

2022 EAST CARROLL PARISH MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

UNINCORPORATED EAST
CARROLL PARISH, TOWN OF
LAKE PROVIDENCE



EAST CARROLL PARISH MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE

Prepared for:
East Carroll Parish



Prepared by:
Stephenson Disaster Management Institute

Mr. Brant Mitchell, CEM
Mrs. Lauren Morgan, MEPP
Mr. Chris Rippetoe, CFM
Dr. Joseph B. Harris, PhD

Louisiana State University – Louisiana Emerging Technology Center
Baton Rouge, LA 70803



This Page Left Intentionally Blank

ACKNOWLEDGMENTS

This 2022 East Carroll Parish Hazard Mitigation Plan Update was coordinated by the East Carroll Parish Hazard Mitigation Plan Update Steering Committee, in collaboration with community stakeholders and the general public. The participating jurisdictions are made up of the following communities:

East Carroll Parish
Town of Lake Providence

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

Kenneth Baker	East Carroll Parish OHSEP
Jerry Bell	Town of Lake Providence (Outgoing Mayor)
Robert Amacker	Town of Lake Providence (Mayor Elect)
Lee Ann W. Clement	Town of Lake Providence
Myrtle Green	West Carroll Parish OHSEP

The 2022 East Carroll Parish Hazard Mitigation Plan Update was written by the Stephenson Disaster Management Institute, Louisiana State University. Further comments should be directed to the East Carroll Parish Office of Homeland Security and Emergency Preparedness: 400 1st St., Lake Providence, LA 71254.



Contents

1. Introduction	1-1
Geography, Population and Economy	1-2
Geography.....	1-2
Population.....	1-4
Economy.....	1-4
Hazard Mitigation	1-5
General Strategy	1-7
2022 Plan Update.....	1-8
2. Hazard Identification and Parish-Wide Risk Assessment	2-1
Prevalent Hazards to the Community.....	2-1
Previous Occurrences	2-2
Probability of Future Hazard Events	2-3
Inventory of Assets for the Entire Parish	2-4
Critical Facilities of the Parish	2-5
Assessing Vulnerability Overview	2-10
Quantitative Methodology	2-10
Qualitative Methodology.....	2-10
Priority Risk Index and Hazard Risk.....	2-11
Future Development Trends.....	2-12
Future Hazard Impacts.....	2-13
Land Use.....	2-14
Hazard Identification.....	2-15
Drought	2-15
Flooding.....	2-19
Levee Failure	2-31
Thunderstorms.....	2-35
Tornadoes	2-46
Tropical Cyclones	2-51
Wildfires	2-61
Winter Weather	2-67
3. Capability Assessment	3-1
Policies, Plans and Programs	3-1
Building Codes, Permitting, Land Use Planning and Ordinances.....	3-2
Administration, Technical, and Financial	3-2

Education and Outreach	3-4
Flood Insurance and Community Rating System	3-4
NFIP Worksheets.....	3-7
4. Mitigation Strategy.....	4-1
Introduction	4-1
Goals	4-1
2022 Mitigation Actions and Update on Previous Plan Actions	4-2
Unincorporated East Carroll Parish Mitigation Actions	4-3
Town of Lake Providence Mitigation Actions	4-31
Action Prioritization	4-46
Appendix A: Planning Process.....	A-1
Purpose	A-1
The East Carroll Parish Hazard Mitigation Plan Update.....	A-1
Planning	A-2
Coordination	A-2
Neighboring Community, Local and Regional Planning Process Involvement	A-2
Program Integration.....	A-3
Meeting Documentation and Public Outreach Activities	A-4
Meeting #1: Hazard Mitigation Plan Update Kick-Off.....	A-4
Meeting #2: Hazard Mitigation Plan Initial Planning Committee Meeting.....	A-5
Meeting #3: Risk Assessment Presentation to Steering Committee	A-5
Meeting #4: Public Meeting.....	A-5
Outreach Activity #1: Public Opinion Survey	A-7
Outreach Activity #2: Incident Questionnaire	A-7
Outreach Activity #3: 2022 East Carroll Parish Hazard Mitigation Plan Public Review	A-9
Appendix B: Plan Maintenance.....	B-1
Purpose	B-1
Monitoring, Evaluating, and Updating the Plan.....	B-1
Responsible Parties	B-1
Methods for Monitoring and Evaluating the Plan and Plan Evaluation Criteria.....	B-1
2022 Plan Version Plan Method and Schedule Evaluation	B-3
Incorporation into Existing Planning Programs	B-3
Continued Public Participation	B-4
Appendix C: Critical Facilities.....	C-1
Critical Facilities within the East Carroll Parish Planning Area.....	C-1

Appendix D: Plan Adoption	D-1
East Carroll Parish	D-1
Town of Lake Providence	D-2
Appendix E: State Required Worksheets	E-1
Mitigation Planning Team	E-1
Capability Assessment	E-2
Unincorporated East Carroll Parish.....	E-2
Town of Lake Providence	E-5
Building Inventory	E-8
Vulnerable Populations.....	E-10
National Flood Insurance Program (NFIP)	E-11

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 East Carroll Parish Hazard Mitigation Plan Update (HMPU) process; (b) identifies natural hazards and risks within the parish; and (c) identifies the parish's hazard mitigation strategy to make East Carroll Parish and its jurisdictions less vulnerable and more disaster resilient. It also includes mitigation project scoping to further identify scopes of work, funding sources, and implementation timing requirements of proposed selected mitigation projects. Information in the plan will be used to help guide and coordinate mitigation and local policy decisions affecting future land use.

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

- East Carroll Parish
- Town of Lake Providence

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/Rita, Gustav/Ike, and Laura/Delta environment in south Louisiana.

This Hazard Mitigation Plan is a comprehensive plan for disaster resiliency in East Carroll 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.

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 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.

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 (CRS), a program that reduces flood insurance premiums in participating communities. This program is further described in Section Three: Capability Assessment.

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 CRS credit, and provides East Carroll Parish and its communities with a blueprint for reducing the impacts of these natural hazards on people and property.

Geography, Population and Economy

Geography

East Carroll Parish is situated at the eastern extreme of the Louisiana-Arkansas border on the Mississippi River. The area is a flat, delta country, made up of rich alluvial soil. Ridges characterize the surface of the land, and swales and swampy areas left by meanders of old streams are prevalent. The parish lies entirely within the Ouachita-Black River drainage basin. Generally speaking, all streams flow to the southwest in the parish. East Carroll is 29 miles long, north and south, and 10 to 18 miles wide, east and west, depending on the variations of Bayou Macon and Mississippi River boundaries. It is bordered by West Carroll Parish on the west, Madison Parish on the south, the Mississippi River on the east, and Arkansas on the north.



Figure 1-1: Location of East Carroll Parish in the State of Louisiana

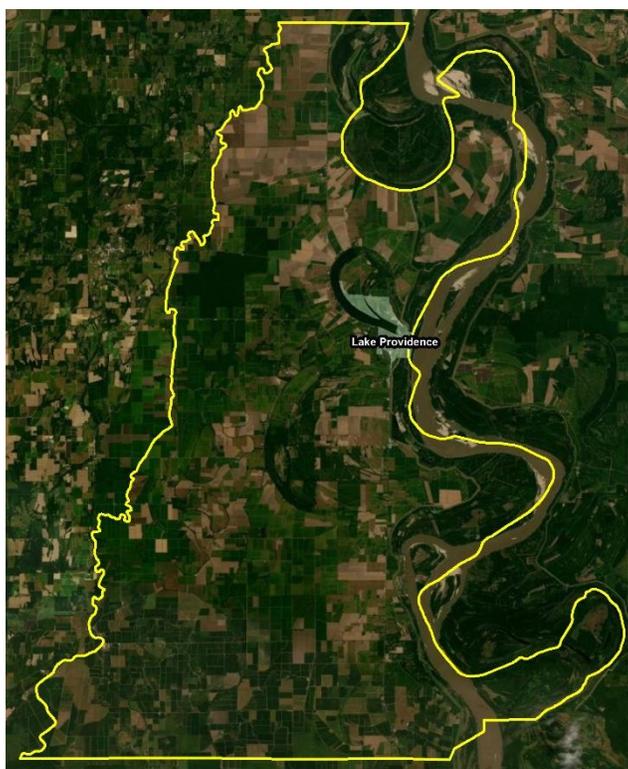


Figure 1-2: Incorporated Jurisdictions within East Carroll Parish

From its beautiful lake to its vast area of woodlands and bayous, East Carroll Parish offers the avid sportsman many opportunities to take advantage of Louisiana's Sportsman's Paradise. An abundance of deer, turkey, ducks, and other wild game draws residents from northeast Louisiana to participate in the many hunting clubs located within the parish. Recently, the Louisiana Wildlife and Fisheries purchased a large tract of woodlands that should enhance this bountiful resource.

The topography of East Carroll Parish is, like most of Louisiana, largely consistent, maintaining an average elevation of 85 feet above sea level.

East Carroll Parish weather is typically warm and humid. Variations in daily temperature are determined by distance from the Gulf of Mexico and, to a much lesser degree, by differences in elevation. The average annual temperature for the state as a whole is 68°F. January is typically the coldest month for Louisiana, averaging approximately 54°F, while July is typically the warmest at an average of 83°F. Winter months are usually mild with cold spells of short duration. For East Carroll Parish in particular, the summer months are usually quite warm, with an average daily maximum temperature in July and August of 92°F. Winters are typically mild. Snowfall averages less than one inch per year. Average annual rainfall for the area is 56 inches. East Carroll Parish is susceptible to the normal weather dangers, such as thunderstorms and flooding.

East Carroll Parish is located in Louisiana Governor’s Office of Homeland Security and Emergency Preparedness (GOHSEP) Region 8 (Figure 1-3).

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



Figure 1-3: Louisiana Homeland Security Regions

Population

The population of East Carroll Parish is estimated at 7,459 (2020 Census) with a population percent change from April 1, 2010 – April 1, 2020 of -4.02%.

Table 1-1: East Carroll Parish Population (Source: US Census)

	2010 Census	2014 Estimate	2020 Census	Percent Change 2010 - 2020
Total Population	7,759	7,487	7,459	-4.02%
Population Density (Pop/Sq. Mi.)	18.4	-----	-----	-----
Total Households	2,904	2,899	2,037	-42.56%
Persons Per Household	-----	-----	2.17	-----

Economy

Because of its location in the fertile, southern Mississippi Valley Delta, about 74% of the land in East Carroll Parish is dedicated to agriculture. The agriculture industry ranges from aquaculture and forestry to row crops. The primary row crops grown in East Carroll include cotton, corn, rice, and soybeans.

Also located in the northeast corner of East Carroll Parish on the Mississippi River is the Port of Lake Providence. The port is a shallow draft port with a Corps of Engineers maintained channel depth of 9 feet, situated on 284 acres with 25 acres of flood free hydraulic fill and four berths. Inbound cargoes include aggregates, coal, dry & liquid fertilizer, forest products, lime, and tire chips. Outbound cargoes include cottonseed and various grain.

Tourism and recreation are beginning to have a bigger impact on the East Carroll Parish economy as well. With a plethora of historical elements in the parish, ranging from cultural memorials such as the Louisiana

State Cotton Museum to Civil War related icons like Grant’s Canal, more people are visiting East Carroll Parish each year. Lake Providence, which provides recreation throughout the year for fishing, skiing, birdwatching, and boating, as well as the fertile hunting grounds of the Bayou Macon Wildlife Management Area, also bring outdoor enthusiasts to the parish.

*Table 1-2: East Carroll Parish Business Patterns
(Source: US Census, CBP)*

Business Description	Number of Establishments	Number of Employees	Annual Payroll (\$1,000)
Retail Trade	19	101	2,306
Manufacturing	5	58	2,088
Health Care and Social Assistance	11	290	9,062
Transportation and Warehousing	8	157	12,559
Construction	4	4	137
Administration/Support and Waste Management/Remediation Services	4	223	4,893
Real Estate and Rental and Leasing	5	5	344
Wholesale Trade	14	124	8,091
Other Services (except Public Administration)	12	42	609
Accommodation and Food Services	7	55	583
Financial and Insurance	3	24	1,526
Professional, Scientific, and Technical Services	5	19	472
Agriculture, Forestry, Fishing and Hunting	7	22	1,266
Educational Services	3	33	753

Hazard Mitigation

To fully understand hazard mitigation efforts in East Carroll 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 in advance of 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 1-4 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 1-4* 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, post-disaster revision is a vital component of improving mitigation. Each hazardous event affords an opportunity to reduce the consequences of future occurrences.

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. More recently, the historically impactful 2020 hurricane season reinforced the need for proper planning and mitigation strategies.

The catastrophic tropical events of 2005 and 2020, coupled with the unprecedented flooding events of 2016 have 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.



Figure 1-4: The Four Phases of Emergency Management and their Relation to Future Hazard Mitigation (Source: Louisiana State Hazard Mitigation Plan 2014)

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 the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) encourages the parishes and the local communities 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 2022 East Carroll Parish Hazard Mitigation Plan (HMP) maintains much of the information from the 2016 plan version, but it now incorporates the order and methodologies of the 2019 Louisiana State Hazard Mitigation Plan.

The sections in the 2016 East Carroll Parish HMP were 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

This plan update 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 East Carroll Parish Hazard Mitigation Steering Committee recognized the benefits from the successful analysis and mitigation planning executed in previous plan updates, as well as improvements to be made in the 2022 update. This plan update remains coherent with those documents, retaining language and content when needed, deleting it when appropriate, and augmenting it when constructive.

2022 Plan Update

This 2022 plan update proceeds with the previous goals of the East Carroll Parish Hazard Mitigation Plan. The current goals are as follows:

1. Protect life and property
2. Ensure emergency services
3. Increase public preparedness
4. Establish and strengthen partnerships for implementation
5. Preserve or restore natural resources
6. Promote a sustainable economy
7. Improve data collection, use, and sharing to reduce the risk from disasters

This plan update makes a number of textual changes throughout, but the most obvious changes are data related and structural edits. First, the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information's (NCEI) Storm Events Database was used in the analysis, which provides historical hazard data from 1950 to 2021. The steering committee was also instrumental in providing detailed data where appropriate to more accurately reflect hazard impacts on the parish and jurisdictions. Furthermore, all of the sections were updated to reflect the most current information and the most current vision of the plan update. The most significant changes are the newly developed hazard profiles and risk assessments, as well as the removal of much repetition between sections from the previous plan updates.

The 2022 plan update is organized in the same format as the 2016 update, with one minor change to this 2022 update as outlined below:

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

Table 1-3: 2022 Plan Update Crosswalk

Plan Update Crosswalk	
2016 Update	2022 Update
Section 1: Introduction	Section 1: Introduction
Section 2: Hazard Identification and Parish-Wide Risk Assessment	Section 2: Hazard Identification and Parish-Wide Risk Assessment
Section 3: Capability Assessment	Section 3: Capability Assessment
Section 4: Mitigation Strategy	Section 4: Mitigation Strategy
Appendix A: Planning Process	Appendix A: Planning Process
Appendix B: Plan Maintenance	Appendix B: Plan Maintenance
Appendix C: Essential Facilities	Appendix C: Critical Facilities
Appendix D: Plan Adoptions	Appendix D: Plan Adoptions
Appendix E: State Required Worksheets	Appendix E: State Required Worksheets

Despite numerous changes in this plan update, the plan remains consistent in its emphasis on the types of hazards that pose the most risk to loss of life, injury, and property in East Carroll Parish and its communities. The extent of this risk is dictated primarily by its geographic location. Most significantly, East Carroll Parish remains at high risk of water inundation from various sources, including flooding and tropical cyclone activity. The entire parish is also at high risk of damages from high winds and wind-borne debris. The 2016 flooding events, along with the 2020 hurricane season were both felt heavily in all parts of East Carroll Parish. Other hazards threaten the parish and/or its communities, 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.

This Page Left Intentionally Blank

2. Hazard Identification and Parish-Wide Risk Assessment

This section assesses the various hazard risks that East Carroll 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 East Carroll Parish Hazard Mitigation Plan published in 2016, as well as the hazards that were identified in the state's 2019 Hazard Mitigation Plan that were 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 Previous Plan	Considered Medium or High Risk in the State's HM Plan	Profiled in the 2022 Update
Drought	X		X
Earthquakes	*		
Flooding	X	X	X
Thunderstorms (Hail, Lightning, & Wind)	X	X	X
Tornadoes	X	X	X
Tropical Cyclones	X	X	X
Wildfires	X		X
Winter Storms	X		X
Dam Failure	*		
Levee Failure	X		X

* Hazard was discounted in previous plan

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

- a) Drought
- b) Flooding
- c) Levee Failure
- d) Thunderstorms (Hail, Lightning, & Wind)
- e) Tornadoes
- f) Tropical Cyclones
- g) Wildfires
- h) Winter Weather

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

- Flooding from rivers and waterways, rainstorms, 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)
 - e) Coastal
- High wind damage most commonly resulting from hurricanes, thunderstorms, and tornadoes
- Property damage resulting from all profiled natural hazards

The potential destructive power of tropical cyclones and floods were determined to be the most prevalent hazard to the parish. Seventeen of the twenty disaster declarations East Carroll Parish has received resulted from either flooding (7) or tropical cyclones (10), which validates these as the most significant hazards. Therefore, the issues of hurricanes and flooding will 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 assess 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 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 East Carroll Parish is included in the hurricane risk assessment.

East Carroll Parish is also susceptible to tornadoes. Tornadoes can spawn from tropical cyclones or severe weather systems that pass-through East Carroll 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

On the next page, [Table 2-2](#) summarizes federal disaster declarations for East Carroll Parish since 1965. Information includes names, dates, and types of disaster.

Table 2-2: East Carroll Parish Major Disaster Declarations.

Disaster Number	Year	Declaration
374	4/27/1973	Severe Storms, Flooding
904	5/3/1991	Severe Storms, Tornadoes, and Flooding
1264	1/21/1999	Severe Ice Storm
1603	8/29/2005	Tropical Cyclone – Hurricane Katrina
1607	9/24/2005	Tropical Cyclone – Hurricane Rita
1668	11/2/2006	Severe Storms, Flooding
1786	9/2/2008	Tropical Cyclone – Hurricane Gustav
3322	5/6/2011	Severe Storms, Flooding
4015	8/18/2011	Severe Storms, Flooding
4080	8/29/2012	Tropical Cyclone – Hurricane Isaac
4102	2/22/2013	Severe Storm, Flooding
4263	3/13/2016	Severe Storms, Flooding
4462	9/19/2019	Flooding
4484	3/24/2020	COVID-19 Pandemic
3527	6/7/2020	Tropical Cyclone – TS Cristobal
3538	8/23/2020	Tropical Cyclone – Tropical Storms Laura and Marco
4559	8/28/2020	Tropical Cyclone – Hurricane Laura
3543	9/14/2020	Tropical Cyclone – Hurricane Sally
4570	10/16/2020	Tropical Cyclone – Hurricane Delta
3549	10/27/2020	Tropical Cyclone – TS Zeta

Probability of Future Hazard Events

The probability of a hazard event occurring in East Carroll 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 National Oceanic and Atmospheric Administration’s (NOAA) National Centers for Environmental Information’s (NCEI) Storm Events Database, which provides historical hazard data from 1950 to 2021. In staying consistent with the state plan, the Storm Events Database was evaluated for the last thirty years (1990 – 2021) to determine future probability of a hazard occurring. While the 31-year record used by the State was adopted for the purpose of determining the overall probability, to assist with determining estimated losses, unless otherwise stated, the full 71-year record was used when Hazus was not 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. The table on the next page shows the annual probability for each hazard occurring across the parish.

Table 2-3: Probability of Future Hazard Reoccurrence.

Hazard	Probability	
	East Carroll Parish (Unincorporated)	Lake Providence
Drought	16%	16%
Flooding	100%	100%
Thunderstorms – Hail	100%	100%
Thunderstorms – Lightning	7%	7%
Thunderstorms - Wind	100%	100%
Tornadoes	33%	33%
Tropical Cyclones	26%	26%
Wildfires	< 1%	< 1%
Winter Storms	10%	10%
Levee Failure	< 1%	< 1%

As shown in the above tables, hailstorms, thunderstorm winds, and flooding for the incorporated and unincorporated areas of the parish have the highest chance of occurrence in the parish (100%). These are followed by tornadoes (33%), tropical cyclones (26%), drought (16%), winter storms (10%), and lightning (7%). Wildfires and levee failure have a less than 1% annual chance of occurrence.

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 \$943,906,000 in structures throughout the parish. The table below provides the total estimated value for each type of structure by occupancy.

Table 2-4: Estimated Total of Potential Losses throughout East Carroll Parish.

Occupancy	East Carroll Parish	Unincorporated Area	Lake Providence
Agricultural	\$22,708,000	\$14,950,000	\$7,758,000
Commercial	\$164,332,000	\$55,702,000	\$108,630,000
Government	\$26,756,000	\$5,924,000	\$20,832,000
Industrial	\$12,239,000	\$10,303,000	\$1,936,000
Religion	\$70,666,000	\$28,496,000	\$42,170,000
Residential	\$623,339,000	\$396,644,000	\$226,695,000
Education	\$23,866,000	\$14,754,000	\$9,112,000
Total	\$943,906,000	\$526,773,000	\$417,133,000

Critical Facilities of the Parish

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

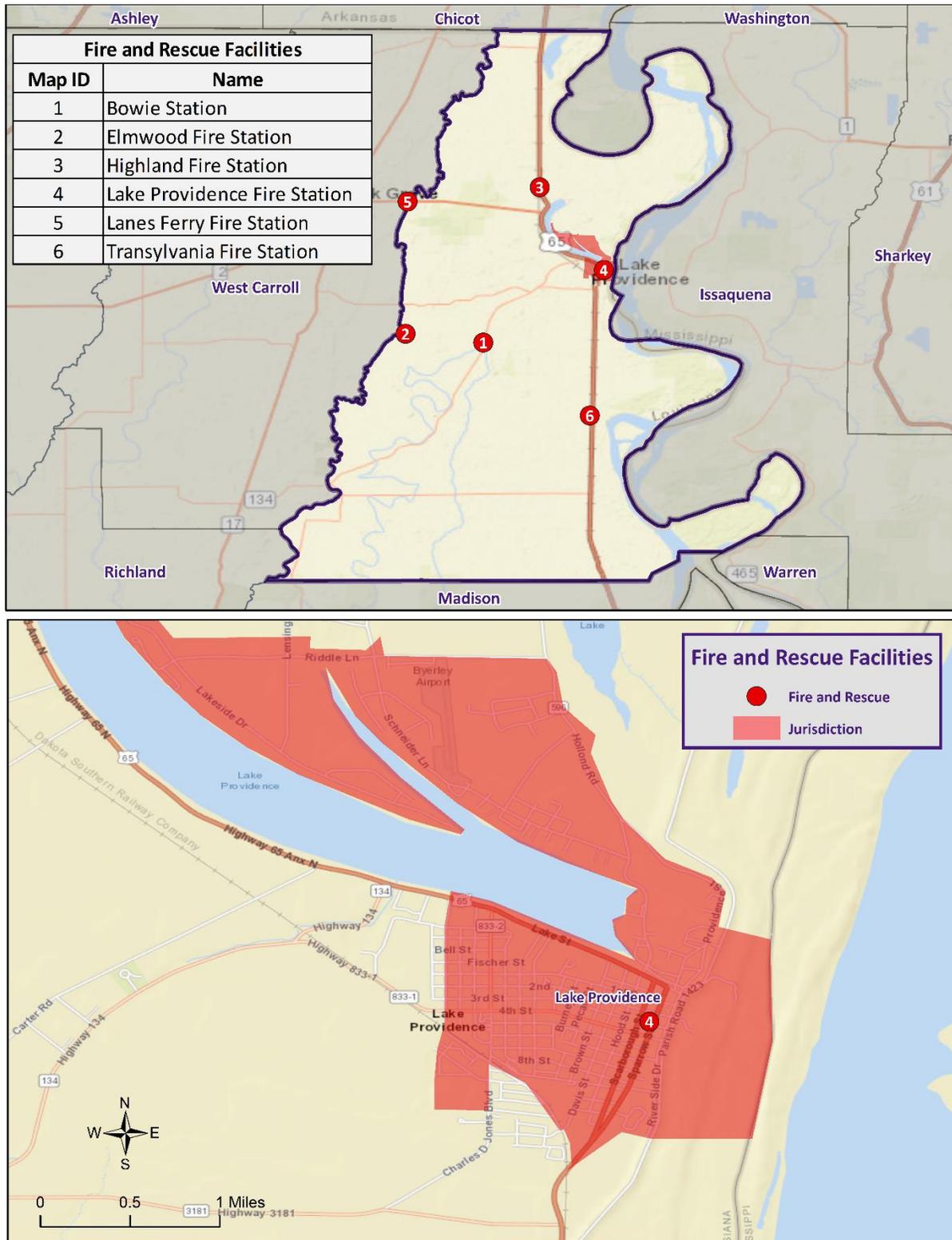


Figure 2-1: Fire and Rescue Facilities in East Carroll Parish.

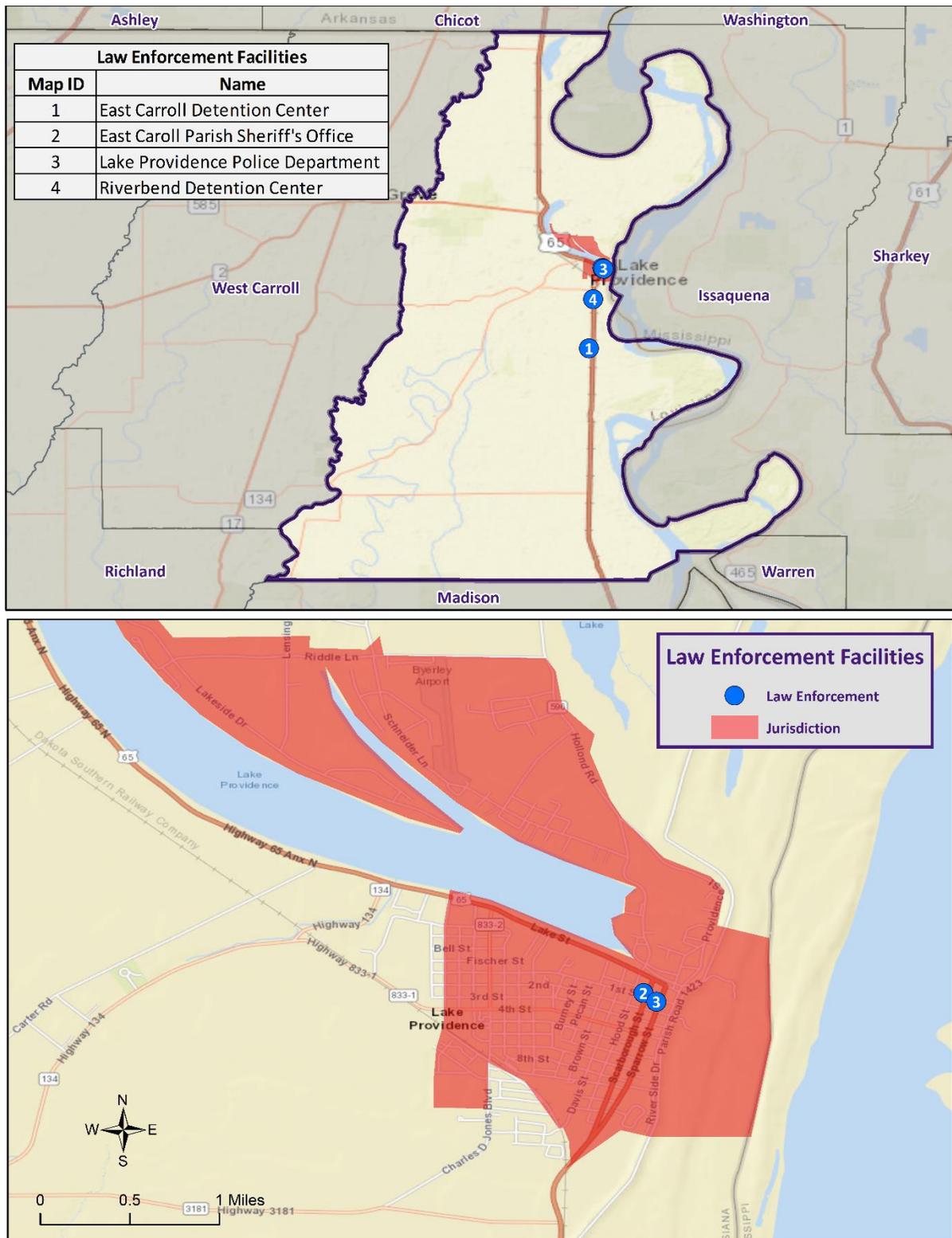


Figure 2-3: Law Enforcement in East Carroll Parish.

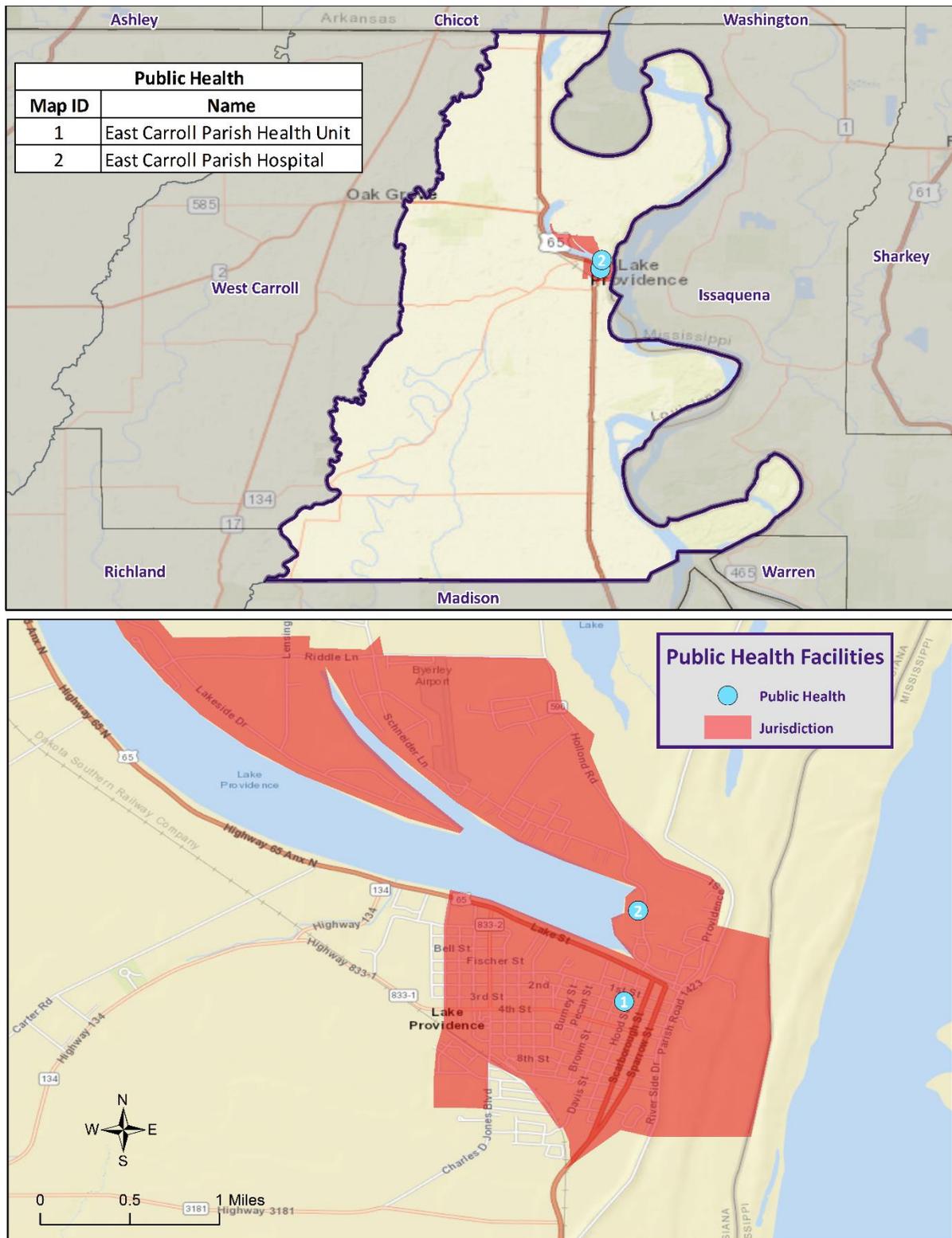


Figure 2-4: Public Health Facilities in East Carroll Parish.

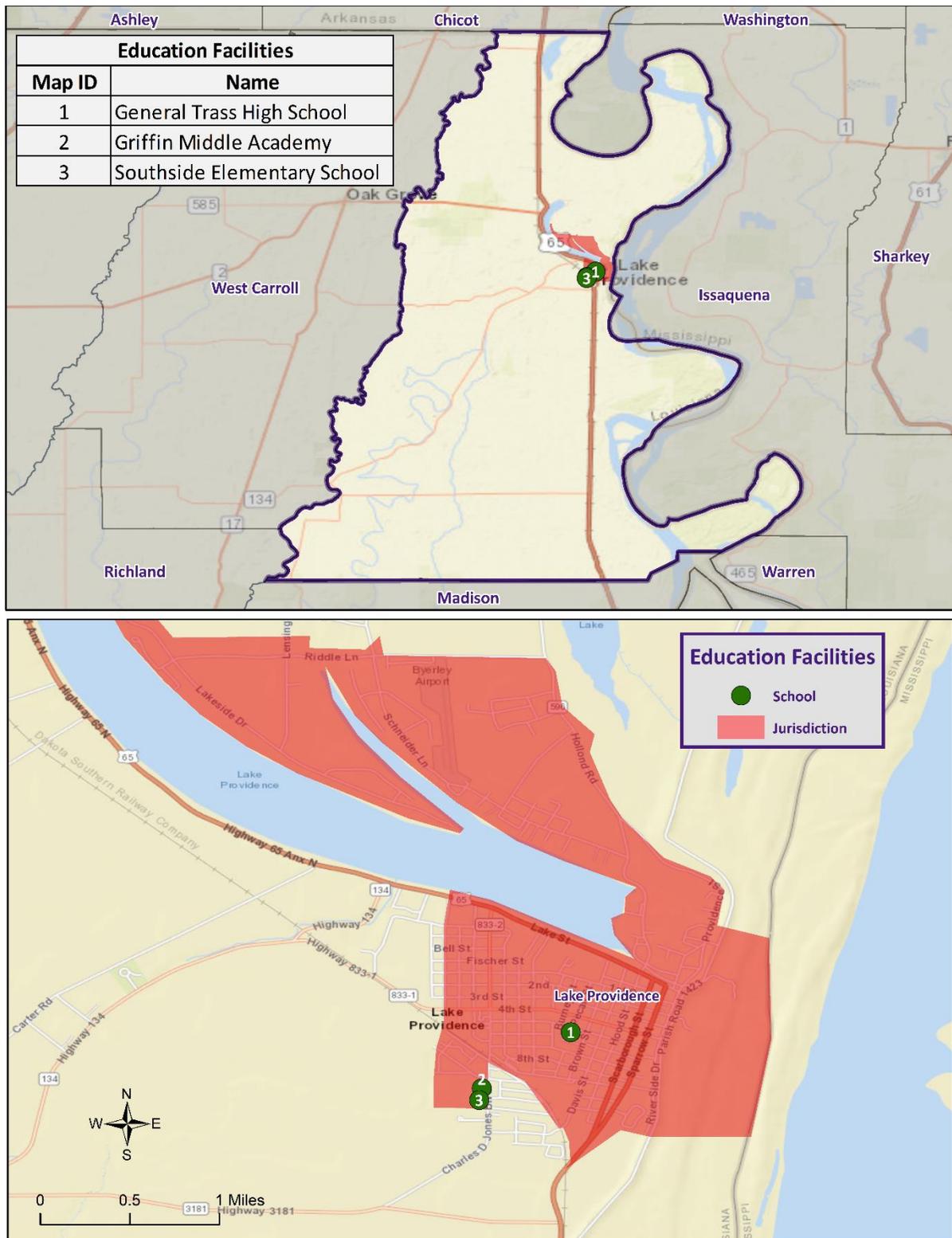


Figure 2-5: Educational Facilities in East Carroll Parish.

Assessing Vulnerability Overview

The purpose of assessing vulnerability is to quantify and/or qualify exposure and determine how various threats and hazards impact life, property, the environment, and critical operations in East Carroll Parish. Vulnerability can be defined as the manifestation of the inherent states of the system (e.g., physical, technical, organizational, cultural) that can be exploited to adversely affect (cause harm or damage to) that system. For example, identifying areas in the parish that suffer disproportional damages from flooding compared with other areas, or overall exposure of an entire town to flooding. Identifying and understanding vulnerability to each threat and hazard provides a strong foundation for developing and pursuing mitigation actions.

The Vulnerability Assessment section for each hazard builds upon the information provided in the Risk Assessment by assessing the potential impact and amount of damage that each hazard has on the parish and each jurisdiction location. To complete the assessment, best available data were collected from a variety of sources, including local, state, and federal agencies, and multiple analyses were performed qualitatively and quantitatively. The estimates provided in the Vulnerability Assessment should be used to understand relative risk from each hazard and the potential losses that may be incurred; however, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning specific hazards and their effects on the built environment, as well as incomplete datasets from approximations and simplifications that are necessary to provide a meaningful and complete analysis. Further, most datasets used in this assessment contain relatively short periods of records, which increases the uncertainty of any statistically based analysis.

Quantitative Methodology

The quantitative methodology consists of utilizing a detailed GIS-based approach informed through the development of comprehensive hazard and infrastructure databases. This data-centric approach forms the foundation for our quantitative vulnerability assessment. GIS technology allowed for the identification and analysis of potentially at-risk community assets such as people and infrastructure. This analysis was completed for hazards that can be spatially defined in a meaningful manner (i.e., hazards with an official and scientifically determined geographic extent) and for which GIS data were readily available.

Qualitative Methodology

The qualitative assessment relies less on technology, but more on historical and anecdotal data regarding expected hazard impacts. The qualitative assessment completed for East Carroll Parish is based on the Priority Risk Index (PRI). The purpose of the PRI is to prioritize all potential hazards, and then group them into three categories of high, moderate, or low risk to identify and prioritize mitigation opportunities. The PRI is a good practice to use when prioritizing hazards because it provides a standardized numerical value for hazards to be compared. PRI scores were calculated using five categories:

- Probability
- Impact
- Spatial Extent
- Warning Time
- Duration

Each degree of risk is assigned a value (1-4) and a weighting factor. To calculate the Risk Factor for a given hazard, the assigned risk value for each category is multiplied by the weighted factor, and the sum of all six categories is totaled together to determine the final Risk Factor. The highest possible Risk Factor is 4.0.

$$\text{Risk Factor} = [(\text{Probability} * 0.25) + (\text{Impact} * 0.25) + (\text{Spatial Extent} * 0.20) + (\text{Warning Time} * 0.15) + (\text{Duration} * 0.15)]$$

Priority Risk Index and Hazard Risk

Hazard risk is determined by calculating the Risk Factor for each hazard impacting East Carroll Parish. A summary of the PRI is found in the following table. The conclusions drawn from the qualitative and quantitative assessments are fitted into three categories based on High, Moderate, or Low designations. Hazards identified as high risk have risk factors of 2.5 or greater. Risk Factors ranging from 2.0 to 2.4 are deemed moderate risk hazards. Hazards with Risk Factors less than 2.0 are considered low risk.

Table 2-5: Summary of the Priority Risk Index.

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	25%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	25%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than a week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self-explanatory	1	15%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Duration	Less than 6 hours	Self-explanatory	1	15%
	Less than 24 hours	Self-explanatory	2	
	Less than one week	Self-explanatory	3	
	More than one week	Self-explanatory	4	

Table 2-6: Associated Risk Factor with PRI Value Range.

Risk Factor	PRI Range
High Risk	2.5 to 4.0
Moderate Risk	2.0 to 2.4
Low Risk	0 to 1.9

Table 2-7: Risk Assessment for East Carroll Parish.

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	Overall Risk
Drought	3	2	4	2	3	2.8
Flooding	4	4	3	4	3	3.65
Thunderstorms – Hail	4	2	3	3	1	2.7
Thunderstorms – Lightning	2	2	2	3	1	2
Thunderstorms - Wind	4	2	3	3	1	2.7
Tornadoes	3	3	2	4	3	2.95
Tropical Cyclones	3	4	4	1	4	3.3
Wildfires	1	3	4	1	2	2.25
Winter Storms	2	2	2	4	2	2.3
Levee Failure	1	2	1	4	2	1.85

Future Development Trends

East Carroll Parish experienced a decline in population and housing between the years of 2000 and 2019, declining in population from 9,384 with 3,303 housing units in the year 2000 to a population of 7,459 with 2,791 housing units in the year 2019. The incorporated area of Lake Providence experienced the largest population decline within the parish falling from a populace of 2,259 in 2010 to 3,587 in 2019 (9.7% overall decline). The unincorporated area of the parish experienced an increase in population rising from 3,757 in 2010 to 3,872 in 2019 (3.1% overall increase).

The incorporated area of Lake Providence experienced the largest growth of housing units from 2010 to 2019 growing from 1,647 in 2010 to 1,689 in 2019. The unincorporated area of the parish experienced a decline in housing units during the same time period. The future population and number of buildings can be estimated using U.S. Census Bureau housing and population data. The tables on the next page show population and housing unit estimates from 2000 to 2019

Table 2-8: Population Growth Rate for East Carroll Parish.

Total Population	East Carroll Parish	Unincorporated Area	Lake Providence
1-Apr-00	9,384	4,275	5,109
1-Apr-10	7,731	3,757	3,974
1-Jul-19	7,459	3,872	3,587
Population Growth between 2000 – 2010	-17.6%	-12.1%	-22.2%
Average Annual Growth Rate between 2000 – 2010	-1.8%	-1.2%	-2.2%
Population Growth between 2010 – 2019	-3.5%	3.1%	-9.7%
Average Annual Growth Rate between 2010 – 2019	-0.35%	0.31%	-0.97%

Table 2-9: Housing Growth Rate for East Carroll Parish.

Total Housing Units	East Carroll Parish	Unincorporated Area	Lake Providence
1-Apr-00	3,303	1,425	1,878
1-Apr-10	2,904	1,257	1,647
1-Jul-19	2,791	1,102	1,689
Housing Growth between 2000 – 2010	-12.1%	-11.8%	-12.3%
Average Annual Growth Rate between 2000 – 2010	-1.2%	-1.2%	-1.2%
Housing Growth between 2010 – 2019	-3.9%	-12.3%	2.6%
Average Annual Growth Rate between 2010 – 2019	-0.4%	-1.2%	0.3%

Future Hazard Impacts

Hazard impacts were estimated for five years and ten years in the future (2025 and 2030). 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 grow within East Carroll Parish from the present until 2030. 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%.

Table 2-10: Estimated Future Impacts, 2018-2030.
(Source: Hazus, US Census Bureau)

Hazard / Impact	Total in Parish (2019)	Hazard Area (2018)	Hazard Area (2025)	Hazard Area (2030)
Flood Damage				
Structures	2,780	705	692	681
Value of Structures	\$949,842,584	\$240,918,959	\$248,565,996	\$254,858,022
# of People	7,433	1,885	1,852	1,826
Tropical Cyclone Damage				
Structures	2,780	2,780	2,726	2,684
Value of Structures	\$949,842,584	\$949,842,584	\$979,991,649	\$1,004,798,472
# of People	7,433	7,433	7,303	7,201

Both population and housing numbers have remained relatively steady throughout the parish since the last update to the East Carroll Parish Hazard Mitigation Plan. With that in mind, East Carroll Parish is mindful in offsetting any new development around the parish with appropriate mitigative actions. Initiatives such as active floodplain management have regulated the development of flood prone areas to continue supporting and encouraging safer communities within East Carroll Parish. The small amount of development that has occurred since 2016 has not in any knowing way altered the parish's vulnerability to natural hazards.

Land Use

The East Carroll Parish Land Use table is provided below. Residential, commercial, and industrial areas account for only 4% of the parish's land use. Agricultural land at 205,032 acres is the largest category accounting for 74% of land in the parish. The parish also consists of wetlands (15%), water areas (5%), and forested areas (2%).

Table 2-11: East Carroll Parish Land Use.
(Source: USGS Land Use Map)

Land Use	Acres	Percentage
Agricultural Land, Cropland, and Pasture	205,032	74%
Wetlands	42,356	15%
Forest Land (Not including forested wetlands)	5,617	2%
Urban/Development	10,008	4%
Water	15,256	5%

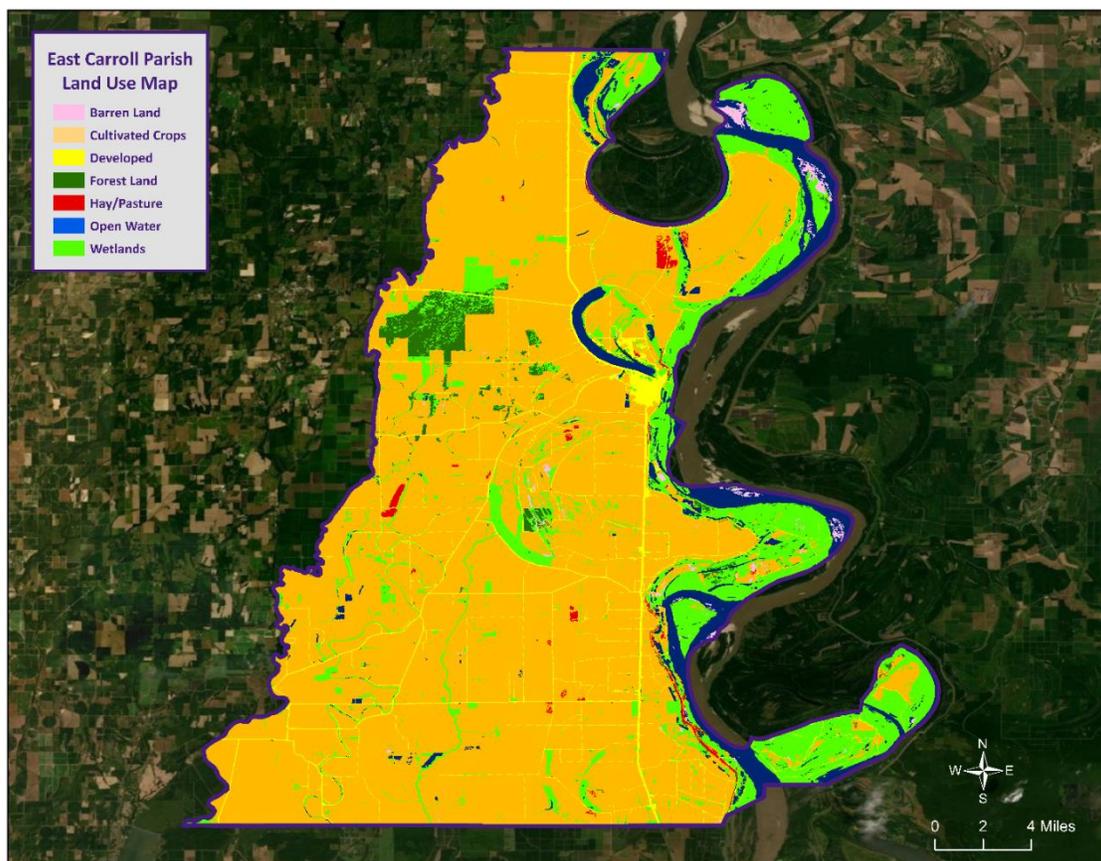


Figure 2-6: East Carroll Parish Land Use Map.
(Source: USGS Land Use Map)

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. And 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

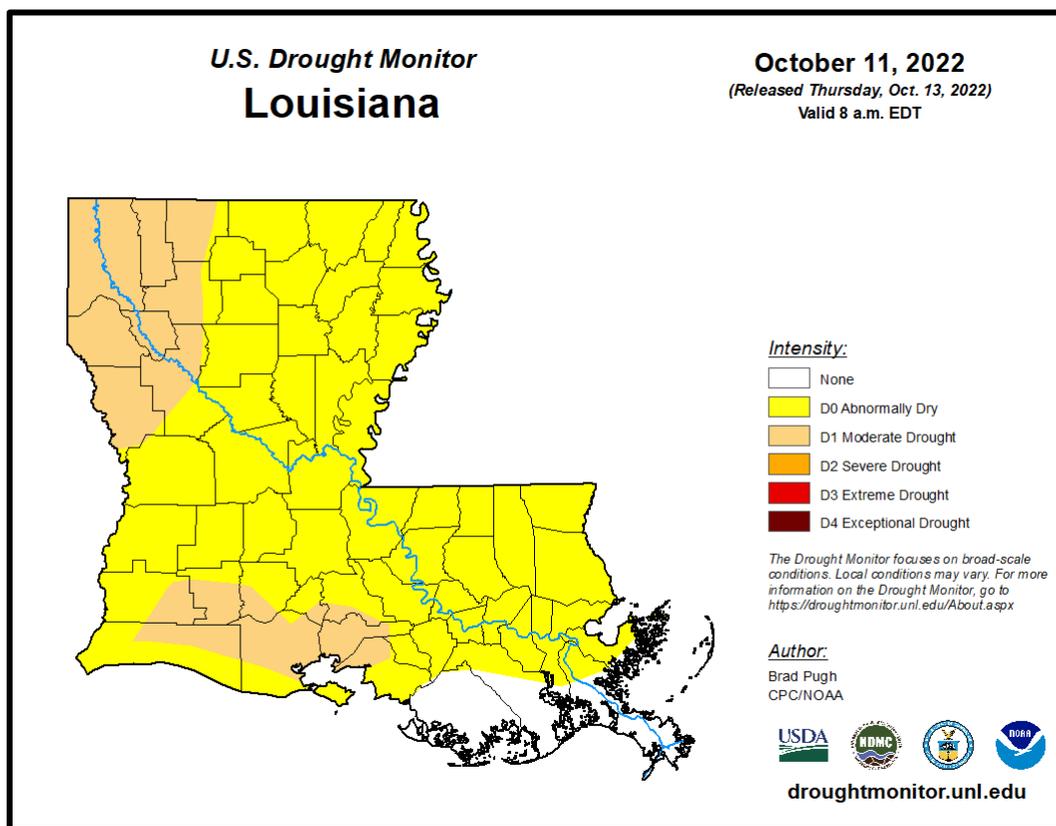
hazards, such as wildfires and/or heat waves. Lastly, drought is a slow onset event, causing less direct—but tremendous indirect—damage. Depletion of aquifers, crop loss, and livestock and wildlife mortality rates are examples of direct impacts. Since the groundwater found in aquifers is the source of 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 2-12* displays the range and Palmer classifications of the PDSI index while *Figure 2-7* displays the current drought monitor for the state of Louisiana and its parishes.

Table 2-12: 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 abnormally dry conditions currently exist within East Carroll Parish.



*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 East Carroll Parish is on the agricultural community. The worst-case drought scenario for East Carroll Parish would be an extreme drought (D3).

Previous Occurrences / Extent

Historically, there have been five drought incidents in East Carroll Parish. Drought events have ranged from Mild to Extreme per the National Climatic Data Center. Since the last update in 2016, there has been one drought event within the boundaries of East Carroll Parish.

Table 2-13: Historical Droughts in East Carroll Parish since the 2016 Update.

Date	Extents	Drought Magnitude	Estimated Damages
December 2017 – February 2018	Severe (D2) drought conditions encompassed much of Northcentral Louisiana to start the second week of December. Including the first half of December, the total rainfall amounts that fell during the Fall months (September/October/November) only ranged from 2-4 inches areawide, which was only 15-25% of normal whereas temperatures during the period remained above normal as well.	\$0	D2
December 2021	The U.S. Drought Monitor indicated Severe Drought (D2) conditions across East Carroll Parish during the month of December. Rainfall across the parish was generally less than 50 percent of normal, and temperatures averaged around 10 degrees above normal through the month.	D2	\$0

Frequency / Probability

Based on the occurrence of five drought events since 1990, the annual chance of a drought event occurring within a given year is calculated at 16% for East Carroll Parish.

Estimated Potential Loses

According to the NCEI Storm Events Database, there have been five drought events which have impacted East Carroll Parish which resulted in limited to no damage to crops in the parish. When examining the drought hazard, the main impact will primarily be on the crops. The following table presents an analysis of agricultural exposure which are susceptible to droughts by type for East Carroll Parish.

Table 2-14: Agricultural Exposure by Crop Type for Droughts in East Carroll Parish.
(Source: LSU AG Center 2018 Parish Totals)

Agricultural Exposure by Type for Drought				
Corn	Cotton	Forestry	Rice	Soybeans
\$22,419,112	\$7,185,671	\$2,816,981	\$3,291,122	\$108,671,549

There have been no reported injuries or deaths as a direct result of drought in East Carroll Parish.

Vulnerability

See *Appendix C: Critical Facilities* for parish and municipality buildings that are susceptible to drought.

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.

Historically, in East Carroll Parish, all types of flooding events have historically been observed except for coastal flooding. 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.

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, but they can also be different along any given river. A 100-year event upstream is different from one downstream due to the change 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 change over time. 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 2-8*.

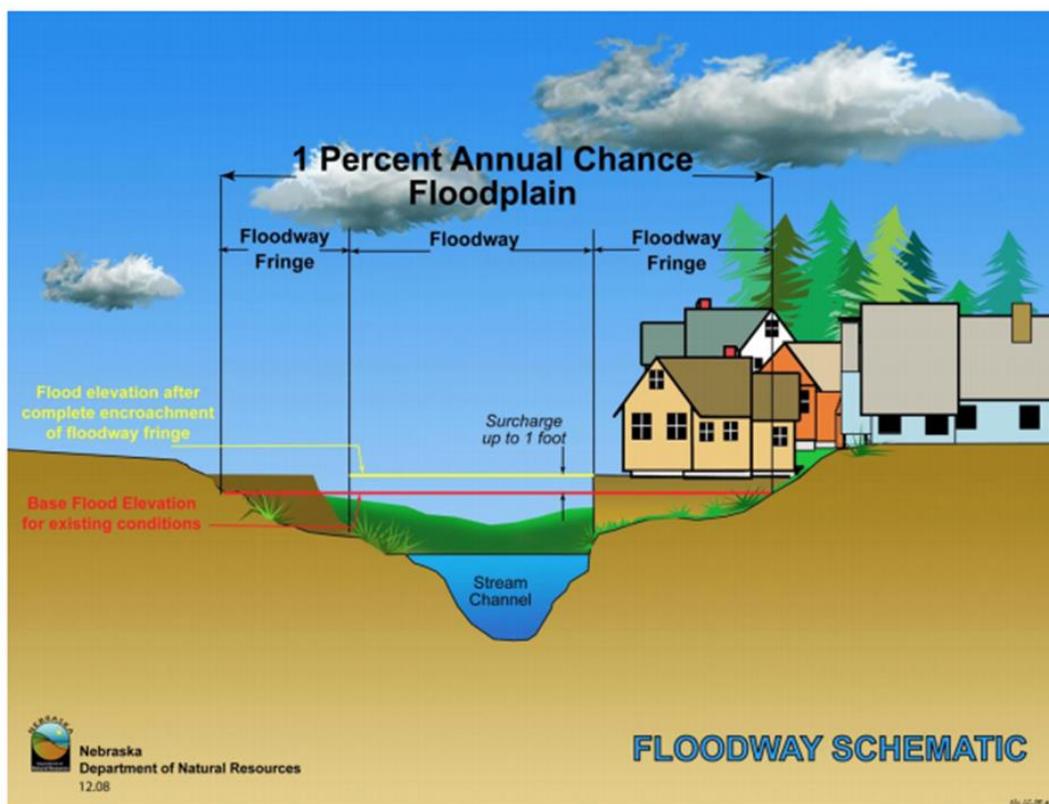


Figure 2-8: Schematic of 100-year Floodplain. The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe.

(Source: Nebraska Department of Natural Resources)

A SFHA is the land area covered by the floodwaters of the base flood (red line in *Figure 2-8*), 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 usually are 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 East Carroll Parish are provided in the table below:

Table 2-15: Repetitive Loss Structures for East Carroll Parish.

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
East Carroll Parish (Unincorporated)	8	5	3	0	23	259,424	\$11,279
Lake Providence	5	4	1	0	12	\$345,519	\$28,793
Total	13	9	4	0	35	\$604,943	\$17,284

All 13 repetitive loss structure were geocoded in order to provide an overview of where the repetitive loss structure was located. Figure 2-9 shows the approximate location of the structure, while Figure 2-10 shows where the highest concentration of repetitive loss structures is located. Through the repetitive loss map, it is clear the primary concentrated area of repetitive loss structures is focused in and around the incorporated area of Lake Providence.

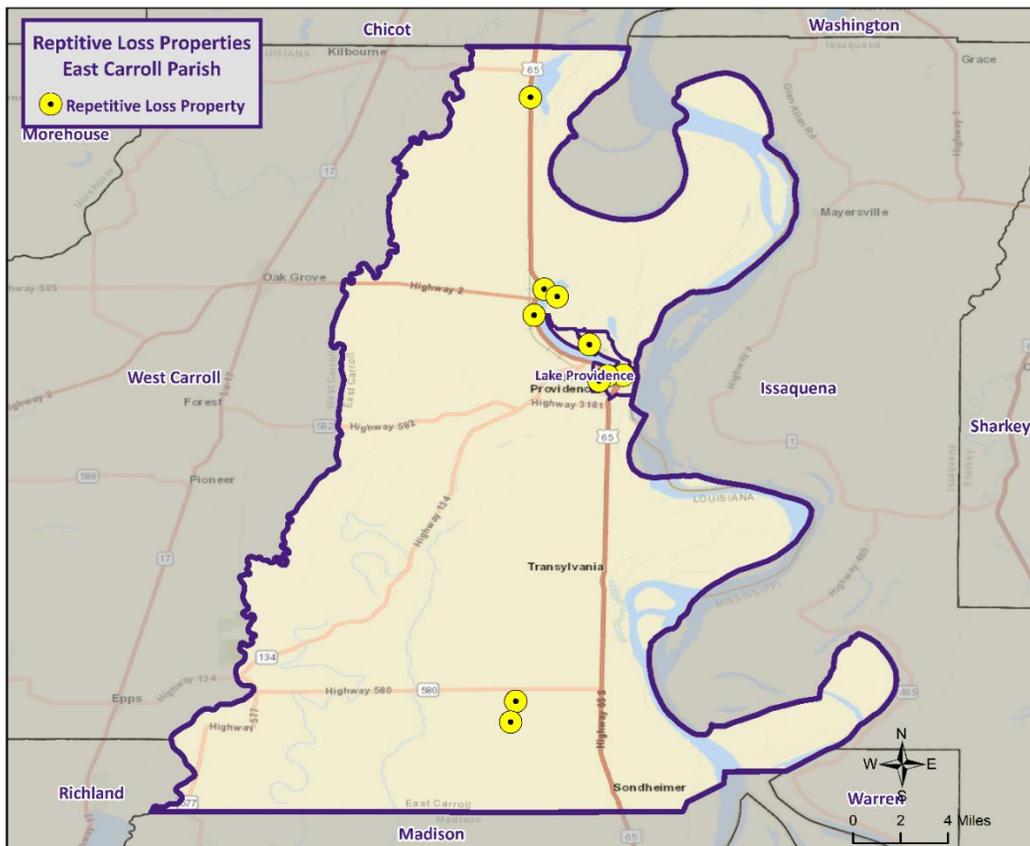


Figure 2-9: Repetitive Loss Properties in East Carroll Parish.

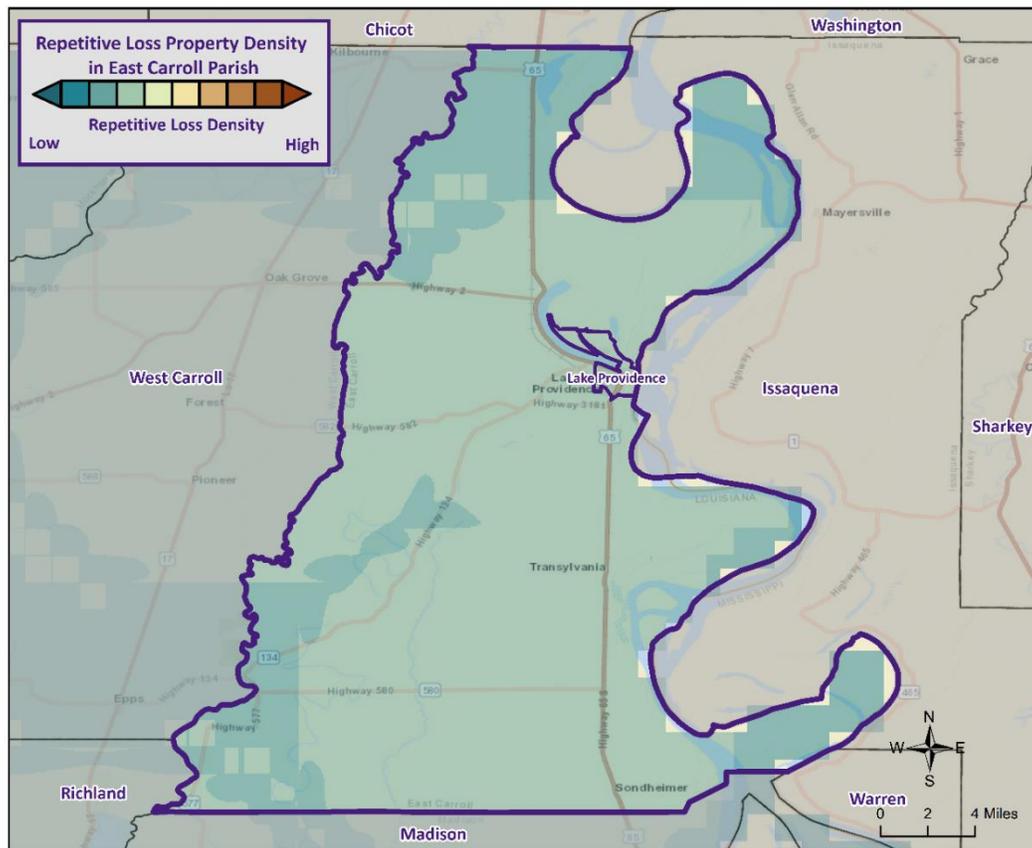


Figure 2-10: Repetitive Loss Property Densities in East Carroll Parish.

National Flood Insurance Program

Flood insurance statistics indicate that East Carroll Parish has 136 flood insurance policies with the NFIP, with total annual premiums of \$108,974. East Carroll Parish and the jurisdiction of Lake Providence are all participants in the NFIP. East Carroll Parish and its jurisdiction 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 East Carroll Parish and its jurisdiction is provided in the tables to follow.

Table 2-16: Summary of NFIP Policies for East Carroll Parish.

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	Insurance Claims Filed Since 1978	Total Loss Payments
East Carroll Parish	88	\$23,404,600	\$64,590	69	\$1,633,507
Lake Providence	48	\$15,009,500	\$44,384	21	\$329,076
Total	136	\$38,414,100	\$108,974	90	\$1,962,583

Table 2-17: Summary of Community Flood Maps for East Carroll Parish.

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Date Joined the NFIP	Tribal
220062	East Carroll Parish	8/2/1977	11/15/1985	11/15/1985 (M)	11/15/1985	No
220063#	Lake Providence	3/29/1974	10/16/1979	10/16/79 (M)	10/16/1979	No

According to the Community Rating System (CRS) list of eligible communities dated April 1, 2022, neither East Carroll Parish nor the incorporated area of Lake Providence participate in the CRS program.

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 floods 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 East Carroll 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 East Carroll Parish experiences.

Flash Floods: Flash floods are characterized by a rapid rise in water level, high velocity, and large amounts of debris. They are 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, by definition, is river-based. Most of the riverine flooding problems occur when rivers crest at flood stage levels, causing extensive flooding in low-lying areas.

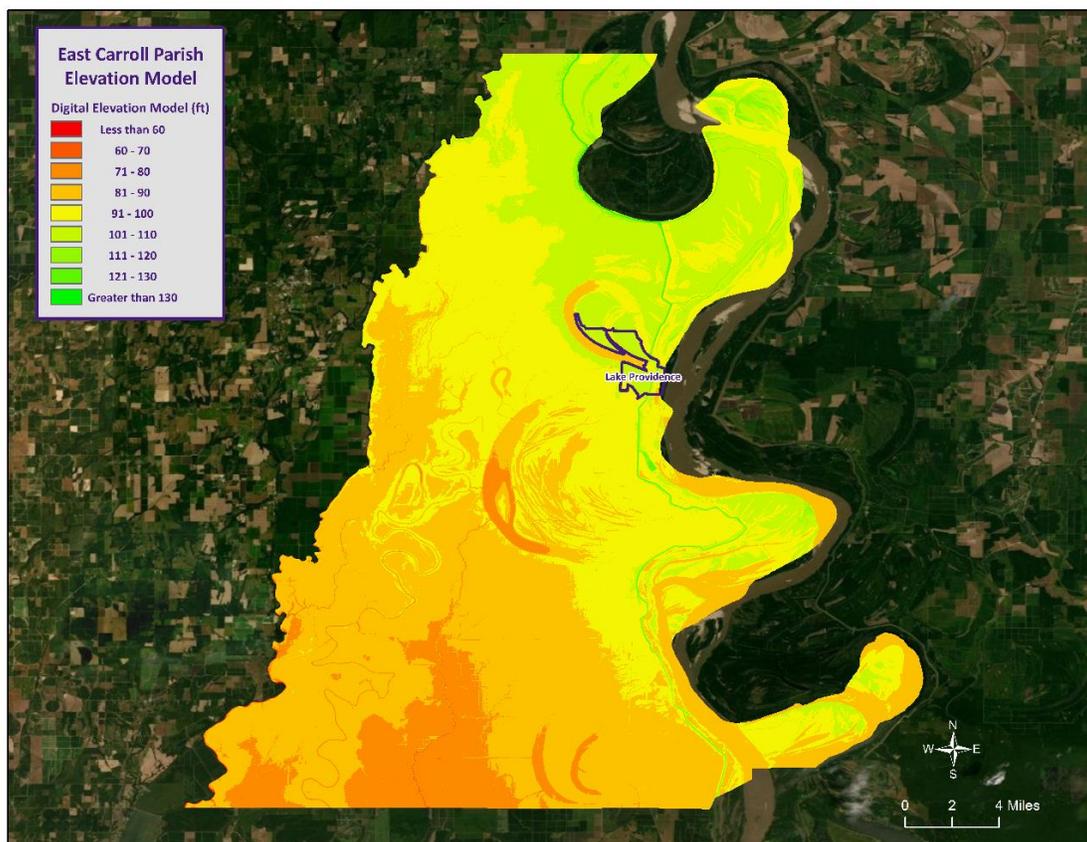


Figure 2-11: Elevation throughout East Carroll Parish.

The digital elevation model (DEM) in the figure below for East Carroll 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 60 feet (NAVD88) to approximately 130 feet (NAVD88). The highest elevations in the parish are approximately 130 feet (NAVD88), located in the unincorporated areas of the parish. The incorporated area of Lake Providence has an average elevation of approximately 105 feet (NAVD88).

Location

East Carroll Parish has experienced significant flooding in its history and can expect more in the future. East Carroll Parish and the incorporated area of Lake Providence are located in low-lying areas and the flat region of northeastern Louisiana. In addition, the parish and incorporated area of Lake Providence lie entirely within the Ouachita-Black River drainage basin, which drains approximately 8,000 square miles in north Louisiana.

Based on previous flood events, 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 five feet can be expected in the unincorporated areas of the parish and the incorporated area of Lake Providence can expect flood depths from three to five feet.

The following is a flood zone map displaying flood zones from Hazus for East Carroll Parish and Lake Providence:

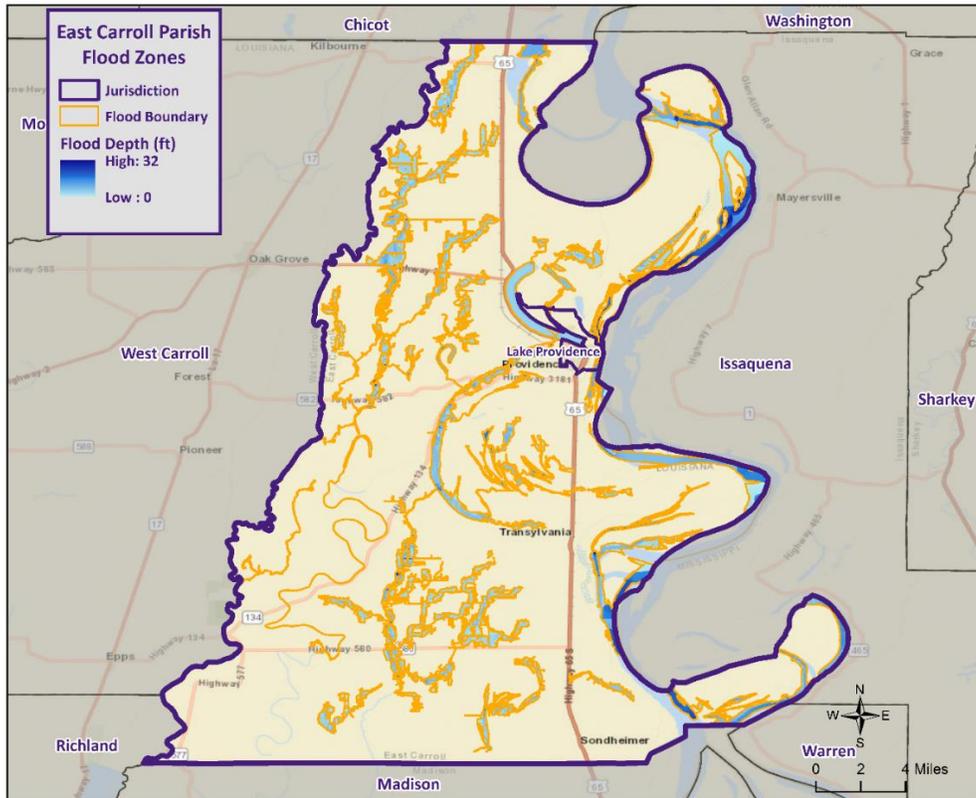


Figure 2-12: East Carroll Parish Areas within the Flood Zones.

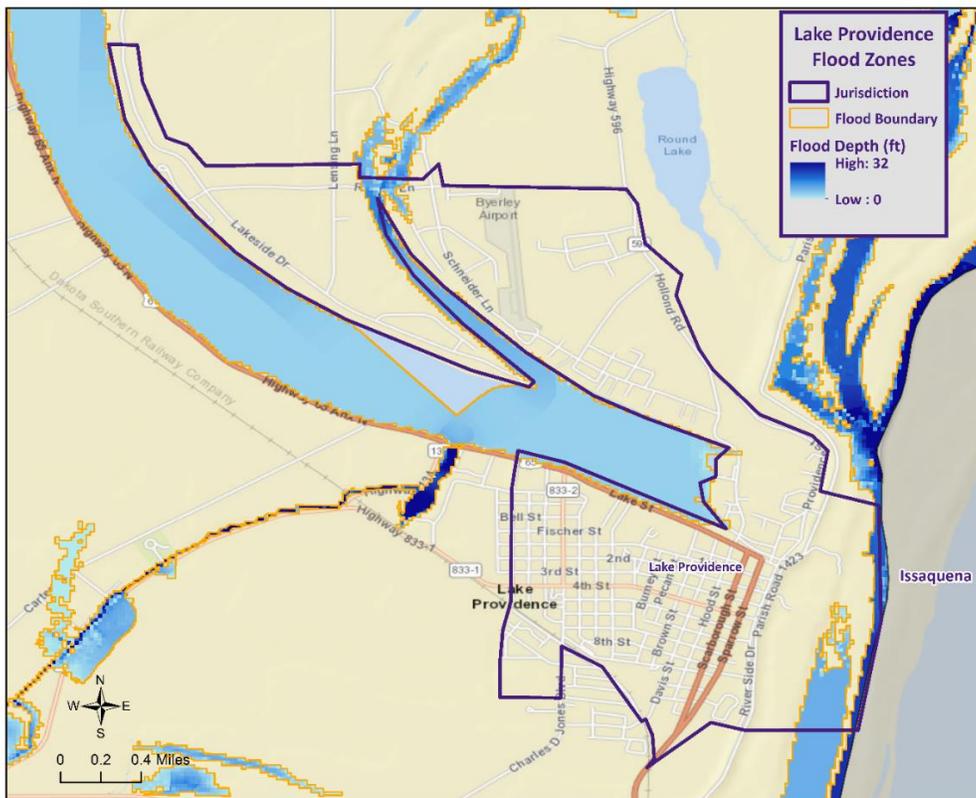


Figure 2-13: Lake Providence Areas within the Flood Zones.

Previous Occurrences / Extents

Historically, there have been 32 flooding events that have caused significant flooding in East Carroll Parish and its jurisdictions between 1990 and 2021. Below is a brief synopsis of the flooding events which occurred since the last East Carroll Parish HMP Update in 2016.

Table 2-18: Historical Floods in East Carroll Parish with Locations since the 2016 East Carroll Parish HMP Update.

Date	Extents	Type of Flooding	Estimated Damages	Location
January 14, 2020	Multiple locations along 2nd Street were flooded and water entered a home on Brown Street.	Flash Flood	\$10,000	Lake Providence
January 14, 2020	Several roads were flooded in and around the Lake Providence area.	Flash Flood	\$2,000	Bowie
February 10, 2020	Part of Highway 3181 was flooded. Some homes in the area were also threatened by flooding.	Flash Flood	\$8,000	Lake Providence
June 10, 2021	Several roads were flooded in and around the Lake Providence area.	Flash Flood	\$5,000	Lake Providence
June 10, 2021	A portion of US Highway 65 between Shelburn and Panola was flooded due to runoff from earlier heavy rainfall.	Flood	\$5,000	Shelburn

Frequency / Probability

The NCEI Storm Events Database identified 32 flooding events within the East Carroll Parish planning area since 1990. The table below shows the probability and return frequency for each jurisdiction.

Table 2-19: Annual Flood Probabilities for East Carroll Parish.

Jurisdiction	Annual Probability	Return Frequency
East Carroll Parish (Unincorporated)	100%	1 event every year
Lake Providence	100%	1 event every year

Based on historical record, the overall flooding probability for the entire East Carroll Parish Planning area is 100%, with 32 events having occurred over a 31-year period.

Estimated Potential Losses

Using the Hazus Flood Model, the 100-year flood scenario, along with the Parish DFIRM, was analyzed to determine losses from this worst-case scenario. On the next page, *Table 2-20* shows the total economic losses that would result from this occurrence.

Table 2-20: Estimated Losses in East Carroll Parish from a 100-year Flood Event.
(Source: Hazus)

Jurisdiction	Estimated Total Losses from 100-Year Flood Event
East Carroll Parish (Unincorporated Area)	\$3,674,000
Lake Providence	\$1,324,000
Total	\$4,998,000

The Hazus Flood model also provides a breakdown for seven primary sectors (Hazus occupancy) throughout the parish. The losses for East Carroll Parish by sector are listed in the following tables:

Table 2-21: Estimated 100-year Flood Losses for East Carroll Parish by Sector.
(Source: Hazus)

East Carroll Parish (Unincorporated)	Estimated Total Losses from 100-Year Flood Event
Agricultural	\$250,000
Commercial	\$1,079,000
Government	\$242,000
Industrial	\$249,000
Religious / Non-Profit	\$680,000
Residential	\$1,174,000
Schools	\$0
Total	\$3,674,000

Table 2-22: Estimated 100-year Flood Losses for Lake Providence by Sector.
(Source: Hazus)

Lake Providence	Estimated Total Losses from 100-Year Flood Event
Agricultural	\$34,000
Commercial	\$161,000
Government	\$61,000
Industrial	\$17,000
Religious / Non-Profit	\$879,000
Residential	\$172,000
Schools	\$0
Total	\$1,324,000

Threat to People

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

*Table 2-23: Vulnerable Populations Susceptible to a 100-year Flood Event.
(Source: Hazus)*

Number of People Exposed to Flood Hazards			
Location	# in Community	# in Hazard Area	% in Hazard Area
East Carroll Parish (Unincorporated)	3,768	1,790	47.5%
Lake Providence	3,991	178	4.5%
Total	7,759	1,968	25.4%

The Hazus flood model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions in the following table:

*Table 2-24: Vulnerable Populations Susceptible to a 100-year Flood Event in East Carroll Parish.
(Source: Hazus)*

East Carroll Parish (Unincorporated)		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,790	47.5%
Persons Under 5 Years	131	7.3%
Persons Under 18 Years	460	25.7%
Persons 65 Years and Over	224	12.5%
White	542	30.3%
Minority	1,248	69.7%

*Table 2-25: Vulnerable Populations Susceptible to a 100-year Flood Event in Lake Providence.
(Source: Hazus)*

Lake Providence		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	178	4.5%
Persons Under 5 Years	18	9.9%
Persons Under 18 Years	42	23.6%
Persons 65 Years and Over	22	12.5%
White	30	16.8%
Minority	148	83.2%

Vulnerability

See *Appendix C: Critical Facilities* for parish and municipality buildings that are susceptible to flooding due to proximity within the 100-year flood plain.

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 mi² 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 mi² 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.

The Mississippi River levee system is constantly monitored during high water events by federal, state, and parish officials. Any potential failure of the Mississippi River levee would be observed long before a failure took place. Once observed, it would be mitigated to prevent any failure in the levee. As a slowly developing hazard, there is significant lead time to warn and evacuate the population in the event of a potential failure. The more likely scenario involving a potential level failure would be an overtopping event for a major precipitation event taking place during a tropical cyclone, similar to Tropical Storm Allison in 2001. An event of this nature is less likely to produce an early warning and most likely to subject more people to flooding,

Location

Levees play a vital role in protecting East Carroll Parish from flooding, particularly floods caused by tropical cyclones. Several areas in the eastern portion of the parish are protected by levees. There are currently two levee alignments that exist within the parish:

- AR-LA Mississippi River
- Wilson Point System

These levees are tested anytime a high water event such as a tropical cyclone or heavy rain storm occurs. The levees located in East Carroll Parish are shown in the following figures:

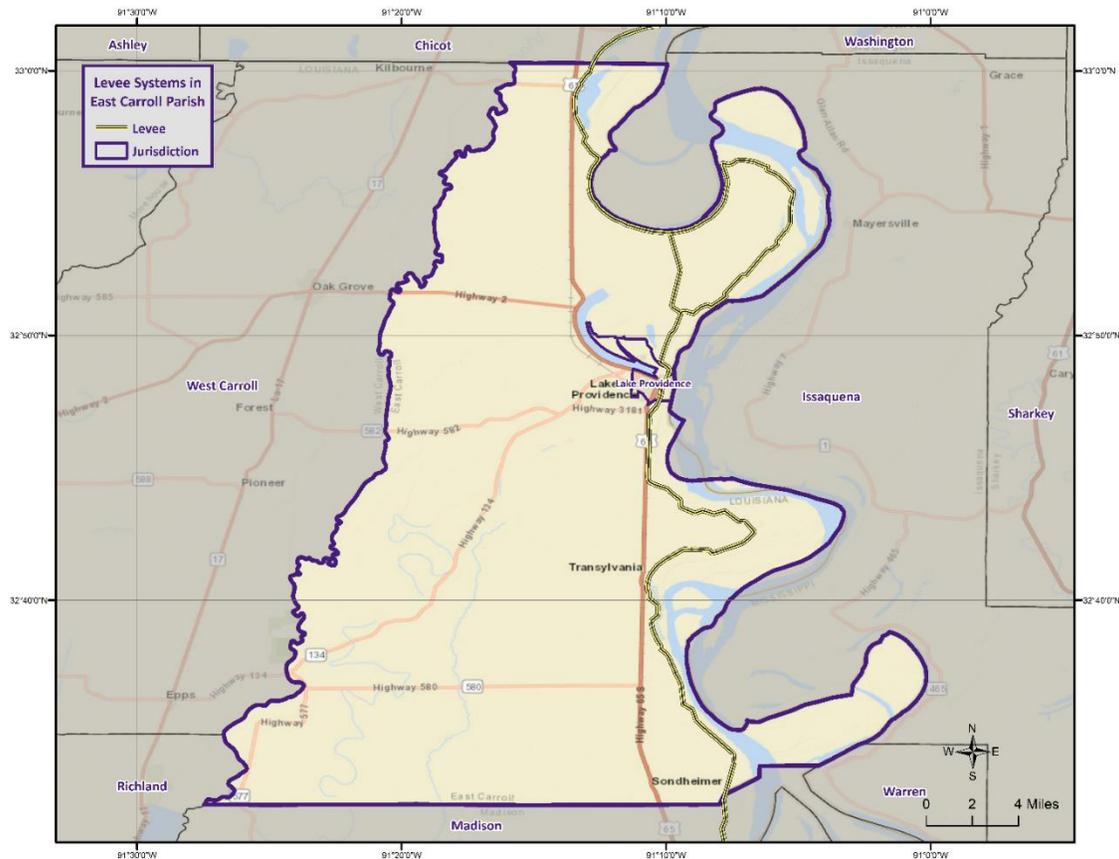


Figure 2-14: Levee Systems in East Carroll Parish.

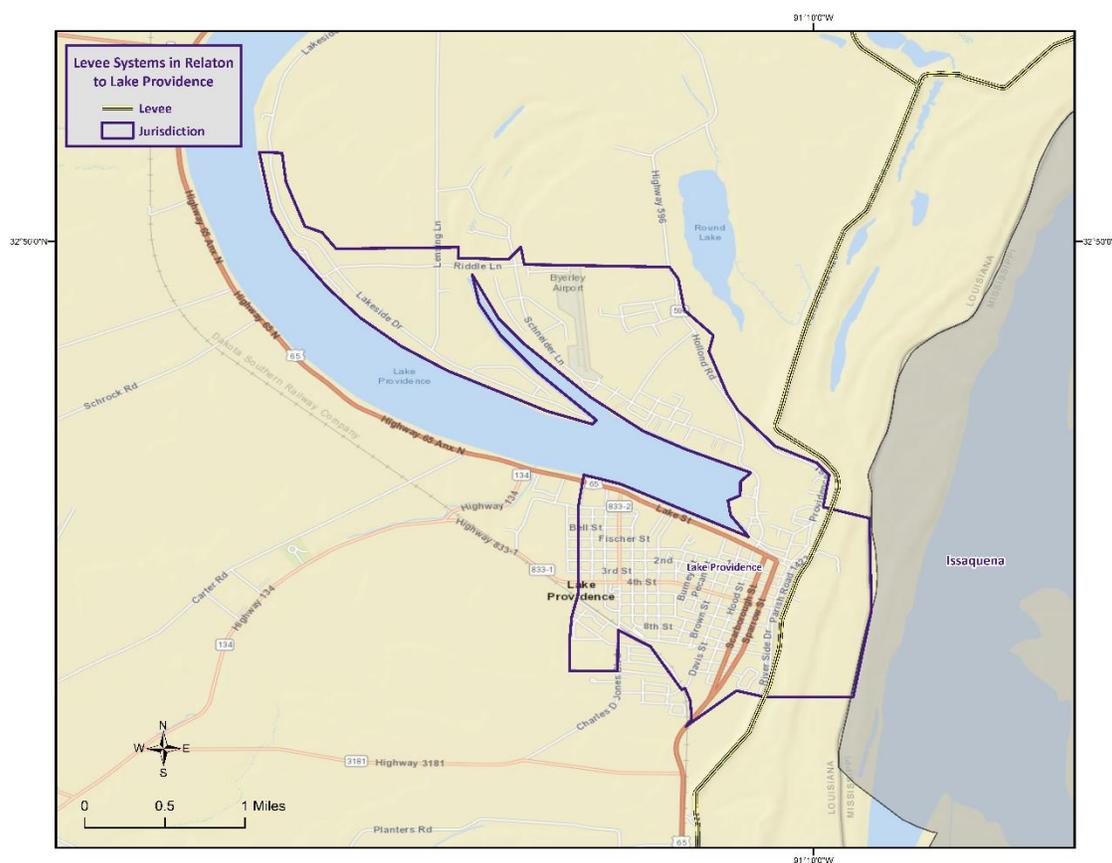


Figure 2-15: Levee Systems in Lake Providence.

Previous Occurrences / Extents

The NCEI Storm Events Database does not record anthropogenic disasters such as levee failures; therefore, it was necessary to rely on local knowledge and media reports. Since the 2016 HMP Update, there have been no flooding events due to levee failure in East Carroll Parish. The entire eastern portion of the parish along the Mississippi River, including the Town of Lake Providence, could potentially be impacted by a levee failure event depending on the location of the failure. However, the specific extent and impact is unknown due to a data deficiency.

Frequency / Probability

It is nearly impossible to predict and model levee failure and its impacts on East Carroll Parish. Due to the unpredictability of levee failures, it is calculated that the probability of a levee failure is less than 1% annually for the unincorporated areas East Carroll Parish and the incorporated area of Lake Providence.

Estimated Potential Losses

Determining the annualized loss as a result of levee failure is difficult in East Carroll Parish due to availability of data on past levee failure events. The National Levee Database (NLD) was utilized to determine the levee systems within East Carroll Parish, the risk level, and populace/infrastructure at risk. The NLD is a congressional authorized database that documents levees in the United States and is maintained by the U.S. Army Corps of Engineers (USACE). The following table provides an extensive list of the levee systems in East Carroll Parish with the risk associated with each system.

Table 2-26: Levee Systems and Risk Associated with each System in East Carroll Parish and Surrounding Parishes.

(Source: National Levee Database)

System	Length (Miles)	People at Risk	Structures at Risk	Property Value at Risk	Overall Risk
AR-LA Mississippi River	359.64	227,280	110,450	\$20.9B	Moderate
Wilson Point System	15.11	12	13	\$645,000	Not Screened

Vulnerability

See *Appendix C: Critical Facilities* for parish and municipality building exposure to levee failures.

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 and therefore 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, multicell, 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 multicell 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, and warming 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) have the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued 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 counties (parishes).

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

- Hail of 1 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 develops in the upper atmosphere initially as ice crystals that are bounced about by high-velocity updraft winds. The ice crystals grow through deposition of water vapor onto their surface, fall partially to a level in the cloud where the temperature exceeds the freezing point, melt partially, get caught in another updraft whereupon re-freezing and deposition grows another concentric layer of ice, and fall after developing enough weight, sometimes after several trips up and down the cloud. The size of hailstones varies depending on the severity and size of the thunderstorm. Higher surface temperatures generally mean stronger updrafts, which allows more massive hailstones to be supported by updrafts, leaving them suspended longer. This longer time means larger hailstone sizes. The following tables display the TORRO Hailstorm Intensity Scale along with a spectrum of hailstone diameters and their everyday equivalents.

Table 2-27: 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 2-28: 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 homes and other 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 *Table 2-29*.

Table 2-29: 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.

Table 2-30 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 2-30: 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	
12	74+	Hurricane	

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 2-31: 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

Hailstorms are a meteorological phenomenon that can occur anywhere. Therefore, the entire planning area for East Carroll Parish and its jurisdictions are equally at risk for hailstorms. The worst-case scenario for hailstorms is hail up to a 2.75" diameter.

Previous Occurrences / Extents

Historically, there have been 53 hail incidents in East Carroll Parish. Hailstorm diameters have ranged from 0.75 inches to 2.75 inches per the National Climatic Data Center since 1990. The most frequently recorded hail sizes have been 0.75-inch in diameter. There have been five significant hailstorm events in East Carroll Parish since the 2016 East Carroll Parish HMP update. The table on the next page contains a brief synopsis of those events.

Table 2-32: Previous Occurrences for Hailstorm Events since the 2016 Hazard Mitigation Plan Update.
(Source: NCEI Storm Events Database)

Date	Hail Size (inches)	Property Damage	Crop Damage
November 3, 2017	1.5	\$10,000	\$0
March 28, 2018	1.75	\$20,000	\$0
March 28, 2018	1.75	\$40,000	\$0
June 3, 2020	1	\$0	\$0
March 16, 2021	1	\$3,000	\$0

Frequency

Hailstorms occur frequently within East Carroll Parish with an annual chance of occurrence calculated at 100% based on the records for the past 31 years (1990 – 2021). *Figure 2-16* displays the density of hailstorm events in East Carroll Parish, while *Figure 2-17* provides an overview of hailstorm size based on location.

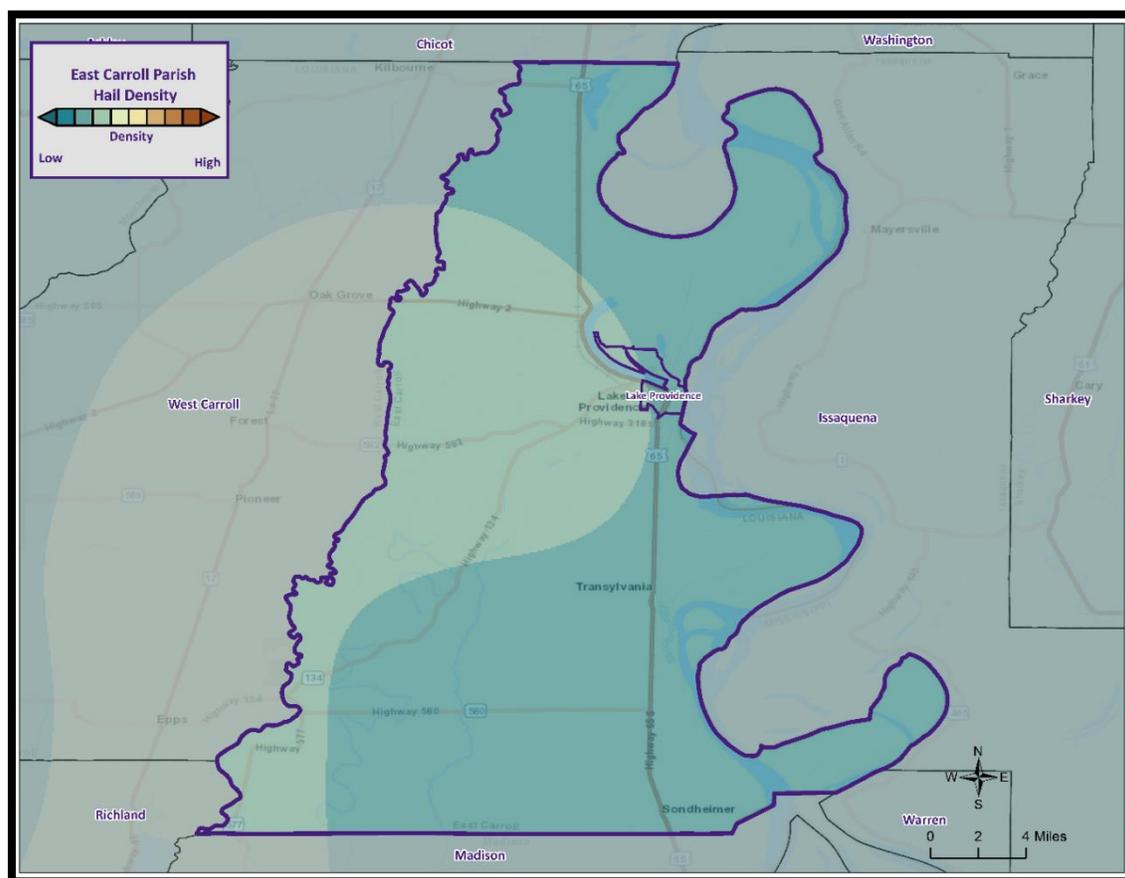


Figure 2-16: Density of Hailstorms by Diameter from 1950-2020.

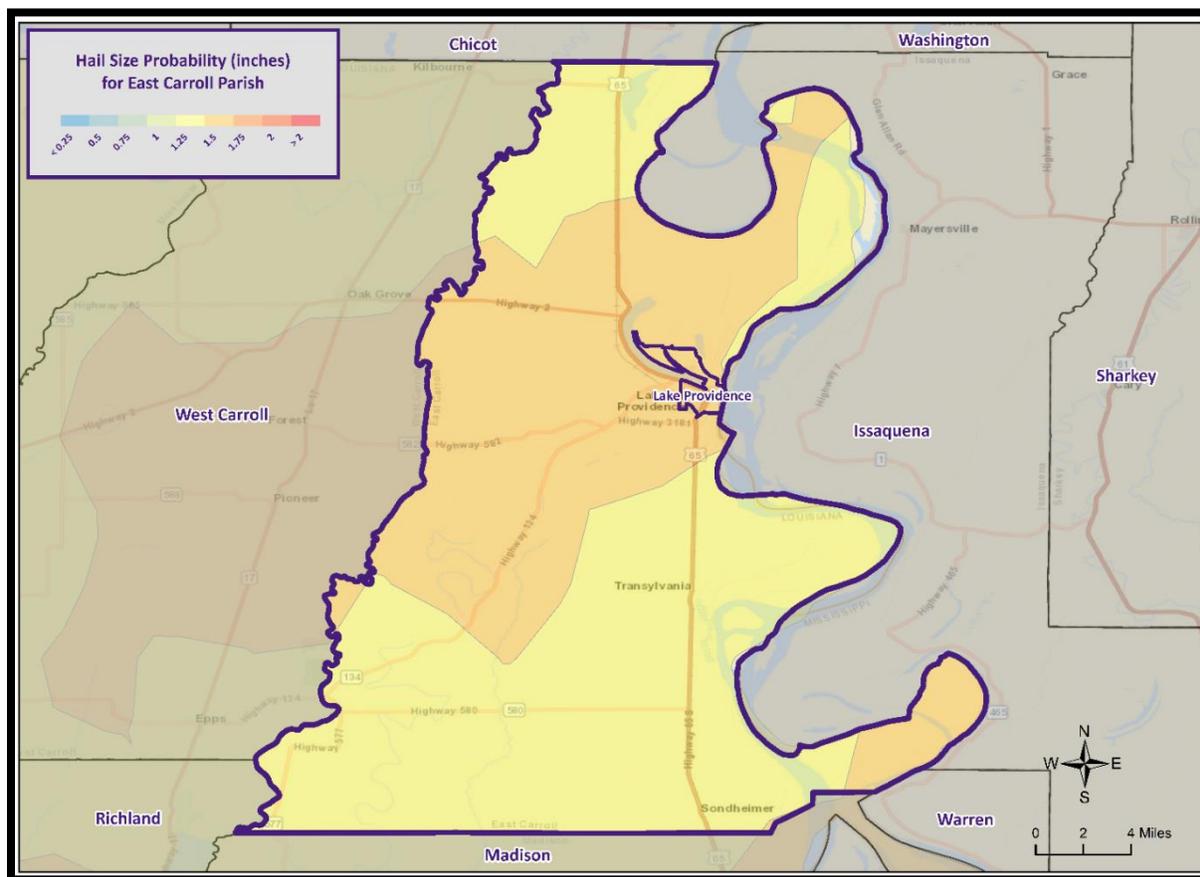


Figure 2-17: Hail Size Probability in Inches for East Carroll Parish.

Estimated Potential Losses

Since 1990, there have been 53 significant hail events that have resulted in property damages according to NCEI Storm Events Database. The total property damages associated with those storms have totaled approximately \$264,000. To estimate the potential losses of a hailstorm 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 the NCEI Storm Events Database (1990 – 2021). This provides an annual estimated potential loss of \$8,800 and \$5,077 per event. The following table provides an estimate of potential property losses for East Carroll Parish:

Table 2-33: Estimated Annual Losses East Carroll Parish and its Jurisdictions Resulting from Hailstorms.

Estimated Potential Annual Losses from Hailstorms	
Unincorporated Area	Lake Providence
\$4,274	\$4,526

There have been no reported injuries or fatalities as a result of a hail events over the 31-year record.

Vulnerability

See *Appendix C: Critical Facilities* for parish and municipality buildings that are susceptible to hailstorms.

High Winds

Location

Because high winds are a meteorological phenomenon that can occur anywhere, the entire planning area for East Carroll Parish is equally at risk from high winds. The worst-case scenario for thunderstorm high wind is wind speeds of approximately 81 mph.

Previous Occurrences / Extents

Historically, there have been 122 thunderstorm high wind events in East Carroll Parish. The high wind events ranged in windspeeds between 46 mph and 81 mph per the National Climatic Data Center since 1990. There have been 22 high wind speed events which impacted the East Carroll Parish Planning area since the 2016 East Carroll Parish HMP update. Below is a brief synopsis of those events.

Table 2-34: Previous Occurrences for Thunderstorm High Wind Events since the 2016 Hazard Mitigation Plan Update.

(Source: NCEI Storm Events Database)

Date	Wind Speed (mph)	Property Damage	Crop Damage
March 27, 2017	58	\$5,000	\$0
March 29, 2017	58	\$4,000	\$0
April 2, 2017	58	\$18,000	\$0
May 21, 2017	58	\$15,000	\$0
March 28, 2018	63	\$30,000	\$0
April 3, 2018	63	\$35,000	\$0
April 3, 2018	60	\$75,000	\$0
April 14, 2018	67	\$7,000	\$0
November 1, 2018	55	\$50,000	\$0
April 13, 2019	60	\$20,000	\$0
April 13, 2019	63	\$15,000	\$0
April 13, 2019	61	\$15,000	\$0
June 24, 2019	63	\$60,000	\$0
June 3, 2020	60	\$4,000	\$0
June 5, 2020	58	\$5,000	\$0
July 31, 2020	58	\$3,000	\$0
March 16, 2021	58	\$3,000	\$0
April 9, 2021	58	\$5,000	\$0
May 4, 2021	58	\$12,000	\$0
May 4, 2021	58	\$5,000	\$0
May 4, 2021	58	\$2,000	\$0
June 8, 2021	75	\$50,000	\$0

Frequency

High winds are a fairly common occurrence within East Carroll Parish and its jurisdictions with an annual chance of occurrence calculated at 100% based on the records for the past 31 years (1990 – 2021). On the next page, *Figure 2-18* displays the thunderstorm wind speed probability for East Carroll Parish and its jurisdictions.

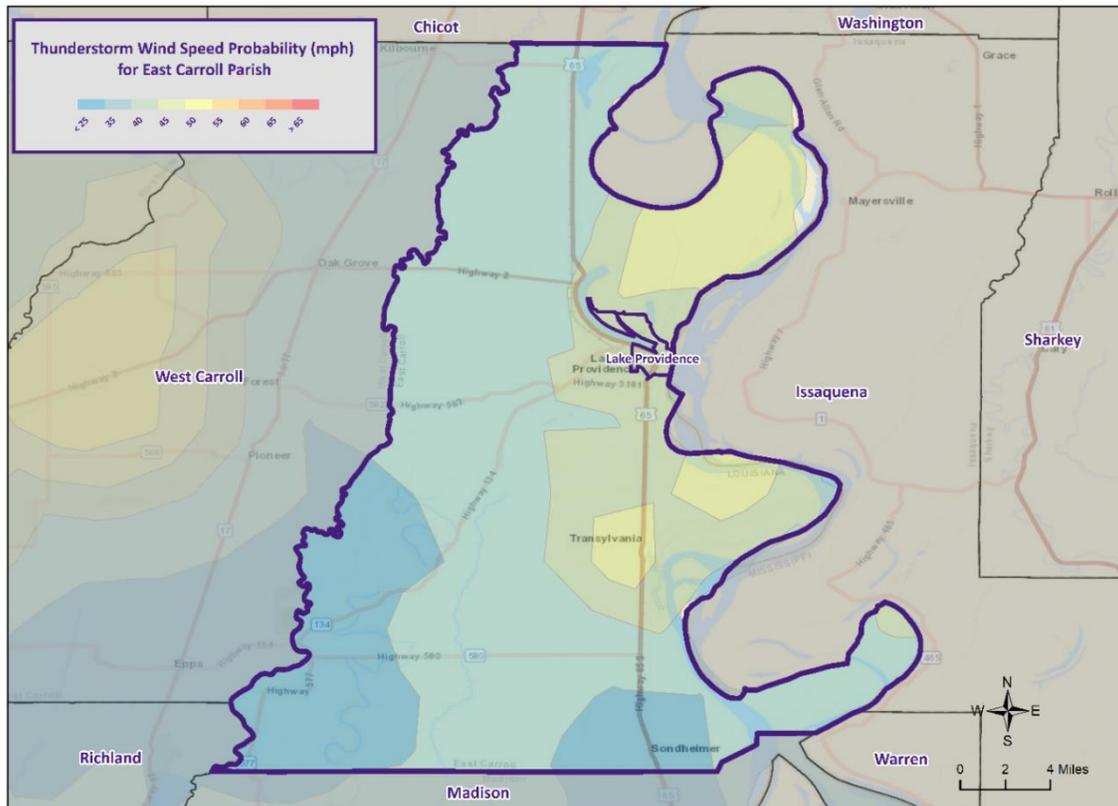


Figure 2-18: Thunderstorm High Wind Speed Probability in Miles Per Hour for East Carroll Parish.

Estimated Potential Losses

Since 1990, there have been 122 significant wind events that have resulted in property damages according to NCEI Storm Events Database. The total property damage associated with these storms totaled approximately \$701,586,000. To estimate the potential losses of a wind event on an annual basis, the total damages recorded for wind events were divided by the total number of years of available wind data in the NCEI Storm Events Database (1990 – 2021). This provides an annual estimated potential loss of \$23,386,200 and \$6,048,155 per event. The following table provides an estimate of potential property losses for East Carroll Parish:

Table 2-35: Estimated Annual Property Losses in East Carroll Parish resulting from Wind Damage.

Estimated Potential Annual Losses from High Winds	
Unincorporated Area	Lake Providence
\$11,357,031	\$12,029,169

There have been three injuries and no fatalities as a result of a thunderstorm high wind event over the 31-year record.

Vulnerability

See *Appendix C: Critical Facilities* for parish and municipality buildings that are susceptible to thunderstorm high winds.

Lightning

Location

Like hail and high winds, lightning is a meteorological phenomenon that can occur anywhere within the East Carroll Parish planning area. The worst-case scenario for lightning events is a lightning activity level of 4 which is approximately 16 to 25 lightning strikes every 15 minutes.

Previous Occurrences / Extent

Historically, there have been two lightning events in East Carroll Parish and its jurisdictions between the years 1990 and 2021. Since the last HMP update, there have been no significant lightning events within the boundaries of East Carroll Parish.

Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in East Carroll Parish is high. However, lightning that meets the definition that is used by the NCEI Storm Events Database that results in damages to property and injury or death to people is a less likely event. East Carroll Parish experienced two significant lightning events between the years 1990 and 2021 resulting in a 7% annual chance of occurrence.

Estimated Potential Losses

Since 1990, there have been two significant lightning events that have resulted in property damages according to NCEI Storm Events Database. The total property damages associated with these storms have totaled approximately \$250,000. 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 lightning data in the NCEI Storm Events Database (1990 – 2021). This provides an annual estimated potential loss of \$8,333 and \$10,000 per event. The following table provides an estimate of potential property losses for East Carroll Parish:

Table 2-36: Estimated Annual Property Losses in East Carroll Parish resulting from Lightning Damage.

Estimated Potential Annual Losses from Lightning	
Unincorporated Area	Lake Providence
\$4,047	\$4,286

Per the NCEI Storm Events Database, there have been no fatalities or injuries as a result of lightning in East Carroll Parish.

Vulnerability

See *Appendix C: Critical Facilities* for parish and municipality building exposure to lightning hazards.

Tornadoes

Tornadoes (also called twisters and 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, which usually occurs in a counterclockwise direction 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 2-37* 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 2-37: 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 2-38: 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 off 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 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 Doppler 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 on 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 missiles 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 East Carroll Parish with actual locations, tornadoes in general are a climatological based hazard and have the same approximate probability of occurring in East Carroll Parish as all of its jurisdictions. Because a tornado has a similar probability of striking anywhere within the planning area for East Carroll Parish, all areas in the parish are equally at risk for tornadoes.

Previous Occurrences / Extent

The NCEI Storm Events Database reports a total of 10 tornadoes or waterspouts occurring within the boundaries of East Carroll Parish since 1990 ranging in extent from F0 to F2 under the Fujita Scale and EF0 to EF2 on the Enhanced Fujita Scale. East Carroll Parish can expect future tornadoes up to an EF2 under the Enhanced Fujita Scale as a worst-case scenario.

The most destructive tornado to impact East Carroll Parish was a F2 tornado which occurred on November 19, 1991. The tornado destroyed two homes, a car dealership, and caused heavy damage to a state highway maintenance yard just across the street from the new car dealership. Since the 2016 HMP Update, one tornado has occurred within the boundaries of East Carroll Parish. The table on the next page contains a list of the events and a brief description of their respective impacts.

Table 2-39: Historical Tornadoes in East Carroll Parish with Locations since the 2016 Update.

Date	Impacts	Property Damage	Location	Magnitude
April 12, 2020	1.16 mile path with a width of 170 yards. This weak tornado started on the south side of Lake Providence and moved north-northeast through the middle of the city. Tree damage was minor and sporadic. Several buildings near City Hall were damaged with minor roof damage and some bricks fell from an exterior wall. The tornado lifted just after cross the levee by the city dump. Maximum estimated winds were 85 mph.	\$300,000	AIMWELL	EF2

Frequency / Probability

Tornadoes occur frequently within East Carroll Parish and its jurisdictions with an annual chance of occurrence calculated at 33% based on the records for the past 31 years (1990 – 2021). *Figure 2-19* displays the density of tornado touchdowns in East Carroll Parish and neighboring parishes.

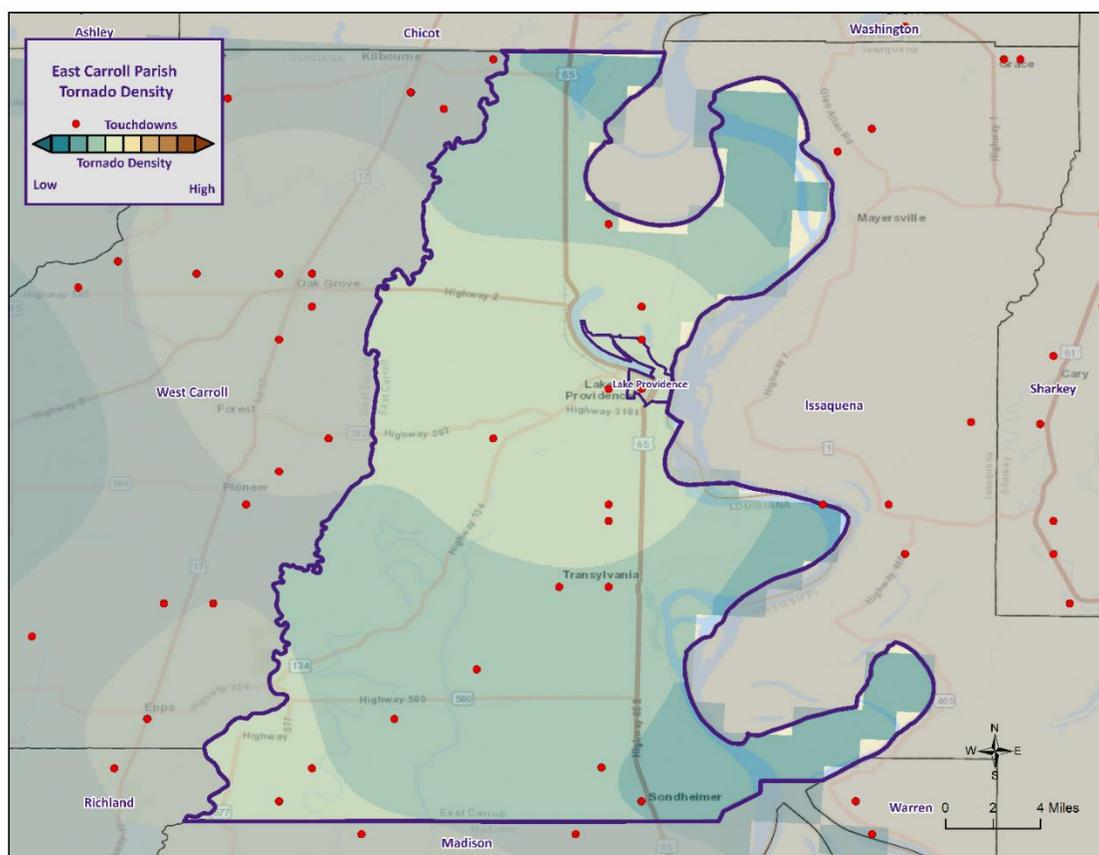


Figure 2-19: Location and Density of Tornadoes to Touchdown in East Carroll Parish. (Source: NOAA/SPC Severe Weather Database)

Estimated Potential Losses

According to the NCEI Storm Events Database, there have been 10 tornadoes that have caused some level of property damage. The total damage from the actual claims for property is approximately \$6,686,352 with an average cost of \$267,454 per tornado event. When annualizing the total cost over the 31-year record, total annual losses based on tornadoes are estimated to be \$267,454. The following table provides an annual estimate of potential losses for East Carroll Parish:

Table 2-40 Estimated Annual Losses for Tornadoes in East Carroll Parish.

Estimated Annual Losses for Tornadoes	
Unincorporated Area	Lake Providence
\$129,884	\$137,570

Table 2-41 presents an analysis of building exposure that are susceptible to tornadoes by general occupancy type for East Carroll Parish along with the percentage of building stock that are mobile homes.

*Table 2-41: Building Exposure by General Occupancy Type for Tornadoes in East Carroll Parish.
(Source: Hazus)*

Building Exposure by General Occupancy Type for Tornadoes (\$1,000)							
Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Mobile Homes (%)
623,339	164,332	12,239	22,708	70,666	26,756	23,866	10.7%

The parish has suffered through a total of 10 events in which tornadoes or waterspouts have accounted for 11 injuries and no fatalities during this 31-year period.

In accessing the overall risk to population, the most vulnerable population throughout the parish are those residing in manufacturing housing. Approximately 10.7% of all housing in East Carroll Parish consists of manufactured housing. The location and density of manufactured houses can be seen in *Figure 2-20* on the next page.

Tropical Cyclones

Tropical cyclones are among the worst hazards 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 2-42: 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 freshwater intrusions from storm surge send animals, such as snakes, into areas occupied by humans.

Location

Hurricanes are the single biggest threat to the state of Louisiana. With any single tropical cyclone event having the potential to devastate multiple parishes at once, tropical cyclones are a significant threat to the entire East Carroll Parish planning area. The worst-case scenario for a tropical cyclone event in East Carroll Parish is a Category 1 Hurricane.

Previous Occurrences / Extents

East Carroll Parish has experienced five major tropical cyclone events since 2002. The table on the next page provides a list of tropical cyclones which have impacted East Carroll Parish since 2002.

Table 2-43: Historical Tropical Cyclone Events in East Carroll Parish from 2002 – 2021.

Date	Name	Storm Type at Time of Impact
2005	Katrina	Hurricane
2005	Rita	Hurricane
2012	Isaac	Tropical Storm
2020	Laura	Tropical Storm
2020	Delta	Tropical Depression

Since the last East Carroll Parish HMP update in 2016, there have been two tropical cyclone events which have impacted the parish. Below is a brief description of each event and the impact they each had on East Carroll Parish.

Tropical Storm Laura (2020)

Laura began as a large tropical wave that emerged off the west coast of Africa on August 16th. The wave traversed the tropical Atlantic for the next several days with little additional organization. On August 19th, the system became better organized, closed off a low-level circulation, and subsequently the National Hurricane Center began issuing advisories on Tropical Depression Thirteen late that evening.

On the morning of August 21st, Tropical Depression Thirteen strengthened into Tropical Storm Laura, which was the earliest twelfth named Atlantic storm, beating the previous record of Hurricane Luis of 1995 by eight days. As Laura moved westward, little additional strengthening took place as the center moved over the northern Lesser Antilles later that evening, and south of Puerto Rico on August 22nd. Early on August 23rd, Tropical Storm Laura made landfall across Hispaniola, traversed the entire island, and made landfall across Eastern Cuba later that evening. Tropical Storm Laura continued west northwestward, traveling just south of the island with a second landfall across Western Cuba late on August 24th.

On August 25th, Laura entered the Gulf of Mexico and became a Category 1 hurricane at 10 AM CDT. Laura began to explosively intensify on August 26th, reaching category 2 by 1 AM CDT, category 3 by 7 AM CDT, and category 4 by 1 PM CDT. Laura reached a peak intensity of 150 mph (130 knots) and a minimum central pressure of 937 millibars (27.67 inches of mercury) by 8 PM CDT.

With little change in strength, Laura made landfall at Cameron, Louisiana around 1 AM CDT August 27th, with sustained winds of 150 mph (130 knots) and a minimum central pressure of 938 millibars (27.70 inches of mercury). Laura was the strongest hurricane to strike Southwest Louisiana since records began in 1851. Laura slowly weakened after landfall but maintained major hurricane status throughout its passage across Cameron, Calcasieu, and southern Beauregard Parishes, and category 2 status across northern Beauregard and Vernon parishes as daybreak approached on August 27th. Laura finally weakened below hurricane strength by Noon as it was crossing I-20 in North Louisiana. With this being the strongest hurricane to affect Southwest Louisiana, wind damage to buildings and trees was major to catastrophic across Cameron and Calcasieu parishes, with considerable damage across Beauregard and Vernon parishes where the core of the hurricane passed.

The National Weather Service in Lake Charles, Louisiana recorded a station record highest peak wind gust of 116 knots (133 mph) at 1:42 AM CDT before the Automated Surface Observing System (ASOS) wind equipment failed. However, the ASOS barometer sensor that was safely within the NWS building (which

received very little damage) recorded a station record minimum sea level pressure of 956 millibars (28.23 inches of mercury) at 2:20 AM CDT when the eye of Hurricane Laura passed nearly overhead.



Figure 2-21: Hurricane Laura in the Gulf Coast Area.

(Source: NOAA)

A total of 33 fatalities occurred throughout the state with four of them coming from falling trees. They included a 14-year-old girl in Vernon Parish, a 68-year-old man in Acadia Parish, a 51-year-old man in Jackson Parish, and a 64-year-old man in Allen Parish. Carbon monoxide poisoning from generators being inside homes, which is strongly discouraged, led to the deaths of twelve people in Calcasieu Parish and two people in Allen Parish. Another man died of drowning while aboard a sinking boat during the storm. Finally, one person died in Calcasieu Parish in a house fire, four people died in Calcasieu Parish, Natchitoches Parish, and Rapides Parish during the cleanup process, and eight others died in Beauregard Parish, Grant Parish, Rapides Parish, and Vernon Parish due to heat-related illnesses following the loss of electricity.

In East Carroll Parish, damage surveys observed sporadic to scattered tree damage throughout the parish with a few incidents of structural damage which was not caused by downed trees. Trees and powerlines were downed in the Lake Providence area.

Tropical Storm Delta (2020)

Hurricane Delta was the record-tying fourth named storm of 2020 to strike Louisiana, as well as the record-breaking tenth named storm to strike the United States in that year. The twenty-sixth tropical cyclone, twenty-fifth named storm, ninth hurricane, and third major hurricane of the record breaking 2020 Atlantic hurricane season, Delta formed from a tropical wave which was first monitored by the National Hurricane

Center on October 1. As it tracked across the western Caribbean, it rapidly intensified into a Category 4 hurricane. In fact, intensifying from tropical depression to Category strength in 40 hours is the fastest rate of intensification of any storm on record in the Atlantic Basin and accomplished by Delta. Delta quickly weakened to a category 1 hurricane after making its first landfall on the Yucatan Peninsula. It gradually recurved north towards the Louisiana coastline, fluctuating in intensity between category 2 and 3.

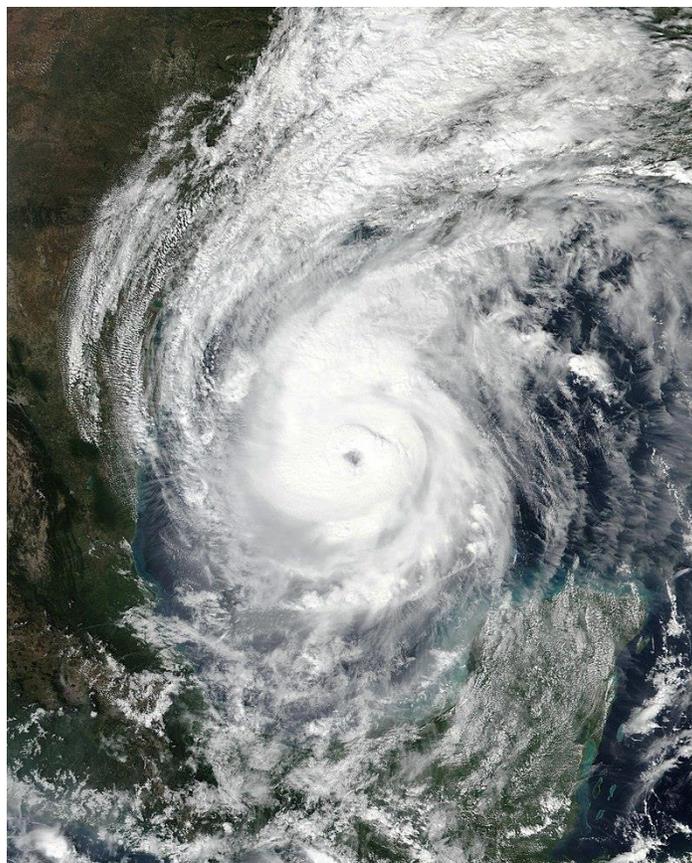


Figure 2-22: Hurricane Delta in the Gulf Coast Area.

(Source: NOAA)

Hurricane Delta made landfall around 5 pm as a category 2 storm east of Cameron, Louisiana or about 15 miles east of where category 4 Hurricane Laura made landfall just a couple of months earlier of the same year. Local impacts included 50 to 70 mph wind gusts across the area, storm surge of 2 to 3 feet above ground, and widespread tree and structural damage. There were six injuries due to Hurricane Delta. In addition, outer bands of Delta produced a significant amount of rainfall on the north side of Baton Rouge Metro. Upwards of five to 10 inches of rain fell, causing street flooding in Baton Rouge and moderate river flooding in the region. Delta caused approximately \$100 million worth of damage across southeast Louisiana.

In East Carroll Parish, scattered trees were blown down across the parish by tropical storm force winds, and some roads were blocked by fallen trees. One tree fell onto a home in the Lake Providence area.

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

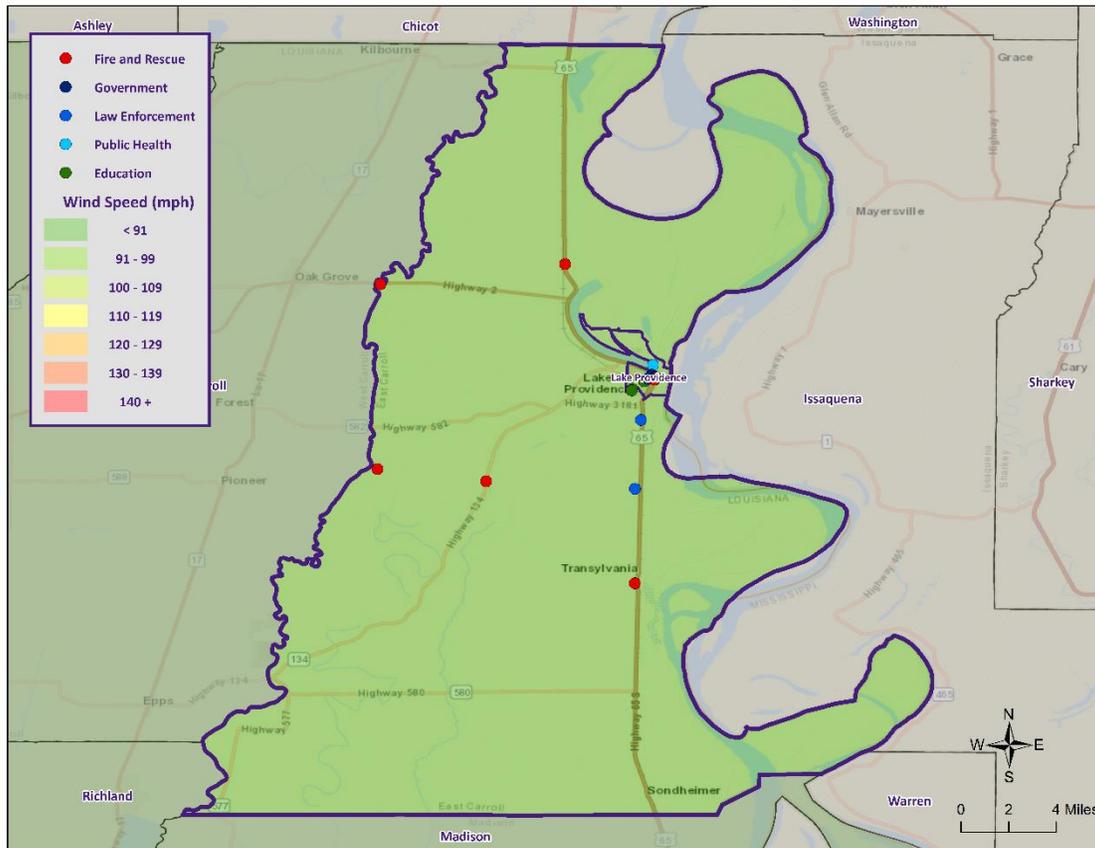


Figure 2-23: Winds Zones for East Carroll Parish in Relation to Critical Facilities

Frequency / Probability

Tropical cyclones are large natural hazard events that regularly impact East Carroll Parish. The annual chance of occurrence for a tropical cyclone is estimated at 26% for East Carroll Parish with five events occurring within 19 years (2002 to 2021). 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. Based on geographical location alone East Carroll Parish and its jurisdictions are highly vulnerable to tropical cyclones. This area has experienced several tropical cyclone events in the past and can expect more in the future.

Estimated Potential Losses

Using Hazus 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 2-44: Total Estimated Losses for a 100-Year Hurricane Event in East Carroll Parish
(Source: Hazus)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event
East Carroll Parish (Unincorporated)	\$184,818
Lake Providence	\$195,756
Total	\$380,573

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

Table 2-45: Ratio of Total Losses to Total Estimated Value of Assets for East Carroll Parish
(Source: Hazus)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event	Total Estimated Value of Assets	Ratio of Estimated Losses to Total Value
East Carroll Parish (Unincorporated)	\$184,818	\$526,773,000	< 0.1%
Lake Providence	\$195,756	\$417,133,000	< 0.1%

Based on the Hazus Hurricane Model, estimated total losses for East Carroll Parish and its jurisdiction was less than 0.1% of the total estimated value of all assets.

The Hazus Hurricane Model also provides a breakdown for seven primary sectors (Hazus occupancy) throughout the parish. The losses for East Carroll Parish and Lake Providence by sector are listed in the tables below.

Table 2-46: Estimated Losses in Unincorporated East Carroll Parish for a 100-Year Hurricane Event
(Source: Hazus)

East Carroll Parish (Unincorporated)	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$556
Commercial	\$3,944
Government	\$613
Industrial	\$252
Religious / Non-Profit	\$1,728
Residential	\$177,145
Schools	\$580
Total	\$184,818

Table 2-47: Estimated Losses in Lake Providence for a 100-Year Hurricane Event
(Source: Hazus)

Lake Providence	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$589
Commercial	\$4,178
Government	\$650
Industrial	\$266
Religious / Non-Profit	\$1,831
Residential	\$187,628
Schools	\$614
Total	\$195,756

Threat to People

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

Table 2-48: Number of People Susceptible to a 100-Year Hurricane Event in East Carroll Parish
(Source: Hazus)

Number of People Exposed to Hurricane Hazards			
Location	# in Community	# in Hazard Area	% in Hazard Area
East Carroll Parish (Unincorporated)	3,768	3,768	100%
Lake Providence	3,991	3,991	100%
Total	7,759	7,759	100%

The Hazus hurricane model was also extrapolated to provide an overview of vulnerable populations throughout East Carroll Parish. These populations are illustrated in the following tables:

Table 2-49: Vulnerable Populations in Unincorporated East Carroll Parish for a 100-Year Hurricane Event
(Source: Hazus)

East Carroll Parish (Unincorporated)		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	3,768	100.0%
Persons Under 5 Years	275	7.3%
Persons Under 18 Years	968	25.7%
Persons 65 Years and Over	471	12.5%
White	1,142	30.3%
Minority	2,626	69.7%

*Table 2-50: Vulnerable Populations in Lake Providence for a 100-Year Hurricane Event
(Source: Hazus)*

Lake Providence		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	3,991	100.0%
Persons Under 5 Years	393	9.9%
Persons Under 18 Years	943	23.6%
Persons 65 Years and Over	499	12.5%
White	669	16.8%
Minority	3,322	83.2%

Vulnerability

See *Appendix C: Critical Facilities* 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.

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 2-51: Southern Group of State Foresters Wildfire Risk Assessment Fire Intensity Scale. (Source: Southern Wildfire Assessment Portal)

Fire Intensity	
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 worse-case scenario for East Carroll Parish and the incorporated area of Lake Providence is a level 3.5 on the fire intensity scale. The following figures display the areas of wildland-urban interface and intermix in East Carroll Parish and its jurisdictions.

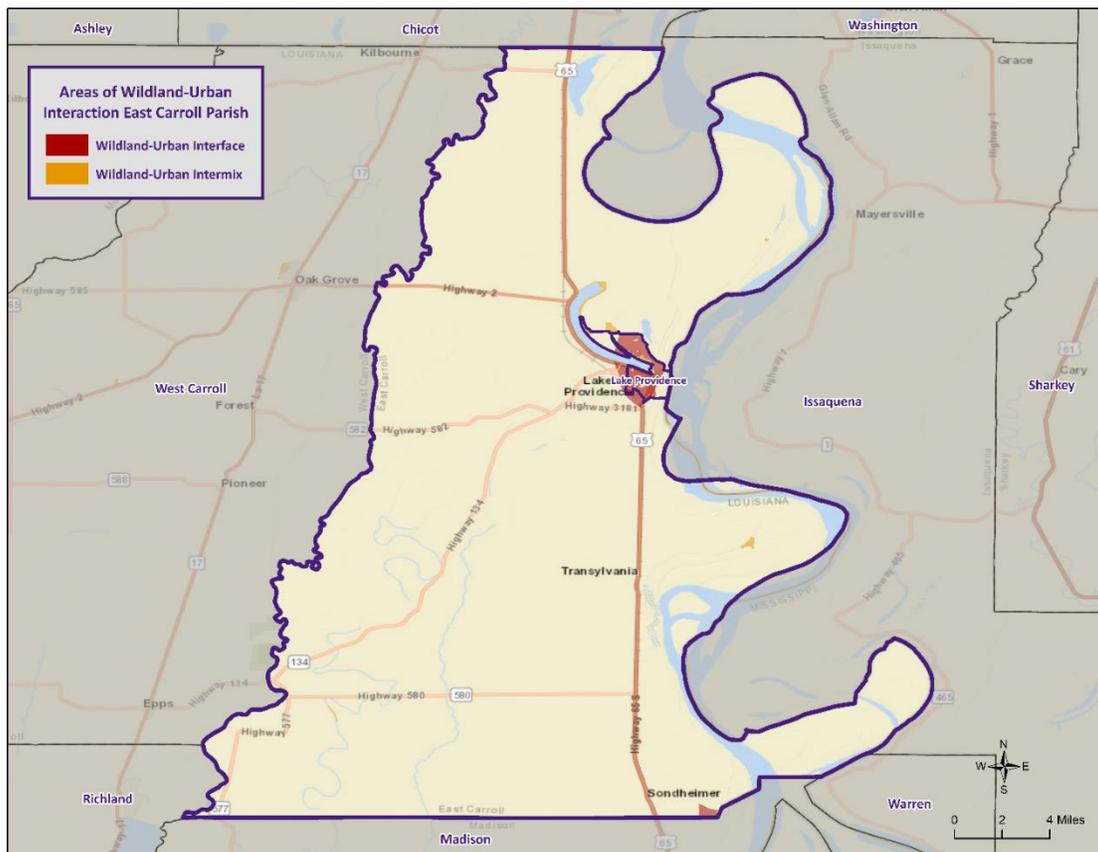


Figure 2-24: Wildland-Urban Interaction in East Carroll Parish.

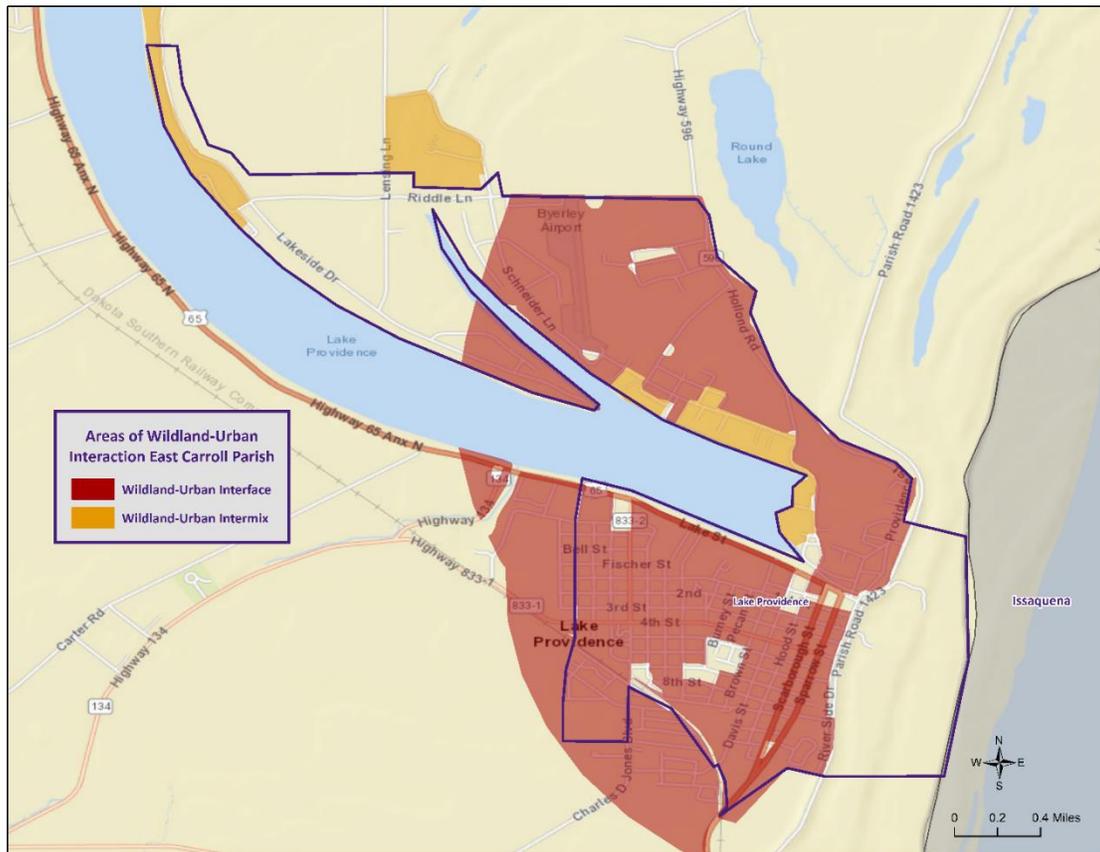


Figure 2-25: Wildland-Urban Interaction in Lake Providence.

Previous Occurrences / Extents

The NCEI Storm Events reports no wildfire events occurring within the boundaries of East Carroll Parish between the years 1990 and 2021. Since the last East Carroll Parish HMP Update in 2016, there have been no occurrences of wildfire events in East Carroll Parish or its jurisdiction.

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

Table 2-52: Potential Wildfire Intensity Levels for East Carroll Parish.
(Source: Southern Wildfire Assessment Portal)

Fire Intensity	
East Carroll Parish	Moderate to High Intensity Level 3.5
Lake Providence	Moderate to High Intensity Level 3.5

Frequency / Probability

Based on historical records, there has been no significant wildfire events within the boundaries of East Carroll Parish and its jurisdiction; therefore, the annual chance of occurrence for wildfires is estimated at less than 1%.

Estimated Potential Loses

According to the NCEI Storm Events database, there has been no wildfire events which has caused property damage, crop damage, injuries, or fatalities in East Carroll Parish and its jurisdiction. In assessing over risk to population, the most vulnerable population throughout the parish consists of those residing in areas of wildland-urban interaction.

Using Hazus, 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 2-53: Total Building Exposure by Wildland-Urban Interaction Areas.

(Source: Hazus)

Jurisdiction	Estimated Total Building Exposure
East Carroll Parish (Unincorporated)	\$148,358,000
Lake Providence	\$505,596,000
Total	\$653,954,000

Hazus 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 2-54: Estimated Exposure for Unincorporated East Carroll Parish by Sector.

(Source: Hazus)

East Carroll Parish (Unincorporated)	Estimated Total Building Exposure by Sector
Agricultural	\$5,386,000
Commercial	\$15,898,000
Government	\$606,000
Industrial	\$5,924,000
Religious / Non-Profit	\$9,308,000
Residential	\$108,650,000
Schools	\$2,586,000
Total	\$148,358,000

Table 2-55: Estimated Exposure for Lake Providence by Sector.
(Source: Hazus)

Lake Providence	Estimated Total Building Exposure by Sector
Agricultural	\$7,388,000
Commercial	\$102,725,000
Government	\$18,316,000
Industrial	\$2,523,000
Religious / Non-Profit	\$39,966,000
Residential	\$319,912,000
Schools	\$14,766,000
Total	\$505,596,000

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 2-56: Population Located within a Wildland-Urban Interaction Areas.
(Source: 2010 U.S. Census Data)

Number of People Located in Wildland-Urban Interaction Areas			
Location	# in Community	# in Hazard Area	% in Hazard Area
East Carroll Parish (Unincorporated)	3,768	678	18%
Lake Providence	3,991	3,674	92.1%
Total	7,759	4,352	56.1%

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

Table 2-57: Population in Unincorporated East Carroll Parish Located within a Wildland-Urban Interaction Area.
(Source: 2010 Census Data)

East Carroll Parish (Unincorporated)		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	678	18.0%
Persons Under 5 Years	49	7.3%
Persons Under 18 Years	174	25.7%
Persons 65 Years and Over	85	12.5%
White	205	30.3%
Minority	473	69.7%

*Table 2-58: Population in Lake Providence Located within a Wildland-Urban Interaction Area.
(Source: 2010 Census Data)*

Lake Providence		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	3,674	92.1%
Persons Under 5 Years	362	9.9%
Persons Under 18 Years	868	23.6%
Persons 65 Years and Over	459	12.5%
White	616	16.8%
Minority	3,058	83.2%

Vulnerability

See *Appendix C: Critical Facilities* 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 Weather

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 following table 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 2-59: 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 East Carroll Parish as all of the adjacent parishes, the entire planning area for East Carroll Parish is equally at risk for winter storms. The worst-case scenario for East Carroll Parish and its jurisdiction is a Ice Damage Index of 2 on the Sperry-Piltz Ice Accumulation Index.

Previous Occurrences / Extents

The NCEI Storm Events Database reports three winter weather events occurring within the boundaries of East Carroll Parish between the years 1990 and 2021. Since the last East Carroll Parish HMP Update in 2016, there has been one incident of winter weather events.

Table 2-60: Historical Winter Weather in East Carroll Parish since the 2016 Update.

Date	Synopsis	Property Damage	Property Damage
April 12, 2020	Sleet fell across the region and led to accumulations of up two tenths of an inch across the county. This resulted in icy roads.	\$300,000	\$10,000

Frequency / Probability

Based on historical records, there have been two significant winter weather events within the boundaries of East Carroll Parish and the jurisdiction of Lake Providence; therefore, the annual chance of occurrence for winter weather is estimated at 10%.

Estimated Potential Losses

Since 1990, there have been three winter weather events that have resulted in property damages according to NCEI Storm Events Database. The total property damages associated with those storms have totaled approximately \$10,000. To estimate the potential losses of a winter weather event on an annual basis, the total damages recorded for winter weather was divided by the total number of years of available winter weather in the NCEI Storm Events Database (1990 - 2021). This provides an annual estimated potential loss of \$3323 and \$3,333 per event. The following table provides an estimate of potential property losses for East Carroll Parish:

Table 2-61: Estimated Annual Losses East Carroll Parish and its Jurisdictions Resulting from Winter Weather.

Estimated Annual Potential Losses from Winter Weather	
Unincorporated Area	Lake Providence
\$157	\$166

There have been no reported injuries or fatalities as a result of winter weather over the 31-year record.

Vulnerability

See *Appendix C: Critical Facilities* for parish and municipality building exposure to winter weather.

This Page Left Intentionally Blank

3. Capability Assessment

This section summarizes the results of efforts by each jurisdiction and other agency 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, East Carroll Parish and the incorporated jurisdictions are able to identify strengths that could be used to reduce losses and reduce risk throughout the communities. 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

These capabilities are unique to the parish and jurisdictions, 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, and take an integrated and strategic look holistically at hazard mitigation in the East Carroll Parish planning area 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 include the following:

Table 3-1: Planning and Regulatory Capabilities

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

All jurisdictions within the East Carroll Parish planning area will work to expand their capabilities by adding to these plans, as well as work to create new plans that will address a long-term recovery and resiliency framework. In instances where there are no existing plans, there will be a concerted effort to explore opportunities to create new plans that will address long-term recovery and resiliency framework as parish and local resources allow.

Building Codes, Permitting, Land Use Planning and Ordinances

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

As of the 2022 update, East Carroll Parish and the incorporated communities 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 East Carroll Parish Police Jury is also responsible for enforcing the parish ordinances related to health and safety, property maintenance standards, and condemnation of unsafe structures.

The East Carroll 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, the jurisdictions within the East Carroll Parish planning area as a whole have a system in place to coordinate and share these capabilities through the OHSEP 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

The jurisdictions within the East Carroll Parish planning area have 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 on the following page shows examples of resources in place.

Table 3-2: Administration 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.			
	East Carroll Unincorporated		Town of Lake Providence
			Comments
Administration	Yes / No		
Planning Commission	No	Yes	
Mitigation Planning Committee	Yes	Yes	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	No	Yes	
Staff	Yes / No		
Chief Building Official	No	Yes	
Floodplain Administrator	Yes	Yes	
Emergency Manager	Yes	Yes	
Community Planner	No	No	
Civil Engineer	No	No	
GIS Coordinator	Yes	No	
Grant Writer	No	No	
Other	No	No	
Technical	Yes / No		
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Yes	
Hazard Data & Information	Yes	Yes	
Grant Writing	No	No	
Hazus Analysis	No	No	
Other	No	No	

Financial capabilities are the resources that East Carroll 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 parish may vary from little to no cost actions, such as outreach efforts, or substantial action costs such acquisition of flood prone properties.

The following financial resources are available to fund mitigation actions in the East Carroll Parish planning area:

Table 3-3: Financial Capabilities

Financial			
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.			
	East Carroll Unincorporated		Town of Lake Providence
			Comments
Funding Resource	Yes / No		
Capital Improvements project funding	Yes	Yes	
Authority to levy taxes for specific purposes	No	Yes	
Fees for water, sewer, gas, or electric services	No	Yes	
Impact fees for new development	No	No	
Stormwater Utility Fee	No	No	
Community Development Block Grant (CDBG)	Yes	Yes	
Other Funding Programs	Yes	Yes	

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 communities and the parish as a whole to maximize opportunities for implementation of activities through greater acceptance and consensus of the community.

The jurisdictions within the East Carroll Parish planning area have existing education and outreach programs to implement mitigation activities, as well as communicate risk and hazard related information to its communities. The existing programs are as follows:

Table 3-4: 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.			
	East Carroll Unincorporated		Town of Lake Providence
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	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	Yes	
Natural Disaster or safety related school program	No	Yes	
Storm Ready certification	No	No	
Firewise Communities certification	No	No	
Public/Private partnership initiatives addressing disaster-related issues	No	No	
Other	Fema Courses		

As reflected with the above existing regulatory mechanisms, programs and resources within the parish, the jurisdictions within the East Carroll Parish planning area remain committed to expanding and improving on the existing capabilities within the parish. Communities will work together along with East Carroll Parish 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 parish, will enhance and expand overall risk reduction for the entirety of East Carroll Parish.

Flood Insurance and Community Rating System

East Carroll Parish is not a participant in the Community Rating System (CRS), nor is the Town of Lake Providence. 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.

The Federal Emergency Management Agency’s National Flood Insurance Program (NFIP) administers the Community Rating System (CRS). 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.

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.

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

As of April 2022, 352 communities in the State of Louisiana participate in the Federal Emergency Management Agency's National Flood Insurance Program (NFIP). Of these communities, 46 (or 13%) participate in the Community Rating System (CRS). Jefferson Parish leads the state with a rating of Class 5, followed by three cities with a rating of Class 6: the Cities of Gretna and Kenner in Jefferson Parish and the City of Mandeville in St.

Tammany Parish. 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. Once the parish has obtained a CRS rating and is a participant, 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 1 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 2011¹, the National Flood Insurance Program (NFIP) completed a comprehensive review of the Community Rating System (CRS) that resulted 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 to evaluate the CRS and refine the program to meet its stated goals. The changes helped to 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.

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

Since the revision of the 2013 Coordinator's Manual, FEMA released the 2017 CRS Coordinator's Manual which continued the evolution of the CRS program and its mission to reward communities that prioritize mindful floodplain regulations. As with the 2013 manual, the changes made in the 2017 manual impact each CRS community differently. Some communities see an increase in the points they receive since points for certain activities have increased (e.g., Activity 420 Open Space Preservation). Other communities receive fewer points for certain activities (e.g., Activity 320 Map Information Service). It is likely that some communities with marginal CRS Class 9 programs have to identify new CRS credits in order to remain in the CRS class. Most notably, as it relates to this hazard mitigation plan, more credit was made available for Activity 410 Floodplain Mapping.

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 2017 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 the 2017 manual will impact their community and when.

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 program 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.

NFIP Worksheets

Parish NFIP worksheets can be found in *Appendix E: State Required Worksheets*.

This Page Left Intentionally Blank

4. Mitigation Strategy

Introduction

The Hazard Mitigation Strategy for East Carroll Parish and its incorporated communities have a common guiding principle and is the demonstration of the parish's 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.

Officials from all jurisdictions within the planning area confirmed the goals, objectives, actions and projects over the period of the hazard mitigation plan update process. The mitigation actions and projects in this 2022 HMP update are a product of analysis and review of the East Carroll Parish Hazard Mitigation Plan Steering Committee under the coordination of the East Carroll Parish Office of Homeland Security and Emergency Preparedness. The committee was presented a list of projects and actions, new and from the 2016 plan, for review from June 2022 – October 2022.

An online public opinion survey of East Carroll Parish residents was conducted between January and October 2022. The survey was designed to capture public perceptions and opinions regarding natural hazards in the East Carroll Parish planning area. In addition, the survey collected 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 East Carroll 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, public feedback could not be incorporated into the plan. The full East Carroll Parish survey can be found at the following link:

<https://www.surveymonkey.com/r/EastCarrollHM2022>

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 East Carroll 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, East Carroll Parish 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 East Carroll Parish Hazard Mitigation Plan Update Planning Committee represent long-term commitments by the parish.

After assessing these goals, the committee decided that the current remain valid. The goals are as follows:

1. Protect life and property
2. Ensure emergency services
3. Increase public preparedness
4. Establish and strengthen partnerships for implementation
5. Preserve or restore natural resources
6. Promote a sustainable economy
7. Improve data collection, use, and sharing to reduce the risk from disasters

The Mitigation Action Plan focuses on actions to be taken by East Carroll Parish and its communities. Every activity in the Mitigation Action Plan is focused on helping the parish and its communities in developing and funding projects that are not only cost effective but also meet the other DMA 2000 criteria. After the adoption of the 2016 East Carroll Parish Hazard Mitigation Plan, large portions of Louisiana were impacted by a flooding event whose ramifications are still being felt by the population. Because of this event, East Carroll Parish reprioritized its efforts and became much more aggressive in seeking funding for flood mitigation efforts, particularly related to drainage.

The Hazard Mitigation Plan Planning Committee 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.

2022 Mitigation Actions and Update on Previous Plan Actions

The East Carroll Parish Hazard Mitigation Plan Planning Committee identified actions that would reduce and/or prevent future damage within the East Carroll Parish planning area. In that effort, the committee focused on a comprehensive range of specific mitigation actions. These actions were identified in thorough fashion by the consultant team and the committee by way of frequent and open communications and meetings held throughout the planning process. The review of these actions, coupled with any ongoing and/or carried over projects from the previous update, provide East Carroll Parish with a solid mitigation strategy through which risk and losses will be reduced.

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.

Status updates for actions included in the previous plan can be found on the following pages. Additionally, new mitigation actions agreed upon by the parish and its jurisdictions are included.

Unincorporated East Carroll Parish Mitigation Actions

Previous Action Update

East Carroll Unincorporated Action Update							
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Goal	Status
EC1: 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	1-5 years	East Carroll Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 1)
EC2: 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 flooding 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	1-5 years	East Carroll Parish OHSEP	Flooding, Tropical Cyclones	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 2)
EC3: 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	1-5 years	East Carroll Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	1, 2, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 3)

EC4: Safe Room Projects	Construction of a safe room for first responders located in East Carroll Parish. Other locations will be identified based on funding availability.	FEMA HMGP	1-5 years	East Carroll Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 4)
EC5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety through mail outs and training opportunities for Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, and Winter Weather 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	1-5 years	East Carroll Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Carried Over - Not Started (See East Carroll Mitigation Action 5)
EC6: 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	1-5 years	East Carroll Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 6)
EC7: Lightning Mitigation	Procurement and Installation of lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP	1-5 years	East Carroll Parish OHSEP	Thunderstorms	1, 2, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 7)
EC8: Warning Systems	Update/upgrade public warning system components throughout East Carroll Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP	1-5 years	East Carroll Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather, Wildfires	1, 2, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 8)

EC9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP	1-5 years	East Carroll Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 9)
EC10: Control Structure Updates	Procure and complete necessary updates to, or replace the control structures located on Tensas River and Baxter River. Updating the structures will allow them to function properly during high water events. Structures currently do not operate adequately during high rain/water events, causing backwater flooding in the affected areas.	FEMA HMGP	1-5 years	East Carroll Parish Police Jury	Flooding, Levee Failure, Tropical Cyclones	1, 2, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 10)
EC11: 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	1-5 years	East Carroll Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	1, 2, 4, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 11)
EC12: All Hazard Education Program	Incorporate an all-hazard education program into all East Carroll Parish's school curriculums.	Local budget, State grants, HMGP, additional grant sources	1-5 years	East Carroll Parish School Board	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Deleted (Duplicate of Action EC5)
EC13: Community Warning Sirens	Obtain community warning sirens to alert the community during hazard events.	Local government budget, HMGP	1-5 years	East Carroll Parish Public Works and East Carroll Parish Engineer	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Deleted (Duplicate of Action EC8)
EC14: EOC Requirements	Develop a plan and evaluate funding requirements for an EOC.	Local government budget, EOC Grant Program	1-5 years	East Carroll Parish Communications District, East Carroll Parish Public Works	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Carried Over - Not Started (See East Carroll Mitigation Action 12)

EC15: Storm Ready Program	Meet the guidelines and apply for the National Weather Service's "Storm Ready Program"	Local government budget, EOC Grant Program, HMGP	1-5 years	East Carroll Parish Communications District, East Carroll Parish OHSEP, Department East Carroll Parish Public Works	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	1, 2, 3, 4, 5, 6, 7	Carried Over - Not Started (See East Carroll Mitigation Action 13)
EC16: Shelter Plan	Develop a comprehensive post-disaster shelter plan.	Local Budget, Pre-Disaster Mitigation Grant Program	1-5 years	East Carroll Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Carried Over - Not Started (See East Carroll Mitigation Action 14)
EC17: Attend Mitigation Seminars	Attend all relevant disaster mitigation seminars and meetings within regional parishes, cities and towns.	Local budget	1-5 years	East Carroll Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Carried Over - Not Started (See East Carroll Mitigation Action 15)
EC18: Monitoring and Communications	Develop and implement systems to increase effective monitoring and communications during all phases of emergency events.	HMGP; FMA; ODP	1-5 years	East Carroll Parish OHSEP and The Town of Lake Providence Mayor's Office	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Carried Over - Not Started (See East Carroll Mitigation Action 16)
EC19: Drainage Ditch Debris	Clear debris from dedicated drainage ditches.	Local Budget or State and Federal Grants	1-5 years	East Carroll Police Jury Highway Department and Town of Lake Providence Public Works	Flooding, Tropical Cyclones	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 17)
EC20: Culvert Resizing	Resize inadequate culverts throughout the Parish and Town.	HMGP; FMA; LADOT	1-5 years	East Carroll Parish Police Jury Highway Department and The Town of Lake Providence Public Works	Flooding, Tropical Cyclones	1, 2, 6	Deleted (Duplicate of Action EC2)
EC21: Flood Insurance Rate Maps	Work with FEMA to update East Carroll Parish's Flood Insurance Rate Maps	FEMA Map Modernization Program; HMGP; FMA	1-5 years	East Carroll Parish OHSEP and The Town of Lake Providence Mayor's Office respectively	Flooding	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 19)
EC22: Local Emergency Response Plan	Implement the local emergency response plan and update all emergency water program plans.	Local government budget, HMGP	1-5 years	East Carroll Parish Office of Homeland Security and Emergency Preparedness	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 20)

EC23: Flood Response Efforts	Coordinate with other volunteer, local, state and federal agencies to review and update flood response efforts.	EMPG; HMGP, and FMA. Funding could be obtained through local budget or grants.	1-5 years	East Carroll Parish OHSEP and The Town of Lake Providence Mayor's Office respectively	Flooding	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 21)
EC24: Fifth Louisiana Levee District Support	Support Fifth Louisiana Levee District in all hazard mitigation initiatives.	N/A	1-5 years	East Carroll Parish OHSEP, East Carroll Police Jury and The Town of Lake Providence Mayor's Office	Flooding, Levee Failure	1, 2, 6	Carried Over - Not Started (See East Carroll Mitigation Action 22)
EC25: Thunderstorm Warning Sirens	Obtain community thunderstorm warning sirens to alert the community during a thunderstorm events.	Local government budget, HMGP	1-5 years	East Carroll Parish Public Works and East Carroll Parish Engineer	Thunderstorms	1, 2, 6	Deleted (Duplicate of Action EC13)
EC26: Auxiliary Power Sources for Tornadoes	Acquire auxiliary power sources for critical infrastructure and facilities.	Local budget, State and Federal Grants	1-5 years	East Carroll Parish OHSEP and The Town of Lake Providence Mayor's Office	Tornadoes	1, 2, 6	Deleted (Duplicate of Action EC6)
EC27: Auxiliary Power Sources for Hurricanes/ Tropical Storms	Acquire auxiliary power sources for critical infrastructure and facilities.	Local budget, State and Federal Grants	1-5 years	East Carroll Parish OHSEP and The Town of Lake Providence Mayor's Office	Tropical Cyclones	1, 2, 6	Deleted (Duplicate of Action EC6)
EC28: Water Resource Identification	Identify existing water resources as well as potential sites for reservoir development.	Local budget or State and Federal grants.	1-5 years	East Carroll Public Works and Engineer	Drought	1, 2, 4, 5, 6	Carried Over - Not Started (See East Carroll Mitigation Action 23)

New Mitigation Actions

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITGATION ACTION 1	Building Retrofits
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Retrofit public buildings exterior shell to maintain use during and after storm events.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 2	Drainage Improvements
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services
PRIORITY	High
Action Description	Implementation of drainage improvement/flood mitigation projects to 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.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 3	Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 3. Increase public preparedness 5. Preserve or restore natural resources
PRIORITY	High
Action Description	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties
Type of Mitigation Action	Local Plans and Regulations Structure and Infrastructure Projects Education and Awareness Programs
How Action Aligns with Risk Reduction	Eliminates risk of repetitive and severe repetitive loss structures.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 4	Safe Room Projects
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services
PRIORITY	Medium
Action Description	Construction of a safe room for first responders located in East Carroll Parish.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Allows for continued operations of essential personal to actively respond during a natural hazard event
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 5	Education and Outreach
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation 5. Preserve or restore natural resources 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Medium
Action Description	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety through mail outs and training opportunities for Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, and Winter Weather hazards as well as providing information on high risk areas.
Type of Mitigation Action	Education and Awareness Programs
How Action Aligns with Risk Reduction	Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 6	Generators for Continuity of Operations and Government
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	High
Action Description	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Allows for continued operations at critical facilities in the event of widespread power outages
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 7	Lightning Mitigation
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Low
Action Description	Procurement and Installation of lightning rods and surge protectors for public buildings to preserve life and property
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Decreases the risk of damage or halting operations of critical facilities due to lightning strikes
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Thunderstorms

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 8	Warning Systems
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Update/upgrade public warning system components throughout East Carroll Parish as necessary. Install audible and/or reverse 911 warning system(s)
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	An upgraded public warning system will increase the likelihood of public notification immediately prior to an event
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather, Wildfires

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 9	Potable Water
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Create redundancy of potable water supply to critical facilities, especially hospitals, and provide protection of potable water supply by acquisition/ installation of backflow preventers at appropriate critical locations.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	A redundant water supply will help to reduce or eliminate the interruption to critical facilities caused by a disaster
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 10	Control Structure Updates
LEAD AGENCY	East Carroll Parish Police Jury
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Procure and complete necessary updates to or replace the control structures located on Tensas River and Baxter River.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Updating the structures will allow them to function properly during high water events. Structures currently do not operate adequately during high rain/water events, causing backwater flooding in the affected areas.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 11	Promote Flood Insurance
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Medium
Action Description	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).
Type of Mitigation Action	Local Plans and Regulations Education and Awareness Programs
How Action Aligns with Risk Reduction	An increased emphasis on the purchase of flood insurance will help to reduce the number of uninsured structures impacted by flooding events, reducing the strain on the NFIP program
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 12	EOC Requirements
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	East Carroll Parish Communications District; East Carroll Parish Public Works
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local government budget, EOC Grant Program
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Low
Action Description	Develop a plan and evaluate funding requirements for an EOC.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	An updated EOC will allow for coordinated response by local and parish agencies during an event
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 13	Storm Ready Program
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	East Carroll Parish Communications District; East Carroll Parish Public Works
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local government budget, EOC Grant Program, HMGP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Medium
Action Description	Meet the guidelines and apply for the National Weather Service's "Storm Ready Program"
Type of Mitigation Action	Local Plans and Regulations Education and Awareness Programs
How Action Aligns with Risk Reduction	Joining the Storm Ready program will help to better prepare communities for disasters through public awareness, education, training and exercises
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 14	Shelter Plan
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local Budget, Pre-Disaster Mitigation Grant Program
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation
PRIORITY	Medium
Action Description	Develop a comprehensive post-disaster shelter plan.
Type of Mitigation Action	Local Plans and Regulations
How Action Aligns with Risk Reduction	A shelter plan will aid in the opening, operation, and closing of shelters in the event of a disaster.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 15	Attend Mitigation Seminars
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local budget
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation 5. Preserve or restore natural resources 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Low
Action Description	Attend all relevant disaster mitigation seminars and meetings within regional parishes, cities and towns.
Type of Mitigation Action	Education and Awareness Programs
How Action Aligns with Risk Reduction	Attendance of mitigation seminars will help to foster collaboration and teach best practices and alternative ideas on how to best mitigate the community against hazards
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 16	Monitoring and Communications
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	Town of Lake Providence Mayor's Office
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP; FMA; ODP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 3. Increase public preparedness 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Low
Action Description	Develop and implement systems to increase effective monitoring and communications during all phases of emergency events.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Improving monitoring and communication systems within the parish could reduce injury during major hazard events. It could increase trust between the public and government officials and allow critical functions to continue during major events.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 17	Drainage Ditch Debris
LEAD AGENCY	East Carroll Parish Police Jury Highway Department
SUPPORTING AGENCIES	Town of Lake Providence Public Works
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local budget or State and Federal grants
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 5. Preserve or restore natural resources
PRIORITY	Medium
Action Description	Clear debris from dedicated drainage ditches.
Type of Mitigation Action	Structure and Infrastructure Project Natural System Protection
How Action Aligns with Risk Reduction	Maintaining an clearing drainage ditches will help to ensure their proper function and allow for the water to flow unimpeded, reducing the threat of backwater flooding
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 18	Flood Insurance Rate Maps
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	Town of Lake Providence Mayor's Office
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA Map Modernization Program; HMGP; FMA
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 3. Increase public preparedness 5. Preserve or restore natural resources 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Medium
Action Description	Work with FEMA to update East Carroll Parish's Flood Insurance Rate Maps
Type of Mitigation Action	Local Plans and Regulations
How Action Aligns with Risk Reduction	Updated flood maps will more accurately identify and assess the flooding risk to the parish
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 19	Local Emergency Response Plan
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local government budget, HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services
PRIORITY	Medium
Action Description	Implement the local emergency response plan and update all emergency water program plans.
Type of Mitigation Action	Local Plans and Regulations
How Action Aligns with Risk Reduction	Updating the local emergency response plan and emergency water program plan will help to better coordinate response efforts across the parish
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 20	Flood Response Efforts
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	Town of Lake Providence Mayor's Office
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	EMPG; HMGP; FMA; Local budget or State and Federal grants
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services
PRIORITY	Medium
Action Description	Coordinate with other volunteer, local, state and federal agencies to review and update flood response efforts.
Type of Mitigation Action	Local Plans and Regulations
How Action Aligns with Risk Reduction	Reviewing and flood response effort and procedures will help to better coordinate response efforts across the parish in the event of a flood disaster
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 21	Fifth Louisiana Levee District Support
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	East Carroll Police Jury; Town of Lake Providence Mayor's Office
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local budget or State and Federal grants
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services
PRIORITY	Low
Action Description	Support Fifth Louisiana Levee District in all hazard mitigation initiatives.
Type of Mitigation Action	Local Plans and Regulations Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Providing support to the Fifth Louisiana Levee District will help to ensure proper maintenance of levees in East Carroll Parish
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 22	Water Resource Identification
LEAD AGENCY	East Carroll Public Works and Engineer
SUPPORTING AGENCIES	N/A
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local budget or State and Federal grants
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Low
Action Description	Identify existing water resources as well as potential sites for reservoir development.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	The addition of new reservoirs would help to lessen the impacts of drought conditions due to the redundancy of water availability
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS UNINCORPORATED EAST CARROLL PARISH	
DESCRIPTION	
EAST CARROLL PARISH MITIGATION ACTION 23	Create Levee Failure Working Group
LEAD AGENCY	East Carroll Parish OHSEP
SUPPORTING AGENCIES	Town of Lake Providence Mayor's Office, U.S. Army Corps of Engineers
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local budget or State and Federal grants
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Low
Action Description	Create a levee failure working group to identify the impact and extent resulting from a levee failure
Type of Mitigation Action	Local Plans and Regulations Education and Awareness Programs
How Action Aligns with Risk Reduction	The creation of a levee failure working group will allow for better information and data exchange, which in turn will allow for an assessment of extent and impacts related to a levee failure
Current Status of Action	New
Hazard Addressed	Levee Failure

Town of Lake Providence Mitigation Actions

Previous Action Update

Town of Lake Providence Action Update							
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Goal	Status
L1: 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	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	1, 2, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 1)
L2: Drainage Improvements	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 flooding 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	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Flooding, Tropical Cyclones	1, 2, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 2)
L3: 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	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	1, 2, 5, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 3)
L4: Safe Room Projects	Construction of a safe room for first responders located in Lake Providence. Other locations will be identified based on funding availability.	FEMA HMGP	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 4)

L5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety through mail outs and training opportunities for Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclone, Wildfires, and Winter Weather 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	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 3, 4, 5, 6, 7	Carried Over - Not Started (See Lake Providence Mitigation Action 5)
L6: 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	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 5, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 6)
L7: Lightning Mitigation	Procurement and Installation of lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Thunderstorms	1, 2, 5, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 7)
L8: Warning Systems	Update/upgrade public warning system components throughout Lake Providence as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather, Wildfires	1, 2, 5, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 8)
L9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	1, 2, 5, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 9)
L10: 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	1-5 years	Town of Lake Providence/ East Carroll Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	1, 2, 4, 5, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 10)

L11: Control Structure Updates	Procure and complete necessary updates to, or replace the control structures located on Tensas River and Baxter River. Updating the structures will allow them to function properly during high water events. Structures currently do not operate adequately during high rain/water events, causing backwater flooding in the affected areas.	FEMA HMGP	1-5 years	Mayor of Lake Providence/ East Carroll Parish Police Jury	Flooding, Levee Failure, Tropical Cyclones	1, 2, 5, 6	Carried Over - Not Started (See Lake Providence Mitigation Action 11)
--------------------------------	---	-----------	-----------	--	--	------------	---

New Mitigation Actions

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
LAKE PROVIDENCE MITIGATION ACTION 1	Building Retrofits
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Retrofit public buildings exterior shell to maintain use during and after storm events.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
LAKE PROVIDENCE MITIGATION ACTION 2	Drainage Improvements
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services
PRIORITY	High
Action Description	Implementation of drainage improvement/flood mitigation projects to 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.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 3	Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 3. Increase public preparedness 5. Preserve or restore natural resources
PRIORITY	High
Action Description	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties
Type of Mitigation Action	Local Plans and Regulations Structure and Infrastructure Projects Education and Awareness Programs
How Action Aligns with Risk Reduction	Eliminates risk of repetitive and severe repetitive loss structures.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 4	Safe Room Projects
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services
PRIORITY	Medium
Action Description	Construction of a safe room for first responders located in Lake Providence.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Allows for continued operations of essential personal to actively respond during a natural hazard event
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 5	Education and Outreach
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation 5. Preserve or restore natural resources 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Medium
Action Description	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety through mail outs and training opportunities for Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, and Winter Weather hazards as well as providing information on high risk areas.
Type of Mitigation Action	Education and Awareness Programs
How Action Aligns with Risk Reduction	Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 6	Generators for Continuity of Operations and Government
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	High
Action Description	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Allows for continued operations at critical facilities in the event of widespread power outages
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 7	Lightning Mitigation
LEAD AGENCY	Lake Providence Mayor’s Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Low
Action Description	Procurement and Installation of lightning rods and surge protectors for public buildings to preserve life and property
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Decreases the risk of damage or halting operations of critical facilities due to lightning strikes
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Thunderstorms

Additional Supporting Information:



IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 8	Warning Systems
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Update/upgrade public warning system components throughout Lake Providence as necessary. Install audible and/or reverse 911 warning system(s)
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	An upgraded public warning system will increase the likelihood of public notification immediately prior to an event
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather, Wildfires

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 9	Potable Water
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Create redundancy of potable water supply to critical facilities, especially hospitals, and provide protection of potable water supply by acquisition/ installation of backflow preventers at appropriate critical locations.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	A redundant water supply will help to reduce or eliminate the interruption to critical facilities caused by a disaster
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 10	Promote Flood Insurance
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 3. Increase public preparedness 4. Establish and strengthen partnerships for implementation 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Medium
Action Description	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).
Type of Mitigation Action	Local Plans and Regulations Education and Awareness Programs
How Action Aligns with Risk Reduction	An increased emphasis on the purchase of flood insurance will help to reduce the number of uninsured structures impacted by flooding events, reducing the strain on the NFIP program
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 11	Control Structure Updates
LEAD AGENCY	Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish Police Jury
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	FEMA HMGP
ASSOCIATED GOALS	1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy
PRIORITY	Medium
Action Description	Procure and complete necessary updates to or replace the control structures located on Tensas River and Baxter River.
Type of Mitigation Action	Structure and Infrastructure Project
How Action Aligns with Risk Reduction	Updating the structures will allow them to function properly during high water events. Structures currently do not operate adequately during high rain/water events, causing backwater flooding in the affected areas.
Current Status of Action	Carried Over – Not Started
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Additional Supporting Information:

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF LAKE PROVIDENCE	
DESCRIPTION	
TOWN OF LAKE PROVIDENCE MITIGATION ACTION 12	Create Levee Failure Working Group
LEAD AGENCY	Town of Lake Providence Mayor's Office
SUPPORTING AGENCIES	East Carroll Parish OHSEP, U.S. Army Corps of Engineers
TIMELINE	1-5 Years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	Local budget or State and Federal grants
ASSOCIATED GOALS	<ol style="list-style-type: none"> 1. Protect life and property 2. Ensure emergency services 6. Promote a sustainable economy 7. Improve data collection, use, and sharing to reduce the risk from disasters
PRIORITY	Low
Action Description	Create a levee failure working group to identify the impact and extent resulting from a levee failure
Type of Mitigation Action	Local Plans and Regulations Education and Awareness Programs
How Action Aligns with Risk Reduction	The creation of a levee failure working group will allow for better information and data exchange, which in turn will allow for an assessment of extent and impacts related to a levee failure
Current Status of Action	New
Hazard Addressed	Levee Failure

Additional Supporting Information:

Action Prioritization

During the prioritization process, 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. Therefore, many projects were prioritized with these factors in mind. In addition, prioritization of the mitigation actions was performed based on the following economic criteria: i) whether the action can be performed with the existing parish resources; ii) whether the action requires additional funding from external sources; and iii) relative costs of the mitigation actions.

In all cases, the committee 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 prioritized the possible activities that could be pursued. Steering committee members consulted appropriate agencies in order to assist with the prioritizations. The results were items that address the major hazards, are appropriate for those hazards, are cost-effective, and are affordable. On-going actions, as well as actions which will provide maximum benefit that can be undertaken by existing parish staff with or without additional external funding were given high priority. The actions with medium benefit and relatively 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 and would result in limited benefit to the community were given low priority.

East Carroll Parish and the incorporated jurisdictions will implement and administer the identified actions based off 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. 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 East Carroll Parish Hazard Mitigation Plan Update

The East Carroll Parish Hazard Mitigation Plan Update process began in January 2022 with a series of emails, phone calls, meetings, and collaborations between the contractor (SDMI) and a diverse group of participating agencies and stakeholders. Update activities were intended to give each participating agency and stakeholder the opportunity to shape the plan to best fit their community's mitigation goals. Community stakeholders and the general public were invited to attend and contribute information to the planning process during specific time periods or meetings.

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

Date	Meeting or Outreach	Location	Public Invited	Purpose
1/4/2022	Kick Off Email	Email	No	Schedule kick off call with Parish OHSEP and SDMI Staff.
1/18/2022	Kick Off Meeting	Phone Conference	No	Discuss with the Parish OHSEP Director expectations and requirements of the project. Discuss meeting schedules, committee make up, and next steps.
6/7/2022	Initial Planning Committee Meeting	Lake Providence, LA	No	Discussion with East Carroll Parish Hazard Mitigation Planning Committee the process and expectations of plan participants. Discuss timeline and action items of each jurisdiction and parish.
8/9/2022	Risk Assessment Review with Planning Committee	Zoom	Yes	Presentation of Risk Assessment Hazards and maps to Planning Committee.
8/9/2022	Public Meeting	Zoom	Yes	Presentation of Risk Assessment Hazards and maps to Public. Presentation also includes current mitigation project highlights within communities and public survey discussion.
1/18/2022 – 10/4/2022	Public Opinion Survey	Online	Yes	This survey asked participants about public perceptions and opinions regarding natural hazards in East Carroll Parish. In addition, questions covered the methods and techniques preferred for reducing the risks and losses associated with these hazards.

Planning

The plan update process consisted of several phases:

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11
Plan Revision	■										
Data Collection	■										
Risk Assessment	■										
Public Input		■									
Mitigation Strategy				■							
Plan Review by GOHSEP and FEMA										■	
FEMA APA											
Plan Adoptions											
Final Plan Approval											

Coordination

The East Carroll Parish Office of Homeland Security and Emergency Preparedness (OHSEP) oversaw the coordination of the 2022 Hazard Mitigation Plan Update Planning Committee during the update process. The parish OHSEP was responsible for identifying members for the committee.

The Parish Director was responsible for inviting the planning committee and key stakeholders to planned meetings and activities via phone call and/or email. SDMI assisted the Parish Director with press releases and social media statements for notification to the media and general public for public meetings and public outreach activities.

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

Neighboring Community, Local and Regional Planning Process Involvement

From the outset of the planning process, the planning committee encouraged participation from a broad range of parish 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 planning meetings at the local and parish level
- Sharing local data and information with jurisdictions
- Incorporation of other planning documents, studies and efforts
- Action item development and action progress from 2016 update
- Risk Assessment review
- Plan document draft review
- Formal adoption of the Hazard Mitigation Plan

The West Carroll Parish OHSEP Director was invited to attend the Initial Planning and Risk Assessment Meetings for East Carroll Parish in an effort to coordinate mitigation efforts where possible as neighboring communities. The West Carroll Parish OHSEP Director was invited via email and phone call to participate in an effort to collaborate with neighboring communities. SDMI assisted East Carroll Parish with encouraging the collaboration with these neighboring communities via email by extending an invitation to the East Carroll Hazard Mitigation Plan Update Meetings.

As part of the coordination and planning process, the parish was provided the State Required Hazard Mitigation Plan Update Worksheet. The completed worksheets can be found in *Appendix E: State Required Worksheets*.

The 2022 Hazard Mitigation Plan Update Planning Committee consisted of representatives from the following parish, municipal or community stakeholders. Below is a detailed list of the 2022 HMPU Steering Committee:

East Carroll Parish Hazard Mitigation Planning Committee			
Name	Title	Agency	Email
Kenneth Baker	Director	East Carroll Parish OHSEP	ecpjoep@bayou.com
Jerry Bell	Outgoing Mayor	Town of Lake Providence	jdbjr13@yahoo.com
Robert Amacker	Mayor Elect	Town of Lake Providence	lakeprovidence@bellsouth.net
Lee Ann W. Clement	Clerk	Town of Lake Providence	
Myrtle Green	Director	West Carroll Parish OHSEP	directorwcpoep@yahoo.com

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 East Carroll Parish programs and planning.

A measure of integration and coordination is achieved through the HMPU participation of Planning Committee members and community stakeholders who administer programs such as: floodplain management under the National Flood Insurance Program (NFIP), Community Rating System, parish planning and zoning and building code enforcement.

East Carroll Parish will continue to integrate the requirements of this Hazard Mitigation Plan into other local planning mechanisms that are to be identified through future meetings of the parish, and through the five-year review process described in *Appendix B: Plan Maintenance*. The primary means for

integrating mitigation strategies into other local planning mechanisms will be through the revision, update and implementation of any individual municipal plans that require specific planning and administrative tasks (e.g. risk assessment, plan amendments, ordinance revisions, capital improvement projects, etc.).

The members of the East Carroll Parish Hazard Mitigation Planning Committee will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their communities 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 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 2016 Hazard Mitigation Plan was also used in the planning process. Other existing data and plans used in the planning process include those listed below.

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

Further information on the plans can be found in *Section 3: Capability Assessment*.

Meeting Documentation and Public Outreach Activities

The following pages contain documentation of the meetings and public outreach activities conducted during this hazard mitigation plan update.

Meeting #1: Hazard Mitigation Plan Update Kick-Off

Date: January 18, 2022

Location: Conference Call

Purpose: Discuss with the Parish OHSEP Director expectations and requirements of the project. Discuss meeting schedules, committee make up, and next steps.

Public Invitation: No

Meeting Invitees:

East Carroll Parish Hazard Mitigation Planning Committee			
Name	Title	Agency	Email
Kenneth Baker	Director	East Carroll Parish OHSEP	ecpjoep@bayou.com
Jerry Bell	Mayor	Town of Lake Providence	jdbjr13@yahoo.com

Meeting #2: Hazard Mitigation Plan Initial Planning Committee Meeting

Date: June 7, 2022**Location:** Lake Providence, LA**Purpose:** Discuss the expectations and requirements of the hazard mitigation plan update process and establish an initial project timeline with the Hazard Mitigation Plan Planning Committee. Assign each individual tasks related to the parish data collection for the plan update.**Public Invitation:** No**Meeting Invitees:**

East Carroll Parish Hazard Mitigation Planning Committee			
Name	Title	Agency	Email
Kenneth Baker	Director	East Carroll Parish OHSEP	ecpjoep@bayou.com
Jerry Bell	Mayor	Town of Lake Providence	jdbjr13@yahoo.com
Myrtle Green	Director	West Carroll Parish OHSEP	directorwcpoep@yahoo.com

Meeting #3: Risk Assessment Presentation to Steering Committee

Date: August 9, 2022**Location:** Zoom**Purpose:** Presentation of Risk Assessment hazards and maps to Steering Committee.**Public Invitation:** No**Meeting Invitees:**

East Carroll Parish Hazard Mitigation Planning Committee			
Name	Title	Agency	Email
Kenneth Baker	Director	East Carroll Parish OHSEP	ecpjoep@bayou.com
Jerry Bell	Mayor	Town of Lake Providence	jdbjr13@yahoo.com
Myrtle Green	Director	West Carroll Parish OHSEP	directorwcpoep@yahoo.com

Meeting #4: Public Meeting

Date: August 9, 2022**Location:** Zoom**Purpose:** The Public Meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process.**Public Invitation:** Yes**Meeting Invitees:**

East Carroll Parish Hazard Mitigation Planning Committee			
Name	Title	Agency	Email
Kenneth Baker	Director	East Carroll Parish OHSEP	ecpjoep@bayou.com
Jerry Bell	Mayor	Town of Lake Providence	jdbjr13@yahoo.com
Myrtle Green	Director	West Carroll Parish OHSEP	directorwcpoep@yahoo.com

Meeting Announcement:

EAST CARROLL PARISH OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

PUBLIC MEETING ANNOUNCEMENT

**East Carroll Parish and its partners are seeking community input for the
2022 East Carroll Parish Hazard Mitigation Plan update**

East Carroll Parish OEP, in partnership with The Louisiana Governor's Office of Homeland Security and Emergency Preparedness and the Stephenson Disaster Management Institute at LSU, is leading the process to update the plan. The East Carroll Parish Multi-Jurisdictional Hazard Mitigation Plan describes the **naturally occurring** risks to the parish and communities, and also outlines strategies to reduce these risks to save lives, reduce property damage, and lessen the impact of future disasters.

Are you passionate about building a more resilient future for your parish? Do you have questions about the natural hazards your community is at risk to? Please join us on August 9, 2022 for a public meeting at 11:00 am to learn more about the plan and share your input on the risks and vulnerabilities that most impact you and your community.

Meeting Location:

Zoom Video Teleconference

<https://lsu.zoom.us/j/99126330301>

Residents of East Carroll 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 the following link:

<https://www.surveymonkey.com/r/EastCarrollHM2022>

East Carroll Parish appreciates your input.

If you have questions, please contact: Kenneth Baker, Director, East Carroll OEP

Outreach Activity #1: Public Opinion Survey

Date: Ongoing throughout planning process

Location: Web survey

Public Invitation: Yes

As referenced in the *Mitigation Strategy* section of this document, an online public opinion survey of East Carroll Parish residents was conducted between January and October 2022. The survey was designed to capture public perceptions and opinions regarding natural hazards in East Carroll Parish. In addition, the survey collected information regarding the methods and techniques preferred by the respondents for reducing the risks and losses associated with local hazards. As of October 17, 2022, there have been zero responses to the East Carroll Parish Hazard Mitigation Public Opinion Survey. Full survey results can be found here: https://www.surveymonkey.com/results/SM-o7_2B78eEOLh3P2fSKw2jCvg_3D_3D/

Outreach Activity #2: Incident Questionnaire

Date: August 9, 2022; Public Meeting Activity

Location: Public Meeting

Public Invitation: Yes

An incident/issue questionnaire was provided at the public meeting in an effort to collect additional information from residents of East Carroll Parish regarding hazard events and their localized impacts. While the information collected via the questionnaire was to be integrated into this planning document, there was no public turnout for the meeting, and subsequently no results could be collected. A copy of the incident questionnaire can be found on the next page.

EAST CARROLL PARISH PUBLIC MEETING

PUBLIC ACTIVITY: INCIDENT/ ISSUE QUESTIONNAIRE

1. HAZARD TYPE(S):

- A. Drought
- B. Flooding
 - I. Riverine
 - II. Flash Flooding
 - III. Ponding
- C. Thunderstorms (Lightning, High Winds, and Hail)
- D. Tornadoes
- E. Tropical Cyclones
- F. Wildfires
- G. Winter Weather

2. DESCRIBE INCIDENT OR ISSUE:

[Empty text box for describing the incident or issue]

3. LOCATION:

A. CITY:

B. ADDRESS OR AREA:

4. INTENSITY:

A. DEPTH (FLOODING) OR SIZE (HAIL ETC.):

B. WIND STRENGTH

5. RECURRING OR ONE TIME:

A. IF RECURRING, HOW OFTEN:

6. WHAT TYPE OF INTERRUPTIONS DOES/DID THE INCIDENT OR ISSUE CAUSE? (BUSINESS CLOSURE, DAMAGE, EVACUATION, ETC.)

7. HOW LONG WAS THE INTERRUPTION (HOURS, DAYS, WEEKS ETC.)

8. HOW COULD THIS HAZARD OR IMPACT BE PREVENTED, FIXED OR ALLEVIATED?

Outreach Activity #3: 2022 East Carroll Parish Hazard Mitigation Plan Public Review

Date: Ongoing

Location: SDMI Hazard Mitigation Website

Public Initiation: Yes

After an initial review by the East Carroll Parish Planning Committee was completed, the 2022 East Carroll Parish Hazard Mitigation Plan was made available for public review and comment. The plan was hosted on SDMI's Hazard Mitigation website: <https://hmplans.sdmi.lsu.edu/Home/Parish/east-carroll>

This Page Left Intentionally Blank

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 East Carroll Parish Hazard Mitigation Steering 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 other applicable 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 buildings. 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

East Carroll 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 Planning 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 Planning 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 Planning Committee will continue to be comprised of the same job functions as currently evident in the Planning 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

East Carroll Parish has developed a method to ensure monitoring, evaluating, and updating of the HMP occurs during the five-year cycle of the plan. The steering committee will become a permanent body and will be responsible for monitoring, evaluating, and updating of the plan. The steering committee meeting will be held annually in order to monitor, evaluate, and update the plan. The East Carroll 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 fully 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 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) Any new or existing procedures that can be done more efficiently
- 4) Any additional ways to gain more diverse and widespread cooperation
- 5) 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 Steering 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 indicates a substantial change in hazard profile and risk assessment in the parish.

Additionally, the public will be canvassed to solicit public input to continue East Carrol 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 Planning 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 Planning 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.

2022 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 2022 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 East Carroll Parish Hazard Mitigation Plan Planning Committee and participating jurisdictions to determine additional implementation procedures when appropriate. This may include integrating the requirements of the East Carroll Parish Hazard Mitigation Plan into each jurisdiction's planning documents, processes, or mechanisms as follows:

- Ordinances, Resolutions, Regulations
- Floodplain Ordinances
- Capital Improvement Plans
- Economic Development Plans
- Emergency Operations Plans
- Continuity of Operations Plans
- Transportation Plan

Opportunities to integrate the requirements of this plan into other local planning mechanisms will continue to be identified through future meetings of the East Carroll 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.). While there have been no instances of the mitigation strategy being incorporated into other planning documents since the adoption of the 2016 East Carroll Hazard Mitigation Plan, the committee members recognize the importance of a holistic approach across all planning efforts and will use their standing to integrate the mitigation strategy outlined in the 2022 East Carroll Hazard Mitigation Plan into other planning documents when appropriate.

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 Village of Lake Providence, East Carroll Parish Police Jury 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:

Unincorporated East Carroll Parish			
<i>Capital Improvements Plan</i>	Updated as needed	East Carroll Parish Police Jury	✓
<i>Continuity of Operations Plan</i>	Updated as needed	East Carroll Parish OHSEP	✓
<i>Local Emergency Operations Plan</i>	Updated as needed	East Carroll Parish OHSEP	✓
<i>Transportation Plan</i>	Updated as needed	East Carroll Parish OHSEP	✓
<i>Economic Development Plan</i>	Updated as needed	East Carroll Parish Police Jury	✓

Town of Lake Providence			
<i>Local Emergency Operations Plan</i>	Updated as needed	Town of Lake Providence Mayor's Office	✓
<i>Continuity of Operations Plan</i>	Updated as needed	East Carroll Parish OHSEP	✓

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 may include:

- 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.

Appendix C: Critical Facilities

Critical Facilities within the East Carroll Parish Planning Area

East Carroll Parish Planning Area Critical Facilities									
Type	Name	Drought	Flooding	Levee Failure	Thunderstorms	Tornadoes	Tropical Cyclones	Wildfires	Winter Weather
Civil Government	East Carroll Parish Courthouse				X	X	X		X
	East Carroll Parish Communications				X	X	X		X
	East Carroll Parish Police Jury Complex				X	X	X		X
	East Carroll Parish School Board				X	X	X	X	X
	Lake Providence City Mayor				X	X	X	X	X
Fire & SAR	Bowie Station				x	x	x		x
	Elmwood Fire Station				X	X	X		X
	Highland Fire Station				X	X	X		X
	Lake Providence Fire Station				X	X	X	X	X
	Lanes Ferry Fire Station				X	X	X		X
	Transylvania Fire Station				X	X	X		X
Law Enforcement	East Carroll Detention Center				X	X	X		X
	East Carroll Parish Sheriff's Office				x	x	x	X	x
	Lake Providence Police Department				X	X	X	X	X
	Riverbend Detention Center				X	X	X		X
Public Health	East Carroll Parish Health Unit				X	X	X	X	X
	East Carroll Parish Hospital				X	X	X	X	X
Schools	General Trass High School				X	X	X		X
	Griffin Middle Academy				X	X	X	X	X
	Southside Elementary School				X	X	X	X	X

This Page Left Intentionally Blank

Appendix D: Plan Adoption

East Carroll Parish

UNITED STATES OF AMERICA
STATE OF LOUISIANA
PARISH OF EAST CARROLL

RESOLUTION

A RESOLUTION ADOPTING THE EAST CARROLL PARISH HAZARD MITIGATION PLAN 2022

WHEREAS, the Parish of East Carroll has prepared a multi-hazard mitigation plan hereby known as the EAST CARROLL PARISH HAZARD MITIGATION PLAN 2022 in accordance with the Disaster Mitigation Act of 2000: and

WHEREAS, the Parish of East Carroll has participated in the process to prepare a DMA compliant Hazard Mitigation Plan based in the FEMA guidance available in the How to Guides;

WHEREAS, the Parish of East Carroll is participating in the Hazard Mitigation Plan prepared by the East Carroll Parish Government under the oversight of a Steering Committee comprised of Parish-Wide representatives;

WHEREAS, East Carroll Parish and local city representatives and governments have participated in the mitigation planning process;

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

WHEREAS, the Plan has been recommended for adoption by the steering committee;

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

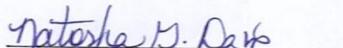
- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program

Therefore, the East Carroll Parish Police Jury does hereby adopt the East Carroll Parish Hazard Mitigation Plan Update 2022.

ADOPTED by a vote of 5 in favor and 0 against, and 0 abstaining, and 0 absent, on this 13th Day of December, 2022.


Kendall Thompson, President

ATTEST:


Natosha G. Davis, Secretary-Treasurer

Town of Lake Providence

Town of Lake Providence***EXECUTIVE DEPARTMENT******201 SPARROW STREET
LAKE PROVIDENCE, LA 71254******TELEPHONE: 318-559-2288
FAX: 318-559-3442******RESOLUTION # 3-2023******A Resolution adopting the Town of Lake Providence Hazard Mitigation Plan 2022***

WHEREAS, the Town of Lake Providence has prepared a multi-hazard mitigation plan hereby known as the East Carroll Parish Hazard Mitigation Plan 2022 in accordance with the Disaster Mitigation Act of 2000, and

WHEREAS, the Town of Lake Providence has participated in the process to prepare the DMA compliant Hazard Mitigation Plan based in the FEMA guidance available in the How to Guides;

WHEREAS, the Town of Lake Providence is participating in the Hazard Mitigation Plans prepared by the East Carroll Parish Government under the oversight of the Steering Committee comprised if the Parish-wide representatives;

WHEREAS, East Carroll and the local city representatives and governments have participated in the mitigation planning process;

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

WHEREAS, the plan has been recommended for adoption by the steering committee;

WHEREAS, adoption of the Plan is required prior to further consideration for FEMA funding under the following programs: Pre-Disaster Mitigation, Hazard Mitigation Grant Program and Flood Mitigation Assistance Program;

NOW THEREFORE, BE IT RESOLVED that during the regular council meeting held January 19, 2023, does hereby adopt the East Carroll Parish Hazard Mitigation Plan Update 2022. This resolution having been submitted to a vote, the votes were as follows:

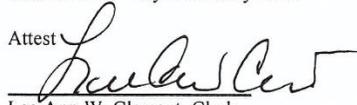
Yeas: Alderman Condrey, Middlebrook, Magee, Roberson, Crye

Nays: None

Absent: None

Thus done 19th day of January 2023

Attest


Lee Ann W. Clement, Clerk


Robert N. Amacker, Jr. Mayor

Appendix E: State Required Worksheets

During the planning process (*Appendix A: Planning Process*), the Hazard Mitigation Plan Update Steering Committee was provided state-required plan update process worksheets to be filled out. The worksheets were presented at the Initial Planning Meeting by SDMI as tools for assisting in the update of the Hazard Mitigation Plan, but also as a state requirement for the update. The plan update worksheets allowed for collection of information such as planning team members, community capabilities, community infrastructure, vulnerable populations and NFIP information. The following pages contain documentation of the state required worksheets.

Mitigation Planning Team

East Carroll Parish Hazard Mitigation Planning Committee			
Name	Title	Agency	Email
Kenneth Baker	Director	East Carroll Parish OHSEP	ecpjoep@bayou.com
Jerry Bell	Outgoing Mayor	Town of Lake Providence	jdbjr13@yahoo.com
Robert Amacker	Mayor Elect	Town of Lake Providence	lakeprovidence@bellsouth.net
Lee Ann W. Clement	Clerk	Town of Lake Providence	
Myrtle Green	Director	West Carroll Parish OHSEP	directorwcpoep@yahoo.com

Capability Assessment

Unincorporated East Carroll Parish

Capability Assessment Worksheet - Unincorporated East Carroll Parish		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
Planning and Regulatory		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
Plans	Yes / No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	5 YEARS
Continuity of Operations Plan	Yes	ANNUAL
Transportation Plan	Yes	AS NEEDED
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
Building Code, Permitting and Inspections	Yes / No	Comments
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	PARISH AND TOWN EACH HAS OWN PLAN
Site plan review requirements	Yes	
Land Use Planning and Ordinances	Yes / No	Comments
Zoning Ordinance	No	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	
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	No	
Mitigation Planning Committee	Yes	Pemac Committee
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	No	
Staff	Yes / No	Comments
Chief Building Official	No	Have an approved official in Monroe
Floodplain Administrator	Yes	
Emergency Manager	Yes	
Community Planner	No	
Civil Engineer	No	Hired for specific
GIS Coordinator	Yes	
Grant Writer	No	
Other	N/A	
Technical	Yes / No	Comments
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Code Red
Hazard Data & Information	Yes	Inside of Plans
Grant Writing	No	
Hazus Analysis	No	
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	No	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	Yes	SHSP and EMPG-HOMELAND SECURITY GRANT

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	Fema Courses	

Town of Lake Providence

Capability Assessment Worksheet – Town of Lake Providence		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
Planning and Regulatory		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
Plans	Yes / No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Parish Plan
Continuity of Operations Plan	Yes	Parish Plan
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	Yes	Evacuation Plan
Building Code, Permitting and Inspections	Yes / No	Comments
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
Land Use Planning and Ordinances	Yes / No	Comments
Zoning Ordinance	Yes	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	
Flood Insurance Rate Maps	Yes	
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	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	Yes / No	Comments
Chief Building Official	Yes	Relies on Parish
Floodplain Administrator	Yes	Relies on Parish
Emergency Manager	Yes	Relies on Parish
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Grant Writer	No	
Other		
Technical	Yes / No	Comments
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	
Hazard Data & Information	Yes	
Grant Writing	No	
Hazus Analysis	No	
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	Yes	

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	Yes	
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other		

Building Inventory

East Carroll Parish Building Inventory								
East Carroll Unincorporated								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Delta Economic Energy District	Civil Government	Nearby: 308 1st Street	Lake Providence	32.80332882	-91.17004704	21,767	Unknown	Brick
East Carroll Parish Courthouse	Civil Government	400 1st Street #6	Lake Providence	32.80377722	-91.17338154	4,443	1/1/1932	Concrete
East Carroll Parish Police Jury Complex	Civil Government	400 1st Street	Lake Providence	32.80375692	-91.17328359	4,443	1/1/1932	Concrete
East Carroll Council on Aging	Civil Government	600 1st Street	Lake Providence	32.80420743	-91.17533157	18,636	Unknown	Wood
East Carroll Parish School Board	Civil Government	514 3rd St.	Lake Providence	32.80221193	-91.17539525	9,660	Unknown	Brick
East Carroll Parish Sheriff's Office	Law Enforcement	301 1st St.	Lake Providence	32.8038657	-91.17179038	7,546	1/1/1980	Brick
East Carroll Detention Center	Law Enforcement	219 Hollybrook Road	Hollybrook	32.73558481	-91.18332586	6,148	1/1/1955	Metal Bldg
Riverbend Detention Center	Law Enforcement	9450 U.S. 65	Lake Providence	32.77810019	-91.179297	396,340	Unknown	Metal Bldg
East Carroll Ambulance Service	Emergency Medical Services	505 Lake Street	Lake Providence	32.80667137	-91.17371972	3,044	1/1/1953	Brick
East Carroll Parish Hospital	Hospital or Medical Center	336 N. Hood Street	Lake Providence	32.81054171	-91.1723643	115,453	Unknown	Brick
East Carroll Health Unit	Public Health	407 2nd St.	Lake Providence	32.80322743	-91.1732875	Unk	1/1/2010	Metal Bldg
Highland Fire Station	Fire Search and Rescue	5052 U.S. 65	Shelburn	32.87177143	-91.22560561	18,750	1/1/1980	Metal Bldg
Transylvania Fire Station	Fire Search and Rescue	311 Sparrow Street	Transylvania	32.67824296	-91.18324321	18,850	1/1/1980	Metal Bldg
Elmwood Fire Station	Fire Search and Rescue	4361 Lanes Ferry Road		32.74754256	-91.33931053	18,767	1/1/1980	Metal Bldg
Lanes Ferry Fire Station	Fire Search and Rescue	9220 Louisiana 2		32.85962897	-91.3375953	13,910	1/1/1980	Metal Bldg
Bowie Fire Station	Fire Search and Rescue	4037 Hwy 134		32.74013175	-91.27335194	18,767	1/1/1980	Metal Bldg
Southside Elementary School	Education	1307 Gould Blvd	Lake Providence	32.79506061	-91.18501689	24,753	Unknown	Brick
Griffen Middle Academy	Education	1205 Charles Jones Blvd	Lake Providence	32.79610749	-91.18506346	24,753	Unknown	Brick
General Trass High School	Education	700 Martin Luther King Drive	Lake Providence	32.80085618	-91.17713082	48,300	1/1/1990	Brick

Town of Lake Providence								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Lake Providence Fire Station	Fire Search and Rescue	311 Sparrow Street	Lake Providence	32.80164557	-91.17137174	\$983	1989	Metal building
Lake Providence City Complex	Civil Government	201 Sparrow St.	Lake Providence	32.80309729	-91.17071544	\$12,330	1985	Brick
Lake Providence Police Department	Law Enforcement	201 Sparrow St	Lake Providence	32.80304256	-91.17050069	See Above	See Above	See Above
Lake Providence Sanitation Department	Civil Government	105 Church St.	Lake Providence	32.80495946	-91.16864565	\$1,772		
East Carroll Parish School Board - Special Education Services	Civil Government	603 4th Street	Lake Providence	32.80213396	-91.17618696	\$13,950	1986	Brick
Byerley Airport	Airports and Airfields	Nearby: 617 Schneider Lane	Lake Providence	32.82111852	-91.18597477	8677	1970	Metal building

Vulnerable Populations

Vulnerable Populations Worksheet					
East Carroll Parish and Jurisdictions					
All Hospitals (Private or Public)	Address	City	Zip Code	Latitude	Longitude
East Carroll Parish Hospital	336 North Hood St.	Lake Providence	71254	32.81054171	-91.1723643
Nursing Homes (Private or Public)	Address	City	Zip Code	Latitude	Longitude
Shady Lake Nursing & Rehabilitation Center	5976 Hwy 65	Lake Providence	71254	32.84683025	-91.22506589
Mobile Home Parks	Address	City	Zip Code	Latitude	Longitude
Unknown Trailer Park	Nearby: 301 Church Street	Lake Providence	71254	32.80623471	-91.16824073

National Flood Insurance Program (NFIP)

National Flood Insurance Program (NFIP)		
	East Carroll Unincorporated	Town of Lake Providence
Insurance Summary		
How many NFIP policies are in the community? What is the total premium and coverage?	PIF: 94; Total Premium: \$58,074.00; Total Coverage: \$24,575,000.00	PIF: 94; Total Premium: \$58,074.00; Total Coverage: \$24,575,000.00
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?	Paid Claims: 139; Total Amount of Paid Claims: \$2,100,595.00; 31 SD	Paid Claims: 139; Total Amount of Paid Claims: \$2,100,595.00; 31 SD
How many structures are exposed to flood risk with in the community?		
Describe any areas of flood risk with limited NFIP policy coverage.		
Staff Resources		
Is the Community FPA or NFIP Coordinator certified?	No	No
Is flood plain management an auxiliary function?	Yes	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)		
What are the barriers to running an effective NFIP program in the community, if any?	Staffing, funding	Staffing, funding
Compliance History		
Is the community in good standing with the NFIP?	Yes	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact(CAC)?	CAV: 3/16/2017; CAC: 7/31/2008	CAV: 3/16/2017; CAC: 7/31/2008
Is a CAV or CAC scheduled or needed? If so when?	No	No
Regulation		
When did the community enter the NFIP?	E: 5/11/1973; R: 11/15/1985	E: 5/11/1973; R: 11/15/1985
Are the FIRMs digital or paper?	Paper	Paper
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meets - Level B ordinance	Meets - Level B ordinance
Community Rating System (CRS)		
Does the community participate in CRS?	No	No
What is the community's CRS Class Ranking?	N/A	N/A
Does the plan include CRS planning requirements?		