Probability of Annual Event	Total Past Damages	Est. Risk or Loss Per Event
1	Dam Failure	0	0.0%	$0.00	$0.00
2	Drought	50	>100.0% 2.4 events / year	$0.00	$0.00
3	Earthquake	0	0.0%	$0.00	$0.00
4	Flooding	1	4.8%	$8,000.00	$8,000.00
5	Hail	4	19.0%	$0.00	$0.00
6	High Winds, Thunderstorms	8	38.1%	$52,000.00	$6,500.00
7	Hurricanes	9	42.9%	$71,000.00	$7,888.89
8	Landslides	1	4.8%	$0.00	$0.00
9	Land subsidence, Sinkholes	0	0.0%	$0.00	$0.00
10	Lightning	0	0.0%	$0.00	$0.00
11	Tornadoes	1	4.8%	$1,000.00	$1,000.00
12a	Wildfire, 2007 to 2020	unknown	unknown	unknown	unknown
12b	Wildfire, 2016 to 2020	2	40.0%	150 acres burned	75 acres per fire
13	Winter Storm	5	23.8%	$0.00	$0.00
All Union Springs Hazard Events		81	>100.0% 3.9 events / year	$132,000.00	$1,629.63

5.3.1 Dam Failure

The risk of losses from dam failure cannot be calculated based on historic records due to lack of data. Even though dam failure is a rare occurrence and is unprecedented to date in Bullock County, an occurrence could cause significant damages downstream.

5.3.2 Drought/Extreme Heat

The risk of losses from drought and extreme heat cannot be calculated based on historic records due to lack of data. Qualitative documentation shows evidence that drought and extreme heat conditions cause agricultural losses and water quantity issues, but it is difficult to define the exact impact from this hazard.

5.3.3 Earthquake

The risk of losses from earthquakes cannot be calculated based on historic records due to a lack of data/occurrence.

5.3.4 Flooding

Bullock County has recorded at least seven flooding events in the last 21 years causing an estimated $120,000 in damages. Total losses from flood events are the third highest among all hazard events; however, expected loss per event is the second highest, at $17,142.86 per flood. The unincorporated part of Bullock County is significantly more at risk for flooding than the municipalities in both the number of flood events and the losses per flood. The expected loss per flood event in unincorporated part of the county is $25,000 per event, as compared to $10,000 per flood in Midway and $8,000 per flood in Union Springs.

It is estimated that there are 15 National Flood Insurance Policies in Bullock County, however, this number does not account for those parcels and persons that are vulnerable to flooding but are not insured. According to the Alabama Emergency Management Agency, there are no repetitive flood losses in Bullock County, the Town of Midway, or the City of Union Springs. It is suspected that there is a high number of residents in Union Springs who are not covered by flood insurance. A visual comparison of FEMA's National Flood Hazard Layer ArcGIS Viewer with the Bullock County Public GIS website shows that there are an estimated 262 properties that are wholly or partially lying within a floodplain in Union Springs, encompassing approximately 721 acres. Of these, 119 parcels, or 45.4 percent, have a structure on the property.

5.3.5 Hail

There have been 15 occurrences of hail in the Bullock County that resulted in $14,000 in property damage. Hail damage has only been reported in the unincorporated part of the county which experienced nine hail events; therefore anticipated loss for hail is $1,555.56 per event.

5.3.6 High Winds, Thunderstorms, Severe Storms

High wind events are one of the costliest hazards in Bullock County. During past 21 years, Bullock County has suffered a total of 40 high wind events, most of which were thunderstorms, resulting in a total of $2,945,000 in property and crop damage, which equates to an estimated $73,625 loss per future event. The unincorporated part of Bullock County has the highest probability for future events, with a 95.2 percent chance of an event each year. Countywide high wind events are the costliest, with an estimated loss of $351,429 per event, as opposed to $12,500 per event in the unincorporated area; $27,600 per event in Midway; and $6,500 per event in Union Springs.

5.3.7 Hurricanes, Tropical Storms, Tropical Depressions

Bullock County has experienced nine tropical cyclone events, resulting in $71,000 in property and crop damages, or $7,889 per hurricane event. It is suspected that losses from these types of events are considerably higher since damage data was not reported for at least three hurricane events.

5.3.8 Landslides

The risk of losses from landslides cannot be calculated based on historic records due to lack of data. Though has been at least one known landslide event in Union Springs, however, there is no damage estimate attached to this event. Any future landslide occurrence in the region would most likely be minor in impact due to the localized nature of these events.

5.3.9 Land Subsidence / Sinkholes

The risk of losses from land subsidence events, such as sinkholes, cannot be calculated based on historic records due to lack of data. Though much of the planning area has depressions noted on topographic maps or has karst terrain, information about previous incidents are limited at best with no damage estimates. Any land subsidence occurrence in the planning area would most likely be minor in impact due to the localized nature of these events.

5.3.10 Lightning

Bullock County has no reported lightning event in the last 21 years. Since it is impossible to have thunder without lightening and the county has experienced at least 35 thunderstorm events over 21 years, it stands to reason that the county has also experienced lightning. In fact, a Union Springs

fire from lightning was reported by the *Union Springs Herald* in August 2015. Even so, it is impossible to calculate the risk of losses from lightning without additional information.

5.3.11 Tornadoes

Bullock County has experienced 18 recorded tornado events since 2000. These events have caused an estimated $159,000 in damages. As a result, the estimated loss per tornado event is $8,833.33. This estimate does include the tornados of March 2019, which according to the Lee County EMA, resulted in tremendous death (23) and injuries (90) as well as property damages $4.6 million. Estimated loss per tornado event is highest in the unincorporated part of the county, at $9,875, as compared to Midway, at $0, and Union Springs, at $1,000 per event.

5.3.12 Wildfires

Wildfires are the most frequent hazard in Bullock County, with an average of 16.71 wildfire events per year over a 14-year period. The impact of most wildfires is assumed to have been minor and localized in mostly undeveloped areas. There is no financial loss data available to gauge the true impact of wildfires within the region. Losses can be calculated, however, based on the number of acres burned. Since 2007, wildfire has burned 3,784.29 acres in Bullock County. Therefore, the estimated loss for wildfire is 16.17 acres per fire. Historically, wildfires have primarily affected vegetation and timber resources in unincorporated part of Bullock County; however, future development in wildland urban interface areas should be mindful of this potential hazard.

5.3.13 Winter Storms

There is a 23.8 percent chance of a winter storm in Bullock County each year, based on past events of the last 21 years. Winter storms include sleet, snow and ice. There have been no cost estimates reported of damages from winter storms, therefore, an estimated loss per event cannot be calculated. These events normally have a short duration and have minor impacts.

5.4 Total Population and Property Valuation Summary by Jurisdiction

The data in Figure 5.10 is derived from local government and tax valuation from the Bullock County Revenue Office, as well as the U.S. Census, 2019 American Community Survey 5-Year Estimates. Property value data is from Tax Year 2020. It is important to note that actual values may be somewhat higher than those values assigned for tax purposes. Also, these values do not always include tax-exempt properties and structures such as government buildings and churches.

Figure 5.10: Population and Property Information by Jurisdiction

Jurisdiction	2019 Population	Number of Parcels	Number of Buildings	Total Appraised Value of Improvements
Bullock County	**10,248**	**9,586**	**3,919**	**$288,812,961**
Town of Midway	683	374	179	$7,796,660
City of Union Springs	3,514	2,137	1,203	$92,107,190
Unincorporated Bullock County	6,051	7,075	2,537	$188,909,111

Source: U.S. Bureau of Census, American Community Survey, 2015-2019 5-Year Estimates, Table DP03: Demographic and Housing Estimates; and Bullock County Revenue Commissioner, 2020 Tax Year

5.5 Critical Facilities / Infrastructure by Jurisdiction

Critical facilities are defined as facilities that are essential to the community or may be crucial to the delivery of vital services, such as utilities and public safety. Critical facilities may also house or serve an at-risk population such as schools, hospitals, or nursing homes. Critical facilities would likely result in catastrophic financial loss if severely damaged or destroyed, such as major industrial buildings, courthouses, and other government facilities. Critical facilities may vary from a transmission line that provides vital electricity to the community, to a hospital that provides medical care, or to the local public safety facilities that serve a community.

Figure 5.10 lists a summary of critical facilities found in Bullock County categorized by type. This list is not all-inclusive and includes facilities prioritized by specific jurisdictions. An inventory of critical facilities will be reviewed periodically and continually updated to reflect any changes in each of the jurisdictions. A concerted effort was made using information from the public, EMA, local government officials and industry stakeholders to identify the critical facilities in the three counties. Such facilities were considered vital to transportation, energy, communication, health care, utility systems, food services, and the delivery of public safety. Structures that are occupied by at-risk populations such as schools are also included. They are listed with the most current assessed value in Figure 5.11. The 'Other Concentrations of Population" includes public housing authorities and companies with more than 100 employees. Other critical facilities locations are the facilities that store Extremely Hazardous Substances (EPCRA Section 302-Extremely Hazardous Substances, CERCLA Hazardous Substances, EPCRA, Section 313 Toxic Chemicals, CAA 122®) Regulated Chemicals for Accidental Release Prevention and other facilities that are covered. Local EMA offices maintain these lists.

Figure 5.10: Bullock County Summary of Critical Facilities

Jurisdiction	Type of Facility						
	Continuity of Government	Fire and Rescue	Law Enforcement	Health	Education	Infrastructure, Transportation, Communication	*Other Concentrations of Population
Bullock County	2	5	2	1	6	8	4
Town of Midway	1	1	0	0	1	2	1
City of Union Springs	2	1	1	4	1	8	7

*Other Concentrations of Populations for Bullock County includes the following public housing facilities and large employers:

- SCARHA - Bullock County Public Housing
- SCARHA - Midway Public Housing
- SCARHA - Union Springs Public Housing
- Union Springs Housing Authority
- Adams Ridge Apartments
- Sardis Mobile Home Park
- Alabama Farmers Coop Inc
- Bonnie Plant Farms
- To Your Health Sprouted Flour
- Bullock County Development Authority
- Wayne Farms

Figure 5.11: Critical Facility Asset Inventory and Estimated Values

BULLOCK COUNTY			
Type of Facility	**Name**	**Location**	**Estimated Value**
Continuity of Government	Courthouse	Union Springs	$1,050,000
	Bullock County Human Resources	Union Springs	$391,640
Fire and Rescue	Almeria Volunteer Fire Dept. 1	Bullock County	$4,530.00
	Corinth Volunteer Fire Dept	Bullock County	$11,000.00
	Highway 51 Volunteer Fire Dept	Bullock County	$6,500
	Smuteye Volunteer Fire Dept.	Bullock County	$4,870
	Greenwood-Fitzpatrick VFD	Bullock County	$43,060.00
Law Enforcement	Bullock County Sheriff's Department	Union Springs	w/Courthouse
	Bullock Correctional Facility	Bullock County	$182,800
Health	Bullock County Health Department	Union Springs	$11,000
Education	Bullock County High School (Union Springs Negro School)	Union Springs	$75,140
	Bullock County Career Technical Center (Union Springs Institute)	Union Springs	$41,890
	South Highlands Middle School	Union Springs	unknown
	Union Springs Elementary	Union Springs	unknown
	Merritt Junior High School	Midway	unknown
	Merritt Elementary School	Midway	unknown
Infrastructure	Alabama Electric Cooperative Inc.	Bullock County	$13,860
	Alabama Power	Bullock County	$19,680
	Dixie Electric Cooperative	Bullock County	$13,500
	South Bullock County Water and Fire Authority	Bullock County	$27,180
Transportation	Franklin Airfield	Bullock County	$573,250
	Bullock County Board of Education Department of Transportation	Union Springs	$419,480
Housing	SCARHA - Bullock County Public Housing	Smuteye	$33,600
Industry	Alabama Farmers Coop Inc	Bullock County	$33,200
	Bonnie Plant Farms	Bullock County	$13,515,310
	To Your Health Sprouted Flour	Bullock County	$1,744,790
Communication	Union Springs Telephone Company	Bullock County	$20,990
	Fitzpatrick Post Office	Bullock County	$151,400

UNION SPRINGS			
Type of Facility	**Name**	**Location**	**Estimated Value**
Continuity of Government	City Hall	Union Springs	$513,420
	Union Springs City Shop	Union Springs	$30,750
Fire and Rescue	Union Springs Volunteer Fire Department	Union Springs	$203,220.00
Law Enforcement	Union Springs Police Department	Union Springs	$83,560
Health	East Central Mental Health	Union Springs	$461,250
	Bullock County Hospital	Union Springs	$404,410
	Bullock County Nursing Home	Union Springs	$563,140
	Bullock County Health Center (Dialysis Clinic Inc.)	Union Springs	$415,450
Education	Conecuh Springs Christian School	Union Springs	$604,240
Infrastructure	Alabama Electric Cooperative Inc.	Union Springs	$45,710
	Alabama Power	Union Springs	$29,230
	Dixie Electric Cooperative	Union Springs	$597,560
	Utilities Board of the City of Union Springs	Union Springs	$560,640
	Suburban Propane	Union Springs	$354,910
Housing	Adams Ridge Apts (Bullock Associates Ltd)	Union Springs	$1,340,080
	SCARHA - Union Springs Public Housing	Union Springs	$41,010
	Sardis Mobile Home Park	Union Springs	$296,400
	Union Springs Housing Authority	Union Springs	$3,663,150
Industry	Bullock County Development Authority	Union Springs	$36,460
	Bullock County Development Authority	Union Springs	$371,120
	Wayne Farms	Union Springs	$1,781,410
Communication	Union Springs Herald	Union Springs	$64,580
	US Post Office	Union Springs	$300,000
	Union Springs Telephone Company	Union Springs	$856,520

MIDWAY			
Type of Facility	**Name**	**Location**	**Estimated Value**
Continuity of Government	Town Hall	Midway	$7,190
Fire and Rescue	Midway Volunteer Fire Department	Midway	unknown
Education	Merritt Elementary School	Midway	unknown
Infrastructure	Midway Sewage Lagoon	Midway	$47,800
Housing	SCARHA - Midway Public Housing	Midway	$43,100
Communication	Union Springs Telephone Company	Midway	$510

5.6 Hazard Impacts

A narrative overview is provided of each hazard's impact on the jurisdictions of Bullock County. The hazards are rated as Minor, Limited, Critical or Catastrophic based on the definitions below:

Minor	Very few injuries, if any, occur. Only minor property damage and minimal disruption of quality of life. Temporary shutdown of critical facilities
Limited:	Minor injuries only. More than 10 percent of property in the affected area is damaged or destroyed. Complete shutdown of critical facilities for more than one day.
Critical:	Multiple deaths/injuries possible. More than 25 percent ofproperty in affected area damaged or destroyed. Complete shutdown of critical facilities for more thanone week.
Catastrophic:	High number of deaths/injuries possible. More than 50 percent of property in affected area damaged or destroyed. Complete shutdown of critical facilities for one month or more.

5.6.1 Dam Failure

Dam regulation and research is an ongoing hazard mitigation issue in the State of Alabama. Currently, there are no state laws to regulate existing private dams or the construction of new private dams that do not require federal licenses or inspections. There have been four attempts to pass legislation requiring inspection of dams on bodies of water over 50 acre-feet or dams higher than 25 feet. Opposition of agricultural interest groups and insurance companies has hampered enactment. As a result, information pertaining to potential damages from dam failure is limited at the current time. Should the ADECA Office of Water Resources conduct a dam study, information regarding high hazard dams would allow for additional studies pertaining to potential vulnerability of this hazard.

There are no records of dam failure in Bullock County. Given the rural location of dams in the county and the lack of historical loss data, it is assumed that a dam failure event could potentially result in minor to moderate losses. Estimating damage losses over a long period of time yields a very low loss estimate overall.

Hazard Impact Rating for Dam Failure

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Minor	Minor	Minor	Minor

5.6.2 Drought

Because it cannot be predicted where drought and extreme heat may occur, all existing and future buildings, facilities, agricultural production, depletion of groundwater resources, and susceptibility to wildfire occurrences, and the general population in the planning area are considered to be vulnerable to this hazard and its impacts. Residents that are very young or advanced in age are more susceptible to health effects from extreme heat. Extreme heat may stress electrical utility providers, due to increased air condition requirements. Need for health services may also increase due to extreme heat. However, due to ongoing planning and relative common occurrence of these hazards, anticipated future damages or losses are expected to be minimal.

All existing and future buildings in Bullock County are vulnerable to the effects of drought and extreme heat. More importantly, all agricultural products and other natural resources are at risk. It is difficult, however, to estimate values for damages, including crop failure, that are primarily due to drought and extreme heat issues. While there is little methodology for calculating loss estimates due to drought and extreme heat, the potential exists for severe impacts to crops and water supplies, as well as to residents particularly those suffering from other health issues.

Hazard Impact Rating for Drought and Extreme Heat

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Critical	Critical	Critical	Critical

5.6.3 Earthquake

Information from the U.S. Geological Survey shows that historical earthquake events have been non-existent in the planning area. Due to the lack of substantive documentation of previous events and being located in the 2% to 4% range of incidence on the U.S. Seismic Hazard Map, it is assumed that although earthquake events may occur at any location within Bullock County, the likelihood is extremely low. Still, all existing and future buildings, facilities, and the general population in the planning area are considered to be vulnerable to this hazard and its impacts should an earthquake occur.

Hazard Impact Rating for Earthquake

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Minor	Minor	Minor	Minor

5.6.4 Flooding

Although they are not large waterbodies in Bullock County, there is definite presence of the Conecuh and Peas Rivers and their tributaries, as well as the tributaries to the Tallapoosa and Chattahoochee Rivers. In the last 21 years, an estimated $120,000 in property damages have occurred from flooding in Bullock County during seven events. All events events were flash floods, with one each in Midway and Union Springs, and the remaining six events in the unincorporated part of the county.

The NFIP has identified flood zones in areas of each jurisdiction. In the unincorporated part of Bullock County and in the Town of Midway, there is very little development in floodplain areas. Development that has occurred is primarily agricultural in nature. In the City of Union Springs, however, there is considerable development in floodplains along the tributaries to the Conecuh River and Old Town Creek. It is estimated that there are 119 structures on parcels that are wholly or partially within a floodplain in Union Springs. With a flood extent up to 15 feet in Union Springs, the impact of a flooding event has the potential to be critical.

Flash flooding is a more frequent threat than riverine flooding and may occur at any location in the county where there are low-lying areas, particularly roads, that may hold water for a short period of time. Flash flooding may potentially affect all residents of Bullock County and cause runoff that becomes fast-rising waters that can cause property and street damage as well as casualties. Unlike riverine flooding, which can be forecasted over a few days, flash flooding is normally a quick onset hazard with little warning. Riverine and flash flooding may occur any time of year, though flooding associated with heavy rains during hurricanes will occur in summer and early autumn.

Historical Insured Flood Losses. According to FEMA flood insurance policy records, there have been no flood losses reported in Bullock County through the NFIP. It should be noted, however, that these loss numbers only include structures that were insured through NFIP and that were reported. It is likely that there are other flood losses not reported in uninsured structures, or that were denied payment.

Repetitive Loss Properties. A repetitive loss property is an insurable structure that has had two or more claims of more than $1,000 within any ten-year period since 1978. A repetitive loss property may or may not be currently insured by the National Flood Insurance Program (NFIP). According to the Alabama Emergency Management Agency, as of 2020, there are no repetitive loss properties in Bullock County.

Hazard Impact Rating for Flooding

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Limited	Limited	Limited	Critical

5.6.5 Hail

Since hail will mostly occur with severe thunderstorms, high winds and tornadoes, hail may occur at any location within Bullock County. While hail is generally not catastrophic in nature, it can cause considerable property damage. In the last 20 years, hail has caused $14,000 in property damage in Bullock County. All existing and future buildings, facilities, and the general population in the county are considered to be vulnerable to this hazard and its impacts. Also, similar to thunderstorms, hail will be more localized than hurricane events but more widespread than tornadoes.

Hazard Impact Rating for Hail

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Minor	Minor	Minor	Minor

5.6.6 High Winds, Thunderstorms, Severe Storms

The impact of thunderstorms is generally in property damage because of falling debris, however, personal injuries and even death are not uncommon. Between 2000 and 2020, Bullock County suffered $2.94 million in property and crop damages. Because severe thunderstorms with high winds may occur at any location within Bullock County, all existing and future buildings, facilities, and the general population in the planning area are considered to be vulnerable to this hazard and its impacts. Severe thunderstorms with high winds can also produce similar effects to tornadoes and hurricanes. These effects will be more localized than hurricane events but more widespread than tornadoes.

Hazard Impact Rating for High Winds, Thunderstorms, Severe Storms

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Critical	Critical	Critical	Critical

5.6.7 Hurricanes, Tropical Storms, Tropical Depressions

Hurricanes and other tropical cyclone events commonly affect a large spatial area. Therefore, all existing and future buildings, facilities, and the general population in Bullock County are considered to be vulnerable to this hazard and its impacts. Since Bullock County is an inland

location, it will not receive some of the intensity and extent of hurricane storms. However, the magnitude of hurricanes affecting the central Gulf Coast can remain high as these storms travel inland into the region. The projected effects of hurricanes on Bullock County may include additional hazards, including flooding from torrential rains, debris creation, and a lesser threat of weak tornadoes spawned by the hurricane system. Hurricanes will provide those widespread effects during the summer and early autumn portions of the year. Normally there are several days of warning before a hurricane impacts the planning area allowing for preparations.

Hazard Impact Rating for Hurricanes, Tropical Storms, Tropical Depressions

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Critical	Critical	Critical	Critical

5.6.8 Landslides

Information from the GSA shows that historical landslide events have been very sparse across the planning area. Due to the lack of documentation of previous events beyond a known landslide in Union Springs, it is assumed that landslides events may occur at any location within the county. All existing and future buildings, facilities, and the general population in Bullock County are considered to be vulnerable to this hazard and its impacts. With little recorded activity and documentation, however, it is believed that potential losses in the county would be minor in scope.

Hazard Impact Rating for Landslides

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Minor	Minor	Minor	Limited

5.6.9 Land Subsidence and Sinkholes

Information from the GSA shows that geology that is conducive to sinkholes and other forms of land subsidence are located with a limited degree across Bullock County. Due to the lack of documentation of previous events beyond one event south of Union Springs, it is assumed that land subsidence may occur at any location within the county. All existing and future buildings, facilities, and the general population in the planning area are considered to be vulnerable to this hazard and its impacts. With little recorded activity and documentation, however, it is believed that potential losses in the planning area would be minor in scope.

Hazard Impact Rating for Land Subsidence and Sinkholes

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Minor	Limited	Minor	Limited

5.6.10 Lightning

Because lightning most often occurs in conjunction with severe thunderstorms and high wind events, lightning may occur at any location within Bullock County. All existing and future buildings, facilities, and the general population in the planning area are considered to be vulnerable to this hazard and its impacts. Also similar to thunderstorms, lightning will be more localized than hurricane events but more widespread than tornadoes.

Hazard Impact Rating for Lightning

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Minor	Minor	Minor	Minor

5.6.11 Tornadoes

All locations in the planning area are susceptible to tornadoes. The most likely time for tornadoes is during the spring months from March through May, with a secondary peak of tornado activity in November, but tornadoes can occur in every month of the year. Tornadoes are generally more destructive than hurricanes in Bullock County, but impacts are far more localized.

Tornadoes may touch down anywhere within the planning area, therefore, all existing and future buildings, facilities, and the general population in the planning area are considered to be vulnerable to this hazard and its impacts. Tornadoes can occur during hurricane events or other severe thunderstorm events, which can create multiple impacts. Even though favorable conditions for tornadoes can be forecasted in advance, the location of a tornado is unknown until a few moments before the storm occurs.

Hazard Impact Rating for Tornadoes

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Critical	Critical	Critical	Critical

5.6.12 Wildfire

The effects caused by wildfires primarily will damage timber land in Bullock County. If factors such as winds and drought are present, wildfires may spread from forested areas to areas with residential structures. These fires may begin due to events, such as burning debris or lightning, and are often difficult to contain due to the lack of access to the fire and a lack of readily available water to control the fires and the rapid spread of these fires. In the event of wildfires, structures in less populated areas in the proximity of the forested areas could be at risk of fire damage. Though all of Bullock County's residents are at least somewhat vulnerable to wildfires, areas in isolated unincorporated areas are at a higher vulnerability according to the Alabama Forestry Commission.

Though several wildfires occur annually in Bullock County, most are very small and only affect small, forested areas. With data available from the Alabama Forestry Commission, it is estimated that Bullock County has suffered 234 wildfires between 2007 and 2020 with a total of 3,784.29 acres burned. Therefore, the average wildfire size in Bullock County is 16.17 acres. The largest wildfire in the county occurred in June 2011 with 395 acres burned. In the 14-year period, Bullock County has had seven fires that burned 100 acres or more. Since more than 80 percent of the land in Bullock County is forested land, it can be assumed that the larger wildfires were in heavily forested areas that are prevalent with the timber industry of the county. Therefore, the timber industry will suffer the greatest loss in these types of events. Although wildfire is the most frequently occurring hazard in Bullock County, the rural nature of the county and relatively small size of most wildfires makes the impact of wildfire minor in the long term.

Hazard Impact Rating for Wildfire

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Minor	Minor	Minor	Minor

5.6.13 Winter Storms and Ice

Historical records show that Bullock County has occasional instances of winter weather, which is primarily through frozen precipitation (snow/ice) that only affects the area for a few days at the most. Even though winter and ice storms are infrequent and of short duration in Bullock County, the inability to respond due to lack of equipment and preparation on the part of both the local

governments and residents, increases the impact of the hazard from minor to limited. Because winter weather events may occur at any location within the county, all existing and future buildings, facilities, and the general population in Bullock are considered to be vulnerable to this hazard and its impacts. Winter weather events will affect those in vulnerable housing more severely than other areas.

Hazard Impact Rating for Winter Storms and Ice

Bullock County	Unincorporated Area	Town of Midway	City of Union Springs
Critical	Critical	Critical	Critical

Minor	Very few injuries, if any, occur. Only minor property damage and minimal disruption of quality of life. Temporary shutdown of critical facilities
Limited:	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.
Critical:	Multiple deaths/injuries possible. More than 25% ofproperty in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.
Catastrophic:	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities forone month or more.

5.7 Risk Index and Hazard Priorities

A rating scale was developed to assist in a qualitative assessment of the risk and potential impact of each identified hazard. Each risk category of probability, impact, location extent, warning time and duration, was assigned criteria that ranked the level of the hazard within the category from low to high, or other measurements as appropriate, as shown in Figure 5.12. The level for each hazard for category was determined based on the hazard profiles and the vulnerability and risk analysis. In order to quantify the risk classifications, the various level within each category were assigned a value from 1 to 4. Each category was also assigned a weighted factor to create a total weighted value with a maximum score of 4.0, also shown in Figure 5.12.

The risk rating scale was applied to each hazard to develop a risk index for each jurisdiction. The result is a weighted score for each hazard. The weighted score was then used to give each hazard a priority rating from 1 to 13, with one being the highest priority hazard and 13 being the lowest priority hazard, to be addressed by each jurisdiction. The Risk Index for each jurisdiction is shown in Figures 5.13 through 5.15 and the Hazard Priorities for each jurisdiction are shown in Figure 5.16. The top three priority hazards are the same for each jurisdiction: tornadoes; high winds, thunderstorms and severe storms; and drought and extreme heat. Medium level priorities vary somewhat by jurisdiction but generally include the following: hurricanes, tropical storms and tropical depressions, hail, winter storms, flood, and lightning in Midway. Lower priority hazards also vary by jurisdiction, but generally include lightning, wildfire, land subsidence and sinkholes, earthquakes, landslides and dam failure.

Figure 5.12: Risk Rating Scale

Category	Level	Criteria	Index Value	Weighted Factor
Probability	Very Low	Less than 1% annual probability	1	30%
	Low	Between 1% and 10% annual probability	2	
	Medium	Between 10% and 100% annual probability	3	
	High	100% annual probability	4	
Impact	Minor	Very few injuries, if any, occur. Only minor property damage and minimal disruption of quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for one month or more.	4	
Location Extent	Negligible	Less than 1% of area affected.	1	20%
	Small	Between 1% and 10% of area affected.	2	
	Moderate	Between 10% and 50% of area affected.	3	
	Large	Between 50% and 100% of area affected.	4	
Warning Time	More than 24 hours	Self explanatory	1	10%
	12 to 24 hours	Self explanatory	2	
	6 to 12 hours	Self explanatory	3	
	Less than 6 hours	Self explanatory	4	
Duration	Less than 6 hours	Self explanatory	1	10%
	Less than 24 hours	Self explanatory	2	
	Less than one week	Self explanatory	3	
	More than one week	Self explanatory	4	

Figure 5.13: Bullock County Hazard Risk Index

Bullock County Natural Hazard Risk Index	Probability		Impact		Location Extent		Warning Time		Duration		Weighted Score
	Index Value 1 to 4	Weighted Factor 30%	Index Value 1 to 4	Weighted Factor 30%	Index Value 1 to 4	Weighted Factor 20%	Index Value 1 to 4	Weighted Factor 10%	Index Value 1 to 4	Weighted Factor 10%	
Dam Failure	1	0.3	1	0.3	1	0.2	2	0.2	1	0.1	**1.1**
Drought and Extreme Heat	3	0.9	3	0.9	4	0.8	1	0.1	4	0.4	**3.1**
Earthquake	1	0.3	1	0.3	2	0.4	4	0.4	1	0.1	**1.5**
Floods	3	0.9	2	0.6	2	0.4	3	0.3	3	0.3	**2.5**
Hail	4	1.2	1	0.3	4	0.8	4	0.4	1	0.1	**2.8**
High Winds, Thunderstorms, Severe Storms	4	1.2	3	0.9	4	0.8	4	0.4	1	0.1	**3.4**
Hurricanes, Tropical Storms, Tropical Depressions	3	0.9	3	0.9	4	0.8	1	0.1	2	0.2	**2.9**
Landslides	1	0.3	1	0.3	1	0.2	4	0.4	1	0.1	**1.3**
Land Subsidence and Sinkholes	2	0.6	2	0.6	1	0.2	4	0.4	1	0.1	**1.9**
Lightning	3	0.9	1	0.3	4	0.8	4	0.4	1	0.1	**2.5**
Tornados	4	1.2	4	1.2	4	0.8	4	0.4	1	0.1	**3.7**
Wildfire	3	0.9	1	0.3	2	0.4	4	0.4	3	0.3	**2.3**
Winter Storms	2	0.6	3	0.9	4	0.8	1	0.1	3	0.3	**2.7**

Figure 5.14: Town of Midway Hazard Risk Index

Town of Midway Natural Hazard Risk Index	Probability		Impact		Location Extent		Warning Time		Duration		Weighted Score
	Index Value 1 to 4	Weighted Factor 30%	Index Value 1 to 4	Weighted Factor 30%	Index Value 1 to 4	Weighted Factor 20%	Index Value 1 to 4	Weighted Factor 10%	Index Value 1 to 4	Weighted Factor 10%	
Dam Failure	1	0.3	1	0.3	0	0.0	2	0.2	1	0.1	**0.9**
Drought and Extreme Heat	3	0.9	3	0.9	4	0.8	1	0.1	4	0.4	**3.1**
Earthquake	1	0.3	1	0.3	2	0.4	4	0.4	1	0.1	**1.5**
Floods	2	0.6	2	0.6	1	0.2	3	0.3	3	0.3	**2.0**
Hail	4	1.2	1	0.3	4	0.8	4	0.4	1	0.1	**2.8**
High Winds, Thunderstorms, Severe Storms	4	1.2	3	0.9	4	0.8	4	0.4	1	0.1	**3.4**
Hurricanes, Tropical Storms, Tropical Depressions	3	0.9	3	0.9	4	0.8	1	0.1	2	0.2	**2.9**
Landslides	1	0.3	1	0.3	1	0.2	4	0.4	1	0.1	**1.3**
Land Subsidence and Sinkholes	1	0.3	1	0.3	1	0.2	4	0.4	1	0.1	**1.3**
Lightning	3	0.9	1	0.3	4	0.8	4	0.4	1	0.1	**2.5**
Tornados	4	1.2	4	1.2	4	0.8	4	0.4	1	0.1	**3.7**
Wildfire	3	0.9	1	0.3	1	0.2	4	0.4	3	0.3	**2.1**
Winter Storms	2	0.6	3	0.9	4	0.8	1	0.1	3	0.3	**2.7**

Figure 5.15: Bullock County Hazard Risk Index

City of Union Springs Natural Hazard Risk Index	Probability		Impact		Location Extent		Warning Time		Duration		Weighted Score
	Index Value 1 to 4	Weighted Factor 30%	Index Value 1 to 4	Weighted Factor 30%	Index Value 1 to 4	Weighted Factor 20%	Index Value 1 to 4	Weighted Factor 10%	Index Value 1 to 4	Weighted Factor 10%	
Dam Failure	1	0.3	1	0.3	0	0.0	2	0.2	1	0.1	**0.9**
Drought/Extreme Heat	3	0.9	3	0.9	4	0.8	1	0.1	4	0.4	**3.1**
Earthquake	1	0.3	1	0.3	2	0.4	4	0.4	1	0.1	**1.5**
Floods	4	1.2	3	0.9	2	0.4	3	0.3	3	0.3	**3.1**
Hail	4	1.2	1	0.3	4	0.8	4	0.4	1	0.1	**2.8**
High Winds, Thunderstorms, Severe Storms	4	1.2	3	0.9	4	0.8	4	0.4	1	0.1	**3.4**
Hurricanes, Tropical Storms, Trop. Depressions	3	0.9	3	0.9	4	0.8	1	0.1	2	0.2	**2.9**
Landslides	2	0.6	2	0.6	2	0.4	4	0.4	1	0.1	**2.1**
Land Subsidence and Sinkholes	2	0.6	2	0.6	1	0.2	4	0.4	1	0.1	**1.9**
Lightning	3	0.9	1	0.3	4	0.8	4	0.4	1	0.1	**2.5**
Tornados	4	1.2	4	1.2	4	0.8	4	0.4	1	0.1	**3.7**
Wildfire	3	0.9	1	0.3	1	0.2	4	0.4	3	0.3	**2.1**
Winter Storms	2	0.6	3	0.9	4	0.8	1	0.1	3	0.3	**2.7**

Figure 5.16: Hazard Priority by Jurisdiction

Bullock County		Town of Midway		Union Springs	
Hazard	**Priority**	**Hazard**	**Priority**	**Hazard**	**Priority**
Tornados	**1**	Tornados	**1**	Tornados	**1**
High Winds, Thunderstorms, Severe Storms	**2**	High Winds, Thunderstorms, Severe Storms	**2**	High Winds, Thunderstorms, Severe Storms	**2**
Drought/Extreme Heat	**3**	Drought/Extreme Heat	**3**	Drought/Extreme Heat	**3**
Hurricanes, Tropical Storms, Trop. Depressions	**4**	Hurricanes, Tropical Storms, Trop. Depressions	**4**	Floods	**3**
Hail	**5**	Hail	**5**	Hurricanes, Tropical Storms, Trop. Depressions	**5**
Winter Storms	**6**	Winter Storms	**6**	Hail	**6**
Floods	**7**	Lightning	**7**	Winter Storms	**7**
Lightning	**7**	Wildfire	**8**	Lightning	**8**
Wildfire	**9**	Floods	**9**	Landslides	**9**
Land Subsidence and Sinkholes	**10**	Earthquake	**10**	Wildfire	**9**
Earthquake	**11**	Landslides	**11**	Land Subsidence and Sinkholes	**11**
Landslides	**12**	Land Subsidence and Sinkholes	**11**	Earthquake	**12**
Dam Failure	**13**	Dam Failure	**13**	Dam Failure	**13**

There is considerable change in the hazard priorities in this plan update from the previously adopted hazard mitigation plan. In 2013, the top priority hazards were (1) wildfire, (2) drought and extreme heat, (3) high winds, including thunderstorms and tornadoes. A comparison of the priority hazards from 2020 and 2013 is provided in Figure 5.17. Factors in the differences might include a longer historical data review in 2020, different methodologies in calculating risk, and more emphasis on hazard impact in 2020 rather than hazard frequency. Further, in 2013, tornadoes, thunderstorms, and severe storms were all grouped into one hazard category for high winds. Hurricanes were also grouped with both high winds and flooding.

Figure 5.17: Hazard Priority Ranking Comparison, 2020 and 2013

Bullock County Hazard Priority Ranking, 2020		Bullock County Hazard Priority Ranking, 2013	
Hazard	**Priority**	**Hazard**	**Priority**
Tornados	**1**	Wildfire	**1**
High Winds, Thunderstorms, Severe Storms	**2**	Drought/Extreme Heat	**2**
Drought/Extreme Heat	**3**	High Winds, Thunderstorms, Severe Storm	**3**
Hurricanes, Tropical Storms, Trop. Depressions	**4**	Winter Storms	**4**
Hail	**5**	Hail	**5**
Winter Storms	**6**	Floods	**5**
Floods	**7**	Dam Failure	**5**
Lightning	**7**	Lightning	**6**
Wildfire	**9**	Landslides	**7**
Land Subsidence and Sinkholes	**10**	Land Subsidence and Sinkholes	**7**
Earthquake	**11**	Earthquake	**7**
Landslides	**12**	Hurricanes, Tropical Storms, Trop. Depressions	**n/a**
Dam Failure	**13**		

SECTION 6: MITIGATION STRATEGY

Section Contents

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6.1 Bullock County Mitigation Goals

Mitigation goals are broad statements that focus on long-term visions to reduce or avoid vulnerabilities to identified hazards within the region. The 2008 Bullock County hazard mitigation plan identified three goals supporting the Bullock County's overall mitigation strategy. During the 2013 update process, the hazard mitigation planning committee reviewed the goals to assess if they were still valid. It was confirmed that the 2008 goals were still valid. The 2013 planning process, however, afforded Bullock County the opportunity to refine the wording of the goals to better communicate their intent. This resulted in an over-arching vision/goal and five additional mitigation goals. In 2020, the Bullock County hazard mitigation goals, strategies and action plans have been realigned to better mesh with the Alabama Emergency Management Division D Regional Hazard Mitigation Plan so that Bullock County can be easily incorporated into the next update of the Division D plan. Figure 6.1 provides a comparison of the 2013 Bullock County Hazard Mitigation Goals from 2013 and 2020. The hazard mitigation goals expected to be achieved by development, adoption, and continuation of the 2020 Bullock County Hazard Mitigation Plan are shown in Figure 6.1. These goals are accompanied by objectives and actions that are designed to support the implementation of the goals. A multi-stage process was used to identify, evaluate, and prioritize the goals, objectives, and actions. The process is described in Section 6.4.

Figure 6.1: Comparison of Bullock County Hazard Mitigation Goals from 2013 and 2020

Division D Goals	2020 Hazard Mitigation Goals	2013 Hazard Mitigation Goals
PREVENTION	Manage the development of land and buildings to minimize the risk of life and property loss due to hazard events.	1. Establish a comprehensive countywide hazard mitigation system.
PROPERTY PROTECTION	Protect structures and their occupants and contents from the damaging effects of hazard events.	Reduce risks through actions and policies that limit the effects of natural hazards on the physical assets and citizens of Bullock County.
NATURAL RESOURCE PROTECTION	Preserve, rehabilitate, and enhance the beneficial functions of the natural environment to promote a balance between natural systems and social and economic demands.	2. Reduce Bullock County's risk from natural hazards
STRUCTURAL MITIGATION	Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where those modifications are feasible and environmentally suitable.	3. Reduce vulnerability of new and future development
EMERGENCY SERVICES	Improve the efficiency, timing, and effectiveness of response and recovery efforts for hazard events.	4. Reduce Bullock County's vulnerability to natural hazards
PUBLIC EDUCATION AND AWARENESS	Educate and foster public awareness of hazards and techniques available for mitigation.	5. Foster public support and acceptance of hazard mitigation

6.2 Bullock County Mitigation Strategies

Mitigation strategies are broad, yet more defined actions that help to further clarify mitigation goals. A wide range of activities that are aligned with the six goals were considered to help achieve the established mitigation goals, in particular emphasizing mitigation concerning new and existing buildings and infrastructure. These strategies provide additional background to addressing any specific hazard concerns. Land use planning in much of the county is limited, due to the lack of land use planning and zoning authority in unincorporated areas, with the exception of floodplain management and subdivision regulations. Also, small municipalities, like Midway and Union Springs, have limited planning and building enforcement functions, due to fiscal constraints and lack of expertise, and may choose not to implement land use, zoning, or code enforcement mechanisms. The six goals are used to categorize mitigation strategies. These are discussed in further detail below, along with the identification of the related hazard(s) that are mitigated through these strategies.

Goal #1: Prevention

Prevention activities are primarily intended to address future development and to keep hazard effects from increasing. Prevention activities are often administered through government programs or regulatory actions that influence the built environment. These activities are particularly effective in hazard mitigation for areas with little current capital investment or development. Examples of prevention activities include:

1. Land use planning and zoning administration (All Hazards, primarily Flooding)
2. Building code enforcement program (Flooding, High Winds)
3. Open space preservation (Flooding)
4. Floodplain management regulations (Flooding)
5. Stormwater management regulations (Flooding)
6. Participation in National Flood Insurance Program (NFIP) (Flooding)
7. Capital improvements planning (All Hazards)

Goal #2: Property Protection

Property protection activities primarily concentrate on the modification of existing buildings and adjacent areas to strengthen their ability to withstand hazard events, or to remove an at-risk structure from hazardous locations. Examples of property protection activities include:

1. Acquisition of flood-prone properties (Flooding)
2. Relocation of flood-prone structures (Flooding)
3. Elevation of flood-prone structures (Flooding)
4. Retrofitting of critical facilities and other structures (All Hazards)

Goal #3: Natural Resource Protection

Natural resource protection activities reduce the impact of hazard events by preserving, rehabilitating, or enhancing the natural environment and its protective functions. These activities would include areas such as floodplains, wetlands, and steep slopes. Examples of natural resource protection activities include:

1. Floodplain protection (Flooding)
2. Watershed management (Flooding)
3. Riparian buffers (Flooding)
4. Forest and vegetation management (Flooding, Wildfire)
5. Conservation easements (Flooding, Land Subsidence)

Goal #4: Structural Mitigation

Structural mitigation protection activities are intended to lessen the impact of a hazard by utilizing construction of an appropriate structure. Examples of structural mitigation protection activities include:

1. Reservoirs (Flooding)
2. Levees and dams (Flooding)
3. Stormwater diversion (Flooding)
4. Retention and detention structures (Flooding)
5. Safe rooms and shelters (High Winds, Extreme Temperatures)

Goal #5: Emergency Services

Emergency services protection activities involve protecting people and property before, during, and after a hazard event. These activities assist in providing capable actions regarding hazard events. Examples of emergency services activities include:

1. Warning alert systems (All Hazards)
2. Continuity of operations (All Hazards)
3. Evacuation routes (All Hazards)
4. Emergency responder training (All Hazards)
5. Provision of alternative power (e.g. generators) (All Hazards)
6. Debris removal (All Hazards)

Goal #6: Public Education and Awareness

Public education and awareness activities inform and remind residents, business owners, elected officials, and other stakeholders about hazards, vulnerable locations, and mitigation actions that can be used to avoid losses. Examples of public education and awareness activities include:

1. Information dissemination, including maps and websites displaying hazard information (All Hazards)
2. Public exposition or workshops (All Hazards)
3. Educational programs (All Hazards)
4. Real estate disclosures (Dam Failure, Flooding, Technological Hazards)

6.3 Capabilities Assessment for Local Jurisdictions

A capability assessment examines the ability of each jurisdiction to implement a comprehensive hazard mitigation strategy by examining existing programs, regulations, resources, and practices. This examination allows a jurisdiction to assess whether mitigation actions are feasible, due to financial resources, political climate, administrative capacity, and other jurisdictional capabilities. Bullock County is governed by the elected Bullock County Commission; and both the Town of Midway and the City of Union Springs have a Mayor/Council form of government. Not all local governments, however, have the same powers of regulation and administrative enforcement capabilities. Figure 6.2 outlines nine mitigation resources that are frequently used to promote or accomplish hazard mitigation goals. The table describes powers or policies that are granted to different types of jurisdictions in general terms, describes the jurisdictions that currently apply those policies in their mitigation efforts, describes the jurisdictions that intend to apply, or have authority to apply, the referenced resource for future implementation, and describes the means by which each jurisdiction will incorporate the mitigation action into its existing powers, authorities, policies, and capabilities. In every case, the primary means of incorporation involves review of

proposed actions and implementation through the appropriate governmental authority such as the city council, county commission, school board, or utility board.

Figure 6.2: Statutory Capability Assessment

Statutory Mitigation Resource	Authorized for…	Practiced by…	Proposed for…	Incorporated through…
Police power: ability to regulate activities of individuals in the jurisdiction for purposes of health, safety, and public welfare	Municipalities	All municipal jurisdictions	All municipal jurisdictions	Council action to enact and enforce regulations
Control of public expenditures: ability to acquire property and improve property owned by the jurisdiction; capacity to borrow and expend funds	Municipalities, Counties, School Boards, Utilities	All jurisdictions	All jurisdictions	Action to approve expenditures by local county commission, city council, school board, or utility board
Building code enforcement: ability to enforce codes related to building materials and construction standards outside of flood hazard areas	Municipalities, Counties	Union Springs	Midway, Bullock County	Council and Commission action to enact and enforce regulations
Floodplain management authority: ability to regulate development in areas of special flood hazard in compliance with NFIP standards; includes authority to regulate land use and subdivisions inside of flood hazard areas	Municipalities, Counties	All participating NFIP jurisdictions	All participating NFIP jurisdictions	Council or Commission action to enact and enforce regulations
Purchase properties: subject to flooding and maintain as permanent open space.	Municipalities, Counties, School Boards, Utilities	All jurisdictions	All jurisdictions	Action to approve expenditures by local county commission, city council, school board, or utility board
Capital improvements: ability to plan and implement public infrastructure to mitigate hazards	Municipalities, Counties, School Boards, Utilities	All jurisdictions	All jurisdictions	Action to approve expenditures by local county commission, city council, school board, or utility board
Zoning authority: ability to divide political jurisdiction into districts for purposes of regulating buildings and their use, both inside and outside of flood hazard areas	Municipalities	Union Springs	Midway	Council action to enact and enforce regulations
Subdivision regulations: ability to regulate new developments involving new parcels and infrastructure, both inside and outside of flood hazard areas	Municipalities, Counties	Union Springs	Bullock County, Midway	County Commission or Council action to enact and enforce regulations
Storm water management program: ability to regulate retention, detention, and release of storm water runoff	Municipalities		Midway, Union Springs	Council action to enact and enforce regulations

The mitigation strategies listed in Section 6.5 are framed by the capacity and capability of local jurisdictions to implement those particular actions through existing authorities, policies, programs, and resources. For the jurisdictions in Bullock County, these are limited. Authority to control

development through land use planning and zoning, a critical tool in hazard mitigation, is vested in municipalities that choose to exercise this practice. The City of Union Springs does have land use regulations while the Town of Midway does not. Capacity for enforcement is limited due to local expertise, financial constraints, and public acceptance. The State of Alabama does not require a jurisdiction to implement land use planning and associated regulations, and many jurisdictions avoid the practice of land use planning and zoning for general purposes and for hazard mitigation. In unincorporated areas within Bullock County, this authority is absent except as it applies to flood control and public street and subdivision regulation. Bullock County has not adopted and does not enforce subdivision regulations.

Flood control, more broadly, is authorized for each local jurisdiction to practice through a local ordinance regulating the placement and construction of new structures. Most municipalities and each county participate in the National Flood Insurance Program (NFIP) and maintain compliance with the applicable regulations (Figure 6.3). Likewise, the enforcement of building codes is more common in a municipality than in a county. These practices are often limited due to capacity constraints in the form of personnel, financial ability, and public acceptance.

Financial and technical capacity are limiting factors for hazard mitigation implementation in many participating jurisdictions. The need for assistance in local planning and implementation is well established. Communities work together through the local EMA and their regional commissions (SCADC) to meet gaps in technical capacity related to planning for mitigation. Local jurisdictions work with county EMAs to implement specific strategies. Authority over spending is vested in local elected or appointed boards and commissions. Primarily, the county commissions and local municipal councils have been the leaders in deciding which mitigation strategies are worthy of investment. Other eligible jurisdictions have traditionally channeled mitigation projects through these local governmental bodies for sponsoring. The use of federal and state grants is a prevalent feature of the financial strategy for mitigation projects involving new construction and major rehabilitation of public facilities or expenditures.

The capabilities of each participating jurisdiction are defined by the authorities, policies, programs, and resources that each utilizes in pursuit of hazard mitigation. Each jurisdiction falls into one of several categories, which possesses distinct authorities and resources to establish hazard mitigation actions. For example, counties and municipalities differ in terms of statutory authority to pursue hazard mitigation. Meanwhile, two communities with the same authority may approach mitigation entirely differently in terms of the exercise of their authority. School and utility boards are subject to even greater restrictions on their authority. Figure 6.3 provides a summary of local plans, ordinances, and programs currently in place, or being developed within jurisdictions in Bullock County. A “Yes” (Y) indicates the item is currently in place and being implemented. A “No” (N) indicates the items is not in place or being implemented.

All jurisdictions in Bullock County participate in the National Flood Insurance Program (NFIP). Figure 6.4 summarizes participation in the NFIP and policy statistics for each jurisdiction in Bullock County. More site specific information on at-risk structures and repetitive loss properties is provided in Section 5: Vulnerability and Risk Assessment.

Figure 6.3: Relevant Plans, Ordinances, and Programs by Jurisdiction

Jurisdiction	Zoning Ordinance	Subdivision Regulations	Code Enforcement	Recent Master Plan	Certified Floodplain Manager	NFIP Participation
Bullock County	N	N	N	N	Y	Y
Town of Midway	N	N	N	N	N	Y
City of Union Springs	Y	Y	Y	Y	N	Y

Figure 6.4: National Flood Insurance Program (NFIP) Participation Status

Jurisdiction	Participation Status	Initial FBHM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
Bullock County	Yes	3/28/1975	6/1/1987	9/11/2009	6/1/1987	No
Midway	Yes	--	9/11/2009	09/11/09(M)	2/8/2013	No
Union Springs	Yes	12/6/1974	8/15/1983	9/11/2009	8/15/1983	No

6.4 Funding Capabilities for Hazard Mitigation Plans

This section describes the Bullock County's designated authority and enabling mechanisms for funding of hazard mitigation projects. In Bullock County, the County Commission has designated the Director of the Bullock County Emergency Management Agency (BCEMA) as the officer of the county authorized to accept federal funding for emergency management purposes. Funds received are deposited by the County Administrator and disbursed by the County Administrator, subject to requisition by the BCEMA Director. State funding for local emergency management organizations is authorized by Code of Alabama, 1975, Section 31-9-10 and Section 31-9-24. Budgets are submitted as required by the political subdivision. Accounts to manage local funding are established within the local government's existing accounting system.

Under the Emergency Management Performance Grant (EMPG) Program, funds are provided by FEMA as authorized in Public Law 81-920 for the purpose of increasing operational capability at the local level. These funds can be expended for necessary and essential personnel and administrative expenses, including but not limited to salaries, benefits, travel, office supplies, equipment and administrative communications. The local governments must match, on a one-for-one basis, financial assistance provided for EMGP purposes. To be eligible to receive EMGP funds to support a local emergency management program, a local government must meet the state's criteria, as outlined by the Alabama Emergency Management Agency.

Local jurisdictions desiring project application funds and maintenance and services funds must follow the criteria as outlined by the Alabama Emergency Management Agency. County and local agencies will maintain such accounts, records, papers and other pertinent supporting materials, which will permit an accurate determination of the status of federal and other contributions as outlined by the Alabama Emergency Management Agency.

The Bullock County Multi-Hazard Mitigation Plan documents the county's process for administering HMGP funds. While specifically intended as the primary guidance for county management of HMGP activities only, it represents the current administrative model for the county's acquisition and stewardship of funding mechanisms generally. The plan defines applicant eligibility criteria, the application process, and management procedures for distribution of funding under the program. These plans are used by the County EMA Staff and the county's Hazard Mitigation Committee.

The county's current strategy is to access federal funds for qualifying initiatives and facilitate development of local funding sources through municipal and county entities to fund local match requirements. To date, Bullock County has continually met the local match requirements associated with funding of federally sponsored programs, due in part to the continual financial support of the hazard mitigation programs and initiatives by local city and county governments. The county mitigation plan is also an umbrella for the local plans required for future mitigation grant programs. Mitigation planning begins at the local level, in communities, towns, and cities where impacts of damaging events are first felt, and the current county plan addresses this issue. Local mitigation planning focuses community attention on development issues prior to a disaster, ensuring participation in a more proactive sense. Active hazard mitigation in a community also contributes to public safety and welfare, economic development, and environmental protection Following adoption of the initial County Hazard Mitigation Plan, Bullock County began pre- and post-disaster mitigations by accessing (or continuing to access) some of the following vehicles using local matching monies: Hazard Mitigation Grant Program (HMGP) - Some of the most significant mitigation in the county has been accomplished with the HMGP. FEMA uses a sliding scale to determine the amount of HMGP funds that it provides after a disaster. HMGP funding, while not sufficient to accomplish all of the desired projects, continues to be the centerpiece of the county's hazard mitigation strategy. In Bullock County, local governments and/or participating agencies are currently the prime source of funding for the local match associated with this program.

Pre-Disaster Mitigation (PDM) – The Pre-Disaster Mitigation (PDM) Program was authorized by §203 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act (Stafford Act), 42 USC, as amended by §102 of the Disaster Mitigation Act of 2000. Funding for the program is provided through the National Pre-Disaster Mitigation Fund to assist local governments (to include Indian Tribal governments) in implementing cost-effective hazard mitigation activities that complement a comprehensive mitigation program.

The Public Assistance Program provides supplemental federal disaster grant assistance for the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The federal share of assistance is at least 75 percent of the eligible cost for emergency measures and permanent restoration. The state determines how the non-federal share (up to 25 percent) is split with the applicants. Eligible applicants include the local governments, Indian tribes and certain PNP organizations. The state EMA is the grant administrator for all funds provided under the Public Assistance Program. As grantee, the AEMA is responsible for administering the programmatic and grants management requirements of the Public Assistance Program. Key among the programmatic requirements is informing the applicants of the assistance available to them: what is eligible and how to apply for it. Grant management includes applying for federal assistance, monitoring and closing out the

grant. The BCEMA, AEMA, and FEMA work in partnership to provide prompt and consistent service to all applicants. Under the new Public Assistance Program, the state will have many of the same roles and responsibilities as under the present system. AEMA recognizes that counties have different capabilities to perform their assigned duties. AEMA intends to work in partnership with those counties requiring technical assistance to serve the needs of their applicants. Once insurance requirements are established, FEMA will reduce otherwise eligible costs by the actual or anticipated insurance recoveries the applicant receives. The BCEMA must notify AEMA/FEMA of any entitlement to insurance settlement or recoveries for a facility and its contents. For insurable buildings located in a special flood hazard area and damaged by flood, the reduction is the maximum amount of insurance proceeds the applicant would have received had the building and its contents been fully covered by a standard flood insurance policy under the National Insurance Program. The applicant is required to buy insurance in the amount of the eligible damages for flood and general hazards. For small projects, a grant is based on an estimate of the cost of the work. For large projects, a final grant is based on actual eligible costs. In large projects, the state disburses progress payments, as required. The dollar amount of a small or large project changes each fiscal year and is based on the Consumer Price Index. *The Economic Adjustment (Title IX) Program* helps local areas design and implements strategies for adjustments due to changes in their economic situation that are causing, or are threatening to cause, serious structural damage to the underlying economic base. Such changes may occur suddenly or over time, and result from, for example, industrial or corporate restructuring, new local/state/federal laws or requirements, reductions in EMA expenditures, and the depletion of natural resources.

By law, PDM project grants are dependent upon the local governments' demonstration that a comprehensive management process is in place after designated calendar dates. After November 1, 2003, AEMA/FEMA-approved local mitigation plans have been required as a condition of receiving PDM grants for local mitigation projects. A local government that does not have a plan in place is not eligible to receive project grants funded under the annual PDM appropriations. After November 1, 2004, the AEMA/FEMA-approved Standard County Mitigation Plan was required as a condition of receiving PDM project grants for local mitigation activities. The Standard County Mitigation Plan is also required for nonemergency assistance provided under the Stafford Act following a presidentially declared disaster, including Public Assistance restoration of damaged facilities (Categories C through G) and HMGP funding. Therefore, the development, maintenance, and updating of local multi-hazard mitigation plans is critical to maintaining eligibility for future FEMA funding.

6.5 Jurisdictional Mitigation Action Plans

A range of mitigation actions and projects are employed to achieve the Bullock County hazard mitigation goals for reducing the effects of hazard events for the county at large, as well as each of the jurisdictions within the county. Local planning stakeholders thoroughly reviewed and considered the Risk Assessment and their local capabilities to determine the most appropriate plan of action for their jurisdictions. Each action or project listed has accessory information, such as designation of a lead agency, hazard(s) addressed, and potential funding source(s). The table in Figure 6.5 describes the key elements of the Mitigation Action Plans.

Mitigation strategies that have been completed or that have been deemed by the mitigation planning committee to no longer be relevant are listed at the beginning of each jurisdiction's

mitigation action plan, with an explanation as to why the action items are no longer included in the action plan. In 2013, the Bullock County Hazard Mitigation Action Plan included 54 action items, of which two have been deleted for the 2020 update. Additionally, Bullock County added 38 new action items to their mitigation action plan. Most of the new action items are low cost best management practices, education and promotion, and investigation and inventory steps to provide a better foundation for the prevention and mitigation of all natural hazards in Bullock County. Similarly, the 2013 plan included 19 mitigation actions for the Town of Midway, of which four were deleted. The 2020 update also added 37 new actions to Midway's Action Plan, most of which are working in concert with Bullock County for implementation. The same is true for the Union Springs Hazard Mitigation Action Plan, which included 23 action items in the 2013 plan. In the 2020 updated action plan, three action items were deleted, and 40 new action items were added. One reason for the increase in action items is that the 2013 Bullock County Hazard Mitigation Plan only included hazard mitigation actions for the top five priority hazards. The 2020 hazard mitigation action plan for each participating jurisdiction in Bullock County now includes at least two action items to address every hazard that is relevant to the jurisdiction. Updated Mitigation Action Plans are provided for the following participating jurisdictions:

6.5.1 Bullock County Hazard Mitigation Action Plan
6.5.2 Town of Midway Hazard Mitigation Action Plan
6.5.3 City of Union Springs Hazard Mitigation Action Plan

Figure 6.5: Key Elements of Mitigation Action Plans

Goal	Category of goal that is met: #1: Manage the development of land and buildings to minimize risk of life and property loss due to hazard events (PREVENTION) #2: Protect structures and their occupants and contents from the damaging effects of hazard events (PROPERTY PROTECTION) #3: Preserve, rehabilitate, and enhance the beneficial functions of the natural environment to promote a balance between natural systems and social and economic demands (NATURAL RESOURCE PROTECTION) #4: Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where those modifications are feasible and environmentally suitable (STRUCTURAL MITIGATION) #5: Improve the efficiency, timing, and effectiveness of response and recovery efforts for hazard events (EMERGENCY SERVICES) #6: Educate and foster public awareness of hazards and techniques
Action Description	Title and description of action to be undertaken
Hazards Addressed	Hazard which the action addresses (1)
Lead Agency	Entity responsible for undertaking the action (2)
Funding Source	Level of funding required for action, where applicable
Priority Status	Categorization based on the following projected criteria: **Completed:** Notable mitigation projects implemented in the past five years **Ongoing:** Action in progress / perennial occurrence **High:** Projected implementation within five years **Medium:** Projected implementation between five and ten years **Low:** Projected implementation beyond ten years

Benefit/Cost Score	The Benefit/Cost score included in the jurisdictional Mitigation Action Plans are considered at the planning level and does not include a full analysis of all costs and benefits associated with action implementation. For example, a mitigation action that scores “High” in benefits and “Low” in costs will be listed as “Moderate” in the plan due to providing a long-term solution, but with a high implementation cost. For some projects, such as routine or ongoing operations conducted with local operating funds and existing staff, this may be the only explicit comparison of costs and benefits. For projects of which grant funding or bond issues may be sought, more in-depth evaluations of costs and benefits may be required. As specific project scopes are detailed, the benefits and costs of an action can be identified with more precision and the benefit-cost ratio (BCR) that results from a full benefit-cost analysis may differ from the planning level Benefit/Cost score presented in the plan. It should be noted that higher scores do not necessarily correspond to high priorities, nor do low scores correspond to low priority projects. An important action with a high priority to a jurisdiction may have a lower Benefit/Cost score because of its complexity, assumed high expense, and other potential costs. Jurisdictions should not be discouraged or deterred from further consideration of actions which have low scores until additional, more specific, evaluations of the costs and benefits has been undertaken. **Low** Benefits: Projects that only benefit a limited population or provides short-term benefits Costs: projects likely to cost over $100,000 and requiring additional funding or staffing outside of normal operations and is complicated to implement. **Moderate** Benefits: Projects that would be felt by moderate amount of population in jurisdiction, or solves a problem for several years Costs: projects that may need additional funding or continued study or staffing outside of normal operations, with estimated costs between $10,000 and $100,000. **High** Benefits: Projects that benefit many in the jurisdiction that are long-term solutions Costs: projects that can be implemented by existing personnel with little additional burden on budget and uncomplicated to implement.
Notes	(1) For the sake of brevity, not all hazards in a group of hazards may be listed in the mitigation action plan; however, it can be assumed that if one hazard in a group of hazards is listed as being addressed, then all other hazards in the group are also addressed. Ex. If an action item addresses a hurricane, then the action item also addresses tropical storms and tropical depressions, even though they may not be listed. (2) In the Lead Agency column, many abbreviations are used for the sake of saving space. BCEMA refers to the Bullock County Emergency Management Agency Co Eng refers to the Bullock County Engineer Local Govt refers to all units of local government Midway refers to the Town of Midway Town Council Union Springs refers to the City of Midway City Council

6.5.1 Bullock County Hazard Mitigation Action Plan

Bullock County Deleted Hazard Mitigation Action Items		Hazard Addressed	Reason for Deletion
5	Purchase, install, and test emergency warning sirens, as needed.	All	Bullock County has transitioned to the Rave Automated Warning System and is no longer utilizing warning sirens.
5	Develop a warning plan to install approximately 10 sirens at targeted sites to adequately cover population pockets in Bullock County	Tornadoes, Hurricanes/ Severe Storms	Bullock County has transitioned to the Rave Automated Warning System and is no longer utilizing warning sirens.

Bullock County Continued Hazard Mitigation Continued Action Items						
Goal	**Action Description**	**Hazards Addressed**	**Lead Agency**	**Funding Source**	**Priority / Status**	**Benefit / Cost Score**
1	Establish a comprehensive countywide hazard mitigation system	All	BCEMA	HMPG/ Local	Low	High
1	Utilize AEMA Flood Relocation Program and other appropriate FEMA and/or AEMA programs to remove at-risk commercial and residential structures from flood prone and other natural hazard areas; include relocation of storm water improvements in urban areas	All	BCEMA/ NFIP	HMGP/ EMPG	Medium	Low
1	Continue to research and provide hazard mitigation, emergency preparedness, and disaster recovery grant writing and/or administration services for available grant and loan programs (e.g., AFGP, FMA, HMGP, PDM, etc.)	All	BCEMA/ Local Government	EMPG/ Local	Medium	High
1	Provide updates for the Bullock County Hazard Mitigation Plan every five years as required by regulations	All	BCEMA	HMGP/ EMPG	High	High
1	Provide local human resources or other resources, such as materials and supplies, to assist in implementation of the Bullock County Hazard Mitigation Plan and its regular update	All	BCEMA, Midway, Union Springs	HMGP/ Local	High	High
1	Consider contract building or Enforcement Staff Person/EMA Staff	All	BCEMA	EMPG/ Local	Medium	Moderate
1	Develop a Geographic Information System (GIS) to maintain current cadastral and spatial data for purposes of inventorying critical facilities and infrastructure, conducting more detailed hazard risk assessments, and for tracking permitting and land use patterns.	All	BCEMA	Local/ HMGP	High	Moderate

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit/ Cost Score
1	Develop a Geographic Information System (GIS) to maintain current cadastral and spatial data for purposes of inventorying critical facilities and infrastructure, conducting more detailed hazard risk assessments, and for tracking permitting and land use patterns.	All	BCEMA	Local/ HMGP	High	Moderate
1	Develop a drought and heat indicator plan and warning system that includes a response strategy to include seniors and public health	Drought/ Extreme Heat	BCEMA	Local/ FSA/ Ext. Service	High	High
1	Limit non-critical water consumption during severe drought conditions	Drought/ Extreme Heat	Local Government	Local	Medium	
1	Continue participation and maintain compliance in the NFIP	Flood	BCEMA, County Eng, Local	Local	High	High
2	Consider model growth and development plan for Bullock County including permitting process in unincorporated areas	All	BCEMA/ County Eng	Local/ HMGP/ EMPG	Medium	Moderate
2	Investigate working with Bullock County Extension System to develop adult training/certification courses on land management to decrease property damage during natural disaster events	All	BCEMA/ NFIP	Local/ HMGP/ EMPG	Medium	Moderate
2	Incorporate and enforce flood management provisions in all county and municipal land use and zoning ordinances and regulations	Flood	BCEMA/ Local Government	Local/ HMGP/ EMPG	Medium	High
2	Ensure that future land use and growth plans do not extend into flood plain areas	Flood	BCEMA/ County Eng	Local/ HMGP	Medium	High
2	Consider enforcing modern building codes at the county and municipal levels; include permitting enforcement	Flood	BCEMA/ County Commission	Local/ HMGP	Medium	High
2	Begin a countywide flood map modernization program for the county, including the development of Digital Flood Insurance Rate Maps (DFIRMs) that will readily provide flood GIS data for local risk assessments and hazard mitigation planning.	Floods	BCEMA	HMGP	Med	Moderate
2	Develop and utilize zoning ordinances and subdivision regulations to manage development in urban fringe areas	Wildfire	BCEMA/ Municipalities	Local/ HMGP	High	High
3	Utilize AEMA flood relocation program and identify and obtain properties in floodplains to be used for greenways, open spaces, parks, trails, and other recreational activities	All	BCEMA/ Local Governments	Local	High	Low

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit/ Cost Score
4	Maintain all county roads to allow constant access for emergency response, recovery and repair, and continuity of delivery services	All	Local Government/ County Engineer	Local/ HMGP/ DOT	High	Low
4	Establish a local reserve fund for repairing and/or incorporating hazard mitigation measures for public and private facilities and infrastructure that are at risk of being damaged or have been damaged by natural hazards	All	BCEMA	Local	High	Low
4	Identify roads that require elevation and paving, and that have a high potential for flooding and/or washing during flood events, to provide access and limit erosion and sedimentation	Flood	County Engineer, BCEMA, NFIP	Local/ HMGP	Medium	Moderate
4	Continue bridge inspection and improvement efforts to prevent washing and/or failure during flood events	Flood	County Engineer, BCEMA	Local/ HMGP/ DOT	High	High
4	Provide adequate safe rooms and community shelters.	Tornadoes, Severe Storms	BCEMA, Local Government	Local/ HMGP/ ADECA	High	Moderate
4	Maintain and expand existing shelter facilities to provide adequate pre-disaster care and space, as needed; upgrade electrical and indicate adequate supplier and 9 elevators	Tornadoes, Severe Storms	BCEMA	Local/ HMGP/ ADECA	High	Low
4	Designate and upgrade/retrofit, as necessary, existing public facilities to provide shelter in areas of Bullock County where there currently are no shelters, primarily targeting schools and community centers, at a rate of one site every two years; combine with ADECA Enhancement Program (Midway)	Tornadoes, Severe Storms	BCEMA	Local/ HMGP/ ADECA	Medium	Low
4	Work with developers, homebuilders and contractors to promote construction of a safe room in all new residential development	Tornadoes, Severe Storms	BCEMA, Local Government	Local/ HMGP/ ADECA	Medium	Moderate
4	Investigate construction of new public shelter facilities in those areas of the county with no shelter facilities as long-term and low-priority task. (Midway)	Tornadoes, Severe Storms	BCEMA	Local/ HMGP/ ADECA	Low	Low
4	Secure funds to assist citizens in constructing private shelters on their land at a rate of five shelters per year	Tornadoes, Severe Storms	BCEMA, Midway, Union Springs	Local/ HMGP/ ADECA	High	Low
5	Designate a volunteer emergency coordinator in each municipality and community to better facilitate communications with the Bullock County Emergency Management Agency	All	Local Govts	Local	High	High

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit/ Cost Score
5	Promote the use of individual weather radios county wide	All	BCEMA	Local/ HMGP	Medium	Moderate
5	Investigate need for emergency water supply during disaster events; added fire hydrants and extended/upgraded water service lines	All	BCEMA/ Local FD/VFD	Local/ HMGP	High	Low
5	Conduct inventory of the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment, or required resources	All	BCEMA	Local	High	High
5	Develop an on-going cycle to provide regular updates to the Bullock County Commission, municipal councils, fire protection and law enforcement officials, utility boards, and other emergency responders	All	BCEMA	Local	High	High
5	Purchase/update emergency generators for post-disaster mitigation and conduct routine tests on backup generators for all critical facilities.	All	BCEMA	Local/ HMGP/ ADECA	High	Moderate
5	Provide for incident command training for the local emergency coordinators and other responders	All	BCEMA	Local/ HMGP/ EMPG	High	Moderate
5	Work with Bullock County medical providers and others to develop emergency supplies and education program, including added generators to be available in drought and extreme heat conditions	All	BCEMA	Local/ EMPG	High	High
5	Investigate the need for and acquire emergency electrical power generation equipment to provide back-up emergency electrical power to critical facilities	All	BCEMA/ Local Government	Local/ HMGP/ ADECA	High	High
5	Continue to identify the County's most at risk critical facilities, and evaluate the potential mitigation techniques and activities for protecting each facility to the maximum extent possible	All	BCEMA	Local/ HMGP	High	High
5	Consider funding for added training and staff for volunteer fire departments to man stations	Wildfires	BCEMA/ Local FD/VFD	Local /HMGP	High	Moderate
6	Publicize information on locations of existing public shelters and when to use them	All	BCEMA	Local/ EMPG	High	High
6	Develop printed public service announcements about hazard safety for publication in local newspaper and agency newsletters	All	BCEMA	Local/ EMPG	High	High
6	Communicate with the general public at least annually to provide a status report of the plan and any project or programs that are a result of the plan and its implementation	All	BCEMA	Local/ EMPG	Medium	High

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit/ Cost Score
6	Cooperate and coordinate with various agencies and entities to assist with distribution of information and materials, including DHR, Bullock County Board of Education, churches, municipalities, etc.	All	BCEMA	Local/ EMPG	Medium	High
6	Create and distribute information to schools and other organizations that list all emergency contact information of local responding agencies	All	BCEMA	Local/ EMPG	Medium	High
6	Develop broadcast public service announcements for airing on local and regional television and radio stations; Utilize Cable Channel 23 for increased public information	All	BCEMA	Local/ EMPG	Medium	Moderate
6	Develop information website with links from Bullock County Commission and municipal websites	All	BCEMA	Local/ EMPG	Medium	High
6	Continue utilizing social media sites to broadcast pending emergency announcements, as well as information about long term hazard mitigation programs.	All	BCEMA	Local	High	High
6	Incorporate hazard awareness and mitigation into the curricula of local schools	All	BCEMA	Local/ EMPG	Medium	Moderate
6	Develop tool kits for distribution to appropriate age levels for widespread continuous distribution	All	BCEMA	Local/ EMPG	Medium	Moderate
6	Develop a portable information display of local fairs and public events to distribute materials	All	BCEMA	Local/ EMPG	Medium	Moderate
6	Work with Bullock County Farm Service Agency and County Extension Service to establish a drought information center	Drought/ Extreme Heat	BCEMA	Local	Medium	Moderate
6	Support Alabama Forestry Commission efforts to help educate private landowners to protect their own and other's property through construction of fire lanes and fire breaks on forested property, making land-owners aware of both their responsibility and liability, include the provision of buffers between land use interface	Wildfire	BCEMA/ County Engineer	Local/ HMGP/ EMPG/AFC	Medium	Moderate

New Hazard Mitigation Actions for Bullock County, 2020						
Goal	**Action Description**	**Hazards Addressed**	**Lead Agency**	**Funding Source**	**Priority / Status**	**Benefit/ Cost Score**
1	Incorporate drought tolerant or xeriscape practices into landscape practices to reduce dependence on irrigation.	Drought / Extreme Heat	BCEMA	Local	High	High
1	Encourage citizens to take water-saving measures, such as installing low-flow water saving showerheads and toilets, turning water flow off while brushing teeth or during other cleaning activities, adjusting sprinklers to water the lawn and not the sidewalk or street, running the dishwasher and washing machine only when they are full, checking for leaks in plumping or dripping faucets, installing rain-capturing devices for irrigation	Drought / Extreme Heat	BCEMA, Water Providers, Building Officials	Local	High	High
1	Encourage the construction of safe rooms in new and existing construction.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Building Officials	Private	High	High
1	Encourage the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings where feasible.	High Winds, Severe Storms, Tornadoes, Hurricanes	Governing Body	HMGP, PDM, USDA	Low	Low
1	Discourage development in areas that have been identified as at-risk to subsidence.	Land Subsidence / Sinkholes	BCEMA, Building Officials	Private	High	High
1	Restrict development in areas with soil that is considered poor or unsuitable for development	Land Subsidence / Sinkholes	BCEMA, Building Officials	Private	High	High
1	Limit economic development activity in areas with a risk for landslides and land subsidence.	Landslides, Subsidence	Local Planning and Building Officials	Local	High	High
1	Support BCEMA efforts to investigate areas of topographical depressions to evaluate local risk for land subsidence or sinkholes.	Subsidence	BCEMA, Bullock County Engineer	Local	Medium	High
1	Recognize the existence of wildfire hazards and identify areas of risk based on a wildfire vulnerability assessment.	Wildfire	BCEMA, Alabama Forestry Commission	Local	Medium	High

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit/ Cost Score
1	Use prescribed burning to reduce fuel loads that threaten public safety and property	Wildfire	Alabama Forestry Commission, Landowners	Private	High	Moderate
2	Conduct an inventory of locations where critical facilities, other buildings, and infrastructure are vulnerable to landslides.	Landslides	BCEMA / SCADC	Local	Medium	High
3	Seek technical assistance through the Alabama Cooperative Extension System and/or the Alabama Forestry Commission with Best Management Practices (BMPs) for channel and drainage system maintenance.	Flooding	Bullock County Engineer, Building Officials, BCEMA	Local	Medium	Low
3	Assess vegetation in wildfire-prone areas to prevent landslides after fires.	Landslides	BCEMA, Alabama Forestry Commission	Local	Medium	High
3	Prevent erosion with proper bank stabilization, sloping or grading techniques, planting vegetation on slopes, terracing hillsides, or installing riprap boulders or geotextile fabric.	Landslides	BCEMA, Bullock County Engineer, Building Officials	Local	Medium	Moderate
4	Partner with Bullock County Board of Education to retrofit public schools with community shelters.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA/Bullock County Schools	HMGP, PDM, USDA	Low	Low
4	Protect critical facilities and infrastructure from lightning damage by installing lightning protection devices and methods, such as lightning rods and grounding, on communications infrastructure and other critical facilities.	Lightning	BCEMA, Midway, Union Springs	HMGP, PDM, USDA	Low	Low
4	Encourage industries, businesses and residents to install and maintain surge protection on critical electronic equipment.	Lightning	BCEMA, Midway, Union Springs	Local	High	High
4	Initiate local inventory of existing publicly- and privately-owned dams and record individual dam characteristics.	Dam Failure	BCEMA, County Engineer, Building Officials	Local	Medium	High

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit/ Cost Score
4	Support Alabama Office of Water Resources efforts to record existing dams and their characteristics on a statewide basis.	Dam Failure	BCEMA, County Engineer, Building Officials	Local	Medium	High
4	Consistently check for leaks to minimize water supply losses.	Drought / Extreme Heat	Water Providers	Local	High	High
4	Developing agreements for secondary water sources that may be used during drought conditions.	Drought / Extreme Heat	Water Providers	Local	High	High
5	Plan for and maintain adequate road and debris clearing capabilities.	High Winds, Severe Storms, Tornadoes, Hurricanes, Winter / Ice Storms	BCEMA, Bullock County Engineer, Public Works	Local	High	High
5	Continue use of Rave Alert System to provide warning of all impending hazardous conditions	Severe Storms, Hail, Lightning, Tornadoes, Hurricanes	BCEMA/ Local Government	Local/HMGP	High	Moderate
6	Encourage participation of residents in the Bullock County automated hazard warning system	Severe Storms, Hail, Lightning, Tornadoes, Hurricanes	BCEMA, Midway, Union Springs	Local	High	High
6	Educate residents about dangers of extreme heat and cold and the steps that can be taken to protect themselves when extreme temperatures occur.	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Provide outreach to vulnerable populations by establishing and promoting accessible heating or cooling centers in the community.	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Increase outreach to vulnerable populations creating a database to track those individuals at high risk of death, such as the elderly, homeless, etc	Drought / Extreme Heat, Winter Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit/ Cost Score
6	Implement public awareness and education efforts about water conservation and water quality	Drought/ Extreme Heat	BCEMA	Local/EMPG	High	High
6	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses.	Earthquake	BCEMA / Bullock County Schools	Local	Medium	High
6	Educate homeowners on safety techniques to follow during and after an earthquake.	Earthquake	BCEMA	Local	Medium	High
6	Include earthquake potential in GIS hazard mapping for residents and design professionals.	Earthquake	BCEMA / SCADC	Local	Medium	High
6	Distribute FEMA Publication 320 - Taking Shelter From the Storm: Building a Safe Room in Your House – to local homebuilders.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Building Officials	Private	High	High
6	Help citizens become more aware of specific erosion risks by notifying property owners located in high-risk areas and disclosing the location of high-risk areas to buyers.	Landslides	BCEMA, Building Officials	Private	Medium	Moderate
6	Incorporate landslide and land subsidence potential into natural hazard education and awareness activities.	Landslides, Subsidence	BCEMA, LEPC	Local	Medium	High
6	Ensure that residents are aware of lightning danger by posting warning signage at local parks	Lightning	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Identify at-risk populations that may be exceptionally vulnerable in the event of long-term power outages.	Winter / Ice Storms	LEPC, Local Coordinator	Local	High	High
6	Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.	Winter / Ice Storms	LEPC, Local Coordinator	Local	High	High
6	Encourage homeowners to install carbon monoxide monitors and alarms.	Winter / Ice Storms	BCEMA, Local Building Officials	Local	High	High

6.5.2 Town of Midway Hazard Mitigation Action Plan

Town of Midway Deleted Hazard Mitigation Action Items		Hazard Addressed	Reason for Deletion
1	Utilize AEMA Flood Relocation Program and other appropriate FEMA and/or AEMA programs to remove at-risk commercial and residential structures from flood prone and other natural hazard areas; include relocation of storm water improvements in urban areas	All	There are no structural properties within the floodplain in the Town of Midway.
4	Maintain and expand existing shelter facilities to provide adequate pre-disaster care and space, as needed; upgrade electrical and indicate adequate supplier and 9 elevators	Tornadoes, Severe Storms	Redundant to other action items.
5	Purchase, install, and test emergency warning sirens, as needed.	All	Bullock County has transitioned to the Rave Automated Warning System and is no longer utilizing warning sirens.
5	Develop a warning plan to install approximately ten sirens at targeted sites to adequately cover population pockets in Bullock County	Tornadoes, Hurricanes/ Severe Storms	Bullock County has transitioned to the Rave Automated Warning System and is no longer utilizing warning sirens.

Town of Midway Continued Hazard Mitigation Continued Action Items						
Goal	**Action Description**	**Hazards Addressed**	**Lead Agency**	**Funding Source**	**Priority / Status**	**Benefit / Cost Score**
1	Participate in the update of the Bullock County Hazard Mitigation Plan every five years as required by regulations	All	BCEMA	HMGP, EMPG	High	High
1	Provide local human resources or other resources, such as materials and supplies, to assist in implementation of the Bullock County Hazard Mitigation Plan and its regular update	All	BCEMA, Midway, Union Springs	HMGP, Local	High	High
1	Continue participation and maintain compliance in the NFIP	Flood	BCEMA, Bullock Co Engineer, Midway	HMGP, NFIP, Local	High	High
2	Develop and utilize zoning ordinances and subdivision regulations to manage local development	Wildfire	Council, Plng Commission, Bldg Dept	Local, HMGP	High	High
2	Ensure that future land use and growth plans do not extend into flood plain areas	Flood	BCEMA, Plng Commission	Local/ HMGP	Medium	High

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
2	Consider enforcing modern building codes at the county and municipal levels; include permitting enforcement	Flood	Council, Plng Commission, Bldg Dept	Local, HMGP	Medium	High
3	Utilize AEMA flood relocation program and identify and obtain properties in floodplains to be used for greenways, open spaces, parks, trails, and other recreational activities	All	BCEMA, Local Governments	Local	High	Low
4	Establish a local reserve fund for repairing and/or incorporating hazard mitigation measures for public and private facilities and infrastructure that are at risk of being damaged or have been damaged by natural hazards	All	BCEMA	Local	High	Low
4	Identify roads that require elevation and paving, and that have a high potential for flooding and/or washing during flood events, to provide access and limit erosion and sedimentation	Flood	County Engineer, BCEMA, NFIP	Local, HMGP	Medium	Moderate
4	Provide adequate safe rooms and community shelters.	Tornadoes, Severe Storms	BCEMA, Local Government	Local, HMGP, ADECA	High	Moderate
4	Designate and upgrade/retrofit, as necessary, existing public facilities to provide shelter in areas of Bullock County where there currently are no shelters, primarily targeting schools and community centers, at a rate of one site every two years; combine with ADECA Enhancement Program (Midway)	Tornadoes, Severe Storms	BCEMA	Local, HMGP, ADECA	Medium	Low
4	Work with developers, homebuilders and contractors to promote construction of a safe room in all new residential development	Tornadoes, Severe Storms	BCEMA, Local Government	Local, HMGP, ADECA	Medium	Moderate
4	Investigate construction of new public shelter facilities in those areas of the county with no shelter facilities as long-term and low-priority task. (Midway)	Tornadoes, Severe Storms	BCEMA	Local, HMGP, ADECA	Low	Low
4	Secure funds to assist citizens in constructing private shelters on their land at a rate of five shelters per year	Tornadoes, Severe Storms	BCEMA, Midway, Union Springs	Local, HMGP, ADECA	High	Low
5	Designate a volunteer emergency coordinator in each municipality and community to better facilitate communications with the Bullock County Emergency Management Agency	All	Local Govts	Local	High	High
5	Promote the use of individual weather radios county wide	All	BCEMA	Local, HMGP	Medium	Moderate
5	Investigate need for emergency water supply during disaster events; added fire hydrants and extended/upgraded water service lines	All	BCEMA, VFD	Local, HMGP	High	Low

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
5	Purchase/update emergency generators for post-disaster mitigation and conduct routine tests on backup generators for all critical facilities.	All	BCEMA	Local, HMGP, ADECA	High	Moderate
5	Investigate the need for and acquire emergency electrical power generation equipment to provide back-up emergency electrical power to critical facilities	All	BCEMA/ Local Government	Local, HMGP, ADECA	High	High
5	Continue to identify the Town's most at risk critical facilities, and evaluate the potential mitigation techniques and activities for protecting each facility to the maximum extent possible	All	BCEMA	Local, HMGP	High	High
5	Consider funding for added training and staff for volunteer fire departments to man stations	Wildfires	BCEMA, VFD	Local, HMGP	High	Moderate
New Hazard Mitigation Actions for the Town of Midway, 2020						
1	Participate in a countywide drought and heat indicator plan and warning system that includes a response strategy to include seniors and public health	Drought/ Extreme Heat	BCEMA	Local, County FSA, Ext Svc	High	High
1	Limit non-critical water consumption during severe drought conditions	Drought/ Extreme Heat	Local Government	Local	Medium	
1	Incorporate drought tolerant practices into landscape practices to reduce dependence on irrigation.	Drought / Extreme Heat	BCEMA	Local	High	High
1	Encourage citizens to take water-saving measures, such as installing low-flow water saving showerheads and toilets, turning water flow off while brushing teeth or during other cleaning activities, adjusting sprinklers to water the lawn and not the sidewalk or street, running the dishwasher and washing machine only when they are full, checking for leaks in plumping or dripping faucets, installing rain-capturing devices for irrigation	Drought / Extreme Heat	BCEMA, Water Providers, Building Officials	Local	High	High
1	Encourage the construction of safe rooms in new and existing construction.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Building Officials	Private	High	High
1	Encourage the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings where feasible.	High Winds, Severe Storms, Tornadoes, Hurricanes	Governing Body	HMGP, PDM, USDA	Low	Low

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
1	Discourage development in areas that have been identified as at-risk to subsidence.	Land Subsidence / Sinkholes	BCEMA, Building Officials	Private	High	High
1	Restrict development in areas with soil that is considered poor or unsuitable for development	Land Subsidence / Sinkholes	BCEMA, Building Officials	Private	High	High
1	Limit economic development activity in areas with a risk for landslides and land subsidence.	Landslides, Subsidence	Local Planning and Building Officials	Local	High	High
1	Support BCEMA efforts to investigate areas of topographical depressions to evaluate local risk for land subsidence or sinkholes.	Subsidence	BCEMA, Bullock County Engineer	Local	Medium	High
1	Recognize the existence of wildfire hazards and identify areas of risk based on a wildfire vulnerability assessment.	Wildfire	BCEMA, Alabama Forestry Commission	Local	Medium	High
1	Use prescribed burning to reduce fuel loads that threaten public safety and property	Wildfire	Alabama Forestry Commission, Landowners	Private	High	Moderate
2	Incorporate and enforce flood management provisions in all county and municipal land use and zoning ordinances and regulations	Flood	BCEMA, Local Government	Local, HMGP, EMPG	Medium	High
2	Conduct an inventory of locations where critical facilities, other buildings, and infrastructure are vulnerable to landslides.	Landslides	BCEMA, SCADC	Local	Medium	High
3	Assess vegetation in wildfire-prone areas to prevent landslides after fires.	Landslides	BCEMA, Alabama Forestry Commission	Local	Medium	High
3	Prevent erosion with proper bank stabilization, sloping or grading techniques, planting vegetation on slopes, terracing hillsides, or installing riprap boulders or geotextile fabric.	Landslides	BCEMA, Bullock County Engineer, Building Officials	Local	Medium	Moderate

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
4	Initiate local inventory of existing publicly- and privately-owned dams and record individual dam characteristics.	Dam Failure	BCEMA, County Engineer, Building Officials	Local	Medium	High
4	Support Alabama Office of Water Resources efforts to record existing dams and their characteristics on a statewide basis.	Dam Failure	BCEMA, County Engineer, Building Officials	Local	Medium	High
4	Consistently check for leaks to minimize water supply losses.	Drought / Extreme Heat	Water Providers	Local	High	High
4	Developing agreements for secondary water sources that may be used during drought conditions.	Drought / Extreme Heat	Water Providers	Local	High	High
4	Partner with Bullock County Board of Education to retrofit public schools with community shelters.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Bullock County Schools	HMGP, PDM, USDA	Low	Low
4	Protect critical facilities and infrastructure from lightning damage by installing lightning protection devices and methods, such as lightning rods and grounding, on communications infrastructure and other critical facilities.	Lightning	BCEMA, Midway, Union Springs	HMGP, PDM, USDA	Low	Low
4	Encourage industries, businesses, and residents to install and maintain surge protection on critical electronic equipment.	Lightning	BCEMA, Midway, Union Springs	Local	High	High
5	Plan for and maintain adequate road and debris clearing capabilities.	High Winds, Severe Storms, Thunderstorms, Tornadoes, Hurricanes, Winter / Ice Storms	BCEMA, County Engineer, Midway, Union Springs	Local	High	High
6	Educate residents about dangers of extreme heat and cold and the steps that can be taken to protect themselves when extreme temperatures occur.	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
6	Provide outreach to vulnerable populations by establishing and promoting accessible heating or cooling centers in the community.	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Increase outreach to vulnerable populations creating a database to track those individuals at high risk of death, such as the elderly, homeless, etc	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Implement public awareness and education efforts about water conservation and water quality	Drought/ Extreme Heat	BCEMA	Local, EMPG	High	High
6	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses.	Earthquake	BCEMA, Bullock County Schools	Local	Medium	High
6	Educate homeowners on safety techniques to follow during and after an earthquake.	Earthquake	BCEMA	Local	Medium	High
6	Distribute FEMA Publication 320 - Taking Shelter From the Storm: Building a Safe Room in Your House – to local homebuilders.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Building Officials	Private	High	High
6	Help citizens become more aware of specific erosion risks by notifying property owners located in high-risk areas and disclosing the location of high-risk areas to buyers.	Landslides	BCEMA, Building Officials	Private	Medium	Moderate
6	Incorporate landslide and land subsidence potential into natural hazard education and awareness activities.	Landslides, Subsidence	BCEMA, LEPC	Local	Medium	High
6	Ensure that residents are aware of lightning danger by posting warning signage at local parks	Lightning	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Identify at-risk populations that may be exceptionally vulnerable in the event of long-term power outages.	Winter / Ice Storms	LEPC, Local Coordinator	Local	High	High
6	Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.	Winter / Ice Storms	LEPC, Local Coordinator	Local	High	High
6	Encourage homeowners to install carbon monoxide monitors and alarms.	Winter / Ice Storms	BCEMA, Building Officials	Local	High	High

6.5.3 City of Union Springs Hazard Mitigation Action Plan

City of Union Springs Deleted Hazard Mitigation Action Items		Hazard Addressed	Reason for Deletion
5	Purchase, install, and test emergency warning sirens, as needed.	All	Bullock County has transitioned to the Rave Automated Warning System and is no longer utilizing warning sirens.
5	Develop a warning plan to install approximately 10 sirens at targeted sites to adequately cover population pockets in Bullock County	Tornadoes, Hurricanes/ Tropical Storms, Severe Storms	Bullock County has transitioned to the Rave Automated Warning System and is no longer utilizing warning sirens.
4	Maintain and expand existing shelter facilities to provide adequate pre-disaster care and space, as needed; upgrade electrical and indicate adequate supplier and 9 elevators	Tornadoes, Severe Storms	Redundant to other action items.

City of Union Springs Continued Hazard Mitigation Continued Action Items						
Goal	**Action Description**	**Hazards Addressed**	**Lead Agency**	**Funding Source**	**Priority / Status**	**Benefit / Cost Score**
1	Utilize AEMA Flood Relocation Program and other appropriate FEMA and/or AEMA programs to remove at-risk commercial and residential structures from flood prone and other natural hazard areas; include relocation of storm water improvements in urban areas	All	BCEMA, NFIP	HMGP, EMPG	Medium	Low
1	Participate in the update of the Bullock County Hazard Mitigation Plan every five years as required by regulations	All	BCEMA	HMGP, EMPG	High	High
1	Provide local human resources or other resources, such as materials and supplies, to assist in implementation of the Bullock County Hazard Mitigation Plan and its regular update	All	BCEMA, Midway, Union Springs	HMGP, Local	High	High
1	Continue participation and maintain compliance in the NFIP	Flood	BCEMA, Bullock Co Engineer, Union Springs	HMGP, NFIP, Local	High	High
2	Incorporate and enforce flood management provisions in all county and municipal land use and zoning ordinances and regulations	Flood	BCEMA, Local Government	Local, HMGP, EMPG	Medium	High

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
2	Consider enforcing modern building codes at the county and municipal levels; include permitting enforcement	Flood	BCEMA, County Engineer,	Local, HMGP	Medium	High
3	Utilize AEMA flood relocation program and identify and obtain properties in floodplains to be used for greenways, open spaces, parks, trails, and other recreational activities	All	BCEMA, Local Governments	Local	High	Low
4	Establish a local reserve fund for repairing and/or incorporating hazard mitigation measures for public and private facilities and infrastructure that are at risk of being damaged or have been damaged by natural hazards	All	BCEMA	Local	High	Low
4	Identify roads that require elevation and paving, and that have a high potential for flooding and/or washing during flood events, to provide access and limit erosion and sedimentation	Flood	County Engineer, BCEMA, NFIP	Local, HMGP	Medium	Moderate
4	Provide adequate safe rooms and community shelters.	Tornadoes, Severe Storms	BCEMA, Local Government	Local, HMGP, ADECA	High	Moderate
4	Designate and upgrade/retrofit, as necessary, existing public facilities to provide shelter in areas of Bullock County where there currently are no shelters, primarily targeting schools and community centers, at a rate of one site every two years; combine with ADECA Enhancement Program (Midway)	Tornadoes, Severe Storms	BCEMA	Local, HMGP, ADECA	Medium	Low
4	Work with developers, homebuilders and contractors to promote construction of a safe room in all new residential development	Tornadoes, Severe Storms	BCEMA, Local Government	Local, HMGP, ADECA	Medium	Moderate
4	Secure funds to assist citizens in constructing private shelters on their land at a rate of five shelters per year	Tornadoes, Severe Storms	BCEMA, Midway, Union Springs	Local, HMGP, ADECA	High	Low
5	Designate a volunteer emergency coordinator in each municipality and community to better facilitate communications with the Bullock County Emergency Management Agency	All	Local Govts	Local	High	High
5	Promote the use of individual weather radios county wide	All	BCEMA	Local, HMGP	Medium	Moderate
5	Investigate need for emergency water supply during disaster events; added fire hydrants and extended/upgraded water service lines	All	BCEMA, Local FD, VFD	Local, HMGP	High	Low
5	Purchase or update emergency generators for post-disaster mitigation and conduct routine tests on backup generators for all critical facilities.	All	BCEMA	Local, HMGP, ADECA	High	Moderate

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
5	Investigate the need for and acquire emergency electrical power generation equipment to provide back-up emergency electrical power to critical facilities	All	BCEMA, Local Government	Local, HMGP, ADECA	High	High
5	Continue to identify the County's most at risk critical facilities, and evaluate the potential mitigation techniques and activities for protecting each facility to the maximum extent possible	All	BCEMA	Local, HMGP	High	High
5	Consider funding for added training and staff for volunteer fire departments to man stations	Wildfires	BCEMA, Local FD, VFD	Local, HMGP	High	Moderate
New Hazard Mitigation Actions for the City of Union Springs, 2020						
1	Incorporate drought tolerant or xeriscape practices into landscape practices to reduce dependence on irrigation.	Drought / Extreme Heat	BCEMA	Local	High	High
1	Encourage citizens to take water-saving measures, such as installing low-flow water saving showerheads and toilets, turning water flow off while brushing teeth or during other cleaning activities, adjusting sprinklers to water the lawn and not the sidewalk or street, running the dishwasher and washing machine only when they are full, checking for leaks in plumping or dripping faucets, installing rain-capturing devices for irrigation	Drought / Extreme Heat	BCEMA, Water Providers, Building Officials	Local	High	High
1	Encourage the construction of safe rooms in new and existing construction.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Building Officials	Private	High	High
1	Encourage the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings where feasible.	High Winds, Severe Storms, Tornadoes, Hurricanes	Governing Body	HMGP, PDM, USDA	Low	Low
1	Discourage development in areas that have been identified as at-risk to subsidence.	Land Subsidence, Sinkholes	BCEMA, Building Officials	Private	High	High
1	Restrict development in areas with soil that is considered poor or unsuitable for development	Land Subsidence, Sinkholes	BCEMA, Building Officials	Private	High	High
1	Limit economic development activity in areas with a risk for landslides and land subsidence.	Landslides, Subsidence	Local Planning and Building Officials	Local	High	High

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
1	Support BCEMA efforts to investigate areas of topographical depressions to evaluate local risk for land subsidence or sinkholes.	Subsidence	BCEMA, Bullock County Engineer	Local	Medium	High
1	Recognize the existence of wildfire hazards and identify areas of risk based on a wildfire vulnerability assessment.	Wildfire	BCEMA, AFC	Local	Medium	High
1	Involve fire protection agencies in determining guidelines and standards and in development and site plan review procedures.	Wildfire	Plng Comm, Bldg Officials	Local	Medium	High
1	Establish wildfire mitigation planning requirements for large scale developments or planned unit developments.	Wildfire	Plng Comm, Bldg Officials	Local	Medium	High
1	Use prescribed burning to reduce fuel loads that threaten public safety and property	Wildfire	AFC, Landowners	Private	High	Moderate
1	Develop a drought and heat indicator plan and warning system that includes a response strategy to include seniors and public health	Drought/ Extreme Heat	BCEMA	Local, County FSA, Ext Service	High	High
1	Limit non-critical water consumption during severe drought conditions	Drought/ Extreme Heat	Local Government	Local	Medium	
2	Encourage use of permeable driveways and surfaces to reduce runoff and promote groundwater recharge.	Drought / Extreme Heat	Plng Comm, Bldg Officials	Local	Medium	High
2	Ensure that future land use and growth plans do not extend into flood plain areas	Flood	BCEMA, County Engineer	Local, HMGP	Medium	High
2	Conduct an inventory of locations where critical facilities, other buildings, and infrastructure are vulnerable to landslides.	Landslides	BCEMA, SCADC	Local	Medium	High
2	Develop and utilize zoning ordinances and subdivision regulations to manage development in urban fringe areas	Wildfire	BCEMA, Co Engineer, Plng Comm, Bldg Officials	Local, HMGP	High	High
3	Assess vegetation in wildfire-prone areas to prevent landslides after fires.	Landslides	BCEMA, AFC	Local	Medium	High
3	Prevent erosion with proper bank stabilization, sloping or grading techniques, planting vegetation on slopes, terracing hillsides, or installing riprap boulders or geotextile fabric.	Landslides	BCEMA, Bullock County Engineer, Bldg Officials	Local	Medium	Moderate

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
4	Initiate local inventory of existing publicly- and privately-owned dams and record individual dam characteristics.	Dam Failure	BCEMA, Bullock Co Engineer, Local Bldg Officials	Local	Medium	High
4	Support Alabama Office of Water Resources efforts to record existing dams and their characteristics on a statewide basis.	Dam Failure	BCEMA, Bullock Co Engineer, Local Bldg Officials	Local	Medium	High
4	Consistently check for leaks to minimize water supply losses.	Drought , Extreme Heat	Water Providers	Local	High	High
4	Developing agreements for secondary water sources that may be used during drought conditions.	Drought , Extreme Heat	Water Providers	Local	High	High
4	Partner with Bullock County Board of Education to retrofit public schools with community shelters.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Bullock County Schools	HMGP, PDM, USDA	Low	Low
4	Protect critical facilities and infrastructure from lightning damage by installing lightning protection devices and methods, such as lightning rods and grounding, on communications infrastructure and other critical facilities.	Lightning	BCEMA, Midway, Union Springs	HMGP, PDM, USDA	Low	Low
4	Encourage industries, businesses and residents to install and maintain surge protection on critical electronic equipment.	Lightning	BCEMA, Midway, Union Springs	Local	High	High
5	Plan for and maintain adequate road and debris clearing capabilities.	High Winds, Severe Storms, Thunderstorms, Tornadoes, Hurricanes, Winter / Ice Storms	BCEMA, Bullock Co Engineer, Local Public Works	Local	High	High
6	Educate residents about dangers of extreme heat and cold and the steps that can be taken to protect themselves when extreme temperatures occur.	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate

Goal	Action Description	Hazards Addressed	Lead Agency	Funding Source	Priority / Status	Benefit / Cost Score
6	Provide outreach to vulnerable populations by establishing and promoting accessible heating or cooling centers in the community.	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Increase outreach to vulnerable populations creating a database to track those individuals at high risk of death, such as the elderly, homeless, etc	Drought / Extreme Heat, Winter / Ice Storms	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Implement public awareness and education efforts about water conservation and water quality	Drought/ Extreme Heat	BCEMA	Local, EMPG	High	High
6	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses.	Earthquake	BCEMA , Bullock Co Schools	Local	Medium	High
6	Educate homeowners on safety techniques to follow during and after an earthquake.	Earthquake	BCEMA	Local	Medium	High
6	Distribute FEMA Publication 320 - Taking Shelter From the Storm: Building a Safe Room in Your House – to local homebuilders.	High Winds, Severe Storms, Tornadoes, Hurricanes	BCEMA, Building Officials	Private	High	High
6	Help citizens become more aware of specific erosion risks by notifying property owners located in high-risk areas and disclosing the location of high-risk areas to buyers.	Landslides	BCEMA, Building Officials	Private	Medium	Moderate
6	Incorporate landslide and land subsidence potential into natural hazard education and awareness activities.	Landslides, Subsidence	BCEMA, LEPC	Local	Medium	High
6	Ensure that residents are aware of lightning danger by posting warning signage at local parks	Lightning	BCEMA, Midway, Union Springs	Local	Medium	Moderate
6	Identify at-risk populations that may be exceptionally vulnerable in the event of long-term power outages.	Winter / Ice Storms	LEPC, Local Coordinator	Local	High	High
6	Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.	Winter / Ice Storms	LEPC, Local Coordinator	Local	High	High
6	Encourage homeowners to install carbon monoxide monitors and alarms.	Winter / Ice Storms	BCEMA, Local Building Officials	Local	High	High

SECTION 7: PLAN MAINTENANCE

Section Contents

7.1 Hazard Mitigation Monitoring, Evaluation, and Update Process
7.2 Hazard Mitigation Plan Incorporation
7.3 Public Awareness/Participation

7.1 Hazard Mitigation Monitoring, Evaluation, and Update Process

The Bullock County Multi-Jurisdictional Hazard Mitigation Plan is developed on a five-year time frame. It is intended to be reviewed on an annual basis for any necessary amendments, and to undergo a major review and update every five years. In this way, Bullock County will have an ongoing mitigation plan and process. The Bullock County EMA Director will continue to serve as the Local Emergency Planning Committee's (LEPC) facilitator and will be responsible for holding regularly scheduled meetings, assigning specific tasks necessary to monitor and update the plan to LEPC members, and serving as the LEPC's liaison with those assigned implementation responsibilities. The facilitator will also serve as the LEPC's liaison with participating municipalities and the Bullock County Commission.

New LEPC committee members may be nominated by the EMA Director and then approved by the entire committee. After the Bullock County Multi-Jurisdictional Hazard Mitigation Plan Update 2020 is finalized and adopted, the LEPC shall meet at least once per year to review and update the plan, as necessary. Periodic review and revision of the Hazard Mitigation Plan is important to ensure the plan's currency and compliance with applicable regulations and to assess the progress of local mitigation actions. Review and revision of the Hazard Mitigation Plan may occur through the following procedures.

Annual Review Process.

On at least an annual basis, the Bullock County EMA Director shall facilitate a meeting of the Local Emergency Planning Committee, local jurisdictions, and other stakeholders. At a minimum, the scope of the annual county-level plan review meeting will include the following:

- Each member or a designated alternate must attend at least one meeting a year.
- A list of completed and ongoing mitigation projects will be reviewed at each meeting.
- Previously implemented mitigation actions will be evaluated for effectiveness.
- There will be an update on the status of current mitigation projects.
- Changing land use patterns and new developments will be addressed.
- Any additions or changes in risk assessment and/or risk vulnerability will be identified.
- Any other concerns will be addressed, possible future mitigation plans discussed, and any new projects will be adopted.

The general public will be invited to attend this meeting through public outreach, as further described in Section 7.3, and encouraged to provide their input into the annual review.

The facilitator will schedule the meetings at a time and location most convenient to LEPC members. All meetings will be advertised in the local newspaper and open to the public for their comments and suggestions. If modifications to the plan are required, the LEPC will oversee, recommend, and/or approve all revisions and amendments to the Bullock County Multi-Jurisdictional Hazard Mitigation Plan. The LEPC will then submit all revisions, except for mitigation projects or activities not of a countywide nature, for adoption (via signed resolutions) by all the jurisdictions. Any new projects or activities (developed and/or proposed prior to the first five-year and between subsequent five-year major updates), not of a countywide nature, will be added to the Bullock County Multi-Jurisdictional Hazard Mitigation Plan upon recommendation

of the LEPC and adoption (via signed resolution) by the appropriate governing body where the proposed project is to be located. In the event that emergency modifications to the plan are required and if Bullock County and/or any of the jurisdictions located therein are involved in an active disaster declaration at the time the modifications are needed, and if the LEPC is unable to meet in a timely fashion and prior to any AEMA and/or FEMA deadlines in order to conduct the revision and amendment process outlined in the immediately preceding paragraph above, then the Bullock County EMA Director can recommend revisions and amendments to the Bullock County Multi-Jurisdictional Hazard Mitigation Plan. The Bullock County EMA Director can then submit any emergency revisions, except for mitigation projects or activities not of a countywide nature, for written approval by the Bullock County Commission. The written approval of just the Chairperson of the Bullock County Commission is acceptable if (1) the membership of the County Commission is unable to meet in a timely fashion and prior to any AEMA and/or FEMA deadlines, and (2) if the proposed revisions do not require or involve local financial commitments or expenditures.

Any emergency projects or activities, not of a countywide nature, will be added to the Bullock County Multi-Jurisdictional Hazard Mitigation Plan upon recommendation of the Bullock County EMA Director and written approval by the appropriate municipal council where the proposed project or activity is to be located. The written approval of just the mayor of the municipality is acceptable if (1) the membership of the respective municipal council is unable to meet in a timely fashion and prior to any AEMA and/or FEMA deadlines, and (2) assuming that the proposed revisions do not require or involve local financial commitments or expenditures. If any emergency modifications to the plan are required and are adopted or approved without the expressed approval (either via signed resolutions or letters of approval) of the memberships of the appropriate governing bodies, the said governing bodies may reserve the right to express their approval and adoption via a later vote. A copy of and/or access to any and all adopted plan revisions will be provided to all LEPC members, the County Commission, and each of the municipalities.

Emergency Review Process.

In certain instances, such as a disaster occurrence impacting a participating jurisdiction, the full Annual Review Process may not be timely enough to address unforeseen issues created by a particular event. In these situations, a county EMA official may facilitate a county-level plan review meeting, similar to the process described above in the Annual Review Process, with the requisite public outreach. Once this meeting is completed, a local amendment may be adopted by a participating jurisdiction that only pertains to the revision of their specific Jurisdictional Mitigation Action Plan in a public session. After any local amendment, the local county EMA official shall submit documentation of the local amendment to the Chair of the plan monitoring and review process.

Five-Year Plan Update.

Before the five-year expiration of the Hazard Mitigation Plan, a thorough review, beginning approximately 18 months prior to plan expiration, shall be held to determine any significant changes in the Bullock County planning area that may affect the county's vulnerability to hazard impacts, and an evaluation of the mitigation strategy and jurisdictional mitigation action plans developed as part of this process. This plan update shall incorporate any changes to federal or state regulations that may affect the Hazard Mitigation Plan contents. The plan update process will follow a locally-driven, public process, similar to the annual plan review process outlined previously.

In addition, multiple state, regional, and local partners will be consulted to provide data or consultation in plan formation. Consulting entities will include: the U.S. Army Corps of Engineers, Alabama Forestry Commission, Geological Survey of Alabama (GSA), Alabama Department of Public Health (ADPH), Alabama Department of Transportation (ALDOT), Alabama Department of Environmental Management (ADEM), Alabama Historical Commission (AHC), neighboring county EMA offices, regional academic providers, and private sector entities, such as local chambers of commerce and the American Red Cross. Upon completion of this review and update, the updated Hazard Mitigation Plan will be submitted to the AEMA and FEMA for review and approval.

The updated plan will again be submitted to the AEMA and FEMA for approval. Implementation of the plan will be the responsibility of a number of local governments and agencies. For each mitigation action item, a responsible agency has been identified. The Bullock County Emergency Management Agency will coordinate implementation efforts with each of the local governments and with other agencies as necessary. A critical part of maintaining an effective and relevant natural hazard mitigation plan is ongoing public review and comment. The LEPC is dedicated to direct involvement of the citizens of Bullock County in providing input on the plan throughout the five-year implementation cycle. A hard copy of the plan will be available for viewing at all appropriate agencies throughout Bullock County, at minimum to include: the Bullock County Emergency Management Agency office, the Bullock County Clerk's office, the offices of the clerks of each municipality, and county or municipal government websites, if available. After adoption, a public information notice in the local newspaper will inform the public that the plan may be viewed at these locations.

If deemed appropriate by the Coordinator of the Bullock County Emergency Management Agency and once adopted, this plan shall be considered as an Annex to the Bullock County Emergency Operations Plan, which is administered through the Bullock County Emergency Management Agency office.

7.2 Hazard Mitigation Plan Incorporation

Once the Bullock County Multi-Jurisdictional Hazard Mitigation Plan is "approvable upon adoption" by FEMA, each jurisdiction shall proceed with adoption procedures. Each proposed action listed in the jurisdictional mitigation action plans are assigned to one or multiple lead agencies or departments to assign responsibility and accountability of action implementation to specific sources. In addition to the assigned local agency or department, each mitigation action plan also has a priority or status assigned that roughly coincides with an implementation timeline. The local jurisdictions in Bullock County will seek to provide operational funding to actions that are ongoing and seek outside funding for capital projects that are outside the realm of normal funding during both pre-disaster and post-disaster periods.

The participating jurisdictions will integrate this Hazard Mitigation Plan into appropriate and relevant municipal and county government decision-making processes, where feasible. This includes integrating the findings of the Hazard Mitigation Plan into documents, such as comprehensive or master plans, future land use plans, subdivision regulations, building

regulations, capital improvement plans, or similar mechanisms. Local EMA officials or planning staffs of the appropriate regional planning council will provide technical assistance for incorporation, upon request. The participating jurisdictions will also work to ensure the goals and actions of local planning documents are consistent with the goals and mitigation actions of the Hazard Mitigation Plan and will not introduce additional hazard vulnerabilities to the local area and region at-large. The Bullock County EMA Director will incorporate applicable information from this Hazard Mitigation Plan into other required emergency management plans, including the Bullock County Emergency Operations Plan and county THIRA. During county-level plan reviews, participating communities will be asked to record the planning documents in which elements of the Hazard Mitigation Plan were incorporated.

The Hazard Mitigation Plan will also be provided to the South Central Alabama Development Commission (SCADC) for consistency with other regional planning and economic development activities, as well as local economic development councils.

7.3 Public Awareness/Participation

Public participation in the hazard mitigation planning process, including monitoring and review of the existing plan, and development and adoption of future plans, is a very important component. Though concerted efforts are made to engage the general public in the hazard mitigation planning process through county-level meetings that were advertised through several methods, there were very few unaffiliated members of the public that participated. Efforts will increase to involve local and state government agencies, businesses, academia, and the general public in the ongoing mitigation planning process to the maximum extent possible.

As described in the Monitoring, Evaluation, and Update process, any significant changes, amendments, or updates to the Hazard Mitigation Plan shall be discussed in open meetings prior to any adoption procedures. Any plan updates or major revisions will be adopted during a public session. The public will be informed of public hearings and other Hazard Mitigation related meetings through a variety of media sources, including but not limited to: local newspaper advertisements and notices, radio advertising, postings at high traffic community areas (e.g. libraries and government buildings), booths at local Severe Weather Expo events, social media such as local Facebook pages, telephone messages, and various websites such as local EMA offices, SCADC, and Open Meetings websites. The Bullock County EMA office and SCADC will keep public copies and provide copies of the Hazard Mitigation Plan to seat of government in each municipality, and other appropriate public locations. Press releases will be published via various media to inform the general public and stakeholders that the Hazard Mitigation Plan is available for review, where to find the Hazard Mitigation Plan, and how they can play a role in its creation and future revisions.

SECTION 8: APPENDICES

Section Contents

8.1 Definitions
8.2 Public Participation Documentation
8.3 Bullock County Hazard Mitigation Plan Local Approval

8.1 Definitions

Applicant: Entity, such as a State, Territory, or Indian Tribal government, applying to FEMA for a grant that will be accountable for the use of the funds. Once grant funds are awarded, the Applicant becomes the "Grantee."

Base Flood: A flood having a 1 percent chance of being equaled or exceeded in any given year.

Base Flood Elevation (BFE): The elevation shown on the Flood Insurance Rate Map (FIRM) for Zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, V1–V30, and VE that indicates the water surface elevation resulting from a flood that has a 1 percent chance of equaling or exceeding that level in any given year.

Benefit-Cost Analysis (BCA): A quantitative procedure that assesses the cost-effectiveness of a hazard mitigation measure by taking a long-term view of avoided future damages as compared to the cost of a project.

Benefit-Cost Ratio (BCR): A numerical expression of the cost-effectiveness of a project calculated as the net present value of total project benefits divided by the net present value of total project costs.

Biomass: Biological material derived from living, or recently living organisms.

Building: A structure with two or more outside rigid walls and a fully secured roof that is affixed to a permanent site; a manufactured home or a mobile home without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws. "Building" does not mean a gas or liquid storage tank or a recreational vehicle, park trailer, or other similar vehicle.

Clean-site certification: A letter from the appropriate local, State, Indian Tribal, or Federal entity stating that no further remedial action is required to protect human health or the environment.

Coastal Barrier Resource System (CBRS): A geographic unit designated to serve as a protective barrier against forces of wind and tidal action caused by coastal storms and serving as habitat for aquatic species. Congress restricted Federal spending and assistance for development-related activities within CBRS units to protect them from further development. Federal flood insurance is unavailable in these areas. CBRS units are identified on FEMA FIRMs.

Coastal High Hazard Area: An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources.

Combustible material: Any material that, in the form in which it is used and under the conditions anticipated, will ignite and burn or will add appreciable heat to an ambient fire.

Community Rating System (CRS): A program developed by FEMA to provide incentives for those communities in the NFIP that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

Cost-effectiveness: Determined by a systematic quantitative method for comparing the costs of alternative means of achieving the same stream of benefits for a given objective. The benefits in the context of hazard mitigation are avoided future damages and losses. Cost-effectiveness is determined by performing a BCA.

Cost share: The portion of the costs of a federally assisted project or program not borne by the Federal Government.

Defensible space: An area that is either natural or manmade, where material capable of allowing a fire to spread unchecked has been treated, cleared, or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire-suppression operations to occur.

Dwelling: A building designed for use as a residence for no more than four families or a single-family unit in a building under a condominium form of ownership.

Elevated Building: A building that has no basement and a lowest floor that is elevated to or above the BFE by foundation walls, shear walls, posts, piers, pilings, or columns. Solid perimeter foundations walls are not an acceptable means of elevating buildings in Zones V and VE.

Environmental Benefits: Environmental benefits are direct or indirect contributions that ecosystems make to the environment and human populations. For FEMA BCA, certain types of environmental benefits may be realized when homes are removed and land is returned to open space uses. Benefits may include flood hazard reduction; an increase in recreation and tourism; enhanced aesthetic value; and improved erosion control, air quality, and water filtration.

Equipment: Tangible, nonexpendable, personal property having a useful life of more than 1 year and an acquisition cost of $5,000 or more per unit. A Grantee may use its own definition of equipment provided such definition would at least include all equipment defined above.

Federal Agency: Any department, independent establishment, Government corporation, or other agency of the executive branch of the Federal Government, including the U.S. Postal Service, but not the American National Red Cross.

Federal Cognizant Agency: The Federal agency responsible for reviewing, negotiating, and approving cost allocation plans or indirect cost proposals developed on behalf of all Federal agencies. The OMB publishes a list of Federal Cognizant Agencies.

Firebreak: a strip of cleared land that provides a gap in vegetation or other combustible material that is expected to slow or stop the progress of a wildfire.

Fire-proofing: Removal or treatment of fuels to reduce the danger of fires igniting or spreading. (e.g., fire-proofing roadsides, campsites, structural timber).

Fire-resistant material: Material that has a property that prevents or retards the passage of excessive heat, hot gases, or flames under conditions of use.

Fire retardant: Chemical applied to lumber or other products to slow combustion and flame spread.

Fire Severity Zone: Three concentric zones around a building used to determine the most effective design for defensible space.

Flammability: The relative ease with which fuels ignite and burn regardless of the quantity of fuel.

Flood Insurance Rate Map (FIRM): Official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community.

Floodplain: Any land area that FEMA has determined has at least a 1 percent chance in any given year of being inundated by floodwaters from any source.

Floodplain Management: The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to, emergency preparedness plans, flood control works, and floodplain management regulations.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities regulate development in these floodways to ensure that there are no increases in upstream flood elevations.

Freeboard: Freeboard is a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. “Freeboard” tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway

conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.

Fuel break: A natural or manmade change in fuel characteristics that affects fire behavior so that fires burning into them can be more readily controlled.

Fuel condition: Relative flammability of fuel as determined by fuel type and environmental conditions.

Governor's Authorized Representative (GAR): The individual, designated by the Governor, who serves as the grant administrator for all funds provided under HMGP; the person empowered by the Governor to execute, on behalf of the State, all necessary documents for disaster assistance.

Grant: An award of financial assistance for a specified purpose by the Federal government to an eligible Grantee.

Grantee: The entity, such as a State, Territory, or Indian Tribal government to which a grant is awarded and that is accountable for the use of the funds provided. The Grantee is the entire legal entity even if only a particular component of the entity is designated in the grant award document.

Green Open Space: Green open space is land that does not directly touch a natural body of water, such as a river, lake, stream, creek, or coastal body of water.

Hazardous fuels reduction: An area strategically located in relation to predicted fire hazard and occurrence where the vegetation has been permanently modified or replaced so that fires burning into it can be more easily controlled (e.g., vegetation management activities).

Hazard mitigation planning: A process used by governments to identify risks, assess vulnerabilities, and develop long-term strategies for protecting people and property from the effects of future natural hazard events.

HMGP Lock-In Ceiling: The level of HMGP funding available to a Grantee for a particular Presidential major disaster declaration.

Identified for Further Review: Subapplications identified for further review contain sufficient information for a preliminary determination of cost-effectiveness and feasibility. In certain instances, FEMA may work with Applicants to confirm cost-effectiveness and feasibility. Identification for further review is not a notification of award.

Ignition-resistant construction: Construction standards based on use of fire-resistant materials, non-combustible materials, and 1-hour fire-rated assemblies.

Increased Cost of Compliance: Coverage for expenses a property owner must incur, above and beyond the cost to repair the physical damage the structure actually sustained from a flooding event, to comply with mitigation requirements of State or local floodplain management ordinances or laws; acceptable mitigation measures are structure elevation, dry floodproofing, structure relocation, structure demolition, or any combination thereof.

Indian Tribal Government: A federally recognized governing body of an Indian or Alaska Native Tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian Tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Indirect cost: Cost that is incurred by a Grantee for a common or joint purpose benefitting more than one cost objective that is not readily assignable to the cost objectives specifically benefited.

Indirect cost rate: Percentage established by a Federal department or agency for a Grantee to use in computing the dollar amount it charges to the grant to reimburse itself for indirect costs incurred in doing the work of the grant activity.

Management costs: Any indirect costs, administrative expenses, and any other expenses not directly chargeable to a specific project that are reasonably incurred by a Grantee or subgrantee in administering and managing a grant or subgrant award. For HMGP, management cost funding is provided outside of Federal assistance limits defined at 44 CFR Section 206.432(b).

Manufactured (Mobile) home: A structure, transportable in one or more sections that is built on a permanent chassis and designed for use with or without a permanent foundation when attached to the required utilities.

Mitigation: Any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.

Mitigation activity: A mitigation measure, project, plan, or action proposed to reduce risk of future damage, hardship, loss, or suffering from disasters. The term "measure" is used interchangeably with the term "project" in this program.

National Flood Insurance Program (NFIP): Provides the availability of flood insurance in exchange for the adoption of a minimum local floodplain management ordinance that regulates new and Substantially Improved development in identified flood hazard areas.

Non-combustible material: Material of which no part will ignite and burn when subjected to fire, such as any material conforming to ASTM E 136.

Nonflammable: Material unlikely to burn when exposed to flame under most conditions.

Non-Federal funds: Financial resources provided by sources other than the Federal Government. The term does not included funds provided to a State or local government through a Federal grant unless the authorizing statute for that grant explicitly allows the funds to be used as cost share for other Federal grants.

Non-Residential structure: Includes, but is not limited to small business concerns, places of worship, schools, farm buildings (including grain bins and silos), pool houses, clubhouses, recreational buildings, mercantile structures, agricultural and industrial structures, warehouses, hotels and motels with normal room rentals for less than 6 months' duration, and nursing homes.

Office of Environmental Planning and Historic Preservation: Integrates the protection and enhancement of environmental, historic, and cultural resources into the FEMA mission and FEMA programs and activities; ensures that FEMA activities and programs related to disaster response and recovery, hazard mitigation, and emergency preparedness comply with Federal environmental and historic preservation (EHP) laws and Executive orders; and provides EHP technical assistance to FEMA staff, local, State, and Federal partners, and Grantees and subgrantees.

Otherwise Protected Areas (OPAs): Designation created by the Coastal Barrier Improvement Act. Flood insurance is restricted in OPAs even though they are not in the CBRS and may receive other forms of Federal assistance. OPAs are identified on FEMA FIRMs.

Period of Performance (POP): The period of time during which the Grantee is expected to complete the grant activities and to incur and expend approved funds.

Pile burning: Piling removed vegetation into manageable piles and burning the individual piles during safe and approved burning conditions.

Post-FIRM Building: A building for which construction or Substantial Improvement occurred after December 31, 1974, or on or after the effective date of an initial FIRM, whichever is later.

Practicable: An action that is capable of being done within existing constraints. The test of what is practicable depends upon the situation and includes consideration of all pertinent factors, such as environment, cost, and technology.

Pre-FIRM Building: A building for which construction or Substantial Improvement occurred on or before December 31, 1974, or before the effective date of an initial FIRM.

Prescribed burning: The deliberate and managed use of fire ignited by management actions to meet specific fuels management objectives.

Presidential Major Disaster: Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby.

Private non-profit (PNP): Any non-governmental agency or entity that currently has: (i) an effective ruling letter from the Internal Revenue Service granting tax exemption under section 501(c), (d), or (e) of the Internal Revenue Code of 1954; or (ii) satisfactory evidence from the State that the organization or entity is a non-profit one organized or doing business under State law.

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

Public Assistance: Supplementary Federal assistance provided under the Stafford Act to State and local governments or certain PNP organizations other than assistance for the direct benefit of individuals and families. For further information, see 44 CFR Part 206, Subparts G and H. Fire Management Assistance Grants under section 420 of the Stafford Act are also considered Public Assistance.

Replacement cost value: The cost to replace property with materials of like kind and quality, without any deduction for depreciation.

Riparian Area: The land that directly abuts a natural body of water, such as a river, lake, stream, creek, or coastal body of water.

Slash: The accumulation of vegetative materials such as tops, limbs, branches, brush, and miscellaneous residue results from forest management activities such as thinning, pruning, timber harvesting, and wildfire hazard mitigation.

Special Flood Hazard Area (SFHA): The land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year. An area having special flood, mudflow, or flood-related erosion hazards, and shown on a Flood Hazard Boundary Map or a FIRM as Zone A, AO, A1–A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1– A30, V1–V30, VE, or V.

State Hazard Mitigation Officer (SHMO): The representative of a State government who is the primary point of contact with FEMA, other Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.

Structural fire protection: The protection of homes or other buildings from wildland fire.

Subapplicant: The entity, such as a community/local government, Tribal government, or PNP, that submits a subapplication for FEMA assistance to the Applicant. Once funding is awarded, the subapplicant becomes the "subgrantee."

Subgrant: An award of financial assistance under a grant by a Grantee to an eligible subgrantee.

Subgrantee: The entity, such as a community/local government, Tribal government, or PNP to which a subgrant is awarded and who is accountable to the Grantee for the use of the funds provided.

Substantial Damage: Damage of any origin sustained by a building whereby the cost of restoring the building to its before-damaged condition would equal or exceed 50 percent of the market value of the building before the damage occurred.

Wildfire: An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Wildland-Urban Interface Area: That geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

All terms not listed above are used consistent with the term definitions used in 44 CFR unless otherwise specified.

8.2 Public Participation Documentation

The update of the Bullock County Multi-Jurisdictional Hazard Mitigation Plan has been fragmented due to changes in local leadership and changes in the position of the Bullock County Emergency Management Director. Some records and files of public participation could not be found by the current Bullock County EMA Director Ray Scott. Therefore, the LEPC membership as was provided in the 2018 draft plan and the current LEPC membership are both provided. Additionally, meeting notes that were provided in the 2018 draft hazard mitigation plan are included in Section 8.2.2. And finally, a memorandum was distributed to LEPC members, EMA directors of surrounding counties, and applicable state and federal agencies asking for review of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan. This communication is included in Section 8.2.3.

8.2.1 LEPC Membership
8.2.2 Meeting Notes
8.2.3 Memorandum for Review of Final Draft

8.2.1 LEPC Membership

2018 LEPC Membership:
The Bullock County EMA directed the following individuals and agencies to serve as members of the Hazard Mitigation Planning Committee:

- Bullock County Association of Volunteer Fire Departments
- Bullock County Commission
- Bullock County Cooperative Extension Office
- Bullock County Department of Human Resources
- Bullock County Economic Development Authority
- Bullock County EMA Director
- Bullock County Engineer
- Bullock County Health Department
- Bullock County Private Citizens
- Bullock County Schools
- Bullock County Sheriff's Office
- Bullock County Solid Waste Officer
- Bullock County VOAD
- May's Distributing Company
- Mayor of Midway
- Mid-Alabama Coalition for the Homeless
- Union Springs Police Department
- Union Springs Volunteer Fire Department

The Bullock County Hazard Mitigation Planning Committee appointed members for the entire five-year planning cycle of the 2018 Natural Hazards Mitigation Plan.

The following agencies helped provide information in regards to the hazard profiles, vulnerability assessments, potential losses, land use and development trends, and mapping data:

Federal:
National Weather Service – Mobile Office
United States Army Corps of Engineers
United States Geological Survey – Alabama District

State:
Alabama Associations of Regional Councils
Security POC
Alabama Emergency Management Agency
Alabama Forestry Commission
Geological Survey of Alabama

Regional:
Bullock County EMA/ Homeland
Bullock County Engineer

2020 LEPC Membership:

BULLOCK COUNTY HAZARD MITIGATION LOCAL EMERGENCY PLANNING COMMITTEE

Name	Title/Position	Agency/Organization
Rob Cameron	Fire Chief	Bullock County Association of Volunteer Fire Departments
Alonza Ellis	Chairman	Bullock County Commission
Johnny Adams	Commissioner	Bullock County Commission
Don Larkins	Commissioner	Bullock County Commission
John McGowan	Commissioner	Bullock County Commission
Solomon Marlow	Commissioner	Bullock County Commission
Carla Elston	Coordinator	Bullock County Cooperative Extension Office
Tracy Larkins	Director	Bullock County Department of Human Resources
David Padgett	Director	Bullock County Economic Development Authority
Ray Scott	EMA Director	Bullock County EMA
Saint T. Thomas	Point of Contact	Bullock County EMA/ Homeland Security POC
Jason DeShazo	County Engineer	Bullock County Roads and Bridges
Connie King	Area Administrator	Bullock County Health Department
Ron Smith	Citizen	Bullock County Private Citizens
Christopher Blair	Superintendent	Bullock County Schools
Raymond Rogers	Sheriff	Bullock County Sheriff's Office
Brad May	Owner	May's Distributing Company
Mildred Whittington	Mayor	Mayor of Midway
Ronald Felder	Police Chief	Union Springs Police Department
Rob Cameron	Fire Chief	Union Springs Volunteer Fire Department
John DeBlock	Meteorologist	National Weather Service – Birmingham Office
Hubert (B) Ansley	Chief, Emergency Management Branch	United States Army Corps of Engineers
Tracy Delaney	SCADC Planner	Alabama Associations of Regional Councils
Monique Smith	Division D Coordinator	Alabama Emergency Management Agency
Mark Richardson	Forestry Specialist	Alabama Forestry Commission

8.2.2 LEPC Meeting Notes

MEETING 1:
Date: March 12, 2018

Subject: Initiation Meeting for the Local Hazard Mitigation Plan

BACKGROUND
On March 12, 2018, representatives of the Bullock County Emergency Management Agency [BCEMA] held a meeting at 10:30 a.m. in the Bullock County Courthouse basement in the County Commission Chambers to begin the process of revising the Natural Hazards Mitigation Plan of 2013.

Attendees:
The meeting was attended by the following people:

- Alonza Ellis, Bullock County Chairman
- Sharon Dean, Union Springs Police Department
- John McGowan, Bullock County Commission
- Duane Anderson, Union Springs Fire Department
- Don Larkins, Bullock County Commission
- Jason Deshazo, Bullock County Engineer
- Johnny Adams, Bullock Commission
- Joshua Powell, EMA Director
- Raymond Rogers, Bullock County Sheriff

Purpose of the Meeting
The meeting had several purposes.
1. Introduce key participants in the planning process
2. Provide and explain in-kind sheets
3. Provide and explain citizen input sheets
4. Discuss types of mitigation actions
5. Discuss the project work program and schedule
6. Explain tasks and placing priorities on projects

Materials Provided and Discussed at the Meeting
Sign-in sheets, in-kind sheets, citizen input sheets, mitigation actions booklets, and a list of priority projects from the 2018 Plan was distributed to all attendees.

Attendees reviewed the requirements for the revised mitigation plan. A number of immediate action items were identified, as well as the need to start gathering data and information for the baseline assessments.

BULLOCK COUNTY HAZARD MITIGATION POTENTIAL PROJECTS- No changes

Property Protection:

- ❖ Relocating
- ❖ Acquiring Property

- ❖ Elevating
- ❖ Barriers
- ❖ Retrofitting

Natural Resource Protection Activities:
- ❖ Wetland Protection
- ❖ Habitat Protection
- ❖ Erosion and Management Control
- ❖ Stream Dumping
- ❖ Shoreline Barrier Protection
- ❖ Forestry Practices

Emergency Services Measures:
- ❖ Hazard Warning
- ❖ Emergency Response
- ❖ Critical Facilities Protection
- ❖ Health and Safety Maintenance
- ❖ Post-Disaster Mitigation

Structural Projects:
- ❖ Reservoirs
- ❖ Levees and Floodwalls
- ❖ Channeling Modifications
- ❖ Diversions
- ❖ Channel Maintenance

Public Involvement Activities:
- ❖ Map Information
- ❖ Outreach Projects
- ❖ Library
- ❖ Technical Assistance
- ❖ Real Estate Disclosure
- ❖ Environmental Education

NEEDED INFORMATION FOR PLAN REVISION

1. All changes within the county to:
   a) Fire Department Listings
   b) Town and City Buildings
   c) Utility Buildings
   d) Airport Listings
   e) Highways
   f) Economy
   g) Utility Companies
   h) Infrastructures

2. Each department/agency must submit any new projects/goals and include Action Plans for each.

3. Data concerning recent hazards in order to update previous statistics.

4. A current census.

5. Vulnerability updates must be assessed.

Please have this information emailed as soon as possible. Send information to Joshua Powell at 21578 Hwy 82 E, Union Springs AL 36089; or by email to jpowellbullockcoema@gmail.com.

Public Involvement
Options for how opportunities for public input could be developed were identified.

Work Plan and Tentative Schedule
The attendees discussed the schedule for the project. There was only one meeting held due to the transition of EMA Directors. When the adoption meeting is scheduled, committee members will be made aware of the meeting via letter and/or email.

MEETING 2:

Subject: Final Adoption Meeting for the Local Hazard Mitigation Plan

BACKGROUND
On August 12, 2013, representatives of the Bullock County Emergency Management Agency [BCEMA] met in conjunction with the regularly scheduled Bullock County Commission Meeting. This meeting was the final adoption of the revision of the Multi- Hazards Mitigation Plan of 2013. The Bullock County Commission Chairman signed the adoption resolution on August 12, 2013.

A meeting will be scheduled for the 2018 Hazard Mitigation Plan final adoption process.

Attendees:
The meeting was attended by the following people:
(To Be Added)

Purpose of the Meeting
1. Discussion about remainder of project
2. Adoption by resolution

Materials Provided at the Meeting
1. Final Copy of Hazard Mitigation Plan Revision

8.2.3 Memorandum for Review of Final Draft

Following the completion of revisions for the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan, the memorandum shown below, along with a comment form, was emailed to Bullock County LEPC members, local officials, emergency management agencies in surrounding counties, and applicable state and federal agencies, along with a comment form. Concurrently, the draft plan was submitted to AEMA and FEMA for final approval. To date, no responses from the survey have been received. When responses are received, they will be included in this section of the appendix.

MEMORANDUM

TO: Bullock County Hazard Mitigation Local Emergency Planning Committee
Bullock County Hazard Mitigation Stakeholders

FROM: Ray Scott, Bullock County Emergency Management Director

DATE: May 11, 2021

SUBJECT: Review of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan

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Please find attached the final draft of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan. I would greatly appreciate your review and comments of this document prior to approval and adoption. I am also sending a brief comment form that can be completed and returned electronically. ***Please submit comment form responses by May 28, 2021.***

Comment forms may be emailed directly to me at scott.ray89@yahoo.com. If you have any questions, you may contact me at the same email address.

Thank you in advance for your time and consideration!

Bullock County Hazard Mitigation Plan
Draft Review Comment Form

Name:_____ County:_____

Organization:_____

Daytime Phone:_____ Email:_____

1. Do you agree with the Bullock County hazard risk assessment as presented in Section 5 of the Bullock County Multi-Jurisdictional Hazard Mitigation Plan?
   _____Yes _____No

   If no, why not?_____

2. Do you agree with the hazard priority ranking by jurisdiction as presented in Figure 5.16 and Figure 5.17 of the Bullock County Multi-Jurisdictional Hazard Mitigation Plan?
   _____Yes _____No

   If no, why not?_____

3. Please list any additional hazard mitigation strategies that you feel need to be included in the Bullock County Multi-Jurisdictional Hazard Mitigation Plan.

8.3 Bullock County Hazard Mitigation Plan Local Approval

The planning participation process and approval of the Hazard Mitigation Plan was outlined in Section 2 of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan. After a public hearing and revisions, as necessary, the plan was submitted to AEMA and FEMA for approval. Following any revisions required by FEMA, the plan will be considered for review and approval by resolution by each of the three local governments in Bullock County. The following resolutions are included as templates for adoption by the jurisdictions included in the plan. After consideration by the local governments, executed resolutions will be forwarded to AEMA and FEMA.

Bullock County, Alabama
DRAFT RESOLUTION NO._____

ADOPT THE 2020 BULLOCK COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the Bullock County Emergency Management Agency has engaged in extensive studies of the hazards facing all of Bullock County; and

WHEREAS, the Bullock County Emergency Management Agency, with guidance from the Bullock County Local Emergency Planning Committee and as required by the Federal Emergency Management Agency, has prepared the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan which will supersede the existing county hazard mitigation plan that was approved in 2013; and

WHEREAS, the Bullock County Commission was provided with adequate opportunity to participate in the hazard mitigation planning process and is represented on the Bullock County Local Emergency Planning Committee; and

WHEREAS, the primary goals of this plan are to reduce the loss of life, property damage, and economic loss; make Bullock County less vulnerable to natural disasters; and to provide education about hazards and hazard mitigation options; and,

WHEREAS, the strategies of this plan are to identify and characterize hazards, assess risk, prioritize and implement mitigation measures; and,

WHEREAS, adoption and implementation of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan would be in the best interest and protection of the citizens of Bullock County.

NOW THEREFORE BE IT RESOLVED that the County Commission of Bullock County, Alabama does hereby adopt the document entitled the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan.

ADOPTED this _____ day of_____, 2021.

_____
Alonza Ellis, Jr., Chairman

ATTEST:

_____
Patrick Smith, County Administrator

Town of Midway, Alabama
DRAFT RESOLUTION NO._____

ADOPT THE 2020 BULLOCK COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the Bullock County Emergency Management Agency has engaged in extensive studies of the hazards facing all of Bullock County, including the Town of Midway; and

WHEREAS, the Bullock County Emergency Management Agency, with guidance from the Bullock County Local Emergency Planning Committee and as required by the Federal Emergency Management Agency, has prepared the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan which will supersede the existing county hazard mitigation plan that was approved in 2013; and

WHEREAS, the Town of Midway was provided with adequate opportunity to participate in the hazard mitigation planning process and is represented on the Bullock County Local Emergency Planning Committee; and

WHEREAS, the primary goals of this plan are to reduce the loss of life, property damage, and economic loss; make Bullock County less vulnerable to natural disasters; and to provide education about hazards and hazard mitigation options; and,

WHEREAS, the strategies of this plan are to identify and characterize hazards, assess risk, prioritize and implement mitigation measures; and,

WHEREAS, adoption and implementation of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan would be in the best interest and protection of the citizens of the Town of Midway.

NOW THEREFORE BE IT RESOLVED that the Town Council of the Town of Midway, Alabama does hereby adopt the document entitled the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan.

ADOPTED this _____ day of_____, 2021.

_____
Mildred Whittington, Mayor

ATTEST:

_____
Patrice Beachem, Town Clerk

City of Union Springs, Alabama
DRAFT RESOLUTION NO._____

ADOPT THE 2020 BULLOCK COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the Bullock County Emergency Management Agency has engaged in extensive studies of the hazards facing all of Bullock County, including the City of Union Springs; and

WHEREAS, the Bullock County Emergency Management Agency, with guidance from the Bullock County Local Emergency Planning Committee and as required by the Federal Emergency Management Agency, has prepared the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan which will supersede the existing county hazard mitigation plan that was approved in 2013; and

WHEREAS, the City of Union Springs was provided with adequate opportunity to participate in the hazard mitigation planning process and is represented on the Bullock County Local Emergency Planning Committee; and

WHEREAS, the primary goals of this plan are to reduce the loss of life, property damage, and economic loss; make Bullock County less vulnerable to natural disasters; and to provide education about hazards and hazard mitigation options; and,

WHEREAS, the strategies of this plan are to identify and characterize hazards, assess risk, prioritize and implement mitigation measures; and,

WHEREAS, adoption and implementation of the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan would be in the best interest and protection of the citizens of the City of Union Springs.

NOW THEREFORE BE IT RESOLVED that the City Council of the City of Union Springs, Alabama does hereby adopt the document entitled the 2020 Bullock County Multi-Jurisdictional Hazard Mitigation Plan.

ADOPTED this _____ day of_____, 2021.

_____
Roderick Clark, Mayor

ATTEST:

_____
Terronda Hooks, Town Clerk