Ouachita

PARISH HAZARD MITIGATION UPDATE – 2016

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OUACHITA PARISH

HAZARD MITIGATION PLAN UPDATE

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Ouachita Parish

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This 2016 Ouachita Parish Hazard Mitigation Plan Update was coordinated by the Ouachita Parish Hazard Mitigation Plan Update Steering Committee, in collaboration with the participating jurisdictions as well as community stakeholders and the general public. The participating jurisdictions are made up of the following communities:

Ouachita Parish
City of Monroe
Town of Richwood
Town of Sterlington
City of West Monroe

Special thanks is directed to all of those who assisted in contributing feedback and expertise on this document, especially the Ouachita Parish Office of Homeland Security and Emergency Management. These combined efforts have made this project possible. The Ouachita Parish Steering Committee consists of the following individuals, who are credited in the creation of this document:

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The 2016 Ouachita Parish Hazard Mitigation Plan Update was written by the Stephenson Disaster Management Institute, Louisiana State University. Further comments should be directed to the Ouachita Parish Office of Homeland Security and Emergency Preparedness: 1000 New Natchitoches Rd., West Monroe, LA 71201.

Contents

1. Introduction

Hazard Mitigation is defined as sustained actions taken to reduce or eliminate long-term risk from hazards and their effects. Hazard Mitigation Planning is the process through which natural hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies that would lessen the impacts are determined, prioritized, and implemented.

In that regard, this plan (a) documents the Ouachita Parish Hazard Mitigation Plan Update process; (b) identifies natural hazards and risks within the parish; and (c) identifies the parish's hazard mitigation strategy to make Ouachita Parish less vulnerable and more disaster resistant. It also includes mitigation project scoping to further identify the extent of work, estimated costs, and implementation timing requirements of proposed selected mitigation projects. Information in the plan will be used to help guide and coordinate mitigation activities and local policy decisions affecting future land use.

The Ouachita Parish Hazard Mitigation Plan is a multi-jurisdictional plan that includes the following jurisdictions that participated in the planning process:

- Unincorporated Ouachita Parish
- City of Monroe
- Town of Richwood
- Town of Sterlington
- City of West Monroe

The Federal Emergency Management Agency (FEMA), now under the Department of Homeland Security, has made reducing losses from natural disasters one of its primary goals. The Hazard Mitigation Plan (HMP) and subsequent implementation of recommended projects, measures, and policies is the primary means to achieving these goals. Mitigation planning and project implementation has become even more significant in a post-Katrina and Rita environment in south Louisiana.

This Hazard Mitigation Plan is a comprehensive plan for disaster resiliency in Ouachita Parish. The parish is subject to natural hazards that threaten life and health and have caused extensive property damage. To better understand these hazards and their impacts on people and property, and to identify ways to reduce those impacts, the parish's Office of Homeland Security and Emergency Preparedness undertook this Natural Hazards Mitigation Plan.

"Hazard mitigation" does not mean that all hazards are stopped or prevented. It does not suggest complete elimination of the damage or disruption caused by such incidents. Natural forces are powerful and most natural hazards are well beyond our ability to control. Mitigation does not mean quick fixes. It is a long term approach to reduce hazard vulnerability. As defined by FEMA, "hazard mitigation" means any sustained action taken to reduce or eliminate the long-term risk to life and property from a hazard event.

Why this plan? Every community faces different hazards and every community has different resources and interests to bring to bear on its problems. Because there are many ways to deal with natural hazards and many agencies that can help, there is no one solution or cookbook for managing or mitigating their effects.

Planning is one of the best ways to correct these shortcomings and produce a program of activities that will best mitigate the impact of local hazards and meet other local needs. A well-prepared plan will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most

appropriate and efficient solutions. It can also ensure that activities are coordinated with each other and with other goals and programs, preventing conflicts and reducing the costs of implementing each individual activity.

Mitigation activities need funding. Under the Disaster Mitigation Act of 2000 (42 USC 5165), a mitigation plan is a requirement for federal mitigation funds. Therefore, a mitigation plan will both guide the best use of mitigation funding and meet the prerequisite for obtaining such funds from FEMA. FEMA also recognizes plans through its Community Rating System, a program that reduces flood insurance premiums in participating communities. This program is described at the end of this chapter.

This plan identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by natural hazards. It fulfills the federal mitigation planning requirements, qualifies for Community Rating System credit, and provides the parish and its municipalities with a blueprint for reducing the impacts of these natural hazards on people and property.

Location, Demography, and Economy

Location

Located in the northeastern portion of Louisiana, Ouachita Parish is an irregular-shaped parish that is located about eighty-five miles east of Shreveport and about seventy miles west of Vicksburg, Mississippi (*Figure 1-1*). Union and Morehouse Parishes border it to the north, Richland Parish to the east, Caldwell Parish to the south, and Lincoln and Jackson Parishes to the west. The total area of the parish is approximately 404,480 acres, of which 13,440 acres is water.

Figure 1-1: Location of Ouachita Parish within the State of Louisiana

The parish is divided nearly in half by the general north-south track of the Ouachita River. Bayou Bartholomew, Bayou de Loutre, and Bayou D'Arbonne, three major tributaries of the Ouachita River, enter the parish near its northern boundary. Bayou Desiard is also a tributary of the river; however it has been dammed to form Black Bayou Lake, just north of the City of Monroe, which is used as a source for the city's public water supply.

Bayou LaFourche, which forms the eastern boundary of Ouachita Parish, drains most of the parish lying east of the Ouachita River. Petticoat Bayou and Raccoon Bayou drain the southeastern portion of the parish south of State Route 15 and east of U.S. Route 165.

The main transportation arteries through Ouachita Parish include Interstate 20, U.S. Highways 80 and 165, and State Highways 15, 34, 139, and 143. Interstate 20 runs in an east-west path through the middle part of the parish. U.S. Highway 80 generally runs parallel to and north of Interstate 20, although it runs south of the interstate in the far eastern portion of the parish. State Highway 15 enters Ouachita Parish from the northwest and ends at the intersection of U.S. Highway 80 west of the City of West Monroe. State Highway 34 enters the parish from the southeast and travels northeast until it intersects with Interstate 20 in the City of West Monroe. State Highway 139 splits from U.S. Highway 80 just north of the Monroe Regional Airport and takes a northeast track toward the City of Bastrop in Morehouse Parish. State Highway 143 originates at the intersection with U.S. Highway 80 in the heart of West Monroe and takes a northerly track through the northern boundary of Ouachita Parish.

Ouachita Parish is located in Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Region 8.

As noted above, Ouachita Parish is located in the northeastern region of Louisiana.

Figure 1-2: Louisiana Homeland Security Regions

Table 1-1: Ouachita Parish Population
(Source: U.S. Census Bureau)

	2010 Census	2014 Census	Current Year (If Available)	Percent Change 2010 - 2014
Total Population	153,720	156,325	____	1.70%
Population Density (Pop/Sq. Mi.)	251.8	____	____	____
Total Households	64,481	66,292	____	____

Economy

Ouachita Parish acts as a population center and economic hub for northeast Louisiana. Over time, the Ouachita Parish area economy has moved from one of dependency on the agriculture and wood/timber industries to one of industry and innovation. The parish's location on Interstate-20 makes it very enticing for manufacturers and processors, warehousing/distribution, telecommunications and back office facilities or any business looking for access to major markets and a skilled labor force. Several new primary industries, including, plastics, insurance, telecommunications, and medical services, now provide a broad base for the local economy and surrounding region. Industry data for business patterns in Ouachita Parish can be found in the table below:

Table 1-2: Business Patterns in Ouachita Parish
(Source: http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl)

Business Description	Number of Employees	Number of Establishments	Annual Payroll ($1,000)
Retail Trade	9,354	682	218,262
Manufacturing	5,023	122	264,692
Health Care and Social Assistance			
Mining, Quarrying, Oil and Gas Extraction	111	24	7,285
Transportation and Warehousing	1,335	100	51,166
Construction	3,600	337	134,061
Administration and Support and Waste Management and Remediation Services	3,138	215	80,414
Real Estate and Rental and Leasing	1,203	187	42,243
Wholesale Trade	2,461	209	113,122
Other Services (except Public Administration)	3,077	379	67,550
Accommodation and Food Services	6,511	296	85,484
Financial and Insurance	4,681	346	182,691
Professional, Scientific, and Technical Services	2,789	446	126,853
Information	2,628	71	190,189
Educational Services	695	41	14,785
Arts, Entertainment, and Recreation	641	48	764
Management of Companies and Enterprises	846	22	42,203
Agriculture, Forestry, Fishing and Hunting	40	14	804
Utilities	250-499	20	___

While nature has presented the parish with a variety of hazards, the parish has the human resources that can face those hazards and manage the impact they have on people and property. This plan will discuss hazards affecting Ouachita Parish. Hazard Profiles (see Section Two) contain detailed information on the likelihood of occurrence, possible magnitude or intensity, areas of the parish that could be affected, and conditions that could influence the manifestation of the hazard.

Hazard Mitigation

To fully understand hazard mitigation efforts in Ouachita Parish and throughout Louisiana, it is first crucial to understand how hazard mitigation relates to the broader concept of emergency management. In the early 1980s, the newly-created Federal Emergency Management Agency (FEMA) was charged with developing a

structure for how the federal, state, and local governments would respond to disasters. FEMA developed the *four phases of emergency management*, an approach which can be applied to all disasters. The four phases are as follows:

- **Hazard Mitigation**—described by FEMA and the Disaster Mitigation Act of 2000 (DMA 2000) as "any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event." The goal of mitigation is to save lives and reduce property damage. Besides significantly aiding in the obviously desirous goal of saving human lives, mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities and minimize community disruption, helping communities return to usual daily living in the aftermath of disaster. Examples of mitigation involve a range of activities and actions including the following: land-use planning, adoption and enforcement of building codes, and construction projects (e.g., flood proofing homes through elevation, or acquisition or relocation away from floodplains).
- **Emergency Preparedness**—includes plans and preparations made to save lives and property and to facilitate response operations before a disaster event.
- **Disaster Response**—includes actions taken to provide emergency assistance, save lives, minimize property damage, and speed recovery immediately following a disaster.
- **Disaster Recovery**—includes actions taken to return to a normal or improved operating condition following a disaster.

Figure 1-3 illustrates the basic relationship between these phases of emergency management. While hazard mitigation may occur both before and after a disaster event, it is significantly more effective when implemented before an event occurs. This is one of the key elements of this plan and its overall strategy: reduce risk before disaster strikes in order to minimize the need for post-disaster response and recovery.

As *Figure 1-3* demonstrates, mitigation relies on updating in the wake of disaster. This can give the appearance that mitigation is only reactive rather than proactive. In reality, however, post-disaster revision is a vital component of improving mitigation. Each hazardous event affords an opportunity to reduce the consequences of future occurrences.

Figure 1-3: The Four Phases of Emergency Management and their Relation to Future Hazard Mitigation
(Source: Louisiana State Hazard Mitigation Plan 2014)

Unfortunately, this cycle can be painful for a community. For instance, the risks of disasters that could create catastrophic incidents in Louisiana were thought to be relatively well-understood prior to 2005. However, the impact of the 2005 hurricane season on the Gulf Coast region of the United States prompted a new level of planning and engagement related to disaster response, recovery, and hazard mitigation. Hurricanes Katrina and Rita hit three weeks apart and together caused astonishing damage to human life and to property. The two storms highlighted a hurricane season that spawned 28 storms—unparalleled in

American history. The 2005 hurricane season confirmed Louisiana's extreme exposure to natural disasters and both the positive effects and the concerns resulting from engineered flood-protection solutions.

The catastrophic events of 2005 had profound impacts on emergency management and hazard mitigation throughout Louisiana. As detailed later in this document, significant funding has been made available to the State of Louisiana and its parishes for the purpose of hazard mitigation planning. The storms also raised awareness of the importance of hazard mitigation among decision-makers and the general population, which has been particularly important since natural hazards will likely be increasing in frequency, magnitude, and impact in the coming years due to climate change.

General Strategy

During the last update to the Louisiana State Hazard Mitigation Plan, the State Hazard Mitigation Team (SHMT) began a long-term effort to better integrate key components of all plans with hazard mitigation implications in Louisiana to ensure that the programs, policies, recommendations, and implementation strategies are internally consistent. As each of these documents has been adopted by various agencies within the state, the SHMT has worked to incorporate this information into the decision process.

Part of the ongoing integration process is that GOHSEP encourages the parishes and the local municipalities with independent hazard mitigation plans to utilize the same plan format and methodologies as the State Hazard Mitigation Plan in order to create continuity of information from local to state mitigation plans and programs.

The 2016 Ouachita Parish Hazard Mitigation Plan maintains much of the information from the 2006 and 2011 plan versions, but it now reflects the order and methodologies of the 2011 Louisiana State Hazard Mitigation Plan. The sections in the 2011 Ouachita Hazard Mitigation Plan were as follows:

- Section One Prerequisites
- Section Two Planning Process
- Section Three Risk Assessment
- Section Four Mitigation Strategy
- Section Five Plan Maintenance
- Appendices

This plan update now also coheres with the Plain Writing Act of 2010, which requires federal agencies to use clear communication that is accessible, consistent, understandable, and useful to the public. While the state of Louisiana and its political subdivisions are not required to meet such standards, the Act aligns with best practices in hazard mitigation. Since successful hazard mitigation relies on full implementation and cooperation at all levels of government and community, a successful hazard mitigation plan must also be easily used at all of these levels. Nevertheless, the Ouachita Parish Hazard Mitigation Steering Committee was not ignorant or dismissive of the successful analysis and mitigation planning executed in previous plan updates. This plan update remains coherent with those documents, retaining language and content when needed, deleting it when appropriate, and augmenting it when constructive.

2016 Plan Update

This 2016 plan update proceeds with the previous goals of the Ouachita Parish Hazard Mitigation Plan. The current goals are as follows:

- Protect health and safety
- Protect existing properties
- Improve the quality of life in Ouachita Parish
- Ensure that public funds are used in the most efficient manner

This plan update makes a number of textual changes throughout, but the most obvious changes are data related and structural edits. First, the Spatial Hazard Events and Losses Database for the United States (SHELDUS) was used as a data source for hazard identification because it incorporates all storm event data from the National Climatic Data Center (NCDC) Storm Events Database used in previous plans, as well as storm event data from other sources including the NOAA Storm Prediction Center, National Hurricane Center, and U.S. Fire Administration. Furthermore, all of the sections were updated to reflect the most current information and the most current vision of the plan update. Second, instead of eleven, separate sections for numerous tables, maps, and appendices, the present plan update has four sections and five appendices. The most significant changes are the newly developed hazard profiles and risk assessments, as well as the removal of repetition between sections from the previous plan updates. The 2016 plan update is organized generally as follows:

- Section One Introduction
- Section Two Hazard Identification and Parish-Wide Risk Assessment
- Section Three Capability Assessment
- Section Four Mitigation Strategy
- Appendix A Planning Process
- Appendix B Plan Maintenance
- Appendix C Essential Facilities
- Appendix D Plan Adoption
- Appendix E State Required Worksheets

Table 1-4: Plan Crosswalk

2011 Plan	Revised Plan (2016)
Section 1: Prerequisites	Section 1: Introduction
Section 2: Planning Process	Appendix A: Planning Process
Section 3: Risk Assessment	Section 2: Hazard Identification and Risk Assessment, Section 3: Capability Assessment
Section 4: Mitigation Strategy	Section 4: Mitigation Strategy
Section 5: Plan Maintenance	Appendix B: Plan Maintenance
Appendices	Appendices

Despite changes in this plan update, the plan remains consistent in its emphasis on the few types of hazards that pose the most risk to loss of life, injury, and property in Ouachita Parish and its municipalities. The extent of this risk is dictated primarily by its geographic location. Most significantly, Ouachita Parish remains at high risk of water inundation from various sources, including flooding, tornadoes, and tropical cyclone activity. All of the parish is also at high risk of damages from high winds and wind-borne debris caused by various meteorological phenomena. Other hazards threaten the parish and/or its municipalities, although not to

such great degrees and not in such widespread ways. In all cases, the relative social vulnerability of areas threatened and affected plays a significant role in how governmental agencies and their partners (local, parish, state, and federal) prepare for and respond to disasters.

Mitigation efforts related to particular hazards are highly individualized by jurisdiction. Flexibility in response and planning is essential. The most important step forward to improve hazard management capability is to improve coordination and information sharing between the various levels of government regarding hazards.

2. Hazard Identification and Parish-Wide Risk Assessment

This section assesses the various hazard risks that Ouachita Parish faces in order to identify a strategy for mitigation. Having identified the categories of hazards, emergencies, disasters, and catastrophes, this section details the major climatological and natural/human-influenced hazards by (1) defining them, (2) explaining how they are measured, (3) describing their geographic extent, (4) surveying their previous occurrences, and (5) evaluating their future likelihood of occurrences.

The table below provides an overview of the hazards that had been previously profiled in the Ouachita Parish Hazard Mitigation Plan published in 2011, as well as the hazards that were identified in the state's 2014 Hazard Mitigation Plan that were considered to be of high or medium risk for the parish by the state. Those hazards identified as high or medium risk by the state or previously identified as a risk by the parish, have been determined to provide a risk to the parish and will be profiled in this section.

Table 2-1: Hazard Profile Summary

Hazard	Profiled in Last Plan	Considered Medium or High Risk in the State's HM Plan	Profiled in the 2016 Update
Subsidence/Coastal Land Loss			
Drought	X		X
Earthquakes	X		*
Expansive Soils			
Fog			
Flooding	X	X	X
Extreme Heat	X		X
Sinkholes			
Thunderstorms (Hail, Lightning, & Wind)	X	X	X
Tornadoes	X	X	X
Tropical Cyclones	X	X	X
Tsunamis			
Wildfires	X		X
Winter Storms	X		X
Dam Failure	X		+
Levee Failure	X		+

* Hazard was profiled but discounted

+ Data deficiency

Prevalent Hazards to the Community

While many of the hazards identified in *Table 2-1* occur in the parish, their occurrence was not merited for further study by the planning committee. The determination was made to focus attention and resources on the most prevalent hazards, which include the hazards previously profiled. Dam and levee failure claim a data deficiency and the hazard of earthquakes was discounted due to having no impact on the parish.

The following hazards have been selected to be included in this risk assessment:

a) Drought
b) Earthquakes
c) Extreme Heat
d) Flooding (backwater, riverine, localized stormwater event)
e) Thunderstorms (hail, lightning, wind)
f) Tornadoes
g) Tropical Cyclones (flooding and high winds)
h) Wildfires
i) Winter Storms
j) Dam Failure
k) Levee Failure

For analysis purposes, the impact of the critical and prevalent hazards is summarized as follows:

- Flooding from rivers and waterways, rain storms, tropical cyclones, and hurricanes in the following forms:
  a) Riverine
  b) Stormwater
  c) Surge
  d) Backwater flooding (as the result of river flooding and surge)
- High wind damage most commonly resulting from hurricanes, thunderstorms, and tornadoes
- Property and crop damage resulting from drought, extreme heat, and wildfires

The potential destructive power of tropical cyclones and flooding were determined to be the most prevalent hazards to the parish. Sixteen of the twenty Presidential Declarations Ouachita Parish has received resulted from either tropical cyclones (7 declarations) or flooding (9 declarations), which validates these as the most significant hazards. Therefore, the issues of hurricanes and floods will both serve as the main focus during the mitigation planning process. Hurricanes present risks from the potential for flooding, primarily resulting from storm surge, and high wind speeds. While storm surge is considered the hazard with the most destructive potential, the risk assessment will also asses non-storm surge flooding as well. Flooding can also occur from non-hurricane events, as flash floods are a common occurrence due to heavy rainfall.

Hurricanes, tropical storms, and heavy storms are fairly common occurrences, and resultant wind damage is of utmost concern. Damage from high winds can include roof damage, destruction of homes and commercial buildings, downed trees and power lines, and damage and disruption to services caused by heavy debris. A wind map for Ouachita Parish is included in the hurricane risk assessment.

Ouachita Parish is also susceptible to tornadoes. Tornadoes can spawn from tropical cyclones or severe weather systems that pass through Ouachita Parish. High winds produced by tornadoes have the potential to destroy residential and commercial buildings, as well as create wind-borne objects from the debris produced by the destruction of the natural and human environment, such as building materials and trees.

Previous Occurrences

Table 2-2 summarizes federal disaster declarations for Ouachita Parish since 1965. Information includes names, dates, and types of disaster.

Table 2-2: Ouachita Parish Major Disaster Declarations

Disaster Declaration Number	Date	Type of Disaster
208	9/10/1965	Tropical Cyclone – Hurricane Betsy
374	4/27/1973	Severe Storms and Flooding
418	2/23/1974	Flooding
470	6/6/1975	Heavy Rains, Tornadoes, and Flooding
565	9/20/1978	Severe Storms and Flooding
675	1/11/1983	Severe Storms and Flooding
829	5/20/1989	Severe Storms and Flooding
904	5/3/1991	Severe Storms, Tornadoes, and Flooding
1264	1/21/1999	Severe Ice Storm
1314	2/15/2000	Severe Winter Storm
1357	1/12/2001	Severe Winter Ice Storm
1437	10/3/2002	Tropical Cyclone – Hurricane Lili
3172	2/1/2003	Loss of Space Shuttle Columbia
1548	9/15/2004	Tropical Cyclone – Hurricane Ivan
1603	8/29/2005	Tropical Cyclone – Hurricane Katrina
1607	9/24/2005	Tropical Cyclone – Hurricane Rita
1668	11/2/2006	Severe Storms and Flooding
1786	9/2/2008	Tropical Cyclone – Hurricane Gustav
1863	12/10/2009	Severe Storms, Tornadoes, and Flooding
4080	8/29/2012	Tropical Cyclone – Hurricane Isaac

Probability of Future Hazard Events

The probability of a hazard event occurring in Ouachita Parish is estimated in the table on the following page. The percent chance of an event happening during any given year was calculated by posting past events and dividing by the time period. Unless otherwise indicated, the time period used to access probability followed the method used in the State of Louisiana's most current Hazard Mitigation Plan. The primary source for historical data used throughout the plan is the Spatial Hazards Events and Losses Database (SHELDUS), which provides historical hazard data from 1960 to 2014. In staying consistent with the state plan, the SHELDUS database was evaluated for the last twenty-five years (1990 – 2015) in order to determine future probability of a hazard occurring. While the 25-year record used by the State was adopted for the purpose of determining the overall probability, in order to assist with determining estimated losses, unless otherwise stated, the full 54-year record was used when Hazus Multi-Hazard (MH) wasn't available to determine losses. This full record was used to provide a more extensive record to determine losses. All assessed damages were adjusted for inflation in order to reflect the equivalent amount of damages with the

value of the U.S. dollar today. In addition, the National Climatic Data Center (NCDC) was also used to help identify hazard data specific to the municipalities. This was used due to it containing specific data for cities, whereas the data within SHELDUS is limited to parishes.

The following table shows the annual probability for each hazard occurring across the parish and in separate jurisdictions:

Table 2-3: Probability of Future Hazard Reoccurrence

Hazard	Probability				
	Ouachita Parish (Unincorporated)	Monroe	Richwood	Sterlington	West Monroe
Drought	4%	4%	4%	4%	4%
Earthquake	<1%	<1%	<1%	<1%	<1%
Extreme Heat	12%	12%	12%	12%	12%
Flooding	100%	88%	24%	28%	76%
Thunderstorms (Hail)	100%	100%	100%	100%	100%
Thunderstorms (Lightning)	36%	36%	36%	36%	36%
Thunderstorms (Wind)	100%	100%	100%	100%	100%
Tornadoes	60%	60%	60%	60%	60%
Tropical Cyclones	12%	12%	12%	12%	12%
Wildfires	<1%	<1%	<1%	<1%	<1%
Winter Storms	76%	76%	76%	76%	76%
Dam Failure	<1%	<1%	<1%	<1%	<1%
Levee Failure	<1%	<1%	<1%	<1%	<1%

As shown in *Table 2-3*, thunderstorm wind and hail for the entire planning area and flooding events for unincorporated Ouachita Parish have the highest annual chance of occurrence in the parish (100%). Flood events in the remaining incorporated areas have a slightly lower chance of occurring annually. Winter storms have a 76% annual chance of occurrence, followed by tornadoes at 60%, lightning at 36%, tropical cyclones and extreme heat at 12%, and drought at 4%. Wildfires have the lowest annual chance of occurrence at less than 1%. Both dam and levee failure have a data deficiency, and earthquakes were discounted since the hazard does not impact the parish.

Inventory of Assets for the Entire Parish

As part of the Risk Assessment, the planning team identified essential facilities throughout the parish. Several methods were used to assist in identifying all essential facilities, including field data collected by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) on critical infrastructure from a previous hazard mitigation project.

Within the entire planning area, there is an estimated value of $25,116,344,000 in structures throughout the parish. The tables on the next page provide the total estimated value for each type of structure by occupancy.

Table 2-4: Estimated Total of Potential Losses throughout Ouachita Parish

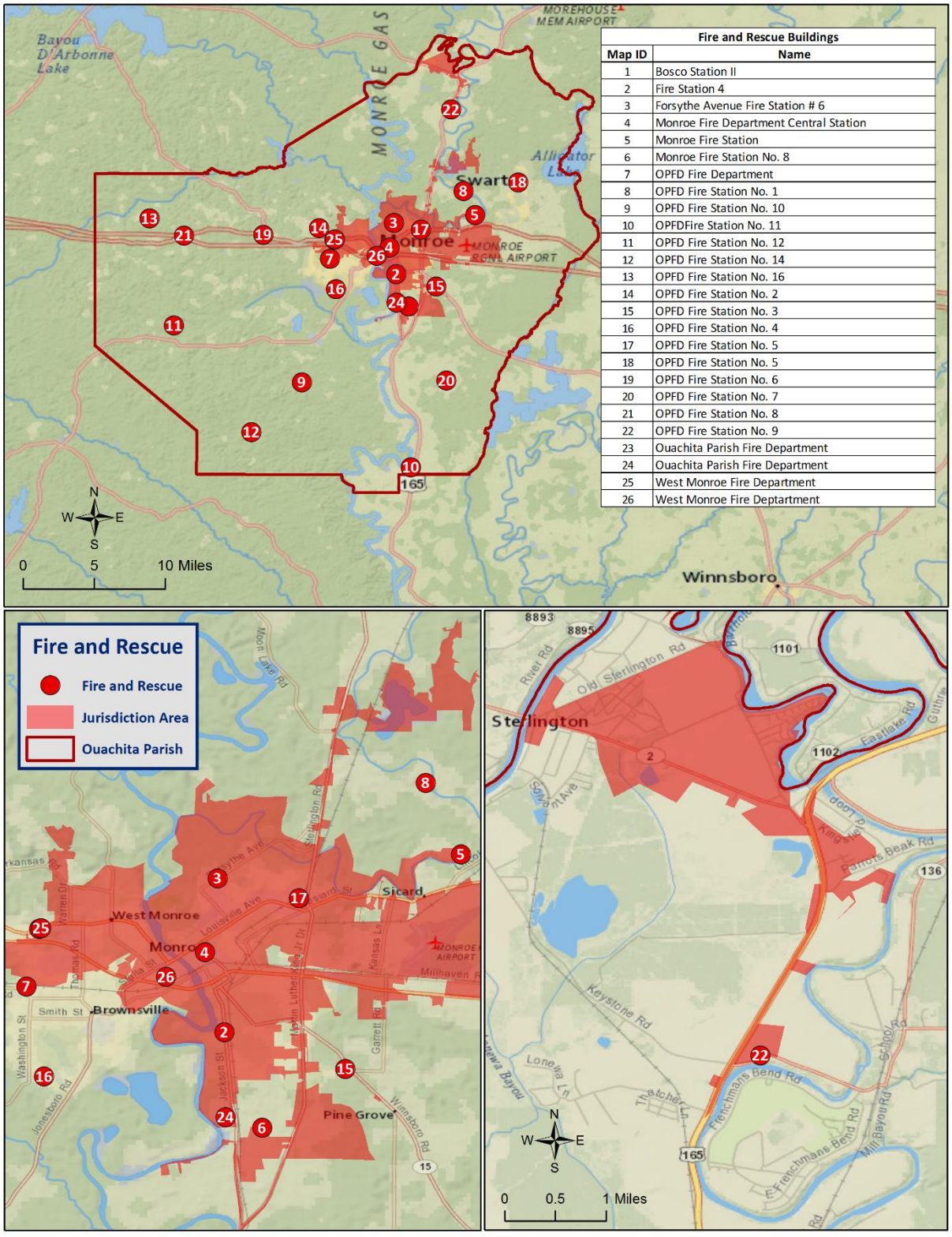
Occupancy	Ouachita Parish	Unincorporated Ouachita Parish	Monroe	Richwood
Agricultural	$55,044,000	$36,398,000	$13,392,000	$0
Commercial	$5,960,373,000	$1,187,949,000	$3,278,790,000	$25,622,000
Government	$221,516,000	$22,391,000	$179,632,000	$5,624,000
Industrial	$1,200,330,000	$571,782,000	$477,556,000	$479,000
Religion	$666,248,000	$286,920,000	$294,188,000	$3,646,000
Residential	$16,757,019,000	$9,424,990,000	$5,427,832,000	$164,038,000
Education	$255,814,000	$77,569,000	$129,721,000	$940,000
Total	$25,116,344,000	$11,607,999,000	$9,801,111,000	$200,349,000

Table 2-4: Estimated Total of Potential Losses throughout Ouachita Parish (Continued)

Occupancy	Sterlington	West Monroe
Agricultural	$164,000	$5,090,000
Commercial	$13,564,000	$1,454,448,000
Government	$1,124,000	$12,745,000
Industrial	$7,357,000	$143,156,000
Religion	$4,334,000	$77,160,000
Residential	$204,295,000	$1,535,864,000
Education	$4,732,000	$42,852,000
Total	$235,570,000	$3,271,315,000

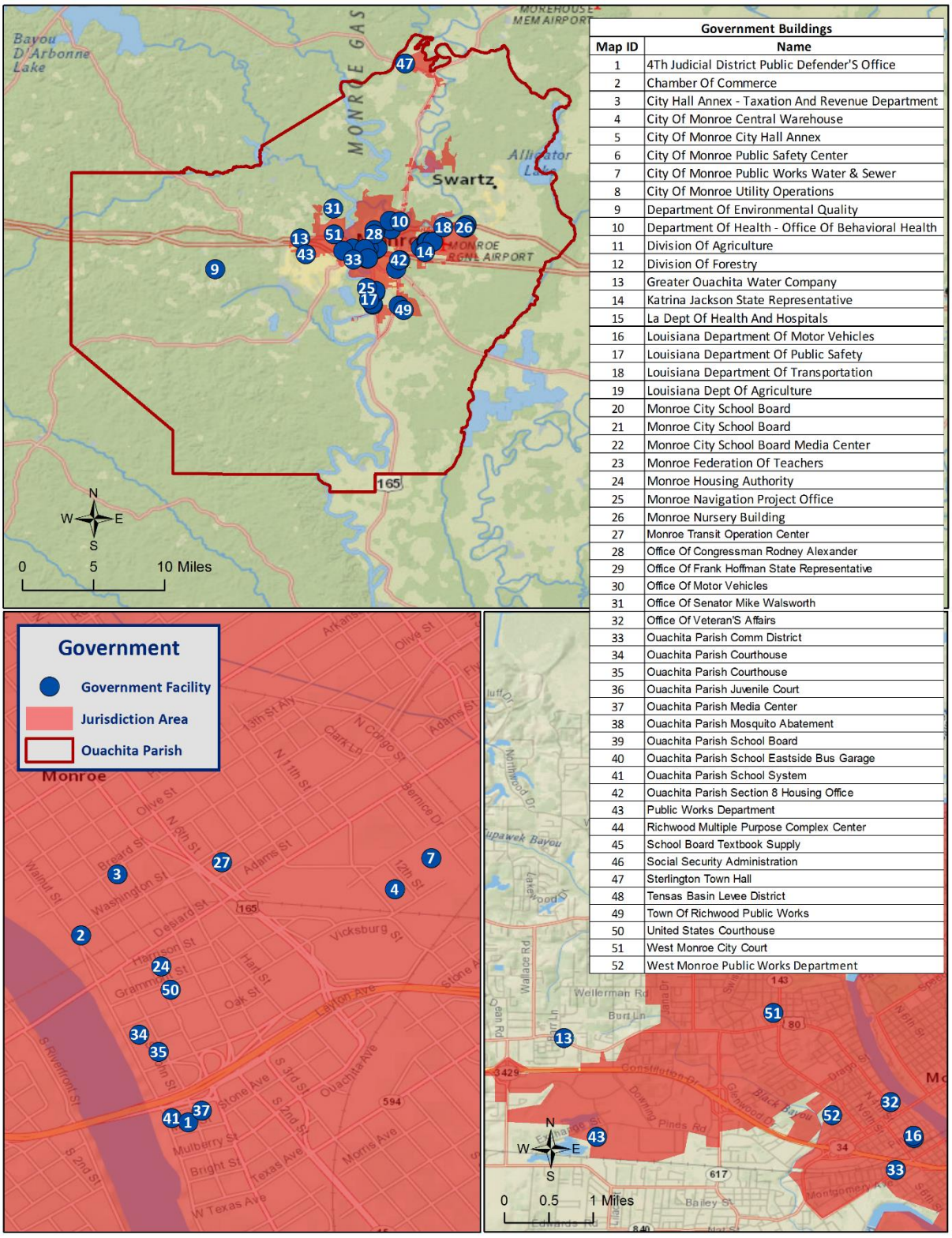
Essential Facilities of the Parish

The following figures show the locations and names of the essential facilities within the parish:



Fire and Rescue Buildings	
Map ID	Name
1	Bosco Station II
2	Fire Station 4
3	Forsythe Avenue Fire Station # 6
4	Monroe Fire Department Central Station
5	Monroe Fire Station
6	Monroe Fire Station No. 8
7	OPFD Fire Department
8	OPFD Fire Station No. 1
9	OPFD Fire Station No. 10
10	OPFDFire Station No. 11
11	OPFD Fire Station No. 12
12	OPFD Fire Station No. 14
13	OPFD Fire Station No. 16
14	OPFD Fire Station No. 2
15	OPFD Fire Station No. 3
16	OPFD Fire Station No. 4
17	OPFD Fire Station No. 5
18	OPFD Fire Station No. 5
19	OPFD Fire Station No. 6
20	OPFD Fire Station No. 7
21	OPFD Fire Station No. 8
22	OPFD Fire Station No. 9
23	Ouachita Parish Fire Department
24	Ouachita Parish Fire Department
25	West Monroe Fire Department
26	West Monroe Fire Deptartment

Figure 2-1: Fire and Rescue Buildings in Ouachita Parish



Government Buildings	
Map ID	Name
1	4Th Judicial District Public Defender'S Office
2	Chamber Of Commerce
3	City Hall Annex - Taxation And Revenue Department
4	City Of Monroe Central Warehouse
5	City Of Monroe City Hall Annex
6	City Of Monroe Public Safety Center
7	City Of Monroe Public Works Water & Sewer
8	City Of Monroe Utility Operations
9	Department Of Environmental Quality
10	Department Of Health - Office Of Behavioral Health
11	Division Of Agriculture
12	Division Of Forestry
13	Greater Ouachita Water Company
14	Katrina Jackson State Representative
15	La Dept Of Health And Hospitals
16	Louisiana Department Of Motor Vehicles
17	Louisiana Department Of Public Safety
18	Louisiana Department Of Transportation
19	Louisiana Dept Of Agriculture
20	Monroe City School Board
21	Monroe City School Board
22	Monroe City School Board Media Center
23	Monroe Federation Of Teachers
24	Monroe Housing Authority
25	Monroe Navigation Project Office
26	Monroe Nursery Building
27	Monroe Transit Operation Center
28	Office Of Congressman Rodney Alexander
29	Office Of Frank Hoffman State Representative
30	Office Of Motor Vehicles
31	Office Of Senator Mike Walsworth
32	Office Of Veteran'S Affairs
33	Ouachita Parish Comm District
34	Ouachita Parish Courthouse
35	Ouachita Parish Courthouse
36	Ouachita Parish Juvenile Court
37	Ouachita Parish Media Center
38	Ouachita Parish Mosquito Abatement
39	Ouachita Parish School Board
40	Ouachita Parish School Eastside Bus Garage
41	Ouachita Parish School System
42	Ouachita Parish Section 8 Housing Office
43	Public Works Department
44	Richwood Multiple Purpose Complex Center
45	School Board Textbook Supply
46	Social Security Administration
47	Sterlington Town Hall
48	Tensas Basin Levee District
49	Town Of Richwood Public Works
50	United States Courthouse
51	West Monroe City Court
52	West Monroe Public Works Department

Figure 2-2: Government Buildings in Ouachita Parish

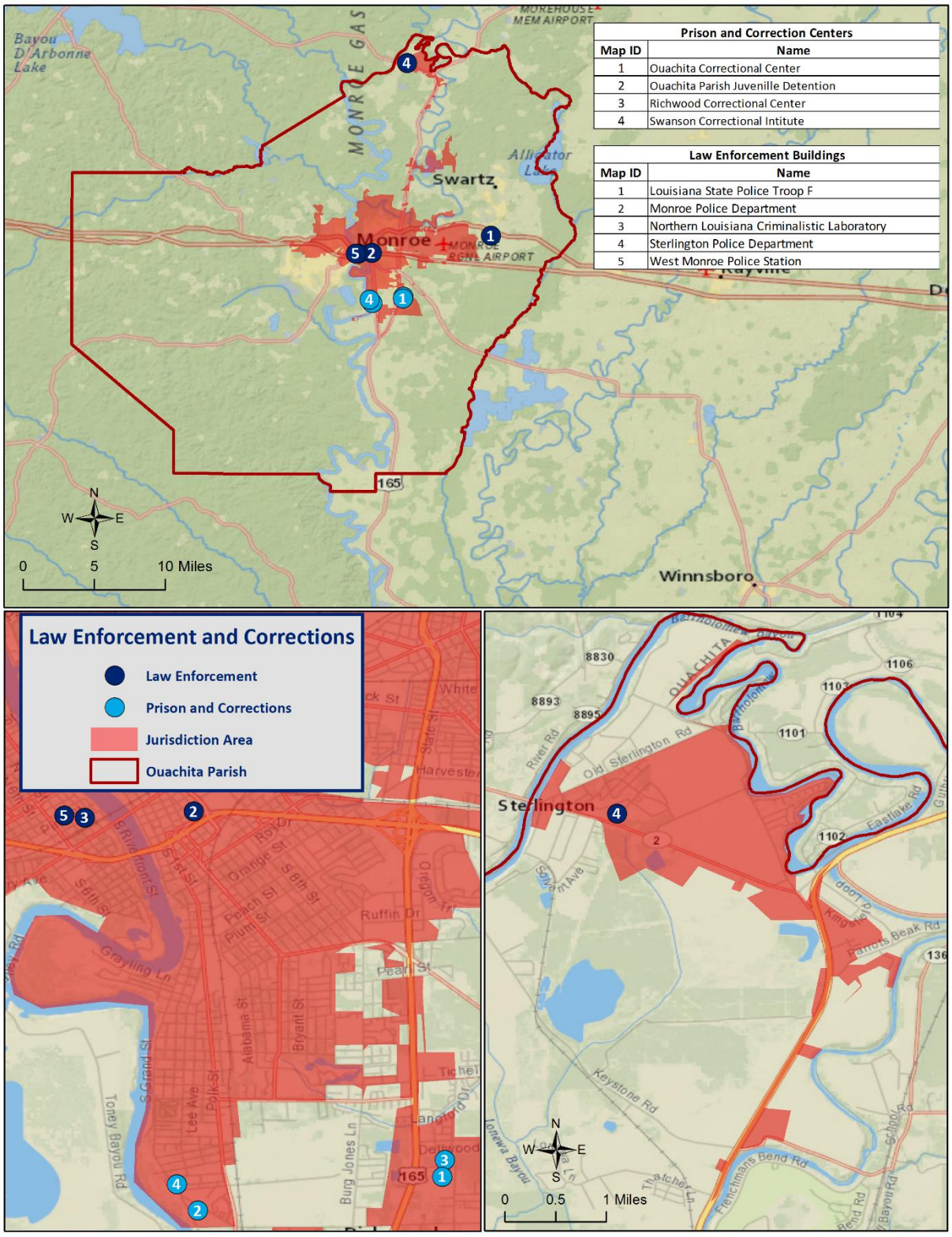


Figure 2-3: Law Enforcement and Correction Buildings in Ouachita Parish

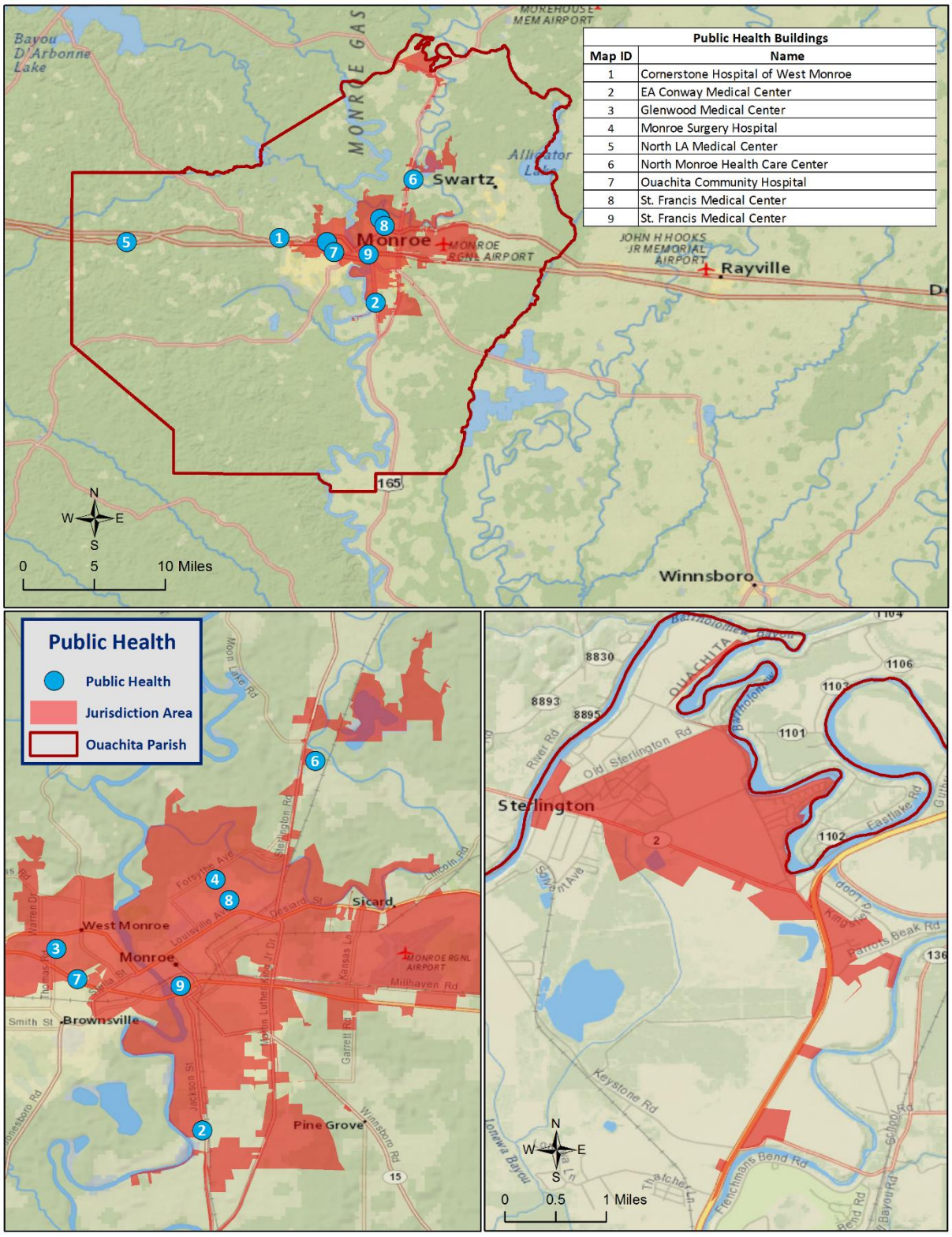


Figure 2-4: Public Health Facilities in Ouachita Parish

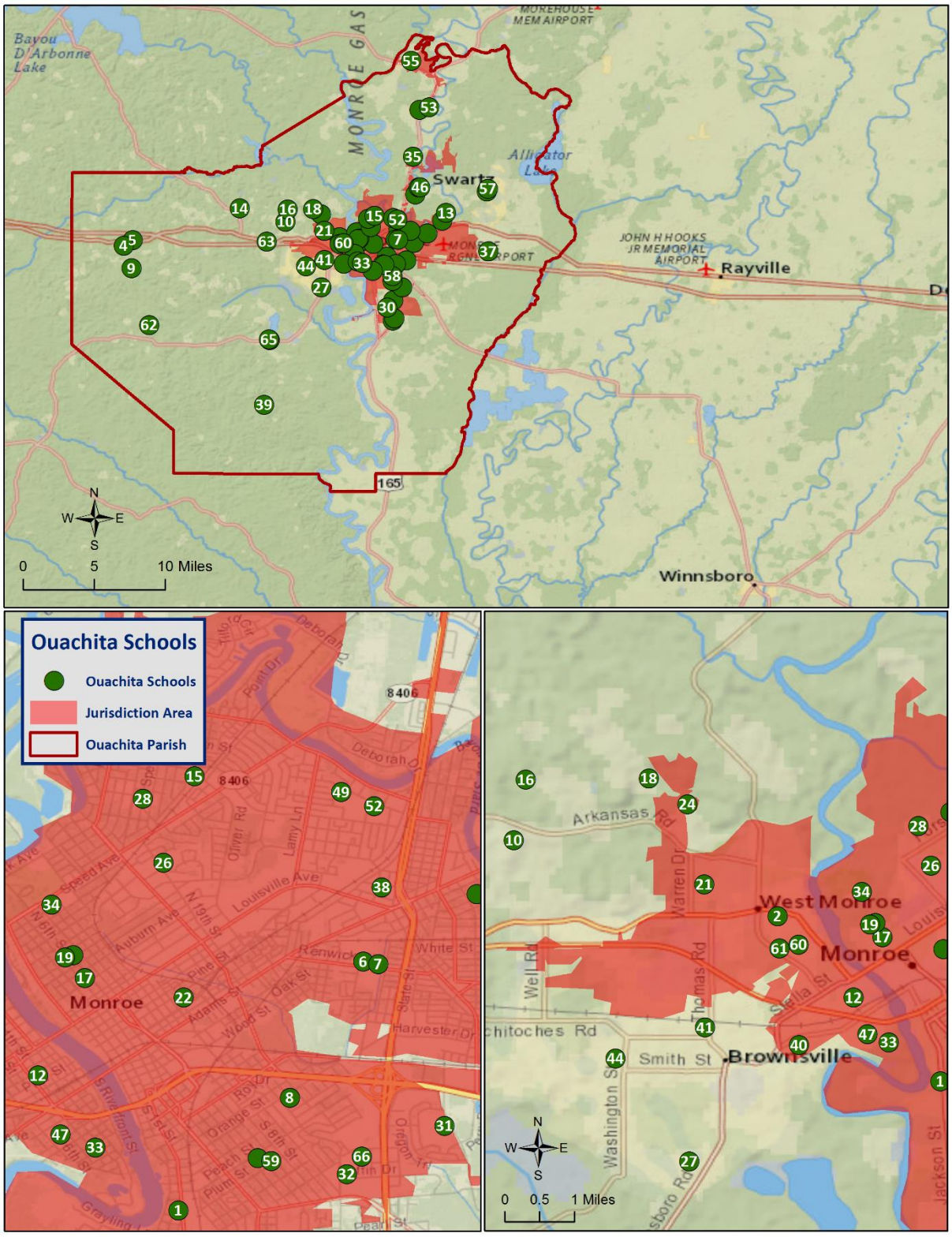


Figure 2-5: School Buildings in Ouachita Parish

Table 2-5: Ouachita Schools Map Legend

Ouachita Schools	
Map ID	**Name**
1	Barkdull Faulk School
2	Boley Elementary School
3	Burg Jones Lane Elementary School
4	Calhoun Elementary School
5	Calhoun Middle School
6	Carroll High Magnet School
7	Carroll Junior High School
8	Carver Elementary School
9	Central Elementary School
10	Claiborne Elementary School
11	Clara Hall Elementary School
12	Crosley Elementary School
13	Cypress Point Elementary
14	Drew Elementary School
15	Geneva Academy
16	George Welch Elementary School
17	Georgia Tucker School
18	Good Hope Middle School
19	Grace Episcopal Lower Elementary School
20	Grace Episcopal Middle School
21	Highland Elementary School
22	J.S. Clark Magnet School
23	Jack Hayes Elementary School
24	Kiroli Elementary School
25	Lakeshore Elementary School
26	Lee Junior High School
27	Lenwill Elementary School
28	Lexington Elementary
29	Lincoln Elementary School
30	Madison James Foster Elementary School
31	Martin Luther King Elementary School
32	Minnie Ruffin Elementary School
33	Mitchell Elementary School
34	Neville High School
35	Ouachita Christian School
36	Ouachita Junior High School
37	Ouachita Parish High School
38	Our Lady Of Fatima School
39	Pinecrest Elementary & Middle School

40	Ramson Elementary School
41	Richardson High School
42	Richwood High School
43	Richwood Middle School
44	Riser Middle School
45	River Oaks Elementary School
46	River Oaks High School
47	Riverbend Elementary School
48	Robinson Elementary School
49	Sallie Humble Elementary School
50	Shady Grove Elementary School
51	Sherrouse School
52	St. Frederick High School
53	Sterlignton Elementary School
54	Sterlington High School
55	Sterlington High School
56	Swartz Elementary School
57	Swartz Lower Elementary School
58	Swayze Elementary
59	Thomas Jefferson Elementary
60	West Monroe High School
61	West Monroe Junior High School
62	West Ouachita Parish High School
63	West Ridge Middle School
64	Woodlawn Elementary School
65	Woodlawn Middle School
66	Wossman High School

Future Development Trends

Ouachita Parish experienced a small growth in population and housing between the years of 2000 and 2014, growing from a population of 147,271 with 60,154 housing units in 2000 to a population of 156,761 with 65,366 housing units in 2014. This growth was largely in the incorporated areas of Richwood and Sterlington from the years 2000 to 2014. The incorporated area of Monroe experienced a decline in population from 2000 to 2010, and the incorporated area of West Monroe experienced a decline from 2010 to 2014. The future population and number of buildings can be estimated using U.S. Census Bureau housing and population data. The following tables show population and housing unit estimates from 2000 to 2014:

Table 2-6: Population Growth Rate for Ouachita Parish

Total Population	Ouachita Parish	Ouachita Parish (Unincorporated)	Monroe	Richwood	Sterlington	West Monroe
1-Apr-00	147,271	78,478	52,016	2,204	1,258	13,315
1-Apr-10	153,910	86,965	48,873	3,394	1,596	13,082
1-Jul-14	156,761	88,260	49,598	3,474	2,463	12,966
Population Growth between 2000 – 2010	4.5%	10.8%	-6.0%	54.0%	26.9%	-1.7%
Average Annual Growth Rate between 2000 – 2010	0.5%	1.1%	-0.6%	5.4%	2.7%	-0.2%
Population Growth between 2010 – 2014	1.9%	1.5%	1.5%	2.4%	54.3%	-0.9%
Average Annual Growth Rate between 2010 – 2014	0.46%	0.37%	0.37%	0.59%	13.58%	-0.22%

Table 2-7: Housing Growth Rate for Ouachita Parish

Total Housing Units	Ouachita Parish	Ouachita Parish (Unincorporated)	Monroe	Richwood	Sterlington	West Monroe
1-Apr-00	60,154	31,414	21,278	627	523	6,312
1-Apr-10	64,481	36,260	20,570	635	696	6,320
1-Jul-14	65,366	36,340	21,132	768	789	6,337
Housing Growth between 2000 – 2010	7.2%	15.4%	-3.3%	1.3%	33.1%	0.1%
Average Annual Growth Rate between 2000 – 2010	0.7%	1.5%	-0.3%	0.1%	3.3%	0.0%
Housing Growth between 2010 – 2014	1.4%	0.2%	2.7%	20.9%	13.4%	0.3%
Average Annual Growth Rate between 2010 – 2014	0.3%	0.1%	0.7%	5.2%	3.3%	0.1%

As shown in the previous tables, Ouachita Parish has experienced slight growth in both population and housing units. Housing grew at a rate of 0.7% annually from 2000 to 2010, and at 0.3% annually from 2010 to 2014. Population growth rates for the parish were slightly lower at 0.5% annually from 2000 to 2010, and slightly higher at 0.46% annually from 2010 to 2014. From 2000 to 2010, the incorporated area of Richwood had the largest increase in population overall at 54%, followed by incorporated area of Sterlington at 26.9%. The incorporated area of Monroe was the only area to have a decline in population during this time period. From 2010 to 2014, Sterlington experienced the largest growth in population at 54.3% followed by Richwood at 2.4%.

The incorporated area of Sterlington had the largest increase in housing units from 2000 to 2010 at 33.1%, followed by the unincorporated area of the parish at 15.4%. The only area in Ouachita Parish to experience a decline in housing units during this time period was Monroe at -3.3%. From 2010 to 2014, Richwood had the largest increase in housing units at 20.9%, followed by Sterlington at 13.4%.

Future Hazard Impacts

Hazard impacts were estimated for five years and ten years in the future (2019 and 2024). Yearly population and housing growth rates were applied to parish inventory assets for composite flood and tropical cyclones. Based on a review of available information, it is assumed that population and housing units will continue to grow within Ouachita from the present until 2024. A summary of estimated future impacts is shown in the table on the next page. Dollar values are expressed in future costs and assume an annual rate of inflation of 1.02%. No changes in development have impacted the community's vulnerability since the plans last update.

Table 2-8: Estimated Future Impacts, 2019-2024
(Source: Hazus, US Census Bureau)

Hazard / Impact	Total in Parish (2014)	Hazard Area (2014)	Hazard Area (2019)	Hazard Area (2024)
Flood Damage				
Structures	65,590	9,570	9,735	9,870
Value of Structures	$25,459,590,035	$3,714,761,546	$3,975,629,080	$4,197,452,523
# of People	156,918	22,896	23,010	23,102
Tropical Cyclones				
Structures	65,590	65,590	66,723	67,644
Value of Structures	$25,459,590,035	$25,459,590,035	$27,247,478,810	$28,767,773,945
# of People	156,918	156,918	157,704	158,336

Land Use

The Ouachita Parish Land Use table is provided on the next page. Residential, commercial, and industrial areas account for only 16% of the parish's land use. Forest land is the largest category at 122,823 acres, accounting for 30% of parish land. At 103,027 acres, agricultural lands account for 25% of parish lands, while 96,479 acres of wetland areas account for 24% of parish lands. The parish also consists of 17,572 acres of water areas, accounting for 4% of all parish lands.

Table 2-9: Ouachita Parish Land Use
(Source: USGS Land Use Map)

Land Use	Acres	Percentage
Agricultural Land, Cropland, and Pasture	103,027	25%
Wetlands	96,479	24%
Forest Land (not including forested wetlands)	122,823	30%
Urban/Development	64,416	16%
Water	17,572	4%

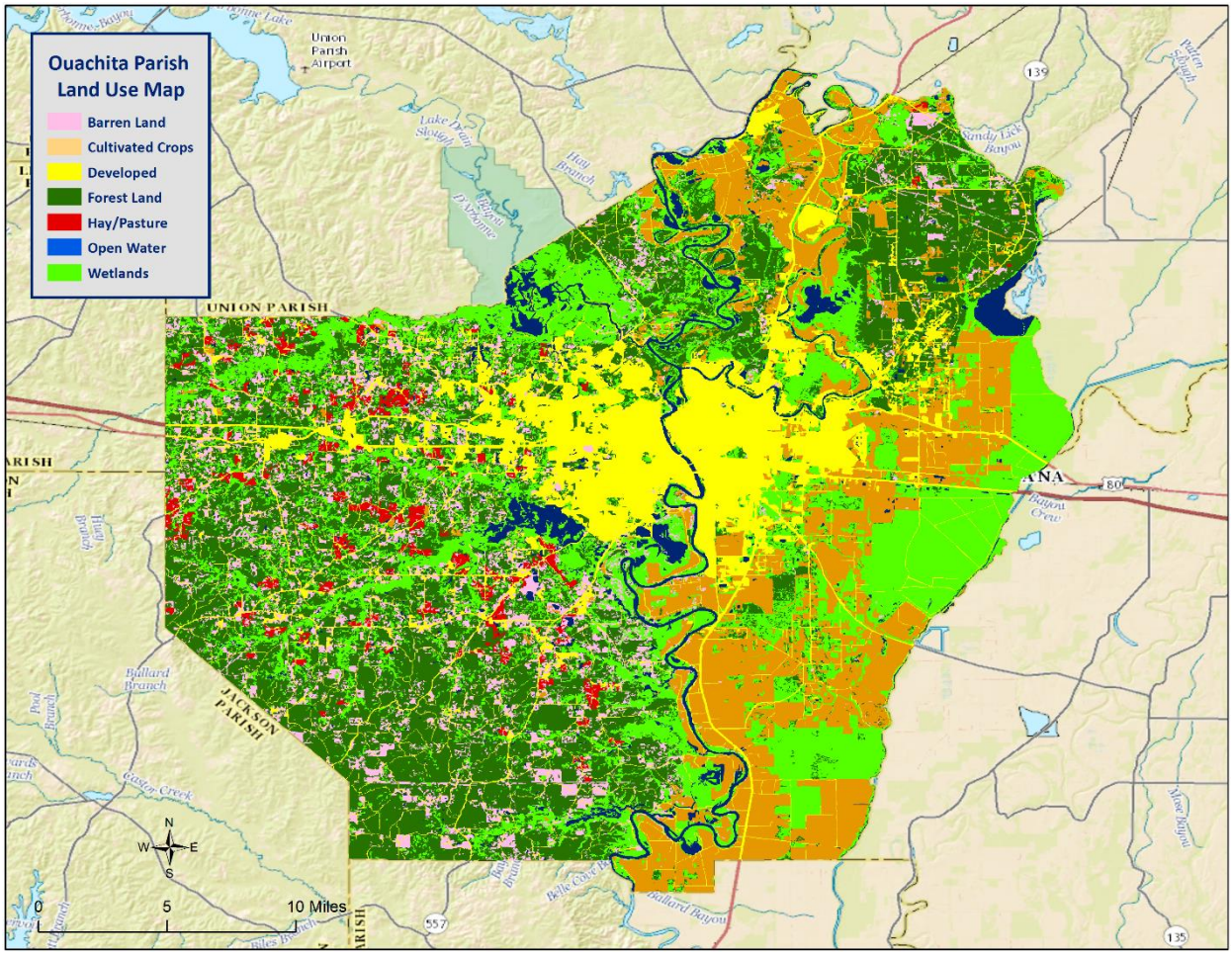


Figure 2-6: Ouachita Parish Land Use Map
(Source: USGS Land Use Map)

Hazard Identification

Drought

A drought is a deficiency in water availability over an extended period of time, caused by precipitation totals and soil water storages that do not satisfy the environmental demand for water, either by evaporation or transpiration through plant leaves. It is important to note that the lack of precipitation alone does not constitute drought; the season during which the precipitation is lacking has a major impact on whether drought occurs. For example, a week of no precipitation in July, when the solar energy to evaporate water and vegetation's need for water to carry on photosynthesis are both high, may trigger a drought, while a week of no precipitation in January may not initiate a drought.

Drought is a unique and insidious hazard. Unlike other natural hazards, no specific threshold of "dryness" exists for declaring a drought. In addition, the definition of drought depends on stakeholder needs. For instance, the onset (and demise) of agricultural drought is quick, as crops need water every few days; once they get rainfall, they improve. But hydrologic drought sets in (and is alleviated) only over longer time periods. A few dry days will not drain a reservoir, but a few rain showers cannot replenish it either. Moreover, different geographical regions define drought differently based on the deviation from local, normal precipitation. Drought can occur anywhere, triggered by changes in the local-to-regional-scale atmospheric circulation over an area, or by broader-scale circulation variations such as the expansion of semi-permanent oceanic high-pressure systems or the stalling of an upper-level atmospheric ridge in place over a region. The severity of a drought depends upon the degree and duration of moisture deficiency, as well as the size of the affected area. Periods of drought also tend to be associated with other hazards, such as wildfires and/or heat waves. Lastly, drought is a slow onset event, causing less direct—but tremendous indirect—damage. Depletion of aquifers, crop loss, and livestock and wildlife mortality rates are examples of direct impacts. Since the groundwater found in aquifers is the source of about 38% of all county and city water supplied to households (and comprises 97% of the water for all rural populations that are not already supplied by cities and counties), droughts can potentially have direct, disastrous effects on human populations. The indirect consequences of drought, such as unemployment, reduced tax revenues, increased food prices, reduced outdoor recreation opportunities, higher energy costs as water levels in reservoirs decrease and consumption increases, and water rationing, are not often fully known. This complex web of impacts causes drought to affect people and economies well beyond the area physically experiencing the drought.

This hazard is often measured using the Palmer Drought Severity Index (PDSI, also known operationally as the Palmer Drought Index). The PDSI, first developed by Wayne Palmer in a 1965 paper for the U.S. Weather Bureau, measures drought through recent precipitation and temperature data with regard to a basic supply-and-demand model of soil moisture. It is most effective in long-term calculations. Three other indices used to measure drought are the Palmer Hydrologic Drought Index (PHDI), the Crop Moisture Index (CMI), which is derived from the PDSI, and the Keetch-Byram Drought Index (KBDI), created by John Keetch and George Byram in 1968 for the U.S. Forest Service. The KBDI is used mainly for predicting the likelihood of wildfire outbreaks. As a compromise, the PDSI is used most often for droughts since it is a medium-response drought indicator. The objective of the PDSI is to provide measurements of moisture conditions that are standardized so that comparisons using the index can be made between locations and between months. *Table 2-10* displays the range and Palmer classifications of the PDSI index. *Figure 2-7* displays the current drought monitor for the State of Louisiana and its parishes.

Table 2-10: Palmer Drought Severity Index Classification and Range

Range	Palmer Classifications
4.0 or more	Extremely Wet
3.0 to 3.9	Very Wet
2.0 to 2.9	Moderately Wet
1.0 to 1.99	Slightly Wet
0.5 to 0.99	Incipient Wet Spell
0.49 to -0.49	Near Normal
-0.5 to -0.99	Incipient Dry Spell
-1.0 to -1.99	Mild Drought
-2.0 to -2.99	Moderate Drought
-3.0 to -3.99	Severe Drought
-4.0 or less	Extreme Drought

The PDSI best measures the duration and intensity of drought-inducing circulation patterns at a somewhat long-term time scale, although not as long-term as the PHDI. Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns in addition to the effects of cumulative patterns of previous months. Although weather patterns can change almost overnight from a long-term drought pattern to a long-term wet pattern, as a medium-response indicator, the PDSI responds relatively rapidly. Data compiled by the National Drought Mitigation Center indicates moderate drought conditions exist in the majority of Ouachita Parish, and severe drought conditions exist in the eastern portions of the parish at the time this plan went to publication (*Figure 2-7*).

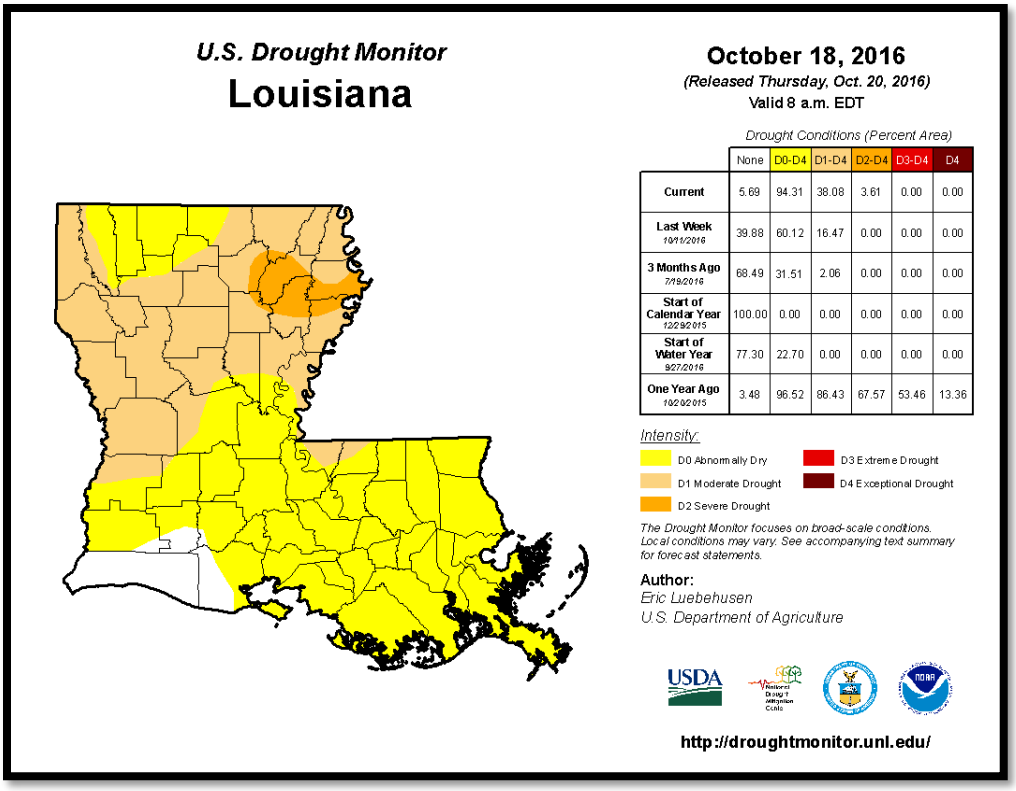


Figure 2-7: United States Drought Monitor for the State of Louisiana and its Parishes (Source: The National Drought Mitigation Center)

Location

Drought typically impacts a region and not one specific parish or jurisdiction. While the entire planning area can experience drought, the major impact of a drought event in Ouachita Parish is on the agricultural community.

Previous Occurrences / Extents

The SHELDUS database reports one drought event occurring within the boundaries of Ouachita Parish between the years of 1990 to 2015. *Table 2-11* identifies the date of occurrence, estimated crop damage, and severity of the event that has occurred in Ouachita Parish. Based on previous occurrences, and in accordance with the Palmer Drought Index, the worst case scenario for drought in Ouachita Parish would be a severe drought event.

Table 2-11: Drought Events with Crop Damage Totals for Ouachita Parish
(Source: SHELDUS)

Date	Crop Damage	Palmer Classification
June 1998	$1,291,497	Severe Drought

Frequency / Probability

Based on previous occurrences of one drought event in 25 years, the probability of drought occurrence in the planning area in any given year is 4%.

Estimated Potential Losses

According to the SHELDUS database, there has been one drought event that has caused some level of crop damage. The total agricultural damage from this event is $1,281,497, with an average cost of $1,281,497 per drought event. When annualizing the total cost over the 25-year record, total annual losses based on drought is estimated to be $51,260. *Table 2-12* presents an analysis of agricultural exposure that is susceptible to drought by major crop type for Ouachita Parish.

Table 2-12: Agricultural Exposure by Crop Type for Droughts in Ouachita Parish
(Source: LSU Ag Center 2014 Parish Totals)

Agricultural Exposure by Type for Drought						
Cotton	Forestry	Soybeans	Feed Grains	Rice	Wheat	Total
$3,154,159	$13,180,969	$11,177,665	$4,766,142	$9,130,507	$1,763,420	$43,172,862

There have been no reported injuries or deaths as a direct result to drought in Ouachita Parish.

Earthquakes

An earthquake is a sudden motion or trembling of the Earth caused by an abrupt release of stored energy in the rocks beneath the Earth's surface. The energy released results in vibrations which are known as seismic waves. Ground motion from seismic waves is expressed as peak ground acceleration (PGA), the fastest measured change in speed for a particle at ground level that is moving because of an earthquake. PGA is commonly measured as a percentage of acceleration due to Earth's gravity (%g). This measurement is relied upon to determine seismic load engineering design and construction requirements. Earthquakes are typically described in terms of magnitude and intensity. Magnitude is the measure of the amplitude of the seismic wave and is often expressed by the Richter scale, and intensity is a measure of how strong the shock was felt at a particular location, indexed by the Modified Mercalli Intensity (MMI) scale. The Richter scale is a logarithmic measurement whereby an increase in the scale by one whole number represents a tenfold increase in measured ground motion of the earthquake (and an increase in energy released of more than 30 times). An increase by two whole numbers represents a 102 (or 100-fold) increase in ground motion, and thus more than 302 (or 900) times the energy released. *Table 2-13* shows the rough correlation between the Richter scale, PGA, and the MMI. The relationship between these is approximate and depends upon such specifics as the depth of the focus (the location of the actual rock movement) and distance from the epicenter (the location on the Earth's surface above the earthquake focus) of the earthquake.

Table 2-13: Comparison of Earthquake Magnitudes for PGA, Richter, and MMI
(Source: USGS Earthquake Hazards Program)

Comparison of Earthquake Metrics			
PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
<0.17	1.0 - 3.0	I	**I**. Not felt except by a very few under especially favorable conditions.
0.17 - 1.4	3.0 - 3.9	II - III	**II**. Felt only by a few persons at rest, especially on upper floors of buildings. **III**. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 - 9.2	4.0 - 4.9	IV - V	**IV**. 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 motorcars rock noticeably. **V**. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 - 5.9	VI - VII	**VI**. Felt by all. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. **VII**. 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.

COMPARISON OF EARTHQUAKE METRICS			
PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
34 - 124	6.0 - 6.9	VII - IX	**VIII**. 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, and walls. Heavy furniture overturned. **IX**. 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.
>124	7.0 and higher	**VIII** or higher	**X**. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. **XI**. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. **XII**. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

The system of subsidence faults in southern Louisiana developed due to accelerated land subsidence and rapid sediment deposition from the Mississippi River. The system stretches across the southern portion of the state from Beauregard Parish in the west to West Baton Rouge Parish in the east and it includes every parish south of this line. This system is thought to be responsible for many of the recorded earthquakes from 1843 to the present. All of the earthquakes that occurred over this period of time were of low magnitude, resulting mostly in limited property damage (such as broken windows, damaged chimneys, and cracked plaster). While faults throughout the northwestern parishes are thought to be inactive, the New Madrid seismic zone lies just to the north of Louisiana and originates in the region of New Madrid, Missouri. The magnitude of historic earthquakes originating in the New Madrid seismic zone is far greater than that generated by the subsidence fault system in coastal Louisiana. A significant seismic event from the New Madrid seismic zone is more likely to have a greater impact on Louisiana than a seismic event from the subsidence fault system.

Location

An earthquake event is a geological hazard that occurs along fault lines. There are no fault lines that extend through Ouachita Parish; however, there are two in the neighboring parishes of Union and Lincoln (*Figure 2-8*).

Previous Occurrences / Extents

Both the SHELDUS and National Climatic Data Center report no earthquake events occurring within the boundaries of Ouachita Parish between the years of 1990 to 2015. The National Oceanic and Atmospheric Administration's National Geophysical Data Center reports no earthquake events occurring within the boundaries of Parish Name between the years 1811 – 2014; however, an earthquake with an intensity of MMI 2 occurred two parishes away in Franklin Parish. *Figure 2-8* displays the location and intensity of each earthquake event in the surrounding parishes. Based on the previous earthquake event in Franklin Parish, an earthquake with an intensity level of MMI 1 could be felt within the planning area. This intensity of an earthquake would only be felt by a very few people.

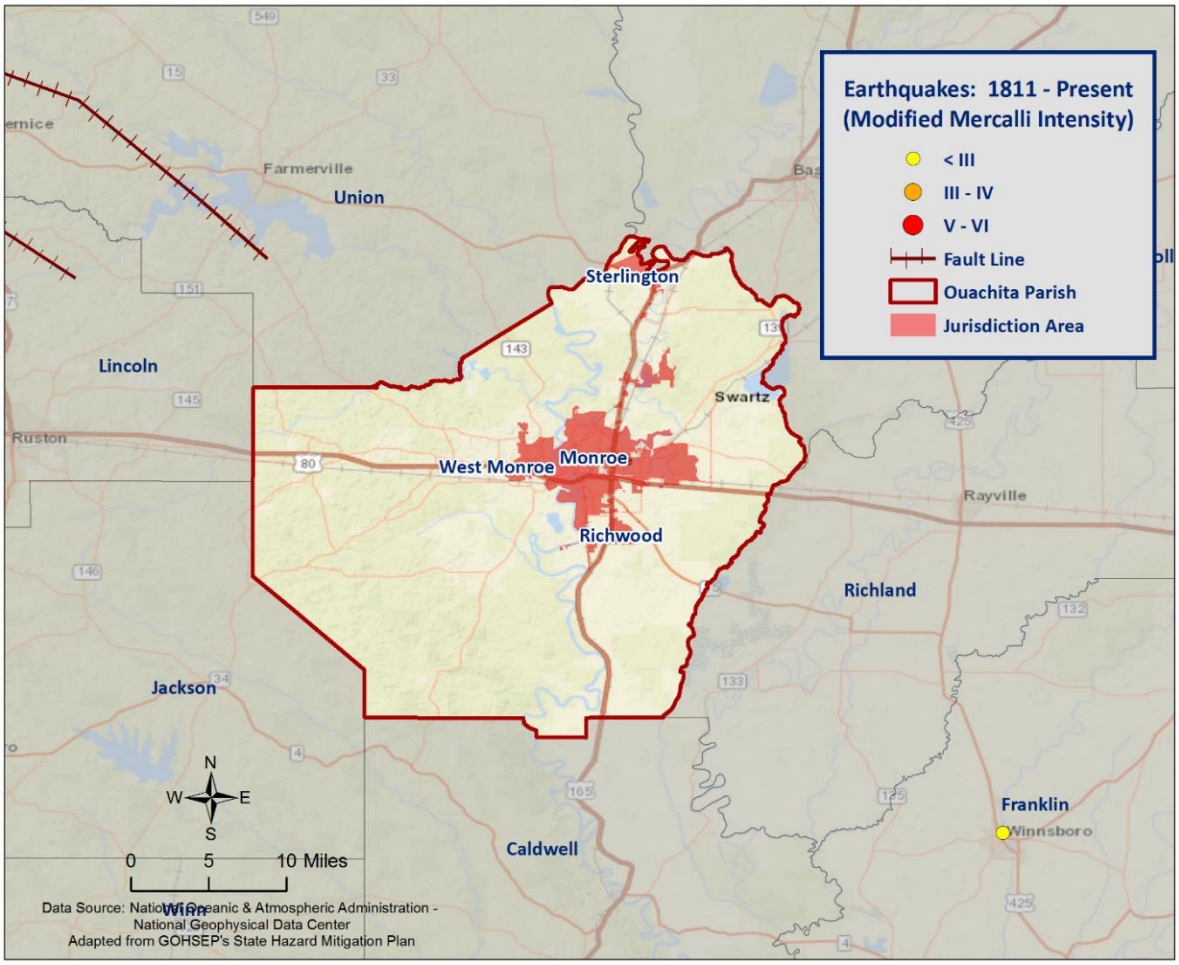


Figure 2-8: Location and Intensity (MMI) of Earthquakes in Ouachita Parish

Frequency / Probability

Based on historical record and Louisiana's State Hazard Mitigation Plan, it is determined that an earthquake event has less than a 1% annual chance of occurrence in the Ouachita Parish planning area, and they would have no impact. As a result, earthquakes are discounted and not carried forward into risk assessment.

Extreme Heat

There is no operational definition for defining heat or a heat wave. Heat waves are the consequence of the same weather pattern as drought, and therefore both hazards often occur concurrently. A heat wave is an extended period of oppressive and above normal temperatures over a given period of time. The World Meteorological Organization recommends the declaration of a heat wave when the daily maximum temperature exceeds the average maximum temperatures by 9 °F and lasts for a period of at least five days.

However, temperature alone is insufficient to describe the stress placed on humans (as well as flora and fauna) in hot weather. It is crucial to consider the effect of relative humidity since it is essential to the body's ability to perspire and cool. Once air temperature reaches 95 °F, perspiration becomes a very significant biophysical mechanism to ensure heat loss. Perspiration is ineffective as a cooling mechanism if the water cannot evaporate (i.e., sweating in high relative humidity is reduced as compared to during dry conditions). To communicate this relationship between temperature and humidity, the National Weather Service (NWS) developed the Heat Index (HI), which provides a warning system based on a combination of air temperature and relative humidity. The HI is presented in *Table 2-14* and *Table 2-15* summarizes the HI risk levels and protective measures. The NWS devised the index for shady, light wind conditions, and thus advises that the HI value can be increased by as much as 15 °F if a person is in direct sunlight with strong, hot winds present.

Most heat disorders (e.g., sunburn, heat cramps, heat exhaustion, and heat stroke) occur because the victim has been overexposed to heat, or has over-exercised in relation to their age and physical condition. Other circumstances that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Seniors and children are most at risk from adverse heat effects.

Extreme heat can also damage roads, bridges, utilities, and railroads. Extreme heat can cause pavement to soften, creating the buckling of roads and highways, which can result in potholes and rutting. These damaged roads can create hazardous conditions, causing motorists to find alternate transportation routes. Old water and sewer lines can deteriorate, increasing the likelihood of line ruptures during extreme heat. The demands on water supplies can result in water rationing, shortages, and restrictions. Extreme heat can also cause strain on several power grids, causing people to minimize the consumption of power during the hottest parts of the day due to overheating. The overwhelming demand of excess electrical power usage can also cause a strain on power capacities, resulting in blackout and /or brown outs. vehicles can overheat, and tires will deteriorate. High temperatures can be partially responsible for the expansion, buckling, or deflection of rails requiring track repairs or speed restrictions to avoid derailments.

Extreme heat can also be detrimental to the agricultural community. Extreme heat stress can reduce plant photosynthetic and transpiration efficiencies and negatively impact plant root development, which collectively can negatively impact yield. Heat injury in plants includes scalding and scorching of leaves and stems, sunburn on fruits and stems, leaf drop, rapid leaf death, and reduction in growth and yield. Extreme heat is particularly impactful when extreme heat is accompanied by drought conditions. The reduced moisture in the soil further exacerbates the effects of extreme temperatures.

The agrarian issues associated with extreme heat are relevant throughout the state, but are particularly significant in rural and agricultural parishes. A reduction of crop yield will diminish the incomes of farmers and producers in the area. If the reduced crop yield lasts over an extended period of time, the resulting reduction in disposable income could have a negative impact on businesses in the affected communities. People wouldn't have any extra money to spend at local establishments, and businesses would be forced to close for good.

According to NOAA, extreme heat is the leading weather-related cause of death in the United States. And while heat-related deaths in Louisiana are not common, due in part to the consistency and predictability of high seasonal temperatures, they do occur and are still very intense and dangerous. Such deaths happen in a variety of circumstances, often in ways that are not easily categorized due to their unexpectedness. For instance, although exposure to heat is higher at the beach than usual, NOAA does not track heat-related deaths there because such deaths happen infrequently.

Table 2-14: Heat Index Advisor Based on Air Temperature (°F) and Relative Humidity (Source: National Weather Service)

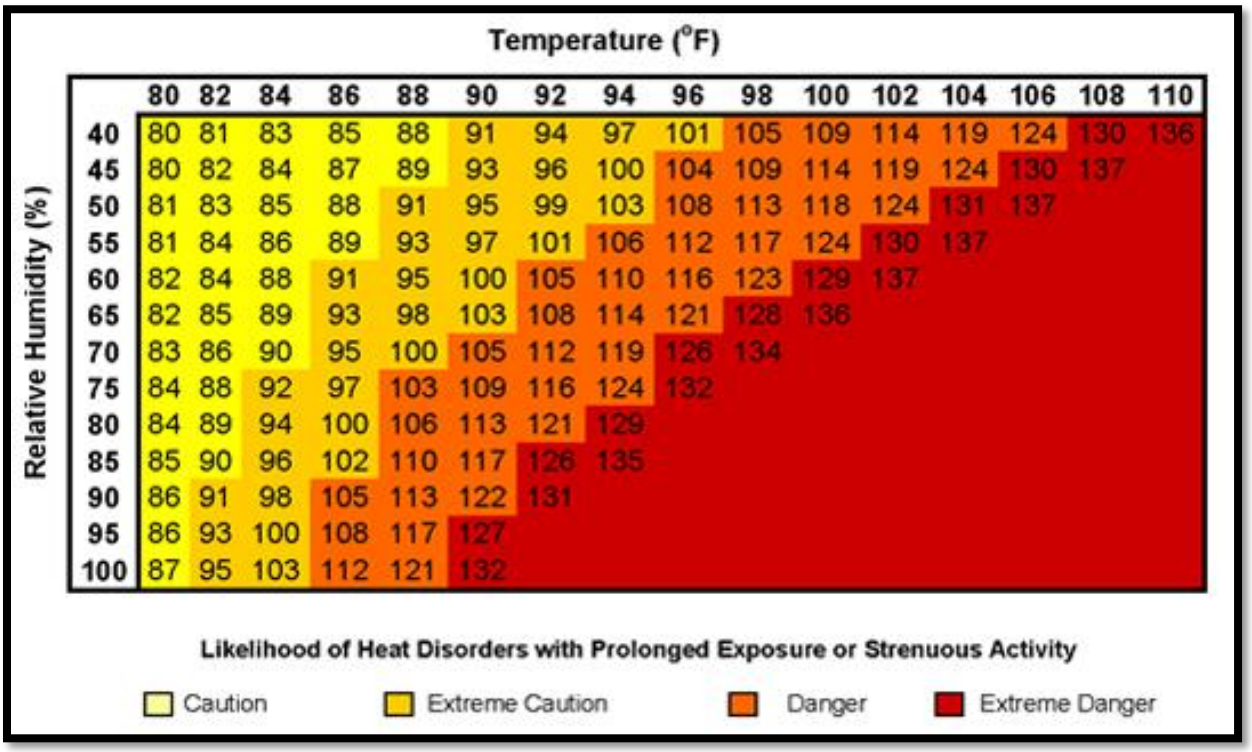


Table 2-15: Summary of Heat Index Risk Levels with Protective Measures (Source: National Weather Service)

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning.
91°F to 103°F	Moderate	Implement precautions and heighten awareness.
103°F to 115°F	High	Additional precautions to protect workers.
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures.

Location

Extreme heat typically impacts a region and not one specific parish or jurisdiction. Because extreme heat is a climatological based hazard and has the same probability of occurring in Ouachita Parish as all of the adjacent parishes, the entire planning area for Ouachita Parish is equally at risk for extreme heat.

Previous Occurrences / Extents

There have been three reports of significant extreme heat events occurring within the boundaries of Ouachita Parish between the years of 1990 to 2015. *Table 2-16* provides an overview of extreme heat events that have impacted the Ouachita Parish planning area since 2010. Based on historical data, the worst case scenario for Ouachita Parish involving extreme heat would be a high risk level event on the HI scale with temperatures ranging from 103 °F to 115 °F.

Table 2-16: Previous Occurrences of Extreme Heat in Ouachita Parish since 2010 (Source: NOAA)

Date	Temperature (°F)
August 14, 2012	103
August 1, 2014	103

Frequency / Probability

Based on the geographical location of the State of Louisiana, and Ouachita Parish in particular, extreme heat events occur frequently. The probability of occurrence is estimated at approximately 12%.

Estimated Potential Losses

According to the SHELDUS database, crop damage due to extreme heat in Ouachita Parish has totaled approximately $14,121 since 1990. To estimate the potential losses of an extreme heat event on an annual basis, the total damages recorded for an extreme event is divided by the total number of years of available extreme heat data in SHELDUS (1960 – 2015). This provides an annual estimated potential loss of $4,707. The following table, based on the 2010 Census data, provides an estimate of potential crop losses for Ouachita Parish:

Table 2-17: Estimated Annual Crop Losses in Ouachita Parish for Extreme Heat

Estimated Annual Potential Losses from Extreme Heat for Ouachita Parish				
Unincorporated Ouachita Parish (56.5% of Population)	Monroe (31.8% of Population)	Richwood (2.2% of Population)	Sterlington (1% of Population)	West Monroe (8.5% of Population)
$319	$179	$12	$6	$48

There have been no reported injuries or deaths as a direct result of extreme heat in Ouachita Parish.

Vulnerability

See Appendix C for parish and municipality agricultural exposure to extreme heat hazards.

Flooding

A flood is the overflow of water onto land that is usually not inundated. The National Flood Insurance Program defines a flood as:

> A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waves, unusual and rapid accumulation or runoff of surface waters from any source, mudflow, or collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Factors influencing the type and severity of flooding include natural variables such as precipitation, topography, vegetation, soil texture, and seasonality, as well as anthropogenic factors such as urbanization (extent of impervious surfaces), land use (agricultural and forestry tend to remove native vegetation and accelerate soil erosion), and the presence of flood-control structures such as levees and dams.

Excess precipitation, produced from thunderstorms or hurricanes, is often the major initiating condition for flooding, and Louisiana can have high rainfall totals at any time of day or year. During the cooler months, slow-moving frontal weather systems produce heavy rainfalls, while the summer and autumn seasons produce major precipitation in isolated thunderstorm events (often on warm afternoons) that may lead to localized flooding. During these warmer seasons, floods are overwhelmingly of the flash flood variety, as opposed to the slower-developing river floods caused by heavy stream flow during the cooler months.

In cooler months, particularly in the spring, Louisiana is in peak season for severe thunderstorms. The fronts that cause these thunderstorms often stall while passing over the state, occasionally producing rainfall totals exceeding ten inches within a period of a few days. Since soil tends to be nearly saturated at this time (due to relatively low overall evaporation rates), spring typically becomes the period of maximum stream flow across the state. Together, these characteristics increase the potential for high water, with low-lying, poorly drained areas being particularly susceptible to flooding during these months.

In Louisiana, six specific types of flooding are of main concern: riverine, flash, ponding, backwater, urban, and coastal.

- **Riverine flooding** occurs along a river or smaller stream. It is the result of runoff from heavy rainfall or intensive snow or ice melt. The speed with which riverine flood levels rise and fall depends not only on the amount of rainfall, but even more on the capacity of the river itself, as well as the shape and land cover of its drainage basin. The smaller the river, the faster that water levels rise and fall. Thus, the Mississippi River levels rise and fall slowly due to its large capacity. Generally, elongated and intensely-developed drainage basins will reach faster peak discharges and faster falls than circular-shaped and forested basins of the same area.
- **Flash flooding** occurs when locally intense precipitation inundates an area in a short amount of time, resulting in local stream flow and drainage capacity being overwhelmed.
- **Ponding** occurs when concave areas (e.g., parking lots, roads, and clay-lined natural low areas) collect water and are unable to drain.
- **Backwater flooding** occurs when water slowly rises from a normally unexpected direction where protection has not been provided. A model example is the flooding that occurred in LaPlace during Hurricane Isaac in 2012. Although the town was protected by a levee on the side facing the

Mississippi River, floodwaters from Lake Maurepas and Lake Pontchartrain crept into the community on the side of town opposite the Mississippi River.

- **Urban flooding** is similar to flash flooding but is specific to urbanized areas. It takes place when storm water drainage systems cannot keep pace with heavy precipitation, and water accumulates on the surface. Most urban flooding is caused by slow-moving thunderstorms or torrential rainfall.
- **Coastal flooding** can appear similar to any of the other flood types, depending on its cause. It occurs when normally dry coastal land is flooded by seawater, but may be caused by direct inundation (when the sea level exceeds the elevation of the land), overtopping of a natural or artificial barrier, or the breaching of a natural or artificial barrier (i.e., when the barrier is broken down by the sea water). Coastal flooding is typically caused by storm surge, tsunamis, or gradual sea level rise.

For purposes of this assessment, ponding, flash flood, and urban flooding are considered to be flooding as a result of storm water from heavy precipitation thunderstorms

Based on stream gauge levels and precipitation forecasts, the National Weather Service (NWS) posts flood statements, watches, and warnings. The NWS issues the following weather statements with regard to flooding:

- **Flood Categories**
  - Minor Flooding: Minimal or no property damage, but possibly some public threat.
  - Moderate Flooding: Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.
  - Major Flooding: Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
  - Record Flooding: Flooding which equals or exceeds the highest stage or discharge at a given site during the period of record keeping.

- **Flood Warning**
  - Issued along larger streams when there is a serious threat to life or property.

- **Flood Watch**
  - Issued when current and developing hydrometeorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.

Floods are measured mainly by probability of occurrence. A 10-year flood event, for example, is an event of small magnitude (in terms of stream flow or precipitation) but with a relatively high annual probability of recurrence (10%). A 100-year flood event is larger in magnitude, but it has a smaller chance of recurrence (1%). A 500-year flood is significantly larger than both a 100-year event and a 10-year event, but it has a lower probability than both to occur in any given year (0.2%). It is important to understand that an X-year flood event does not mean an event of that magnitude occurs only once in X years. Instead, it means that on average, we can expect a flood event of that magnitude to occur once every X years. Given that such statistical probability terms are inherently difficult for the general population to understand, the Association of State Floodplain Managers (ASFPM) promotes the use of more tangible expressions of flood probability. As such, the ASFPM also expresses the 100-year flood event as having a 25% chance of occurring over the life of a 30-year mortgage.

It is essential to understand that the magnitude of an X-year flood event for a particular area depends on the source of flooding and the area's location. The size of a specific flood event is defined through historic data of precipitation, flow, and discharge rates. Consequently, different 100-year flood events can have very different impacts. The 100-year flood event in two separate locations have the same likelihood to occur, but they do not necessarily have the same magnitude. For example, a 100-year event for the Mississippi River means something completely different in terms of discharge values (ft^3/s) than for the Amite River. Not only are the magnitudes of 100-year events different between rivers, they can be different along any given river. A 100-year event upstream is different from one downstream due to the variation of river characteristics (volume, discharge, and topography). As a result, the definition of what constitutes a 100-year flood event is specific to each location, river, and time, since floodplain and river characteristics temporally fluctuate. Finally, it is important to note that each flood event is unique. Two hypothetical events at the same location, given the same magnitude of stream flow, may still produce substantially different impacts if there were different antecedent moisture characteristics, different times of day of occurrence (which indicates the population's probable activities at the flood's onset), or other characteristic differences.

The 100-year flood event is of particular significance since it is the regulatory standard that determines the obligation (or lack thereof) to purchase flood insurance. Flood insurance premiums are set depending on the flood zone, as modeled by National Flood Insurance Program (NFIP) Rate Maps. The NFIP and FEMA suggest insurance rates based on Special Flood Hazard Areas (SFHAs), as diagrammed in *Figure 2-9*.

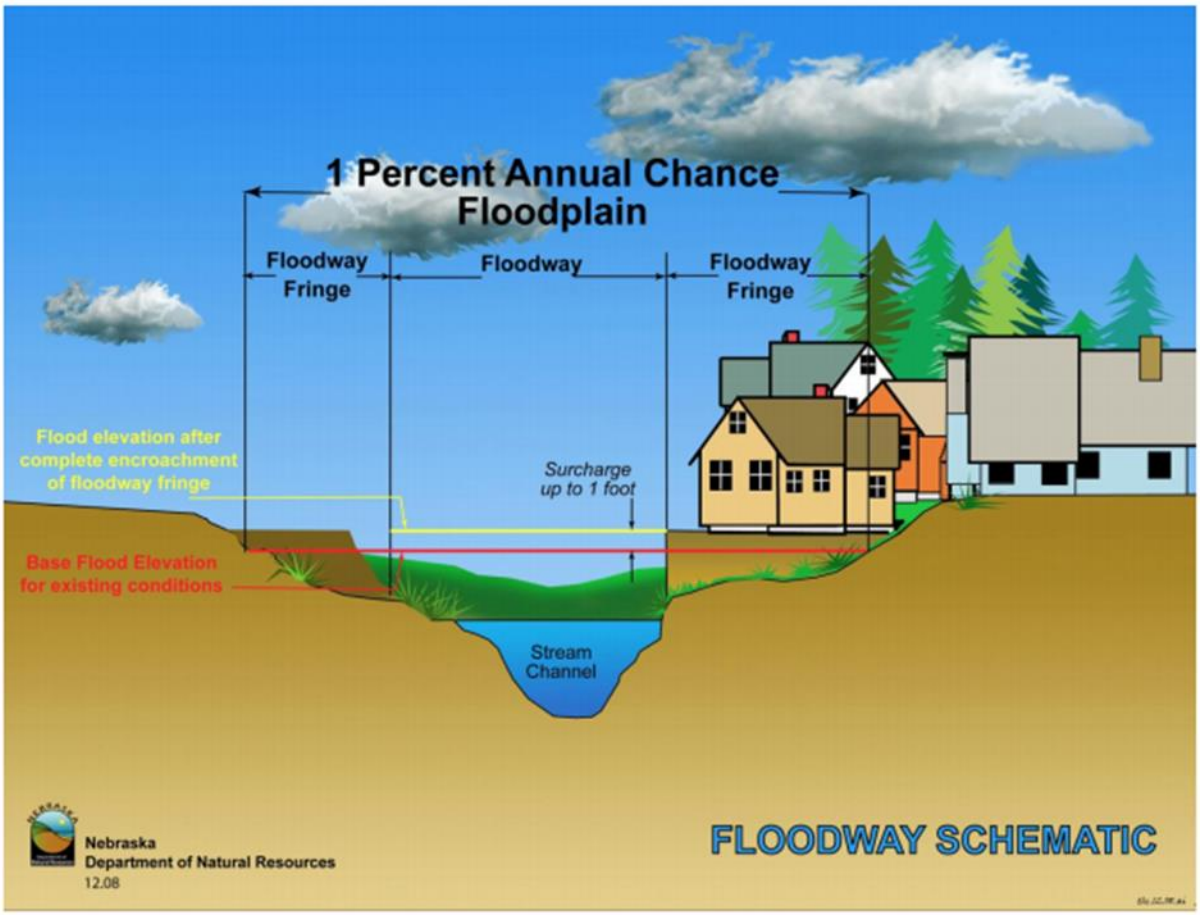


Figure 2-9: Schematic of 100-Year Floodplain. The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe
(Source: Nebraska Department of Natural Resources)

A SFHA is the land area covered by the floodwaters of the base flood (red line in *Figure 2-9*), where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Property Damage

The depth and velocity of flood waters are the major variables in determining property damage. Flood velocity is important because the faster water moves, the more pressure it puts on a structure and the more it will erode stream banks and scour the earth around a building's foundation. In some situations, deep and fast moving waters can push a building off its foundation. Structural damage can also be caused by the weight of standing water (hydrostatic pressure).

Another threat to property from a flood is called "soaking". When soaked, many materials change their composition or shape. Wet wood will swell, and if dried too quickly, will crack, split, or warp. Plywood can come apart and gypsum wallboard can deteriorate if it is bumped before it has time to completely dry. The longer these materials are saturated, the more moisture, sediment, and pollutants they absorb.

Soaking can also cause extensive damage to household goods. Wooden furniture may become warped, making it unusable, while other furnishings such as books, carpeting, mattresses, and upholstery are usually not salvageable. Electrical appliances and gasoline engines will flood, making them worthless until they are professionally dried and cleaned.

Many buildings that have succumbed to flood waters may look sound and unharmed after a flood, but water has the potential to cause severe property damage. Any structure that experiences a flood should be stripped, cleaned, and allowed to dry before being reconstructed. This can be an extremely expensive and time consuming effort.

Repetitive Loss Properties

Repetitive loss structures are structures covered by a contract for flood insurance made available under the NFIP that:

a. Have incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event; and
b. At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

Severe repetitive loss (SRL) is defined by the Flood Insurance Reform Act of 2004 and updated in the Biggert-Waters Flood Insurance Reform Act of 2012. For a property to be designated SRL, the following criteria must be met:

a. It is covered under a contract for flood insurance made available under the NFIP; and
b. It has incurred flood related damage –
    1) For which four or more separate claims payments have been made under flood insurance coverage with the amount of each claim exceeding $5,000 and with the cumulative amount of such claims payments exceeding $20,000; or
    2) For which at least two separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

Figures regarding repetitive loss structures for Ouachita Parish are provided in the table below:

Table 2-18: Repetitive Loss Structures for Ouachita Parish

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
Ouachita Parish (Unincorporated)	135	120	14	1	373	$7,256,005	$19,453
Monroe	339	305	34	0	1,082	$18,104,386	$16,732
Richwood	0	0	0	0	0	$0	$0
Sterlington	0	0	0	0	0	$0	$0
West Monroe	97	82	13	2	303	$8,549,164	$28,215
Total	571	507	61	3	1,758	$33,909,555	$19,289

Of the 571 repetitive loss properties in Ouachita Parish, 568 were able to be geocoded in order to provide an overview of where the repetitive loss structures were located throughout the parish. *Figure 2-10* shows the approximate location of the 568 structures, while *Figure 2-11* shows where the highest concentration of repetitive loss structures are located. Through the repetitive loss map, it is clear that the primary concentrated area of repetitive loss structures is focused in and around the incorporated areas of West Monroe and Monroe.

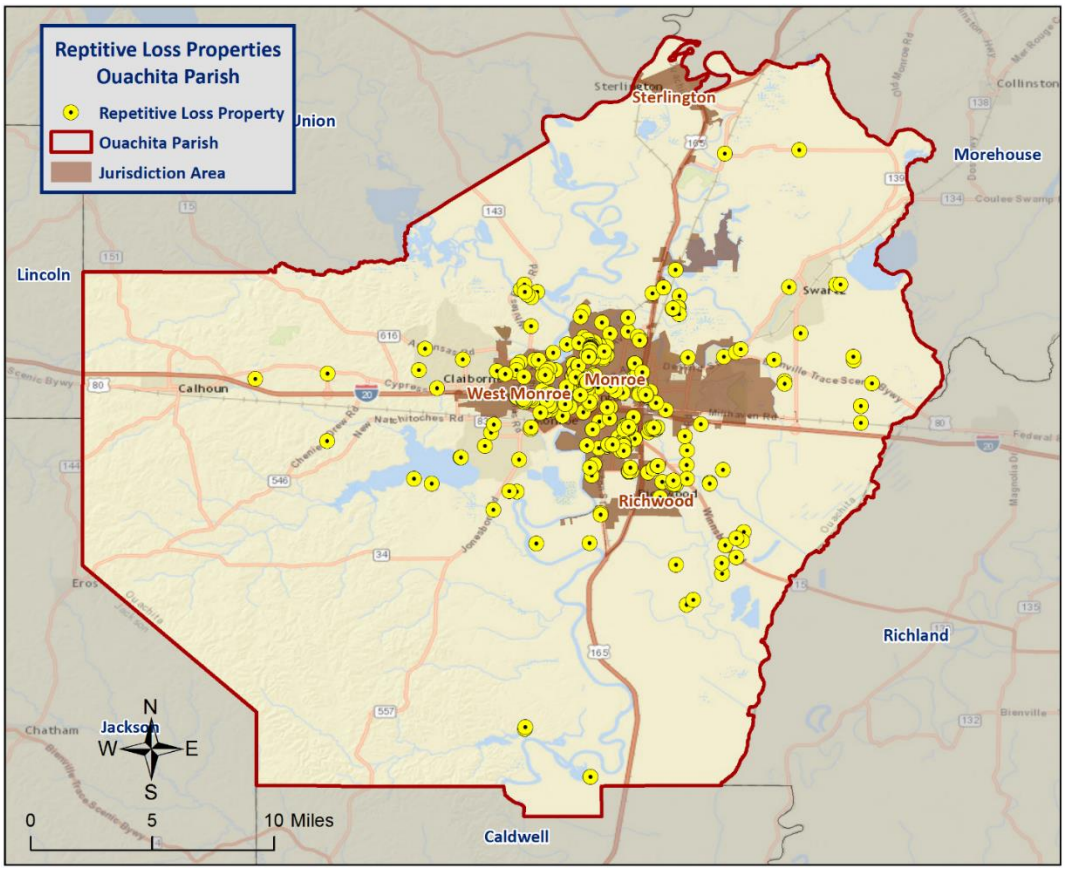


Figure 2-10: Repetitive Loss Properties in Ouachita Parish

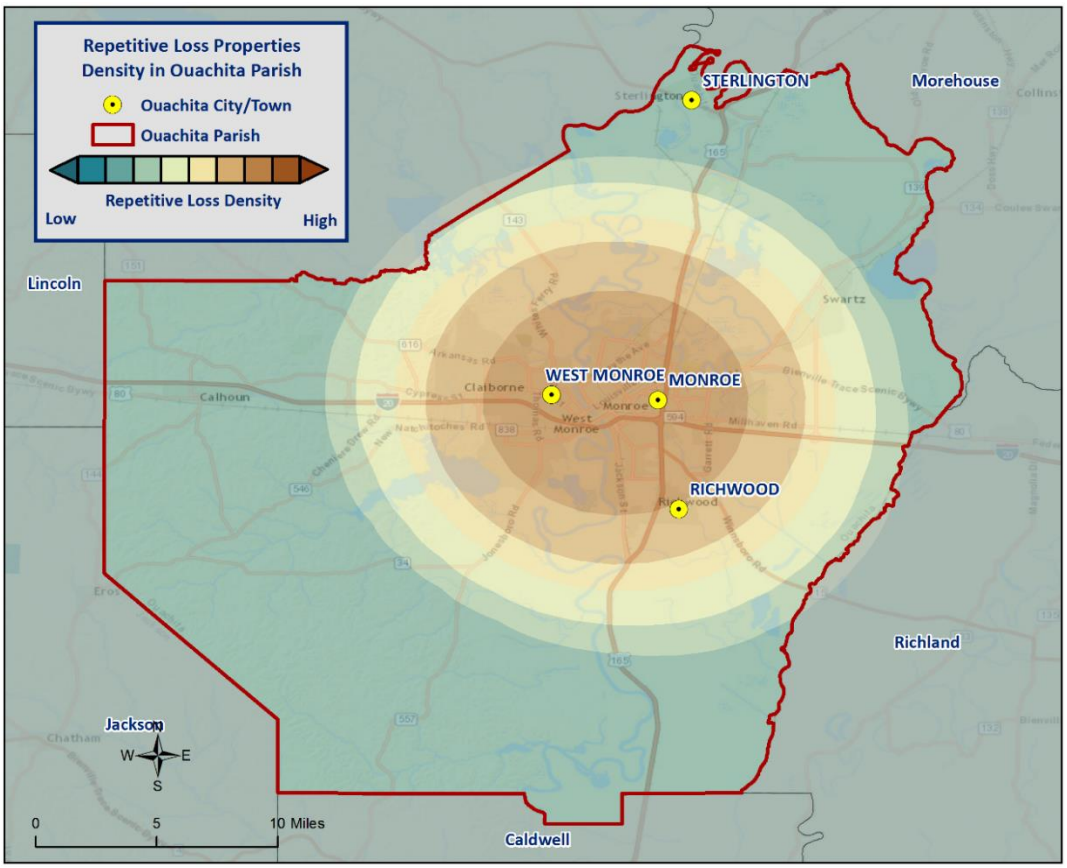


Figure 2-11: Repetitive Loss Property Densities in Ouachita Parish

National Flood Insurance Program

Flood insurance statistics indicate that Ouachita Parish has 5,844 flood insurance policies with the NFIP, with total annual premiums of $4,041.656. Ouachita Parish and the incorporated areas of Monroe, Richwood, Sterlington, and West Monroe are all participants in the NFIP. Ouachita Parish and each of the incorporated jurisdictions will continue to adopt and enforce floodplain management requirements, including regulating new construction Special Flood Hazard Areas, and will continue to monitor activities including local requests for new map updates. Flood insurance statistics and additional NFIP participation details for Ouachita Parish are provided in the tables on the next page.

Ouachita Parish and the communities listed above will continue their active participation in the NFIP through various education and outreach activities. These activities will include community outreach on the availability of flood insurance within the parish and incorporated municipalities, as well as flood safe building initiatives throughout the parish. The Parish Floodplain Manager will continue to work in coordination with each community to ensure floodplain management regulations are adopted and enforced. The Parish Floodplain Manager and community floodplain managers for the City of Monroe and City of West Monroe will continue to seek and attend floodplain management and NFIP continuing education.

Table 2-19: Summary of NFIP Policies for Ouachita Parish

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed Since 1978	Total Loss Payments
Ouachita Parish (Unincorporated)	2,320	$479,229,100	$1,610,334	1,894	$53,648,503
Monroe	3,166	$691,867,800	$2,186,078	4,033	$79,085,820
Richwood	4	$790,000	$2,061	3	$89,817
Sterlington	10	$2,420,000	$4,206	3	$57,823
West Monroe	344	$71,621,300	$238,977	685	$17,486,085
Total	5,844	$1,245,928,200	$4,041,656	6,618	$150,368,048

*While the City of Monroe, the Town of Richwood, the Town of Sterlington, and the City of West Monroe all have active NFIP policies, the parish will continue to promote NFIP participation through education and outreach.

Table 2-20: Summary of Community Flood Maps for Ouachita Parish

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Date Joined the NFIP	Tribal
220135#	Ouachita Parish	9/13/1974	7/2/1980	1/20/2016	7/2/1980	No
220136#	Monroe	9/6/1974	12/18/1979	1/20/2016	12/18/1979	No
220378#	Richwood	-	9/30/1987	1/20/2016	9/30/1987	No
220400#	Sterlington	1/9/1976	3/15/1994	1/20/2016	6/14/1994	No
220138#	West Monroe	11/16/1973	12/1/1978	1/20/2016	12/1/1978	No

According to the Community Rating System (CRS) list of eligible communities dated October 1, 2016, Ouachita Parish and the City of Monroe participate in the CRS, while the incorporated areas of Richwood, Sterlington, and West Monroe do not participate.

Table 2-21: List of Areas within Ouachita Parish that Participate in the Community Rating System

Community Number	Name	CRS Entry Date	Current Effective Date	Current Class	% Discount for SFHA	% Discount for Non-SFHA	Status
220135	Ouachita Parish	10/1/2002	5/1/2008	9	5	5	C
220136	Monroe	10/1/2003	10/1/2012	10	0	0	R

Threat to People

Just as with property damage, depth and velocity are major factors in determining the threat posed to people by flooding. It takes very little depth or velocity for flood waters to become dangerous. A car will float in less than two feet of moving water, and can be swept downstream into deeper waters, trapping passengers within the vehicle. Victims of flooding have often put themselves in perilous situations by entering flood waters that they believe to be safe, or by ignoring travel advisories.

Major health concerns are also associated with floods. Flood waters can transport materials such as dirt, oil, animal waste, and chemicals (e.g., farm, lawn, and industrial) that may cause illnesses of various degrees when coming in contact with humans. Flood waters can also infiltrate sewer lines and inundate wastewater treatment plants, causing sewage to backup and creating a breeding ground for dangerous bacteria. This infiltration may also cause water supplies to become contaminated and undrinkable.

Flooding in Ouachita Parish

By definition, flooding is caused when an area receives more water than the drainage system can convey. The following is a synopsis of the types of flooding that Ouachita Parish experiences.

Flash Flooding: Flash flooding is characterized by a rapid rise in water level, high velocity, and large amounts of debris. It is capable of uprooting trees, undermining buildings and bridges, and scouring new channels. Major factors in flash flooding are the high intensity and short duration of rainfall, as well as the steepness of watershed and stream gradients.

Local Drainage or High Groundwater Levels: Locally heavy precipitation may produce flooding in areas other than delineated floodplains or along recognizable drainage channels. If local conditions cannot accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding problems.

Backwater Flooding: Backwater flooding is normally associated with riverine flooding and connotes minimal velocity. All low lying areas are at risk. A heavy rainfall event coupled with a swollen river, canal, bayou, or marsh hinders drainage outflow, causing backwater flooding to the same areas susceptible to storm surge.

Riverine Flooding: Riverine flooding is, by definition, river-based. Most of the riverine flooding problems occur when the Ouachita River crests at flood stage levels, causing extensive flooding in low-lying areas.

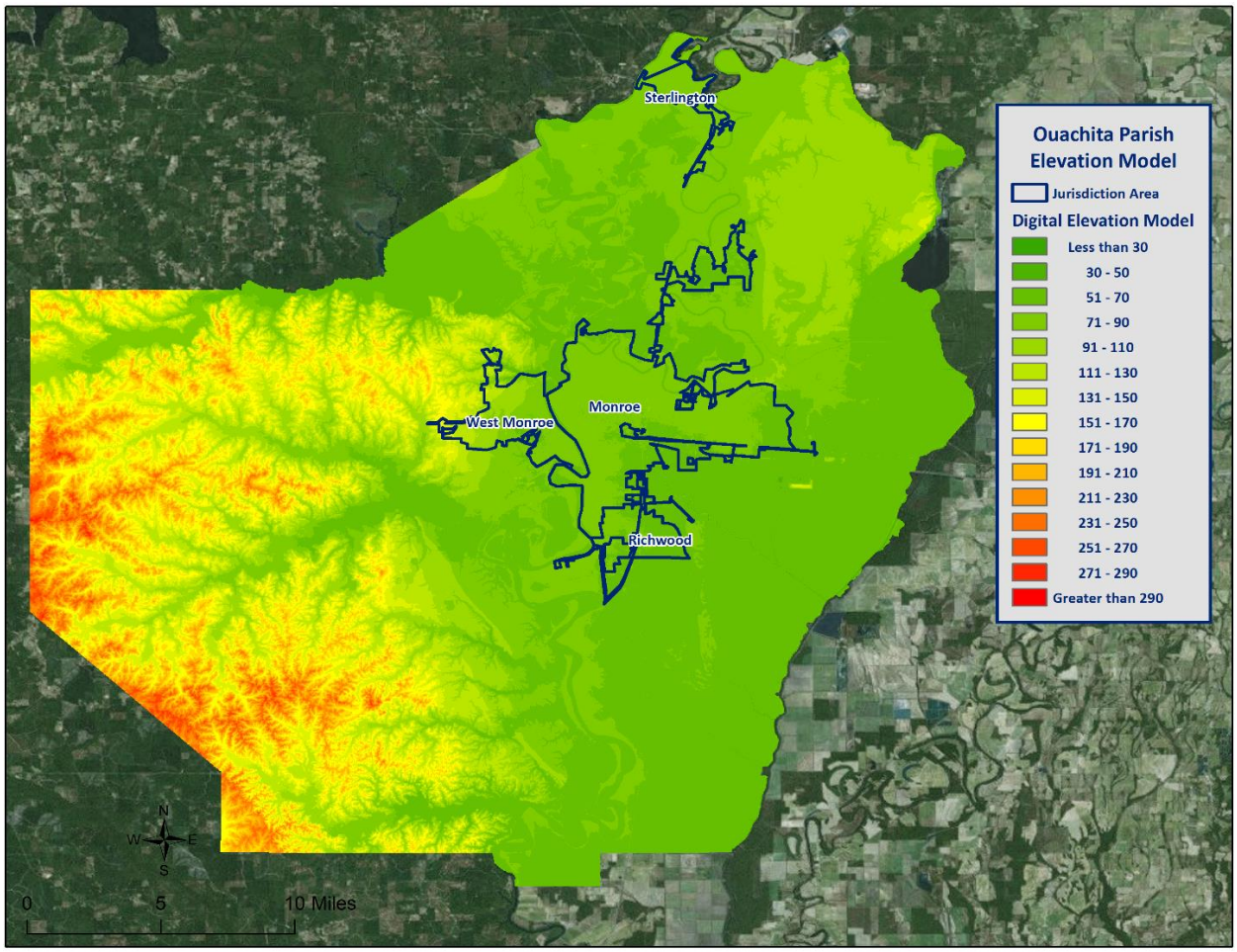


Figure 2-12: Elevation throughout Ouachita Parish

Looking at the digital elevation model (DEM) in the figure above for Ouachita Parish is instructive in visualizing where the low lying and high risk areas are for the parish. Elevations in the parish range from less than 30 feet to over 290 feet. The highest elevations in the parish are approximately 290 feet, located in the western portions of the parish. The incorporated areas range in elevation from 56 to 82 feet, with the incorporated area of Sterlington averaging 56 feet, Richwood averaging 69 feet, Monroe averaging 72 feet, and West Monroe averaging 82 feet.

Location

Ouachita Parish has experienced significant flooding in its history and can expect more in the future. Many parts of the parish are located in the 100-year floodplain. The following are enlarged maps of the incorporated areas showing the areas within each jurisdiction that are at risk of flooding:

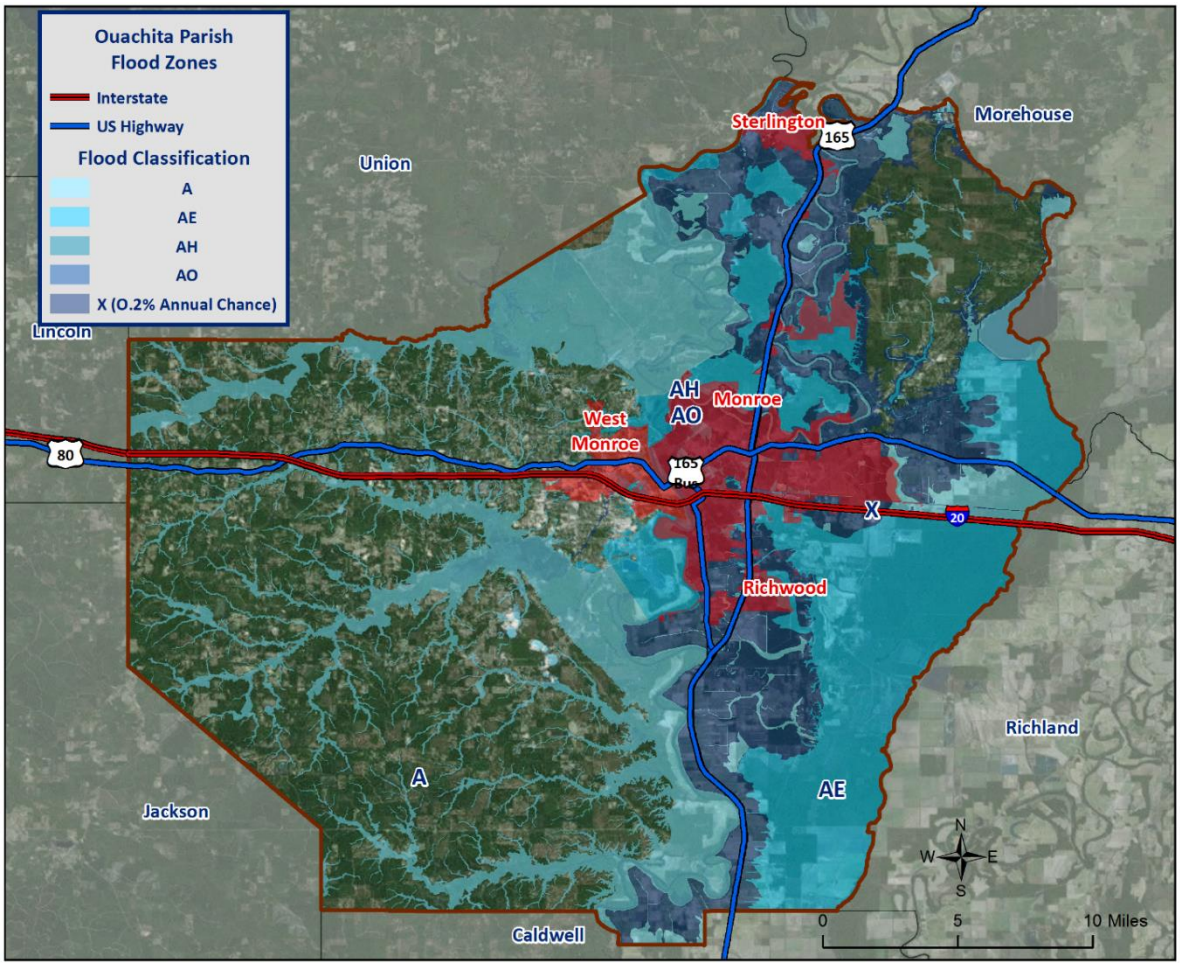


Figure 2-13: Ouachita Parish Areas within the Flood Zones

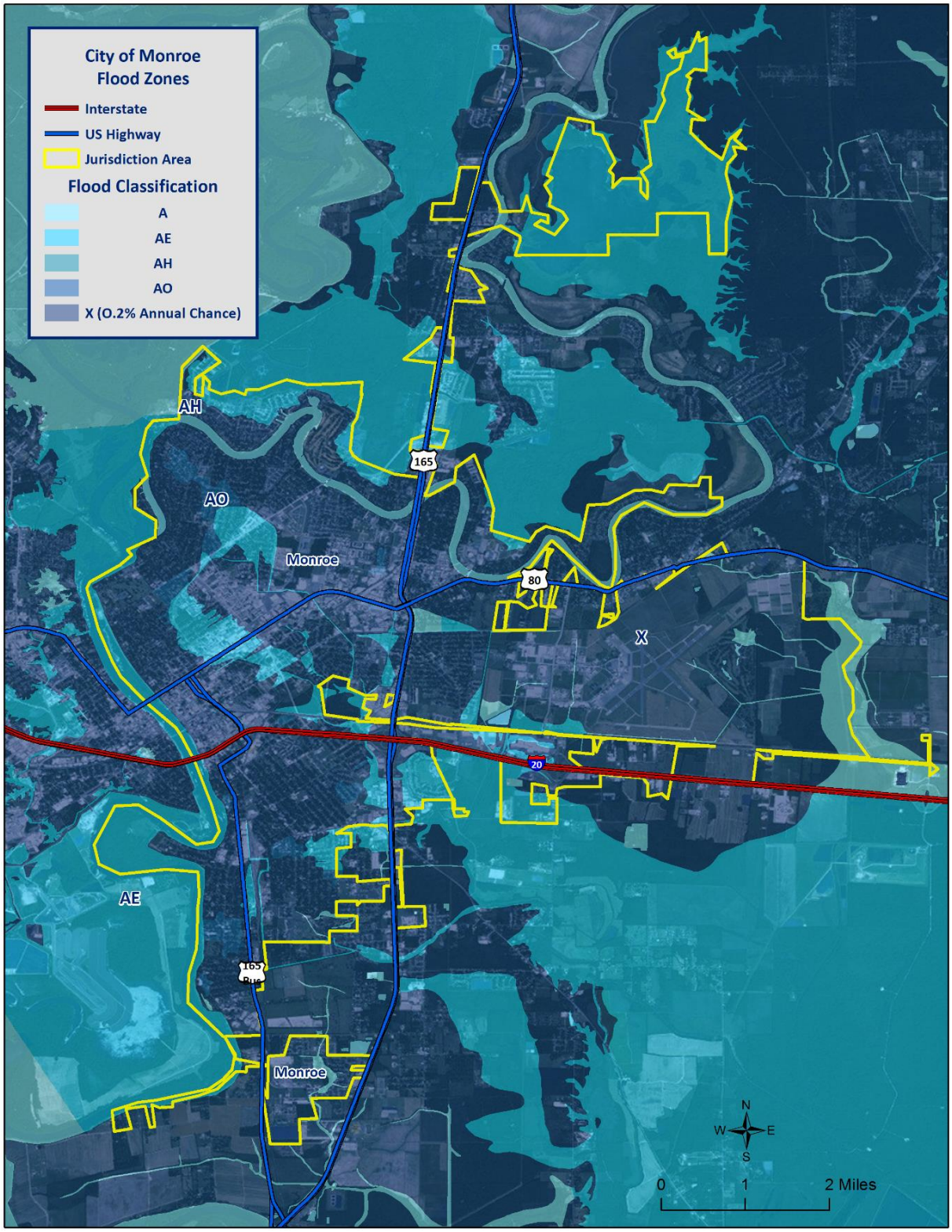


Figure 2-14: City of Monroe Areas within the Flood Zones

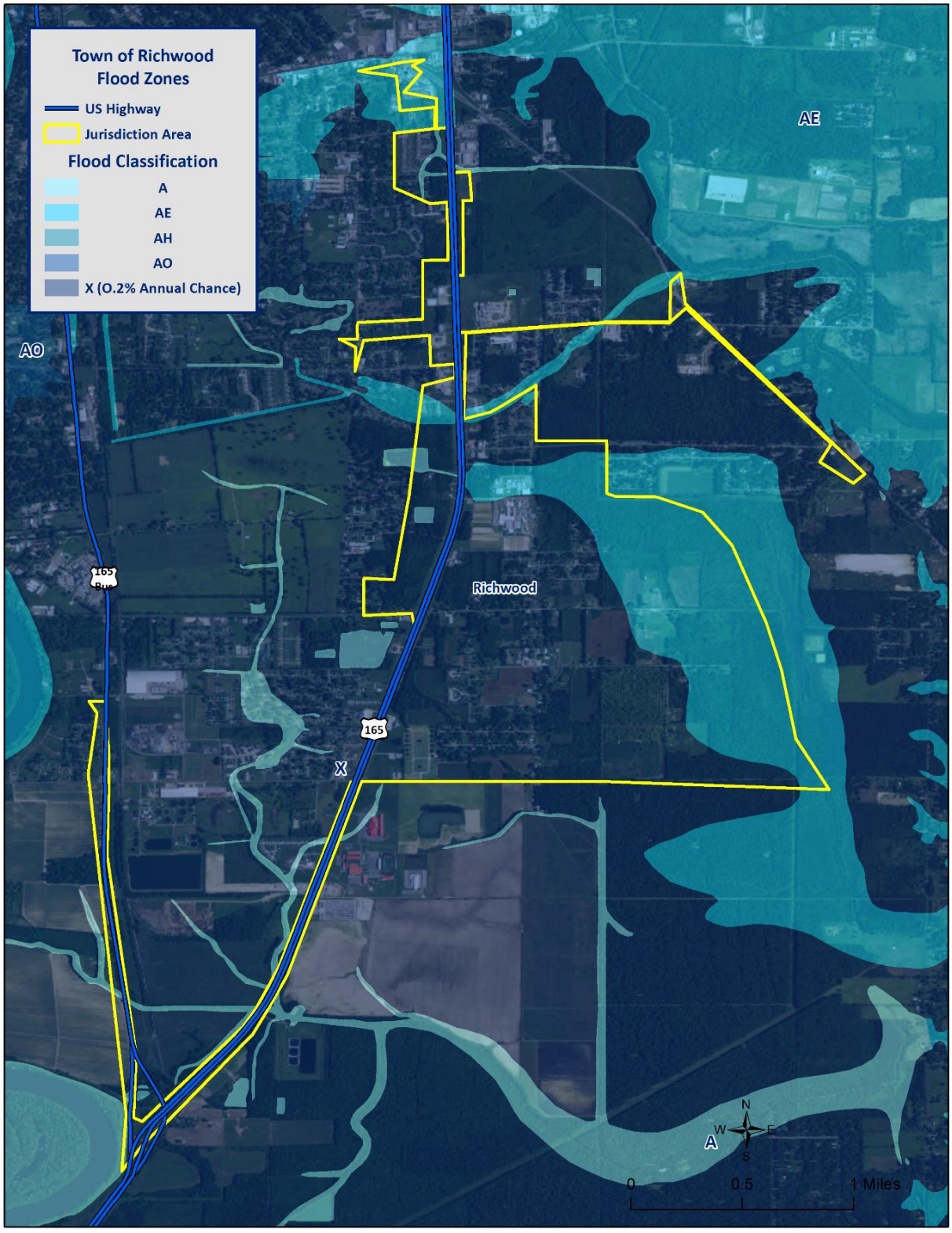


Figure 2-15: Town of Richwood Areas within the Flood Zones

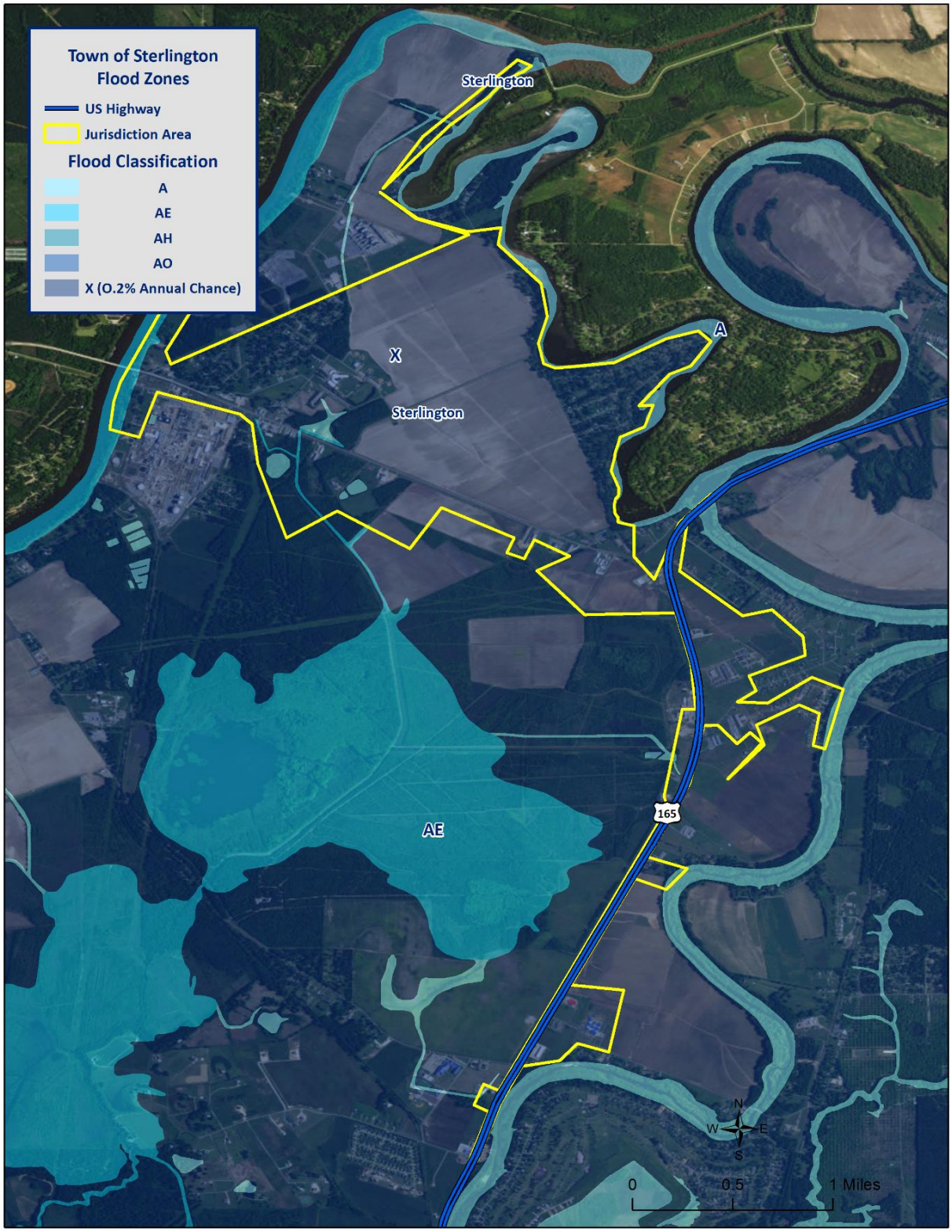


Figure 2-16: Town of Sterlington Areas within the Flood Zones

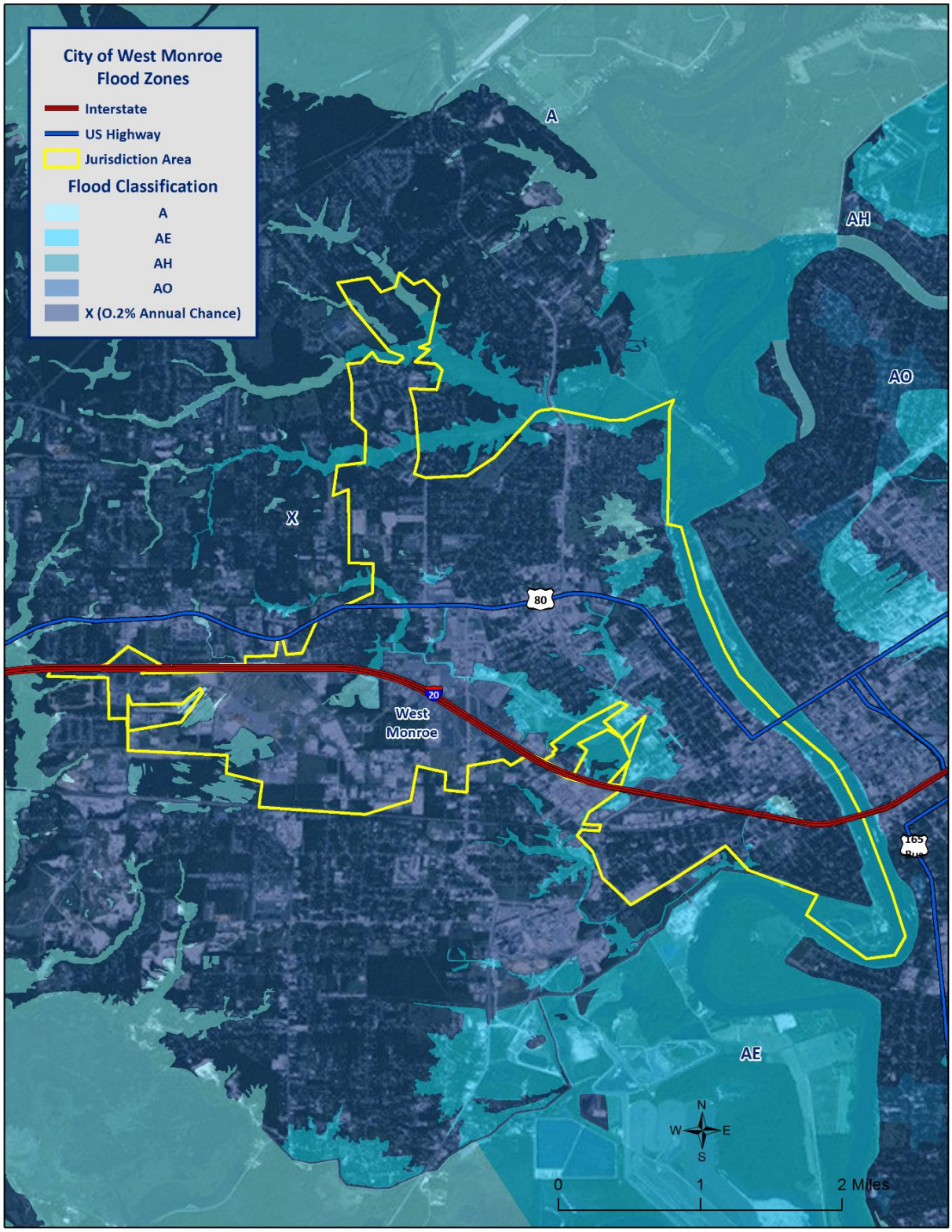


Figure 2-17: City of West Monroe Areas within the Flood Zones

Previous Occurrences / Extents

Historically, there have been 83 flooding events that have created significant flooding in Ouachita Parish between 1990 and 2015. Below is a brief synopsis of the eight flooding events that have occurred since 2010, including flooding events that have occurred since the parish's last planning update.

Table 2-22: Historical Floods in Ouachita Parish with Locations from 2010 - 2015

Date	Extents	Type of Flooding	Estimated Damages	Location
June 9, 2010	Heavy rainfall caused flash flooding in the Frizzell area. Water was over the road in front of Macs Fresh Market along Highway 139.	Flash Flood	$0	UNINCORPORATED AREA
November 29, 2010	Heavy rainfall caused flash floods in the Monroe area. A truck stalled in flood waters under a railroad bridge on Trenton Street.	Flash Flood	$500	MONROE
April 26, 2011	Volatile storms caused heavy rainfall in the parish. In Monroe, a man drowned when he drove his automobile into a flooded intersection at Arizona Street and East Street. A Monroe woman drowned when she drove through a barricaded and flooded roadway at Plum Street.	Flash Flood	$100,000	PARISHWIDE
February 4, 2012	Heavy rainfall caused extensive flooding throughout the parish. A house on Cedarbrook Drive in Monroe was flooded.	Flash Flood	$20,000	PARISHWIDE
March 11, 2012	Several reports of severe street flooding and road closures were reported in portions of Monroe and West Monroe due to heavy rainfall.	Flood	$0	MONROE AND WEST MONROE
June 2, 2013	Heavy rainfall caused extensive flooding throughout the parish. High water was reported across several roads in Monroe.	Flash Flood	$0	PARISHWIDE
April 6, 2014	Heavy rainfall caused extensive flooding in the Swartz community. Water entered homes off of Highway 139 and several other roads flooded.	Flash Flood	$100,000	UNINCORPORATED AREA
May 18, 2015	Excessive heavy rainfall was widespread across the portion. The Sunshine Estates Mobile Home Park was flood southwest of Monroe.	Flash Flood	$100,000	PARISHWIDE

Since 2010, there have been no significant flooding events in the incorporated areas of Richwood and Sterlington.

The worst-case scenarios are based on several different types of flooding events. Storm water excesses and riverine flooding primarily affect the low-lying areas of the parish, and flood depths of up to eight to ten feet can be expected in the unincorporated areas of the parish. The incorporated areas of Monroe and West Monroe can expect flood depths from three to six feet, while the incorporated areas Richwood and Sterlington can expect flood depths from two to four feet.

Frequency / Probability

While other parts of this plan, along with the State's Hazard Mitigation Plan, have relied on the SHELDUS database to provide the annual probability, due to Ouachita Parish having multiple jurisdictions, it was necessary to assess the historical data found in the National Climatic Data Center for Ouachita Parish and its jurisdictions to properly determine probability for future flood events. The table below shows the probability and return frequency for each jurisdiction.

Table 2-23: Annual Flood Probabilities for Ouachita Parish

Jurisdiction	Annual Probability	Return Frequency
Ouachita Parish (Unincorporated)	100%	Less than once a year
Monroe	88%	1 – 2 years
Richwood	24%	4 – 5 years
Sterlington	28%	3 – 4 years
West Monroe	76%	1 – 2 years

Based on historical record, the overall flooding probability for the entire Ouachita Parish planning area is 100%, with 83 events occurring over a 25-year period.

Estimated Potential Losses

Using the Hazus 2.2 Flood Model, along with the Parish DFIRM, the 100-year flood scenario was analyzed to determine losses from this worst-case scenario. *Table 2-24* shows the total economic losses that would result from this occurrence.

Table 2-24: Estimated Losses in Ouachita Parish from a 100-Year Flood Event (Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Flood Event
Ouachita Parish (Unincorporated)	$212,718,000
Monroe	$113,451,000
Richwood	$295,000
Sterlington	$428,000
West Monroe	$165,889,000
Total	$492,781,000

The Hazus 2.2 Flood Model also provides a breakdown by jurisdiction for seven primary sectors (Hazus occupancy) throughout the parish. The losses for each jurisdiction by sector are listed in the following tables. These sectors are comprised of privately owned structures/facilities, as well as locally, state, and federally owned structures/facilities.

Table 2-25: Estimated 100-Year Flood Losses for Unincorporated Ouachita Parish by Sector (Source: Hazus 2.2)

Ouachita Parish (Unincorporated)	Estimated Total Losses from 100-Year Flood Event
Agricultural	$1,550,000
Commercial	$12,945,000
Government	$3,759,000
Industrial	$22,202,000
Religious / Non-Profit	$4,985,000
Residential	$165,665,000
Schools	$1,612,000
Total	$212,718,000

Table 2-26: Estimated 100-Year Flood Losses for Monroe by Sector (Source: Hazus 2.2)

Monroe	Estimated Total Losses from 100-Year Flood Event
Agricultural	$10,000
Commercial	$49,274,000
Government	$5,322,000
Industrial	$10,178,000
Religious / Non-Profit	$3,764,000
Residential	$44,559,000
Schools	$344,000
Total	$113,451,000

Table 2-27: Estimated 100-Year Flood Losses for Richwood by Sector (Source: Hazus 2.2)

Richwood	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$44,000
Government	$0
Industrial	$0
Religious / Non-Profit	$100,000
Residential	$151,000
Schools	$0
Total	$295,000

Table 2-28: Estimated 100-Year Flood Losses for Sterlington by Sector (Source: Hazus 2.2)

Sterlington	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$6,000
Government	$0
Industrial	$0
Religious / Non-Profit	$353,000
Residential	$69,000
Schools	$0
Total	$428,000

Table 2-29: Estimated 100-Year Flood Losses for West Monroe by Sector (Source: Hazus 2.2)

West Monroe	Estimated Total Losses from 100-Year Flood Event
Agricultural	$186,000
Commercial	$68,433,000
Government	$380,000
Industrial	$7,725,000
Religious / Non-Profit	$11,828,000
Residential	$71,379,000
Schools	$5,958,000
Total	$165,889,000

Threat to People

The total population within the parish that is susceptible to a flood hazard is shown in the table below:

Table 2-30: Vulnerable Populations Susceptible to a 100-Year Flood Event (Source: Hazus 2.2)

Number of People Exposed to Flood Hazards			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Ouachita Parish (Unincorporated)	**86,854**	**8,356**	**9.6%**
Monroe	**48,815**	**8,767**	**18.0%**
Richwood	**3,392**	**162**	**4.8%**
Sterlington	**1,594**	**21**	**1.3%**
West Monroe	**13,065**	**5,123**	**39.2%**
Total	**153,720**	**22,429**	**14.6%**

The Hazus 2.2 Flood Model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions in the following tables:

Table 2-31: Vulnerable Populations Susceptible to a 100-Year Flood Event in Unincorporated Ouachita Parish (Source: Hazus 2.2)

Ouachita Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	8,356	9.6%
Persons Under 5 Years	609	7.3%
Persons Under 18 Years	1,585	19.0%
Persons 65 Years and Over	1,029	12.3%
White	5,049	60.4%
Minority	3,307	39.6%

Table 2-32: Vulnerable Populations Susceptible to a 100-Year Flood Event in Monroe (Source: Hazus 2.2)

Monroe		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	8,767	18.0%
Persons Under 5 Years	686	7.8%
Persons Under 18 Years	1,690	19.3%
Persons 65 Years and Over	1,107	12.6%
White	2,930	33.4%
Minority	5,837	66.6%

Table 2-33: Vulnerable Populations Susceptible to a 100-Year Flood Event in Richwood (Source: Hazus 2.2)

Richwood		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	162	4.8%
Persons Under 5 Years	6	3.6%
Persons Under 18 Years	19	11.5%
Persons 65 Years and Over	130	80.4%
White	29	17.7%
Minority	133	82.3%

Table 2-34: Vulnerable Populations Susceptible to a 100-Year Flood Event in Sterlington (Source: Hazus 2.2)

Sterlington		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	21	1.3%
Persons Under 5 Years	2	8.3%
Persons Under 18 Years	5	22.7%
Persons 65 Years and Over	2	10.8%
White	16	78.2%
Minority	5	21.8%

Table 2-35: Vulnerable Populations Susceptible to a 100-Year Flood Event in West Monroe (Source: Hazus 2.2)

West Monroe		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	5,123	39.2%
Persons Under 5 Years	397	7.8%
Persons Under 18 Years	815	15.9%
Persons 65 Years and Over	836	16.3%
White	3,172	61.9%
Minority	1,951	38.1%

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to flooding due to proximity within the 100-year floodplain.

Thunderstorms

The term "thunderstorm" is usually used as a catch-all term for several kinds of storms. Here, "thunderstorm" is defined to include any precipitation event in which thunder is heard or lightning is seen. Thunderstorms are often accompanied by heavy rain and strong winds, and depending on conditions, occasionally by hail or snow. Thunderstorms form when humid air masses are heated, which causes them to become convectively unstable. Consequently, the air masses rise. Upon rising, the air masses' water vapor condenses into liquid water and/or deposits directly into ice when they rise sufficiently to cool to the dew-point temperature.

Thunderstorms are classified into four main types (single-cell, multi-cell, squall line, and supercell), depending on the degree of atmospheric instability, the change in wind speed with height (called wind shear), and the degree to which the storm's internal dynamics are coordinated with those of adjacent storms. There is no such interaction for single-cell thunderstorms, but there is significant interaction with clusters of adjacent thunderstorms in multi-cell thunderstorms, and with a linear "chain" of adjacent storms in squall line thunderstorms. Though supercell storms have no significant interactions with other storms, they have very well-organized and self-sustaining internal dynamics, which allows them to be the longest-lived and most severe of all thunderstorms.

The life of a thunderstorm proceeds through three stages: the developing (or cumulus) stage, the mature stage, and the dissipation stage. During the developing stage, the unstable air mass is lifted as an updraft into the atmosphere. This sudden lift rapidly cools the moisture in the air mass, releasing latent heat as condensation and/or deposition occurs, which warms the surrounding environment, thus making it less dense than the surrounding air. This process intensifies the updraft and creates a localized lateral rush of air from all directions into the area beneath the thunderstorm to feed continued updrafts. At the mature stage, the rising air is accompanied by downdrafts caused by the shear of falling rain (if melted completely), or hail, freezing rain, sleet, or snow (if not melted completely). The dissipation stage is characterized by the dominating presence of the downdraft as the hot surface that gave the updrafts their buoyancy is cooled by precipitation. During the dissipation stage, the moisture in the air mass largely empties out.

The Storm Prediction Center, in conjunction with the National Weather Service (NWS), has the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued, along with definitions of each:

- *Severe Thunderstorm Watch*: Issued to alert people to the possibility of a severe thunderstorm developing in the area. Expected time frame for these storms is three to six hours.

- *Severe Thunderstorm Warning*: Issued when severe thunderstorms are imminent. This warning is highly localized and covers parts of one to several parishes (counties).

A variety of hazards might be produced by thunderstorms, including lightning, hail, tornadoes or waterspouts, flash flooding, and high-speed winds called downbursts. Nevertheless, given the criteria, the National Oceanic and Atmospheric Administration (NOAA) characterizes a thunderstorm as severe when it produces one or more of the following:

- Hail of one inch in diameter or larger
- Wind gusts to 58 mph or greater
- One or more tornadoes

Tornadoes and flooding hazards have been profiled within this report; therefore, for the purpose of thunderstorms, the sub-hazards of hail, high winds, and lightning will be profiled.

Thunderstorms occur throughout Louisiana at all times of the year, although the types and severity of those storms vary greatly depending on a wide variety of atmospheric conditions. Thunderstorms generally occur more frequently during the late spring and early summer when extreme variations exist between ground surface temperatures and upper atmospheric temperatures.

Hazard Description

Hailstorms

Hailstorms are severe thunderstorms in which balls or chunks of ice fall along with rain. Hail initially develops in the upper atmosphere as ice crystals that are bounced about by high-velocity updraft winds. The ice crystals grow through deposition of water vapor onto their surface. They then fall partially to a level in the cloud where the temperature exceeds the freezing point, melt partially, and then get caught in another updraft whereupon re-freezing and deposition grows another concentric layer of ice. After several trips up and down the cloud, they develop enough weight to fall. The size of hailstones varies depending on the severity and size of the thunderstorm. Higher surface temperatures generally mean stronger updrafts, which allow more massive hailstones to be supported by updrafts, leaving them suspended longer. This longer suspension time results in larger hailstone sizes. The tables on the next page display the TORRO Hailstorm Intensity Scale, along with a spectrum of hailstone diameters and their everyday equivalents.

Table 2-36: TORRO Hailstorm Intensity Scale

Intensity Category		Hail Diameter (mm)	Probable Kinetic Energy	Typical Damage Impacts
H0	Hard Hail	5	0 - 20	No damage
H1	Potentially Damaging	5 - 15	>20	Slight general damage to plant, 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 body work
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		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

Table 2-37: Spectrum of Hailstone Diameters and Their Everyday Description (Source: National Weather Service)

Spectrum of Hailstone Diameters	
Hail Diameter Size	**Description**
1/4”	Pea
1/2”	Plain M&M
3/4”	Penny
7/8”	Nickle
1” (severe)	Quarter
1 1/4”	Half Dollar
1 1/2”	Ping Pong Ball / Walnut
1 3/4”	Golf Ball
2”	Hen Egg / Lime
2 1/2"	Tennis Ball
2 3/4"	Baseball
3”	Teacup / Large Apple
4”	Softball
4 1/2"	Grapefruit
4 3/4” – 5”	Computer CD-DVD

Hailstorms can cause widespread damage to structures, automobiles, and crops. While the damage to individual structures or vehicles is often minor, the cumulative cost to communities, especially across large metropolitan areas, can be quite significant. Hailstorms can also be devastating to crops. Thus, the severity of hailstorms depends on the size of the hailstones, the length of time the storm lasts, and where it occurs.

Hail rarely causes loss of life, although large hailstones can cause bodily injury.

High Winds

In general, high winds can occur in a number of different ways, within and without thunderstorms. The Federal Emergency Management Agency (FEMA) distinguishes these as shown in the following table.

Table 2-38: High Winds Categorized by Source, Frequency, and Duration
(Source: Making Critical Facilities Safe from High Wind, FEMA)

High Winds Categories			
High Wind Type	**Description**	**Relative Frequency in Louisiana**	**Relative Maximum Duration in Louisiana**
Straight-line Winds	Wind blowing in straight line; usually associated with intense low-pressure area	High	Few minutes – 1 day
Downslope Winds	Wind blowing down the slope of a mountain; associated with temperature and pressure gradients	N/A	N/A
Thunderstorm Winds	Wind blowing due to thunderstorms, and thus associated with temperature and pressure gradients	High (especially in the spring and summer	Few minutes – several hours
Downbursts	Sudden wind blowing down due to downdraft in a thunderstorm; spreads out horizontally at the ground, possibly forming horizontal vortex rings around the downdraft	Medium-to-High(~5% of all thunderstorms)	~15 – 20 minutes
Northeaster (nor'easter) Winds	Wind blowing due to cyclonic storm off the east coast of North America; associated with temperature and pressure gradients between the Atlantic and land	N/A	N/A
Hurricane Winds	Wind blowing in spirals, converging with increasing speed toward eye; associated with temperature and pressure gradients between the Atlantic and Gulf and land	Low-to-Medium	Several days
Tornado Winds	Violently rotating column of air from base of a thunderstorm to the ground with rapidly decreasing winds at greater distances from center; associated with extreme temperature gradient	Low-to-Medium	Few minutes – few hours

The only high winds of present concern are thunderstorm winds and downbursts. Straight-line winds are common but are a relatively insignificant hazard (on land) compared to other high winds. Downslope winds are common but relatively insignificant in the hilly areas of Louisiana where they occur. Nor'easters are cyclonic events that have at most a peripheral effect on Louisiana, and none associated with high winds. Winds associated with hurricanes and tornadoes will be considered in their respective sections.

The following table presents the Beaufort Wind Scale, first developed in 1805 by Sir Francis Beaufort, which aids in determining relative force and wind speed based on the appearance of wind effects.

Table 2-39: Beaufort Wind Scale
(Source: NOAA's SPC)

Beaufort Wind Scale			
Force	**Wind (MPH)**	**WMO Classification**	**Appearance of Wind Effects on Land**
			Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-17	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	18-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-30	Strong Breeze	Larger tree branches moving, whistling in wires
7	31-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Twigs breaking off trees, generally impedes progress
9	47-54	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	54-73	Violent Storm	N/A
12	74+	Hurricane	N/A

Major damage directly caused by thunderstorm winds is relatively rare, while minor damage is common and pervasive, and most noticeable when it contributes to power outages. These power outages can have major negative impacts such as increased tendency for traffic accidents, loss of revenue for businesses, increased vulnerability to fire, food spoilage, and other losses that might be sustained by a loss of power. Power outages may pose a health risk for those requiring electric medical equipment and/or air conditioning.

Lightning

Lightning is a natural electrical discharge in the atmosphere that is a by-product of thunderstorms. Every thunderstorm produces lightning. There are three primary types of lightning: intra-cloud, cloud-to-ground, and cloud-to-cloud. Cloud-to-ground lightning has the potential to cause the most damage to property and crops, while also posing as a health risk to the populace in the area of the strike.

Damage caused by lightning is usually to homes or businesses. These strikes have the ability to damage electrical equipment inside the home or business, and can also ignite a fire that could destroy homes or crops.

Lightning continues to be one of the top three storm-related killers in the United States per FEMA, but it also has the ability to cause negative long-term health effects to the individual that is struck. The following table outlines the lightning activity level that is a measurement of lightning activity.

Table 2-40: Lightning Activity Level (LAL) Grids

LAL	Cloud and Storm Development	Lightning Strikes/15 Min
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent.	>25
6	Similar to LAL 3 except thunderstorms are dry	

Hazard Profile

Hailstorms

Location

Because hailstorms are a climatological based hazard, the entire planning area for Ouachita Parish is equally at risk for hailstorms.

Previous Occurrences / Extents

The SHELDUS database and NCDC reports 154 significant hailstorm events occurring within the boundaries of Ouachita Parish between the years of 1990 - 2015. According to the National Climatic Data Center, hailstorm diameters experienced in Ouachita Parish have ranged from 0.5 inches to 4 inches since 1990. The most frequently recorded hail size has been 0.75 inch diameters. *Figure 2-18* displays the density of hailstorms in Ouachita Parish and adjacent parishes. Based on the National Climatic Data Center dataset, *Table 2-41* provides an overview of hailstorms that have impacted the Ouachita Parish planning area since 2009. Ouachita Parish can expect to experience hail up to 4 inches in diameter for future events.

Table 2-41: Previous Occurrences of Hailstorms in Ouachita Parish (Source: NCDC)

Date	Recorded Hail Size (inches)	Location
January 20, 2010	1.75	LAKESHORE
April 23, 2010	1.75	LAKESHORE
May 19, 2010	1	RICHWOOD
May 26, 2010	0.88	STEVEN
May 26, 2010	1	STEVEN
June 9, 2010	1	STERLINGTON
March 29, 2011	1.75	FRIZZELL
April 4, 2011	1	PINE GROVE
April 15, 2011	0.75	LAKESHORE
April 15, 2011	1	MONROE
April 26, 2011	1	CADERVILLE
April 26, 2011	1	CADERVILLE
February 1, 2012	0.75	MAGENTA
March 2, 2012	0.75	STEVEN
April 3, 2012	0.75	FOREST PARK
April 3, 2012	0.88	KIROLI WOODS
April 5, 2012	1	DESHARD
July 20, 2012	1.75	STEVEN
July 20, 2012	1	WEST MONROE
October 17, 2012	0.75	CALHOUN
June 1, 2013	1	LAPINE
April 6, 2014	0.75	CALHOUN
June 8, 2014	1.75	DESHARD
June 9, 2014	0.75	LAKESHORE
December 23, 2014	0.75	STEVEN
December 23, 2014	0.75	LAKESHORE

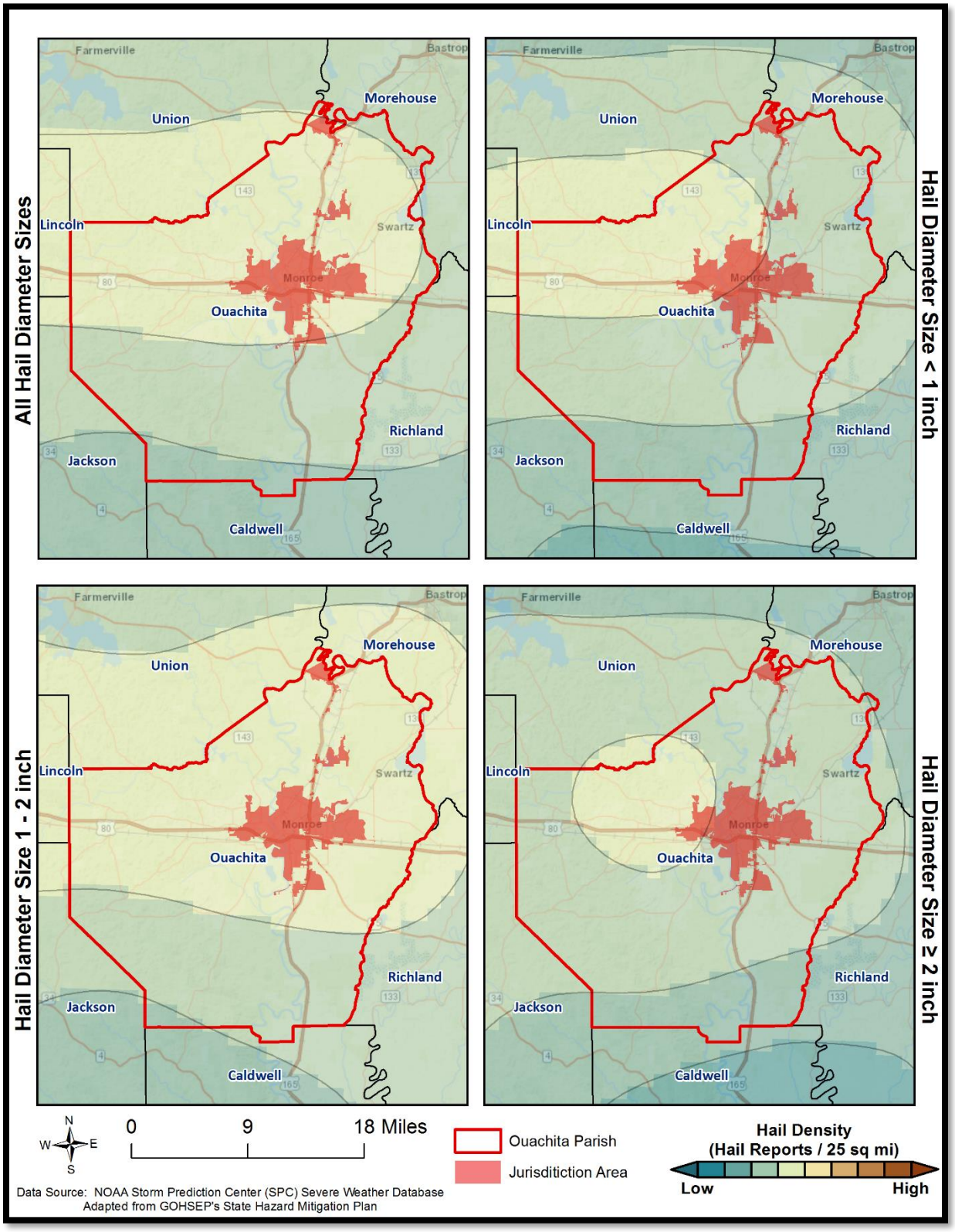


Figure 2-18: Density of Hailstorms by Diameter from 1950-2012
(Source: State of Louisiana Hazard Mitigation Plan 2014)

Frequency

Based on historical data from SHELDUS and NCDC for the past 25 years, it is estimated the probability of occurrence for a significant hailstorm event is approximately 100%. The probability was determined based on a review of significant hail data that has caused damages in the last 25 years, in which Ouachita Parish has had 154 recorded events.

Estimated Potential Losses

According to the SHELDUS database, property damage due to hailstorms in Ouachita Parish have totaled approximately $3,768 since 1990. To estimate the potential losses of a hail event on an annual basis, the total damages recorded for hail events was divided by the total number of years of available hail data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of $151. *Table 2-42* provides an estimate of potential property losses for Ouachita Parish.

Table 2-42: Estimated Annual Property Losses in Ouachita Parish from Hailstorms

Estimated Annual Potential Losses from Hailstorms for Ouachita Parish				
Unincorporated Ouachita Parish (56.5% of Population)	Monroe (31.8% of Population)	Richwood (2.2% of Population)	Sterlington (1% of Population)	West Monroe (8.5% of Population)
$85	$48	$3	$2	$13

There have been no deaths or injuries due to hailstorms from 1990 – 2015 in Ouachita Parish.

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to hailstorms.

High Winds

Location

Because high winds are a climatological based hazard, the entire planning area for Ouachita Parish is equally at risk for high winds.

Previous Occurrences / Extents

The SHELDUS database reports a total of 192 thunderstorm wind events occurring within the boundaries of Ouachita Parish between the years of 1990 to 2015. The significant thunderstorm wind events experienced in Ouachita Parish have ranged in wind speed from 40 mph to 115 mph. Ouachita Parish can expect to receive thunderstorm winds up to 115 mph for future high wind events. The table on the next page provides an overview of significant high wind events over the last five years.

Table 2-43: Previous Occurrences for Thunderstorm High Wind Events

Location	Date	Recorded Wind Speeds (mph)	Property Damage	Crop Damage
MONROE	May 19, 2010	58	$0	$0
LAKESHORE	May 20, 2010	60	$15,000	$0
STEVEN	May 26, 2010	60	$0	$0
STEVEN	May 26, 2010	60	$0	$0
MILLHAVEN	May 26, 2010	61	$0	$0
LAKESHORE	May 26, 2010	60	$0	$0
LAKESHORE	June 1, 2010	62	$0	$0
LAKESHORE	June 1, 2010	70	$50,000	$0
MONROE	June 1, 2010	60	$0	$0
LAKESHORE	July 26, 2010	61	$0	$0
CHENIERE	August 5, 2010	60	$0	$0
MONROE	August 5, 2010	60	$0	$0
LAKESHORE	August 16, 2010	62	$60,000	$0
STEVEN	August 16, 2010	60	$0	$0
CALHOUN	February 24, 2011	61	$0	$0
DESHARD	February 24, 2011	60	$0	$0
CHENIERE	February 24, 2011	62	$0	$0
LAKESHORE	February 24, 2011	60	$0	$0
LAKESHORE	April 26, 2011	70	$200	$0
KIROLI WOODS	April 26, 2011	69	$30,000	$0
CALHOUN	April 26, 2011	70	$0	$0
STEVEN	April 26, 2011	62	$0	$0
KIROLI WOODS	April 26, 2011	70	$0	$0
INDIAN VLG	April 26, 2011	64	$500	$0
LAKESHORE	April 27, 2011	81	$0	$0
LAKESHORE	April 27, 2011	75	$0	$0
MAIDOO	August 20, 2011	62	$0	$0
STERLINGTON	August 24, 2011	58	$0	$0
CADERVILLE	April 2, 2012	62	$20,000	$0
BROWNSVILLE	April 2, 2012	62	$10,000	$0
DESHARD	April 2, 2012	61	$15,000	$0
WILDS	June 12, 2012	61	$0	$0
RICHWOOD	June 14, 2012	60	$0	$0
STEVEN	July 20, 2012	69	$0	$0
MAIDOO	July 20, 2012	60	$0	$0
STEVEN	August 6, 2012	60	$0	$0
WEST MONROE	October 17, 2012	61	$0	$0

Location	Date	Recorded Wind Speeds (mph)	Property Damage	Crop Damage
BROWNSVILLE	December 25, 2012	60	$0	$0
FOLKSVILLE	January 29, 2013	69	$0	$0
STEVEN	January 29, 2013	69	$0	$0
EDGEWATER	January 29, 2013	74	$0	$0
LAKESHORE	May 21, 2013	62	$0	$0
STEVEN	June 1, 2013	61	$0	$0
STEVEN	June 1, 2013	63	$5,000	$0
EDGEWATER	June 28, 2013	77	$70,000	$0
LAKESHORE	June 28, 2013	77	$0	$0
LAKESHORE	June 28, 2013	74	$0	$0
LAKESHORE	June 28, 2013	74	$0	$0
LAKESHORE	June 28, 2013	58	$0	$0
STEVEN	August 11, 2013	62	$30,000	$0
DREW	December 21, 2013	67	$0	$0
CHENIERE	December 21, 2013	69	$0	$0
LAKESHORE	December 21, 2013	69	$2,500,000	$0
STEVEN	April 14, 2014	63	$50,000	$0
STEVEN	April 14, 2014	63	$0	$0
DESHARD	June 9, 2014	69	$0	$0
LAKESHORE	June 9, 2014	66	$0	$0
STEVEN	June 28, 2014	61	$0	$0
LAKESHORE	September 6, 2014	40	$30,000	$0
STEVEN	October 13, 2014	66	$0	$0
LAKESHORE	October 13, 2014	69	$0	$0
DESHARD	April 22, 2015	75	$1,000,000	$0
STEVEN	May 25, 2015	61	$0	$0
FONDALE	June 9, 2015	60	$0	$0
FOREST PARK	June 24, 2015	60	$0	$0
INDIAN VLG	December 28, 2015	61	$0	$0

Frequency

High winds are a fairly common occurrence within Ouachita Parish, with an annual chance of occurrence calculated at 100%.

Estimated Potential Losses

Since 1990, there have been 192 significant wind events that have resulted in property damages according to the SHELDUS database. The total property damages associated with those storms have totaled $3,997,223. To estimate the potential losses of a wind event on an annual basis, the total damages recorded for wind events was divided by the total number of years of available wind data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of $159,889. The following table provides an estimate of potential property losses for Ouachita Parish:

Table 2-44: Estimated Annual Property Losses in Ouachita Parish Resulting from High Winds

Estimated Annual Potential Losses from Thunderstorm Winds for Ouachita Parish				
Unincorporated Ouachita Parish (56.5% of Population)	Monroe (31.8% of Population)	Richwood (2.2% of Population)	Sterlington (1% of Population)	West Monroe (8.5% of Population)
$90,340	$50,774	$3,528	$1,658	$13,589

There have been no reported injuries or fatalities as a result of a thunderstorm wind event over the 25-year record.

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to high winds.

Lightning

Location

Like hail and high winds, lightning is a climatological based hazard and has the same probability of occurring throughout the entire planning area for Ouachita Parish.

Previous Occurrences / Extents

The SHELDUS database reports a total of nine lightning events occurring within the boundaries of Ouachita Parish between the years of 1990 - 2015. The SHELDUS database only records lightning events that cause death, injuries, crop damage, and/or property damage, so these numbers do not accurately reflect the number of lightning events in Ouachita Parish, which occur on a nearly monthly basis. The planning area can expect to have a lightning density of 11-12 flashes per sq. mile per year. Since 2010, there have been no lightning events that have caused property damage or loss of life in the Ouachita Parish planning area.

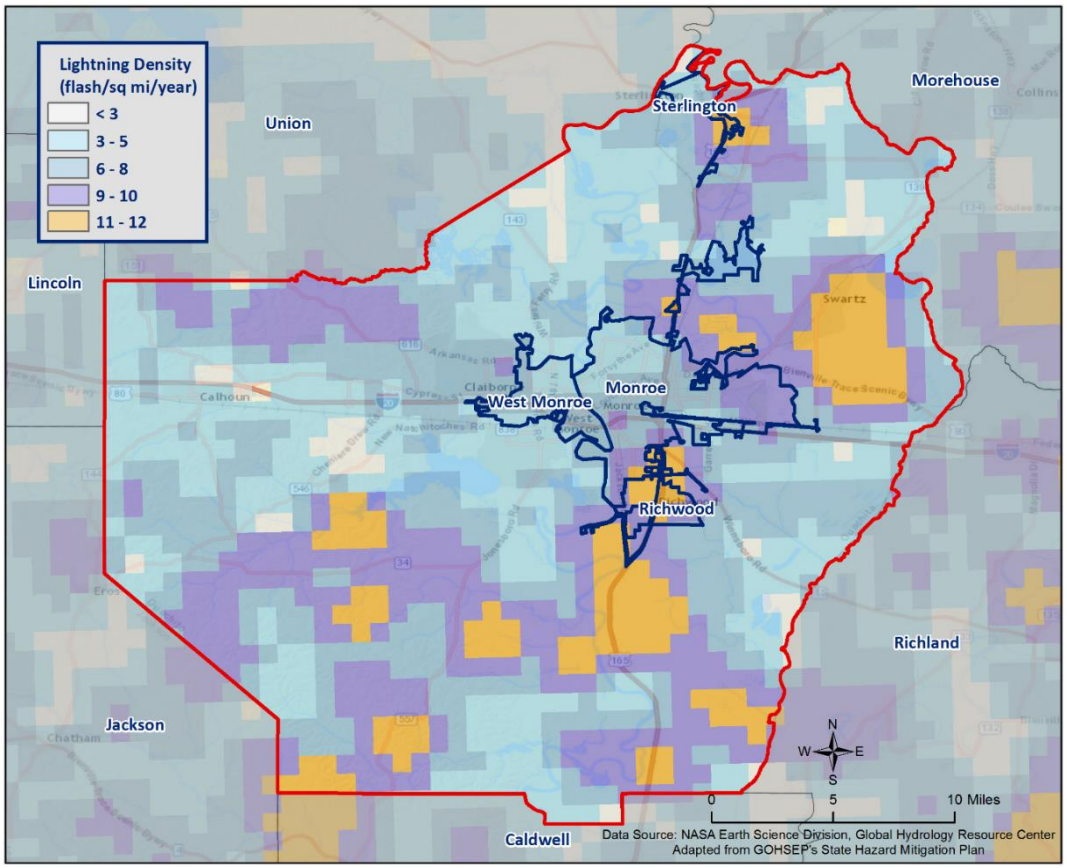


Figure 2-19: Lightning Density Reports for Ouachita Parish

Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in Ouachita Parish is high. However, lightning that meets the definition that is used by SHELDUS and the NCDC that actually results in damages to property and injury or death is a less likely event. According to SHELDUS, there have been nine lightning events that have caused property damages or injuries over the last 25 years, establishing an annual probability of 36%.

Estimated Potential Losses

Since 1990, there have been nine significant lightning events that have resulted in property damages according to the SHELDUS database. The total property damages associated with lightning events totaled $689,936. To estimate the potential losses of a lightning event on an annual basis, the total damages recorded for lightning events was divided by the total number of years of available major lightning strike data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of $27,597. The table on the next page provides an estimate of potential property losses for Ouachita Parish.

Table 2-45: Estimated Annual Property Losses in Ouachita Parish from Lightning

Estimated Annual Potential Losses from Thunderstorm Lightning for Ouachita Parish				
Unincorporated Ouachita Parish (56.5% of Population)	Monroe (31.8% of Population)	Richwood (2.2% of Population)	Sterlington (1% of Population)	West Monroe (8.5% of Population)
$8,905	$334	$309	$7,424	$2,105

There have been one reported injury and no fatalities in Ouachita Parish as a result of a lightning strikes over the 25-year record.

Vulnerability

See Appendix C for parish and municipality building exposure to lightning hazards.

Tornadoes

Tornadoes (also called twisters or cyclones) are rapidly rotating funnels of wind extending between storm clouds and the ground. For their size, tornadoes are the most severe storms, and 70% of the world's reported tornadoes occur within the continental United States, making them one of the most significant hazards Americans face. Tornadoes and waterspouts form during severe weather events, such as thunderstorms and hurricanes, when cold air overrides a layer of warm air, causing the warm air to rise rapidly. This usually results in a counterclockwise rotation in the northern hemisphere. The updraft of air in tornadoes always rotates because of wind shear (differing speeds of moving air at various heights), and it can rotate in either a clockwise or counterclockwise direction; clockwise rotations (in the northern hemisphere) will sustain the system, at least until other forces cause it to die seconds to minutes later.

Since February 1, 2007, the Enhanced Fujita (EF) Scale has been used to classify tornado intensity. The EF Scale classifies tornadoes based on their damage pattern rather than wind speed; wind speed is then derived and estimated. This contrasts with the Saffir-Simpson scale used for hurricane classification, which is based on measured wind speed. *Table 2-46* shows the EF scale in comparison with the old Fujita (F) Scale, which was used prior to February 1, 2007. When discussing past tornadoes, the scale used at the time of the hazard is used. Damage and adjustment between scales can be made using the following tables.

Table 2-46: Comparison of the Enhanced Fujita (EF) Scale to the Fujita (F) Scale

Wind Speed (mph)	**Enhanced Fujita Scale**					
	EF0	**EF1**	**EF2**	**EF3**	**EF4**	**EF5**
	65-85	86-110	111-135	136-165	166-200	>200
	Fujita Scale					
	F0	**F1**	**F2**	**F3**	**F4**	**F5**
	<73	73-112	113-157	158-206	207-260	>261

Table 2-47: Fujita and Enhanced Fujita Tornado Damage Scale

Scale	Typical Damage
F0/EF0	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1/EF1	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2/EF2	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; light-object missiles generated; cars lifted off ground.
F3/EF3	Severe damage. Roofs and some walls torn of well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4/EF4	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5/EF5	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

The National Weather Service (NWS) has the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued, along with definitions of each:

- *Tornado Watch*: Issued to alert people to the possibility of a tornado developing in the area. A tornado has not been spotted but the conditions are favorable for tornadoes to occur.
- *Tornado Warning*: Issued when a tornado has been spotted or when radar identifies a distinctive "hook-shaped" area within a thunderstorm line.

Structures within the direct path of a tornado vortex are often reduced to rubble. Structures adjacent to the tornado's path are often severely damaged by high winds flowing into the tornado vortex, known as inflow winds. It is here, adjacent to the tornado's path, that the building type and construction techniques are critical to the structure's survival. Although tornadoes strike at random, making all buildings vulnerable, mobile homes, homes with crawlspaces, and buildings with large spans are more likely to suffer damage.

The major health hazard from tornadoes is physical injury from flying debris, or being in a collapsed building or mobile home. Within a building, flying debris or projectiles are generally stopped by interior walls. However, if a building has no partitions, any glass, brick, or other debris blown into the interior is life threatening. Following a tornado, damaged buildings are a potential health hazard due to instability, electrical system damage, and gas leaks. Sewage and water lines may also be damaged.

Peak tornado activity in Louisiana occurs during the spring, as it does in the rest of the United States. Nearly one-third of observed tornadoes in the United States occur during April. About half of those in Louisiana, including many of the strongest, occur between March and June. Fall and winter tornadoes are less frequent, but the distribution of tornadoes throughout the year is more uniform in Louisiana than in locations farther north.

Location

While there is a significant tornado record in Ouachita Parish with actual locations, tornadoes in general are a climatological based hazard and have the same approximate probability of occurring in Ouachita Parish as all of its jurisdictions. Because a tornado has a similar probability of striking anywhere within the planning area for Ouachita Parish, all jurisdictions are equally at risk for tornadoes.

Previous Occurrences / Extents

SHELDUS reports a total of 15 tornadoes or waterspouts occurring within the boundaries of Ouachita Parish between the years of 1990 - 2015. The tornadoes experienced in Ouachita Parish have from ranged EF0 to EF2 on the EF scale, and ranged from F0 to F4 on the F scale. The worst case scenario Ouachita Parish can expect in the future is an EF4 tornado.

The tornado that caused the most damage to property occurred on October 13, 2014. The EF2 tornado was responsible for over $4 million in damage. The tornado responsible for the most injuries occurred on December 2, 1983. The tornado injured 10 individuals in the south portion of Monroe. There have been no fatalities in Ouachita Parish as a result of tornadoes.

Table 2-48: Historical Tornadoes in Ouachita Parish with Locations from 2010 - 2015

Date	Impact	Property Damage	Location	Magnitude
November 29, 2010	3.67 mile path with a width of 100 yards. Damaged a metal awning and snapped numerous trees.	$10,857	UNINCORPORATED AREA	E1
April 26, 2011	1.88 mile path with a width of 50 yards. Damaged the roof of a home and uprooted several trees.	$210	UNINCORPORATED AREA	EF0
October 13, 2014	0.7 mile path with a width of 225 yards. Uprooted several trees that fell on houses.	$250,000	UNINCORPORATED AREA	EF1
October 13, 2014	9.05 mile path with a width of 300 yards. Significantly damaged several homes and a high school in its path.	$4,000,000	UNINCORPORATED AREA, WEST MONROE, AND MONROE	EF2

The incorporated areas of Sterlington and Richwood have not experienced a tornado event from 2009 to the present. Since 2011, the year in which the last update to this hazard mitigation plan was written, Ouachita Parish has had three tornadoes touchdown in the unincorporated areas of the parish and the incorporated areas of West Monroe and Monroe. The following is a brief synopsis of these events:

April 26, 2011 – EF0 Tornado in Frizzell

A tornado touched down on southwest of the intersection of Highway's 594 and 139 knocking over several trees. The tornado continued on a north-northeast path along Highway 139 where it uprooted larger trees along Trichel Lane and Vinwood Road. The tornado dissipated just north of the intersection of Highway 139 and Stubbs Vinson Road where it damaged the roof of a home.

October 13, 2014 – EF1 Tornado in Okaloosa

An EF1 tornado touched down near the intersection of the western branch of Murry Circle where it snapped numerous trees as it crossed Eastern Murry Circle and Gardner Road. Several homes on Murry Circle and Gardner Road sustained damage from fallen trees before the tornado lifted.

October 13, 2014 – EF2 Tornado in Monroe and West Monroe

An EF2 tornado touched down in North Central Ouachita Parish. The tornado initially uprooted and snapped several trees as it moved towards the city of West Monroe. In West Monroe, the tornado damaged the roofs of several homes and businesses before damaging the roof of West Monroe High School. The tornado moved east into Monroe where it snapped 15 power poles and several trees. Monroe received some of the strongest winds from the tornado. The tornado uplifted at the intersection of Lamy Lane and Armand Street.

Frequency / Probability

Tornadoes are a sporadic occurrence within Ouachita Parish, with an annual chance of occurrence calculated at 60% based on the records for the past 25 years (1990 - 2015). The following figure displays the density of tornado touch downs in Ouachita Parish and neighboring parishes.

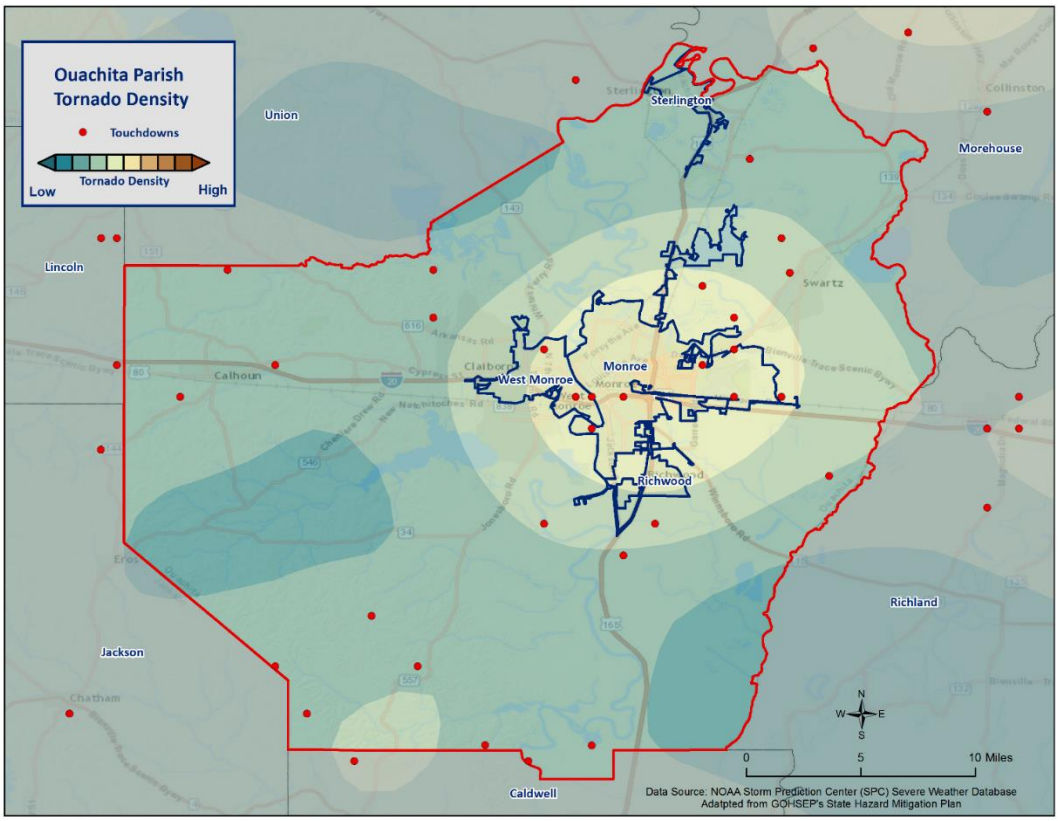


Figure 2-20: Location and Density of Tornadoes to Touch Down in Ouachita Parish (Source: NOAA/SPC Severe Weather Database)

Estimated Potential Losses

According to the SHELDUS database, there have been 15 tornadoes that have caused some level of property damage. The total damage from the actual claims for property is $4,699,809, with an average cost of $313,321 per tornado strike. When annualizing the total cost over the 25-year record, total annual loses based on tornadoes are estimated to be $187,992. To provide an estimated annual estimated potential loss per jurisdiction, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the table on the next page provides an annual estimate of potential losses for Ouachita Parish.

Table 2-49: Estimated Annual Losses from Tornadoes in Ouachita Parish

Estimated Annual Potential Losses from Tornadoes for Ouachita Parish				
Unincorporated Ouachita Parish (56.5% of Population)	Monroe (31.8% of Population)	Richwood (2.2% of Population)	Sterlington (1% of Population)	West Monroe (8.5% of Population)
$106,218	$59,698	$4,148	$1,949	$15,978

Table 2-50 presents an analysis of building exposure that is susceptible to tornadoes by general occupancy type for Ouachita Parish, along with the percentage of building stock that are mobile homes.

Table 2-50: Building Exposure by General Occupancy Type for Tornadoes in Ouachita Parish (Source: FEMA's Hazus 2.2)

Building Exposure by General Occupancy Type for Tornadoes Exposure Types ($1,000)							
Residential	**Commercial**	**Industrial**	**Agricultural**	**Religion**	**Government**	**Education**	**Mobile Homes (%)**
16,757,019	5,960,373	1,200,330	55,044	666,248	221,516	255,814	21.3%

There have been no injuries or fatalities during this 25-year period.

In assessing the overall risk to population, the most vulnerable population throughout the parish are those residing in manufacturing housing. Approximately 21.3% of all housing in Ouachita Parish consists of manufactured housing. Based on location data collected in a previous hazard mitigation project, there are 22 known locations where manufactured housing is concentrated. Each of those 22 locations have an overall number of manufactured houses ranging from two to 53. The location and density of manufactured houses can be seen in *Figure 2-21*.

Manufactured housing is more likely to sustain damage from a tornado than any other residential structure. The highest concentration of manufactured home parks is located in the unincorporated area of Ouachita Parish (*Table 2-51*). However, this does not influence the risk associated with a tornado event since they strike at random, making all structures and population within the planning area equally vulnerable.

Table 2-51: Manufactured Home Distribution throughout Ouachita Parish

Location	Number of Manufactured Home Parks	% of Manufactured Home Parks
Unincorporated Area	17	77.3%
Monroe	2	9.1%
Richwood	1	4.5%
Sterlington	1	4.5%
West Monroe	1	4.5%

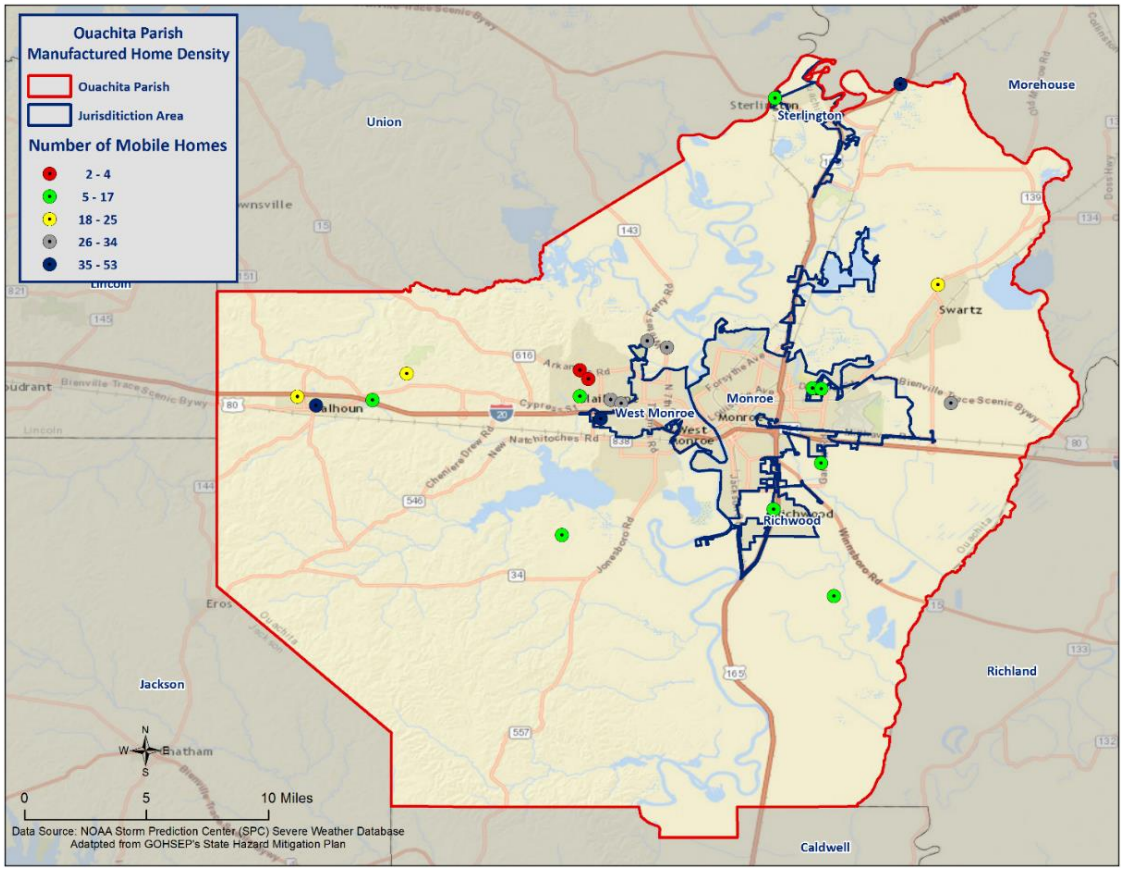


Figure 2-21: Location and Approximate Number of Units in Manufactured Housing Locations throughout Ouachita Parish

Vulnerability

See Appendix C for parish and municipality building exposure to tornado hazards.

Tropical Cyclones

Tropical cyclones are among the worst hazards that Louisiana faces. These spinning, low-pressure air masses draw surface air into their centers and attain strength ranging from weak tropical waves to the most intense hurricanes. Usually, these storms begin as clusters of oceanic thunderstorms off the western coast of Africa, moving westward in the trade wind flow. The spinning of these thunderstorm clusters begins because of the formation of low pressure in a perturbation in the westerly motion of the storms associated with differential impacts of the Earth's rotation. The west-moving, counterclockwise-spinning collection of storms, now called a tropical disturbance, may then gather strength as it draws humid air toward its low-pressure center. This results in the formation of a tropical depression (defined when the maximum sustained surface wind speed is 38 mph or less), then a Tropical Cyclone (when the maximum sustained surface wind ranges from 39 mph to 73 mph), and finally a hurricane (when the maximum sustained surface wind speeds exceed 73 mph). On the next page, the table presents the Saffir-Simpson Hurricane Wind Scale, which categorizes tropical cyclones based on sustained winds.

Table 2-52: Saffir-Simpson Hurricane Wind Scale

Saffir-Simpson Hurricane Wind Scale			
Category	**Sustained Winds**	**Pressure**	**Types of Damage Due to Winds**
Tropical Depression	<39 mph	N/A	N/A
Tropical Cyclone	39-73 mph	N/A	N/A
1	74-95 mph	>14.2 psi	Very dangerous winds will produce some damage. Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallow-rooted trees may be toppled, especially after the soil becomes waterlogged. Extensive damage to power lines and poles will likely result in power outages that could last several days.
2	96-110 mph	14-14.2 psi	Extremely dangerous winds will cause extensive damage. Well-constructed frame homes could sustain major roof and siding damage. Many shallow-rooted trees will be snapped or uprooted, especially after the soil becomes waterlogged, and block numerous roads. Near total power loss is expected, with outages that could last from several days to weeks.
3	111-129 mph	13.7 -14 psi	Devastating damage will occur. Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, especially after the soil becomes waterlogged, blocking numerous roads. Electricity and water may be unavailable for several days to weeks after the storm passes.
4	130-156 mph	13.3-13.7 psi	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 trees will be snapped or uprooted, especially after the soil becomes waterlogged, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher	<13.7 psi	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 will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks to months.

Many associated hazards can occur during a hurricane, including heavy rains, flooding, high winds, and tornadoes. A general rule of thumb in coastal Louisiana is that the number of inches of rainfall to be expected from a tropical cyclone is approximately 100 divided by the forward velocity of the storm in mph; so a fast-moving storm (20 mph) might be expected to drop five inches of rain while a slow-moving (5 mph) storm could produce totals of around 20 inches. However, no two storms are alike, and such generalizations have limited utility for planning purposes. Hurricane Beulah, which struck Texas in 1967, spawned 115 confirmed tornadoes. In recent years, extensive coastal development has increased the storm surge resulting from these storms so much that this has become the greatest natural hazard threat to property and loss of life in the state. Storm surge is a temporary rise in sea level generally caused by reduced air pressure and strong onshore winds associated with a storm system near the coast. Although storm surge can technically occur at any time of the year in Louisiana, surges caused by hurricanes can be particularly deadly and destructive. Such storm surge events are often accompanied by large, destructive waves (exceeding ten meters in some places) that can inflict a high number of fatalities and economic losses. In 2005, Hurricane Katrina clearly demonstrated the destructive potential of this hazard, as it produced the highest modern-day storm surge levels in the State of Louisiana, reaching up to 18.7 feet near Alluvial City in St. Bernard Parish.

Property can be damaged by the various forces that accompany a tropical cyclone. High winds can directly impact structures in three ways: wind forces, flying debris, and pressure. By itself, the force of the wind can knock over trees, break tree limbs, and destroy loose items, such as television antennas and power lines. Many things can be moved by high winds. As winds increase, so does the pressure against stationary objects. Pressure against a wall rises with the square of the wind speed. For some structures, this force is enough to cause failure. The potential for damage to structures is increased when debris breaks the building “envelope” and allows the wind pressure to impact all surfaces (the building envelope includes all surfaces that make up the barrier between the indoors and the outdoors, such as the walls, foundation, doors, windows, and roof). Mobile homes and buildings in need of maintenance are most subject to wind damage. High winds mean bigger waves. Extended pounding by waves can demolish any poorly or improperly designed structures. The waves also erode sand beaches, roads, and foundations. When foundations are compromised, the building will collapse.

Nine out of ten deaths during hurricanes are caused by storm surge flooding. Falling tree limbs and flying debris caused by high winds have the ability to cause injury or death. Downed trees and damaged buildings are a potential health hazard due to instability, electrical system damage, broken pipelines, chemical releases, and gas leaks. Sewage and water lines may also be damaged. Salt water and fresh water intrusions from storm surge send animals, such as snakes, into areas occupied by humans.

Location

Hurricanes are the single biggest threat to all of Louisiana. With any single hurricane having the potential to devastate multiple parishes at once, the risk of a tropical cyclone has the probability of impacting anywhere within the planning area for Ouachita Parish. As such, all jurisdictions are equally at risk for tropical cyclones.

Previous Occurrences / Extents

The central Gulf of Mexico coastline is among the most hurricane-prone locations in the United States, and hurricanes can affect every part of the state. The SHELDUS database reports a total of three tropical cyclone events occurring within the boundaries of Ouachita Parish between the years 2002 and 2014 (*Table 2-53*). The tropical cyclone events experienced in Ouachita Parish include depressions, storms, and hurricanes. As a worst case scenario, Ouachita Parish can expect to experience hurricanes at the Category 1 level in the future.

Table 2-53: Historical Tropical Cyclone Events in Ouachita Parish from 2002 - 2015 (Source: SHELDUS)

Date	Name	Storm Type At Time of Impact
September 1, 2008	Gustav	Tropical Storm
September 13, 2008	Ike	Tropical Storm
August 30, 2012	Isaac	Tropical Storm

Hurricane Gustav (2008)

Hurricane Gustav entered the southeast Gulf of Mexico as a major Category 3 hurricane on August 31, 2008, after developing in the Caribbean Sea and moving across western Cuba. Gustav tracked northwestward across the Gulf toward Louisiana and made landfall as a Category 2 hurricane near Cocodrie, Louisiana, during the morning of September 1st. Gustav continued to move northwest across south Louisiana and weakened to a Category 1 storm over south central Louisiana later that day. The storm diminished to a tropical depression over northwestern Louisiana on September 2nd.

The highest wind gust recorded was 117 mph (102 kts) at a USGS site at the Houma Navigational Canal and at the Pilot Station East C-MAN near the Southwest Pass of the Mississippi River. The highest sustained wind of 91 mph was recorded at the Pilot's Station East C-MAN site. However, due to the failure of equipment at some observation sites during the storm, higher winds may have occurred. The minimum sea level pressure measured was 951.6 millibars at a USGS site at Caillou Lake, southwest of Dulac, and 954.5 millibars at the LUMCON facility near Dulac. Rainfall varied considerably across southeast Louisiana, ranging from around four inches to just over 11 inches.

Gustav produced widespread wind damage across southeast Louisiana, especially in the area from Houma and Thibodaux through the greater Baton Rouge area. Hurricane force wind gusts occurred also across the inland areas, including the Baton Rouge area and surrounding parishes. A peak wind gust of 91 mph was recorded at the Baton Rouge (Ryan Field) Airport at 1:12 PM CST. This was only one mph less than the highest wind gust recorded during Hurricane Betsy in 1965. After the storm, the electric utility serving most of southeast Louisiana reported 75 to 100 percent of utility customers were without power, in areas ranging from Lafourche and Terrebonne Parishes northwest through the Baton Rouge area to central Louisiana and southwest Mississippi. Considerable damage occurred to many houses and structures as large tree limbs and trees were toppled by the hurricane force winds. Preliminary estimates from the American Red Cross indicated that around 13,000 single family dwellings were damaged by the hurricane in southeast Louisiana, and several thousand more apartments and mobile homes were also damaged. Early estimates from Louisiana Economic Development indicated that Gustav caused at least $4.5 billion in property damage in Louisiana, including insured and uninsured losses.

In Ouachita Parish, tropical storm force winds downed numerous trees and power lines. One tree was downed on a home in West Monroe with the other trees being reported down on Prairie Road in the southern portion of the parish as well as Old Sterlington Road in the northern portion of the parish. Numerous power lines were downed all across the parish as well resulting in numerous power outages. A tree fell on a state trooper’s vehicle in the western portion of the parish.

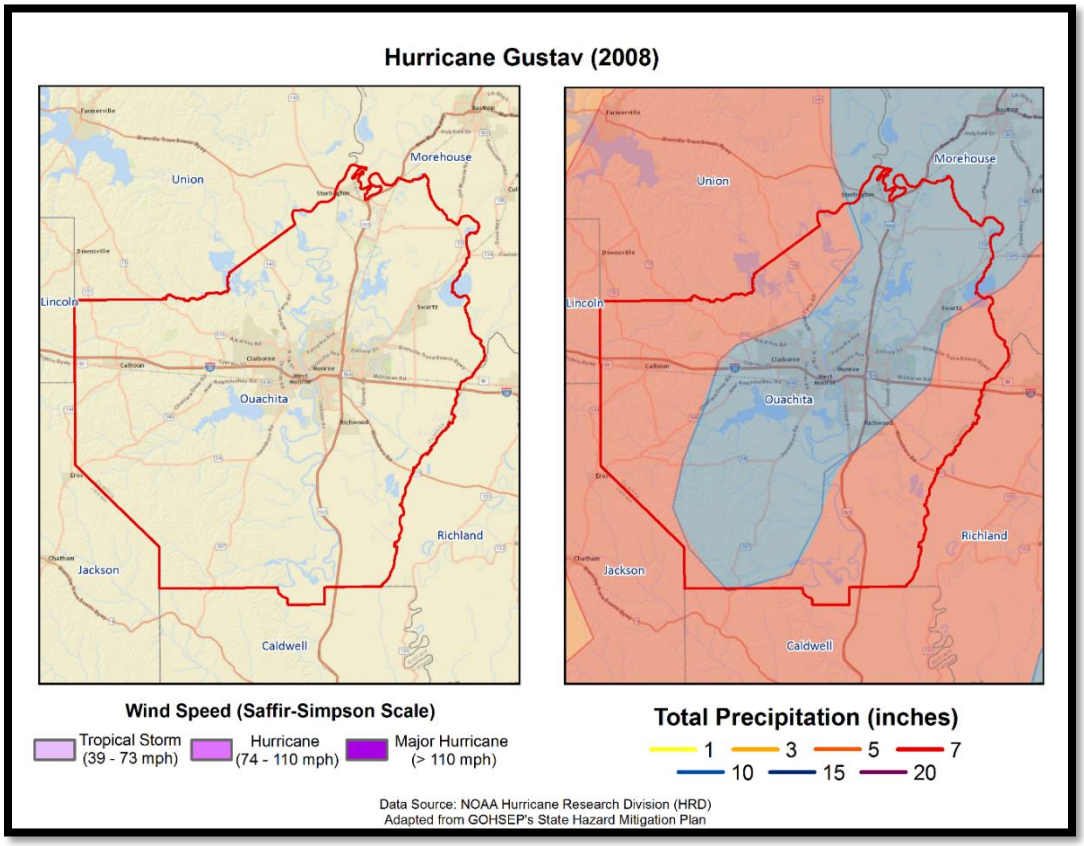


Figure 2-22: Wind Speed and Precipitation Totals in Ouachita Parish for Hurricane Gustav

Hurricane Ike (2008)

Hurricane Ike caused wind damage, storm surge flooding, and tornadoes across southwest Louisiana. Ike made landfall near Galveston, TX early in the morning on September 13, 2008, as a strong category 2 hurricane. Sustained hurricane force winds were confined to extreme western Cameron Parish. The highest recorded winds in southwest Louisiana were experienced at Lake Charles Regional Airport, with sustained winds of 53 mph (46 kts) and gusts of 77 mph (67 kts). The lowest pressure reading occurred at Southland Field near Sulphur, LA, with a low of 994.6 millibars. Several tornadoes were reported across southwest Louisiana. The most significant one was near Mamou, where ten to fifteen homes were damaged, including one that lost its roof. Storm surge was a significant event. Water levels ranged from 14 feet in western Cameron Parish, to eight feet in St. Mary Parish. This resulted in widespread flooding of the same areas that flooded during Hurricane Rita in 2005. Most of Cameron Parish was under water. Over 3,000 homes were flooded. This extended north into Calcasieu Parish, where another 1,000 homes flooded in Lake Charles, Westlake, and Sulphur. In Vermilion Parish, at least 1,000 homes flooded in Pecan Island, Forked Island, Intracoastal City, and Henry. This extended east into Iberia Parish, where another 1,000 homes flooded south of Highway 14 and Highway 90. In St. Mary Parish, some of the worst flooding occurred in Franklin, where a man-made levee failed, flooding over 450 homes. Maximum storm total rainfall ranged from six to eight inches across Cameron, Calcasieu, and Beauregard Parishes. No fatalities were reported in southwest Louisiana. Total property damages, however, were high. Losses were estimated to be almost $420 million across southwest Louisiana. Agricultural losses were over $225 million.

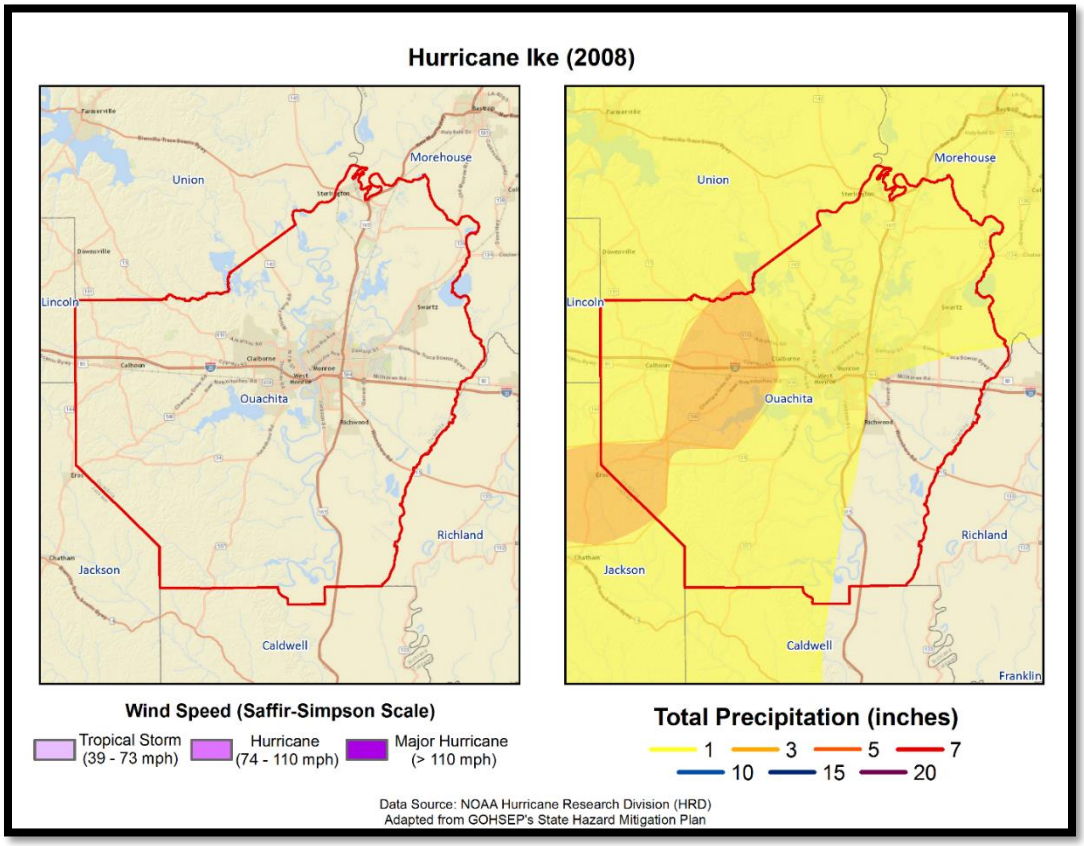


Figure 2-23: Wind Speed and Precipitation Totals in Ouachita Parish for Hurricane Ike

In Ouachita Parish, the remnants of Hurricane Ike resulted in tropical storm force winds. The winds downed several trees and power lines which resulted in numerous power outages across the parish.

Hurricane Isaac (2012)

Hurricane Isaac made landfall in Southeast sections of Louisiana, however tropical storm conditions were felt well to the west of the center. No injuries or deaths were reported. Scattered power outages and downed trees occurred. As the system lifted north of the area flash flooding occurred in Rapides Parish as rain bands sat over the same location. The highest surge occurred at Amerada Pass were a storm tide rose to 3.46 feet resulting in a surge of 2.18 feet. Tides were actually pushed out at most coastal locations while the hurricane was making landfall resulting in tides at some locations 1 to 3 feet below normal and boats being stranded for several hours. Several trees and power lines were downed in Ouachita Parish.

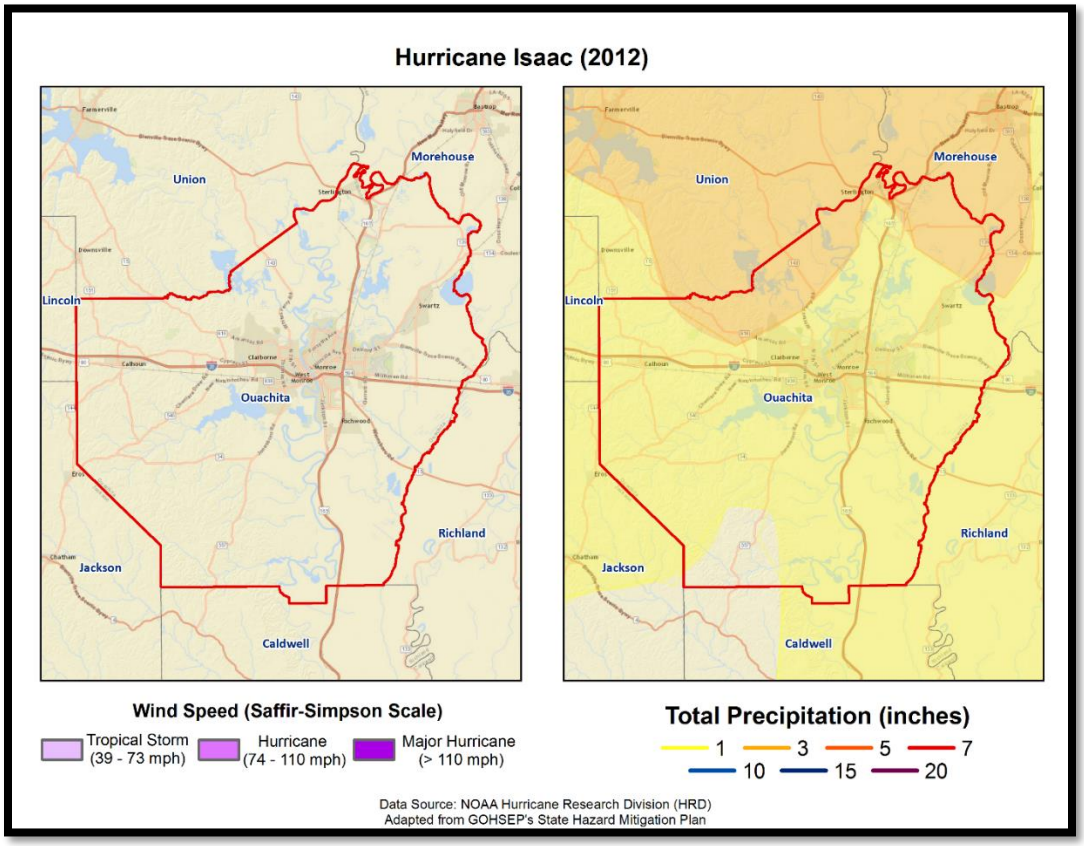


Figure 2-24: Wind Speed and Precipitation Totals in Ouachita Parish for Tropical Storm Lee

The following figure displays the wind zones that affect Ouachita Parish in relation to critical facilities throughout the parish.

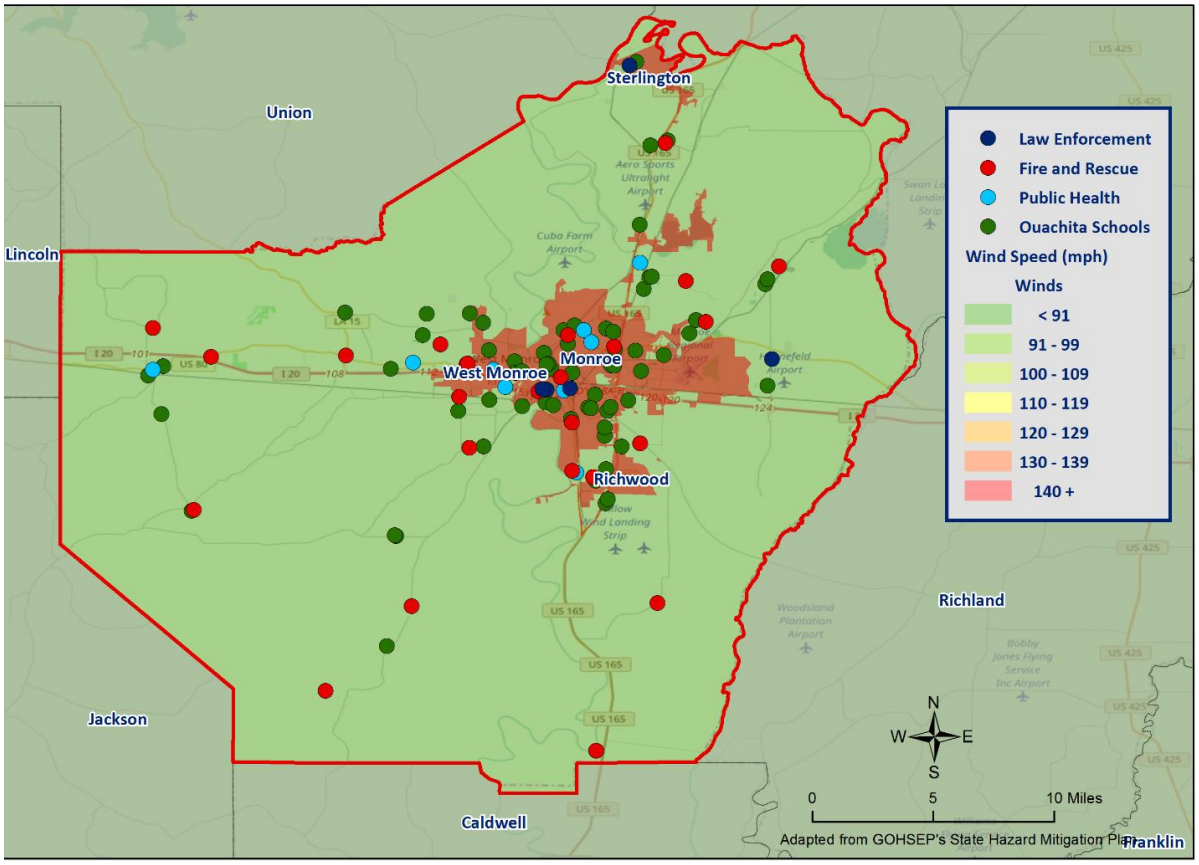


Figure 2-25: Winds Zones for Ouachita Parish in Relation to Critical Facilities

Frequency / Probability

Tropical cyclones are large natural hazard events that regularly impact Ouachita Parish. The annual chance of occurrence for a tropical cyclone is estimated at 12% for Ouachita Parish and its municipalities, with three events occurring within 25 years. The tropical cyclone season for the Atlantic Basin is from June 1st through November 30th, with most of the major hurricanes (Saffir-Simpson Categories 3, 4, & 5) occurring between the months of August and October. This area has experienced several tropical cyclone events in the past and can expect more in the future.

Estimated Potential Losses

Using Hazus 2.2 100-Year Hurricane Model, the 100-year hurricane scenario was analyzed to determine losses from this worst-case scenario. The table on the next page shows the total economic losses that would result from this occurrence.

Table 2-54: Total Estimated Losses for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Jurisdiction	Estimated total Losses from 100-Year Hurricane Event
Ouachita Parish (Unincorporated)	$4,491,618
Monroe	$2,524,447
Richwood	$175,416
Sterlington	$82,433
West Monroe	$675,651
Total	$7,949,565

Total losses from a 100-year hurricane event for each jurisdiction were compared with the total value of assets to determine the ratio of potential damage to total inventory in the table below.

Table 2-55: Ratio of Total Losses to Total Estimated Value of Assets for each Jurisdiction in Ouachita Parish
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event	Total Estimated Value of Assets	Ratio of Estimated Losses to Total Value
Unincorporated	$4,491,618	$11,607,999,000	0.0%
Monroe	$2,524,447	$9,801,111,000	0.0%
Richwood	$175,416	$200,349,000	0.1%
Sterlington	$82,433	$235,570,000	0.0%
West Monroe	$675,651	$3,271,315,000	0.0%

Based on the Hazus 2.2 Hurricane Model, estimated total losses range from less than 0.1% to 0.1% of the total estimated value of all assets for the unincorporated area of Ouachita Parish and the incorporated areas of Monroe, Richwood, Sterlington, and West Monroe.

The Hazus 2.2 Hurricane Model also provides a breakdown by jurisdiction for seven primary sectors (Hazus occupancy) throughout the parish. The losses for each jurisdiction by sector are listed in the tables on the following pages. These sectors are comprised of privately owned structures/facilities, as well as locally, state, and federally owned structures/facilities.

Table 2-56: Estimated Losses in Unincorporated Ouachita Parish for a 100-Year Hurricane Event (Source: Hazus 2.2)

Ouachita Parish (Unincorporated)	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$1,564
Commercial	$31,066
Government	$5,833
Industrial	$4,843
Religious / Non-Profit	$18,936
Residential	$4,422,220
Schools	$7,156
Total	$4,491,618

Table 2-57: Estimated Losses in Monroe for a 100-Year Hurricane Event (Source: Hazus 2.2)

Monroe	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$879
Commercial	$17,460
Government	$3,278
Industrial	$2,722
Religious / Non-Profit	$10,643
Residential	$2,485,443
Schools	$4,022
Total	$2,524,447

Table 2-58: *Estimated Losses in Richwood for a 100-Year Hurricane Event (Source: Hazus 2.2)*

Richwood	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$61
Commercial	$1,213
Government	$228
Industrial	$189
Religious / Non-Profit	$740
Residential	$172,706
Schools	$279
Total	$175,416

Table 2-59: Estimated Losses in Sterlington for a 100-Year Hurricane Event (Source: Hazus 2.2)

Sterlington	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$29
Commercial	$570
Government	$107
Industrial	$89
Religious / Non-Profit	$348
Residential	$81,159
Schools	$131
Total	$82,433

Table 2-60: Estimated Losses in West Monroe for a 100-Year Hurricane Event (Source: Hazus 2.2)

West Monroe	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$235
Commercial	$4,673
Government	$877
Industrial	$729
Religious / Non-Profit	$2,849
Residential	$665,212
Schools	$1,076
Total	$675,651

Threat to People

The total population within the parish that is susceptible to a hurricane hazard is shown in the table below:

Table 2-61: Number of People Susceptible to a 100-Year Hurricane Event in Ouachita Parish (Source: Hazus 2.2)

Number of People Exposed to Hurricane Hazards			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Ouachita Parish (Unincorporated)	**86,854**	**86,854**	**100.0%**
Monroe	**48,815**	**48,815**	**100.0%**
Richwood	**3,392**	**3,392**	**100.0%**
Sterlington	**1,594**	**1,594**	**100.0%**
West Monroe	**13,065**	**13,065**	**100.0%**
Total	**153,720**	**153,720**	**100.0%**

The HAZUS-MH hurricane model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions. These populations are illustrated in the following tables:

Table 2-62: Vulnerable Populations in Unincorporated Ouachita Parish for a 100-Year Hurricane Event (Source: Hazus 2.2)

Ouachita Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	86,854	100.0%
Persons Under 5 Years	6,332	7.3%
Persons Under 18 Years	16,476	19.0%
Persons 65 Years and Over	10,692	12.3%
White	52,477	60.4%
Minority	34,377	39.6%

Table 2-63: Vulnerable Populations in Monroe for a 100-Year Hurricane Event (Source: Hazus 2.2)

Monroe		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	48,815	100.0%
Persons Under 5 Years	3,817	7.8%
Persons Under 18 Years	9,412	19.3%
Persons 65 Years and Over	6,165	12.6%
White	16,314	33.4%
Minority	32,501	66.6%

Table 2-64: Vulnerable Populations in Richwood for a 100-Year Hurricane Event (Source: Hazus 2.2)

Richwood		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	3,392	100.0%
Persons Under 5 Years	121	3.6%
Persons Under 18 Years	389	11.5%
Persons 65 Years and Over	2,726	80.4%
White	599	17.7%
Minority	2,793	82.3%

Table 2-65: Vulnerable Populations in Sterlington for a 100-Year Hurricane Event (Source: Hazus 2.2)

Sterlington		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	1,594	100.0%
Persons Under 5 Years	133	8.3%
Persons Under 18 Years	361	22.7%
Persons 65 Years and Over	172	10.8%
White	1,246	78.2%
Minority	348	21.8%

Table 2-66: Vulnerable Populations in West Monroe for a 100-Year Hurricane Event (Source: Hazus 2.2)

West Monroe		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	13,065	100.0%
Persons Under 5 Years	1,013	7.8%
Persons Under 18 Years	2,079	15.9%
Persons 65 Years and Over	2,132	16.3%
White	8,090	61.9%
Minority	4,975	38.1%

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to tropical cyclones.

Wildfires

A wildfire is combustion in a natural setting, marked by flames or intense heat. Most frequently, wildfires are ignited by lightning or unintentionally by humans. Fires set purposefully (but lawfully) are referred to as controlled fires or burns. There are three different types of wildfires: (1) **Ground fires** burn primarily in the thick layers of organic matter directly on the forest floor and even within the soil. Ground fires destroy root networks, peat, and compact litter. These fires spread extremely slowly and can smolder for months. (2) **Surface fires** burn litter and vegetative matter in the underbrush of a forest. (3) **Crown fires** spread rapidly by wind and move quickly by jumping along the tops of trees. There are two types of crown fires: (a) *passive (or dependent)* crown fires rely on heat transfer from surface fire, whereas (b) *active (or independent)* crown fires do not require any heat transfer from below. Active crown fires tend to occur with greater tree density and drier conditions. A firestorm is a mass, crown fire (also called a running crown fire, area fire, or conflagration). They are large, continuous, intense fires that lead to violent convection. They are characterized by destructively violent surface in-drafts near and beyond their perimeter. Crown fires are the most damaging and most difficult to contain. The intensity of crown fires enables the fire to produce its own wind gusts. These so-called *fire whirls* can move embers ahead of the fire front and ignite new fires. Fire whirls are spinning vortex columns of ascending hot air and gases rising from the fire. Large fire whirls have the intensity of a small tornado.

The conditions conducive to the occurrence of wildfires are not distributed equally across the United States. Wildfires have a much greater likelihood of occurring in the western part of the country. Although less frequent than in other areas, wildfires do occur in Louisiana. Wildfire danger can vary greatly season to season, and is exacerbated by dry weather conditions. Factors that increase susceptibility to wildfires are the availability of fuel (e.g., litter and debris), topography (i.e., slope and elevation affect various factors like precipitation, fuel amount, and wind exposure), and specific meteorological conditions (e.g., low rainfall, high temperatures, low relative humidity, and winds). The potential for wildfire is often measured by the Keetch–Byram Drought Index (KBDI), which represents the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in the soil. The KBDI tries to measure the amount of precipitation needed to return soil to its full field capacity, with KBDI values ranging from 0 (moist soil) to 800 (severe drought).

According to the State of Louisiana Forestry Division, most forest fires in Louisiana are caused by intentional acts (arson) or carelessness and negligence committed by people, exacerbated by human confrontation with nature. The wildland–urban interface is the area in which development meets wildland vegetation, where both vegetation and the built environment provide fuel for fires. As development near wildland settings continues, more people and property are exposed to wildfire danger. *Figure 2-26* displays the areas of wildland-urban interaction in Ouachita Parish.

The Southern Group of State Foresters developed the Southern Wildfire Risk Assessment Portal to create awareness among the public and government sectors about the threat of wildfires in their areas. The Southern Wildfire Assessment Portal allows users to identify areas that are most prone to wildfires. The table on the next page summarizes the intensity levels assigned to areas in the Southern Wildfire Assessment Portal.

Table 2-67: Southern Group of State Foresters Wildfire Risk Assessment Fire Intensity Scale (Source: Southern Wildfire Assessment Portal)

Fire Intensity Scale	
Level	**Definition**
1	Lowest Intensity: Minimal direct wildfire impacts. Location has a minimal chance of being directly impacted by a wildfire.
2	Low Intensity: Small flames usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress.
3	Moderate Intensity: Flames up to eight feet in length; short-range spotting is possible.
4	High Intensity: Large flames up to 30 feet in length; short-range spotting common; medium range spotting possible.
5	Highest Intensity: Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire induced winds.

Location

Wildfires impact areas that are populated with forests and grasslands. The following figures display the areas of wildland-urban interface and intermix in Ouachita Parish and its jurisdictions.

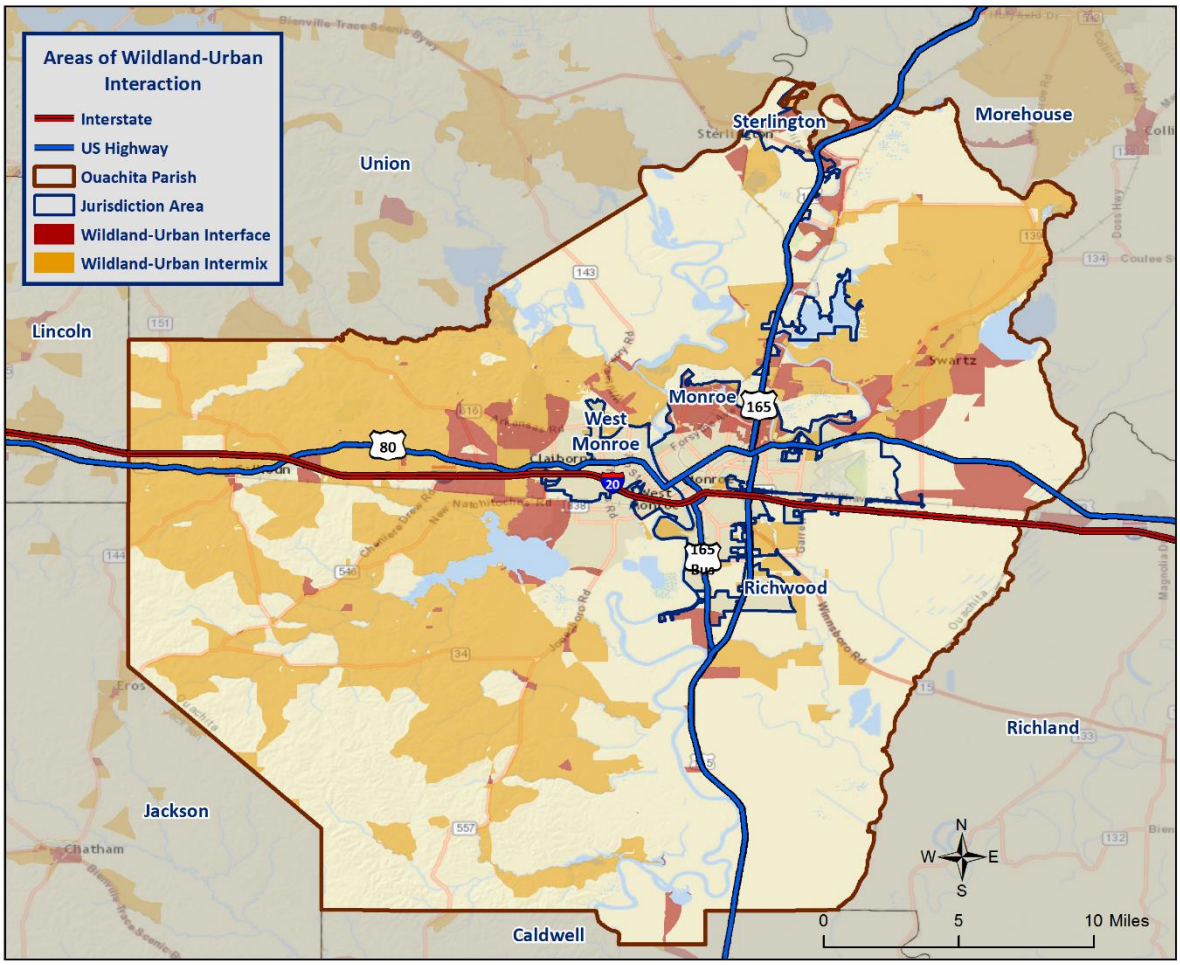


Figure 2-26: Wildland-Urban Interaction in Ouachita Parish

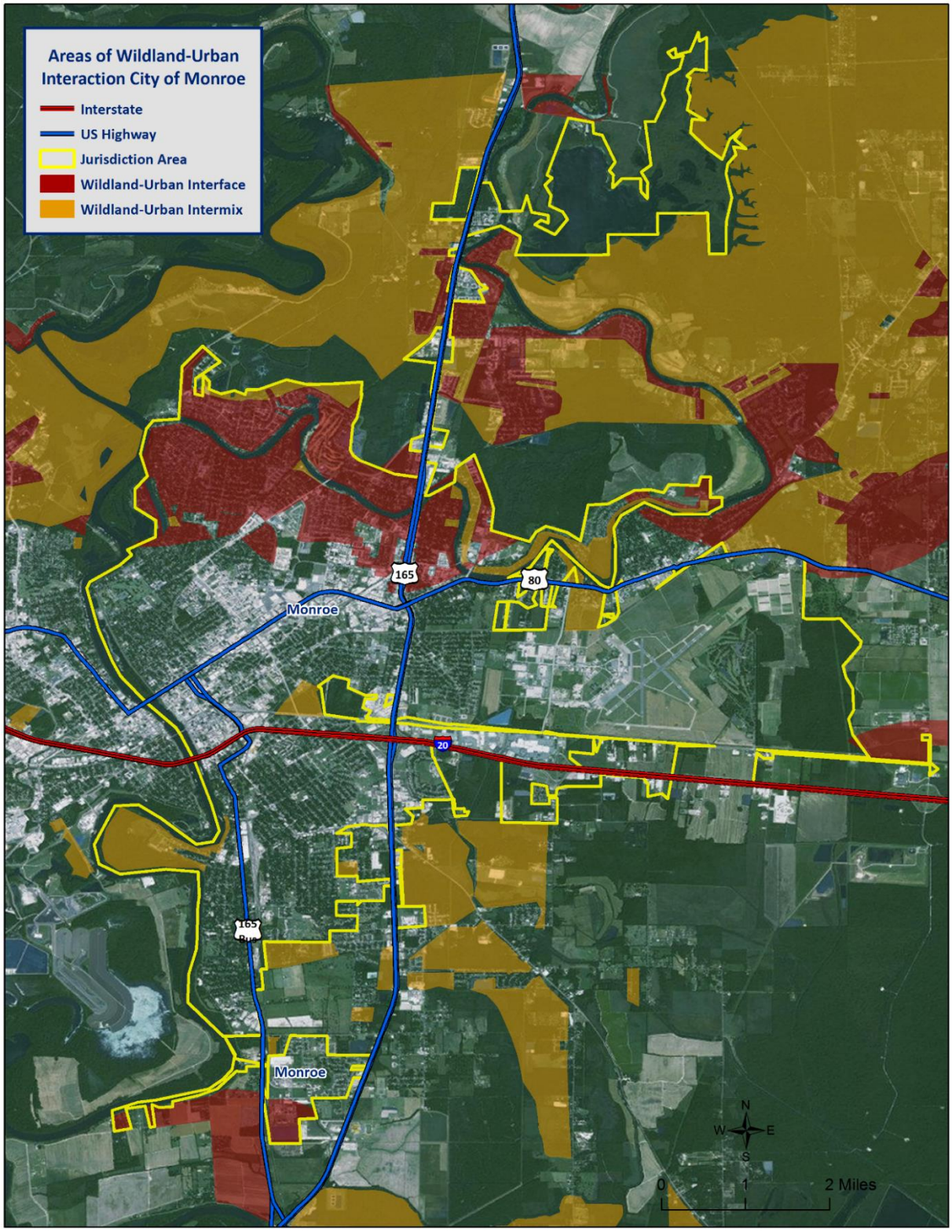


Figure 2-27: Wildland-Urban Interaction in the City of Monroe

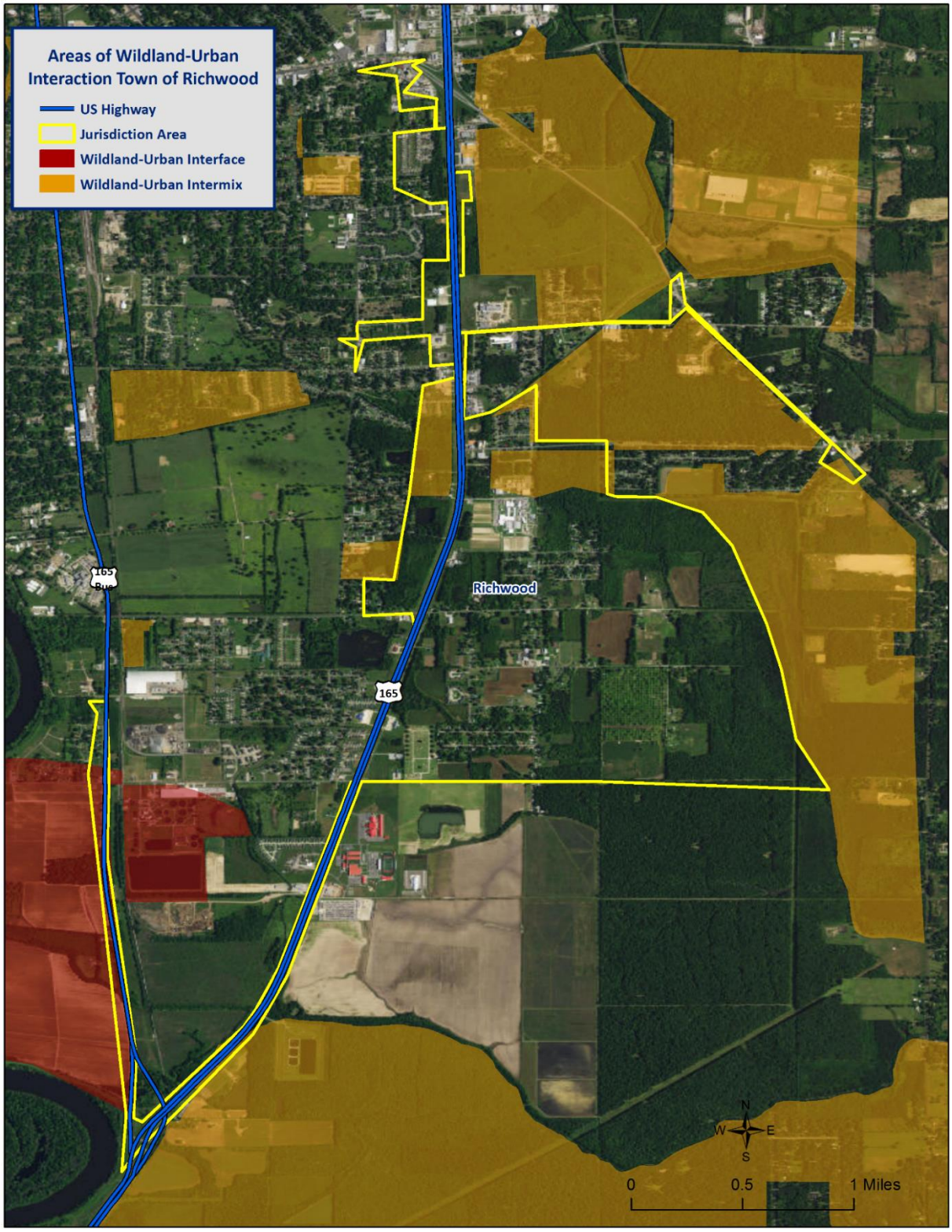


Figure 2-28: Wildland-Urban Interaction in the Town of Richwood

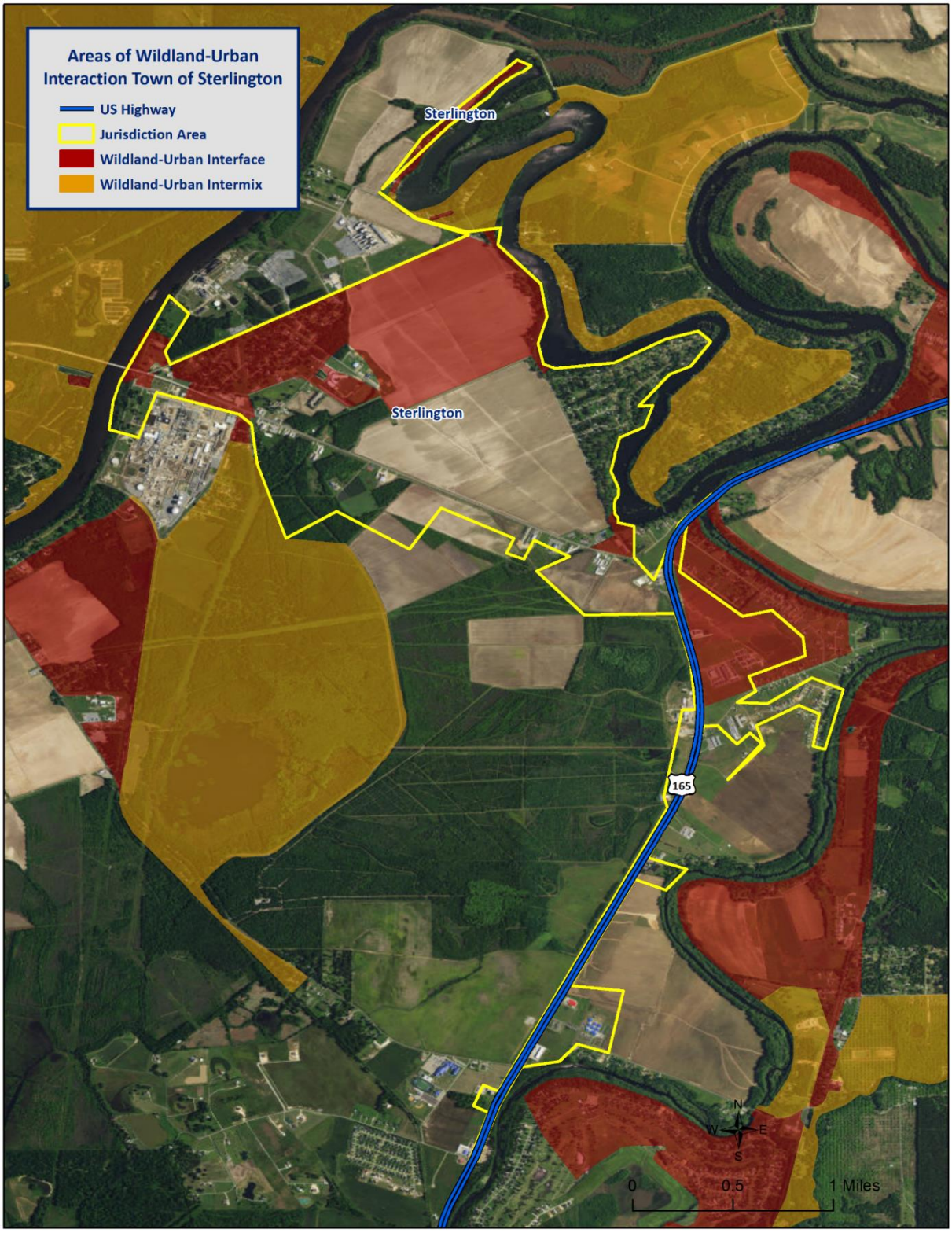


Figure 2-29: Wildland-Urban Interaction in the Town of Sterlington

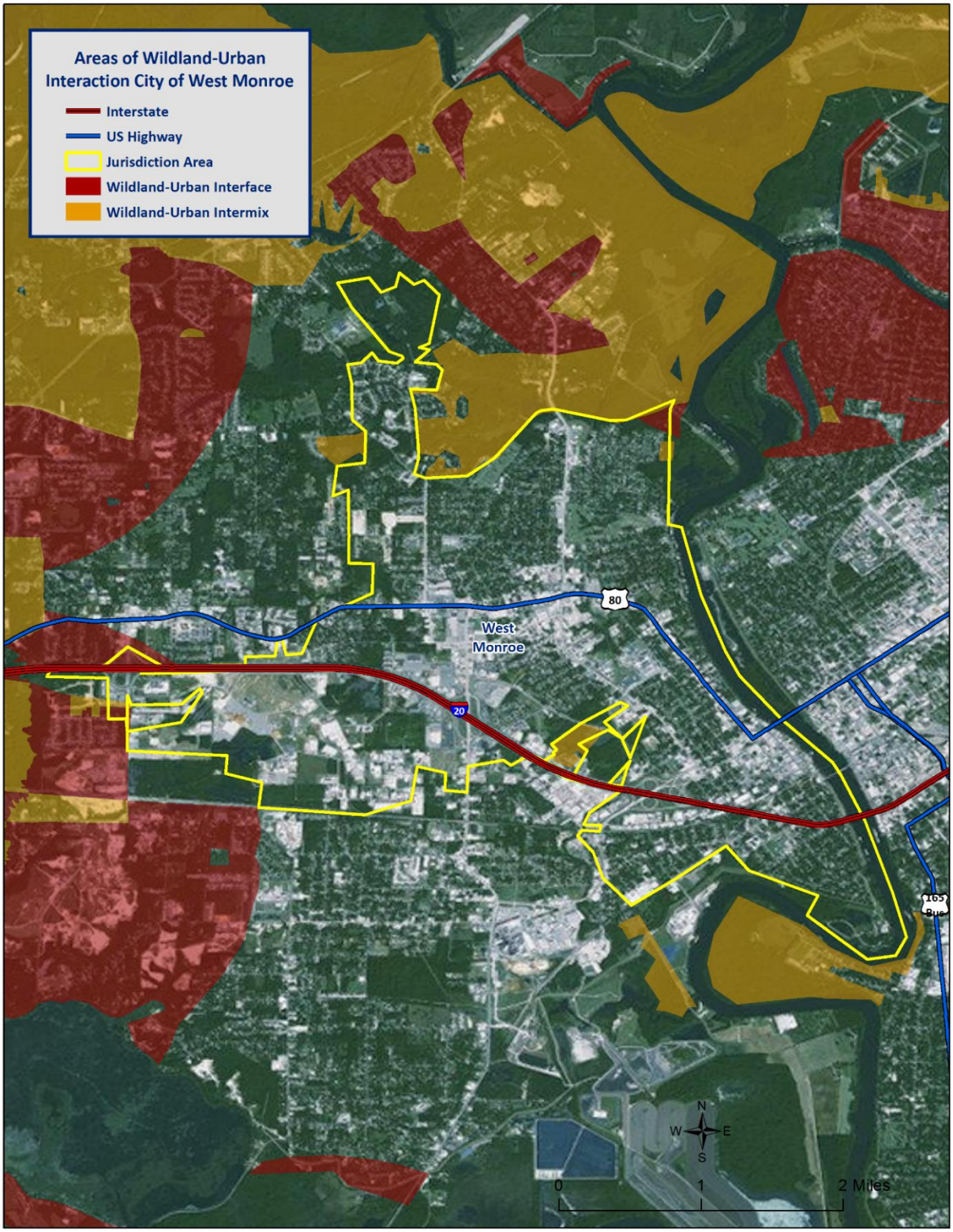


Figure 2-30: Wildland-Urban Interaction in the City of West Monroe

Previous Occurrences / Extents

There have been no reported wildfire events that have occurred within the boundaries of Ouachita Parish between the years of 1990 and 2015.

Since 2010, there have been no reported wildfire events in the incorporated areas of Monroe, Richwood, Sterlington, and West Monroe.

Based on the Southern Group of State Foresters Risk Assessment Portal, the following table outlines the intensity that each jurisdictional area within Ouachita Parish could potential experience due to a wildfire event.

Table 2-68: Potential Wildfire Intensity Levels for Ouachita Parish
(Source: Southern Wildfire Assessment Portal)

Potential Wildfire Intensity	
Ouachita Parish (Unincorporated)	Highest Intensity Level 5
Monroe	Moderate Intensity Level 3
Richwood	Moderate Intensity Level 3
Sterlington	High Intensity Level 4
West Monroe	Moderate to High Intensity Level 3.5

Frequency / Probability

With no recorded events in 25 years, wildfire events within the boundaries of Ouachita Parish have an annual chance of occurrence calculated at less than 1% based.

Estimated Potential Losses

There have been no wildfire events that have caused property damage, crop damage, injuries, or fatalities in Ouachita Parish. In assessing the overall risk to population, the most vulnerable population throughout the parish consists of those residing in areas of wildland-urban interaction. *Figure 2-26* displays the areas of wildland-urban interaction in Ouachita Parish.

Using Hazus 2.2, along with wildland-urban interaction areas, the following table presents an analysis of total building exposure that is located within the wildland-urban interaction areas.

Table 2-69: Total Building Exposure by Wildland-Urban Interaction Areas
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Building Exposure
Ouachita Parish (Unincorporated)	$9,550,213,000
Monroe	$3,110,908,000
Richwood	$84,704,000
Sterlington	$140,415,000
West Monroe	$181,933,000
Total	$13,068,173,000

Hazus 2.2 also provides a breakdown by jurisdiction for seven primary sectors (Hazus occupancy) throughout the parish. Utilizing this information with the wildland-urban interaction areas allows for identifying the total exposure by jurisdiction. The total exposure for each jurisdiction by sector is listed in the following tables. These sectors are comprised of privately owned structures/facilities, as well as locally, state, and federally owned structures/facilities.

Table 2-70: Estimated Exposure for Unincorporated Ouachita Parish by Sector (Source: Hazus 2.2)

Ouachita Parish (Unincorporated)	Estimated Total Building Exposure by Sector
Agricultural	$32,892,000
Commercial	$813,834,000
Government	$11,846,000
Industrial	$338,208,000
Religious / Non-Profit	$215,306,000
Residential	$8,072,524,000
Schools	$65,603,000
Total	$9,550,213,000

Table 2-71: Estimated Exposure for Monroe by Sector (Source: Hazus 2.2)

Monroe	Estimated Total Building Exposure by Sector
Agricultural	$6,042,000
Commercial	$555,425,000
Government	$9,082,000
Industrial	$49,327,000
Religious / Non-Profit	$56,750,000
Residential	$2,407,009,000
Schools	$27,273,000
Total	$3,110,908,000

Table 2-72: Estimated Exposure for Richwood by Sector
(Source: Hazus 2.2)

Richwood	Estimated Total Building Exposure by Sector
Agricultural	$0
Commercial	$6,673,000
Government	$2,868,000
Industrial	$479,000
Religious / Non-Profit	$2,480,000
Residential	$72,204,000
Schools	$0
Total	$84,704,000

Table 2-73: Estimated Exposure for Sterlington by Sector
(Source: Hazus 2.2)

Sterlington	Estimated Total Building Exposure by Sector
Agricultural	$164,000
Commercial	$7,882,000
Government	$1,124,000
Industrial	$1,072,000
Religious / Non-Profit	$3,052,000
Residential	$127,121,000
Schools	$0
Total	$140,415,000

Table 2-74: Estimated Exposure for West Monroe by Sector
(Source: Hazus 2.2)

West Monroe	Estimated Total Building Exposure by Sector
Agricultural	$98,000
Commercial	$39,596,000
Government	$0
Industrial	$8,197,000
Religious / Non-Profit	$8,644,000
Residential	$125,398,000
Schools	$0
Total	$181,933,000

Threat to People

The total population within the parish that is located within a wildland-urban interaction area is shown in the table below:

Table 2-75: Populations Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Number of People Located in Wildland-Urban Interaction Areas			
Location	**# in Community**	**# in Area**	**% in Area**
Ouachita Parish (Unincorporated)	**86,854**	**27,380**	**31.5%**
Monroe	**48,815**	**12,159**	**24.9%**
Richwood	**3,392**	**131**	**3.9%**
Sterlington	**1,594**	**732**	**45.9%**
West Monroe	**13,065**	**122**	**0.9%**
Total	**153,720**	**40,524**	**26.4%**

The 2010 U.S. Census data was also extrapolated to provide an overview of populations located within wildland-urban interaction areas throughout the jurisdictions. That data is illustrated in the following tables:

Table 2-76: Population in Unincorporated Ouachita Parish Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Ouachita Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	27,380	31.5%
Persons Under 5 Years	1,996	7.3%
Persons Under 18 Years	5,194	19.0%
Persons 65 Years and Over	3,370	12.3%
White	16,543	60.4%
Minority	10,837	39.6%

Table 2-77: Population in Monroe Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Monroe		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	12,159	24.9%
Persons Under 5 Years	951	7.8%
Persons Under 18 Years	2,344	19.3%
Persons 65 Years and Over	1,536	12.6%
White	4,064	33.4%
Minority	8,095	66.6%

Table 2-78: Population in Richwood Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

Richwood		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	131	3.9%
Persons Under 5 Years	5	3.6%
Persons Under 18 Years	15	11.5%
Persons 65 Years and Over	105	80.4%
White	23	17.7%
Minority	108	82.3%

Table 2-79: Population in Sterlington Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

Sterlington		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	732	45.9%
Persons Under 5 Years	61	8.3%
Persons Under 18 Years	166	22.7%
Persons 65 Years and Over	79	10.8%
White	572	78.2%
Minority	160	21.8%

Table 2-80: Population in West Monroe Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

West Monroe		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	122	0.9%
Persons Under 5 Years	9	7.8%
Persons Under 18 Years	19	15.9%
Persons 65 Years and Over	20	16.3%
White	76	61.9%
Minority	46	38.1%

Vulnerability

See Appendix C for parish and municipality facilities that could potentially be exposed to a wildfire hazard. Buildings were determined based on whether or not they fall within the wildfire-urban interface and/or intermix.

Winter Storms

For Louisiana and other parts of the southeastern United States, a severe winter storm occurs when humid air from the Gulf of Mexico meets a cold air mass from the north. Once the cold air mass crosses Louisiana, and the temperature drops, precipitation may fall in the form of snow or sleet. If the ground temperature is cold enough but air temperature is above freezing, rain can freeze instantly on contact with the surface, causing massive ice storms.

The winter storm events that affect the state of Louisiana are ice storms, freezes, and snow events. Of the winter storm types listed above, ice storms are the most dangerous. Ice storms occur during a precipitation event when warm air aloft exceeds 32 °F, while the surface remains below the freezing point. Ice will form on all surfaces when precipitation originating as rain or drizzle contacts physical structures. These ice storms are usually accompanied by freezing temperatures and occasionally snow.

Winter storms can be accompanied by strong winds, creating blizzard conditions with blinding, wind driven snow, severe drifting, and dangerous wind chill. These types of conditions are very rare in Louisiana, even in north Louisiana, but ice storms are more common. The climatic line between snow and rain often stalls over north Louisiana, creating ideal conditions for ice accumulation.

In a typical winter storm event, homes and buildings are damaged by ice accumulation, either directly by the weight of the ice on the roofs or by trees and/or limbs falling on buildings. While it is not very prevalent, this type of damage can occur in Louisiana, particularly in north Louisiana. Effects of winter weather more likely to occur in Louisiana, especially southern Louisiana, include extreme temperatures which can cause waterlines to freeze and sewer lines to rupture. This is especially true with elevated or mobile homes, since cold air is able to access more of the building's infrastructure. Winter storms can also have a devastating effect on agriculture, particularly on crops (like citrus) that are dependent on warm weather. Long exposures to low temperatures can kill many kinds of crops, and ice storms can weigh down branches and fruit.

Winter storms are not only a direct threat to human health through conditions like frostbite and hypothermia, but they are also an indirect threat to human health due to vehicle accidents and loss of power and heat, which can be disrupted for days. However, these impacts are rarely seen in Louisiana. As people use space heaters and fireplaces to stay warm, the risk of household fires and carbon monoxide poisoning increases.

Winter storm events occur throughout Louisiana usually during the colder calendar months of December, January, and February. Severe weather events do not occur with the same frequency across all parts of Louisiana. The northern quarter of Louisiana has historically experienced the most severe winter events between 1987 and 2012. The central, and to an even greater extent the southern parts of the state, such as Ascension Parish, have experienced the fewest severe winter events. The table on the next page shows the Sperry-Piltz Ice Accumulation Index which is utilized to predict the potential damage to overhead utility systems from freezing rain and ice storms.

Table 2-81: Sperry-Piltz Ice Accumulation Index

Ice Damage Index	Damage and Impact Descriptions
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structure. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

Location

Because a winter storm is a climatological based hazard and has the same probability of occurring in Ouachita Parish as all of the adjacent parishes, the entire planning area for Ouachita Parish is equally at risk for winter storms.

Previous Occurrences / Extents

According to SHELDUS, there have been 19 reported winter storm events that have occurred within the boundaries of Ouachita Parish between the years of 1990 and 2015. The table on the next page provides a brief synopsis of each event. Based on historic data, Ouachita Parish can expect an ice damage index of 2 on the Sperry-Piltz Ice Accumulation Index.

Table 2-82: Previous Occurrences for Winter Storm Events from 2010 - 2015

Date	Synopsis	Property Damage	Crop Damage
January 7, 2010	Bitterly cold temperatures swept into the region causing a hard freeze. The cold temperatures froze water pipes in many homes throughout the parish. Some city and parish water lines burst as well resulting in many residents being without water.	$500,000	$0
February 11, 2010	Snowfall totals across the parish ranged from 3 to 5 inches with 5 inches measured in Monroe and 4.2 inches measured in Schwartz.	$0	$0
February 3, 2011	Freezing rain fell throughout the parish with approximately 0.25 inches falling in Ouachita Parish.	$0	$0
January 15, 2013	Significant ice accumulation was reported throughout Ouachita Parish. In some locations, over one quarter of an inch of ices was reported. This resulted in numerous power outages across the parish. In addition, scattered trees fell onto homes causing significant damage.	$250,000	$0
January 5, 2014	An arctic air mass brought below freezing temperatures to the area. Extreme cold temperatures resulted in frozen water lines. Temperatures in Monroe reached a low of 15°F.	$0	$0
February 7, 2014	Ice accumulation of one tenth of an inch resulted in a few slick spots across elevated bridges and overpasses.	$0	$0
February 11, 2014	A wintery mix was reported throughout the parish. A mixture of rain and sleet fell followed by a brief mixture of snow.	$0	$0
February 23, 2015	Freezing rain and sleet of approximately one tenth of an inch was reported throughout the parish.	$0	$0
March 4, 2015	Freezing rain, sleet, and snow fell throughout the parish. Approximately one tenth of an inch of sleet was reported throughout the parish.	$0	$0

Based on previous winter storm events, the worst-case scenario for the unincorporated area of Ouachita Parish and the incorporated areas of Monroe, Richwood, Sterlington, and West Monroe is approximately three to five inches of snow accumulation and approximately one tenth to one quarter inch of ice accumulation.

Frequency / Probability

With 19 recorded events in 25 years, winter storm events within the boundaries of Ouachita Parish have an annual chance of occurrence calculated at 76% based on the SHELDUS dataset.

Estimated Potential Losses

Since 1990, there have been 19 reported winter weather events that have resulted in property and/or crop damages according to the SHELDUS database. The total property damages associated with these storms have totaled $13,330,888. To estimate the potential losses of a winter weather event on an annual basis, the total damage recorded for winter weather events was divided by the total number of years of available winter weather data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of $533,236. To assess potential losses to the participating jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. The following table provides an estimate of potential property losses for Ouachita Parish based on the 2010 Census data:

Table 2-83: Estimated Annual Losses for Winter Weather Events in Ouachita Parish

Estimated Annual Potential Losses from Winter Weather for Ouachita Parish				
Unincorporated Ouachita Parish (56.5% of Population)	Monroe (31.8% of Population)	Richwood (2.2% of Population)	Sterlington (1% of Population)	West Monroe (8.5% of Population)
$301,286	$169,333	$11,766	$5,529	$45,321

From 1990 to 2015, there have been three injuries and one fatality as a result of winter weather in Ouachita Parish.

Vulnerability

See Appendix C for parish and municipality building exposure to winter weather hazards.

Dam Failure

Dams are water storage, control, or diversion barriers that impound water upstream in reservoirs. Dams are a vital part of our nation's infrastructure, providing drinking water, flood protection, renewable hydroelectric power, navigation, irrigation, and recreation. These critical daily benefits are also inextricably linked to the potential harmful consequences of a dam failure.

Dam failure is a collapse or breach in the structure. A dam failure can result in severe loss of life, economic disaster, and extensive environmental damage. While most dams have storage volumes small enough that failures have few repercussions, dams with large storage volumes can cause significant flooding downstream. Dam failures often have a rapid rate of onset, leaving little time for evacuation. The first signs of the failure may go unnoticed upon visual inspection of the dam structure. However, continual maintenance and inspection of dams often provide the opportunity to identify possible deficiencies in their early stages and can prevent a possible catastrophic failure event.

The duration of the flooding event caused by the failure depends largely on the amount of water and downstream topography. Given smaller volumes of water and a topography suited for transporting the water rapidly downstream, the event may only last hours. Because of the lack of seasonality and other predictive factors, a predictive frequency or likelihood of dam failures cannot be determined. However, the National Dam Safety Program (NDSP) produces hazard rankings (high, significant, and low) and definitions of dam structures, based on potential impact.

Dam/reservoir failures can result from any one of or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Negligent operation, including the failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway;
- Landslides into reservoirs, which cause surges that result in overtopping; and
- High winds, which can cause significant wave action and result in substantial erosion;
-

Location

Ouachita Parish is awaiting a response from the U.S. Army Corps of Engineers on dam locations within the Ouachita Parish Planning area. Currently, a data deficiency exists for dam failure in Ouachita Parish.

Previous Occurrences / Extents

There have been no reported dam failures in Ouachita Parish from 1990 to 2015. Dam information including the extent of dam failures has been requested from the USACE. Ouachita Parish is awaiting a response from the USACE, and will continue to work to update this information as new data is received.

Frequency / Probability

Based on the 25-year record, it is determined that a dam failure has less than a 1% annual chance of occurrence in the Ouachita Parish planning area. Ouachita Parish is awaiting a response from the USACE, and will continue to work to update this information as new data is received.

Levee Failure

Levees and floodwalls are flood control barriers constructed of earth, concrete, or other materials. For the purposes of this plan, levees are distinguished from smaller flood barriers (such as berms) by their size and extent. Berms are barriers that only protect a small number of structures, or at times only a single structure. Levees and floodwalls are barriers that protect significant areas of residential, commercial, or industrial development; at a minimum, they protect a neighborhood or small community. Levee failure involves the overtopping, breach, or collapse of the levee. Levee failure is especially destructive to nearby development during flood and hurricane events.

The northern half of Louisiana is protected by levees on the Ouachita River, under the authority of the Vicksburg District of the United States Army Corp of Engineers (USACE). The Vicksburg District encompasses 68,000 mi^2 in the states of Arkansas, Mississippi and Louisiana. They manage seven drainage basins, including the Yazoo, Pearl, Big Black, Red, Ouachita, and Mississippi Rivers; 12 locks and dams on the Pearl, Red, and Ouachita Rivers; 1,808 miles of levees, including 468 miles along the Mississippi River; and multiple lakes with 1,709 miles of shoreline.

Coastal and southern Louisiana are protected by an extensive levee system under the authority of the New Orleans District of the USACE. This system includes 30,000 mi^2 of Louisiana south of Alexandria, including 961 miles of river levees in the Mississippi River and Tributaries Project, 449 miles of river levees in the Atchafalaya Basin, and 340 miles of hurricane-protection levees. Other levees have been built along stretches of rivers throughout Louisiana by local levee districts and private citizens. The data regarding these non-federal levees are managed by the individual entity responsible for construction and subsequent maintenance and are not kept in a consistent format for comprehensive hazard analysis.

The effects of a levee failure on property is similar to that of a flood, as discussed in the flooding section. One major difference is that the velocity of the water is increased in the area of the breach, so the potential for property damage is higher in these areas.

A levee failure occurs during high water events, so the populace is normally alerted to the potential danger. Levees are normally monitored during these events and the population in danger is alerted to a possible levee failure. However, if people consider themselves safe once a levee has been breached and do not evacuate, the results could be deadly.

Location

Ouachita Parish is awaiting a response from the U.S. Army Corps of Engineers on levee locations within the Ouachita Parish Planning area. Currently, a data deficiency exists for levee failure in Ouachita Parish.

Previous Occurrences / Extents

There have been no reported levee failures in Ouachita Parish from 1990 to 2015. Levee information including the extent of a levee failure has been requested from the U.S. Army Corps of Engineers. Ouachita Parish is awaiting a response from the USACE, and will continue to update this information as new data is received.

Frequency / Probability

Based on the 25-year record, it is determined that a levee failure has less than a 1% annual chance of occurrence in the Ouachita Parish planning area. Ouachita Parish is awaiting a response from the USACE, and will continue to work to update this information as new data is received.

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3. Capability Assessment

This section summarizes the results of the Ouachita Parish jurisdictions and other agency efforts to develop policies, programs, and activities that directly or indirectly support hazard mitigation. It also provides information on resources and gaps in the parish's infrastructure, as well as relevant changes in its law since the last plan update, in order to suggest a mitigation strategy.

Through this assessment, Ouachita Parish and the participating jurisdictions are able to identify strengths that could be used to reduce losses and reduce risk throughout the community. It also identifies areas where mitigation actions might be used to supplement current capabilities and create a more resilient community before, during, and after a hazard event.

Policies, Plans, and Programs

Ouachita Parish capabilities are unique to the parish, including planning, regulatory, administrative, technical, financial, and education and outreach resources. There are a number of mitigation-specific acts, plans, executive orders, and policies that lay out specific goals, objectives, and policy statements which already support or could support pre- and post-disaster hazard mitigation. Many of the ongoing plans and policies hold significant promise for hazard mitigation. They take an integrated and strategic look holistically at hazard mitigation in Ouachita Parish to propose ways to continually improve it. These tools are valuable instruments in pre- and post-disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework. Examples of existing documents in Ouachita Parish and its jurisdictions are shown in the table on the following page.

Table 3-1: Ouachita Parish Planning and Regulatory Capabilities

Planning and Regulatory						
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.						
	Ouachita Parish	Monroe	Richwood	Sterlington	West Monroe	
Plans	Yes / No					
Comprehensive / Master Plan	No	Yes	No	No	Yes	
Capital Improvements Plan	Yes	Yes	No	Yes	Yes	
Economic Development Plan	Yes	Yes	No	No	Yes	
Local Emergency Operations Plan	Yes	Yes	Yes	Yes	Yes	
Continuity of Operations Plan	Yes	Yes	Yes	Yes	Yes	
Transportation Plan	Yes	Yes	Yes	Yes	No	
Stormwater Management Plan	Yes	Yes	Yes	Yes	Yes	
Community Wildfire Protection Plan	Yes	Yes	Yes	Yes	No	
Other plans (redevelopment, recovery, coastal zone management)	Shelter plan for incoming evacuees	Yes			N/A	
Building Code, Permitting and Inspections	Yes / No					
Building Code	Yes	Yes	Yes	Yes	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	N/A	N/A	N/A	N/A	
Fire Department ISO/PIAL rating	Yes	Yes	4	Yes	Yes	
Site plan review requirements	Yes	Yes	Yes	Yes	Yes	
Land Use Planning and Ordinances	Yes / No					
Zoning Ordinance	No	Yes	Yes	No	Yes	
Subdivision Ordinance	Yes	Yes	Yes	No	Yes	
Floodplain Ordinance	Yes	Yes	Yes	Yes	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	Yes	Yes	No	Yes	
Flood Insurance Rate Maps	Yes	Yes	Yes	Yes	Yes	
Acquisition of land for open space and public recreation uses	No	Yes	No	No	Yes	
Other	N/A	N/A	N/A	N/A	N/A	

Building Codes, Permitting, Land Use Planning and Ordinances

The Ouachita Parish Police Jury provides oversight for building permits and codes, land use planning, and all parish ordinances.

As of the 2016 update, Ouachita Parish and its jurisdictions ensure that all adopted building codes are enforced and in compliance relating to the construction of any structure within the boundaries of the parish. Building permits are required prior to beginning any type of construction or renovation projects, installation of electrical wiring, plumbing or gas piping, moving manufactured/modular or portable buildings, and reroofing or demolitions.

The Ouachita Parish Police Jury is also responsible for enforcing the Parish Ordinances relating to health and safety, property maintenance standards, and condemnation of unsafe structures.

The Ouachita Parish Police Jury meets regularly to consider any proposed ordinance changes, and to take final actions on proposed changes.

While local capabilities for mitigation can vary from community to community, Ouachita Parish as a whole has a system in place to coordinate and share these capabilities through Ouachita Parish Government and through this Parish Hazard Mitigation Plan.

Some programs and policies, such as the above described, might use complementary tools to achieve a common end, but fail to coordinate with or support each other. Thus, coordination among local mitigation policies and programs is essential to hazard mitigation.

Administration, Technical, and Financial

As a community, Ouachita Parish has administrative and technical capabilities in place that may be utilized in reducing hazard impacts or implementing hazard mitigation activities. Such capabilities include staff, skillset, and tools available in the community that may be accessed to implement mitigation activities and to effectively coordinate resources. The ability to access and coordinate these resources is also important. The table below shows examples of resources in place in Ouachita Parish and its jurisdictions.

Table 3-2: Ouachita Parish Administrative and Technical Capabilities

Administration and Technical						
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.						
	Ouachita Parish	Monroe	Richwood	Sterlington	West Monroe	
Administration	Yes / No					
Planning Commission	No	Yes	Yes	No	Yes	
Mitigation Planning Committee	Yes	Yes	Yes	Yes	Yes	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	Yes	Yes	No	Yes	
Mutual Aid Agreements	N/A	N/A	N/A	N/A	N/A	
Staff	Yes / No; FT/PT; % Hazard Mitigation					
Chief Building Official	Yes	Yes	No	No	Yes	
Floodplain Administrator	Yes	Yes	Yes	Yes	Yes	
Emergency Manager	Yes	Yes	Yes	Yes	Yes	
Community Planner	No	Yes	Yes	No	Yes	
Civil Engineer	Yes	Yes	Yes	No	Yes	
GIS Coordinator	Yes	Yes	Yes	No	Yes	
Grant Writer	No	Yes	No	No	Yes	
Other	N/A	N/A	N/A	N/A	N/A	
Technical	Yes / No					
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Yes	Yes	Yes	Yes	
Hazard Data & Information	No	Yes	No	No	Yes	
Grant Writing	No	Yes	No	No	Yes	
Hazus Analysis	Yes	Yes	Yes	Yes	N/A	
Other	N/A	N/A	N/A	N/A	N/A	

Financial capabilities are the resources that Ouachita Parish and its incorporated jurisdictions have access to or are eligible to use in order to fund mitigation actions. Costs associated with implementing the actions identified by the jurisdictions may vary from little/no cost actions, such as outreach efforts, to substantial action costs such acquisition of flood prone properties.

The following resources are available to fund mitigation actions in Ouachita Parish and its jurisdictions:

Table 3-3: Ouachita Parish Financial Capabilities

Financial						
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.						
	Ouachita Parish	Monroe	Richwood	Sterlington	West Monroe	
Funding Resource	Yes / No					
Capital Improvements project funding	Yes	Yes	No	Yes	Yes	
Authority to levy taxes for specific purposes	Yes	Yes	Yes	Yes	Yes	
Fees for water, sewer, gas, or electric services	Yes	Yes	No	Yes	Yes	
Impact fees for new development	No	No	No	No	No	
Stormwater Utility Fee	No	No	No	No	No	
Community Development Block Grant (CDBG)	Yes	Yes	No	Yes	Yes	
Other Funding Programs	N/A	N/A	N/A	N/A	N/A	

Education and Outreach

A key element in hazard mitigation is promoting a safer, more disaster resilient community through education and outreach activities and/or programs. Successful outreach programs provide data and information that improves overall quality and accuracy of important information for citizens to feel better prepared and educated with mitigation activities. These programs enable the individual jurisdictions and parish as a whole to maximize opportunities for implementation of activities through greater acceptance and consensus of the community.

Ouachita Parish and its jurisdictions have existing education and outreach programs to implement mitigation activities, as well as to communicate risk and hazard related information to its communities. The existing programs are as follows:

Table 3-4: Ouachita Parish Education and Outreach Capabilities

Education and Outreach						
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.						
	Ouachita Parish	Monroe	Richwood	Sterlington	West Monroe	
Program / Organization	Yes / No					
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Yes	No	No	Yes	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	Yes	Yes	Yes	Yes	
Natural Disaster or safety related school program	Yes	Yes	Yes	No	No	
Storm Ready certification	Yes	N/A	No	No	No	
Firewise Communities certification	N/A	N/A	No	No	No	
Public/Private partnership initiatives addressing disaster-related issues	Yes	Yes	Yes	No	Yes	
Other	N/A	N/A	N/A	N/A	N/A	

In some cases, the jurisdictions rely on Ouachita Parish OHSEP and/or Ouachita Parish Government Agencies for the above listed planning and regulatory, administrative and technical, financial, and education and outreach capabilities. Comments regarding the jurisdictions utilization or intentions to utilize and leverage the capabilities of the parish government can be found in Appendix E in the jurisdictional specific worksheets.

As reflected in the aforementioned existing regulatory mechanisms, programs, and resources within each jurisdiction, Ouachita Parish and its jurisdiction remains committed to expanding and improving on the existing capabilities within the parish. All participating jurisdictions will work toward increased participation in funding opportunities and available mitigation programs. Should funding become available, the hiring of additional personnel to dedicate to hazard mitigation initiatives and programs, as well as increasing ordinances within the jurisdictions, will help to enhance and expand risk reduction measures within the parish.

With the sharing of these capabilities, the following municipalities and entities are recognized by the Parish of Ouachita under the Hazard Mitigation Plan, allowing them to apply for available hazard mitigation funding for as long as these municipalities and entities notify the parish of their intentions and the parish concurs:

- Unincorporated Ouachita Parish
- City of Monroe
- Town of Richwood
- Town of Sterlington
- City of West Monroe

Flood Insurance and Community Rating System

Ouachita Parish is a participant in the Community Rating System (CRS), as well as the City of Monroe. Obtaining the CRS rating for the parish and participating jurisdictions is recognized as an eventual goal by the Hazard Mitigation Steering Committee. Participation in the CRS strengthens local capabilities by lowering flood insurance premiums for jurisdictions that exceed NFIP minimum requirements.

Under the Federal Emergency Management Agency (FEMA), the National Flood Insurance Program (NFIP) administers the Community Rating System. Under the CRS, flood insurance premiums for properties in participating communities are reduced to reflect the flood protection activities that are being implemented. This program can have a major influence on the design and implementation of flood mitigation activities, so a brief summary is provided here.

A community receives a CRS classification based upon the credit points it receives for its activities. It can undertake any mix of activities that reduce flood losses through better mapping, regulations, public information, flood damage reduction and/or flood warning and preparedness programs.

There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction (see *Figure 3-1*). A community that does not apply for the CRS or that does not obtain the minimum number of credit points is a class 10 community.

During the last update, 38 Louisiana communities participated, including Ouachita Parish (class 9) and the City of Monroe (class 10). Mandeville, Shreveport, and Jefferson and East Baton Rouge Parishes had the best classifications in the state, class 7. As of the 2016 update, Jefferson, East Baton Rouge, and Terrebonne Parishes all lead the state with best classifications, class 6.

CLASS	DISCOUNT	CLASS	DISCOUNT
1	45%	6	20%
2	40%	7	15%
3	35%	8	10%
4	30%	9	5%
5	25%	10	–

SFHA (Zones A, AE, A1–A30, V, V1–V30, AO, and AH): Discount varies depending on class.

SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO): 10% discount for Classes 1–6; 5% discount for Classes 7–9.*

Non-SFHA (Zones B, C, X, D): 10% discount for Classes 1–6; 5% discount for Classes 7–9.

* In determining CRS Premium Discounts, all AR and A99 Zones are treated as non-SFHAs.

Figure 3-1: CRS Discounts by Class (Source: FEMA)

As of May 2012, 310 communities in the State of Louisiana participate in the Federal Emergency Management Agency's NFIP. Of these communities, 41 (or 13%) participate in the Community Rating System (CRS). Of the top fifty Louisiana communities, in terms of total flood insurance policies held by residents, 27 participate in the CRS. The remaining 23 communities present an outreach opportunity for encouraging participation in the CRS.

The CRS provides an incentive not just to start new mitigation programs, but to keep them going. There are two requirements that "encourage" a community to implement flood mitigation activities.

First, the parish will receive CRS credit for this plan when it is adopted. To retain that credit, though, the parish must submit an evaluation report on progress toward implementing this plan to FEMA by October 1st of each year. That report must be made available to the media and the public.

Second, the parish must annually recertify to FEMA that it is continuing to implement its CRS credited activities. Failure to maintain the same level of involvement in flood protection can result in a loss of CRS credit points and a resulting increase in flood insurance rates to residents.

In 2011[1], the National Flood Insurance Program (NFIP) completed a comprehensive review of the Community Rating System that will result in the release of a new CRS Coordinator's Manual.

The changes to the 2013 CRS Coordinator's Manual are the result of a multi-year program evaluation that included input from a broad group of contributors in order to evaluate the CRS and refine the program to meet its stated goals.

The upcoming changes will drive new achievements in the following six core flood loss reduction areas important to the NFIP: (1) reduce liabilities to the NFIP Fund; (2) improve disaster resiliency and sustainability of communities; (3) integrate a whole community approach to addressing emergency management; (4) promote natural and beneficial functions of floodplains; (5) increase understanding of risk, and; (6) strengthen adoption and enforcement of disaster-resistant building codes.

The 2013 CRS Coordinator's Manual changes will impact each CRS community differently. Some communities will see an increase in the points they receive since points for certain activities have increased (e.g., Activity 420 Open Space Preservation). Other communities will receive fewer points for certain activities (e.g., Activity

[1] https://www.fema.gov/national-flood-insurance-program-community-rating-system

320 Map Information Service). It is likely that some communities with marginal CRS class 9 programs will have to identify new CRS credits in order to remain in the CRS.

Typically, CRS communities do not request credit for all the activities they are currently implementing unless it would earn enough credit to advance the community to a higher CRS class. A community that finds itself losing CRS credit with the 2013 manual could likely identify activities deserving credit they had not previously received.

Due to the changes in both activities and CRS points, community CRS coordinators should speak with their ISO/CRS Specialist to understand how and when the 2013 manual will impact their community.

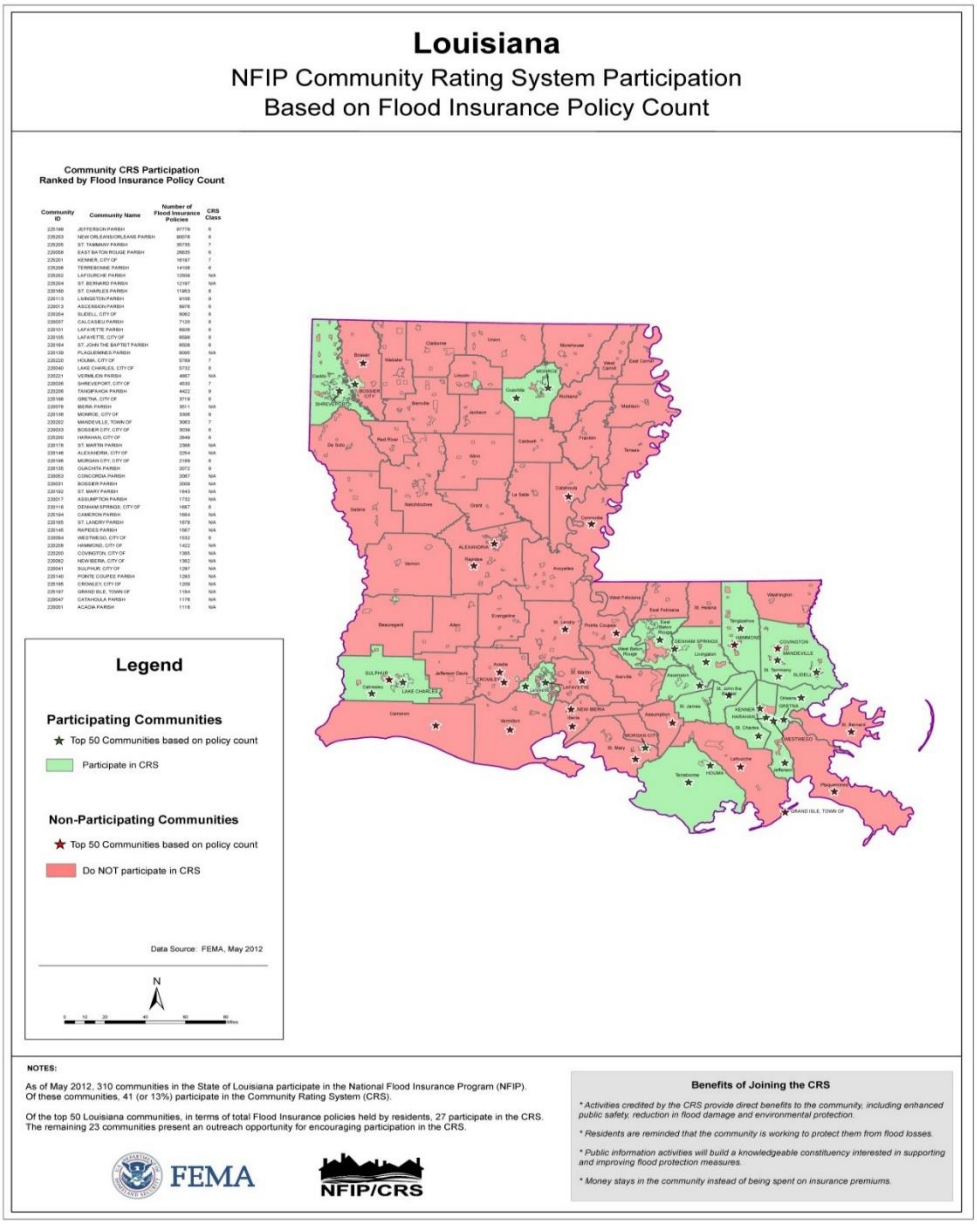

Figure 3-2: Louisiana CRS NFIP Participation
(Source: FEMA[2])

[2] http://www.fema.gov/media-library-data/20130726-2128-31471-9581/ks_ky_la_crs_may_2012_508.zip

In addition to the direct financial reward for participating in the Community Rating System, there are many other reasons to participate in the CRS. As FEMA staff often say, "If you are only interested in saving premium dollars, you're in the CRS for the wrong reason." The other benefits that are more difficult to measure in dollars include:

1. The activities credited by the CRS provide direct benefits to residents, including:
   – Enhanced public safety
   – A reduction in damage to property and public infrastructure
   – Avoidance of economic disruption and losses
   – Reduction of human suffering
   – Protection of the environment

2. A community's flood programs will be better organized and more formal. Ad hoc activities, such as responding to drainage complaints rather than an inspection program, will be conducted on a sounder, more equitable basis.

3. A community can evaluate the effectiveness of its flood programs against a nationally recognized benchmark.

4. Technical assistance in designing and implementing a number of activities is available at no charge from the Insurance Services Office.

5. The public information activities will build a knowledgeable constituency interested in supporting and improving flood protection measures.

6. A community would have an added incentive to maintain its flood programs over the years. The fact that its CRS status could be affected by the elimination of a flood related activity or a weakening of the regulatory requirements for new developments would be taken into account by the governing board when considering such actions.

7. Every time residents pay their insurance premiums, they are reminded that the community is working to protect them from flood losses, even during dry years.

More information on the Community Rating System can be found at www.fema.gov/nfip/crs.shtm

NFIP Worksheets

Parish and participating jurisdiction NFIP worksheets can be found in Appendix E: State Required Worksheets

4. Mitigation Strategy

Introduction

Ouachita Parish's Hazard Mitigation Strategy has a common guiding principle and is the demonstration of the parish's and participating jurisdictions' commitment to reduce risks from hazards. The strategy also serves as a guide for parish and local decision makers as they commit resources to reducing the effects of hazards.

Ouachita Parish confirmed the goals, objectives, actions, and projects over the period of the Hazard Mitigation Plan Update process. The mitigation actions and projects in this 2016 update are a product of analysis and review of the Ouachita Parish Hazard Mitigation Plan Steering Committee, under the coordination of the Ouachita Parish Office of Homeland Security and Emergency Preparedness. The committee was presented a list of projects and actions, new and from the 2011 plan, for review from November 2016 – June 2017.

An online public opinion survey was conducted of Ouachita Parish residents between November 2016 and June 2017. The survey was designed to capture public perceptions and opinions regarding natural hazards in Ouachita Parish. In addition, the survey sought to collect information regarding the methods and techniques preferred by the respondents for reducing the risks and losses associated with local hazards.

This activity was created in an effort to confirm that the goals and action items developed by the Ouachita Parish Hazard Mitigation Plan Steering Committee are representative of the outlook of the community at large. However, because there were no responses to the survey, this public feedback could not be incorporated into the plan. The full Ouachita Parish survey can be found at the following link:

https://www.surveymonkey.com/r/OuachitaParish

During the public meeting in January, the committee provided a status of the projects from 2011 and the proposed actions for the 2016 update. Committee members then agreed on the submission of each project based on feasibility for funding, ease of completion and other community specific factors. The actions were later prioritized.

Goals

The goals represent the guidelines that the parish and its communities want to achieve with this plan update. To help implement the strategy and adhere to the mission of the Hazard Mitigation Plan, the preceding section of the plan update was focused on identifying and quantifying the risks faced by the residents and property owners in Ouachita Parish from natural and manmade hazards. By articulating goals and objectives based on the previous plans, the risk assessment results, and intending to address those results, this section sets the stage for identifying, evaluating, and prioritizing feasible, cost effective, and environmentally sound actions to be promoted at the parish and municipal level – and to be undertaken by the state for its own property and assets. By doing so, Ouachita Parish and its jurisdictions can make progress toward reducing identified risks.

For the purposes of this plan update, goals and action items are defined as follows:

- **Goals** are general guidelines that explain what the parish wants to achieve. Goals are expressed as broad policy statements representing desired long-term results.
- **Action Items** are the specific steps (projects, policies, and programs) that advance a given goal. They are highly focused, specific, and measurable.

The current goals of the Ouachita Parish Hazard Mitigation Plan Update Steering Committee represent long-term commitments by the parish and its jurisdictions. After assessing these goals, the committee decided that the current four goals remain valid.

The goals are as follows:

- Protect health and safety
- Protect existing properties
- Improve the quality of life in Ouachita Parish
- Ensure that public funds are used in the most efficient manner

The Mitigation Action Plan focuses on actions to be taken by Ouachita Parish and its jurisdictions. All of the activities in the Mitigation Action Plan will be focused on helping the parish and its municipalities in developing and funding projects that are not only cost effective, but also meet the other DMA 2000 criteria of environmental compatibility and technical feasibility.

The Hazard Mitigation Plan Steering Committee and each jurisdiction reviewed and evaluated the potential action and project lists in which consideration was given to a variety of factors. Such factors include determining a project's eligibility for federal mitigation grants, as well as its ability to be funded. This process required evaluation of each project's engineering feasibility, cost effectiveness, and environmental and cultural factors.

2016 Mitigation Actions and Update on Previous Plan Actions

The Ouachita Parish Hazard Mitigation Plan Steering Committee and participating jurisdictions each identified actions that would reduce and/or prevent future damage within Ouachita Parish and their respective communities. In that effort, each jurisdiction focused on a comprehensive range of specific mitigation actions. These actions were identified in thorough fashion by the consultant team, the committee, and the individual jurisdictions by way of frequent and open communications and meetings held throughout the planning process.

As outlined in the Local Mitigation Planning Handbook, the following are eligible types of mitigation actions:

- **Local Plans and Regulations –** These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- **Structure and Infrastructure Projects –** These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area, and also includes projects to construct manmade structures to reduce the impact of hazards.
- **Natural System Protection –** These actions minimize the damage and losses and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs –** These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.

The established and agreed upon parish and jurisdiction actions relative to the parish-wide goals are below. Additionally, action updates from the previous plan updates can be found in the first table below.

Ouachita 2011 Hazard Mitigation Action Update

Ouachita Parish - Unincorporated						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
O1: Shelter Structures	Continually inventory and Retrofit/upgrade existing structures and/or construct new structures to act as shelters during and after Hurricanes/Tropical Storms and other severe weather events.	HMGP, PDM	12-48 Months	OPPJ, OPOHSEP, Parish Public Works	Hurricanes/Tropical Storms	All bathrooms in all community centers in Monroe and West Monroe have been renovated to serve as shelters using funds made available by Ouachita Homeland Security.
O2: Harden Critical Facilities	Storm harden/retrofit critical facilities throughout Ouachita Parish. Actions can include but are not limited to window shutters, roof straps, flood proofing, roll-up door reinforcement (i.e. for fire stations).	HMGP, PDM	12-48 Months	OPPJ, OPOHSEP, Parish Public Works	Dam Failure, Flood, Hail, Hurricane / Tropical Storms, Levee Failure, Thunderstorm, Tornado	New hurricane roof systems have been installed on 4 community centers that will be used as shelters, using Homeland Security funds.
O3: Warning Sirens	Purchase warning sirens for the parish. The parish is already in the process of purchasing indoor warning systems through Alert FM. The parish is purchasing 50 portable and one wall unit.	HMGP, PDM, EMPG	12-48 Months	OPPJ, OPOHSEP, GOHSEP	Dam / Levee Failure, Drought, Earthquake, Extreme Heat, Flooding, Hail, Hazardous Materials, Hurricanes / Tropical Storms, Thunderstorms, Tornadoes, Wildfires, Winter Storms	AlertFm is available to all residents who choose to download the Smart Phone App or purchase a receiver. Receivers have been given to all schools.
O4: Outdoor Warning Sirens	Purchase outdoor warning sirens to place in areas throughout the Parish.	HMGP, PDM, EMPG	12-48 Months	OPPJ, OPOHSEP, GOHSEP	Dam / Levee Failure, Drought, Earthquake, Extreme Heat, Flooding, Hazardous Materials, Hurricanes / Tropical Storms, Thunderstorms, Tornadoes, Wildfires, Winter Storms	This has been cost prohibitive
O5: Elevate Flood Prone Structures	Elevate new and existing flood prone structures and infrastructure and key electrical equipment throughout Ouachita Parish.	HMGP, PDM, FMA, RFC, SRL	36 Months	OPPJ, OPOHSEP	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	Very few have been done. This is an expensive process.
O6: Upgrade Bridges and Crossings	Replace and/or upgrade bridges and other crossings throughout Ouachita Parish.	HMGP, PDM, local funding sources	1-5 Years	OPPJ, OPOHSEP, LADOTD	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	On going. These are done as funds become available

O7: Drainage Improvements	Pursue drainage improvements throughout Ouachita Parish. Actions can include but are not limited to installing/upgrading culverts and headwalls as well as enlarging storm water ditches and canals. See Appendix C for specific locations and projects.	HMGP, PDM, FMA	12-48 Months	OPPJ, OPOHSEP, Parish Public Works	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	Carried Over
O8: Generators and Back Up Power Systems for Critical Facilities	Provide generators/back-up power systems for critical facilities (including but not limited to lift stations, water plants, police, EMS, Fire and other first responder facilities) throughout the Ouachita Parish.	HMGP, EMPG	12-48 Months	OPPJ, OPOHSEP	Hurricanes, Severe Winter Weather, Thunderstorm, Tornado	Carried Over
O9: Improve Detention / Retention Ponds	Construct or improve existing detention/retention ponds where appropriate to collect storm water to reduce flooding.	HMGP, PDM, FMA	12-48 Months	OPPJ, OPOHSEP, Parish Public Works	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	Carried Over
O10: Safe Rooms	Retrofit existing structures or construct new structures to act as safe rooms during tornados or other severe weather events.	HMGP, PDM, state and local funding sources	1-3 Years	OPPJ, OPOHSEP, GOHSEP	Tornadoes	0% No funds
O11: Educational Programs	Provide educational programs and information to the public regarding the hazards identified in this 2011 Hazard Mitigation Plan update. Programs and informational items include presentations at community meetings and schools, pamphlets that are provided at public facilities and schools, and public service announcements and advertisements on local cable channels.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornadoes, Wildfire	Educational programs are offered at community meetings, schools and other venues. Attendance and interest is usually low except when a major weather event is immanent.
O12: Minimize Tree Damage	Minimize damage to structures and infrastructure from falling trees. Actions include but are not limited to the following: • Pursue and coordinate a dangerous tree and limb removal program to protect infrastructure and critical facilities from damage. This includes working with private homeowners for voluntary removal of hazardous trees and limbs on private property. • Coordinate contracting to remove and/or trim trees that endanger structures, infrastructure, and vital roadways.	HMGP, PA, local funding sources, Utilities	6-12 Months	OPPJ, OPOHSEP, Entergy, other utilities	Hurricanes/Tropical Storms, Severe Winter Weather, Thunderstorms, Tornadoes	Carried Over

O13: Community Education Program	Develop a community education program for presentation to local schools and community groups. Establish a speaker's bureau to schedule and make presentations.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornadoes, Wildfire	Other that as mentioned in 12 above, this has not been done
O14: Funding for Project Implementation	Pursue all possible funding opportunities for project implementation.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornadoes, Wildfire	All funding possibilities are always pursued.
O15: PSAs	Coordinate PSA's with local television and radio stations.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornados, Wildfire	This is done anytime there is a pending event.
O16: Advance Public Notice	Coordinate advance public notice by local television and radio stations.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornados, Wildfire	Local media is always on standby for any public announcement that needs to be made. We are prepared to use broadcast, print media and social media to notify the public of any event.
O17: Water Reduction and Conservation Programs	Establish and coordinate water reduction and water conservation programs with local water providers and utility companies. Prepare brochures to be mailed to water customers.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Drought	Carried Over
O18: Wildfire Educational Campaigns	Design and implement comprehensive educational campaign for wildfire.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Wildfire	20% This is only done through the efforts of the Fire Departments.
O19: Wildfire Building Standards	Educate homeowners on mitigating damage due to wildfire by encouraging and implementing the use of building standards outlined in the national Fire Wise Program.	HMGP, PDM	12-48 Months	OPPJ, OPOHSEP, Parish Public Works	Dam Failure, Flood, Hurricane/Tropical Storms, Levee Failure, Thunderstorm, Tornado	Carried Over
O20: GIS Commission	Establish a parish wide G.I.S. commission, develop implementation structure and establish and adopt base maps.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornadoes, Wildfire	In Progress

O21: Flood Property Mitigation Program	Establish and implement a Flood Property Mitigation Program.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP. Floodplain Mgt.	Dam Failure, Flood, Hurricanes, Levee Failure, Thunderstorms	In Progress
O22: Update NFIP Repetitive Loss List	Review the current FEMA NFIP Repetitive Loss List for Ouachita Parish to identify the correct, updated address and exact location of each individual structure. Many structures on the list are not mapped due to inaccurate or outdated addresses. Purge the list of any repetitive loss structure that is located within an incorporated area of the Parish, and, transfer responsibility for mitigation to the appropriate NFIP community. Submit any corrections to the State Floodplain Manager of Louisiana and FEMA Region VI.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP. Floodplain Management	Dam Failure, Flood, Hurricanes, Levee Failure, Thunderstorms	In Progress
O23: Storm Ready Program	Continue to participate in the "Storm Ready" Program in Ouachita Parish, which involves recertification every three years. The Parish is will be recertified as a "Storm Ready" community in 2011 to early 2012. In order for the parish to remain a "Storm Ready" community, they will be required to undergo recertification again in 2014-2015 falling within the five year life of this 2011 Plan Update.	HMGP, PDM, local funding sources	6-12 Months	OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornadoes, Wildfire	Completed
O24: Drive Development Away From Hazards	Continue to Update and enforce ordinances that drive development away from known hazard areas. This can include but is not limited to developing and/or updating floodplain ordinances that require new structures built in Special Flood Hazard Areas to have a minimum building elevation at least one foot above base flood elevation.	OPPJ, OPOHSEP, local governments	12-48 Months	OPPJ	NFIP PARTICIPATION - Dam Failure, Flood, Hurricane/Tropical Storms, Levee Failure, Thunderstorm	In Progress
O25: DFIRMs	Upon completion of levee stability studies and pending any necessary modifications to the preliminary D-FIRMS (issued in 2009), adopt new DFIRMS once available from FEMA and approved by the Parish (incorporated and un-incorporated areas).	Local Funding Sources	12-48 Months	OPPJ, OPOHSEP	NFIP PARTICIPATION - Dam Failure, Flood, Hurricane/Tropical Storms, Levee Failure, Thunderstorm	In Progress

O26: Relocate Flood Prone Properties	Relocate flood prone properties throughout the Parish to locations out of the floodplain to prevent future flood losses.	HMGP, PDM, FMA, RFC, SRL	36 Months	OPPJ, OPOHSEP	Dam Failure, Flood, Hurricane/Tropical Storms, Levee Failure, Thunderstorm	Carried Over
O27: Dam Failure	Work with those individual dam owners to analyze the potential dam inundation zones and levels that could occur due to dam failure.	HMGP, PDM, local funding sources	12-48 Months	OPPJ, OPOHSEP	Dam Failure	Carried Over
O28: Acquire Flood Prone Properties	Acquire flood prone properties (including Repetitive Loss and Severe Repetitive Loss Properties).	HMGP, PDM, FMA, RFC, SRL	12-36 Months	OPPJ, OPOHSEP	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	Carried Over
O29: Water Retention Ponds	Construct water retention ponds to collect storm water run-off and use as an alternate water source throughout Ouachita Parish.	HMGP, PDM, FMA	12-48 Months	OPPJ, OPOHSEP, Parish Public Works	Drought	Carried Over
O30: Wildfire Defensible Space Program	Develop a defensible space program in order to reduce fuels surrounding homes in the urban-wildland interface.	HMGP, PDM	12-48 Months	OPPJ, OPOHSEP, Local Fire Departments	Wildfire	Carried Over

City of Monroe						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
M1: Auxiliary Power Sources for New and Existing Critical infrastructure	Provide portable generators and backup or redundancy in electric power to critical city services including primary power stations, primary emergency shelters, potable water, sewage systems(73 sewer lift stations), and emergency responder facilities.	Local Revenue	1-5 Years	Monroe Public Works Department	All Hazards	In Progress
M2: Sewer System Rehabilitation	Continue sewer line rehabilitation program.	LA DEQ, State Revolving Loan, Local	1-5 Years	Monroe Project Management Division, Infrastructure Program	Flooding	In Progress
M3: New Chemical Storage Building	Construct new chemical storage building that meets 100-mph wind load.	Local Revenue	6-24 Months	Monroe Public Works Department	High Wind, Hurricanes	Carried Over
M4: Storage Capacity Enhancement of Bayous and Drainage Canals	Develop and implement a sustainable bayou and canal program that either enhances or restores the capacities of the bayous and drainage canals. Other than general revenue, another funding alternative could be for the city to establish special stormwater taxing districts for areas within the 100-year flood zones.	HMGP, Local Revenue	6-24 Months	Monroe Public Works Department	Flooding	Carried Over
M5: Debris Reduction Public Outreach Program	Develop a public outreach program focused on debris reduction in the City's drainage canals. Working through the Beautification Department, pattern a program following its annual fall volunteer cleanup along Bayou Desiard and the Ouachita River.	Louisiana Litter Abatement Grant	6-24 Months	Monroe Public Works Department, Monroe Beautification Department	Flooding	In Progress
M6: School-based All-Hazard Education Program	Incorporate an all-hazard education program into all City of Monroe school curriculums.	American Red Cross	6-24 Months	Monroe City Schools	All Hazards	In Progress
M7: Recertification of Floodwall Levee	The Monroe City Council will provide the TBLB with a formal letter strongly supporting the recertification of the floodwall along the Ouachita River.	None Needed	6-24 Months	Monroe City Council, Planning and Urban Development Dept.	Flooding, Levee Failure	Carried Over
M8: Commodity Flows Study	Conduct a transportation chemical commodity flows study.	U.S. DOT, LA DOTD, Hazardous Materials Emergency Preparedness Grant	6-24 Months	Monroe Fire Department; Ouachita Local Emergency Planning Committee	Hazardous Materials	In Progress

M9: Community Rating System (CRS) Strategy	Develop strategy that identifies actions the city can take to enhance its CRS rating.	HMGP, Local Revenue	6-24 Months	Planning and Urban Development Department	Flooding	In Progress
M10: Hazard Mitigation Plan for Historic Structures	Conduct a study that includes a highly detailed structural inventory of historic buildings within the City that are listed on the National Register of Historic Places, an analysis of the vulnerability of each structure to high winds and flood, and a recommended actions needed to be taken to create more resilient historic structures.	HMGP	6-24 Months	Planning and Urban Development Department	Flooding, High Wind, Hurricanes, Tornadoes	In Progress
M11: Transportation Evacuation Study	Working with the North Delta Regional Planning and Development District, identify those roadway links that frequently flood, impeding or jeopardizing evacuation during flood events. The City needs to coordinate this planning effort with Ouachita Parish Office of Homeland Security and Emergency Preparedness. The results of the study should be integrated into the North Delta Long-Range Transportation Plan and Transportation Improvement Program.	HMGP, Federal Highway Administration/ MPO	6-24 Months	Planning and Urban Development Department, North Delta Regional Planning and Development District	Flooding, High Wind, Hurricanes, Tornadoes	In Progress
M12: Mitigation Planning Coordination	Attend all relevant disaster mitigation seminars and meetings with various regional, parish, or municipal organizations.	Local Revenue	6-24 Months	Planning and Urban Development Department, Monroe Fire Department	All Hazards	In Progress
M13: Comprehensive Plan Revision	Review and upgrade the existing Comprehensive Plan to incorporate hazard considerations.	LA Community Resiliency Grant	6-24 Months	Planning and Urban Development Department	All Hazards	Complete, Revisions Ongoing
M14: Zoning Ordinance Revision	Review and update existing Zoning Ordinance to incorporate hazard considerations.	LA Community Resiliency Grant	6-24 Months	Planning and Urban Development Department	All Hazards	Complete, Revisions Ongoing
M15: Calypso Street Stormwater Station Reconstruction	Elevate floor of pump station, modify piping, and replace all three pumps and controls.	HMGP, Local Revenue	6-24 Months	Monroe Department of Public Works	Flooding, Levee Failure	Carried Over
M16: Phillips Lake Drainage Project	Modify existing Marquette Street pump station, build small pump station in lake, install suction line, and put in various piping changes.	Louisiana Community Resiliency Grant, Local Revenue	6-24 Months	Monroe Department of Public Works	Flooding	Carried Over
M17: Storm Drainage Pump Stations Upgrades	Modify and upgrade nine pump stations; purchase portable diesel generators.	HMGP, Local Revenue	6-24 Months	Monroe Department of Public Works	Flooding, Levee Failure	Complete
M18: Structural Assessment of Fire Stations	Conduct fire station structural assessment study.	Local Revenue	6-24 Months	Monroe Fire Department	All Hazards	Carried Over

M19: ULM Emergency Management Plan	Develop and implement a Comprehensive Emergency Management Plan involving both campus and community stakeholders.	U.S. Department of Education Institutions of Higher Education for Emergency Management Planning Grant	6-24 Months	ULM Police Department	All Hazards	Complete, Revisions Ongoing
M20: Citywide Drainage Study	Conduct a citywide drainage study.	HMGP	1-5 Years	Monroe Engineering Department; Public Works Department	Flooding, High Wind, Hurricanes	Carried Over
M21: Storm Drainage Cleanup Program	Create a storm drain cleanup program.	Local Revenue	6-24 Months	Public Works Department, Beautification Department	Flooding	In Progress
M22: Weatherization Assistance Program	Weatherize homes of low-income households to sustain winter storms.	Louisiana Housing Finance Agency, Louisiana Community Action Agency	1-5 Years	Monroe Department of Planning and Development	Sever Winter Weather	In Progress
M23: Weatherization/ Hazardous Materials Education Program	Develop a weatherization education program.	Louisiana Housing Finance Agency, Louisiana Community Action Agency	1-5 Years	Monroe Department of Planning and Development, Ouachita Parish Health Unit	Severe Winter Weather	In Progress
M24: Airport Canal Erosion Project	Construct a Gunite drainage membrane in the Airport Canal from White Street to Owl Street.	HMGP	6-24 Months	Public Works Department	Flooding	Carried Over
M25: Long-Term Post-Disaster Redevelopment Plan	Prepare a long-term post disaster redevelopment plan	HMGP	1-5 Years	Monroe Planning and Urban Development	All Hazards	Carried Over
M26: Require all utilities for new construction projects to be installed underground	Constructing utilities underground where available will during the City's vulnerable to utility damage and power outages from wind events and winter storms.	N/A	1-5 Years	Monroe Planning and Urban Development	Winter Storms	In Progress
M27: Elevation/acquisition/flood proofing projects for new and existing repetitive loss structures	Elevate, acquire, or flood proof new and existing repetitive loss structures throughout the City.	N/A	1-5 Years	Monroe Planning and Urban Development	Flooding, Dam Failure, Levee Failure	Carried Over
M28: Structurally harden all existing and future critical facilities to withstand strong winds	The hardening of critical facilities will mitigate potential damages associated with high wind events, including thunderstorms, tornadoes, and hurricanes/tropical storms. Hardening can include, but is not limited to, shatter-proof windows, reinforced walls, and reinforced foundations.	N/A	1-5 Years	Monroe Planning and Urban Development	High Wind	In Progress

Town of Richwood						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
R1: New Shelters for Hurricanes	Continually inventory and Retrofit/upgrade existing structures and/or construct new structures to act as shelters during and after Hurricanes/Tropical Storms and other severe weather events.	HMGP, PDM	12-48 Months	Town of Richwood, OPOHSEP, Richwood Public Works	Hurricanes / Tropical Storms	Carried Over
R2: Harden and Retrofit Critical Facilities	Storm harden/retrofit critical facilities throughout Town of Richwood. Actions can include but are not limited to window shutters, roof straps, flood proofing, roll-up door reinforcement (i.e. for fire stations).	HMGP, PDM	12-48 Months	Town of Richwood, OPOHSEP, Richwood Public Works	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm, Tornado	Completed
R3: Elevate Flood Prone Structures	Elevate new and existing flood prone structures and infrastructure and key electrical equipment throughout Town of Richwood.	HMGP, PDM, FMA, RFC, SRL	36 Months	Town of Richwood, OPOHSEP	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	In Progress
R4: Upgrade Bridges and Crossings	Replace and/or upgrade bridges and other crossings throughout Town of Richwood.	HMGP, PDM, local funding sources	1-5 Years	Town of Richwood, OPOHSEP, LADOTD	Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	Carried Over
R5: Drainage Improvements	Pursue drainage improvements throughout Town of Richwood. Actions can include but are not limited to installing/upgrading culverts and headwalls as well as enlarging storm water ditches and canals.	HMGP, PDM, FMA	12-48 Months	Town of Richwood, OPOHSEP, Richwood Public Works	Dam Failure, Flood, Hurricane/Tropical Storms, Levee Failure, Thunderstorm	In Progress
R6: Generators and Back Up Power for Critical Facilities	Provide generators/back-up power systems for critical facilities throughout the Town of Richwood.	HMGP, EMPG	12-48 Months	Town of Richwood, OPOHSEP	Hurricanes, Severe Winter Weather, Thunderstorm, Tornado	In Progress
R7: New Shelters for Tornadoes	Retrofit existing structures or construct new structures to act as safe rooms during tornados or other severe weather events.	HMGP, PDM, state and local funding sources	1-3 Years	Town of Richwood, OPOHSEP, GOHSEP	Tornadoes	Carried Over

R8: Educational Programs	Provide educational programs and information to the public regarding the hazards identified in this 2011 Hazard Mitigation Plan update. Programs and informational items include presentations at community meetings and schools, pamphlets that are provided at public facilities and schools, and public service announcements and advertisements on local cable channels.	HMGP, PDM, local funding sources	6-12 Months	Town of Richwood, OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornadoes, Wildfire	In Progress
R9: Minimize Tree Damage	Minimize damage to structures and infrastructure from falling trees. Actions include but are not limited to the following: • Pursue and coordinate a dangerous tree and limb removal program to protect infrastructure and critical facilities from damage. This includes working with private homeowners for voluntary removal of hazardous trees and limbs on private property. • Coordinate contracting to remove and/or trim trees that endanger structures, infrastructure, and vital roadways.	HMGP, PA, local funding sources, utility companies	6-12 Months	Town of Richwood, OPOHSEP, Entergy, other utilities	Hurricanes / Tropical Storms, Severe Winter Weather, Thunderstorms, Tornadoes	Completed
R10: Funding for Project Implementation	Pursue all possible funding opportunities for project implementation.	HMGP, PDM, local funding sources	6-12 Months	Town of Richwood, OPOHSEP	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hazardous Materials, Hurricanes, Levee Failure, Severe Winter Weather, Thunderstorms, Tornadoes, Wildfire	Carried Over
R11: Water Conservation Programs	Establish a water conservation programs with local water providers and utility companies. Prepare brochures to be mailed to water customers.	HMGP, PDM, local funding sources	6-12 Months	Town of Richwood, OPOHSEP	Drought	Carried Over
R12: Flood Property Mitigation Program	Establish and implement a Flood Property Mitigation Program.	HMGP, PDM, local funding sources	6-12 Months	Town of Richwood, OPOHSEP, Floodplain Management	Dam Failure, Flood, Hurricanes, Levee Failure, Thunderstorms	Completed

R13: Update NFIP Repetitive Loss List	Review the current FEMA NFIP Repetitive Loss List for Town of Richwood to identify the correct, updated address and exact location of each individual structure. Many structures on the list are not mapped due to inaccurate or outdated addresses. Purge the list of any repetitive loss structure that is located within an incorporated area of the Parish, and, transfer responsibility for mitigation to the appropriate NFIP community. Submit any corrections to the State Floodplain Manager of Louisiana and FEMA Region VI.	HMGP, PDM, local funding sources	6-12 Months	Town of Richwood, OPOHSEP, Floodplain Management	Dam Failure, Flood, Hurricanes, Levee Failure, Thunderstorms	In Progress
R14: Development Away from Hazard Areas	Develop ordinances that drive development away from known hazard areas. This can include but is not limited to developing and/or updating floodplain ordinances.	Town of Richwood, OPOHSEP, local govts.	12-48 Months	Town of Richwood	NFIP PARTICIPATION - Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	Completed
R15: DFIRMs	Adopt new DFIRMS once available from FEMA and approved by the town (incorporated and un-incorporated areas).	Local funding sources	12-48 Months	Town of Richwood, OPOHSEP	NFIP PARTICIPATION - Dam Failure, Flood, Hurricane / Tropical Storms, Levee Failure, Thunderstorm	In Progress
R16: Acquire Flood Prone Properties	Acquire flood prone properties (including Repetitive Loss and Severe Repetitive Loss Properties).	HMGP, PDM, FMA, RFC, SRL	12-36 Months	Town of Richwood, OPOHSEP	Dam Failure, Flood, Hurricane/Tropical Storms, Levee Failure, Thunderstorm	Carried Over
R17: Defensible Space Program	Develop a defensible space program in order to reduce fuels surrounding homes in the urban-wildland interface.	HMGP, PDM	12-48 Months	Town of Richwood, OPOHSEP, local fire departments	Wildfire	In Progress

Town of Sterlington						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
S1: Public Education and Outreach	Develop disaster education program, to include information from FEMA, NWS, and USDA, to educate citizens about the drought hazard	HMGP, Local	1-5 Years	Mayor's Office	All Hazards	This is a continuing process. Public education about hazards is an ongoing process. Yearly exercises are help with all of the local plants.
S2: Training for First Responders	Provide training for EMS personnel	Homeland Security Funds, Local Budget	1-5 Years	Mayor's Office	All Hazards	All required training is accomplished on a regular basis.
S3: Conduct Commodity Flow Study	Develop transportation chemical commodity flow study	Homeland Security Funds, DOTD, Local Budget	1-5 Years	Mayor's Office, Public Works, Fire Department	Hazardous Materials	This has not been done
S4: Alternate Evacuation Route	Work with Ouachita Parish and LADOTD to examine alternate exit route for the Power Avenue area	DOTD, Local Budget	1-5 Years	Mayor's Office, Public Works, Fire Department	All Hazards	There are only two ways out of Sterlington, North or South. These routes are clearly marked and are discussed at all public meetings.
S5: Previous Occurrence and Extent Data Collection	Begin gathering town specific previous occurrence and extent data; this data will be incorporated into future updates of the plan.	Local Budget	1-5 Years	Mayor's Office, Public Works, Fire Department	Winter Storms, Wildfires	This is an on-going process
S6: Building Code Implementation	Implement and enforce International Building Codes	HMGP, Local	1-5 Years	Mayor's Office	All Hazards	We are in the process of making our codes math the Parish codes
S7: Floodplain Regulation – Limit Development	Continue to include and update mitigation requirements in floodplain development regulations	Local Budget	2 Years	Mayor's Office	Flooding	On-going process
S8: Warning Systems	Upgrade or expand warning system for Town of Sterlington	HMGP, Local	2 Years	Mayor's Office	Hurricane, High Wind, Tornado	The current alarm system is maintained by the local chemical plant
S9: Emergency Generator	Install emergency generator at Sterlington wastewater treatment facility, Sterlington Police Station, sewer lift stations, Sterlington Elementary School, and East Ouachita Recreation Center.	HMGP, Local	4 Years	Public Works	All Hazards	In Progress

S10: Retrofit, or incorporate mitigation into the design of, existing buildings and infrastructure to reduce the impacts of flood	Drainage projects to alleviate standing water issues throughout town.; Add backflow protection to homes to prevent sewer backup issues.; Resize culverts at Francis, and Ronaldson, Davis, Taylor and Rogers, Highway 2 and Old Sterlington Rd, Old Sterlington Rd. east of Ronaldson, and Francis and High St.; Increase capacity of local drainage canals; increase capacity of lift station at Harvey and Francis Streets; increase capacity of lift station at District 10 on Power Ave.	HMGP, Local, Non-Disaster HMA Grants	1-5 Years	Public Works	Flooding, Communicable Diseases	Carried Over
S11: Hail-Proofing Public Buildings	Hail-proof public buildings	HMGP, Local, Non-Disaster HMA Grants	1-5 Years	Mayor's Office	Hail	Carried Over
S12: Retrofit of Critical Facilities	Retrofit/harden roof and facility for Sterlington Public Works Facility and East Ouachita Recreation Center	HMGP, Local, Non-Disaster HMA Grants	1-5 Years	Mayor's Office	Hurricane, High Wind	Carried Over
S13: Protection of Critical Facilities	Create wildfire safety zones around critical facilities by managing and altering landscaping and vegetation	HMGP, Local, Non-Disaster HMA Grants	1-5 Years	Mayor's Office	Wildfire	Carried Over
S14: Protection of Critical Facilities	Winterize/weatherize Sterlington Water System and sewer system infrastructure	HMGP, Local, Non-Disaster HMA Grants	1-5 Years	Mayor's Office	Ice/Winter Storms	In Progress
S15: Retrofit Existing Structures to Function as Safe Rooms	Retrofit Sterlington Town Hall, East Ouachita Recreation Center, Sterlington Middle School, Sterlington Elementary School, and Sterlington Police Station to protect life and prevent injury of those housed inside	HMGP, Local, Non-Disaster HMA Grants	1-5 Years	Mayor's Office	Hurricane/High Wind, Tornado	Carried Over
S16: Community Shelters	Construct multi-purpose community shelter to provide immediate life protection for events with little or no warning as well as serve as new town hall and government complex.	HMGP, Local, Non-Disaster HMA Grants	1-5 Years	Mayor's Office	Hurricane/High Wind, Tornado	Carried Over

City of West Monroe						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
WM1: Master Drainage Plan	The Master Drainage Plan will include information on the existing storm sewer system and potential projects to help alleviate flooding. It will include flood plans for Black Bayou. The Master Drainage Plan will also include an analysis of future development and possible solutions for maintaining pre-developed runoff rates.	General Fund	4 Years	City Engineer	Flooding	In Progress
WM2: Emergency Procedures	West Monroe will begin preparing a winter weather preparation plan. The plan will consist of working with the power company to trim trees that overhang power lines, the purchase of emergency generators, and determining when to begin preparation activities such as salting streets. Emergency contact numbers will also be distributed between departments. The emergency contact list will clearly specify who to call for individual hazard events. Evacuation plans for flooding, hazardous materials, tornados and other hazard events will be created.	General Fund	3 Years	Public Works	Extreme Heat, Flooding, Winter Storm, Hailstorm, Hurricane, Lightning, Tornado, Hazardous Materials, Pipeline Rupture	Complete
WM3: Stormwater Pollution Prevention Plan	Determine the need for stormwater pollution prevention greater than what is required by the EPA. By reducing sediment that infiltrates the storm sewer system, the City can reduce flooding caused by congested storm sewers. The Stormwater Pollution Prevention Plan will also analyze the amount of pollutants that accumulate in the storm sewer system and possible projects and ordinances to prevent and reduce the amount of pollutants in the storm sewer system and ultimately in Black Bayou and the Ouachita River.	General Fund / Grant	3 Years	City Engineer	Flooding	In Progress
WM4: Levee Failure - Evacuation Plan	Develop an evacuation and notification plan for a potential levee failure. The plan will identify the residents and critical facilities most susceptible to damage.	General Fund	2 Years	City Depts./Tensas Levee District	Flooding, Levee Failure	In Progress
WM5: Targeted Drainage Projects	Upon completion of the Master Drainage Plan, several drainage projects will be prioritized to reduce flooding. Until that time, the drainage projects found in the Project Scoping Report should take precedent.	General Fund / HMGP / EDA	Continuing	City Engineer	Flooding	Carried Over

WM6: Warning System	Investigate the feasibility of implementing several options in the warning system. Some mitigation options may be deemed too expensive for the benefit provided. An audible warning system installed around the city will be investigated. The City will also place a link to real-time weather information on the West Monroe website.	General Fund	Continuing	City Council	Flooding, Hailstorm, Lightning, Tornado, Levee Failure	In Progress
WM7: Review Building Codes	The Building Department will review the current Building Codes and determine whether any changes should be made.	General Fund	Continuing	Building Department	Flooding, Hailstorm, Hurricane, Lightning, Tornado	In Progress
WM8: Public Service Announcements	Plan a public service announcement program through which all potential hazards will be addressed and announcements will be made throughout the year	General Fund	1 Year	Public Works	Extreme Heat, Flooding, Winter Storm, Hailstorm, Hurricane, Lightning, Tornado, Hazardous Materials, Pipeline Rupture	In Progress
WM9: Non-Potable Water Reuse System	The City is currently investigating upgrading the wastewater treatment plant to provide treated water for industrial use. The City also intends to construct a non-potable water system at the wastewater treatment plant for non-essential potable water usage such as the chlorinator.	General Fund / LaDEQ / EPA	1 Year	City Council	Extreme Heat	Complete
WM10: Maintain Storm Sewer System	Attempt to budget more money towards maintenance and replacement but will also seek funding from outside sources. The Department of Public Works continues to inspect the existing infrastructure to determine the priority of repairs and replacements.	General Fund / Grants	Continuing	Public Works	Flooding	In Progress
WM11: School Program	Preparing a school program to inform children about the dangers that certain hazards cause.	General Fund	1 Year	Advisory Team	Extreme Heat, Flooding, Winter Storm, Hailstorm, Hurricane, Lightning, Tornado, Hazardous Materials, Pipeline Rupture, Levee Failure	In Progress
WM12: Safety Town*	Expand the “Safety Town” project. “Safety Town” is a facility that children will go to be educated about the dangers of various hazards.	General Fund	2 Years	Advisory Team/OOHSEP	Extreme Heat, Flooding, Winter Storm, Hailstorm, Hurricane, Lightning, Tornado, Hazardous Materials, Pipeline Rupture	Complete

WM13: Heat/Winter Elderly Plan - Council on Aging	The West Ouachita Senior Center Division will continue to check in on the elderly during extreme heat and provide fans for those homes without air conditioning. They will also contact them during winter weather to make sure they have proper medication and transportation if necessary. Information will be provided to residents concerning the dangers of extreme heat and ways to keep cool. The City will also conduct public service announcements with shelter locations and other areas to keep cool or warm.	General Fund	Continuing	Senior Center	Extreme Heat, Winter Storm	Carried Over
WM14: Enhance/Upgrade Sanitary Sewer	The Public Works Department will be responsible for inspecting all sanitary sewer lines and manholes for inflow/infiltration.	General Fund	Continuing	Public Works	Flooding	In Progress
WM15: Water Conservation Plan	The Department of Public Works will coordinate with the Department of Economic Development to prepare and implement a water conservation plan.	General Fund	3 Years	Public Works	Extreme Heat	Carried Over
WM16: GIS System	The City is currently creating a geographic information system (GIS). The GIS will include the water, sanitary sewer and storm sewer facilities of the City. It will also include information from this Plan such as special flood hazard areas and critical facilities.	General Fund	Continuing	Public Works	Flooding, Winter Storm, Hurricane, Tornado, Hazardous Materials, Pipeline Rupture	In Progress
WM17: Repetitive Floodloss Structures/Buyouts	The Planning and Zoning Department will review the Repetitive Flood Loss Structures list and make any changes or corrections that are necessary to the list. The Department will also prioritize the structures so that facilities are not removed in a checkerboard type fashion.	General Fund / HMGP	Continuing	City Planner	Flooding	In Progress
WM18: NOAA Weather Radio in Public Buildings	Research the cost to provide NWR in all public buildings as well as assisted living facilities. The NWR system will help provide warning and post-disaster information that can be helpful.	General Fund	2 Years	Public Works	Flooding, Winter Storm, Hailstorm, Hurricane, Tornado	Complete
WM19: Review Data Gaps	The Hazard Mitigation Advisory Team will continue to research past hazard events that little historical information was given such as hailstorms and lightning.	General Fund	5 Years	City Engineer	Winter Storm, Hailstorm, Lightning, Hazardous Materials	In Progress
WM20: Enhance/Upgrade Waterlines	The Public Works Department will be responsible for reviewing waterline construction dates and materials to determine if line repairs should be completed.	General Fund / CWEF / LGAP	Continuing	Public Works	Hazardous Materials	Complete
WM21: Hazard Map Availability	Provide the hazard maps generated during the planning process for public access at the library and City website.	General Fund	<1 Year	Advisory Team	Flooding, Tornado, Hazardous Materials	Carried Over

WM22: Review Funding Sources	Acquiring funding for each project will be the responsibility of the department assigned to each task. The City will budget for projects as well, but each department will be charged with completing the research on funding sources and completing the necessary paperwork and documentation. Departments will be encouraged to include mitigation projects into their operating budgets for the year.	General Fund	1 Year	City Depts.	Extreme Heat, Flooding, Winter Storm, Hailstorm, Hurricane, Lightning, Tornado, Hazardous Materials, Pipeline Rupture	Complete
WM23: Water Level Gauge/Call System	The Public Works Department will determine the feasibility of placing water level gauges on Black Bayou and the Ouachita River to help determine flood risk.	General Fund / Grant	5 Years	Public Works / Tensas Levee District	Flooding	Carried Over
WM24: Warning Signs	Determine areas with localized flooding as well as high water areas. The City Council will then determine whether warning signs should be placed at these locations to notify residents of potential flooding danger.	General fund	1 Year	City Council / Public Works	Flooding	Complete
WM25: Mosquito Abatement Program	West Monroe will continue to work with the Ouachita Parish Mosquito Abatement District to inform the public of the dangers of mosquito carried diseases. The City will also conduct mosquito fogging in conjunction with Ouachita Parish's treatment schedule.	General Fund	2 Years	Public Works	Disease	In Progress
WM26: Evaluate Construction of Saferooms/Shelters	The City will investigate the need for safe rooms in public buildings and critical facilities.	General Fund	5 Years	Building Department	Tornado	Complete
WM27: Generators, Lightning rods & Surge Protection	The City will enhance critical facilities by adding lightning rods, surge protection, and generators to the facilities. These will be added to both current and new facilities.	General Fund	2 Years	Building Department	Lightning	In Progress
WM28: Evaluate Detention Pond Construction	The City recently completed a drainage project, Restoration Park, which created wetlands, provided detention, and beautified the area. The project will help reduce runoff rates to Black Bayou. Additional projects like Restoration Park will be necessary if future development is not required to discharge stormwater at pre-developed conditions. The Department of Public Works and City Engineer will be responsible for monitoring the situation and determining whether additional projects will be necessary.	General Fund	Continuing	Public Works	Flooding	Carried Over
WM29: Encourage underground Utility Construction	The Keep West Monroe Beautiful Department will investigate the feasibility of placing above ground utility facilities below ground.	General Fund	Continuing	City Planner/City Engineer	Winter Storm	In Progress

Unincorporated Ouachita - New Mitigation Actions

Ouachita Unincorporated - New Mitigation Actions						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
O1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
O2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Flooding, High Wind, Tropical Cyclones	New
O3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Dam Failure, Levee Failure	New
O4: Safe Room Projects	Construction of a safe room for first responders located in Ouachita Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones, Wildfires	New
O5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Drought, Dam Failure, Levee Failure, and Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high winds, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New

O6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high winds, hail), Extreme Heat	New
O7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Lightning	New
O8: Warning Systems	Update/upgrade public warning system components throughout Ouachita Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure, Levee Failure	New
O9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes, Drought, Extreme Heat	New
O10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Tropical Cyclones, Flooding	New
O11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
O12: Dam/Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam/levee failure.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
O13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Drought	New
O14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Wildfires	New
O15: Cooling Shelter Construction	Construct or enhance a cooling facility for the public to utilize during periods of extreme heat to protect life and safety of citizens.	FEMA HMGP, Local	1-5 years	Ouachita Parish OHSEP	Extreme Heat	New

City of Monroe - New Mitigation Actions

City of Monroe						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
M1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
M2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Flooding, High Wind, Tropical Cyclones	New
M3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Dam Failure, Levee Failure	New
M4: Safe Room Projects	Construction of a safe room for first responders located in Monroe. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones, Wildfires	New
M5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Drought, Dam Failure, Levee Failure, and Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high winds, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New

M6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high winds, hail), Extreme Heat	New
M7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Lightning	New
M8: Warning Systems	Update/upgrade public warning system components throughout Monroe as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure, Levee Failure	New
M9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes, Drought, Extreme Heat	New
M10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Flooding	New
M11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
M12: Dam/Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam/levee failure.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
M13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Drought	New
M14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Wildfires	New
M15: Cooling Shelter Construction	Construct or enhance a cooling facility for the public to utilize during periods of extreme heat to protect life and safety of citizens.	FEMA HMGP, Local	1-5 years	City of Monroe/Ouachita Parish OHSEP	Extreme Heat	New

Town of Richwood - New Mitigation Actions

Town of Richwood						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
R1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
R2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Flooding, High Wind, Tropical Cyclones	New
R3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Dam Failure, Levee Failure	New
R4: Safe Room Projects	Construction of a safe room for first responders located in Belcher. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones, Wildfires	New
R5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Drought, Dam Failure, Levee Failure, and Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high winds, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New

R6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high winds, hail), Extreme Heat	New
R7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Lightning	New
R8: Warning Systems	Update/upgrade public warning system components throughout Richwood as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure, Levee Failure	New
R9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes, Drought, Extreme Heat	New
R10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Tropical Cyclones, Flooding	New
R11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
R12: Dam/Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam/levee failure.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
R13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Drought	New
R14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Wildfires	New
R15: Cooling Shelter Construction	Construct or enhance a cooling facility for the public to utilize during periods of extreme heat to protect life and safety of citizens.	FEMA HMGP, Local	1-5 years	Town of Richwood/Ouachita Parish OHSEP	Extreme Heat	New

Town of Sterlington - New Mitigation Actions

Town of Sterlington						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
S1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
S2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Flooding, High Wind, Tropical Cyclones	New
S3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Dam Failure, Levee Failure	New
S4: Safe Room Projects	Construction of a safe room for first responders located in Sterlington. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones, Wildfires	New
S5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Drought, Dam Failure, Levee Failure, and Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high winds, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New

S6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high winds, hail), Extreme Heat	New
S7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sterlington as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure, Levee Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes, Drought, Extreme Heat	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
S12: Dam/Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam/levee failure.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Wildfires	New
S15: Cooling Shelter Construction	Construct or enhance a cooling facility for the public to utilize during periods of extreme heat to protect life and safety of citizens.	FEMA HMGP, Local	1-5 years	Town of Sterlington/Ouachita Parish OHSEP	Extreme Heat	New

City of West Monroe - New Mitigation Actions

City of West Monroe						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
WM1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
WM2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Flooding, High Wind, Tropical Cyclones	New
WM3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Dam Failure, Levee Failure	New
WM4: Safe Room Projects	Construction of a safe room for first responders located in West Monroe. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones, Wildfires	New
WM5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Drought, Dam Failure, Levee Failure, and Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high winds, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New

WM6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high winds, hail), Extreme Heat	New
WM7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Lightning	New
WM8: Warning Systems	Update/upgrade public warning system components throughout West Monroe as necessary. Install audible and/or reverse 911 warning system(s).	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure, Levee Failure	New
WM9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes, Drought, Extreme Heat	New
WM10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Flooding	New
WM11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
WM12: Dam/Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam/levee failure.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
WM13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Drought	New
WM14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Wildfires	New
WM15: Cooling Shelter Construction	Construct or enhance a cooling facility for the public to utilize during periods of extreme heat to protect life and safety of citizens.	FEMA HMGP, Local	1-5 years	City of West Monroe/Ouachita Parish OHSEP	Extreme Heat	New

Action Prioritization

During the prioritization process, each jurisdiction and the steering committee considered the costs and relative benefits of each new action. Costs can usually be listed in terms of dollars, although at times it involves staff time rather than the purchase of equipment or services that can be readily measured in dollars. In most cases, benefits, such as lives saved or future damage prevented, are hard to measure in dollars, many projects were prioritized with these factors in mind.

In all cases, the jurisdictions concluded that the benefits (in terms of reduced property damage, lives saved, health problems averted and/or economic harm prevented) outweighed the costs for the recommended action items.

The steering committee met internally for mitigation action meetings to review and approve Ouachita Parish and the jurisdiction's mitigation actions. On-going actions, as well as actions which can be undertaken by existing parish or local staff without need for additional funding, were given high priority. The actions with high benefit and low cost, political support, and public support but require additional funding from parish or external sources were given medium priority. The actions that require substantial funding from external sources with relatively longer completion time were given low priority. There have been no changes in financial, legal and political priorities within the past 5 years, with the methodology and prioritization process remaining the same.

Ouachita Parish and the participating jurisdictions will implement and administer the identified actions based off of the proposed timeframes and priorities for each reflected in the portions of this section where actions are summarized. The inclusion of any specific action item in this document does not commit the parish to implementation. Each action item will be subject to availability of staff and funding. Certain items may require regulatory changes or other decisions that must be implemented through standard processes, such as changing regulations. This plan is intended to offer priorities based on an examination of hazards.

Appendix A: Planning Process

Purpose

The Hazard Mitigation Plan Update process prompts local jurisdictions to keep their hazard mitigation plan current and moving toward a more resilient community. The plan update builds on the research and planning efforts of previous plans while reviewing recent trends. The steering committee followed FEMA's hazard mitigation planning process per the FEMA Local Mitigation Planning Handbook. This planning process assured public involvement and the participation of interested agencies and private organizations. Documentation of the planning process for the updated plan is addressed in this section.

The Ouachita Parish Hazard Mitigation Plan Update

The Ouachita Parish Hazard Mitigation Plan Update process began in October 2016 with a series of meetings and collaborations between the contractor (SDMI) and the participating jurisdictions. Update activities were intended to give each jurisdiction the opportunity to shape the plan to best fit their community's goals. Community stakeholders and the general public were invited to attend and contribute information to the planning process during specific time periods or meetings.

Ouachita Parish includes the unincorporated area of Ouachita Parish, as well as the four incorporated municipalities that participated in the plan update process – the City of Monroe, Town of Richwood, Town of Sterlington, and City of West Monroe. Ouachita Parish Office of Homeland Security and Emergency Preparedness (OHSEP) invited communities' representatives to meetings, where they supplied critical infrastructure data and reviewed work-in-progress for the plan update.

Similar to the development of the original Hazard Mitigation Plan, the role of the steering committee members during the plan update was to attend the planning meetings and provide valuable information on the parish, develop parts of the plan update, and review the results of research conducted by SDMI. Tasks completed by the steering committee include:

- Reviewing and revising the list of potential hazards included in the plan update
- Assembling a list of critical facilities, such as hospitals, police stations, and shelters
- Updating mitigation goals and objectives
- Determining prudent mitigation measures
- Prioritization of identified mitigation measures

The table below details the meeting schedule and purpose for the planning process:

Date	Meeting or Outreach	Location	Public Invited	Purpose
10/17/2016	Initial Coordination	Telephone/ Email	No	Discuss with Parish HM coordinator and any Steering Committee members expectations and requirements of the project.
11/29/2016	Kick-Off Meeting	West Monroe, LA	No	Discuss with the plan steering committee expectations and requirements of the project. Assign plan worksheets to jurisdictions.
1/11/2017	Risk Assessment Overview	West Monroe, LA	No	Discuss and review the risk assessment with the steering committee discuss and review expectations for public meeting.
1/11/2017	Public Meeting	West Monroe, LA	Yes	The public meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Maps of the Ouachita Parish communities were provide for the meeting attendees to identify specific areas where localized hazards occur.
Ongoing	Public Survey Tool	Online	Yes	This survey asked participants about public perceptions and opinions regarding natural hazards in Ouachita Parish. In addition, we asked about the methods and techniques preferred for reducing the risks and losses associated with these hazards. Survey Results: https://www.surveymonkey.com/r/OuachitaParish
2 Week Period	Public Plan Review (Digital)		Yes	SDMI HM Plan Website

Planning

The plan update process consisted of several phases:

Phase	Month 1-2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Plan Revision								
Data Collection								
Risk Assessment								
Public Input								
Mitigation Strategy and Actions								
Plan Review by GOHSEP and FEMA								
Plan Adoption								
Plan Approval								

Coordination

The Ouachita Parish OHSEP oversaw the coordination of the 2016 Hazard Mitigation Plan Update Steering Committee during the update process. The Ouachita Parish OHSEP and participating jurisdictions were responsible for identifying members for the committee.

The Parish Director and SDMI were jointly responsible for inviting the Steering Committee and key stakeholders to all planned meetings and activities by email invitations and calendar invites. SDMI assisted the Parish Director with meeting notices, website and social media statements for notification to the media and general public for public meetings and public outreach activities.

SDMI was responsible for facilitating meetings and outreach efforts during the update process.

Neighboring Community, Local and Regional Planning Process Involvement

From the outset of the planning process, the Hazard Mitigation Team encouraged participation from a broad range of jurisdictional entities. The involvement of representatives from the city, state, and regional agencies provided diverse perspectives and mitigation ideas.

Formal participation in this plan includes but is not limited to the following activities:

- Participation in Hazard Mitigation Team meetings at the local and parish level
- Sharing local data and information
- Local action item development
- Plan document draft review
- Formal adoption of the Hazard Mitigation Plan document by each jurisdiction following provisional approval by The State of Louisiana and FEMA

The 2016 Hazard Mitigation Plan Update Steering Committee consisted of representatives from the following parish, municipal, or community stakeholders:

- Ouachita Parish Police Jury
- Ouachita Parish Office of Homeland Security and Emergency Preparedness
- Ouachita Parish Fire Department
- Ouachita Parish Sheriff's Office
- City of Monroe
- Town of Richwood
- Town of Sterlington
- City of West Monroe
- American Medical Response

The Parish of Union were invited by the Ouachita Parish OHSEP via email invitation to participate in all meetings and activities as well in an effort to collaborate with neighboring communities. In addition, the participation of the GOHSEP Region 8 Coordinator during the process also contributed to neighboring community representation.

As part of the coordination and planning process, each jurisdiction was provided the State Required Hazard Mitigation Plan Update Worksheet. Jurisdictions with the capability to complete and return these worksheets returned them to assist with the 2016 update. The completed worksheets can be found in Appendix E – State Required Plan Update Worksheets.

On the next page is a detailed list of the 2016 Hazard Mitigation Plan Update Steering Committee.

Name	Title	Agency	Address	Email
Neal Brown	OEP Director	Ouachita OHSEP	1000 New Natchitoches Road, West Monroe 71201	anbrown@OHSEP.net
Scotty Robinson	Police Jury President	Ouachita Parish Police Jury	675 Caldwell Road, West Monroe, LA 71291	srobinson@oppj.org
Kevin Crosby	Parish Engineer	Ouachita Parish Police Jury	2000 N 7th Street, West Monroe, LA 71291	kcrosby@lazenbyengr.com
Walt Caldwell	District C Police Juror	Ouachita Parish Police Jury	301 South Grand, Suite 201, Monroe, LA 71201	waltermcaldwelliv@gmail.com
Pat Hemphill	Fire Chief	Ouachita Parish Fire Department	1000 New Natchitoches Road, West Monroe 71201	phemphill@oppj.org
Jay Russell	Sheriff	Ouachita Parish Sheriff Department	PO Box 1803, Monroe, LA 71210	jay.russell@opso.com
Terry Williams	Chief	Monroe Fire Department	1810 Martin Luther King Drive, Monroe, La 71201	terry.williams@ci.monroe.la.us
Quienton Holmes	Chief	Monroe Police Department	1810 Martin Luther King Drive, Monroe, La 71201	quienton.holmes@ci.monroe.la.us
Todd Smith	Chief	West Monroe Fire Department	2301 North 7th, West Monroe, La 71291	tsmith@westmonroe.la.gov
Jeff Terrell	Chief	West Monroe Police Department	2301 North 7th, West Monroe, La 71291	jterrell@westmonroe.la.gov
Vern Breland	Mayor	Town Of Sterlington	503 Hwy 2, Sterlington, LA 71280	vbreland@yahoo.com
Gerald Brown	Mayor	Town of Richwood	2710 Martin Luther King Drive, Richwood, LA 71202	
Justin Nowlin	Supervisor of Operations	American Medical Response	607 North 3rd, Monroe, La 71201	justin.nowlin@amr.net

Program Integration

Local governments are required to describe how their mitigation planning process is integrated with other ongoing local and area planning efforts. This subsection describes Ouachita Parish programs and planning.

A measure of integration and coordination is achieved through the Hazard Mitigation Plan participation of steering committee members and community stakeholders, who administer programs such as floodplain management under the National Flood Insurance Program (NFIP) and parish planning and zoning and building code enforcement.

Opportunities to integrate the requirements of this Hazard Mitigation Plan into other local planning mechanisms will continue to be identified through future meetings of the parish and jurisdictions, and through the five-year review process described in the Plan Maintenance section. The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update, and implementation of each jurisdiction's individual city/town plans that require specific planning and administrative tasks (e.g. risk assessment, plan amendments, ordinance revisions, capital improvement projects, etc.).

The members of the Ouachita Parish Hazard Mitigation Steering Committee will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the parish. Existing plans, studies, and technical information were incorporated in the planning process. Examples include flood data from FEMA, the U.S. Army Corps of Engineers (USACE or Corps), and the U.S. Geological Survey. Much of this data was incorporated into the risk assessment component of the plan relative to plotting historical events and the magnitude of damages that

occurred. The parish's 2005 Hazard Mitigation Plan was also used in the planning process. Other existing parish and jurisdiction data and plans reviewed and/or incorporated into the planning process include those listed below:

- Emergency Operations Plan
- State of Louisiana Hazard Mitigation Plan
- Flood Insurance Rate Maps

Further information on other plans and capabilities reviewed can be found in the Capabilities Assessment, Section 3.

Meeting Documentation and Public Outreach Activities

The following pages contain information from the meetings and public outreach activities conducted during this Hazard Mitigation Plan Update for Ouachita Parish.

Meeting #1: Coordination Discussion

Date: October 17, 2016

Location: Email

Purpose: Discuss with the Hazard Mitigation Lead for the parish (OHSEP Director) the expectations and requirements of the Hazard Mitigation Plan Update process and to establish and initial project timeline.

Public Initiation: No

Invitees Included: Ouachita Parish OHSEP, SDMI Staff

Meeting #2: Hazard Mitigation Plan Update Kick-Off

Date: November 29, 2016

Location: West Monroe, Louisiana

Purpose: Discuss the expectations and requirements of the Hazard Mitigation Plan Update process and to establish and initial project timeline with the parish's Hazard Mitigation Plan Steering Committee. Assign each individual jurisdiction and the parish data collection for the plan update.

Public Initiation: No

Invitees Included:

Name	Title	Agency
Neal Brown	OEP Director	Ouachita OHSEP
Scotty Robinson	Police Jury President	Ouachita Parish Police Jury
Kevin Crosby	Parish Engineer	Ouachita Parish Police Jury
Walt Caldwell	District C Police Juror	Ouachita Parish Police Jury
Pat Hemphill	Fire Chief	Ouachita Parish Fire Department
Jay Russell	Sheriff	Ouachita Parish Sheriff Department
Terry Williams	Chief	Monroe Fire Department
Quienton Holmes	Chief	Monroe Police Department
Todd Smith	Chief	West Monroe Fire Department
Jeff Terrell	Chief	West Monroe Police Department
Vern Breland	Mayor	Town Of Sterlington
Gerald Brown	Mayor	Town of Richwood
Justin Nowlin	Supervisor of Operations	American Medical Response

Meeting #3: Risk Assessment Overview

Date: January 11, 2017

Location: West Monroe, LA

Purpose: Members of the Hazard Mitigation Plan Update Steering Committee were invited and were presented the results of the most recent risk assessment and an overview of the public meeting presentation during this overview. The assessment was conducted based on hazards identified during previous plans.

Public Initiation: No

Invitees Included:

Name	Title	Agency
Neal Brown	OEP Director	Ouachita OHSEP
Scotty Robinson	Police Jury President	Ouachita Parish Police Jury
Kevin Crosby	Parish Engineer	Ouachita Parish Police Jury
Walt Caldwell	District C Police Juror	Ouachita Parish Police Jury
Pat Hemphill	Fire Chief	Ouachita Parish Fire Department
Jay Russell	Sheriff	Ouachita Parish Sheriff Department
Terry Williams	Chief	Monroe Fire Department
Quienton Holmes	Chief	Monroe Police Department
Todd Smith	Chief	West Monroe Fire Department
Jeff Terrell	Chief	West Monroe Police Department
Vern Breland	Mayor	Town Of Sterlington
Gerald Brown	Mayor	Town of Richwood
Justin Nowlin	Supervisor of Operations	American Medical Response

Meeting #4: Public Meeting

Date: January 11, 2017

Location: West Monroe, LA

Purpose: The public meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Maps of the Ouachita Parish communities were provided for the meeting attendees to identify specific areas where localized hazards occur.

Public Initiation: Yes

Invitees Included:

Name	Title	Agency
Neal Brown	OEP Director	Ouachita OHSEP
Scotty Robinson	Police Jury President	Ouachita Parish Police Jury
Kevin Crosby	Parish Engineer	Ouachita Parish Police Jury
Walt Caldwell	District C Police Juror	Ouachita Parish Police Jury
Pat Hemphill	Fire Chief	Ouachita Parish Fire Department
Jay Russell	Sheriff	Ouachita Parish Sheriff Department
Terry Williams	Chief	Monroe Fire Department
Quienton Holmes	Chief	Monroe Police Department
Todd Smith	Chief	West Monroe Fire Department
Jeff Terrell	Chief	West Monroe Police Department
Vern Breland	Mayor	Town Of Sterlington
Gerald Brown	Mayor	Town of Richwood
Justin Nowlin	Supervisor of Operations	American Medical Response

****Subject Matter Experts from parish government were present to answer specific questions about proposed projects from any citizens****

Meeting Public Notice

OUACHITA PARISH
OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

MEETING NOTICE – January 4, 2017

Ouachita Parish to hold Public Meetings for Hazard Mitigation Plan Update

WEST MONROE LA – Ouachita Parish Office of Homeland Security & Emergency Preparedness is in the process of updating the Ouachita Parish Hazard Mitigation Plan and are required to hold public meetings on the plan update. The Public meeting will be held on January 11, 2017 in the Ouachita Parish Emergency Operations Center located at 1000 New Natchitoches Road, West Monroe, LA from 10:30AM to 11:30AM.

Natural hazards have the potential to cause property loss, loss of life, economic hardship, and threats to public health and safety. While an important aspect of emergency management deals with disaster recovery (the actions that a community takes to repair damages), an equally important aspect of emergency management involves hazard mitigation - sustained actions taken to reduce long-term risk to life and property. They are things we do today to be more protected in the future. For example, elevating buildings in flood hazard areas, installing hurricane clips and storm shutters, relocating critical facilities out of hazard areas, using fire-resistant construction materials in wildfire hazard areas, etc. Hazard mitigation actions are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage. With careful selection, they can be long-term, cost-effective means of reducing risk and helping to create a more sustainable and disaster-resilient community.

A hazard mitigation plan describes an area's vulnerability to the various natural hazards that are typically present, along with an array of actions and projects for reducing key risks. While natural disasters cannot be prevented from occurring, the continued implementation of mitigation strategies identified in the plan will gradually, but steadily, make our communities more sustainable and disaster-resilient.

The Disaster Mitigation Act of 2000 (DMA 2000) requires all states and local governments to have a hazard mitigation plan in order to be eligible to apply for certain types of federal hazard mitigation project grants. Hazard mitigation plans must be: (a) implemented on an ongoing basis, and (b) updated every five years to ensure that they remain applicable representations of local risk and locally-preferred risk reduction strategies.

Ouachita Parish is in the beginning stages of updating its hazard mitigation plan. Public meeting will be held on January 11, 2017 for all citizens interested in learning about and participating in discussions concerning the Ouachita Hazard Mitigation Plan.

Residents of Ouachita Parish are asked to participate in a survey about public perceptions and opinions regarding natural hazards in the parish. The survey results will be used in the development of the plan. This short web-based survey can be found at https://www.surveymonkey.com/r/OuachitaParish

For more information, please contact: Archie Neal Brown, Ouachita Parish OHSEP Director

Stephenson Disaster Management Institute
Louisiana State University • 3000 Business Education Complex • Baton Rouge, Louisiana 70803

Outreach Activity #1: Public Opinion Survey

Date: Ongoing throughout planning process
Location: Web Survey
Public Initiation: Yes
No comments were collected through this activity.

Outreach Activity #2: Incident Questionnaire

Date: Public Meeting Activity
Location: Public Meeting
Public Initiation: Yes
The public was asked to provide information regarding which types of hazards concerned them the most. No public elected to participate in this activity, therefore no feedback was collected at this time.

Outreach Activity #3: Mapping Activities

Public meeting attendees were asked to identify areas on jurisdictional maps provided that were "problem areas". They were also asked to indicate any areas of new development. This activity gave the public an opportunity to interact with SDMI's GIS Mapping section, as well as provide valuable input on areas that may flood repeatedly during rain events that may not get reported to local emergency managers as significant events. However, because no members of the public attended, no comments were collected.

Public Plan Review Documentation

The Ouachita Parish Hazard Mitigation Draft Plan was placed on the SDMI website to collect comments and feedback from the public. This outreach provided the public an opportunity to comment on the plan during the drafting stage and prior to plan approval. No feedback or public comment was received during this time.

Appendix B: Plan Maintenance

Purpose

The section of the Code of Federal Regulations (CFR) pertaining to Local Mitigation Plans lists five required components for each plan: a description of the planning process; risk assessments; mitigation strategies; a method and system for plan maintenance; and documentation of plan adoption. This section details the method and system for plan maintenance, following the CFR's guidelines that the Plan Update must include (1) "a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle," (2) "a process by which local governments incorporated the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans", and (3) "discussion on how the community will continue public participation in the plan maintenance process."

Monitoring, Evaluating, and Updating the Plan

The Ouachita Parish Planning Committee will be responsible for monitoring, evaluating, and documenting the plan's progress throughout the year. Part of the plan maintenance process should include a system by which local governing bodies incorporate the HMP into the parish's comprehensive or capital improvement plans. This process provides for continued public participation through the diverse resources of the parish to help in achieving the goals and objectives of the plan. Public participation will be achieved through availability of copies of HMP in parish public library and parish website. This section describes the whole update process which includes the following:

- Responsible parties
- Methods to be used
- Evaluation criteria to be applied
- Scheduling for monitoring and evaluating the plan

Responsible Parties

Ouachita Parish has developed a method to ensure that a regular review and update of the Hazard Mitigation Plan occurs. This will be the responsibility of the steering committee, which consists of representatives from governmental organizations, local businesses, and private citizens, who will be involved in the process of monitoring, evaluating and updating the plan. All committee members in this plan will remain active in the steering committee.

Although the people filling the positions may change from year to year, the parish and its stakeholders will have representatives on the Steering Committee. The future Steering Committee will continue to be comprised of the same job functions as currently evident in the Steering Committee. However, the decision of specific job duties will be left to the Parish OHSEP Director to be assigned as deemed appropriate.

Methods for Monitoring and Evaluating the Plan and Plan Evaluation Criteria

Ouachita Parish has developed a method to ensure monitoring, evaluating, and updating of the HMP occurs during the five-year cycle of the plan. The planning committee will become a permanent body and will be responsible for monitoring, evaluating, and updating of the plan. The planning committee meeting will be held annually in order to monitor, evaluate, and update the plan. The Ouachita Parish OHSEP Director will be responsible for conducting the annual planning committee meetings.

The lead person of the agency responsible for the implementation of a specific mitigation action will submit a progress report to the Director at least thirty days prior to the planning committee meeting. The progress report will provide project status monitoring to include the following: whether the project has started; if not started, reason for not starting; if started, status of the project; if the project is completed, whether it has eliminated the problem; and any changes recommended to improve the implementation of the project etc. In addition, the progress report will provide status monitoring on the plan evaluation, changes to the hazard profile, changes to the risk assessment, and public input on the Hazard Mitigation Plan updates and reviews.

Progress on the mitigation action items and projects will be reviewed during the annual planning committee meeting. The criteria that would be utilized in the project review will include the following:

1) Whether the action was implemented and reasons, if the action was not implemented

2) What were the results of the implemented action

3) Were the outcomes as expected, and reasons if the outcomes were not as expected

4) Did the results achieve the stated goals and objectives

5) Was the action cost-effective

6) What were the losses avoided after completion of the project

7) In case of a structural project, did it change the hazard profile

In addition to monitoring and evaluating the progress of the mitigation plan actions and projects, the mitigation plan is required to be maintained and monitored annually, and updated every five years. The annual maintenance, monitoring and evaluation of the plan will be conducted in the annual planning committee meeting. The planning committee will review each goal and objective to determine their relevance to changing situations in the parish, as well as changes to state or federal policy, and to ensure that they are addressing current and expected conditions. The planning committee will evaluate if any change in hazard profile and risk in the parish occurred during the past year. In addition, the evaluation will include the following criteria in respect of plan implementation:

1) Any local staffing changes that would warrant inviting different members to the planning committee

2) Any new organizations that would be valuable in the planning process or project implementation need to be included in the planning committee

3) Are there any procedures that can be done more efficiently

4) Are there more ways to gain more diverse and widespread cooperation

5) Are there any different or additional funding sources available for mitigation planning and implementation

The HMP will be updated every five years to remain eligible for continued HMGP funding. The planning committee will be responsible for updating the HMP. The OHSEP Director will be the lead person for the HMP update. The HMP update process will commence at least one year prior to the expiration of the plan. The HMP will be updated after a major disaster if an annual evaluation of the plan indicate a substantial change in hazard profile and risk assessment in the parish.

Additionally, the public will be canvassed to solicit public input to continue Ouachita Parish's dedication to involving the public directly in review and updates of the Hazard Mitigation Plan. Meetings will be scheduled as needed by the plan administrator to provide a forum for which the public can express their concerns, opinions, and/or ideas about the plan. The plan administrator will be responsible for using parish resources to publicize the annual public meetings and maintain public involvement through the newspapers, radio, and public access television channels. Copies of the plan will be catalogued and kept at all appropriate agencies in the city government, as well as at the Public Library.

The review by the steering committee and input from the public will determine whether a plan update is needed prior to the required five-year update.

Annual Reports on the progress of actions, plan maintenance, monitoring, evaluation, incorporation into existing planning programs, and continued public involvement will be documented at each annual meeting of the committee and kept by the Parish OHSEP Director. The Steering Committee will work together as a team, with each member sharing responsibility for completing the monitoring, evaluation and updates. It is the responsibility of the Parish OHSEP Director for contacting committee members, organizing the meeting and providing public noticing for the meeting to solicit public input.

2016 Plan Version Plan Method and Schedule Evaluation

For the current plan update, the previously approved plan's method and schedule were evaluated to determine if the elements and processes involved in the required 2016 update. Based on this analysis, the method and schedule were deemed to be acceptable, and nothing was changed for this update.

Incorporation into Existing Planning Programs

It is and has been the responsibility of the Ouachita Parish Hazard Mitigation Plan Steering Committee and participating jurisdictions to determine additional implementation procedures when appropriate. This may include integrating the requirements of the Ouachita Parish Hazard Mitigation Plan into each jurisdiction's planning documents, processes, or mechanisms as follows:

- Ordinances, Resolutions, Regulations
- Comprehensive Master Plan
- Capital Improvements Plan
- Economic Development Plan
- Emergency Operations Plan
- Continuity of Operations Plan
- Transportation Plan
- Stormwater Management Plan
- Community Wildfire Protection Plan
- Floodplain Ordinances

Opportunities to integrate the requirements of this plan into other local planning mechanisms will continue to be identified through future meetings of the Ouachita Parish Hazard Mitigation Steering Committee and through the five-year review process described herein. The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update and implementation of each jurisdiction's individual plans that require specific planning and administrative tasks (e.g. risk assessment, plan amendments, ordinance revisions, capital improvement projects, etc.). The members of the steering committee will meet with Department Heads to discuss what should be included in the changes

that are necessary before the changes are introduced to the city council or police jury meetings. Steering committee members will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Ouachita Parish Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability within the parish.

During the planning process for new and updated local planning documents at the parish and jurisdiction level, such as a risk assessment, comprehensive plan, capital improvements plan, or emergency operations plan, the jurisdictions will provide a copy of the Parish Hazard Mitigation Plan to the appropriate parties and recommend that all goals and strategies of new and updated local planning documents are consistent with and support the goals of the Parish Hazard Mitigation Plan and will not contribute to increased hazards.

Although it is recognized that there are many possible benefits to integrating components of this plan into other parish and jurisdiction planning mechanisms, the development and maintenance of this stand-alone Hazard Mitigation Plan is deemed by the steering committee to be the most effective and appropriate method to ensure implementation of parish and local hazard mitigation actions.

On behalf of the jurisdictions of the City of Monroe, Town of Richwood, Town of Sterlington, and City of West Monroe, Ouachita Parish has the authority to incorporate the contents of the Hazard Mitigation Plan into the parish's existing regulatory mechanisms. Agreements are currently in place with jurisdictions to allow for the parish incorporation mechanisms to take place.

The following parish and local plans incorporate requirements of this HMP Update as follows through steering committee member and jurisdiction representation throughout the planning process as described above:

Ouachita Unincorporated
Capital Improvements Plan/Updated as needed/Ouachita Parish Police Jury
Economic Development Plan/Updated as needed/Ouachita Parish Police Jury
Local Emergency Operations Plan/Updated as needed/Ouachita Parish OHSEP
Continuity of Operations Plan/Updated as needed/Ouachita Parish OHSEP
Transportation Plan/Updated as needed/Ouachita Parish OHSEP
Stormwater Management Plan/Updated as needed/ Ouachita Parish Police Jury
Community Wildfire Plan/Updated as needed/Ouachita Parish OHSEP
Shelter Plan for Incoming Evacuees/Update as needed/Ouachita Parish OHSEP

City of Monroe
Comprehensive Master Plan/Update as needed/Ouachita Parish Police Jury and Mayor of Monroe
Capital Improvements Plan/Updated as needed/Ouachita Parish Police Jury and Mayor of Monroe
Economic Development Plan/Updated as needed/Ouachita Parish Police Jury and Mayor of Monroe
Local Emergency Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Monroe
Continuity of Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Monroe
Transportation Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Monroe
Stormwater Management Plan/Updated as needed/ Ouachita Parish Police Jury and Mayor of Monroe
Community Wildfire Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Monroe

Town of Richwood
Local Emergency Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Richwood
Continuity of Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Richwood
Transportation Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Richwood
Stormwater Management Plan/Updated as needed/ Ouachita Parish Police Jury and Mayor of Richwood
Community Wildfire Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Richwood

Town of Sterlington
Capital Improvements Plan/Updated as needed/Ouachita Parish Police Jury and Mayor of Sterlington
Local Emergency Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Sterlington
Continuity of Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Sterlington
Transportation Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Sterlington
Stormwater Management Plan/Updated as needed/ Ouachita Parish Police Jury and Mayor of Sterlington
Community Wildfire Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of Sterlington

City of West Monroe
Comprehensive Master Plan/Update as needed/Ouachita Parish Police Jury and Mayor of West Monroe
Capital Improvements Plan/Updated as needed/Ouachita Parish Police Jury and Mayor of West Monroe
Economic Development Plan/Updated as needed/Ouachita Parish Police Jury and Mayor of West Monroe
Local Emergency Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of West Monroe
Continuity of Operations Plan/Updated as needed/Ouachita Parish OHSEP and Mayor of West Monroe
Stormwater Management Plan/Updated as needed/ Ouachita Parish Police Jury and Mayor of West Monroe

Continued Public Participation

Public participation is an integral component of the mitigation planning process and will continue to be essential as this plan evolves over time. Significant changes or amendments to the plan require a public hearing prior to any adoption procedures. Other efforts to involve the public in the maintenance, evaluation, and revision process will be made as necessary. These efforts will include at least one of the following:

- Advertising meetings of the Mitigation Committee in the local newspaper, public bulletin boards, and/or city and county office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the Mitigation Committee
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place
- Utilizing city and parish web sites to advertise any maintenance and/or periodic review activities taking place
- Keeping copies of the plan in appropriate public locations

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Appendix C: Essential Facilities

Ouachita Parish Essential Facilities – All Jurisdictions

Ouachita Parish Unincorporated Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*	Dam Failure+	Levee Failure+
Fire and Rescue	Bosco Station II				X	X	X	X	X				
	OPFD Fire Department				X	X	X	X	X				
	OPFD Fire Station No 1				X	X	X	X	X	X			
	OPFD Fire Station No 10				X	X	X	X	X	X			
	OPFD Fire Station No 11				X	X	X	X	X				
	OPFD Fire Station No 12				X	X	X	X	X	X			
	OPFD Fire Station No 14				X	X	X	X	X				
	OPFD Fire Station No 16				X	X	X	X	X	X			
	OPFD Fire Station No 2				X	X	X	X	X				
	OPFD Fire Station No 4				X	X	X	X	X				
	OPFD Fire Station No 5				X	X	X	X	X	X			
	OPFD Fire Station No 6				X	X	X	X	X	X			
	OPFD Fire Station No 7				X	X	X	X	X				
	OPFD Fire Station No 8				X	X	X	X	X				
	OPFD Fire Station No 9				X	X	X	X	X	X			
Government	Department of Environmental Quality			X	X	X	X	X	X	X			
	Greater Ouachita Water Co.			X	X	X	X	X	X	X			
	Office of Senator Mike Walsworth			X	X	X	X	X	X	X			
Law Enforcement	Louisiana State Police Troop F				X	X	X	X	X				
Public Health	Cornerstone Hospital of West Monroe				X	X	X	X	X	X			
	North LA Medical Center				X	X	X	X	X	X			
Schools	Calhoun Elementary School				X	X	X	X	X				

	Calhoun Middle School				X	X	X	X	X	X			
	Central Elementary School				X	X	X	X	X				
	Claiborne Elementary School				X	X	X	X	X	X			
	Drew Elementary School				X	X	X	X	X	X			
	George Welch Elementary				X	X	X	X	X	X			
	Good Hope Middle School				X	X	X	X	X				
	Jack Hayes Elementary School				X	X	X	X	X	X			
	Lakeshore Elementary School				X	X	X	X	X				
	Lenwill Elementary School				X	X	X	X	X				
	Ouachita Christian School				X	X	X	X	X	X			
	Ouachita Parish High School				X	X	X	X	X				
	Pinecrest Elementary and Middle School				X	X	X	X	X				
	Richardson High School				X	X	X	X	X				
	Richwood High School				X	X	X	X	X				
	Richwood Middle School				X	X	X	X	X				
	Riser Middle School				X	X	X	X	X				
	River Oaks Elementary School			X	X	X	X	X	X	X			
	River Oaks High School				X	X	X	X	X	X			
	Robinson Elementary School				X	X	X	X	X	X			
	Shady Grove Elementary School				X	X	X	X	X				
	Sterlington High School				X	X	X	X	X	X			
	Swartz Elementary School				X	X	X	X	X	X			
	Swartz Lower Elementary School				X	X	X	X	X	X			
	Swayze Elementary				X	X	X	X	X	X			
	West Ouachita Parish High School				X	X	X	X	X	X			
	West Ridge Middle School				X	X	X	X	X	X			
	Woodlawn Elementary School				X	X	X	X	X				
	Woodlawn Middle School				X	X	X	X	X				

Monroe Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfire	Winter Storms*	Dam Failure+	Levee Failure+
Fire and Rescue	Fire Station 4				X	X	X	X	X				
	Forsythe Avenue Fire Station 6			X	X	X	X	X	X				
	Monroe Fire Department Central Station				X	X	X	X	X				
	Monroe Fire Station				X	X	X	X	X	X			
	Monroe Fire Station No 8				X	X	X	X	X				
	OPFD Fire Station No 5				X	X	X	X	X				
	Ouachita Parish Fire Department				X	X	X	X	X				
Government	4th Judicial District Public Defender's Office				X	X	X	X	X				
	Chamber of Commerce				X	X	X	X	X				
	City Hall Annex - Taxation and Revenue Dept.				X	X	X	X	X				
	City of Monroe Central Warehouse				X	X	X	X	X				
	City of Monroe City Hall Annex				X	X	X	X	X				
	City of Monroe Public Safety Center			X	X	X	X	X	X				
	City of Monroe Public Works Water and Sewer				X	X	X	X	X	X			
	City of Monroe Utility Operations				X	X	X	X	X				
	Department of Health - Office of Behavioral Health				X	X	X	X	X				
	Division of Agriculture				X	X	X	X	X				
	Division of Forestry				X	X	X	X	X				
	Katrina Jackson State Representative				X	X	X	X	X				
	LA Department of Health and Hospitals			X	X	X	X	X	X				
	Louisiana Department of Public Safety				X	X	X	X	X	X			
	LA Dept. of Transportation and Development				X	X	X	X	X				

	LA Dept. of Agriculture				X	X	X	X	X				
	Monroe City School Board			X	X	X	X	X	X				
	Monroe City School Board Media Center				X	X	X	X	X				
	Monroe Federation of Teachers				X	X	X	X	X	X			
	Monroe Housing Authority				X	X	X	X	X				
	Monroe Navigation Project Office			X	X	X	X	X	X				
	Monroe Nursery Building				X	X	X	X	X				
	Monroe Transit Operation Center				X	X	X	X	X				
	Office of Congressman Rodney Alexander				X	X	X	X	X				
	Office of Motor Vehicles				X	X	X	X	X				
	Ouachita Parish Courthouse			X	X	X	X	X	X	X			
	Ouachita Parish Juvenile Court				X	X	X	X	X				
	Ouachita Parish Media Center				X	X	X	X	X				
	Ouachita Parish Mosquito Abatement				X	X	X	X	X				
	Ouachita Parish School Board				X	X	X	X	X				
	Ouachita Parish School Eastside Bus Garage				X	X	X	X	X				
	Ouachita Parish School System				X	X	X	X	X	X			
	Ouachita Parish Section 8 Housing Office				X	X	X	X	X				
	School Board Textbook Supply				X	X	X	X	X				
	Social Security Administration				X	X	X	X	X				
	Tensas Basin Levee District				X	X	X	X	X	X			
	United States Courthouse				X	X	X	X	X				
Law Enforcement	Monroe Police Department				X	X	X	X	X				
Prison and Corrections	Ouachita Parish Juvenile Detention				X	X	X	X	X				
	Swanson Correctional Institute				X	X	X	X	X				
Public Health	EA Conway Medical Center				X	X	X	X	X				
	Monroe Surgery Hospital				X	X	X	X	X				
	North Monroe Health Care Center				X	X	X	X	X				

	St. Francis Medical Center				X	X	X	X	X				
	St. Francis Medical Center				X	X	X	X	X				
Schools	Barkdull Faulk School				X	X	X	X	X				
	Burg Jones Lane Elementary				X	X	X	X	X				
	Carroll High Magnet School				X	X	X	X	X				
	Carroll Junior High School				X	X	X	X	X				
	Carver Elementary School				X	X	X	X	X				
	Clara Hall Elementary School				X	X	X	X	X				
	Cypress Point Elementary				X	X	X	X	X				
	Geneva Academy			X	X	X	X	X	X	X			
	Georgia Tucker School				X	X	X	X	X				
	Grace Episcopal Lower Elementary School				X	X	X	X	X				
	Grace Episcopal Middle School				X	X	X	X	X				
	J.S. Clark Magnet School				X	X	X	X	X				
	Lee Junior High School				X	X	X	X	X				
	Lexington Elementary				X	X	X	X	X				
	Lincoln Elementary School				X	X	X	X	X				
	Madison James Foster Elementary School				X	X	X	X	X				
	Martin Luther King Elementary			X	X	X	X	X	X				
	Minnie Ruffin Elementary School				X	X	X	X	X				
	Neville High School				X	X	X	X	X				
	Ouachita Junior High School				X	X	X	X	X				
	Our Lady of Fatima School				X	X	X	X	X				
	Sallie Humble Elementary School				X	X	X	X	X				
	Sherrouse School				X	X	X	X	X				
	St. Frederick High School				X	X	X	X	X	X			
	Thomas Jefferson Elementary				X	X	X	X	X				
	Wossman High School			X	X	X	X	X	X				

Richwood Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flooding	Hail	Lightning	Wind	Tornado	Tropical Cyclone	Wildfire	Winter Storms*	Dam Failure+	Levee Failure+
Fire and Rescue	OPFD Fire Station No 3				X	X	X	X	X				
Government	Richwood Multiple Purpose Complex Center				X	X	X	X	X	X			
	Town of Richwood Public Works				X	X	X	X	X	X			
Prison and Corrections	Ouachita Correctional Center				X	X	X	X	X				
	Richwood Correctional Center			X	X	X	X	X	X	X			

Sterlington Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfire	Winter Storms*	Dam Failure+	Levee Failure+
Government	Sterlington Town Hall				X	X	X	X	X	X			
Law Enforcement	Sterlington Police Department				X	X	X	X	X				
Schools	Sterlington Elementary School				X	X	X	X	X				
	Sterlington High School				X	X	X	X	X				

West Monroe Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfire	Winter Storms*	Dam Failure+	Levee Failure+
Fire and Rescue	Ouachita Parish Fire Department				X	X	X	X	X				
	West Monroe Fire Department				X	X	X	X	X				
	West Monroe Fire Department				X	X	X	X	X				
Government	Louisiana Department of Motor Vehicles				X	X	X	X	X				
	Office of Frank Hoffman State Representative				X	X	X	X	X				
	Office of Veteran's Affairs				X	X	X	X	X				
	Ouachita Parish Comm. District				X	X	X	X	X				
	Public Works Department				X	X	X	X	X				
	West Monroe City Court				X	X	X	X	X				
	West Monroe Public Works Department			X	X	X	X	X	X				
Law Enforcement	Northern Louisiana Criminalistics Lab				X	X	X	X	X	X			
	West Monroe Police Station				X	X	X	X	X	X			
Public Health	Glenwood Medical Center				X	X	X	X	X				
	Ouachita Community Hospital				X	X	X	X	X				
Schools	Boley Elementary School				X	X	X	X	X				
	Crosley Elementary School				X	X	X	X	X				
	Highland Elementary School				X	X	X	X	X				
	Kiroli Elementary School				X	X	X	X	X				
	Mitchell Elementary School				X	X	X	X	X				
	Ramson Elementary School				X	X	X	X	X				
	Riverbend Elementary School				X	X	X	X	X				
	West Monroe High School				X	X	X	X	X				
	West Monroe Junior High School				X	X	X	X	X				

* There are no critical facilities vulnerable to the hazard.

+ Denotes a data deficiency

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Appendix D: Plan Adoption

Mr. Caldwell, seconded by Mr. Smiley offered the following resolution for adoption:

RESOLUTION NO. 17-65

A RESOLUTION ACCEPTING AND ADOPTING THE HAZARD MITIGATION PLAN FOR OUACHITA PARISH, LOUISIANA, INCLUDING THE TOWN OF RICHWOOD; AND FURTHER PROVIDING WITH RESPECT THERETO.

WHEREAS, representatives of our community have participated in the process to prepare a Disaster Mitigation Act of 2000 (DMA 2000) compliant multi-jurisdictional Hazard Mitigation Plan; and,

WHEREAS, appropriate opportunity for input by public and community officials has been provided through press releases, open meetings and availability of draft documents; and,

WHEREAS, the Hazard Mitigation Plan has been recommended for adoption by the Hazard Mitigation Planning Committee; and,

WHEREAS, adoption of the Plan is required for consideration of FEMA funding under the following programs:

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program

NOW, THEREFORE:

BE IT RESOLVED by the Ouachita Parish Police Jury in legal and regular session convened on this 2nd day of October, 2017, that the Ouachita Parish Police Jury hereby accepts and adopts The Hazard Mitigation Plan for Ouachita Parish, Louisiana.

The above resolution was adopted on the 2nd day of October, 2017.

* * *

CERTIFICATION

I hereby certify that the foregoing is a true and correct copy of Resolution 17-65 adopted at a Regular Meeting of the Ouachita Parish Police Jury held on the 2nd day of October, 2017, in which a quorum was present and voting and that the resolution adopted is still in effect and has not been rescinded or revoked.

Signed at Monroe, Louisiana on the 3rd day of October, 2017.

Karen Cupit

Karen Cupit, Recording Secretary

RESOLUTION

STATE OF LOUISIANA

CITY OF MONROE **No:** 7065

The following Resolution was introduced by Mr./~~Ms.~~ Wilson who moved for its adoption and was seconded by ~~Mr.~~/Ms. Woods

A RESOLUTION ACCEPTING AND ADOPTING THE HAZARD MITIGATION PLAN FOR CITY OF MONROE, LOUISIANA AND FURTHER PROVIDING WITH RESPECT THERETO.

WHEREAS, representatives of our community have participated in the process to prepare a Disaster Mitigation Act of 2000 (DMA 2000) compliant multi-jurisdictional Hazard Mitigation Plan; and,

WHEREAS, appropriate opportunity for input by public and community officials has been provided through press releases, open meetings and availability of draft documents; and,

WHEREAS, the Hazard Mitigation Plan has been recommended for adoption by the Hazard Mitigation Planning Committee; and,

WHEREAS, adoption of the Plan is required for consideration of FEMA funding under the following programs:

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program

NOW, THEREFORE:

BE IT RESOLVED that the City of Monroe does hereby accept and adopt The Ouachita Parish Hazard Mitigation Plan Update 2017 as the Hazard Mitigation Plan for the City of Monroe, LA.

This Resolution having been submitted in writing, and was then submitted to a vote as a whole, the vote thereon being as follows:

Ayes: Echols, Ezernack, Woods, Wilson + Clark

Nays: none

Absent: none

And the Resolution was declared ADOPTED on the 10th day of October, 2017.

Gretchen H. Ezernack
CHAIRMAN

Cardus S. Riley
CITY CLERK

TOWN OF RICHWOOD

PARISH OF OUACHITA

STATE OF LOUISIANA

FILED: October 30, 2017

MOVED BY: Alderperson Richard

SECONDED BY: Alderperson Profit

RESOLUTION 2017-10

A RESOLUTION ACCEPTING AND ADOPTING THE HAZARD MITIGATION PLAN FOR OUACHITA PARISH, LOUISIANA; AND FURTHER PROVIDING WITH RESPECT THERETO

A REGULAR MEETING HELD ON 19TH OCTOBER 2017 BY THE MAYOR AND BOARD OF ALDERPERSONS OF THE TOWN OF RICHWOOD, THIS SAID GOVERNING BODY CONSIDERED THE FOLLOWING:

WHEREAS, REPRESENTATIVE OF OUR COMMUNITY HAVE PARTICIPATED IN THE PROCESS TO PREPARE A DISASTER MITIGATION ACT OF 2000 (DMA 2000) COMPLIANT MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN; AND

WHEREAS, APPROPRIATE OPPORTUNITY FOR INPUT BY PUBLIC AND COMMUNITY OFFICIALS HAS BEEN PROVIDED THROUGH PRESS RELEASES, OPEN MEETING AND AVAILABILITY OF DRAFT DOCUMENTS; AND,

WHEREAS, ADOPTION OF THE PLAN IS REQUIRED FOR CONSIDERATION OF FEMA FUNDING UNDER THE FOLLOWING PROGRAMS:

- PRE-DISASTER MITIGATION
- HAZARD MITIGATION GRANT PROGRAM
- FLOOD MITIGATION ASSISTANCE PROGRAM

NOW, THEREFORE BE IT RESOLVED BY THE TOWN OF RICHWOOD IN LEGAL AND REGULAR SESSION CONVENED ON THIS _____ DAY OF OCTOBER 2017, THAT THE TOWN OF RICHWOOD HEREBY ACCEPTS AND ADOPTS THE HAZARD MITIGATION PLAN FOR OUACHITA PARISH, LOUISIANA.

THIS RESOLUTION HAVING BEEN SUBMITTED IN WRITING AND THEN SUBMITTED TO FINAL VOTE AS A WHOLE AND THE VOTE THEREON BEING AS FOLLOWED:

CLEVELAND	√ Yea	_____ Nay	_____ Absent	_____ Abstain
FLEMING	_____ Yea	_____ Nay	√ Absent	_____ Abstain
PROFIT	√ Yea	_____ Nay	_____ Absent	_____ Abstain
KEYS	√ Yea	_____ Nay	_____ Absent	_____ Abstain
RICHARD	√ Yea	_____ Nay	_____ Absent	_____ Abstain

THIS RESOLUTION WAS APPROVED BY VOTES ON THE 19TH DAY OF OCTOBER 2017.

A TRUE COPY
Town Clerk
Richwood, LA

D. Woods
Town Clerk

C. Rainwater
Attest

Certification

I hereby certify that the foregoing is a true and correct copy of Resolution No. 2017-10, adopted at a Regular Meeting of the Town of Richwood held on the 19th day of October 2017, in which a quorum was present and voting and that the resolution adopted is still in effect and has not been rescinded or revoked.

Signed at Richwood, Louisiana on the 30th day of October 2017.

Signature: D. Woods

Title: Town Clerk

STATE OF LOUISIANA

TOWN OF STERLINGTON

RESOLUTION NUMBER 2017-10-24

A RESOLUTION ACCEPTING AND ADOPTING THE HAZARD MITIGATION PLAN FOR OUACHITA PARISH, LOUISIANA; AND FURTHER PROVIDING WITH RESPECT THERETO.

WHEREAS, representatives of our community have participated in the process to prepare a Disaster Mitigation Act of 2000 (DMA 2000) compliant multi-jurisdictional Hazard Mitigation Plan; and,

WHEREAS, appropriate opportunity for input by public and community officials has been provided through press releases, open meetings and availability of draft documents; and,

WHEREAS, the Hazard Mitigation Plan has been recommended for adoption by the Hazard Mitigation Planning Committee; and,

WHEREAS, adoption of the Plan is required for consideration of FEMA funding under the following programs:

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program

NOW, THEREFORE:

BE IT RESOLVED by the Town of Sterlington in legal and regular session convened on this 24th day of October, 2017, that the Town of Sterlington hereby accepts and adopts The Hazard Mitigation Plan for Ouachita Parish, Louisiana.

The above resolution was adopted on the 24th day of October, 2017.

CERTIFICATION

I hereby certify that the foregoing is a true and correct copy of Resolution no. 2017-10-24 adopted at a Regular Meeting of the Town of Sterlington held on the 24th day of October, 2017, in which a quorum was present and voting and that the resolution adopted is still in effect and has not been rescinded or revoked.

Signed at Sterlington, Louisiana on the 30th day of October, 2017.

Signature: Marilyn Delmore

Title: Town Clerk

STATE OF LOUISIANA

CITY OF WEST MONROE

RESOLUTION NO. 7106 MOTION BY: Mrs. Mitchell

SECONDED BY: Mr. Brian

A RESOLUTION ADOPTING THE UPDATED HAZARD MITIGATION PLAN (2016 UPDATE) FOR THE CITY OF WEST MONROE, LOUISIANA, AND OTHERWISE PROVIDING WITH RESPECT THERETO.

WHEREAS, the Governor's Office of Homeland Security and Emergency Preparedness along with the Federal Emergency Management Agency have concluded their review of the proposed updated Hazard Mitigation Plan (2016 update) for the City of West Monroe, Louisiana, being the "2016 Ouachita Parish Hazard Mitigation Plan Update", all in conformance with 44 CFR Part 206, and that updated plan has received a satisfactory review.

NOW, THEREFORE:

SECTION 1. BE IT RESOLVED by the Mayor and Board of Aldermen of the City of West Monroe, Louisiana, in regular and legal session convened, that the Hazard Mitigation Plan for the City of West Monroe, Louisiana, shall be the "2016 Ouachita Parish Hazard Mitigation Plan Update", a copy of which is presented with this Resolution and is hereby adopted, with that copy of the "2016 Ouachita Parish Hazard Mitigation Plan Update" to be retained and available for inspection in the office of Planning and Zoning in West Monroe City Hall, 2305 N 7th Street, West Monroe, LA, and a copy to be available online (currently at https://hmplans.sdmi.lsu.edu/api/Parishes/361).

SECTION 2. BE IT FURTHER RESOLVED by the Mayor and Board of Aldermen on the City of West Monroe, Louisiana, in regular and legal session convened, that Dave Norris, Mayor of the City of West Monroe, be and he is hereby authorized to take any and all action and to execute any and all documents he deems either necessary or appropriate in order to carry out the provisions of the foregoing Resolution, and to more fully adopt and implement the provisions of the updated Hazard Mitigation Plan of the City of West Monroe, Louisiana.

The above Resolution was read and considered by Sections at a public meeting of the Mayor and Board of Aldermen, in regular and legal session convened, voted on by yea or nay vote, this 10th day of October, 2017, the final vote being as follows:

YEA: Mitchell, Bennett, Brian

NAY: NONE

NOT VOTING: NONE

ABSENT: Pearson, Hamilton

ATTEST:

BENNY CHILCUTT, CITY CLERK
CITY OF WEST MONROE
STATE OF LOUISIANA

APPROVED THIS 10TH DAY OF OCTOBER, 2017.

DAVE NORRIS, MAYOR
CITY OF WEST MONROE
STATE OF LOUISIANA

A TRUE COPY
CINDY EMORY, Dy. Clerk
City Clerk's Office
City of West Monroe

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Appendix E: State Required Worksheets

During the planning process (Appendix A) the Hazard Mitigation Plan Update Steering Committee was provided state-required plan update process worksheets to be filled out by each jurisdiction. The worksheets were presented at the Kickoff Meeting by the contractor as tools for assisting in the update of the Hazard Mitigation Plan. The plan update worksheets allowed for collection of information such as planning team members, community capabilities, critical infrastructure and vulnerable populations and NFIP information. The following pages contain documentation of the worksheets.

Mitigation Planning Team

Name	Title	Agency	Address	Email
Neal Brown	OEP Director	Ouachita OHSEP	1000 New Natchitoches Road, West Monroe 71201	anbrown@OHSEP.net
Scotty Robinson	Police Jury President	Ouachita Parish Police Jury	675 Caldwell Road, West Monroe, LA 71291	srobinson@oppj.org
Kevin Crosby	Parish Engineer	Ouachita Parish Police Jury	2000 N 7th Street, West Monroe, LA 71291	kcrosby@lazenbyengr.com
Walt Caldwell	District C Police Juror	Ouachita Parish Police Jury	301 South Grand, Suite 201, Monroe, LA 71201	waltermcaldwelliv@gmail.com
Pat Hemphill	Fire Chief	Ouachita Parish Fire Department	1000 New Natchitoches Road, West Monroe 71201	phemphill@oppj.org
Jay Russell	Sheriff	Ouachita Parish Sheriff Department	PO Box 1803, Monroe, LA 71210	jay.russell@opso.com
Terry Williams	Chief	Monroe Fire Department	1810 Martin Luther King Drive, Monroe, La 71201	terry.williams@ci.monroe.la.us
Quienton Holmes	Chief	Monroe Police Department	1810 Martin Luther King Drive, Monroe, La 71201	quienton.holmes@ci.monroe.la.us
Todd Smith	Chief	West Monroe Fire Department	2301 North 7th, West Monroe, La 71291	tsmith@westmonroe.la.gov
Jeff Terrell	Chief	West Monroe Police Department	2301 North 7th, West Monroe, La 71291	jterrell@westmonroe.la.gov
Vern Breland	Mayor	Town Of Sterlington	503 Hwy 2, Sterlington, LA 71280	vbreland@yahoo.com
Gerald Brown	Mayor	Town of Richwood	2710 Martin Luther King Drive, Richwood, LA 71202	
Justin Nowlin	Supervisor of Operations	American Medical Response	607 North 3rd, Monroe, La 71201	justin.nowlin@amr.net

Capability Assessment

Ouachita Unincorporated

Planning and Regulatory		

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Ouachita Parish		
Plans	Yes/No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	Yes	Done during the yearly budget mtg
Economic Development Plan	Yes	North Delta Planning
Local Emergency Operations Plan	Yes	Through OHSEP
Continuity of Operations Plan	Yes	Covered in Emerg Op Plan
Transportation Plan	Yes	Covered in Emerg Op Plan
Stormwater Management Plan	Yes	Covered in Emerg Op Plan
Community Wildfire Protection Plan	Yes	Covered in Emerg Op Plan
Other plans (redevelopment, recovery, coastal zone management)	Shelter plan for incoming evacuees	Covered in Parish Shelter Plan
Building Code, Permitting and Inspections		
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire Department ISO/PIAL rating	Yes	Rating - 4
Site plan review requirements	Yes	For all new developments
Land Use Planning and Ordinances		
Zoning Ordinance	No	
Subdivision Ordinance	Yes	approved 2016
Floodplain Ordinance	Yes	approved 2016
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	
Flood Insurance Rate Maps	Yes	New map effective 01/20/16
Acquisition of land for open space and public recreation uses	No	
Other		

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Comments
Planning Commission	No	
Mitigation Planning Committee	Yes	OHSEP & PEMAC
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	Dept of Public Works
Staff		
Chief Building Official	Yes	Certified Contractor
Floodplain Administrator	Yes	Certified
Emergency Manager	Yes	OHSEP Director
Community Planner	No	
Civil Engineer	Yes	Certified P.E. (Contract)
GIS Coordinator	Yes	Public Works has certified GIS contractor
Grant Writer	No	
Other		
Technical		
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Alert FM, NWS, IPAWS
Hazard Data & Information	No	
Grant Writing	No	This will be hired on an as needed basis by contract
Hazus Analysis	Yes	In Mitigation Plan
Other		

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	Local, Federal and State Funding
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	Sewer
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	We apply for any for which we qualify.
Other Funding Programs		

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	VOAD, CERT
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	MFD,WMFD. OPFD, MPD, WMPD, OPSO, OHSEP
Natural Disaster or safety related school program	Yes	Review all School Hat Mit plans yearly
Storm Ready certification	Yes	Certified Storm Ready Community by NWS
Firewise Communities certification		
Public/Private partnership initiatives addressing disaster-related issues	Yes	United Way, Red Cross, VOAD,
Other		

City of Monroe

Planning and Regulatory		

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Monroe		
Plans	Yes/No	Comments
Comprehensive / Master Plan	Yes	City has an Updated ComPlan
Capital Improvements Plan	Yes	Engineering Dept in charge
Economic Development Plan	Yes	City /North La.Eco. Dev. and Chamber
Local Emergency Operations Plan	Yes	City/Interagency Plan
Continuity of Operations Plan	Yes	Install generators/ on duty personnel
Transportation Plan	Yes	Coord.with Monroe Trans. Sytm
Stormwater Management Plan	Yes	State Approv. Storm. Manag. Plan
Community Wildfire Protection Plan	Yes	State/Parish & City Fire Marshal
Other plans (redevelopment, recovery, coastal zone management)	Yes	Commt. Redevl.Plan/state Recovery
Building Code, Permitting and Inspections		
Building Code	Yes	Adopted State IBC Code
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire Department ISO/PIAL rating	Yes	Monroe Fire Dpt. Is No 1 rated
Site plan review requirements	Yes	For all new Develop. and additions
Land Use Planning and Ordinances		
Zoning Ordinance	Yes	Newly Updated
Subdivision Ordinance	Yes	Newly Updated
Floodplain Ordinance	Yes	Approved by state
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	SWEPP (Fire Dept.)
Flood Insurance Rate Maps	Yes	New Maps Effc. Jan. 20, 2016
Acquisition of land for open space and public recreation uses	Yes	
Other		

Administration and Technical		
Identify whether your community has the following administrative and technical capabilities.For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.		
Administration	**Yes/No**	**Comments**
Planning Commission	Yes	
Mitigation Planning Committee	Yes	Eng. Police.Planning. Fire & Pwk
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	Public Works Department
Staff		
Chief Building Official	Yes	Certified
Floodplain Administrator	Yes	
Emergency Manager	Yes	Mayor
Community Planner	Yes	Certified
Civil Engineer	Yes	Certified
GIS Coordinator	Yes	
Grant Writer	Yes	
Other		
Technical		
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	National Weather Service
Hazard Data & Information	Yes	
Grant Writing	Yes	
Hazus Analysis	Yes	Done in the last Haz. Mitig. Plan
Other		

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	City Capital Bonding
Authority to levy taxes for specific purposes	Yes	Millage
Fees for water, sewer, gas, or electric services	Yes	Water, Sewer
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs		

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Keep Monroe/Ouachita Beau.
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	PWD,Fire, PUD Police, Eng.
Natural Disaster or safety related school program	Yes	Hazard Mitigation Mat. Deliver to schs.
Storm Ready certification		
Firewise Communities certification		
Public/Private partnership initiatives addressing disaster-related issues	Yes	City, United Way,Red Cross, Cham
Other		

Town of Richwood

Planning and Regulatory		

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Richwood		
Plans	Yes/No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Through Ouachita OHSEP
Continuity of Operations Plan	Yes	Covered in Parish Emerg Op Plan
Transportation Plan	Yes	Covered in Parish Emerg Op Plan
Stormwater Management Plan	Yes	Covered in Parish Emerg Op Plan
Community Wildfire Protection Plan	Yes	Covered in Parish Emerg Op Plan
Other plans (redevelopment, recovery, coastal zone management)		
Building Code, Permitting and Inspections		
Building Code	Yes	Covered by Ouachita Parish Police Jury
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire Department ISO/PIAL rating	4	Rating - 4 (Parish Fire Dept)
Site plan review requirements	Yes	Covered by Ouachita Parish Police Jury
Land Use Planning and Ordinances		
Zoning Ordinance	Yes	Covered by Ouachita Parish Police Jury
Subdivision Ordinance	Yes	approved 2016 (Parish)
Floodplain Ordinance	Yes	approved 2016 (Parish)
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	Covered by Ouachita Parish Police Jury
Flood Insurance Rate Maps	Yes	New map effective 01/20/16 (Parish)
Acquisition of land for open space and public recreation uses	No	
Other		

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Comments
Planning Commission	Yes	Covered by Ouachita Parish Police Jury
Mitigation Planning Committee	Yes	Covered by Ouachita Parish Police Jury
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	Covered by Ouachita Parish Police Jury
Staff		
Chief Building Official	No	
Floodplain Administrator	Yes	Covered by Ouachita Parish Police Jury
Emergency Manager	Yes	OHSEP Director
Community Planner	Yes	Covered by Ouachita Parish Police Jury
Civil Engineer	Yes	Covered by Ouachita Parish Police Jury
GIS Coordinator	Yes	Covered by Ouachita Parish Police Jury
Grant Writer	No	
Other		
Technical		
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Alert FM, NWS, IPAWS by OHSEP
Hazard Data & Information	No	
Grant Writing	No	
Hazus Analysis	Yes	Covered in Parish Plan
Other		

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes/No	Comments
Capital Improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	No	
Other Funding Programs		

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	OPFD, OPSO, OHSEP
Natural Disaster or safety related school program	Yes	OPSD reviews all School plans yearly
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	Yes	United Way, VOAD,
Other		

Town of Sterlington

Planning and Regulatory

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Sterlington		
Plans	Yes/No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Through OHSEP
Continuity of Operations Plan	Yes	Covered in Parish Emergency Op Plan
Transportation Plan	Yes	Covered in Parish Emergency Op Plan
Stormwater Management Plan	Yes	Covered in Parish Emergency Op Plan
Community Wildfire Protection Plan	Yes	Covered in Parish Emergency Op Plan
Other plans (redevelopment, recovery, coastal zone management)		
Building Code, Permitting and Inspections		
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	
Fire Department ISO/PIAL rating	Yes	Volunteer
Site plan review requirements	Yes	For all new developments
Land Use Planning and Ordinances		
Zoning Ordinance	No	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	
Flood Insurance Rate Maps	Yes	Parish Maps are used
Acquisition of land for open space and public recreation uses	No	
Other		

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Comments
Planning Commission	No	
Mitigation Planning Committee	Yes	OHSEP & PEMAC
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	No	
Staff		
Chief Building Official	No	
Floodplain Administrator	Yes	Parish F.P. Administrator is used
Emergency Manager	Yes	Parish OHSEP Director is used
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Grant Writer	No	
Other		
Technical		
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Alert FM, NWS, IPAWS
Hazard Data & Information	No	
Grant Writing	No	
Hazus Analysis	Yes	In Parish Mitigation Plan
Other		

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	Local, Federal and State Funding
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	Sewer
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	We apply for any for which we qualify.
Other Funding Programs		

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	
Natural Disaster or safety related school program	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other		

City of West Monroe

Planning and Regulatory		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
West Monroe		
Plans	Yes/No	Comments
Comprehensive / Master Plan	Yes	City has an updated plan
Capital Improvements Plan	Yes	City Engineer
Economic Development Plan	Yes	Economic Dir
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)		
Building Code, Permitting and Inspections		
Building Code	Yes	Adopted State Code
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire Department ISO/PIAL rating	Yes	COWM Fire Dpt No 2 Rating
Site plan review requirements	Yes	
Land Use Planning and Ordinances		
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	
Other		

Administration and Technical		

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Comments
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff		
Chief Building Official	Yes	
Floodplain Administrator		
Emergency Manager	Yes	
Community Planner	Yes	
Civil Engineer	Yes	
GIS Coordinator	Yes	
Grant Writer	Yes	
Other		
Technical		
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	911 / National Weather Service
Hazard Data & Information	Yes	
Grant Writing	Yes	
Hazus Analysis		
Other		

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs		

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	KWMB
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	WMFD Fire Prevention
Natural Disaster or safety related school program	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	Yes	United Way, Red Cross
Other		

Building Inventory

Critical Facility (If Yes, Mark X)	Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Ouachita Unincorporated									
X	MAIN COURTHOUSE (4th floor sprinklered)	Parish Office and Court Rooms	300 ST. JOHN	MONROE	32.4997766	-92.116104	$30,675,000	1929	Reinforced Masonry
X	PUBLIC WORKS-MAIN BLDG/OFF-SHOP	Public Works Offices and Shop	337 WELL RD	WEST MONROE	32.50569	-92.189796	$1,650,000	1979	Reinforced Masonry
X	COURTHOUSE ANNEX - 3 Story	Parish Office and Court Rooms	400 ST. JOHN	MONROE	32.4982929	-92.114963	$4,600,000	1950	Reinforced Masonry
X	COURTHOUSE ANNEX - 1 Story	Parish Office and Court Rooms	400 ST. JOHN	MONROE	32.4982929	-92.114963	$2,540,000	1950	Reinforced Masonry
X	COMMUNICATIONS DISTRICT - 911	911 System	800 COLEMAN AVE	WEST MONROE			$816,509	2002	Reinforced Masonry
X	SANITARY SEWER LIFT STATION	Sewer Lift Station	4801 HWY 165 S	MONROE			$197,000		Reinforced Masonry
X	HEALTH UNIT	Ouachita Parish Public Health Unit and State Public Health Offices	1650 DESARD	Monroe			$7,850,000		Reinforced Masonry
	RECREATION CENTER	Recreation Center/Emergency Shelter	710 HOLLAND DR.	OSTERLAND			$1,200,000		Reinforced Masonry
	RECREATION CENTER	Recreation Center/Emergency Shelter	701 LINCOLN	HILL SWARTZ			$1,200,000		Reinforced Masonry
	PUBLIC LIB - OUCHITA VALLEY	Library/Emergency Shelter	581 MCMILLAN RD	WEST MONROE			$3,150,000	1976	Reinforced Masonry
	PUBLIC LIB - WEST MONROE	Library/Emergency Shelter	315 CYPRESS STREET	WEST MONROE			$1,919,250	1976	Reinforced Masonry
	PUBLIC LIB - CARVER	Library/Emergency Shelter	2941 RENWICK STREET	MONROE			$1,302,300	1976	Reinforced Masonry
	PUBLIC LIB - ANNA MEYER	Library/Emergency Shelter	1808 HWY 165 SOUTH	MONROE			$1,482,075	1994	Reinforced Masonry
	PUBLIC LIB - MAIN	Library/Emergency Shelter	1800 STUBBS AVENUE	MONROE			$7,324,200	1976	Reinforced Masonry

	PUBLIC LIB - WEST OUACHITA	Library/Emergency Shelter	188 HWY 546	WEST MONROE			$2,025,000	2001	Reinforced Masonry
	PUBLIC LIB - LOUISE WILLIAMS BRANCH	Library/Emergency Shelter	140 BAYOU OAKS DRIVE	MONROE			$2,250,000	2005	Reinforced Masonry
	PUBLIC LIB - SEARCY MEMORIAL	Library/Emergency Shelter	5775 Jonesboro Road	West Monroe			$2,500,000	2010	Reinforced Masonry
X	FIRE DISTRICT-STATION #1 Finks Hideaway	Fire Station	1148 FINK'S HIDEAWAY	MONROE			$467,000	1988	Reinforced Masonry
X	FIRE DISTRICT - STATION #2 WALLACE	Fire Station	717 WALLACE RD	WEST MONROE			$467,000	1967	Reinforced Masonry
X	FIRE DISTRICT-STATION #3 TICHELLI	Fire Station	2557 TICHELI RD	MONROE			$315,000	1967	Reinforced Masonry
X	FIRE DISTRICT - STATION #4 KING STREET	Fire Station	514 KING STREET	WEST MONROE			$467,000	1967	Reinforced Masonry
X	FIRE DISTRICT - STATION #7 KINCAID	Fire Station	3167 PRAIRIE	MONROE			$505,000	1967	Reinforced Masonry
X	FIRE DISTRICT - STATION #5 SWARTZ	Fire Station	3413 Hwy 594 Swartz	MONROE			$360,000	1987	Reinforced Masonry
X	FIRE DISTRICT - STATION #9 FAIRBANKS	Fire Station	232 HWY 134	MONROE			$655,000	1987	Reinforced Masonry
X	FIRE DISTRICT - STATION #6 CHENIERE	Fire Station	152 CHENIERE DREW RD	WEST MONROE			$600,000	1988	Reinforced Masonry
X	FIRE DISTRICT - STATION #8 CALHOUN	Fire Station	133 COWBOY LANE	WEST MONROE			$372,000	1988	Reinforced Masonry
X	FIRE DISTRICT - STATION #12 CADEVILLE	Fire Station	3947 CAPLES RD	WEST MONROE			$600,000	1988	Reinforced Masonry
X	FIRE DISTRICT-STATION #10 LUNA	Fire Station	2323 HWY LA 557	WEST MONROE			$550,000	1988	Reinforced Masonry
X	FIRE DISTRICT - STATION #11 BOSCO	Fire Station	226 BLANKSTON RD.	MONROE			$525,000	1994	Reinforced Masonry

X	FIRE DISTRICT - STATION #14 CYPRESS COMM.	Fire Station	936 CYPRESS SCHOOL	WEST MONROE			$525,000	1994	Reinforced Masonry
X	FIRE DISTRICT- STATION #16 CARLTON	Fire Station	1257 HWY 151 NORTH	CALHOUN			$525,000	1994	Reinforced Masonry
X	Ouachita Parish EOC and Ouachita Fire Dispatch	OPFD Dispatch & Parish Emergency Operations Center	1000 NEW NATCHITOCHES	WEST MONROE			$3,019,000	2003	Reinforced Masonry
X	CHAUVIN BAYOU PUMP STATION	Main Parish Pump Station	4141 Levee Drive	MONROE			$5,435,600		Concrete
X	RIVER STYX BAYOU PUMP STATION	Main Parish Pump Station	924 HORSELAKE ROAD	MONROE			$5,290,630		Concrete
X	SEWER DISTRICT #16 LIFT STATION	Sewer Lift Station	120 HERITAGE DR LOT 25	WEST MONROE					
	SEWER DISTRICT #16 AER PAC TREATMENT PLANT	Sewer Lift Station	E. OF 118 COUNTRY WAY TRACT 4	WEST MONROE					
	SEWER DISTRICT #16 AER PAC TREATMENT PLANT	Sewer Lift Station	221 CREEK STONE DR LOT 49	WEST MONROE					
	SEWER DISTRICT #16 AER PAC TREATMENT PLANT	Sewer Lift Station	503 HODGE WATSON LOT 37	CALHOUN					
X	SEWER DISTRICT #16 LIFT STATION	Sewer Lift Station	713 HODGE WATSON LOT 54	CALHOUN					
X	SEWER DISTRICT #16 LIFT STATION	Sewer Lift Station	115 AUGUSTA DRIVE LOT 24	CALHOUN					
	SEWER DISTRICT #16 AER PAC TREATMENT PLANT	Sewer Lift Station	105 GREENFIELD DIRCLE LOT 29	WEST MONROE					
	SEWER DISTRICT #16 AER PAC TREATMENT PLANT	Sewer Lift Station	607 TEAL CIRCLE LOT 11	WEST MONROE					
X	SEWER DISTRICT #16 LIFT STATION	Sewer Lift Station	108 TEAL LOOP LOT 30	WEST MONROE					
	SEWER DISTRICT #16 AER PAC TREATMENT PLANT	Sewer Lift Station	155 BIEDENHARN DRIVE	WEST MONROE					

	SEWER DISTRICT #16 AER PAC TREATMENT PLANT	Sewer Lift Station	E. OF 107 IBERIA CIRCLE LOT 16	WEST MONROE					
X	SEWER DISTRICT #16 LIFT STATION	Sewer Lift Station	218 STANDARD REED RD E. OF LOT 1	WEST MONROE					
X	Fresh Water Plant	Fresh Water Treatment and Storage	1020 A&B MILLER RD	MONROE	32.4100339	-92.0346195	$875,000		Steel
X	HUNTINGTON PARK WELL - HORIZONTAL TANK	Water Storage Tank	1612 GARRETT ROAD	MONROE			$125,000		Steel
X	STORAGE TANK 70,000 GALLONS	Water Storage Tank	190 PARKER ROAD	MONROE			$125,000		Steel
X	WATER TOWER - CLEO - ELEVATED - 200,000 gallons	Water Storage Tank	293 CLEO RD	MONROE			$175,000		Steel
X	WTR TANK/TWR - W. Ouachita Ind. District	Water Storage Tank	INDUSTRIAL PARKWAY	MONROE			$450,000		Steel
X	TREATMENT PLANT	Fresh Water Treatment Plant	HUEY LEONARD LOOP	MONROE			$800,000		Steel
X	TREATMENT PLANT	Fresh Water Treatment Plant	98 COMANCHE TRAIL	MONROE			$850,000	1960	Concrete
Monroe									
X	Monroe City Hall	Civil Government	400 Lea Joyner Expressway	Monroe	32.502158	-92.108645	3,540,935	1966	Concrete
X	Police Building, Jail & Courts	Law Enforcement	700 Wood Street/600 Calypso	Monroe	32.501372	-92.110734	4,061,899	1966	Concrete
X	JPS Aviation Offices	Transportation	5410 Operations Rd	Monroe	32.511948	-92.043450	112,320	1967	Concrete
X	Flight Control Tower	Transportation	5403 Operations Rd	Monroe	32.511077	-92.044126	397,000	1980	Concrete
X	Masur Museum	Museum	1400 South Grand	Monroe	32.490127	-92.113117	632,564	1930	Concrete
X	Fire Station, #1	Fire/Search and Rescue	508 Olive St	Monroe	32.507858	-92.115730	570,242	1960	Concrete
X	Fire Station, #2	Fire/Search and Rescue	915 Orange St	Monroe	32.493425	-92.102878	129,900	1965	Concrete

X	Fire Station #6	Fire/Search and Rescue	2001 Forsythe Ave	Monroe	32.532750	-92.111560	129,900	1975	Concrete
X	Fire Station #4	Fire/Search and Rescue	300 Forrest Ave.	Monroe	32.480819	-92.109396	129,900	1966	Concrete
X	Fire Station #5	Fire/Search and Rescue	3110 Breard	Monroe	32.526213	-92.084030	129,900	1966	Concrete
X	Fire Station #7	Fire/Search and Rescue	5500 Operations Road	Monroe	32.513279	-92.043634	129,900	1980	Metal
X	Fire Dept. Training, Tower	Fire/Search and Rescue	300 Forest	Monroe	32.480819	-92.109396	120,674	1965	Concrete
X	Fire Station #8	Fire/Search and Rescue	1204 Richwood Rd #1	Monroe	32.448279	-92.096738	122,028	1965	Concrete
X	Adm. Bldg. La Purchase Garden & Zoo	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	65,000	1965	Wood
	Bismark Trading Post Concession	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	75,000	1960	Wood
	Small animal & primate bldg.	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	1,655,600	1970	Wood
	Reptile Building located	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	63,000	1970	Wood
	Restrooms located @ LA Purchase Gardens & Zoo	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	31,000	1970	Wood
	LA Purchase-Office/Kitchen BV	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	74,000	1970	Wood
	One Story, BV, Building known as Kangaroo Building	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	40,000	1970	Wood
	Giraffe Building & Animal Hospital	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	216,000	1970	Wood
	Small Primate Building	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	75,000	1970	Wood
X	Education Building & Office	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	138,000	1970	Wood
X	CPA Building Kitchen/RR	Recreation	1405 Bernstein Dr	Monroe	32.468229	-92.096809	111,000	2000	Wood
	Dept. Public Works Off & Check-In room	Civil Government	1200 Grammont	Monroe	32.506005	-92.106023	587,035	1970	Metal
X	Steel elevated water tank	Water Storage Tank	1200 Grammont	Monroe	32.506005	-92.106023	264,600	1960	

	Grammont Elevated Tank								
X	Powell Ave. Community Center	Recreation	1401 Powell Avenue	Monroe	32.511888	-92.074494	1,000,700	1970	Concrete
X	Chenault Park Golf Club	Recreation	8475 Millhaven Road	Monroe	32.498034	-92.020579	246,000	1970	
X	Saul Adler Community Center	Recreation	3900 Westminister Ave	Monroe	32.536049	-92.086172	1,181,041	1970	Concrete
	Saul Adler Community Center (Batting Cages)	Recreation	3900 Westminister Ave	Monroe	32.536049	-92.086172	200,000	2015	Concrete
X	Saul Adler Community Center (restrooms)	Recreation	3900 Westminister Ave	Monroe	32.536049	-92.086172	71,420	2016	Concrete
X	Harvey H. Benoit Community Center	Recreation	1700 Oaklawn	Monroe	32.493848	-92.088055	1,565,076	1970	Concrete
X	Pavilion, ICM situated Benoit Rec. Family Pav.	Recreation	1700 Oaklawn	Monroe	32.493848	-92.088055	90,000	2004	Concrete
X	Pavilion, ICM situated Benoit Recreation 1 of 3	Recreation	1700 Oaklawn	Monroe	32.493848	-92.088055	66,500	2004	Concrete
X	Pavilion, ICM situated Benoit Recreation 2 of 3	Recreation	1700 Oaklawn	Monroe	32.493848	-92.088055	66,500	1977	Concrete
X	Pavilion, ICM situated Benoit Recreation 3 of 3	Recreation	1700 Oaklawn	Monroe	32.493848	-92.088055	66,500	1990	Concrete
X	Harvey H. Benoit Community Center (Restrooms)	Recreation	1700 Oaklawn	Monroe	32.493848	-92.088055	71,420	2016	Concrete
X	Miller Maddox Marbles Community Center	Recreation	2950 Renwick St	Monroe	32.514150	-92.084490	1,181,040	1970	Concrete
X	Henrietta Windom Johnson Community Center	Recreation	2800 Burg Jones Lane	Monroe	32.474114	-92.088940	1,181,040	1970	Concrete
X	Henrietta W. Johnson Community Center (restrooms)	Recreation	2800 Burg Jones Lane	Monroe	32.474114	-92.088940	71,420	2016	Concrete

X	Rochelle Ave., Pumping Station	Pump Station	901 Rochelle Ave	Monroe	32.520492	-92.120502	1,495,000	1970	
X	Midway Fire Station #9	Fire/Search and Rescue	1015 Inabnet Blvd	Monroe	32.541015	-92.028866	121,528	1970	Concrete
X	Jail Extension Bldg.	Law Enforcement	700 Wood Street	Monroe	32.501372	-92.110734	539,852	1970	Concrete
X	Monroe Transit System Garage & Office	Transportation	604 Washington Street	Monroe	32.506132	-92.113378	1,121,609	1970	Concrete
X	Monroe Transit System Terminal	Transportation	205 Catalpa	Monroe	32.502512	-92.113977	244,380	1970	Concrete
X	B. J. Washington Community Center	Recreation	1300 Richwood Rd	Monroe	32.448159	-92.095941	328,860	1970	Concrete
	Fire Station #10 River Oaks	Fire/Search and Rescue	3702 Barbados	Monroe	32.555726	-92.111899	228,000	1970	Concrete
	Selman Field Golf Storage	Recreation	1051 Kansas Ln	Monroe	32.502442	-92.056337	72,820	1955	Concrete
	Selman Golf Pro Shop	Recreation	1051 Kansas Ln	Monroe	32.502442	-92.056337	358,000	1960	Concrete
	Selman Golf Cart Storage	Recreation	1051 Kansas Ln	Monroe	32.502442	-92.056337	53,000	1960	Concrete
X	City Hall Annex	Civil Government	316 Breard St	Monroe	32.505804	-92.117467	656,670	1960	Concrete
	Forsythe Golf & Cart Storage	Recreation	2500 Sycamore Street	Monroe	32.523334	-92.130319	110,000	1960	Concrete
X	Allen St. Pump Station 1 & 2 Story, Brick	Pump Station	110 Allen Avenue	Monroe	32.469644	-92.114815	165,000	1965	
X	Pine St. Pump Station 1 & 2 Story Brick	Pump Station	7 Olive Street	Monroe	32.505430	-92.120940	1,026,000	1965	
X	Willow St. Pump Station 1 Story Brick 1100	Pump Station	107 Willow Street	Monroe	32.529193	-92.127583	495,000	1965	
X	Sewer Pump Station	Pump Station	103 Standifer Ave	Monroe	32.464645	-92.114284	55,440	1972	
	City Cemetery Office & Storage		3701 South Grand	Monroe	32.464540	-92.114863	71,400	1966	Concrete
X	Colonial Dames Museum	Museum	528 South Grand	Monroe	32.497148	-92.115976	38,220	1970	Concrete
X	Utility Engineering Bldg., Office, Brick		910 North 9th	Monroe	32.513454	-92.115863	232,260	1960	Concrete

X	Welding Shop & Office		400 S 18th St 300	Monroe	32.509062	-92.099550	71,480	1975	
X	Street Dept., Office		401 S 18th St	Monroe	32.509062	-92.099550	80,730	1975	
X	Plum St. Pump Station, Brick	Pump Station	13 Plum St	Monroe	32.495328	-92.134725	105,000	1975	
X	Lamy Lane Pump Station, Brick	Pump Station	2003 Lamy Ln	Monroe	32.534461	-92.093082	709,000	1975	
X	Hadley St. Pump Station, Brick	Pump Station	311 Hadley St	Monroe	32.484802	-92.078800	16,800	1960	
X	Maintenance Construction Office & Shop		1201 Oak Street	Monroe	32.504620	-92.105087	54,200	1960	Metal
X	Ouachita River Pump Station	Pump Station	817 Park Ave	Monroe	32.529045	-92.127512	197,400	1960	
X	Waterworks Pump & filtration plant,AAA Old Plant	Pump Station	2405 North 10th Street	Monroe	32.527917	-92.126597	2,265,600	1960	
X	Steel Water Storage Tank 3.1 Million Gals	Water Storage Tank	2401 N 10th	Monroe	32.527917	-92.126597	460,800	1960	
X	Water treatment plant #2 New Plant	Water Treatment Plant	2401 N 10th	Monroe	32.527917	-92.126597	3,087,000	1960	Concrete
X	Water treatment plant Chemical Feed bldg.	Water Treatment Plant	2401 N 10th	Monroe	32.527917	-92.126597	278,900	1960	Concrete
X	Steel elevated water tank Powell Elevated Tank	Water Storage Tank	Powell Ave	Monroe	32.511924	-92.074858	264,600	1960	
X	Booster Pump Station Thomas St. Pump Station	Pump Station	790 Thomas	Monroe	32.470592	-92.105179	123,480	1960	
X	Steel Water tank on ground	Water Storage Tank	790 Thomas	Monroe	32.470592	-92.105179	298,800	1960	
X	Bayou DeSiard Pump Station	Pump Station	2530 Levee Dr	Monroe	32.554370	-92.119616	192,000	1960	
X	Selman Field Pump Station	Pump Station	4960 Transport Ave	Monroe	32.515060	-92.050227	496,100	1960	
X	Selman 4.0MG Storage Tank Station	Water Storage Tank	4960 Transport Dr	Monroe	32.515060	-92.050227	736,500	1960	

X	Bayou Bartholomew Pump Station	Pump Station	1595 Levee Dr	Bastrop	32.721831	-92.039029	424,500	1960	
X	Garage & supplies.		1400-1401 Wood St	Monroe	32.506739	-92.103613	205,100	1960	Metal
X	Ruffin Drive Storage Tank	Water Storage Tank	2100 Ruffin Dr Extension	Monroe	32.486179	-92.079177	505,000	1960	
X	Ruffin Drive Pump Station	Pump Station	2100 Ruffin Dr Extension	Monroe	32.486179	-92.079177	362,800	1965	
X	Waste Water Treatment Office Building		770 Richwood Road #2	Monroe	32.437424	-92.103050	78,000	1970	Metal
X	Hawes St. Pump Station ., brick		2708 Hawes St	Monroe	32.477329	-92.115446	1,135,000	1977	Concrete
X	Flood Control Pump Station Pope/Westminster		2505 Oliver Rd	Monroe	32.539591	-92.107807	1,705,988	1975	
X	Forsythe Park Restrooms		Sycamore Street	Monroe	32.523334	-92.130319	40,000	1975	Concrete
X	Emily P Robinson Community Center		3504 Jackson St.	Monroe	32.465823	-92.107814	1,390,000	1960	Concrete
X	Chenault Park, Pumping Station		8475 Milhaven Rd	Monroe	32.493956	-92.028888	75,000	1960	
X	City Shop & mtnc Warehouse complex		209 N 11th St	Monroe	32.504747	-92.106481	2,600,000	1960	Metal
X	Calypso Street, Pumping Station		500 South Grand	Monroe	32.497373	-92.116486	295,000	1960	
X	Marquette Street Pumping Station		2151 Island Drive	Monroe	32.544865	-92.124432	300,000	1960	
X	Pepsi-Cola/Royal Crown water pump station		1700 Blk S Grand	Monroe	32.487814	-92.111547	95,000	1960	
X	Stubbs Ave Pumping Station		901 Stubbs Ave	Monroe	32.515346	-92.117022	340,000	1970	
X	Water Treatment Plant, office bldg.		2401 North 10th	Monroe	32.527917	-92.126597	200,384	1970	Concrete
X	Fire Dept Training Bldg		300 Forest Avenue	Monroe	32.480819	-92.109396	43,000	1980	Concrete
X	Drivers License Office		5171 Northeast Rd	Monroe	32.512595	-92.047727	1,000,000	2004	Concrete

X	Maintenance & Facility Storage Bldg in Chennault Park		8475 Millhave Road	Monroe	32.493956	-92.028888	100,000	2004	
X	City Hall Annex - Jackson St.		3901 Jackson St	Monroe	32.461922	-92.107009	11,009,445	1980	Concrete
X	Office & Break room		400 R Operations Rd	Monroe	32.511948	-92.043450	20,000	2006	Concrete
X	Public Safety Building		1810 Martin Luther King	Monroe	32.485507	-92.084841	5,278,995	2006	Concrete
X	Fire Dept. Garage and Maintenance		1810R Martin Luther King	Monroe	32.485507	-92.084841	542,000	2008	Concrete
X	Fire Station		300 Forrest Avenue	Monroe	32.480819	-92.109396	1,025,000	2011	Concrete
X	Monroe Regional Airport Main Building, A		5400 Operations Rd	Monroe	32.511948	-92.043450	6,112,566	2011	Concrete
X	Boarding Building, Building B		5400 Operations Rd	Monroe	32.511948	-92.043450	6,174,618	2011	Concrete
X	Ticketing Building, Building C		5400 Operations Rd	Monroe	32.511948	-92.043450	4,313,330	2011	Concrete
X	Passenger Causeway Connector		5400 Operations Rd	Monroe	32.511948	-92.043450	437,315	2011	Concrete
X	Baggage Claim, Building D		5400 Operations Rd	Monroe	32.511948	-92.043450	3,633,000		Concrete
X	Rental Car Offices, Building E		5413 Operations Rd	Monroe	32.511948	-92.043450	849,213	2011	Concrete
	Car Wash Building, Building F		5413 Operations Rd	Monroe	32.511948	-92.043450	460,940	2011	Concrete
X	Gas Station, Building G		5413 Operations Rd	Monroe	32.511948	-92.043450	671,238	2011	Concrete
	Toll Booth, Building H		5413 Operations Rd	Monroe	32.511948	-92.043450	92,233	2011	Concrete
	Veterinary Office, Zoo		1405 Bernstein Park Drive	Monroe	32.468229	-92.096809	35,000		Wood
X	Water Distribution		1350 Grammont St	Monroe	32.505964	-92.105908	200,134		Metal
X	Water Distribution Rec Room		1350 1/2 Grammont St	Monroe	32.505964	-92.105908	45,000		Metal
X	AARF Station		5706 Operations Road	Monroe	32.516246	-92.046360	2,051,559	2015	Metal

X	MLU Gasoline Street Building		5000 Gasoline Alley	Monroe	32.504994	-92.048143	108,250	2016	Metal
X	Liller Maddox Marbles Community Center		2950 Renwick St	Monroe	32.514150	-92.084490	71,420	2016	Concrete
X	Mt. Nebo Neighborhood Park		3013 Jackson St	Monroe	32.470877	-92.107986	71,420	2016	Concrete
X	Lida Benton Neighborhood Park		3317 Lee Ave	Monroe	32.466976	-92.111109	71,420	2016	Concrete
Richwood									
X	Richwood Town Hall	Town Hall, Mayors, Office, Police Department	5130 Brown Road	Richwood	32.447196	-92.077097	$750,000	1985	Metal
	PUBLIC LIB - OLLIE BURNS BRANCH	Library/Emergency Shelter	5601 U.S. 165 SOUTH	RICHWOOD			$2,500,000	2010	Reinforced Masonry
Sterlington									
X	Sterlington Town Hall	Town Hall	105 High Ave	Sterlington	32.693872	-92.07498	$1,100,000	1965	Reinforced Masonry
X	Sterlington Police Department	Sterlington PD offices	103 High Ave	Sterlington	32.694361	-92.074644	$85,000	1985	Metal
	REC CENTER	Recreation Center/Emergency Shelter	709 FRANCIS AVENUE	STERLINGTON			$1,200,000	1996	Reinforced Masonry
	PUBLIC LIB - STERLINGTON BRANCH	Library/Emergency Shelter	305 KEYSTONE ROAD	STERLINGTON			$1,732,500	2005	Reinforced Masonry
West Monroe									
X	City Hall	Main City Administration Building	2305 N 7th St	West Monroe	32.520912	-92.148531	6,006,440	1978	Reinforced Masonry
X	Police/Court Building	Police Dpt, Jail, and City Court Building	2301-2303 N 7th St	West Monroe	32.520243	-92.14856	115,169,074	1978	Reinforced Masonry
	Police Maint. Shop	Police Vehicle Maint	474 Lincoln St	West Monroe	32.519766	-92.149442	256,218	1978	Steel
X	Convention Center	Emergency Evacuation Shelter/ Convention Center	901 Ridge Ave	West Monroe	32.520848	-92.149563	8,491,780	1979	Reinforced Masonry
	Convention Cntr Storage Build	Equipment Storage	901 Ridge Ave	West Monroe	32.520274	-92.149522	29,282	1979	Metal
	Farmer's Market	Farmer's Market	1700 N 7th St	West Monroe	32.510854	-92.144653	113,102	1973	Wood

X	West Ouachita Senior Center	Emergency Evacuation Shelter/ Senior Center	1717 N 7th St	West Monroe	32.511244	-92.145057	3,042,490	1989	Reinforced Masonry
X	Recreation Center	Emergency Evacuation Shelter / Recreation Center	1801 N 7th St	West Monroe	32.511413	-92.145924	1,178,865	1973	Steel
X	Fire Administration Building	Emergency Response Admin / Fire Admin	4341 Cypress St	West Monroe	32.515907	-92.171688	415,179	1990	Wood
X	Cypress St Fire Station	Fire Station	4343 Cypress St	West Monroe	32.515745	-92.172332	805,255	2001	Steel
	KIROLI Office Building	Park Office Building	820 Kiroli Rd	West Monroe	32.545244	-92.163828	131,769	1987	Wood
	KIROLI Lodge	Event Building	820 Kiroli Rd	West Monroe	32.548598	-92.165446	695,448	1987	Wood
	Park Ranger Residence	Park Security Residence	820 Kiroli Rd	West Monroe	32.544791	-92.164192	117,128	1987	Wood
	West Monroe DMV	Office of Motor Vehicles	501 Natchitoches St	West Monroe	32.500279	-92.125917	497,794	1995	Reinforced Masonry
X	5th Street Fire Station	Fire Station	306 N 5th St	West Monroe	32.499313	-92.129384	930,250	1956	Wood
	WM Community Cntr Admin	Emergency Evacuation Shelter / Community Center	400 S 5th St	West Monroe	32.494372	-92.124533	561,580	1994	Reinforced Masonry
X	WM Community Cntr Gym	Emergency Evacuation Shelter / Community Center	400 S 5th St	West Monroe	32.494372	-92.124533	878,460	1995	Steel
X	WM Community Cntr Education Bldg	Emergency Evacuation Shelter / Community Center	400 S 5th St	West Monroe	32.494372	-92.124533	1,195,150	2011	Steel
	Trenton St Pro Shop	Leased to YMCA after school	2410 Trenton St	West Monroe	32.525623	-92.137833	256,218	2003	Reinforced Masonry
	Restoration Park Admin	Admin Office for Restoration Park	651 Downing Pines Rd	West Monroe	32.508147	-92.172064	190,333	2000	Wood
	IKE Hamilton Exp Center	Sandbag staging area, Large animal	501 Mane St	West Monroe	32.505544	-92.181103	19,033,300	2001	Steel

		evac, RV evac / Exposition Center							
X	Public Works Complex	Public Works Admin, Vehicle Maint, Staging	301 W Pavillion Dr	West Monroe	32.500057	-92.177305	2,342,560	2001	Steel
	Lazarre House	Park Security Residence	60 S Riverfront St	West Monroe	32.489486	-92.116409	73,205	2000	Wood
X	SPARTA Reuse Facility	Sewer Treatment Facility / Water Reclamation	101 E Martin St	West Monroe	32.462495	-92.151019	21,670,000	2012	Steel
X	Otis St Fire Station	Fire Station	404 Otis St	West Monroe	32.523806	-92.144376	577,500	2012	Steel
X	Water Well #2	Water Treatment and Admin Office	4339 Cypress St	West Monroe	32.515617	-92.171233			
X	Water Well #5	Water Well	103 N Hilton St	West Monroe	32.518987	-92.170439			
X	Water Well #6	Water Well	401 Thomas Rd	West Monroe	32.512314	-92.155942			
X	Water Well #7 & #9	Water Well	143 Fairlane Dr	West Monroe	32.529406	-92.170455			
X	Water Well #8	Water Well	122 Wassan St	West Monroe	32.497570	-92.171315			
X	Water Well #10 & #11	Water Well and Elevated Storage Tank	Exchange St	West Monroe	32.500254	-92.182740			
X	Elevated Water Tank	Elevated Water Storage Tank	706 Slack St	West Monroe	32.510825	-92.143909			
X	Constitution Lift Station	Sewer Lift Station	700 Downing Pines	West Monroe				2000	Unreinforced Masonry
X	Black Bayou Lift Station	Sewer Lift Station	1500 Old Natchitoches	West Monroe	32.482347	-92.140238		1990	
X	Montgomery St Lift Station	Sewer Lift Station	Jonesboro & Montgomery	West Monroe				1956	Unreinforced Masonry
X	Austin Street Lift Station	Sewer Lift Station	End of Austin @ levee	West Monroe				1956	Unreinforced Masonry
X	S 5th St Lift Station	Sewer Lift Station	S 5th St & Coleman	West Monroe	32.497138	-92.127015		1969	
X	Plum St Lift Station	Sewer Lift Station	Plum & Natchitoches	West Monroe				1945	Unreinforced Masonry
X	N 9th St Lift Station	Sewer Lift Station	End of 9th by Stella	West Monroe	32.500137	-92.136182		1945	Unreinforced Masonry
X	Drago Lift Station	Sewer Lift Station	End of Drago by Canal	West Monroe	32.505735	-92.142858		1956	Unreinforced Masonry
X	Pine Terrace Lift Station	Sewer Lift Station	Behind Sonic on 1910 N 7th	West Monroe				1960	

X	McMillian Lift Station	Sewer Lift Station	401 McMillian & Polk	West Monroe				1965	
X	Old K-Mart Lift Station	Sewer Lift Station	3426 Cypress S - 3400 Cypress	West Monroe				1965	Unreinforced Masonry
X	Greenwood Lift Station	Sewer Lift Station	Greenwood & N 7th	West Monroe				1960	Unreinforced Masonry
X	Olympic Lift Station	Sewer Lift Station	On Olympic	West Monroe				1960	Unreinforced Masonry
X	Golf Course Lift Station	Sewer Lift Station	On Arkansas by Golf Course	West Monroe				1962	
X	City Hall Lift Station	Sewer Lift Station	N 7th & Ridge	West Monroe				1965	
X	Laurel St Lift Station	Sewer Lift Station	Laurel & Pelican	West Monroe	32.521583	-92.139100		1963	Unreinforced Masonry
X	Jackson St Lift Station	Sewer Lift Station	Jackson & Cypress	West Monroe	32.517952	-92.141741		1964	Unreinforced Masonry
X	Boley Lift Station	Sewer Lift Station	Boley School	West Monroe	32.517772	-92.145127		1965	
X	Plum Creek Lift Station	Sewer Lift Station	Behind Texas Rd House	West Monroe	32.495317	-92.134895		1993	
X	Slack St Lift Station	Sewer Lift Station	704 Slack by Lady Rebel Field	West Monroe				1975	
X	Dopson Lift Station	Sewer Lift Station	End of Dobson Place	West Monroe				1966	Unreinforced Masonry
X	Hicks Street Lift Station	Sewer Lift Station	On Arkansas by Canal	West Monroe					
X	12th Street Lift Station	Sewer Lift Station	1201 Arkansas	West Monroe	32.528605	-92.154094			

Vulnerable Populations

Ouachita Parish

Name	Street	City	Zip Code	Latitude	Longitude
All Hospitals (Private or Public)					
University Health	4864 Jackson St.	Monroe	71202	32.450261	-92.106643
St. Francis Medical Center	309 Jackson St.	Monroe	71201	32.499181	-92.11407
St. Francis Community Health	920 Oliver Rd	Monroe	71201	32.521822	-92.103175
St. Francis Community Health Center	2600 Tower Dr.	Monroe	71201	32.52899	-92.096933
North Monroe Medical Center	3510 Medical Park Dr. #1	Monroe	71203	32.579075	-92.070626
Glenwood Regional Medical Center	503 McMillan Rd	West Monroe	71291	35.512932	-92.156153
Nursing Homes (Private or Public)					
Northeast Louisiana Veterans Home	6700 US-165	Monroe	71203	32.586814	-92.068934
Ouachita Healthcare & Rehabilitation Center	7950 Millhaven Rd.	Monroe	71203	32.496444	-92.027325
Bastrop Rehabilitation Hospital	4310 South Grand St.	Monroe	71202	32.457191	-92.115858
The Oaks	1000 Mckeen Pl.	Monroe	71201	32.522276	92.118788
Mary Goss Nursing Home	3300 White St.	Monroe	71203	32.517356	-92.078183
Savannah Grand of WM	3702 Cypress St	West Monroe	71291	32.517825	-92.166162
Rosemont Assisted Living	110 Regency Pl	West Monroe	71291	32.513980	-92.144457
Ridgecrest Nursing Home	1616 Wellerman Rd	West Monroe	71291	32.525790	-92.165403
Landmark Nursing & Rehab Center	1611 Wellerman Rd	West Monroe	71291	32.523344	-92.163110
Stoneybrook Alzheimer Assisted Living	308 Norris Ln	West Monroe	71291	32.517522	-92.174014
West Monroe Guest House	109 McClendon Church Rd	West Monroe	71291	32.503355	-92.163071
Christus St. Josephs Home	2301 Sterlington Rd	Monroe	71203	32.541643	-92.079473
Azalea Estates of Monroe	4380 Old Sterlington Rd	Monroe	71203	32.575931	-92.066743
Avalon Place	4385 Old Sterlington Rd	Monroe	71203	32.576154	-92.068482
Landmark Nursing & Rehab	1611 Wellerman Rd	West Monroe	71291	32.523507	-92.163080
Ridgecrest Nursing Home	1616 Wellerman Rd	West Monroe	71291	32.525762	-92.165177
Savannah Grand of West Monroe	3702 Cypress St	West Monroe	71291	32.518274	-92.166294
Stoneybrook Alzheimer's Assisted	308 Norris Lane	West Monroe	71291	32.517558	-92.173921

Mobile Home Parks					
University Estates	5310 Desiard St.	Monroe	71203	32.525811	-92.061404
Blanks St. MHP	5103 Blanks St.	Monroe	71203	32.523707	-92.060651
Aurora Mobile Home Park	5602 Desiard St. #79	Monroe	71203	32.524889	-92.056286
Francis Drive MHP	301-385 Francis Dr.	Monroe	71203	32.526346	-92.06262
Harvester Dr. MHP	3505-3669 Harvester Dr.	Monroe	71203	32.505459	-92.079275
Warren Place Home Park	1103 Warren Drive	West Monroe	71291	32.527191	-92.163509
Northwood Mobile Home Park	107 Briarwood Drive	West Monroe	71291	32.538235	-92.163879
Millstead's Mobile Home Park	191 US-80	Calhoun	71225	32.515056	-92.356421
Deer Run Mobile Home Park	161 Cowboy Rd	Calhoun	71225	32.519684	-92.325291
Pine Hill Mobile Home Park	191 US-80	Calhoun	71225	32.527066	-92.275508
Drew Mobile Home Park	755 Ole Hwy 15	West Monroe	71291	32.534020	-92.236236
Country Village Mobile Home Park	3100 Arkansas Rd	West Monroe	71291	32.537903	-92.203105
Canaan Land Mobile Home Park	2809 Arkansas Rd	West Monroe	71291	32.535750	-92.200258
Caldwell Estates	113 Caldwell Rd	West Monroe	71291	32.545812	-92.193406
Belair Mobile Home Park	182 Betty Lane	West Monroe	71291	32.518292	-92.179071
River City Mobile Home Park	4700 Cypress St	West Monroe	71291	32.514531	-92.179830
Pavilion RV Park	309 Well Rd	West Monroe	71292	32.506594	-92.191499
Northwood Mobile Home Park	103 Briarwood Dr	West Monroe	71291	32.538294	-92.164071
Sterling Oaks Mobile Home Estates	1315 New Natchitoches Rd	West Monroe	71292	32.493762	-92.179721
Caddo Ridge Mobile Home Park	616 Washington St	West Monroe	71292	32.474635	-92.176751
Oak Alley Mobile Home Park	268 Sandal St	West Monroe	71292	32.474583	-92.159236
Morning Meadow Manufactures Home Community	307 New Natchitoches	West Monroe	71292	32.489592	-92.161332
Circle Drive Mobile Home Park	5415 Whites Ferry Rd	West Monroe	71291	32.563622	-92.161836
Pecanland Mobile Home & RV Park	2300 Garrett Rd	Monroe	71202	32.479704	-92.057517
Azalea Garden Community	400 Dolly Drive	Monroe	71203	32.565085	-91.978591
Double K Estates	2216 US-80	Monroe	71203	32.51697	-91.970374
Regan Mobile Home Park	4414 Winnsboro Rd	Monroe	71202	32.421085	-92.034404
Other					
Louisiana Baptist Children's Home	7200 Desiard	Monroe	71203	32.523674	-92.049136

National Flood Insurance Program (NFIP)

Ouachita Parish

ELEMENT F: STATE REQUIREMENT

National Flood Insurance Program (NFIP)

Ouachita Parish

	Ouachita Parish	Monroe	Richwood	Sterlington	West Monroe	
Insurance Summary						**Comments**
How many NFIP polices are in the community? What is the total premium and coverage?	2039; $1,444,393.00; $428,383,986.00	2219; $1,571,840.00; $466,182,573.00	240; $297,375.00; $50,398,116.00	420; $297,375.00; $88,196,703.00	1079; $749,679.00; $226,791,522.00	
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	582; $26,872,005.00	633; $29,226,767.00	68; $3,139,785.00	120; $5,540.620.00	308; $14,220,923.00	
How many structures are exposed to flood risk with in the community?	1852	2015	219	381	980	
Describe any areas of flood risk with limited NFIP policy coverage.	Town & Country area, Tanglewood area, Frenchman's Bend area.	Parkview, Oregon Trail, River Oaks	Southern part of the main population area	The entire lower Sterlington area	7th street Area	
Staff Resources						
Is the Community FPA or NFIP Coordinator certified?	Yes	No	No	No	No	
Is flood plain management an auxiliary function?	No	Yes	Yes	Yes	Yes	
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit Review, Inspection, GIS	Permit Review, Inspection, GIS, Eng.	Use the parish FPM	We use the Parish FPM	Permit Review	
What are the barriers to running an effective NFIP program in the community, if any?	Stretched finances	None	No Money	Little or no money for NFIP	Resources	
Compliance History						
Is the community in good standing with the NFIP?	Yes	Yes	Yes	Yes	Yes	

Are there any outstanding compliance issues(i.e., current violations)?	No	Up to date	No	No	None	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact(CAC)?	2014	2014	2014	2014	?	
Is a CAV or CAC scheduled or needed? If so when?	No	No	No	No	No	
Regulation						
When did the community enter the NFIP?	7/2/1980	12/18/1979	9/30/1987	6/14/1994	12/1/1978	
Are the FIRMs digital or paper?	Both	Paper and Digital	Use the parish FPM	Both	Digital	
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meets the current requirements	Meet FEMA and exceed 1ft floor boarding above BFE	Meets the current requirements	Meets the current requirements	Yes	
Community Rating System (CRS)						
Does the community participate in CRS?	Yes	Yes	No	No	No	
What is the community's CRS Class Ranking?	9	9	N/A	N/A	No	
Does the plan include CRS planning requirements?	Yes	Yes adopted with the new ord.	N/A	N/A	No	