2024 TENSAS PARISH MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

UNINCORPORATED TENSAS PARISH,
NEWELLTON, ST. JOSEPH,
WATERPROOF

TENSAS PARISH OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS LOUISIANA

TENSAS PARISH
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN UPDATE

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Tensas Parish

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This 2024 Tensas Parish Hazard Mitigation Plan Update was coordinated by the Tensas Parish Hazard Mitigation Plan Update Planning Committee, in collaboration with community stakeholders and the general public. The participating jurisdictions are made up of the following communities:

Unincorporated Tensas Parish
Village of Newellton
Village of St. Joseph
Village of Waterproof

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Contents

1. Introduction

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

In that regard, this plan (a) documents the Tensas 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 Tensas 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 Tensas Parish Hazard Mitigation Plan is a multi-jurisdictional plan that includes the following jurisdictions which participated in the planning process:

- Unincorporated Tensas Parish
- Village of Newellton
- Village of St. Joseph
- Village of Waterproof

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 Tensas 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 Tensas Parish and its communities with a blueprint for reducing the impacts of these natural hazards on people and property.

Geography, Population and Economy

Geography

Tensas Parish is located in the northeast portion of the State of Louisiana, along the west bank of the Mississippi River. To the north are Madison Parish and Warren County, Mississippi; to the south are Catahoula Parish, Concordia Parish, and Adams County, Mississippi; to the east are Claiborne and Jefferson Counties, Mississippi; to the west is Franklin Parish.

Since it is in the meander belt of the Mississippi River, water dominates the geography of Tensas Parish. Dozens of lakes, bayous, and sloughs are crowded between the two rivers that form its eastern and west boundaries. In Tensas Parish, water drains away from the Mississippi levees in a southwesterly direction. From the Tensas River, on the other hand, water drains to the east. Water accumulates in the center of the parish but is taken back into the Tensas River by the larger bayous.

Figure 1-1: Location of Tensas Parish in the State of Louisiana

Figure 1-2: Incorporated Jurisdictions within Tensas Parish

Tensas Parish's climate is signified as humid-subtropical, which is consistent amongst the entirety of the state of Louisiana. 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 68ºF. January is typically the coldest month for Louisiana, averaging approximately 54ºF, while July is typically the warmest at an average of 83ºF. Winter months are usually mild with cold spells of short duration. For Tenas 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 57 inches. Tenas Parish is susceptible to the normal weather dangers, such as thunderstorms and flooding, and tornadoes. Even though Tensas Parish is roughly 185 miles from the Gulf of Mexico, the state of Louisiana's proximity to the Gulf makes the parish susceptible to tropical cyclone events. Hurricane season lasts from June 1st to November 30th, with most hurricanes forming in August, September, and October.

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

As noted above, Tensas Parish is located in the north-eastern region of Louisiana.

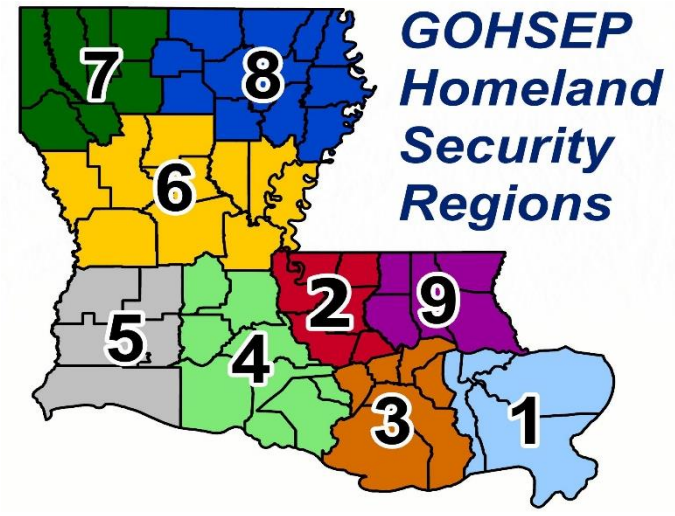

Figure 1-3: Louisiana Homeland Security Regions

Population

The population of Tensas Parish is estimated at 4,147 (2020 Census) with a population percent change from April 1, 2010 – April 1, 2020 of -26.65%.

Table 1-1: Tensas Parish Population
(Source: US Census)

	2010 Census	2016 Estimate	2020 Census	Percent Change 2010 - 2020
Total Population	5,252	4,830	4,147	-26.65%
Population Density (Pop/Sq. Mi.)	8.7		6.9	-26.09%
Total Households	2,049	2,049	1,593	-28.63%
Persons Per Household			2.83	-------

Economy

The State of Louisiana is the nation's third leading manufacturer of pulp wood and softwood plywood, and Tensas Parish is one of the largest producers of timber in the state. The parish has forests of pine, oak, gum, cypress, mixed oak-pine, oak-hickory, and elm-ash-cottonwood trees. With these vast natural resources, Tensas Parish and wood chip plants, saw mills, and a particleboard plant located within its boundaries.

The parish was developed for cotton agriculture, which dominated the economy through the early 20th century. There has also been some cattle ranching in the 1930s and timber extraction. Agricultural crops are produced on 181,000 acres, with the primary crops being cotton, corn, soybeans, grain sorghum and rice. Other major employment industries within Tensas Parish include retail/wholesale trade, healthcare, and the parish government.

Table 1-2: Tensas Parish Business Patterns
(Source: US Census, CBP)

Business Description	Number of Establishments	Annual Payroll ($1,000)	Number of Employees
Agriculture, forestry, fishing and hunting	7	695	15
Construction	4	420	15
Manufacturing	5	12,096	193
Wholesale trade	14	7,479	149
Retail trade	30	7,806	327
Transportation and warehousing	16	10,010	163
Information	4	421	7
Finance and insurance	14	8,431	67
Real estate and rental and leasing	11	420	15
Professional, scientific, and technical services	8	479	14
Administrative and support and waste management and remediation services	6	6,176	203
Educational services	3	842	38
Health care and social assistance	29	29,257	1,027
Arts, entertainment, and recreation	8	912	58
Accommodation and food services	18	2,564	223
Other services (except public administration)	10	435	32

Hazard Mitigation

To fully understand hazard mitigation efforts in Tensas 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.

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

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.

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 2024 Tensas Parish Hazard Mitigation Plan (HMP) maintains much of the information from the 2019 plan version, but it now incorporates the order and methodologies of the 2019 Louisiana State Hazard Mitigation Plan.

The sections in the 2019 Tensas 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 Tensas Parish Hazard Mitigation Planning 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 2024 update. This plan update remains coherent with those documents, retaining language and content when needed, deleting it when appropriate, and augmenting it when constructive.

2024 Plan Update

This 2024 plan update proceeds with the previous goals of the Tensas Parish Hazard Mitigation Plan. The current goals are as follows:

1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact
2. Improve data collection, use, and sharing to reduce the impact of hazards
3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities
4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities

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 2023. The planning 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 2024 plan update is organized in the same format as the 2019 update, with one minor change to this 2024 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: 2024 Plan Update Crosswalk

Plan Update Crosswalk	
2019 Update	**2024 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 Tensas Parish and its communities. The extent of this risk is dictated primarily by its geographic location. Most significantly, Tensas 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 Tensas 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.

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2. Hazard Identification and Parish-Wide Risk Assessment

The risk assessment identifies and assesses a large variety of threats and hazards that impact the parish to identify a strategy for mitigation. Having identified the categories of hazards, emergencies, disasters, and catastrophes, this section describes the risks associated with each identified hazard of concern. Each section (1) defines the hazard, (2) explains how each hazard is measured, (3) provides the hazard's geographic extent, (4) analyzes the previous occurrences, (5) evaluates each hazard's future likelihood of occurrence, and (6) identifies the worst-case scenario for each hazard.

The following steps were used to define the risk of each hazard:

- Profile and describe each hazard
  - Geographic areas most affected by the hazard
  - Previous occurrences and detailed description of events occurring in the last 5-years
  - Occurrence probability/frequency estimates
  - Worst-case scenarios
- Determine exposure to each hazard
  - Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them would be exposed to each hazard
  - Vulnerability analysis for people and infrastructure

The primary source for historical data used throughout the risk assessment is the National Centers for Environmental Information (NCEI) Storm Events Database, which provides natural hazard event data from 1950 to the present. In staying consistent with climatological studies, the NCEI Storm Events Database was evaluated for the past 31 years (1993 – 2023) to determine the future probability and frequency of a hazard occurring when data was available.

Data Limitations

Throughout the planning process, every effort was made to use the best available data. Much of the historic natural-hazard occurrence information was obtained through the National Oceanic and Atmospheric Administration's (NOAA) NCEI. The NCEI Storm Events Database contains data from January 1950 to the present (i.e., within the past few months); however, there are some issues with events recorded prior to 1996. From the years 1950 to 1954, the NCEI Storm Events Database only contain information on tornado events, until thunderstorm wind and hail events were added to the database for the time period between 1955 and 1992. All event types identified in the National Weather Service (NWS) Directive 10-1605 (48 in total) are recorded from 1996 to the present. For these hazards, only 27 years (1996 – 2023) worth of data was evaluated to determine the future probability and frequency of a hazard occurring. Additionally, property damage and crop damage estimates from the NCEI Storm Events Database are a "best guess" based on all available data at the time of the event publication.

The NCEI Storm Events Database does not record all events, only occurrences that have sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. Even then, there are events that may not be covered due to changes in data collection and processing procedures over time. Also, events such as tornadoes or hailstorms rely heavily on eye-witness accounts which creates a reporting bias in urban areas. The inception of Doppler radar in 1980 significantly decreased this bias, especially for tornado events, but records prior to 1980 are not as detailed or complete as post 1980-records.

The Storm Prediction Center (SPC) National Severe Weather Database browser examines convective/thunderstorm-related winds only and does not include wind data from hurricane or non-thunderstorm wind damage. This data contains measured and estimated wind gusts including wind damage without estimated wind speeds. For many observations, this results in several thunderstorm wind events with no estimated or actual wind speed estimates.

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in an approximation of risk. These estimates may be used to understand the relative risk from hazards and potential losses. However, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning hazards and their effects on the built environment, as well as approximations and simplifications that are necessary for a comprehensive analysis.

Identifying Hazards

Several emergency management and hazard mitigation documents at the state and local levels were reviewed to identify a comprehensive list of hazards that may impact the parish. These documents addressed a wide range of hazards including natural, technological, and human-caused. The two main documents referenced in finalizing the parish's comprehensive hazard list were the 2019 Hazard Mitigation Plan for the parish and the state of Louisiana's 2019 Hazard Mitigation Plan. Typically, unless otherwise noted in the plan, all hazards previously identified in the parish's 2019 Hazard Mitigation Plan and all hazards in the state of Louisiana's 2019 Hazard Mitigation Plan identified as medium or high risk by the state are profiled in the risk assessment. The table below provides a comprehensive list of the hazards selected based on the above criteria.

Table 2-1: Hazard Profile Summary.

Hazard	Profiled in Last Plan	Considered Medium or High Risk in the State's HM Plan	Profiled in the 2024 Update
Drought	X		X
Excessive Heat	X		X
Flooding	X	X	X
Levee Failure	X		+
Sinkholes	X		X
Thunderstorms (Hail, Lightning, & Wind)	X	X	X
Tornadoes	X	X	X
Tropical Cyclones	X		X
Wildfires	X		X
Winter Weather	X		X

+ Data Deficiency

Historical Context and Previous Occurrences

The following table and figures display past Presidential Declaration occurrences and provides background on the type of natural disasters that have affected the parish in the past.

Table 2-2: Major Disaster Declarations in the Parish.

Disaster Number	Year	Declaration
374	4/27/1973	Severe Storms and Flooding
904	5/3/1991	Severe Storms, Tornadoes, and Flooding
1603	8/29/2005	Tropical Cyclone – Hurricane Katrina
1607	9/24/2005	Tropical Cyclone – Hurricane Rita
1668	11/2/2006	Severe Storms and Flooding
1786	9/2/2008	Tropical Cyclone – Hurricane Gustav
3322	5/6/2011	Flooding
4015	8/18/2011	Flooding
4080	8/29/2012	Tropical Cyclone – Hurricane Isaac
4484	3/24/2020	COVID-19 Pandemic
3527	6/7/2020	Tropical Cyclone – Tropical Storm 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 – Tropical Storm Zeta
3556	2/18/2021	Severe Winter Storm
4590	3/9/2021	Severe Winter Storms
4611	8/29/2021	Tropical Cyclone – Hurricane Ida
3574	9/13/2021	Tropical Cyclone – Tropical Storm Nicholas

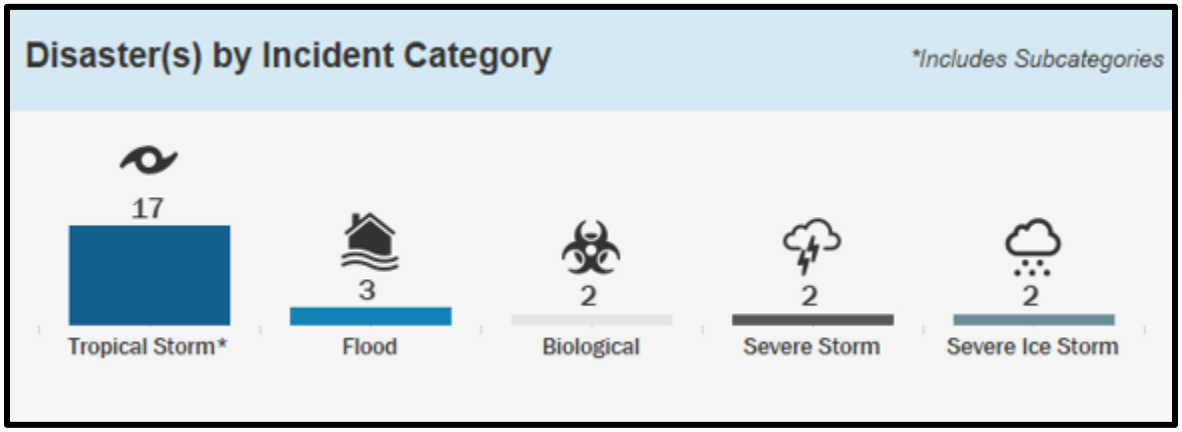


Figure 2-1: Presidential Disaster Declarations for the Parish by Disaster Type Since 1950. (Source: FEMA Disaster Declarations Summary: Open Government Dataset)

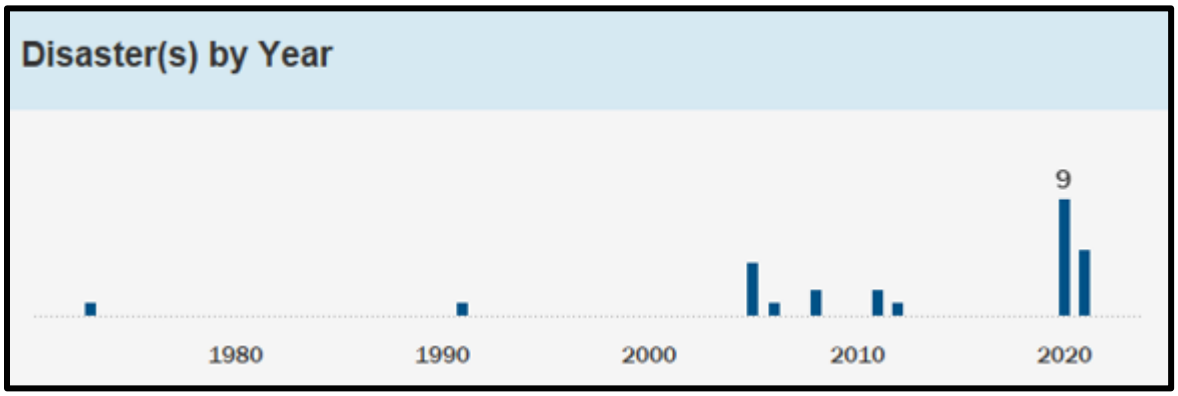


Figure 2-2: Total Presidential Disaster Declarations Yearly Totals for the Parish from 1950 to 2023. (Source: FEMA Disaster Declarations Summary: Open Government Dataset)

Probability of Future Threats and Hazards

The probability of each hazard occurring in the parish is estimated in the following table:

Table 2-3: Probability of Future Hazard Reoccurrence.

Hazard	Probability			
	Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
Drought	21%	21%	21%	21%
Excessive Heat	4%	4%	4%	4%
Flooding	57%	32%	39%	25%
Levee Failure	< 1%	< 1%	< 1%	< 1%
Sinkholes	< 1%	< 1%	< 1%	< 1%
Thunderstorm Hail	100%	100%	100%	100%
Thunderstorm Lightning	4%	4%	4%	4%
Thunderstorm Winds	100%	100%	100%	100%
Tornadoes	39%	39%	39%	39%
Tropical Cyclones	23%	23%	23%	23%
Wildfires	< 1%	< 1%	< 1%	< 1%
Winter Weather	50%	50%	50%	50%

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 of the 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 within the parish that suffer disproportional damage compared to other areas, or overall exposure of the entire parish to flooding. Identifying and understanding vulnerability to each threat and hazard provides a strong foundation for developing and pursuing mitigation actions.

The vulnerability analysis 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. To complete the analysis, the 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 analysis should be used to understand the 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 and 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.

Vulnerability Analysis Methodology

To direct the vulnerability analysis effort for the parish, two distinct methodologies were applied. The first includes a quantitative analysis that relies upon the best available data and technology, while the second methodology includes a qualitative analysis that relies more on local knowledge and rational decision-making. Upon completion, the methodologies are combined to create a vulnerability analysis that allows for some degree of quality control and assurance. The quantitative assessment focuses on potential hazard loss estimates, while the qualitative assessment is comprised of a scoring system built around values assigned by the Planning Team as to the likelihood of occurrence, spatial extent, and potential impact of each hazard.

Quantitative Methodology

The quantitative methodology consists of utilizing Hazus, a geographic information system (GIS)-based loss estimation software available from the Federal Emergency Management Agency (FEMA), as well as a detailed GIS-based approach independent of the Hazus software. These two GIS-based studies together help form a quantitative vulnerability analysis. GIS technology allows 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.

Additionally, the National Risk Index developed by FEMA was utilized to determine the composite risk to 18 natural hazards to include avalanche, coastal flooding, cold wave, drought, earthquake, hail, heat wave, hurricane, ice storm, landslide, lightning, riverine flooding, strong wind, tornado, tsunami, volcanic activity, wildfire, and winter weather. Historic loss ratio, expected annual loss, and overall risk factor for any of the above hazards which are profiled in this plan are provided in the vulnerability analysis to provide further context on the risk associated to the hazard. Expected annual loss and the risk factor are calculated using the following formulas:

Expected Annual Loss = Exposure * Annualized Frequency * Historic Loss Ratio

Risk Index = Expected Annual Loss * Social Vulnerability / Community Resilience

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 the 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. Adapted 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 five categories is totaled together for a final score. The highest possible Risk Factor is a 4.0.

Risk Factor = [(Probability * 0.25) + (Impact * 0.25) + (Spatial Extent * 0.20) + (Warning Time *0.15) + (Duration * 0.15)]

Priority Risk Index and Hazard Risk

Hazard risk is determined by calculating the Risk Factor for each hazard impacting the 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 a risk factor of 2.5 or greater. Risk factors ranging from 2.0 to 2.4 are deemed moderate risk hazards while hazards with risk factors less than 2.0 are considered low risk.

Table 2-4: 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 2-5: 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

Vulnerability Analysis (NRI & PRI)

The first table is the overall risk associated with each threat and hazard with 2.5 or above deemed high risk, 2.0 to 2.4 deemed medium risk, and less than 2.0 deemed low risk. The final table summarizes the composite risk of 18 natural hazards outlined previously on the parish by expected annual loss, social vulnerability, community resilience, and overall risk rating.

Table 2-6: PRI Vulnerability Analysis for the Parish.

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	Overall Risk
Drought	3	2	4	2	3	**2.8**
Excessive Heat	2	2	4	1	2	**2.25**
Flooding	3	4	3	4	3	**3.4**
Levee Failure	1	3	4	1	3	**2.4**
Sinkhole	1	3	2	4	2	**2.3**
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 Weather	3	4	4	1	2	**3**

Table 2-7: National Risk Index (NRI) Summarization of Risk to Eighteen Natural Hazards for the Parish. (Source: National Risk Index)

Expected Annual Loss	Social Vulnerability	Community Resilience	Overall Risk Rating
Very Low	Relatively High	Very Low	Very Low

Inventory of Assets for the Entire Parish

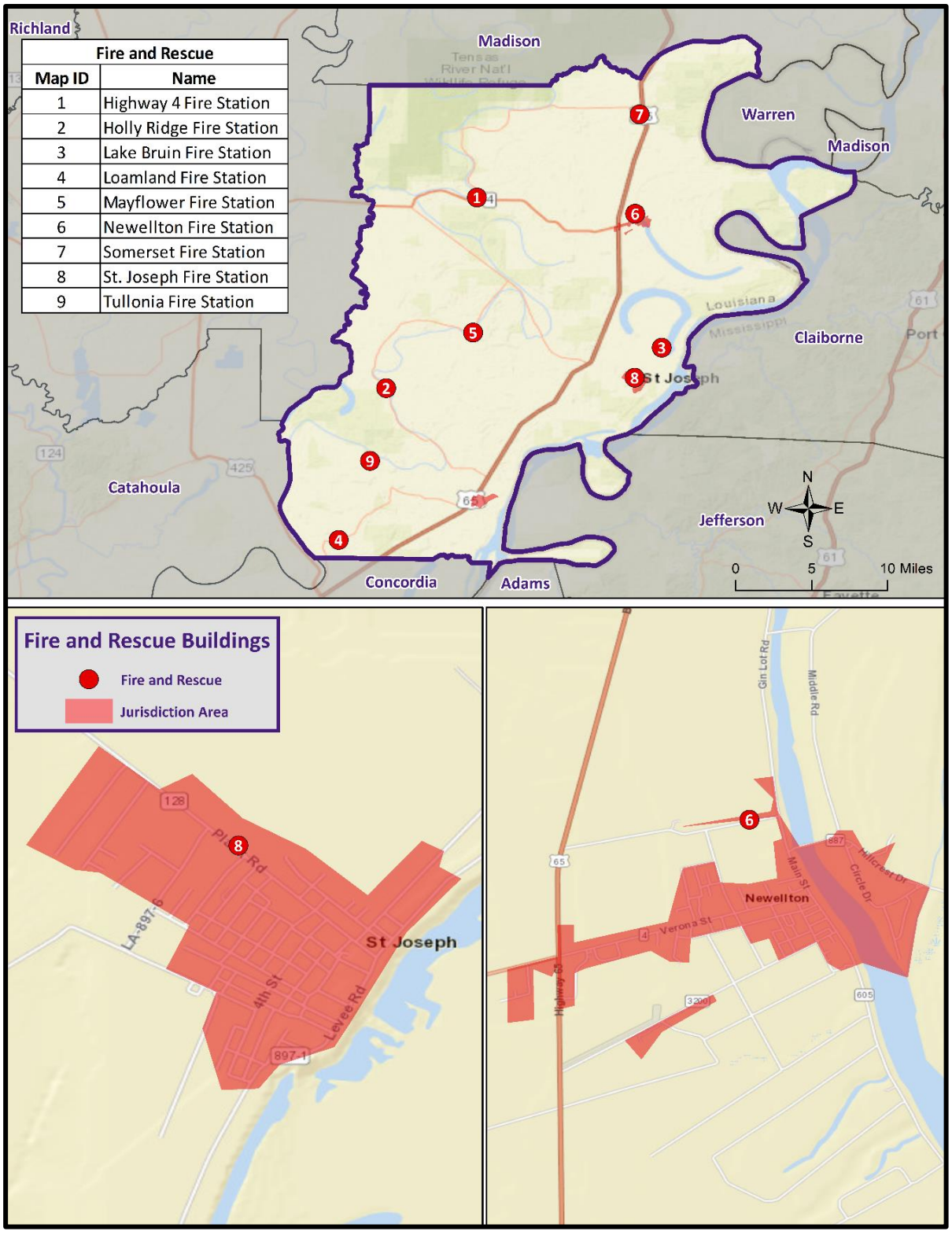
As part of the Risk Assessment, the planning team identified essential facilities throughout the parish. Within the entire planning area, there is an estimated value of $1,088,129,000 in structures throughout the parish. The table below provides the total estimated value for each type of structure by occupancy.

Table 2-8: Estimated Total of Potential Losses throughout the Parish.

Occupancy	Parish	Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
Agricultural	$44,363,000	$15,322,000	$8,684,000	$510,000	$19,847,000
Commercial	$132,343,000	$82,893,000	$24,252,000	$13,832,000	$11,366,000
Government	$14,595,000	$6,594,000	$1,337,000	$5,483,000	$1,181,000
Industrial	$31,260,000	$4,194,000	$22,372,000	$819,000	$3,875,000
Religion	$39,992,000	$18,530,000	$10,576,000	$3,886,000	$7,000,000
Residential	$810,995,000	$461,406,000	$126,622,000	$141,660,000	$81,307,000
Education	$14,581,000	$2,176,000	$9,050,000	$3,355,000	$0
Total	**$1,088,129,000**	**$591,115,000**	**$202,893,000**	**$169,545,000**	**$124,576,000**

Critical Facilities of the Parish

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



Fire and Rescue	
Map ID	Name
1	Highway 4 Fire Station
2	Holly Ridge Fire Station
3	Lake Bruin Fire Station
4	Loamland Fire Station
5	Mayflower Fire Station
6	Newellton Fire Station
7	Somerset Fire Station
8	St. Joseph Fire Station
9	Tullonia Fire Station

Figure 2-3: Fire and Rescue Facilities in the Parish.

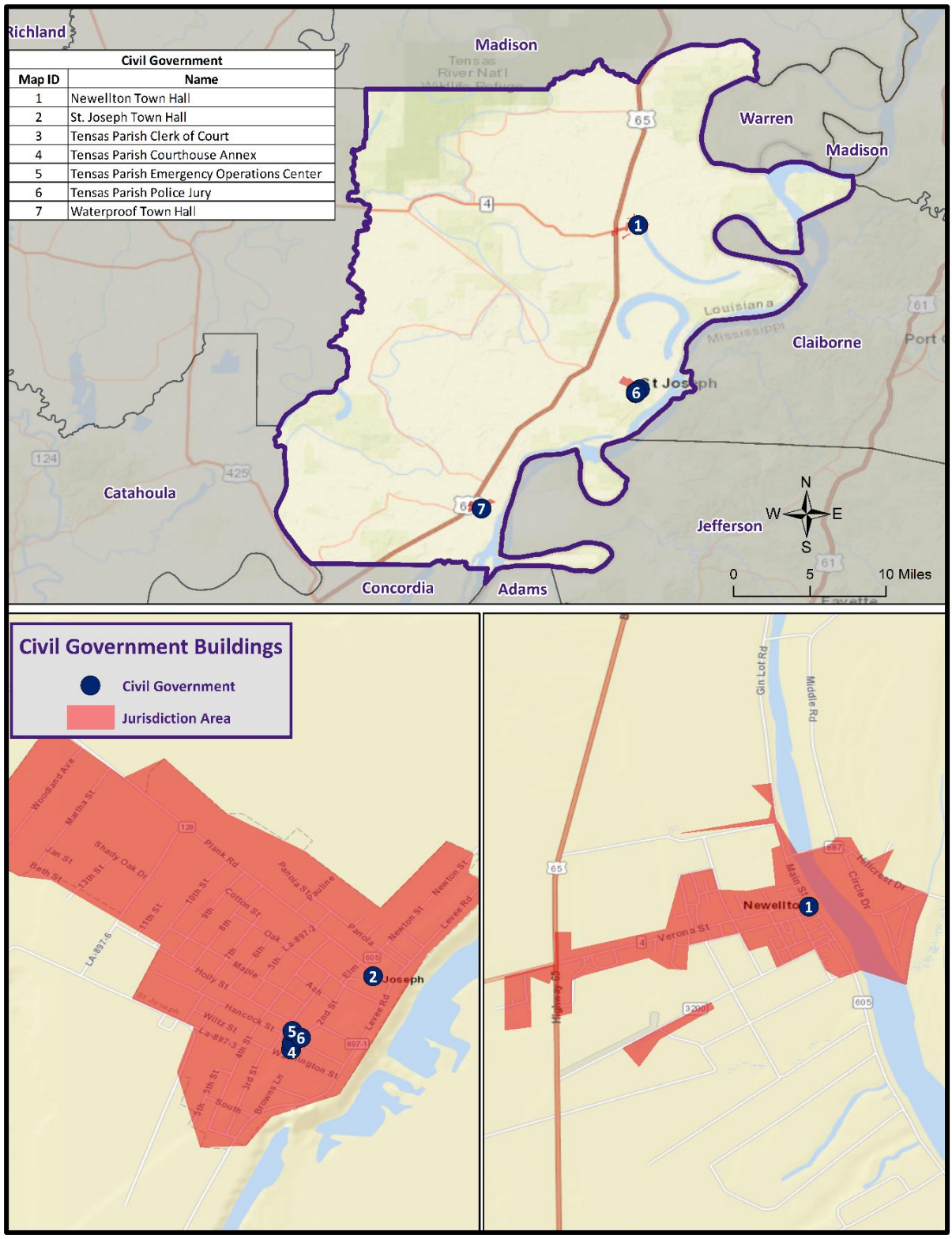


Figure 2-4: Government Buildings in the Parish.

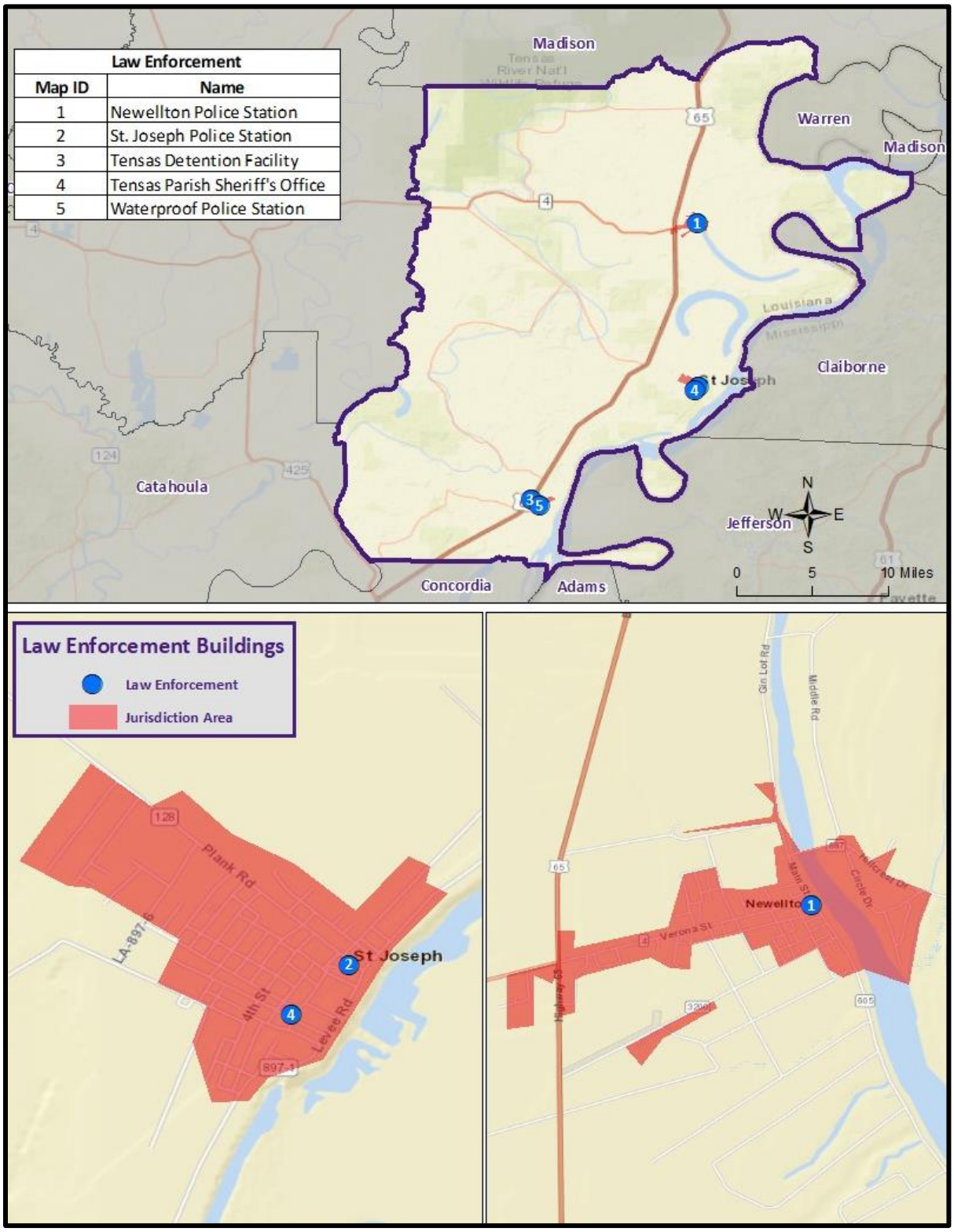


Figure 2-5: Law Enforcement in the Parish.

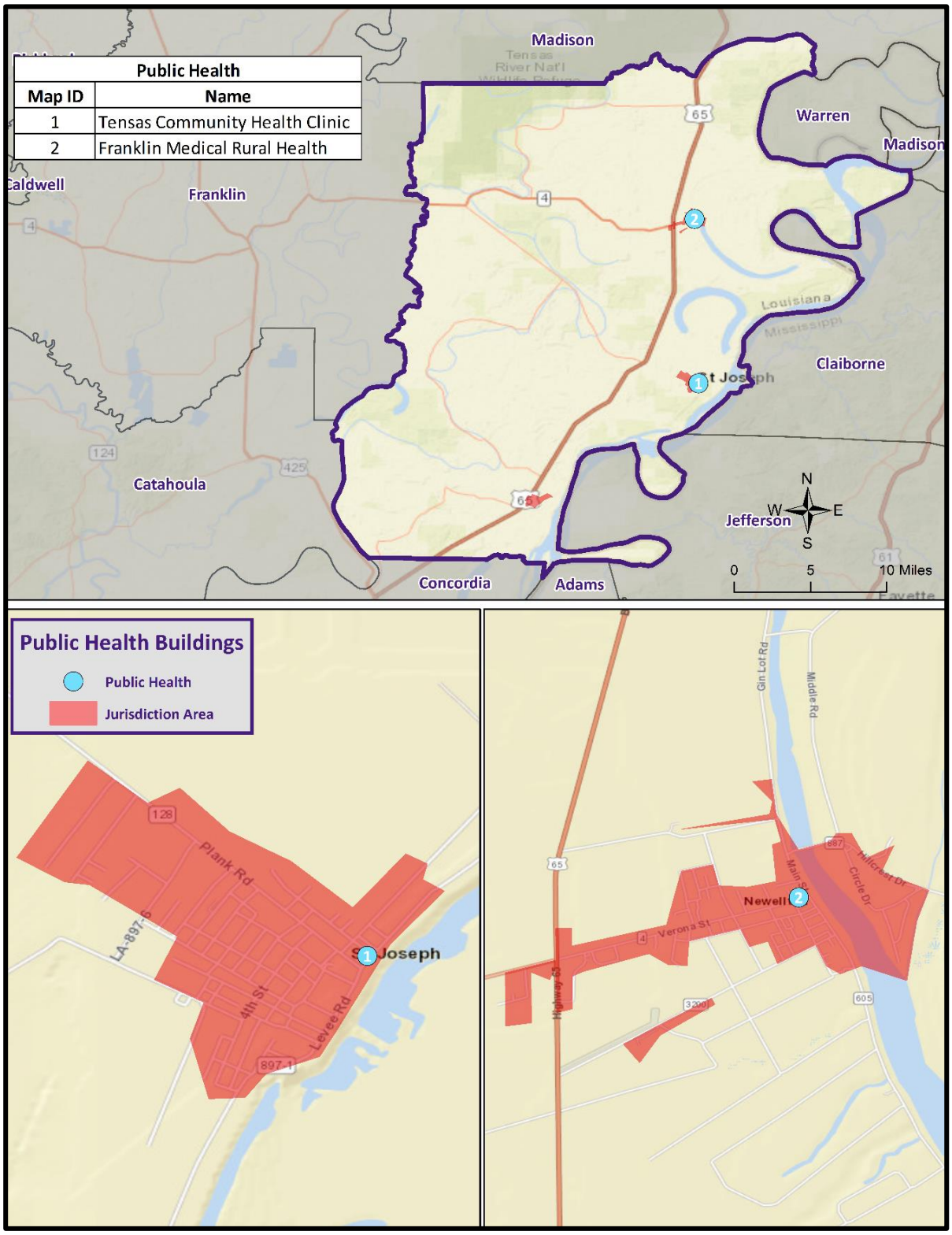


Figure 2-6: Public Health Facilities in the Parish.

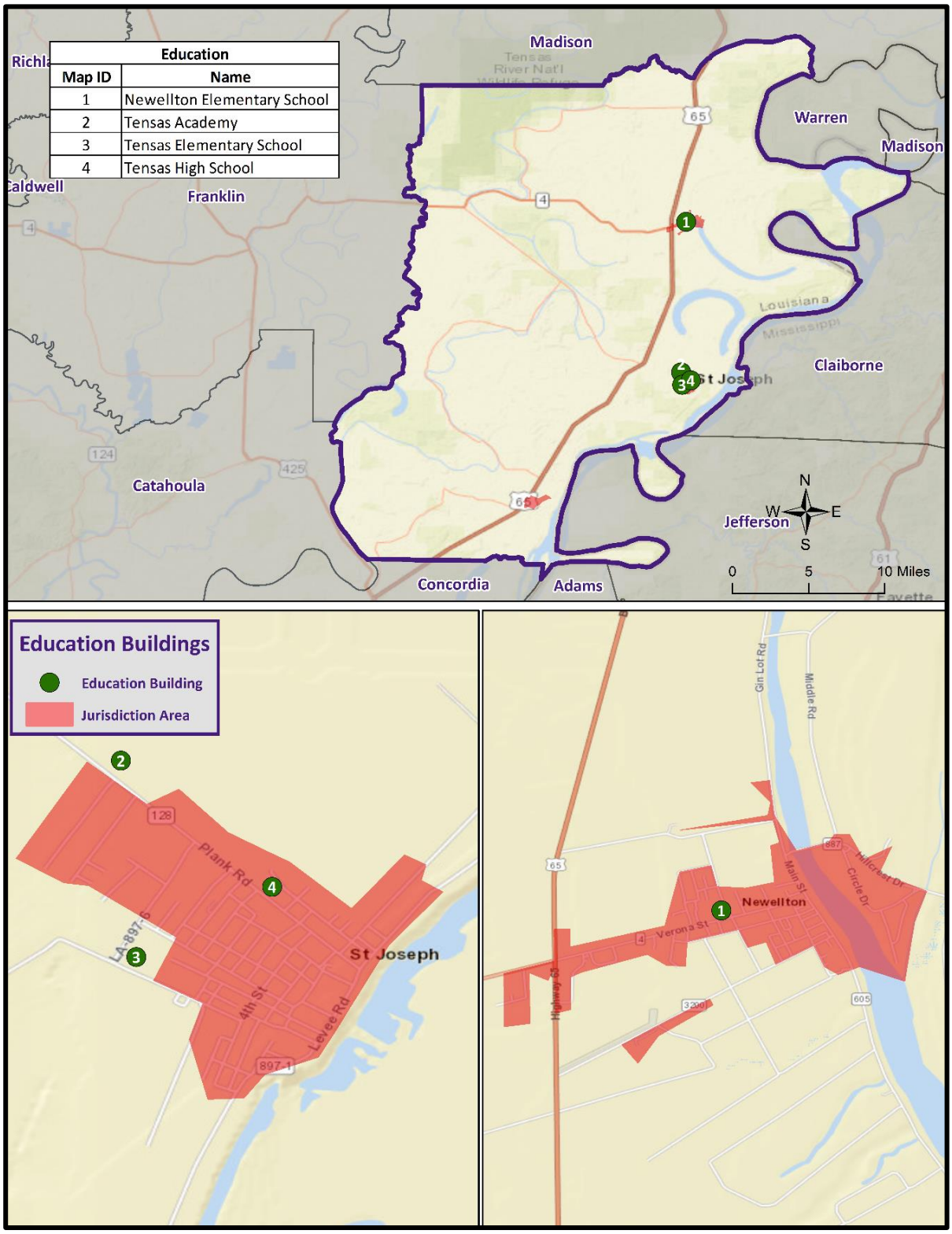


Figure 2-7: Educational Facilities in the Parish.

Population and Development Trends

The future population and number of buildings can be estimated using U.S. Census Bureau housing and population data. The following tables show population and housing unit estimates from 2000 to 2020:

Table 2-9: Population Growth Rate for the Parish.

Total Population	Parish	Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
1-Apr-00	6,535	2,523	1,853	1,335	824
1-Apr-10	5,231	2,192	1,182	1,172	685
1-Apr-20	4,147	1,732	1,047	828	540
Population Growth between 2000 – 2010	-20.0%	-13.1%	-36.2%	-12.2%	-16.9%
Average Annual Growth Rate between 2000 – 2010	-2.0%	-1.3%	-3.6%	-1.2%	-1.7%
Population Growth between 2010 – 2020	-20.7%	-21.0%	-11.4%	-29.4%	-21.2%
Average Annual Growth Rate between 2010 – 2020	-2.07%	-2.10%	-1.14%	-2.94%	-2.12%

Table 2-10: Housing Growth Rate for the Parish.

Total Population	Parish	Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
1-Apr-00	3,359	1,730	595	607	427
1-Apr-10	3,357	1,814	563	562	418
1-Apr-20	2,791	1,421	539	439	392
Housing Growth between 2000 – 2010	-0.1%	4.9%	-5.4%	-7.4%	-2.1%
Average Annual Growth Rate between 2000 – 2010	0.0%	0.5%	-0.5%	-0.7%	-0.2%
Housing Growth between 2010 – 2020	-16.9%	-21.7%	-4.3%	-21.9%	-6.2%
Average Annual Growth Rate between 2010 – 2020	-1.7%	-2.2%	-0.4%	-2.2%	-0.6%

Socially Vulnerable Populations

The following tables illustrate at risk populations in Tensas Parish, and their respective jurisdictions, compared to the United States as a whole. As seen in the tables below, Tensas Parish and their jurisdictions demonstrate an above average percentage differences than that of the U.S. when dealing with at risk communities.

Based on the parish and their incorporated jurisdictions, reliability of the information presented becomes a factor. To combat misinformation and skewed values when dealing with socially vulnerable populations, the U.S. Census Bureau along with Headwater Economics, has denoted values by color and given them a reliability denotation. Any values in **black** are denoted as “high reliability”. This means that error in data based off of the sampling size for that specific population is relatively small and should not be cause for concern. Any values in **orange** are denoted as “medium reliability”. This means that values could be skewed based off of the sampling size being inaccurately examined. Populations and values in orange should be interpreted with caution. Any values in **red** are denoted as “low reliability”. This means that

population values and data taken from the census are very unreliable as the sample size included for this data incorporation were very small or insufficient. An emphasis has been placed on values in red in that anyone using them for studies, local plans and regulatory measures, or projects, should consult the respective community for a more comprehensive evaluation of said population(s). *Neighborhoods at Risk* also cites a data limitation to any community with less than 1,000 people residing in it. (US Census Beau 2021, Headwater Economics)

Additionally, there are some limitations to the data that is provided below. Families in poverty are based upon the amount families within the identifiable area. Rental units, mobile homes, and households with no car are based upon the amount of housing units within the identifiable area. People who do not speak English well is based upon the population of the identifiable area who are five years of age or older. People without a high school degree are based upon the population of the identifiable area who are 25 years of age or older. All other indicators used to identify neighborhoods at risk are based upon the identifiable area's total population. For reference to populations with specific limitations, the table below illustrates the population sample size used to evaluate their respective areas, not the total number of people a specific indicator applies to.

Limiting Factors in Neighborhoods at Risk – Population Sample Size (2021)					
Indicators 2021	**Tensas Parish**	**Village of Newellton**	**Village of St. Joseph**	**Village of Waterproof**	**United States**
Families in poverty	838	189	120	76	80,755,759
Rental units, mobile homes, households with no car	1,502	383	259	170	124,010,992
People who do not speak English well	4,042	1,107	630	617	310,302,360
People without a high school degree	2,964	771	497	357	225,152,317
Total Population	**4,269**	**1,174**	**644**	**675**	**329,725,481**

Neighborhoods at Risk – Unincorporated Tensas Parish				
Indicators 2021	**Tensas Parish Population**	**Tensas Parish Percentage**	**U.S. Percentage**	**Percentage Difference (Tensas vs U.S.)**
People under 5 years	227	5.3%	5.9%	-11%
People over 65 years	1,074	25.2%	16.0%	45%
People of color (including Hispanic)	2,473	57.9%	40.6%	35%
People who do not speak English well	-	**0.0%**	4.1%	**-200%**
People without a high school degree	659	22.2%	11.1%	67%
Families in poverty	210	25.1%	8.9%	95%
Housing units that are rentals	472	31.4%	35.4%	-12%
Housing units that are mobile homes	165	11.0%	5.2%	72%
Households with no cars	130	8.7%	8.3%	5%
People with disabilities	554	13.0%	12.6%	3%
People without health insurance	479	11.3%	8.5%	28%
Population of Tensas Parish: *4,269*				

Neighborhoods at Risk – Village of Newellton				
Indicators 2021	**Newellton Population**	**Newellton Percentage**	**U.S. Percentage**	**Percentage Difference (Newellton vs U.S.)**
People under 5 years	67	5.7%	5.9%	-3%
People over 65 years	188	16.0%	16.0%	0%
People of color (including Hispanic)	880	75.0%	40.6%	60%
People who do not speak English well	-	**0.0%**	4.1%	**-200%**
People without a high school degree	227	29.4%	11.1%	90%
Families in poverty	71	37.6%	8.9%	123%
Housing units that are rentals	142	37.1%	35.4%	5%
Housing units that are mobile homes	**62**	**16.2%**	5.2%	**103%**
Households with no cars	**29**	**7.6%**	8.3%	**-9%**
People with disabilities	**83**	**7.1%**	12.6%	**-56%**
People without health insurance	169	14.4%	8.5%	52%
Population of Newellton: *1,174*				

Neighborhoods at Risk – Village of St. Joseph				
Indicators 2021	St. Joseph Population	St. Joseph Percentage	U.S. Percentage	Percentage Difference (St. Joseph vs U.S.)
People under 5 years	14	2.2%	5.9%	-91%
People over 65 years	155	24.1%	16.0%	40%
People of color (including Hispanic)	475	73.8%	40.6%	58%
People who do not speak English well	-	0.0%	4.1%	-200%
People without a high school degree	82	16.5%	11.1%	39%
Families in poverty	35	29.2%	8.9%	107%
Housing units that are rentals	100	38.6%	35.4%	9%
Housing units that are mobile homes	14	5.4%	5.2%	4%
Households with no cars	37	14.3%	8.3%	53%
People with disabilities	112	17.9%	12.6%	35%
People without health insurance	16	2.6%	8.5%	-106%
Population of St. Joseph: 644				

Neighborhoods at Risk – Village of Waterproof				
Indicators 2021	Waterproof Population	Waterproof Percentage	U.S. Percentage	Percentage Difference (Waterproof vs U.S.)
People under 5 years	58	8.6%	5.9%	37%
People over 65 years	151	2.4%	16.0%	-148%
People of color (including Hispanic)	569	84.3%	40.6%	70%
People who do not speak English well	-	0.0%	4.1%	-200%
People without a high school degree	52	14.6%	11.1%	27%
Families in poverty	44	57.9%	8.9%	147%
Housing units that are rentals	78	45.9%	35.4%	26%
Housing units that are mobile homes	17	10.0%	5.2%	63%
Households with no cars	23	13.5%	8.3%	48%
People with disabilities	108	16.0%	12.6%	24%
People without health insurance	122	18.1%	8.5%	72%
Population of Waterproof: 675				

Land Use

The Parish Land Use table is provided on the following page. Residential, commercial, and industrial areas account for only 4% of the parish's land use. Agricultural land is the largest category at 230,386 acres, accounting for 56% of parish land. At 131,211 acres, wetlands account for 32% of parish lands, while 21,899 acres of open water account for 5% of parish lands. The parish also consists of 10,783 acres of forested areas, accounting for 3% of all parish lands.

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

Land Use	Acres	Percentage
Agricultural Land, Cropland, and Pasture	230,386	56%
Wetlands	131,211	32%
Forest Land (Not including forested wetlands)	10,783	3%
Urban/Development	16,262	4%
Water	21,899	5%

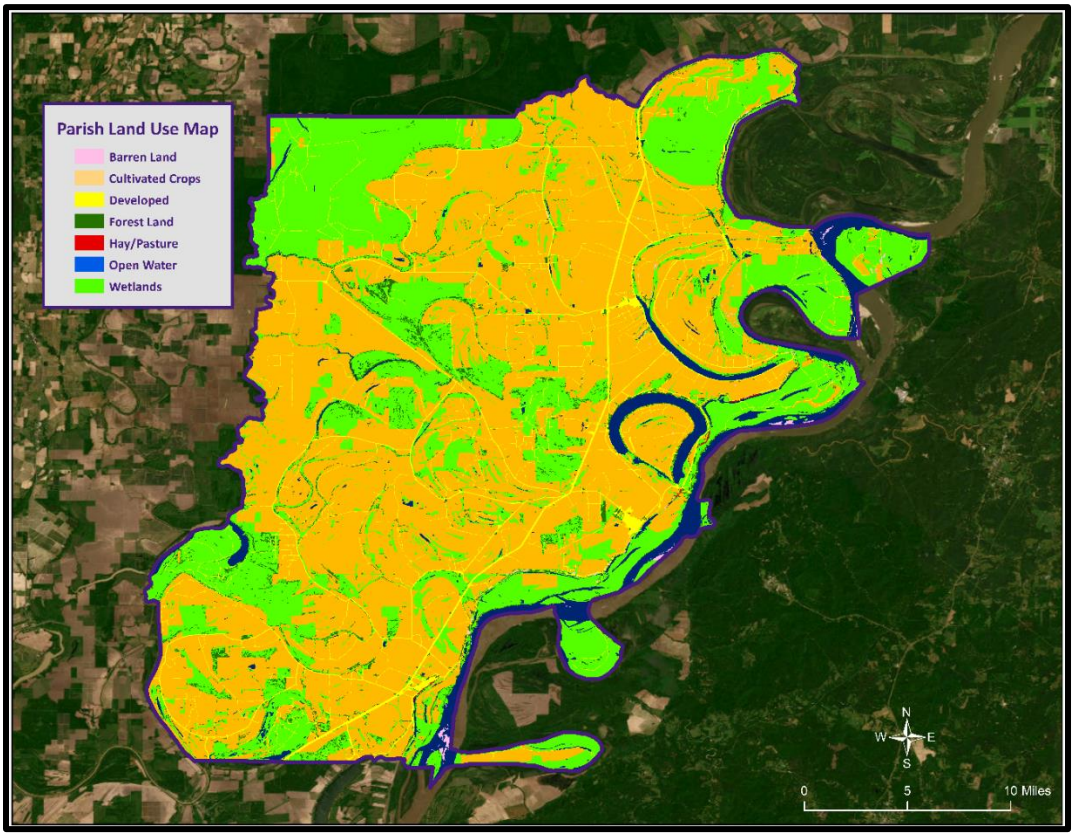


Figure 2-8: Parish Land Use Map.
(Source: USGS Land Use Map)

Future Hazard Impacts

Hazard impacts for flood and tropical cyclones were estimated for the years 2025 and 2030. Yearly population and housing decline 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 decrease within the parish from the present until 2030. A summary of estimated future impacts is shown in the table on the following page. Dollar values are expressed in future costs and assume an annual rate of inflation of 1.02%

Table 2-12: Estimated Future Impacts, 2020 - 2030.
(Source: Hazus, US Census Bureau)

Hazard / Impact	Total in Parish (2020)	Hazard Area (2020)	Hazard Area (2025)	Hazard Area (2030)
Flood Damage				
Structures	2,791	462	424	389
Value of Structures	$1,088,129,000	$179,999,155	$173,933,594	$168,072,430
# of People	4,147	686	618	556
Tropical Cyclone Damage				
Structures	2,791	2,791	2,564	2,355
Value of Structures	$1,088,129,000	$1,088,129,000	$1,051,461,540	$1,016,029,689
# of People	4,147	4,147	3,735	3,363

Since the previous plan update in 2019, the population and housing development within Tensas Parish have decreased. Tensas Parish will continue to be vigilant 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 Tensas Parish. The development that has occurred since 2019 has not in any knowing way altered the parish's vulnerability to natural hazards. Tensas Parish will continue to monitor the rise of development and ensure that any new planning project is within the limitations of this hazard mitigation plan and for the best interest of the public, especially socially vulnerable populations.

Population and development can have various impacts on natural disasters and extreme weather events. Let's explore how each of these factors can influence drought, extreme heat, sinkholes, thunderstorms, tornadoes, wildfires, winter weather, and levee failure:

Drought:

a) Population Increase: As the population grows, the demand for water resources also increases, leading to higher water consumption. This can exacerbate drought conditions, especially in regions already experiencing water scarcity.
b) Development: Land development can alter natural landscapes, leading to reduced water retention and increased runoff. This alteration of the natural hydrological cycle can worsen drought conditions by reducing groundwater recharge and surface water availability.

Extreme Heat:

a) Population Increase: With a growing population, there may be an increased demand for water resources, which could impact water supply for both households and agriculture during extreme heating events.
b) Development: Rapid development in urban areas could increase the urban heat index which would require more planning and development strategies to mitigate.

Sinkholes:

a) Population Increase: With a growing population, there is often a conversion of natural landscapes into urban or agricultural areas which can disturb underlying geology.
b) Development: Urban development typically increases demand for water resources, leading to more groundwater extraction.

Thunderstorms and Tornadoes:

a) Population Increase: A higher population density in tornado-prone regions increases the potential for casualties and property damage during severe thunderstorms and tornado events.
b) Development: Urbanization can lead to the creation of heat islands, altering local atmospheric conditions and potentially influencing thunderstorm development. Additionally, more infrastructure can obstruct natural wind patterns, potentially enhancing localized wind damage during tornadoes.

Wildfires:

a) Population Increase: As more people move into wildland-urban interface areas (where human development meets natural vegetation), the risk of wildfires and their impacts on communities increase. Human activities can also inadvertently trigger wildfires.
b) Development: Construction in fire-prone areas may lead to an accumulation of combustible materials, such as buildings, which can serve as fuel sources during wildfire events.

Winter Weather:

a) Population Increase: Higher populations in regions with cold climates can lead to increased demand for energy resources, such as electricity and heating. This higher demand can strain energy infrastructure during severe winter weather events, leading to power outages and potential hazards.
b) Development: Urbanization and changes in land use can disrupt local microclimates, leading to altered patterns of snow accumulation and melt. Additionally, increased impervious surfaces in urban areas can lead to more rapid runoff during snowmelt, potentially causing flooding.

In conclusion, population increase and development can exacerbate the impacts of natural disasters and extreme weather events. Proper urban planning, infrastructure maintenance, and responsible land-use decisions are essential to mitigate these risks and build resilient communities.

Hazard Profile, Risk Assessment, and Vulnerability Analysis

Drought

Profile

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

Drought is a unique and insidious hazard. Unlike other natural hazards, no specific threshold of "dryness" exists for declaring a drought. In addition, the definition of drought depends on stakeholder needs. For instance, the onset (and demise) of agricultural drought is quick, as crops need water every few days; once they get rainfall, they improve. But hydrologic drought sets in (and is alleviated) only over longer time periods. A few dry days will not drain a reservoir, but a few rain showers cannot replenish it either. Moreover, different geographical regions define drought differently based on the deviation from local, normal precipitation. Drought can occur anywhere, triggered by changes in the local-to-regional-scale atmospheric circulation over an area, or by broader-scale circulation variations such as the expansion of semi-permanent oceanic high-pressure systems or the stalling of an upper-level atmospheric ridge in place over a region. The severity of a drought depends upon the degree and duration of moisture deficiency, as well as the size of the affected area. Periods of drought also tend to be associated with other hazards, such as wildfires and/or heat waves. Lastly, drought is a slow onset occurrence, 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, 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. The tables on the following page display the range and Palmer classifications of the PDSI index, and the United States Drought Monitor Intensity scale.

Table 2-13: Palmer Drought Severity Index Classification and Range.

Range	Palmer Classification
4.0 or more	Extremely Wet
3.0 to 3.99	Very Wet
2.0 to 2.99	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

Table 2-14: U.S. Drought Monitor Drought Intensity Scale.
(Source: National Drought Mitigation Center)

Range/Category	Description	PDSI Equivalent
D0	Abnormally Dry	-1.0 to -1.99
D1	Moderate Drought	-2.0 to -2.99
D2	Severe Drought	-3.0 to -3.99
D3	Extreme Drought	-4.0 to -4.99
D4	Exceptional Drought	-5.0 or less

The following figure displays the drought conditions in the state of Louisiana. Data compiled by the National Drought Mitigation Center indicates exceptional drought conditions exist in the parish at the time this plan went to publication.

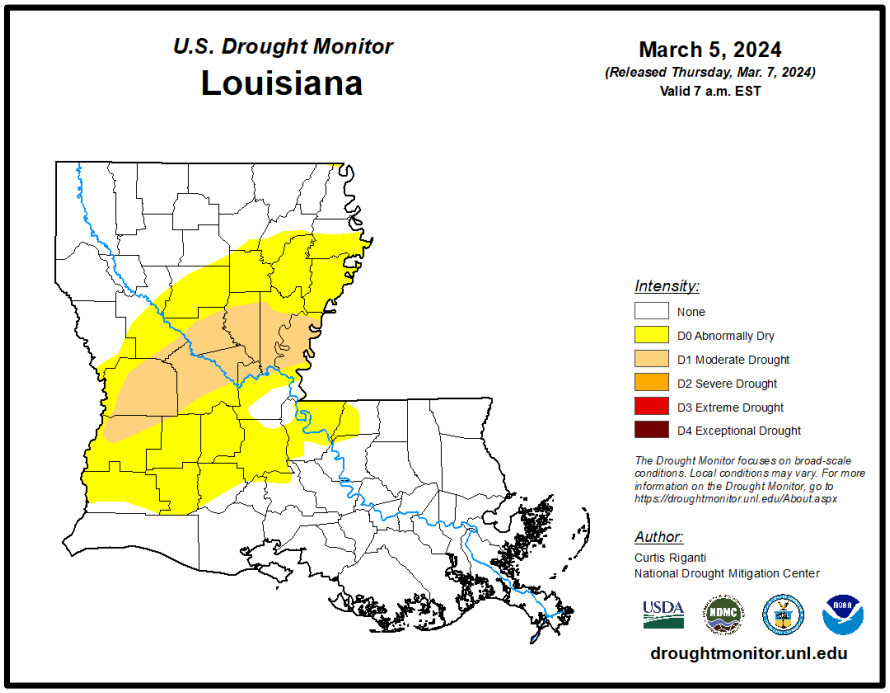


Figure 2-9: United States Drought Monitor for the State of Louisiana and its Parishes.
(Source: The National Drought Mitigation Center)

Risk Assessment

Geographic Extent

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 occurrence in the parish is on the agricultural community. The worst-case drought scenario for the parish and the jurisdictions of the parish would be a exceptional drought (D4).

Previous Occurrences

The parish experienced six drought occurrences between the years 1996 and 2023. Since the last update in 2019, there have been two drought occurrences within the boundaries of the parish.

Table 2-15: Historical Droughts in the Parish since the 2019 Update.

Date	Impacts	Crop Damage	Magnitude
December 2021	The U.S. Drought Monitor indicated Severe Drought (D2) conditions across Tensas Parish during the month of December. Rainfall across the parish was generally around 50 percent of normal, and temperatures averaged around 10 degrees above normal through the month. The combination of warm and dry weather resulted in depleted soil moisture conditions and reduced flows on local bayous and streams. Impacts to agriculture were minimal during the month, but reduced short subsoil moisture conditions would be a problem headed into spring planting season if conditions did not improve. Wheat and cover crops were still in pretty good condition due to roughly weekly light rain showers across the parish.	$0	D2
August – November 2023	The combined effects of persistent above-normal temperatures and minimal precipitation starting in early July 2023 resulted in mounting drought impacts across portions of central and northeast Louisiana.	$2,000,000	D3

Probability

The annual return rate (frequency) for periods of drought in the parish is 0.21 (21% annual probability) or approximately 1 drought occurrence every 4 to 5 years.

Climate Change Impacts

Climate change is expected to increase the number and intensity of droughts in the state of Louisiana. Drought can be caused by both a reduction in precipitation, as well as by heat that results in increased evaporation. Changes in temperature and types of precipitation in the state of Louisiana will affect drought characteristics. An increase in rain and a decrease in winter weather events with increased temperatures will cause peak streamflow to occur earlier in the year. This change in the hydrologic cycle will have significant impacts on natural systems in Louisiana including the intensity, duration, and frequency of droughts.

Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for drought.

Table 2-16: National Risk Index (NRI) Summarization of Drought Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Estimated Impact and Potential Loss

The parish and the jurisdictions of the parish are vulnerable to drought by means of soil desiccation (drying out), which causes foundation damage to structures as well as buckling of roads. However, the main impact of a drought occurrence is on the agricultural community. The following table presents an analysis of agricultural exposure that is susceptible to drought by major crop type for the parish.

Table 2-17: Agricultural Exposure by Crop Type for Droughts in the Parish. (Source: LSU Ag Center 2020 Parish Totals)

Agricultural Exposure by Type for Drought			
Cotton	**Feed Grains**	**Soybeans**	**Wheat**
$50,734,176	$32,785,728	$72,478,429	$8,498,473

Vulnerable Population

As mentioned previously, the main impact of drought is on the agricultural community and certain infrastructure. There is no direct impact on the populace of the parish. There have been no reported deaths or injuries as a result of drought within the parish and the jurisdictions of the parish.

Vulnerability Score

The following table below displays the vulnerability score for drought within Tensas Parish.

Table 2-18: Drought Vulnerability Score for the Parish.

Drought Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	3	2	4	2	3	2.8

Excessive Heat

Profile

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

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

Most heat disorders (e.g., sunburn, heat cramps, heat exhaustion, and heat stroke) occur because the victim has been overexposed to heat, or has over-exercised in relation to their age and physical condition. Other circumstances that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Seniors and children are most at risk from adverse heat effects. Extreme heat can also damage roads, bridges, pipelines, utilities, and railroads. High temperatures can be partially responsible for deflection of rails and related railroad accidents.

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

Table 2-19: Summary of Heat Index Risk Levels with Protective Measures.
(Source: National Weather Service)

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

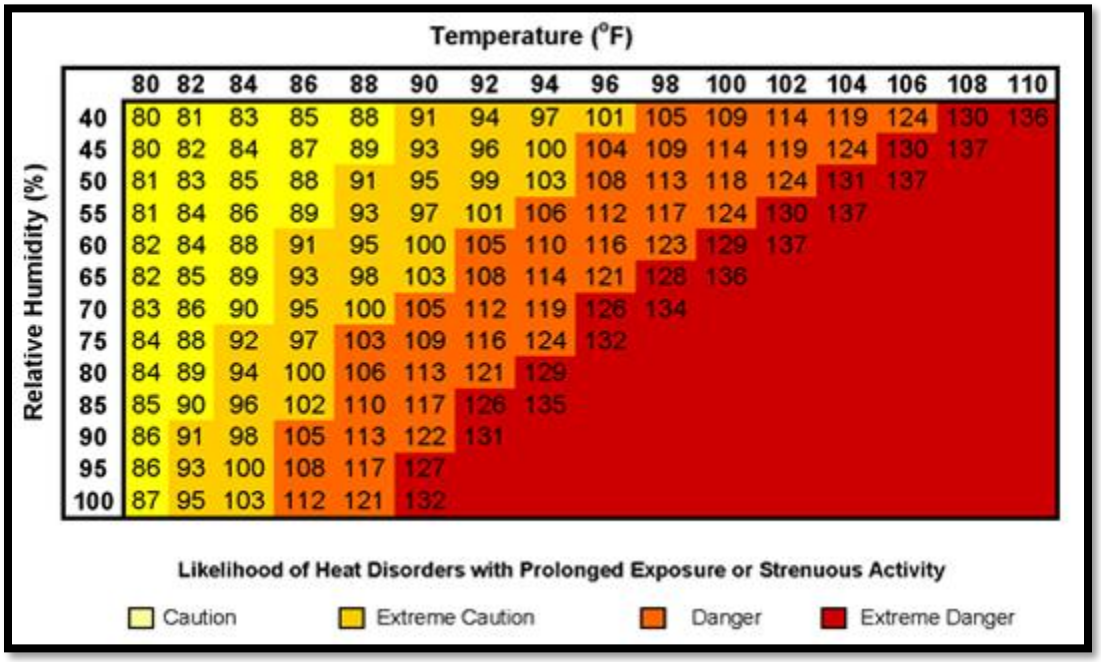


Figure 2-10: Heat Index Advisor based on Air Temperature (°F) and Relative Humidity. (Source: National Weather Service)

Risk Assessment

Geographic Extent

Extreme heat typically impacts a region and not one specific parish or jurisdiction. Because extreme heat is a climatological based hazard, it has the same probability of occurring in the parish as all of the adjacent parishes. The entire planning area of the parish is equally at risk for extreme heat. Based on historical data, the worst-case scenario for the parish involving extreme heat would be a high-risk level on the HI scale with temperatures ranging from 103°F to 115°F.

Previous Occurrences

The parish experienced one extreme heat occurrence between the years 1996 and 2023. Since the last update in 2019, there have been no extreme heat occurrences within the boundaries of the parish.

Probability

The annual return rate (frequency) for extreme heat occurrences in the parish is 0.04 (4% annual probability) or approximately 1 extreme heat event every 28 years.

Climate Change Impacts

Climate change has caused a rise in extreme heat events within St. Joseph Parish and its jurisdictions, especially in urban areas that experience higher temperatures due to the urban heat island effect. Cities in Louisiana are experiencing, at a minimum, two more weeks of extreme heat (days over 95° F) than compared to 50 years ago. With the rise in extreme heat events, there will be several environmental and economic implications within the state of Louisiana including the disruption of the natural system such as agriculture, forestry, fishing, mining, manufacturing, transportation, and utilities.

Climate change is driving a relentless escalation in extreme heat events, reshaping the very fabric of our environment. Rising greenhouse gas emissions are enhancing the greenhouse effect, trapping heat within the atmosphere. Consequently, extreme heat occurrences have become more frequent, intense, and

prolonged. Heatwaves, once sporadic, have transformed into enduring episodes, subjecting regions to temperatures that push the boundaries of historical records. Urban areas, already prone to heat island effects due to concrete and asphalt, are rendered even more stifling. These elevated temperatures pose an array of challenges to ecosystems, agriculture, infrastructure, and human health. Vulnerable populations bear the brunt, as their reduced capacity to adapt heightens the risks of heat-related illnesses, mortality, and displacement. In addition, elevated heat negatively impacts economies, straining energy demand, reducing worker productivity, and exacerbating health care costs.

Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for extreme heat.

Table 2-20: National Risk Index (NRI) Summarization of Excessive Heat Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Estimated Impact and Potential Loss

Since 1996, there has been one significant extreme heat event that has resulted in property damages according to NCEI Storm Events Database. The total property damages associated with this event has totaled approximately $1,000. To estimate the potential losses of an extreme heat event on an annual basis, the total damages recorded for these events was divided by the total number of years of available data in the NCEI Storm Events Database (1996 - 2023). This provides an annual estimated potential loss of $36 and $1,000 per event. The following table provides an estimate of potential property losses for the parish:

Table 2-21: Estimated Annual Losses in the Parish and its Jurisdictions Resulting from Excessive Heat.

Excessive Heat Estimated Annual Potential Losses			
Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
$15	$8	$8	$5

Vulnerable Population

There have been no reported fatalities or injuries due to excessive heat in the parish. However, extreme heat poses a dire threat to vulnerable populations, magnifying existing disparities and triggering a cascade of health, social, and economic challenges. The elderly, children, low-income individuals, and those with underlying health conditions are particularly susceptible. Their compromised physiological resilience makes them more prone to heat-related illnesses, including life-threatening conditions like heat stroke. Mortality rates surge, disproportionately affecting the elderly, as soaring temperatures strain their already fragile health. Economic strain intensifies for low-income communities, unable to afford proper cooling measures, leading to discomfort and potential productivity losses. Inadequate housing exacerbates the issue, as substandard dwellings lack insulation and ventilation, turning homes into heat traps. Moreover, social isolation heightens vulnerability, as limited social connections hinder access to aid and cooler environments. The lack of resources, clean water, and medical care amplifies risks. Environmental injustices come to the fore, as marginalized neighborhoods, trapped in urban heat islands,

experience even higher temperatures due to scant greenery. This extreme heat can induce migration and displacement, straining resources and instigating social tensions. Utility disruptions during heatwaves further compromise their well-being, and overburdened healthcare systems struggle to cope with the influx of heat-related cases.

Vulnerability Score

The following table below displays the vulnerability score for excessive heat within Tensas Parish.

Table 2-22: Excessive Heat Vulnerability Score for the Parish.

Excessive Heat Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	2	2	4	1	2	2.25

Flooding

Profile

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.

Extreme precipitation, produced from mid-latitude cyclones, thunderstorms, or hurricanes, is often the major initiating condition for flooding. During the cooler months, slow-moving frontal weather systems produce heavy rainfalls, while the summer and autumn seasons produce major precipitation in isolated thunderstorm occurrences (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.

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. For example, 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.
- **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 (wen 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.

Based on stream gauge levels and precipitation forecasts, the 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 occurrence, for example, is an occurrence of small magnitude (in terms of stream flow or precipitation) but with a relatively high annual probability of recurrence (10%). A 100-year flood occurrence 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 occurrence and a 10-year occurrence, 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 occurrence does not mean an occurrence of that magnitude occurs only once in X years. Instead, it means that on average, we can expect a flood occurrence 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 occurrence as having a 25% chance of occurring over the life of a 30-year mortgage.

The 100-year flood occurrence 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 the figure on the following page.

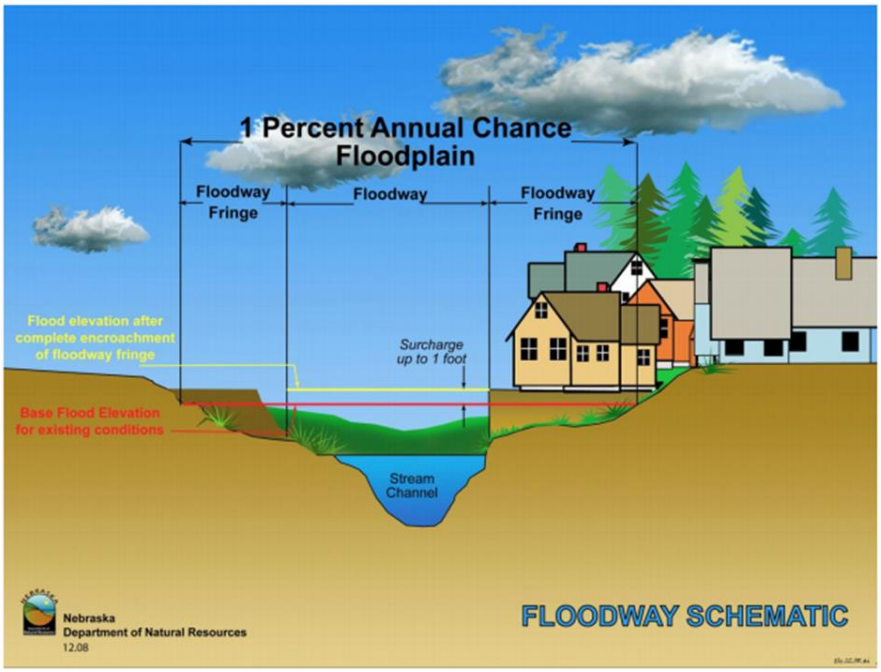


Figure 2-11: Schematic of 100-Year Floodplain.
The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe.
(Source: Nebraska Department of Natural Resources)

A SFHA is the land area covered by the floodwaters of the base flood (red line in the above figure), where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. Flood zones for the parish are shown in the following figures.

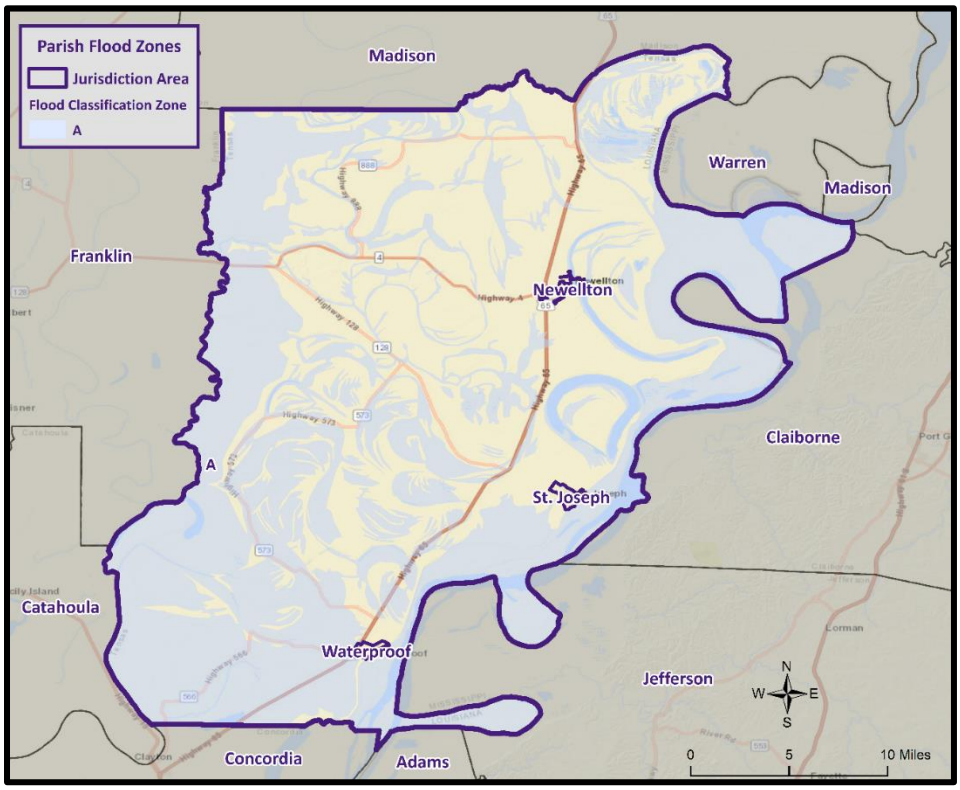


Figure 2-12: Parish Areas within the Flood Zones.

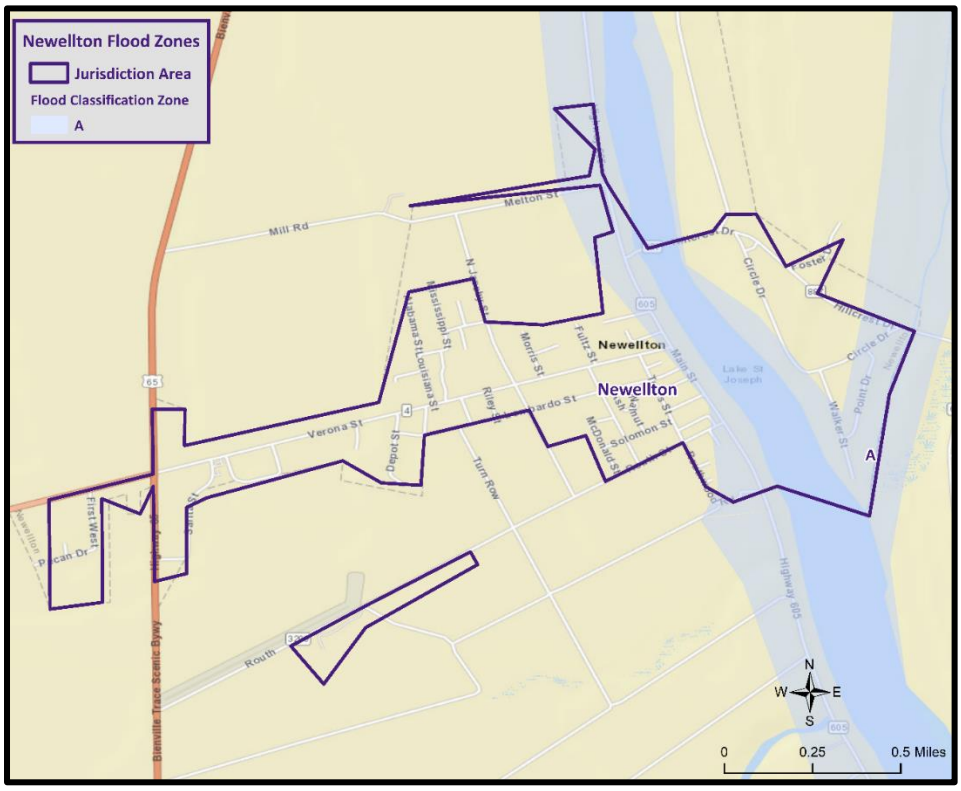


Figure 2-13: Newellton Areas within the Flood Zones.

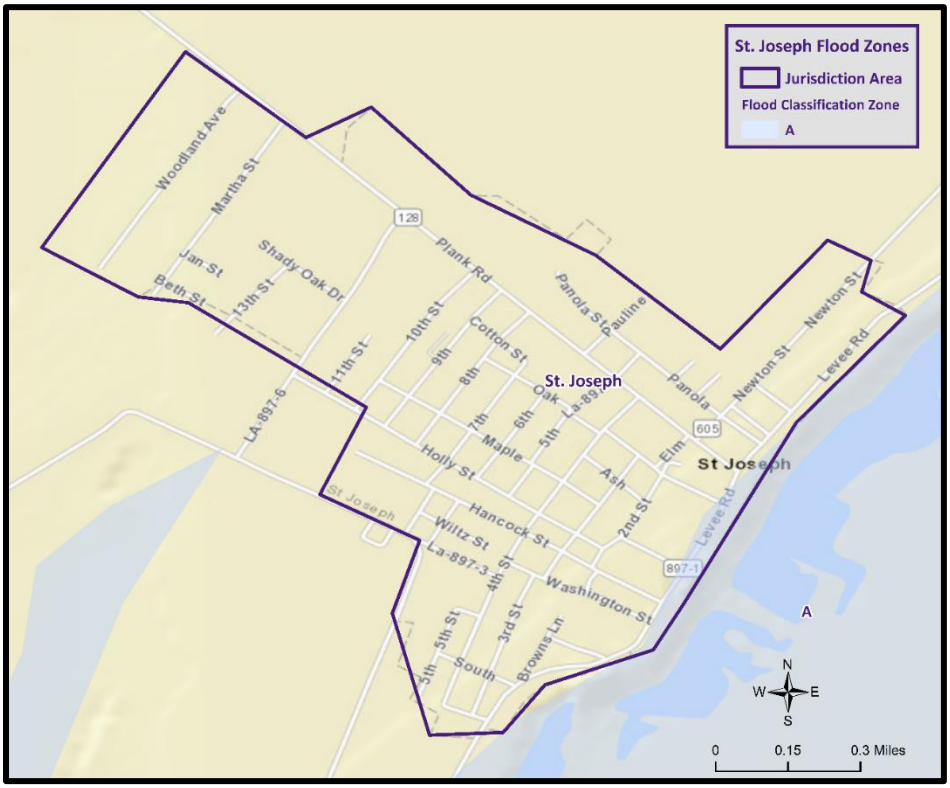


Figure 2-14: St. Joseph Areas within the Flood Zones.

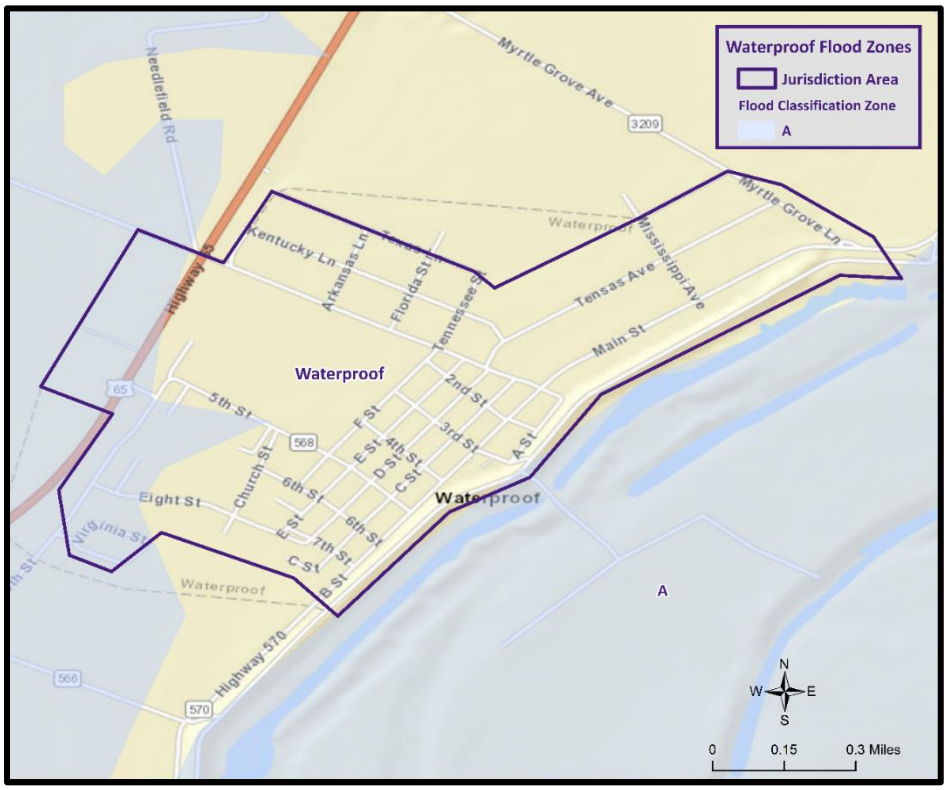


Figure 2-15: Waterproof Areas within the Flood Zones.

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 claim's 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 the parish are provided in the table below:

Table 2-23: Repetitive Loss Structures for the Parish.

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
Unincorporated Tensas Parish	3	3	0	0	20	208,683	$10,434
Newellton	15	13	2	0	49	$997,605	$20,359
St. Joseph	2	2	0	0	5	$110,110	$22,022
Waterproof	0	0	0	0	0	$0	$0
TOTAL	**20**	**18**	**2**	**0**	**74**	**$1,316,398**	**$17,789**

The 20 repetitive loss structures were geocoded in order to provide an overview of where the repetitive loss structures are located throughout the parish. The figures on the following page show the approximate locations of the structures and where the highest concentration of repetitive loss structures is located. Through the repetitive loss maps, it is clear the primary concentration of repetitive loss structures is focused in the incorporated areas of Newellton.

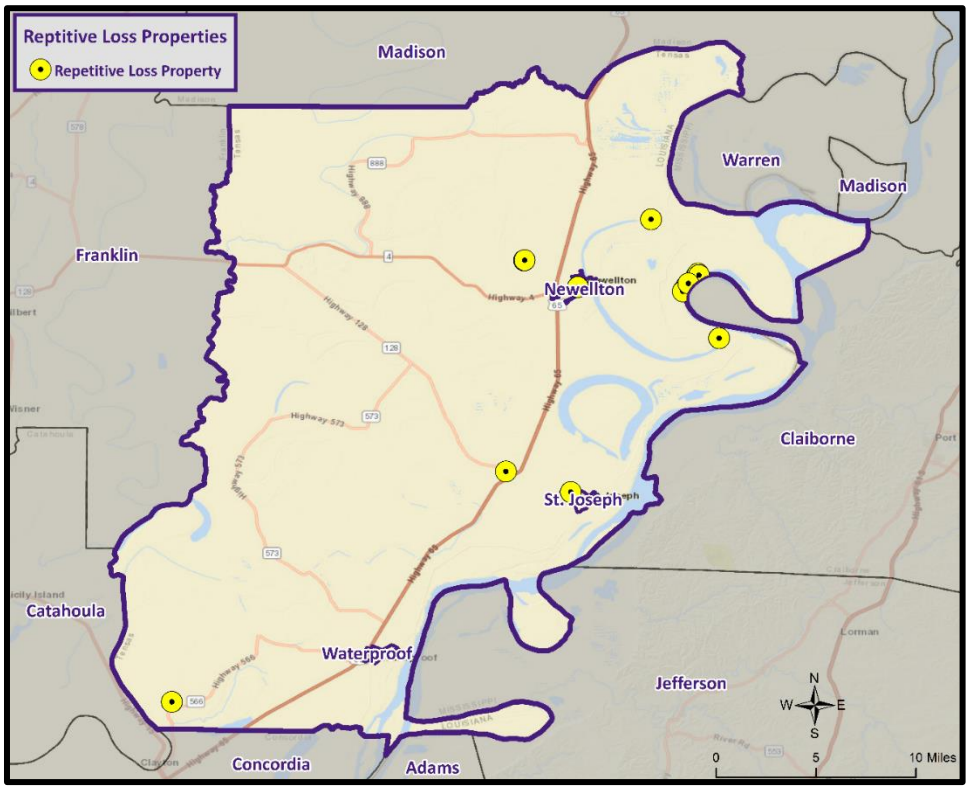


Figure 2-16: Repetitive Loss Properties in the Parish.

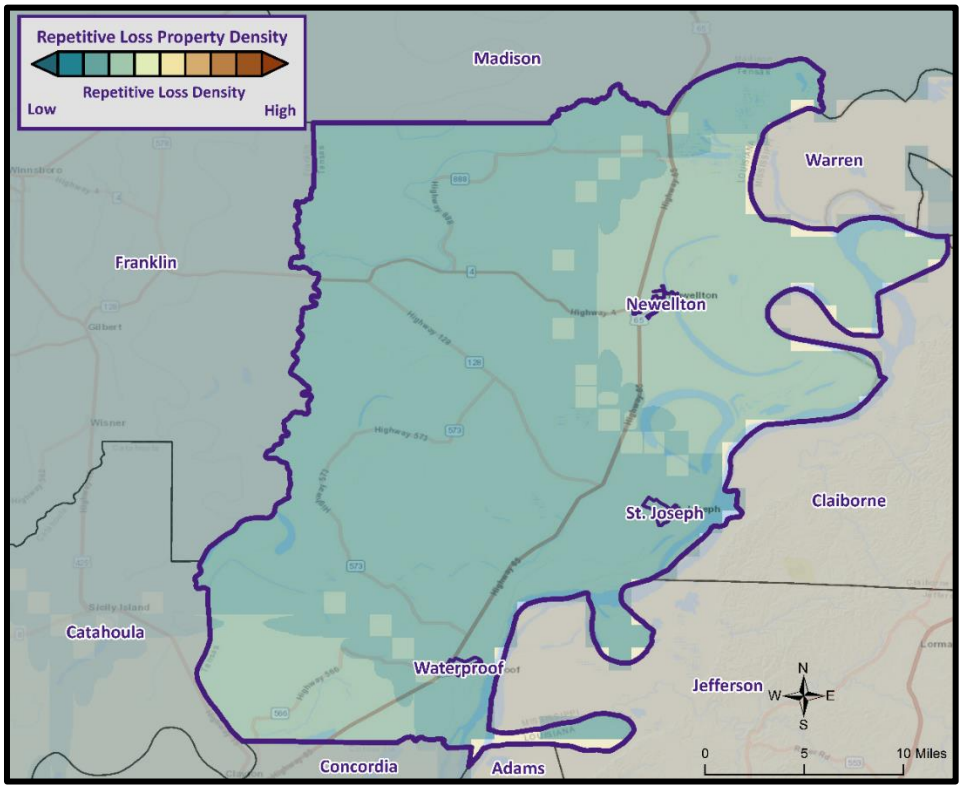


Figure 2-17: Repetitive Loss Property Densities in the Parish.

National Flood Insurance Program

Flood insurance statistics indicate that the Parish has 310 flood insurance policies with the NFIP, with total annual premiums of $105,606. The parish and the jurisdictions of Newellton, St. Joseph, and Waterproof are all participants in the NFIP. The parish and all of its jurisdictions will continue to adopt and enforce floodplain management requirements, including regulating new construction Special Flood Hazard Areas, making substantial improvement and/or damage determinations, or determining the necessary permits required of owners to bring a substantially improved/damaged structure back into compliance. The parish will continue to monitor activities including local requests for new map updates. Flood insurance statistics and additional NFIP participation details for the parish and its jurisdictions are provided in the following tables.

Table 2-24: Summary of NFIP Policies for the Parish.

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed Since 1978	Total Loss Payments
Unincorporated Tensas Parish	275	$77,261,000	$92,798	210	$2,944,297
Newellton	15	$3,114,000	$5,978	25	$386,811
St. Joseph	16	$4,915,000	$5,344	11	$48,595
Waterproof	4	$901,000	$1,486	1	$608
Total	**310**	**$86,191,000**	**$105,606**	**247**	**$3,380,311**

Table 2-25: Summary of Community Flood Maps for the Parish.

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Adopted Date	Current Effective Map Date	Date Joined the NFIP	Tribal
220053#	Unincorporated Tensas Parish	9/6/1974	4/3/1978	4/3/1978	4/3/1978	4/3/1978	No
220054#	Newellton	6/14/1974	3/16/1982	3/16/1982	3/16/82(M)	3/16/1982	No
220055#	St. Joseph	4/9/1976		NSFHA	NSFHA	8/26/1977	No
220056#	Waterproof	5/24/1974	6/21/1977	11/27/1979	11/27/79(M)	6/21/1977	No

According to the Community Rating System (CRS) list of eligible communities, the unincorporated area of the parish and its jurisdictions do not 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 water can also infiltrate sewer lines and inundate wastewater treatment plants, causing sewage to back up and creating a breeding ground for dangerous bacteria. This infiltration may also cause water supplies to become contaminated and undrinkable.

Elevations in the Parish

The digital elevation model (DEM) for the parish is instructive in visualizing where the low-lying and high-risk areas are for the parish. Elevations in the parish range from less than 30 feet (NAVD88) to approximately 90 feet (NAVD88). The highest elevations in the parish are approximately 90 feet (NAVD88), located in the unincorporated areas of the parish. The incorporated areas of Tensas Parish range in elevation from 69 to 79 feet (NAVD88), with the Waterproof averaging 69 feet (NAVD88), St. Joseph averaging 75 feet (NAVD88), and Newellton averaging 79 feet (NAVD88).

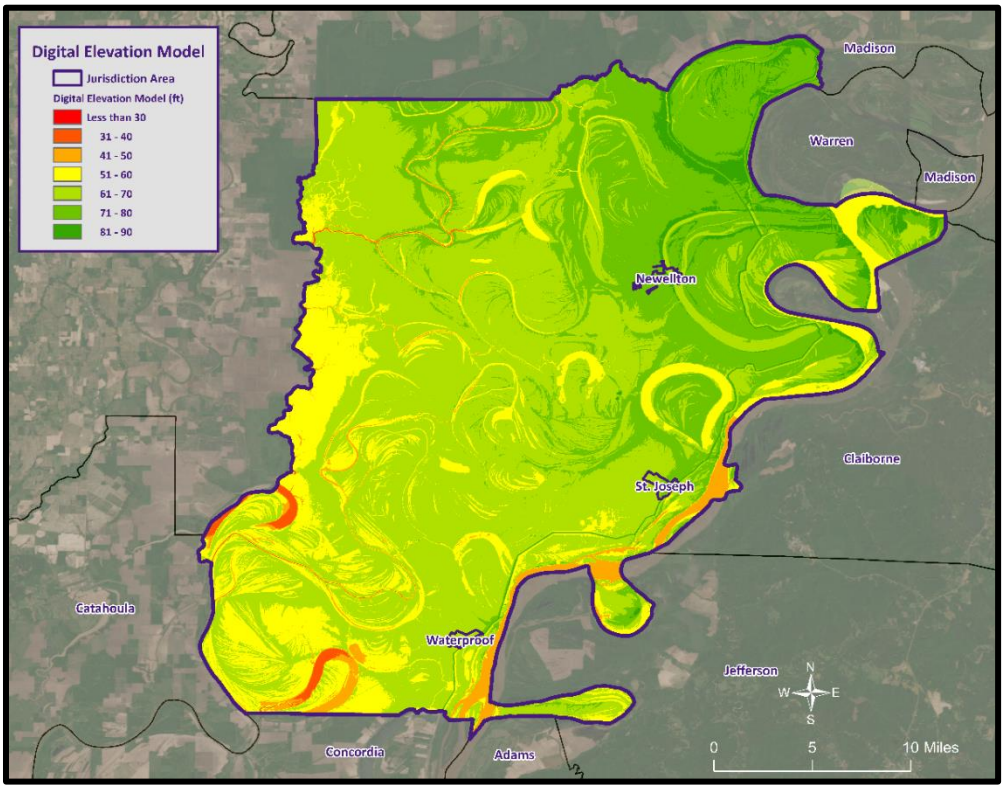


Figure 2-18: Elevation throughout the Parish.

Risk Assessment

Geographic Extent

The parish has experienced significant flooding in its history and can expect more in the future. Tensas Parish is bordered to the east by the Mississippi River, which runs along the entire eastern part of the parish. The majority of the flood issues for Tensas Parish are associated with the Mississippi River; however, there are some specific areas of concern within the parish. These areas of concern are the Point Drive area in Newellton, the western drainages of Clarks Bayou, the Lake Bruin area on the western leg of Highway 606, the northwestern boundary of St. Joseph, the Tensas Academy area, and the residential areas in central Waterproof.

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 six feet can be expected in the unincorporated areas of the parish. The incorporated areas of Newellton, St. Joseph, and Waterproof can expect flood depths from three to five feet.

Previous Occurrences

The parish experienced 28 flooding occurrences between the years 1996 and 2023. Since the last update in 2019, there has been one flood occurrence within the boundaries of the parish.

Table 2-26: Historical Flooding Events in the Parish since the 2019 Update.

Date	Area	Type of Flood	Property Damage	Fatalities	Injuries
4/23/2020	ST. JOSEPH	FLASH FLOOD	$3,000	0	0

Probability

The annual return rate (frequency) for periods of flooding in the parish is 1.00 (100% annual probability) or approximately 1 flood occurrences every year. The table below shows the probability and return frequency for each jurisdiction in the parish.

Table 2-27: Annual Flood Probabilities for Each Jurisdiction in the Parish.

Jurisdiction	Annual Probability	Return Frequency
Unincorporated Tensas Parish	57%	1 flood every 1 to 2 years
Newellton	32%	1 flood every 3 to 4 years
St. Joseph	39%	1 flood every 2 to 3 years
Waterproof	25%	1 flood every 4 years

Climate Change Impacts

Atmospheric moisture, precipitation, and atmospheric circulation can be affected by climate change, since radiative forcing alters heating which affects evaporation and sensible heating at the Earth's surface. This process alters the amount, frequency, intensity, duration, and type of precipitation which is part of the hydrological cycle. The Intergovernmental Panel on Climate Change reports that over 105-year period (1901 – 2005) precipitation has increased 5 to 10%. Additionally, water resource managers observed the following:

- Historical hydrological patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply quality, flood management, and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection and emergency response.

Climate change poses significant threats to both infrastructure and vulnerable populations in the context of flooding. Rising global temperatures have led to the intensification of extreme weather events, such as heavy rainfall and storms, which increase the frequency and severity of floods. Infrastructure, such as roads, bridges, and buildings, designed to withstand historical weather patterns, is now facing greater stress and damage due to the increased volume and intensity of floodwaters.

One of the most pressing impacts of climate change on infrastructure is the increased risk of damage and disruption to critical lifeline systems, such as water supply networks, energy grids, and transportation systems. Floods can compromise the integrity of these systems, leading to widespread power outages, disrupted water access, and road closures, hindering emergency response and recovery efforts. As floods become more frequent and severe, the cost of repairing and reinforcing infrastructure becomes a significant burden on governments and communities.

Furthermore, climate change disproportionately affects vulnerable populations, including low-income communities, the elderly, and those with limited mobility or access to resources. These communities often reside in flood-prone areas with inadequate infrastructure and limited capacity to adapt to changing conditions. Floods can exacerbate existing social inequalities, displacing vulnerable populations and exposing them to health risks, property loss, and economic hardship. Lack of access to timely information and limited evacuation resources can further endanger their lives during extreme flooding events.

Additionally, climate change can disrupt local economies in flood-affected regions. Agricultural lands can be damaged, leading to reduced crop yields and affecting livelihoods. Businesses, particularly those without insurance or financial resilience, may face bankruptcy due to flood-related losses. The overall economic impacts ripple beyond immediate flood-affected regions, affecting supply chains and markets globally.

Addressing the impacts of climate change on infrastructure and vulnerable populations requires a comprehensive approach. Building more resilient infrastructure, incorporating climate adaptation measures, and enforcing zoning regulations to prevent development in flood-prone areas are essential steps. Additionally, governments must prioritize support and resources for vulnerable communities, providing them with better access to early warning systems, evacuation plans, and social safety nets to cope with flood-related challenges. Long-term climate change mitigation efforts are also necessary to reduce the severity and frequency of floods, ultimately safeguarding both infrastructure and vulnerable populations from the detrimental effects of flooding.

Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for flooding.

Table 2-28: National Risk Index (NRI) Summarization of Riverine Flood Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Estimated Impact and Potential Loss

Using the Hazus Flood Model, the 100-year flood scenario was analyzed to determine losses from this scenario. The table below shows the total economic losses that would result from a 100-year flood occurrence.

Table 2-29: Estimated Losses in the Parish from a 100-Year Flood Event. (Source: Hazus)

Jurisdiction	Estimated Loss
Unincorporated Tensas Parish	$16,328,000
Newellton	$0
St. Joseph	$0
Waterproof	$0
Total	**$16,328,000**

The Hazus Flood Model also provides a breakdown by jurisdiction for seven primary categories (Hazus occupancy) throughout the parish. The losses for each jurisdiction by sector are listed in the following tables:

Table 2-30: Estimated 100-year Flood Losses for the Unincorporated Area of the Parish by Sector. (Source: Hazus)

Unincorporated Tensas Parish	Estimated Total Losses from 100-Year Flood Event
Agricultural	$1,260,000
Commercial	$4,647,000
Government	$1,261,000
Industrial	$596,000
Religious / Non-Profit	$170,000
Residential	$6,169,000
Schools	$2,225,000
Total	$16,328,000

Vulnerable Population

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

Table 2-31: 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**
Unincorporated Tensas Parish	1,732	686	39.6%
Newellton	1,047	0	0.0%
St. Joseph	828	0	0.0%
Waterproof	540	0	0.0%
Total	**4,147**	**686**	**16.5%**

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

Table 2-32: Vulnerable Populations Susceptible to a 100-year Flood Event in the Parish. (Source: Hazus)

Unincorporated Tensas Parish		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	686	39.6%
Persons Under 5 Years	48	7.0%
Persons Under 18 Years	174	25.3%
Persons 65 Years and Over	119	17.3%
White	300	43.7%
Minority	386	56.3%

Vulnerability Score

The table below displays the vulnerability score for flooding within Tensas Parish.

Table 2-33: Flood Vulnerability Score for the Parish.

Flood Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	3	4	3	4	3	3.4

Levee Failure

Profile

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

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

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

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

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

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.

Risk Assessment

Geographic Extent

Per the National Inventory of Levees, there are three levee systems located within the unincorporated areas of the parish and in the incorporated areas of St. Joseph and Waterproof. Levee Failure does not pose a threat to the incorporated area of Newellton. The areas of inundation will generally be directly downstream of the levee and the low-lying areas surrounding the area of levee failure, but a working group will be established to determine the specific locations of inundation. The actions for a levee failure working group can be found in *Section 4: Mitigation Strategy*. The following figure displays the levee systems located in the parish:

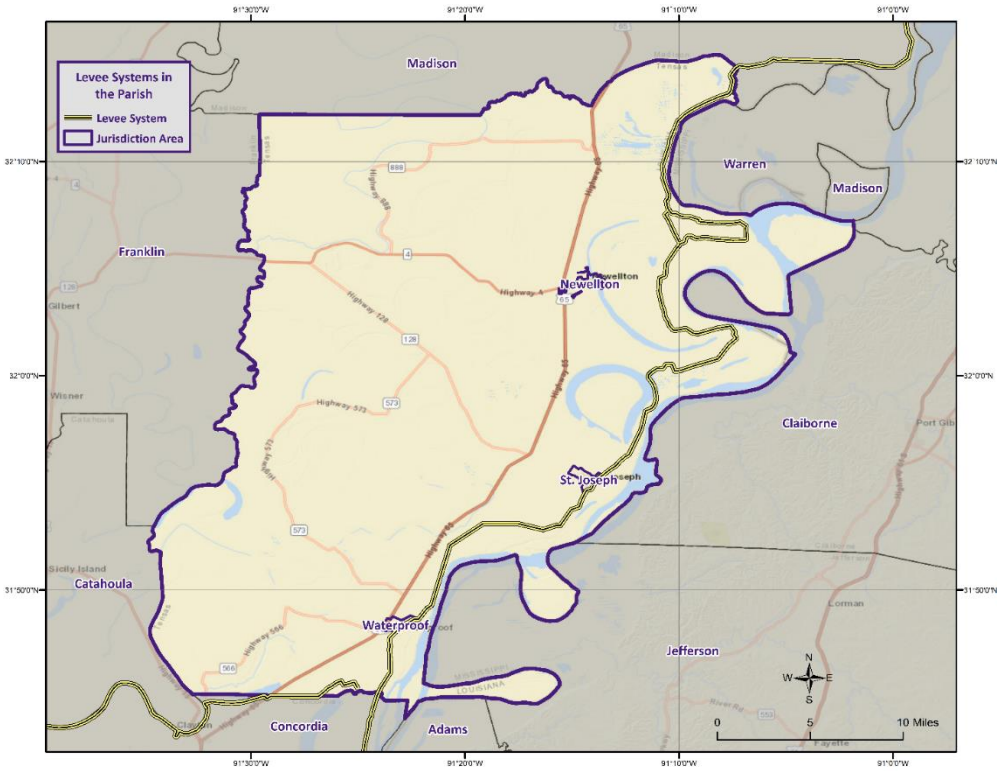


Figure 2-19: Levee Systems in the Parish.

Previous Occurrences

There have been no reported levee failure occurrences within the parish and the jurisdictions. The parish claims a data deficiency on the extent of levee failure for the levee system located in the parish. This data deficiency includes potential inundation areas and subsequent impacts related to the overtopping, collapse, or breaching of the levee located within the parish. As these inundation zones haven't yet been identified, the parish will continue to develop an extent and additional relevant data associated with this hazard.

Probability

It is nearly impossible to predict and model levee failure and its impact on the 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 of the parish and its jurisdictions.

Climate Change Impacts

Extreme precipitation, primarily the type that contributes to flash flooding and not widespread areal flooding, is expected to increase due to climate change. While this may not contribute to the traditional definition of a levee failure, it could increase the chances of a levee overtopping.

Vulnerability Analysis

Estimated Impact and Potential Loss

Determining the annualized loss as a result of a levee failure is difficult in the parish due to availability of data on past levee failure events. The National Inventory of Levees was utilized to determine the levees within the parish, the risk level, and height of the levee. The following table provides an extensive list of the levees in the parish with the risk associated with each system.

Table 2-34: Levees and Risk Associated with each in the Parish.
(Source: National Inventory of Levees)

System	Risk	Height (ft)	Population	Buildings	Property Value
AR-LA Mississippi River	High	35	227,280	110,450	$20.9 Billion
Point Pleasant System	No Data	No Data	14	148,852	$3 Million
Red River BW LA	High	20	19,638	10,170	$1.72 Billion

Vulnerable Population

There have been no reported fatalities or injuries due to levee failure in the parish.

Vulnerability Score

The table below displays the vulnerability score for levee failure within Tensas Parish.

Table 2-35: Levee Failure Vulnerability Score for the Parish.

Levee Failure Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	1	3	4	1	3	**2.4**

Sinkholes

Profile

Sinkholes are areas of ground—varying in size from a few square feet to hundreds of acres and reaching in depth from 1 to more than 100 ft.—with no natural external surface drainage. Sinkholes are usually found in karst terrain—that is, areas where limestone, carbonate rock, salt beds, and other water-soluble rocks lie below the Earth's surface. Karst terrain is marked by the presence of other uncommon geologic features such as springs, caves, and dry streambeds that lose water into the ground. In general, sinkholes form gradually (in the case of cover subsidence sinkholes), but they can also occur suddenly (in the case of cover-collapse sinkholes).

Sinkhole formation is a very simple process. Whenever water is absorbed through soil, encounters water-soluble bedrock, and then begins to dissolve it, sinkholes start to form. The karst rock dissolves along cracks; as the fissures grow, soil and other particles fill the gaps, loosening the soil above the bedrock. Figure 1 illustrates the development of a cover subsidence sinkhole. As the soil sinks from the surface, a depression forms, which draws in more water, funneling it down to the water-soluble rock. The increase of water and soil in the rock pushes open the cracks, again drawing more soil and water into it. This positive feedback loop continues, unless clay plugs into the cracks in the bedrock, at which time a pond may form. A sudden cover-collapse sinkhole occurs when the topsoil above dissolving bedrock does not sink, but forms a bridge over the soil that is sinking beneath it. Underground soil continues to fill the bedrock fissures, until finally the soil bridge collapses and fills the void beneath it.

Both kinds of sinkholes can occur naturally or through human influence. While sinkholes tend to form naturally in karst areas, sinkholes can form in other geological areas that have been altered by humans such as mining, sewers, hydraulic fracture drilling, groundwater pumping, irrigation, or storage ponds. In all of these cases, and others, the cause for the sinkhole is that support for surface soil has been weakened or substantially removed.

In the United States, 20% of land in the United States is susceptible to sinkholes. Most of this area lies in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. In Louisiana, most of the sinkholes are precipitated by the human-influenced collapse of salt dome caverns. The collapse of a salt dome is usually a slow process; however, it may occur suddenly and without any advance warning.

Risk Assessment

Geographic Extent

Currently, there are three identifiable salt dome locations in the parish with three having a two-mile buffer around the location impacting the parish. The figure on the following page displays the location of salt domes with their relative location to the nearest jurisdiction. As depicted in the figure, the salt domes are dispersed throughout the parish, with four of the salt domes located in the unincorporated areas of the parish and one located within the incorporated area of Newellton. At this time, there are no salt domes or sinkholes located in or near the incorporated areas of St. Joseph or Waterproof, but the salt domes will continue to be monitored.

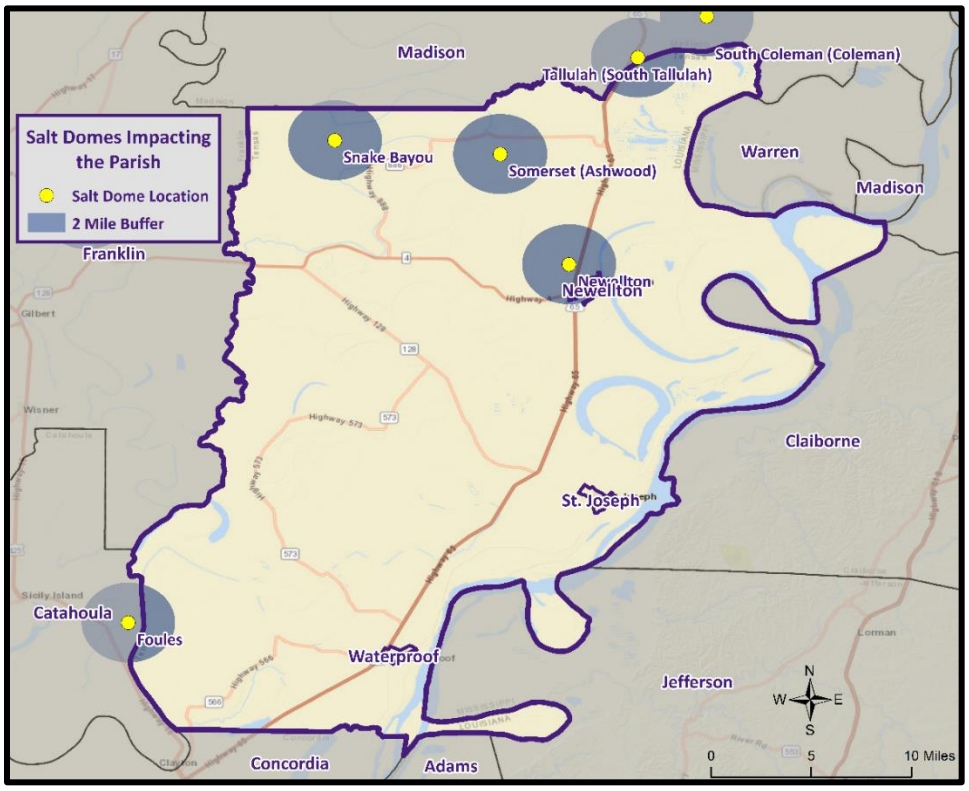


Figure 2-20: Salt Dome Locations in the Parish.

Previous Occurrences

There have been no recorded incidents of sinkholes or salt dome collapses in the parish to date.

Probability

Based on historical data for the past 28-years, there has been no incident of a sinkhole formation or salt dome collapse in the Parish. The annual chance of occurrence is calculated at less than 1%.

Climate Change Impacts

Climate change is exerting significant impacts on the occurrence and behavior of sinkholes, geological formations characterized by ground collapse. Altered precipitation patterns, intensified by climate change, result in increased infiltration of water into the ground, eroding underground rock layers and forming voids that can lead to sinkhole formation. Rising sea levels, another consequence of climate change, contribute to the intrusion of saltwater into coastal aquifers, accelerating the dissolution of underground rocks and enhancing the likelihood of sinkhole development. Furthermore, shifting hydrological patterns and extreme weather events, both exacerbated by climate change, disrupt natural water movement and contribute to the instability of soil and rock formations, increasing the susceptibility of sinkhole formation. As climate change continues to reshape ecosystems and exacerbate these processes, adequate mitigation strategies, including improved urban planning, infrastructure design, and geological assessments, become essential to curbing the escalating impacts of sinkholes on both natural landscapes and human settlements.

Vulnerability Analysis

Sinkholes can have profound and wide-ranging impacts on both natural environments and human communities. These sudden depressions in the Earth's surface can pose serious risks to infrastructure, causing damage to roads, buildings, and utility lines. The resulting economic losses can be substantial,

affecting businesses, disrupting local economies, and straining resources for repairs and recovery. Human populations can be directly affected through displacement due to sinkhole-related damage, leading to temporary or permanent evacuations and upending lives. Public safety concerns also arise as sinkholes can appear with little warning, endangering individuals and vehicles. The environmental consequences are also significant, altering local hydrology, groundwater flow, and potentially causing groundwater contamination if hazardous materials are exposed. As urbanization and climate change further interact with sinkhole dynamics, understanding and managing these impacts becomes increasingly crucial for sustainable development and community resilience.

Estimated Impact and Potential Loss

The six salt dome locations were analyzed to determine the number of people and homes that are potentially susceptible to losses from a sinkhole materializing from the salt domes. The following table is based on conducting a two-mile buffer around the center of the salt domes. The values were determined by querying the 2020 U.S. Census block data to determine the number of houses and people located within two miles of the salt domes and sinkholes. Critical facilities were also analyzed to determine if they fell within the two-mile buffer of the salt domes and sinkholes. Total value for all occupancy group from Hazus was used to estimate a total loss of all facilities that were within two miles of the salt domes and sinkholes.

Table 2-36: Estimated Potential Losses from a Sinkhole formation. (Source: U.S. 2020 Census Data and Hazus)

Salt Dome Name	Total Building Exposure	Critical Infrastructure Exposure	Number of People Exposed	Number of Houses Exposed
Foules	$312,000	0	124	63
Newellton	$219,605,000	5	1,047	539
Snake Bayou	$8,919,000	0	6	11
Somerset (Ashwood)	$13,969,000	0	91	89
South Coleman (Coleman)	$230,000	0	6	3
Tallulah (South Tallulah)	$230,000	0	23	43

Vulnerable Population

Per the NCEI Storm Events Database, there have been no reported fatalities or injuries as a result of sinkholes. However, sinkholes pose particularly severe and disproportionate impacts on vulnerable populations, exacerbating existing social disparities. Low-income communities often lack the resources to adequately prepare for and recover from sinkhole-related events. These populations may reside in areas prone to sinkhole formation due to limited housing options or historical settlement patterns. When sinkholes occur, they can destroy homes, disrupt essential services, and force displacement, leaving vulnerable individuals without stable housing and access to necessary amenities. Additionally, marginalized communities might face barriers in receiving timely assistance and information, compounding the challenges they face in the aftermath of sinkhole incidents. Limited financial means can hinder the ability to rebuild or relocate, trapping vulnerable populations in unsafe environments.

Vulnerability Score

Table 2-37: Sinkhole Vulnerability Score for the Parish.

Sinkhole Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	1	3	2	4	2	**2.3**

Thunderstorms (Hail, Lightning, & Thunderstorm Wind)

Overview

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

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

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

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

- **Severe Thunderstorm Watch:** Issued to alert people to the possibility of a severe thunderstorm developing in the area. Expected time frame for these storms is three to six hours.
- **Severe Thunderstorm Warning:** Issued when severe thunderstorms are imminent. This warning is highly localized and covers parts of one to several counties.

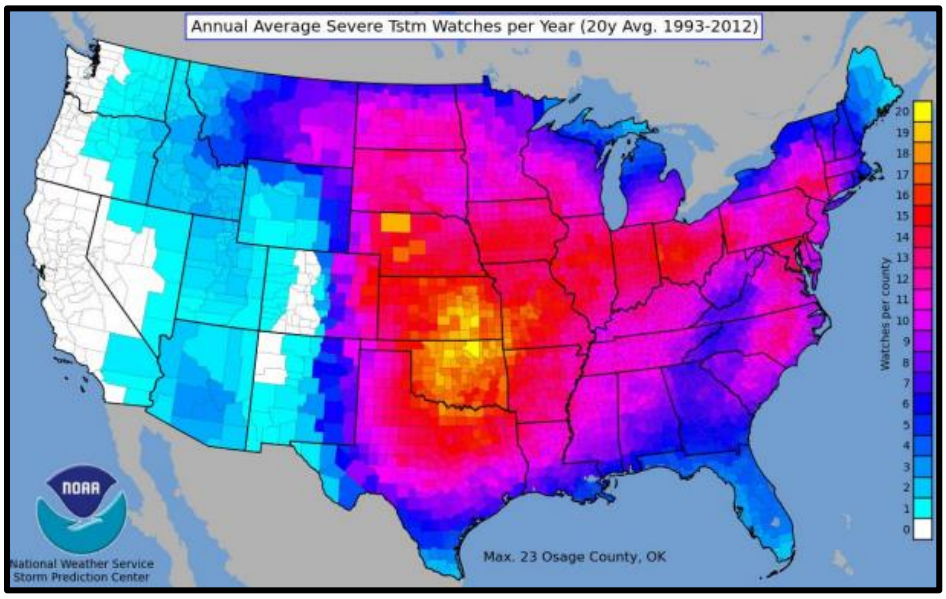


Figure 2-21: County-Level Severe Thunderstorm Watches Issued Per Year on Average.

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

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

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

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

Climate Change Impacts

The impact of climate change on thunderstorms is not well understood at this time. However, thunderstorms are complex, dynamic systems fueled by heat and moisture which can be measured with CAPE (convective available potential energy). It is predicted that CAPE will increase across the Eastern United States by the second half of the 21st century, meaning there is more energy to fuel severe thunderstorms. In this same time frame, there would be a small decrease in vertical wind shear, which helps produce long-lived severe storms. However, the increase in energy outweighs the decreasing shear to produce a net increase in environmental favorability for severe thunderstorms by the end of the century. Some climate models maintained by the Goddard Institute for Space Studies indicate that the number of severe thunderstorms will not change much, but the severe storms that do occur would have stronger winds and more intense precipitation.

Climate change is influencing the frequency and severity of thunderstorms, resulting in significant impacts on infrastructure and vulnerable populations. As global temperatures rise, the atmosphere becomes more energized, leading to an increase in the intensity of thunderstorm activity. Thunderstorms bring heavy rainfall, strong winds, hail, and lightning, all of which can cause substantial damage to various types of infrastructure.

One of the most significant impacts of thunderstorms on infrastructure is the damage to power and communication lines. Strong winds and lightning strikes can lead to power outages, disrupting essential services and communication networks. This can have severe consequences for communities that rely on electricity for medical equipment, communication, and daily living. Additionally, damage to power infrastructure can result in economic losses due to business interruptions and increased repair costs.

Furthermore, heavy rainfall associated with thunderstorms can lead to flash flooding, overwhelming stormwater drainage systems and causing road and bridge damage. This not only disrupts transportation networks but also poses a safety hazard for motorists and pedestrians. Flooded roads can isolate communities and hinder emergency response efforts, leaving vulnerable populations at higher risk during and after thunderstorm events.

Vulnerable populations, such as low-income communities and the elderly, often lack access to resources and live in areas with inadequate infrastructure. They are disproportionately affected by the impacts of thunderstorms. For instance, substandard housing in flood-prone regions can suffer severe damage during storms, displacing already marginalized individuals and families. The elderly and people with limited mobility may face difficulties evacuating during severe weather events, putting their lives at risk.

Moreover, thunderstorms can lead to an increase in lightning-related accidents and wildfires. Lightning strikes can cause fires that spread rapidly, threatening communities and posing additional risks to vulnerable populations living in areas prone to wildfires. These events not only endanger lives but also strain emergency response resources and increase the financial burden on affected communities.

To address the impacts of climate change on infrastructure and vulnerable populations concerning thunderstorms, several measures are crucial. Investment in resilient infrastructure, such as strengthening power grids and stormwater drainage systems, can help mitigate damage and improve response capabilities. Additionally, raising awareness and providing resources to vulnerable communities can enhance preparedness and evacuation plans. Climate change mitigation efforts to reduce greenhouse gas emissions are also essential in curbing the intensification of thunderstorms, ultimately safeguarding both infrastructure and vulnerable populations from the adverse effects of these severe weather events.

Hail Profile

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

time results in larger hailstone sizes. The tables below display the TORRO Hailstorm Intensity Scale, along with a spectrum of hailstone diameters and their everyday equivalents.

Table 2-38: 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 2-39: 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.

Lightning Profile

Lightning is defined by the National Weather Service as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Damage may also be indirect which occurs when the current passes through or near an object.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it transpires inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charged center and deliver negative charge to the earth. However, a large minority of flashes carry a positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike five to ten miles from the storm in areas that most people do not consider a threat. Positive lightning also has a longer duration, so fires are more easily ignited. When positive lightning strikes, it usually carries a high peak electrical current, which can potentially result in greater damage.

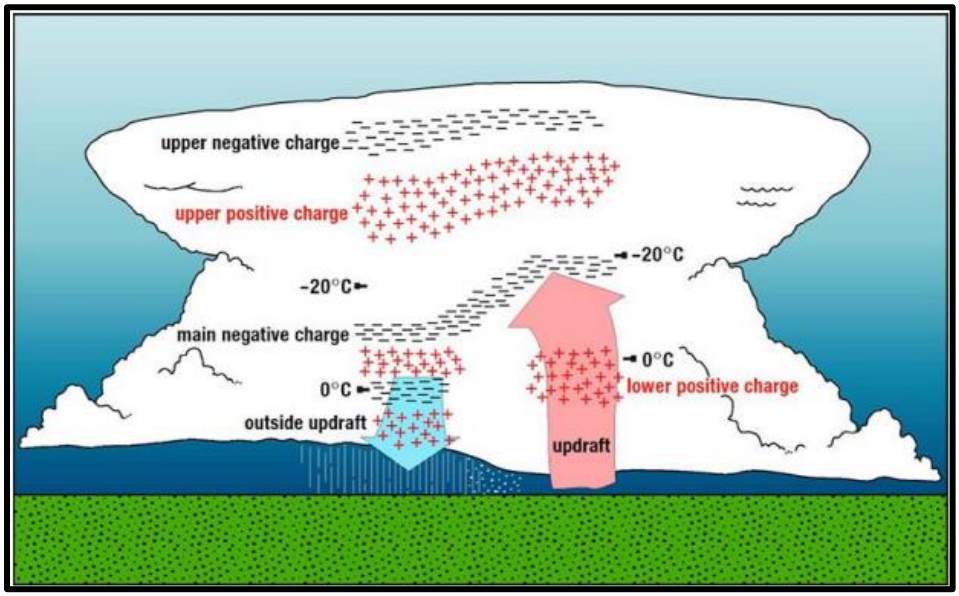


Figure 2-22: Charge Distribution in a Typical Storm Cloud.
(Source: The National Severe Storms Laboratory)

Lightning continues to be one of the top three storm-related killers in the United States per FEMA, but if not fatal 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 and intensity scale:

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

LAL	Cloud and Storm Development	Lightning Strikes/15 Min
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reaches 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	

Thunderstorm Wind Profile

In general, high winds occur in a number of different ways, with and without thunderstorms. Similar to hailstorms (and often associated with the same storm), high wind damage densities and reports resulting from severe thunderstorms vary spatially across Louisiana. The only high winds of present concern from the following table 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 Louisiana. Nor'easters are cyclonic low-pressure systems that have a minimal impact if any on Louisiana while hurricane winds have a significant impact on the state due to its location.

Table 2-41: High Winds Categorized by Source.
(Source: Making Critical Facilities Safe from High Wind, FEMA)

High Wind Type	Description
Straight-Line Winds	Wind blowing in straight line; usually associated with intense low-pressure area
Downslope Winds	Wind blowing down the slope of a mountain; associated with temperature and pressure gradients
Thunderstorm Winds	Wind blowing due to thunderstorms, and thus associated with temperature and pressure gradients
Downbursts	Sudden wind blowing down due to downdraft in a thunderstorm; spreads out horizontally at the ground, possible forming horizontal vortex rings around the downdraft.
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 Ocean and land
Hurricane Winds	Wind blowing in spirals, converging with increasing speed toward eye; associated with temperature and pressure gradients between the Atlantic Ocean, Gulf of Mexico, and land
Tornado Winds	Violently rotating column of air from base of thunderstorm to the ground with rapidly decreasing winds at greater distances from center; associated with extreme temperature gradient

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, increased vulnerability to fire, food spoilage, and other losses that might be sustained by a loss of power. The following table presents the Beaufort Wind Scale, first developed in 1805 by Sir Francis Beaufort, which aids in determining relative force and wind speed based on the appearance of wind effects:

Table 2-42: Beaufort Wind Scale.
(Source: NOAA's SPC)

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

Hail Risk Assessment

Geographic Extent

Because hailstorms are a climatological based occurrence that can occur anywhere, the entire planning area is at risk from hailstorms. The worst-case scenario for hailstorms is hail up to 2.5 inches in diameter.

Previous Occurrences

The parish experienced 37 hail occurrences between the years 1996 and 2023. Since the last update in 2019, there have been two hail occurrences within the boundaries of the parish.

Table 2-43: Historical Hail Occurrences in the Parish since the 2019 Update.

Date	Magnitude (inches)	Property Damage	Fatalities	Injuries
6/14/2023	1.75	$400,000	0	0
6/15/2023	1	$20,000	0	0

Probability

The annual return rate (frequency) for hail occurrences in the parish is 1.32 (100% annual probability) or approximately 1 to 2 hail occurrences every year. The figures on the following page display the density of hailstorm events and an overview of hailstorm size based on location.

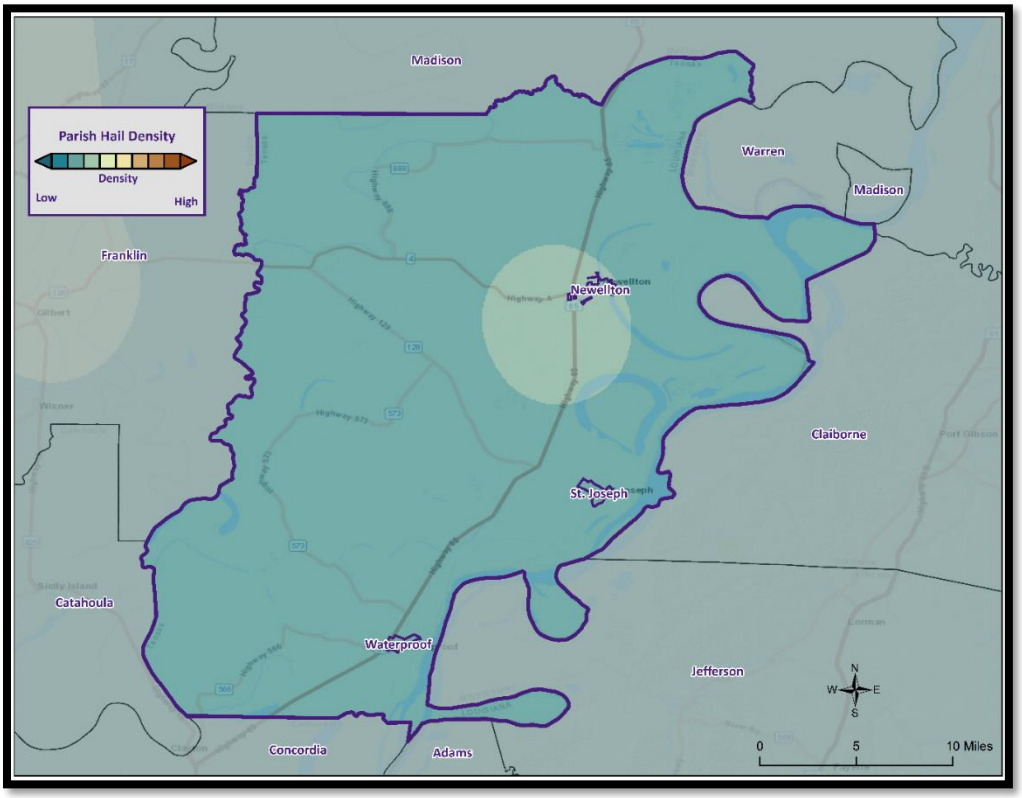


Figure 2-23: Density of Hailstorms by Diameter from 1950-2019.

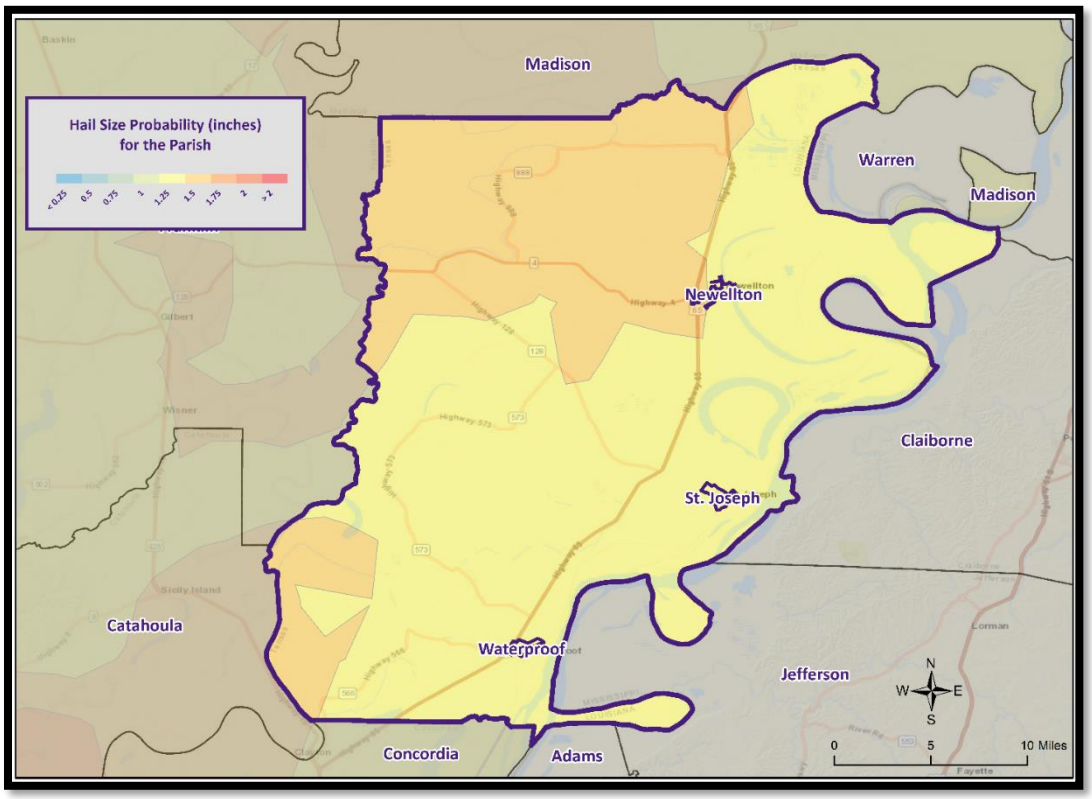


Figure 2-24: Hail Size Probability in Inches for the Parish.

Lightning Risk Assessment

Geographic Extent

Because lightning strikes are a climatological based occurrence that can occur anywhere, the entire planning area is at risk from lightning strikes. The worst-case scenario for lightning incidents is a lightning activity level of 4 which is approximately 16 to 25 lightning strikes every 15 minutes.

Previous Occurrences

The parish experienced one lightning occurrence between the years 1996 and 2023. Since the last update in 2019, there have been no significant lightning occurrences within the boundaries of the parish.

Probability

The annual return rate (frequency) for lightning occurrences in the parish is .04 (4% annual probability) or approximately 1 lightning occurrence every 28 years.

Thunderstorm Wind Risk Assessment

Geographic Extent

Because thunderstorm winds are a climatological-based occurrence that can occur anywhere, the entire planning area is at risk from thunderstorm wind. The worst-case scenario for thunderstorm wind occurrences is hail wind speeds of approximately 80 knots.

Previous Occurrences

The parish experienced 113 thunderstorm wind occurrences between the years 1996 and 2023. Since the last update in 2019, there have been 17 thunderstorm wind occurrences within the boundaries of the parish.

Table 2-44: Historical Thunderstorm Wind Occurrences in the Parish since the 2019 Update.

Date	Magnitude (knots)	Property Damage	Crop Damage	Fatalities	Injuries
1/11/2020	50	$2,000	$0	0	0
1/11/2020	50	$2,000	$0	1	1
12/13/2020	50	$2,000	$0	0	0
3/22/2022	50	$2,000	$0	0	0
4/13/2022	55	$5,000	$0	0	0
4/13/2022	45	$5,000	$0	0	0
5/25/2022	50	$5,000	$0	0	0
7/13/2022	40	$5,000	$0	0	0
5/11/2023	52	$2,000	$0	0	0
5/11/2023	52	$1,000	$0	0	0
6/12/2023	55	$10,000	$0	0	0
6/12/2023	55	$10,000	$0	0	0
6/16/2023	75	$250,000	$0	0	0
6/16/2023	80	$350,000	$0	0	0
6/27/2023	52	$1,000	$0	0	0
6/27/2023	52	$1,000	$0	0	0
6/27/2023	52	$1,000	$0	0	0

Probability

The annual return rate (frequency) for thunderstorm wind occurrences in the parish is 4.04 (100% annual probability) or approximately 4 to 5 thunderstorm wind occurrences every year. The following figure displays the thunderstorm wind speed probability for the parish.

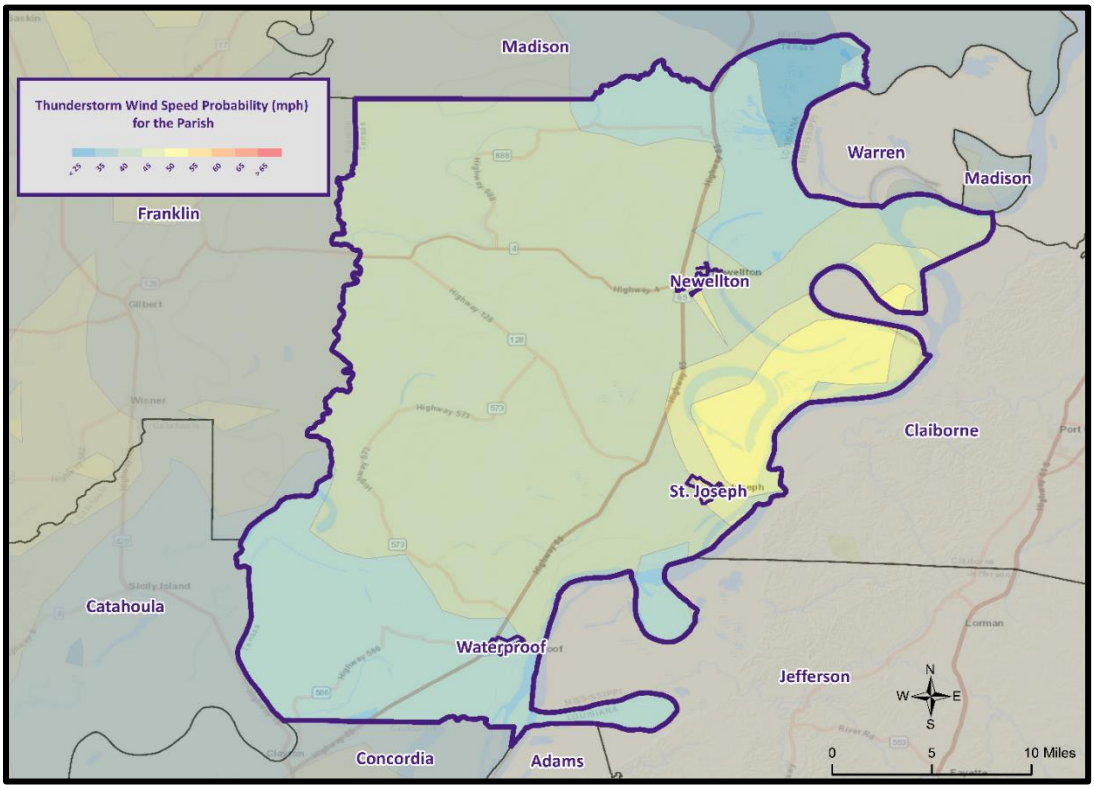


Figure 2-25: Thunderstorm High Wind Speed Probability in Miles Per Hour for the Parish.

Hail Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for hail.

Table 2-45: National Risk Index (NRI) Summarization of Hail Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Estimated Impact and Potential Loss

Since 1996, there have been 37 significant hail occurrences per the NCEI Storm Events Database. The total property damage associated with these storms totaled approximately $1,464,000. To estimate the potential losses on an annual basis, the total damages recorded were divided by the total number of years of available data in the NCEI Storm Events Database (1996 – 2023). This provides an annual estimated potential loss of $52,286 and $39,568 per event. The table on the next page provides an estimate of potential property losses for the Parish.

Table 2-46: Estimated Annual Property Losses in the Parish resulting from Hail Damage.

Estimated Annual Potential Losses			
Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
$21,837	$13,201	$10,439	$6,808

Vulnerable Population

Per the NCEI Storm Events Database, there have been no reported injuries or fatalities as a result of hail.

Vulnerability Score

The table below displays the vulnerability score for hail within Tensas Parish

Table 2-47: Hail Vulnerability Score for the Parish.

	Hail Vulnerability Score					
	Probability	Impact	Spatial Extent	Warning Time	Duration	Risk Factor
Risk Level	4	2	3	3	1	2.7

Lightning Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for lightning.

Table 2-48: National Risk Index (NRI) Summarization of Lightning Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Very Low	Very Low

Estimated Impact and Potential Loss

Since 1996, there has been one significant lightning occurrence per the NCEI Storm Events Database. The total property damage associated with this storm totaled approximately $1,000. To estimate the potential losses on an annual basis, the total damages recorded were divided by the total number of years of available data in the NCEI Storm Events Database (1996 – 2023). This provides an annual estimated potential loss of $36 and $1,000 per event. The following table provides an estimate of potential property losses for the Parish:

Table 2-49: Estimated Annual Property Losses in the Parish resulting from Lightning Damage.

Estimated Annual Potential Losses			
Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
$15	$9	$7	$5

Vulnerable Population

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

Vulnerability Score

The table below displays the vulnerability score for lightning within Tensas Parish

Table 2-50: Lightning Vulnerability Score for the Parish.

Lightning Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	2	2	2	3	1	**2**

Thunderstorm Wind Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for thunderstorm wind.

Table 2-51: National Risk Index (NRI) Summarization of Thunderstorm Wind Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Estimated Impact and Potential Loss

Since 1996, there have been 113 significant thunderstorm wind occurrences per the NCEI Storm Events Database. The total property damage associated with these storms totaled approximately $3,150,000. To estimate the potential losses on an annual basis, the total damages recorded were divided by the total number of years of available data in the NCEI Storm Events Database (1996 – 2023). This provides an annual estimated potential loss of $112,500 and $27,876 per event. The following table provides an estimate of potential property losses for the Parish:

Table 2-52: Estimated Annual Property Losses in the Parish resulting from Thunderstorm Wind Damage.

Estimated Annual Potential Losses			
Unincorporated Tensas Parish	**Newellton**	**St. Joseph**	**Waterproof**
$46,986	$28,403	$22,462	$14,649

Vulnerable Population

Per the NCEI Storm Events Database, there have been no reported injuries or fatalities as a result of thunderstorm winds.

Vulnerability Score

The table below displays the vulnerability score for thunderstorm wind within Tensas Parish.

Table 2-53: Thunderstorm Wind Vulnerability Score for the Parish.

Thunderstorm Wind Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	4	2	3	3	1	**2.7**

Tornadoes

Profile

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

Since February 1, 2007, the Enhanced Fujita (EF) Scale has been used to classify tornado intensity. The EF Scale classifies tornadoes based on their damage pattern rather than wind speed; wind speed is then derived and estimated. This contrasts with the Saffir-Simpson scale used for hurricane classification, which is based on measured wind speed. The following table shows the EF scale in comparison with the original 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 2-54: 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 2-55: Fujita and Enhanced Fujita Tornado Damage Scale.

Scale	Typical Damage
F0/EF0	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1/EF1	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2/EF2	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; light-object missiles generated; cars lifted off ground.
F3/EF3	Severe damage. Roofs and some walls torn of well-constructed houses; trains overturned; most trees in Brusly 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.

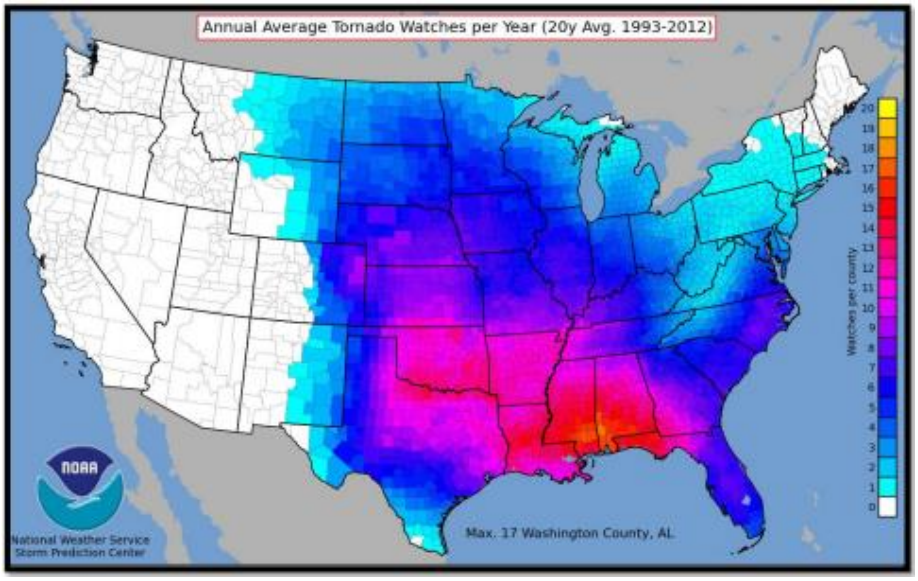


Figure 2-26: County-Level Tornado Watches Issued Per Year on Average. (Source: NOAA SPC)

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

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

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.

Risk Assessment

Geographic Extent

Tornadoes occur sporadically throughout the parish and the occurrence of a tornado in the parish is highly unpredictable making it impossible to forecast the exact time and locations of when a tornado will touch down or the path it will take. Because of this, the entire planning area is considered equally at risk for a tornadic incident. The worst-cast scenario of a tornado occurrence is an EF2 tornado.

Previous Occurrences

The parish experienced 22 tornado occurrences between the years 1996 and 2023. Since the last update in 2019, there have been three tornado occurrences within the boundaries of the parish.

Date	Location	Magnitude	Property Damage	Crop Damage	Fatalities	Injuries
4/13/2019	NEW LIGHT	EF1	$70,000	$0	0	0
4/13/2019	FRANKLIN	EF1	$50,000	$0	0	0
12/16/2019	ST. JOSEPH LAKE	EF0	$4,000	$0	0	0

Probability

The annual return rate (frequency) for tornado occurrences in the parish is 0.39 (39% annual probability) or approximately 1 tornado occurrence every 2 to 3 years. The following figure displays the tornado density for the parish.

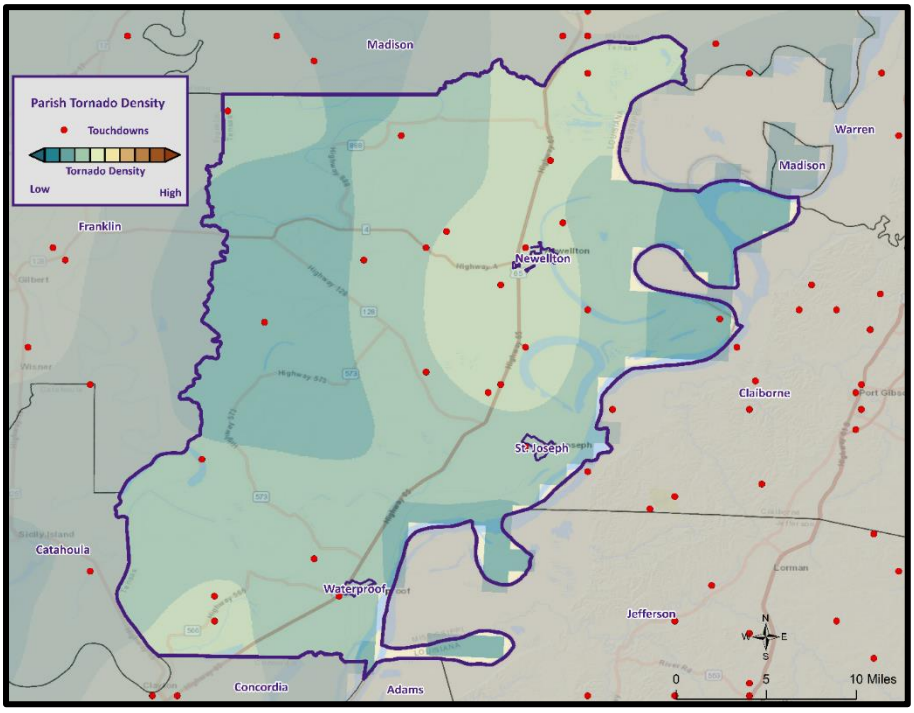


Figure 2-27: Location and Density of Tornadoes to Touchdown in the Parish (Source: NOAA/SPC Severe Weather Database

Climate Change Impacts

Similar to thunderstorms, the impacts of climate change on the occurrence and strength of tornadoes is not well understood at this time, but is an area of ongoing research. While only about 1% of thunderstorms will produce a tornado, preliminary research and climate models indicate that the environmental suitability for severe thunderstorms, and therefore tornadoes, could increase over the Eastern United States by the end of the century.

Climate change is contributing to the increasing frequency and intensity of tornadoes, leading to significant impacts on both infrastructure and vulnerable populations. As global temperatures rise, the atmosphere becomes more unstable, creating conditions favorable for the development of severe thunderstorms and tornadoes. Tornadoes are powerful and destructive, capable of causing widespread damage to various types of infrastructure.

One of the most significant impacts of tornadoes on infrastructure is the destruction of buildings and critical facilities. Tornadoes can flatten homes, schools, hospitals, and businesses, leaving communities devastated and in need of urgent assistance. The damage to infrastructure disrupts essential services, such as electricity, water supply, and communication networks, exacerbating the challenges faced by affected communities during recovery and rebuilding efforts.

Vulnerable populations are particularly at-risk during tornadoes. Low-income communities often live in substandard housing and lack access to proper storm shelters, leaving them more exposed to the destructive forces of tornadoes. Furthermore, elderly individuals and people with disabilities may struggle to seek shelter and escape the path of these fast-moving storms, increasing their vulnerability to injury or death. Tornadoes can also disproportionately affect marginalized communities due to limited access to emergency response services and resources.

Moreover, tornadoes can lead to economic hardships for vulnerable populations. Homes and properties are often uninsured or underinsured in these areas, leaving residents with significant financial burdens after tornadoes strike. As a result, vulnerable communities may face challenges in recovering and rebuilding their lives, perpetuating cycles of poverty and inequality.

To address the impacts of climate change on infrastructure and vulnerable populations concerning tornadoes, proactive measures are essential. Building tornado-resistant infrastructure and implementing better early warning systems can help minimize the damage caused by tornadoes. For vulnerable populations, providing accessible storm shelters and ensuring access to emergency resources and support are critical to saving lives and reducing the long-term impacts of tornadoes. Additionally, climate change mitigation efforts are crucial to addressing the root causes of tornado intensification, as reducing greenhouse gas emissions can help stabilize the climate and potentially mitigate the future increase in tornado frequency and severity.

Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The table on the following page provides an overview of each category at the county level for tornadoes.

Table 2-56: National Risk Index (NRI) Summarization of Tornado Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Estimated Impact and Potential Loss

Since 1996, there have been 11 significant tornado occurrences per the NCEI Storm Events Database. The total property damage associated with these storms totaled approximately $5,896,000. To estimate the potential losses on an annual basis, the total damages recorded were divided by the total number of years of available data in the NCEI Storm Events Database (1996 – 2023). This provides an annual estimated potential loss of $210,571 and $536,000 per event. The following table provides an estimate of potential property losses for the Parish:

Table 2-57: Estimated Annual Property Losses in the Parish resulting from Tornado Damage.

Estimated Annual Potential Losses			
Unincorporated Tensas Parish	Newellton	St. Joseph	Waterproof
$87,945	$53,163	$42,043	$27,419

The following table presents an analysis of building exposure that are susceptible to tornadoes by general occupancy type for the parish along with the percentage of building stock that are mobile homes.

Table 2-58: Building Exposure by General Occupancy Type for Tornadoes in the Parish. (Source: Hazus)

Building Exposure by General Occupancy Type for Tornadoes – Exposure Types ($1,000)							
Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Mobile Homes (%)
810,995	132,343	31,260	44,363	39,992	14,595	14,581	16.4

Vulnerable Population

Per the NCEI Storm Events Database, there have been no reported fatalities and three injuries as a result of tornadoes.

In accessing the overall risk to population, the most vulnerable population throughout the parish are those residing in manufacturing housing. Approximately 16.4% of all housing in the Parish consists of manufactured housing. The location and density of manufactured houses can be seen in the figure on the following page.

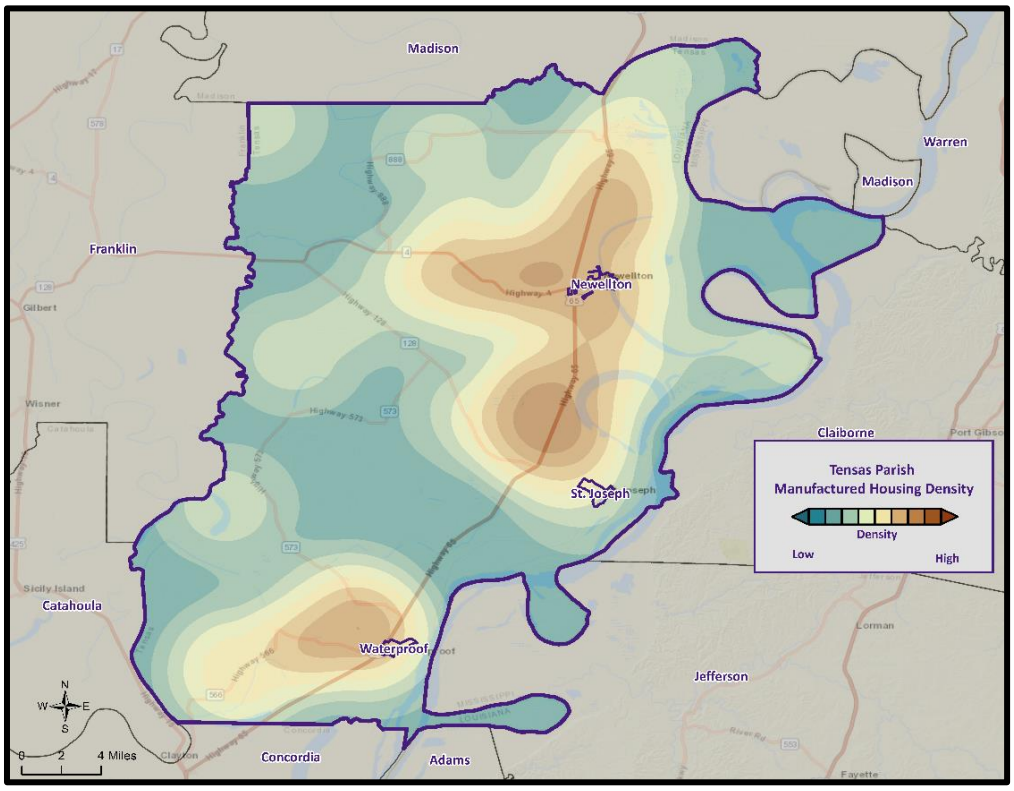


Figure 2-28: Location and Approximate Number of Units in Manufactured Housing Locations throughout the Parish.

Vulnerability Score

The table below displays the vulnerability score for tornadoes within Tensas Parish

Table 2-59: Tornado Vulnerability Score for the Parish.

Tornado Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	3	3	2	4	3	**2.95**

Tropical Cyclones

Profile

Hurricanes, typhoons, and cyclones, are names for powerful tropical storms in which winds rotate around a closed circulation of low-pressure. In the Atlantic and eastern Pacific basins, they are known as hurricanes, in Asia (western Pacific) they are known as typhoons, and in Australia they are called cyclones. In the Northern Hemisphere, hurricane winds rotate in a counter-clockwise direction (clockwise in the Southern Hemisphere). The key energy source for a hurricane is the release of latent heat energy from condensation.

This energy is found where there is a deep layer of warm water to fuel the system. Conditions for hurricane formation include warm waters, rotational force from the earth's spin (Coriolis Effect), and the absence of vertical wind shear (stability in the lower atmosphere). Tropical disturbances that affect North America typically originate off the west coast of Africa. If the tropical disturbance lowers in pressure and starts to rotate around a low pressure center, it may turn into a tropical depression. Barometric pressure (measured in millibars or inches) continues to fall in the center as these storm systems develop in intensity. When sustained wind speeds reach 39 mph, the system becomes a tropical storm and is given a name by the National Hurricane Center. When sustained wind speeds reach 74 mph, it becomes a hurricane. Hurricanes are much larger and powerful storms with an average diameter of 350 miles. The start of the official Atlantic hurricane season is June 1st and ends November 30th. Peak hurricane season is August and September in the Northern Hemisphere, when water temperatures and evaporation rates are greatest. Associated with these storms are damaging winds, heavy precipitation, and tornadoes. Coastal areas are also vulnerable to storm surge, wind-driven waves, and tidal flooding, which can cause more destruction than cyclone winds.

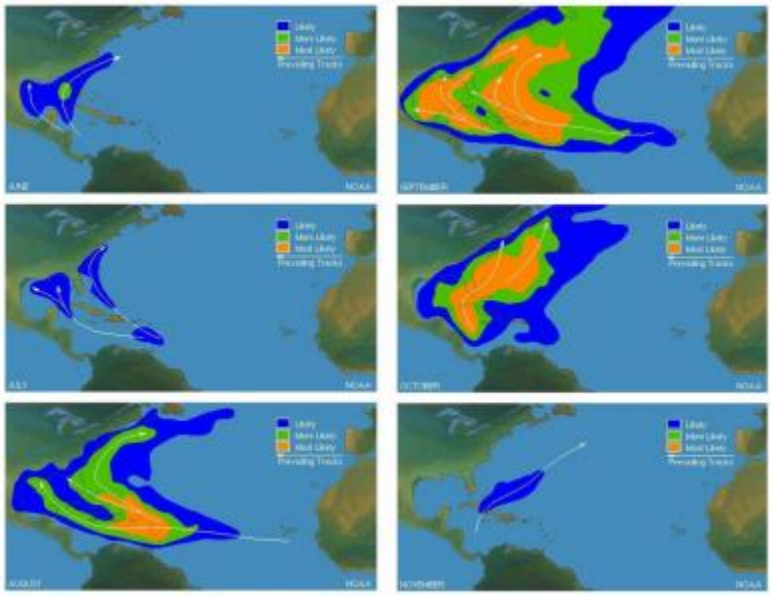


Figure 2-29: Areas of Likely Tropical Cyclone Formation and Tracking. (Source: NOAA NHC)

Hurricane intensity is classified by the Saffir-Simpson Scale, which categorizes hurricane intensity based upon maximum sustained wind speeds on a scale of one to five, with five being the most intense. Typically, higher category hurricanes have lower pressure and greater storm surge. Categories three, four, and five are classified as "major" hurricanes, and while hurricanes within this range comprise only 20

percent of total landfalls, they account for over 70 percent of the damage incurred in the United States. Hurricane (Category 1 or higher) return periods are shown the following figure:

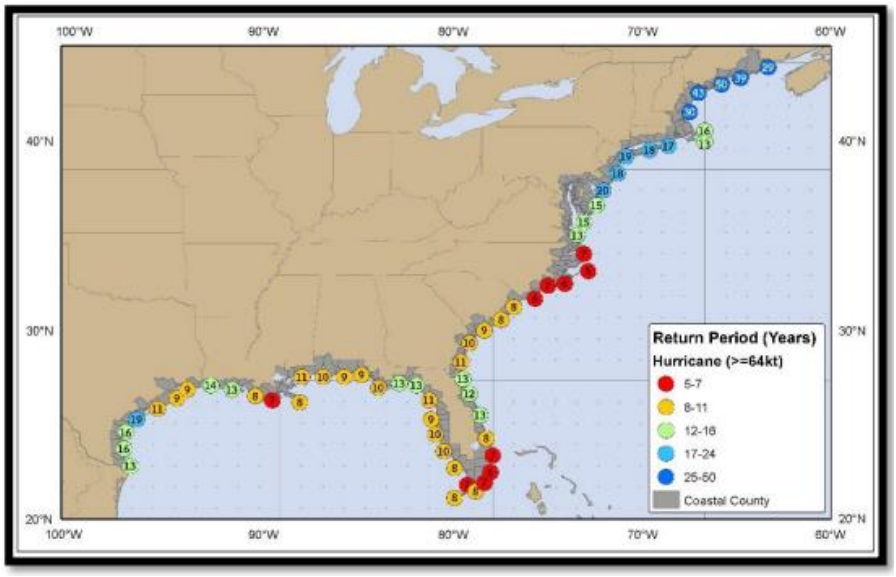


Figure 2-30: Hurricane Return Periods for the Atlantic Basin (USA). (Source: NOAA NHC)

Table 2-60: 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.

Storm surge is elevated water level that is pushed towards the shore by the force of strong winds that result in the piling up of water. The advancing surge combines with the normal tides, which in extreme cases can increase the normal water height over 20 feet. The storm surge arrives ahead of the storm's actual landfall and the more intense the hurricane is, the sooner the surge arrives. Water rise can be very rapid and can move far inland, posing a serious threat to those who have not yet evacuated flood-prone areas. Debris carried by the waves can also contribute to the devastation. As the storm approaches shore, the greatest storm surge will be to the north of the hurricane eye, in the right-front quadrant of the direction in which the hurricane is moving. Such a surge of high water topped by waves driven by hurricane force winds can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast. Storm sure heights, and associated waves, are dependent upon the shape of the continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. While disassociated with the Saffir-Simpson Scale, storm surge remains the leading killer of residents along immediate coastal areas. Researchers at the Southern Regional Climate Center have indicated that hurricane strength at approximately 12-18 hours prior to landfall is a better indicator of storm surge strength (compared to wind speeds at landfall).

Many other 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.

Risk Assessment

Geographic Extent

Tropical cyclones typically impact multiple regions and not one specific jurisdiction or campus. Because of this, all of the planning area is susceptible to the effects of tropical cyclones. Tropical cyclones are the single biggest threat to all of South 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 parish planning area. The worst-case scenario for a tropical cyclone event in the parish is a Tropical Storm.

Previous Occurrences

The parish experienced five tropical cyclone occurrences between the years 2002 and 2023. Since the last update in 2019, there has been one tropical cyclone occurrence within the boundaries of the parish.

Table 2-61: Historical Tropical Cyclone Occurrences in the Parish since the 2019 Update.

Date	Magnitude	Name	Property Damage	Crop Damage	Fatalities	Injuries
8/27/2020	Tropical Storm	Laura	$35,000	$0	0	0

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.

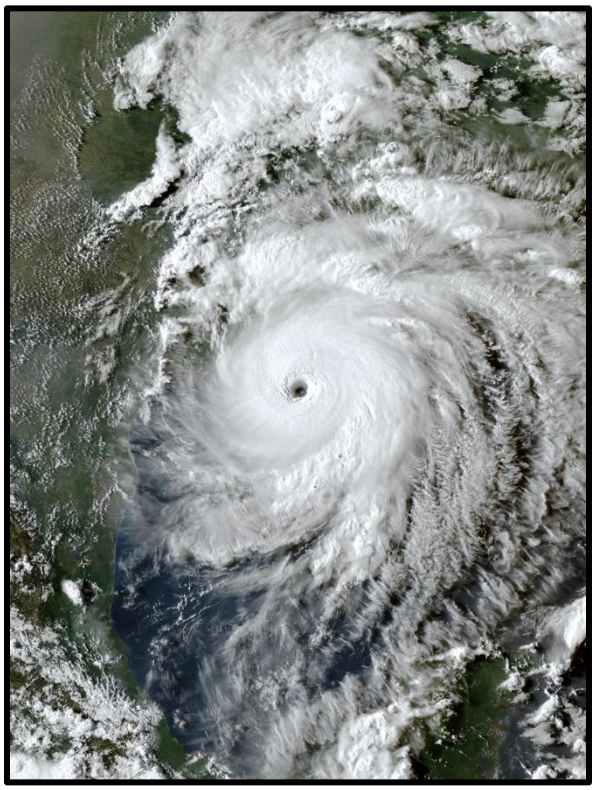


Figure 2-31: Hurricane Laura in the Gulf Coast Area. (Source: NOAA)

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.

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 Morehouse Parish during the cleanup process, and eight others died in Beauregard Parish,

Grant Parish, Morehouse Parish, and Vernon Parish due to heat-related illnesses following the loss of electricity.

In Tensas Parish, numerous trees and power lines were downed parish wide.

Probability

The annual return rate (frequency) for tropical cyclone occurrences in the parish is 0.23 (23% annual probability) or approximately 1 tropical cyclone occurrence every 4 to 5 years.

Climate Change Impacts

Climate change has the potential to alter the prevalence and severity of extreme incidents such as tropical cyclones. Louisiana is expected to experience more days with temperatures above 95°F this century which means an increase in sea surface and ambient temperatures, alterations in the hydrological cycle, and an increase in seal level which collectively may increase the frequency of large storm incidents and impacts. Research indicates that the warming climate will increase the frequency of Category 4 and 5 hurricanes but decrease the frequency of less severe tropical cyclone incidents by the end of the century. This increase in the frequency of Category 4 and 5 hurricanes will lead to an increase in damage to the built environment and increased negative effects on the economy and ecosystem.

Climate change is amplifying the impacts of tropical cyclones on both infrastructure and vulnerable populations, making them more frequent and severe. As ocean temperatures rise due to global warming, tropical cyclones have access to greater energy, leading to stronger and more destructive storms. The intensification of cyclones poses significant risks to infrastructure located in coastal regions.

One of the primary impacts of tropical cyclones on infrastructure is the damage caused by strong winds and storm surges. Cyclones can rip apart buildings, topple power lines, and uproot trees, leading to widespread destruction of homes, businesses, and public facilities. Coastal areas are particularly vulnerable to storm surges, which can inundate low-lying regions and cause severe flooding, damaging roads, bridges, and critical lifeline infrastructure such as water and sewage systems.

Vulnerable populations face disproportionate risks during tropical cyclones, especially in low-lying coastal communities. People with limited mobility, the elderly, and low-income households often lack resources and access to evacuation options, making them more susceptible to the devastating impacts of cyclones. Displacement, property damage, and loss of livelihoods are common consequences for vulnerable populations affected by cyclones, exacerbating existing social inequalities and pushing them further into hardship.

Moreover, tropical cyclones can have long-lasting effects on the mental and physical health of vulnerable populations. The trauma caused by experiencing such extreme weather events can lead to long-term psychological distress. Lack of access to healthcare and resources after cyclones can also result in a higher risk of waterborne diseases and malnutrition for vulnerable communities.

To mitigate the impacts of climate change on infrastructure and vulnerable populations concerning tropical cyclones, several actions are crucial. Investing in more resilient infrastructure that can withstand stronger storms and higher storm surges is essential to minimize damage and ensure the continuity of critical services. Enhancing early warning systems and evacuation plans can save lives and improve the preparedness of vulnerable populations. Additionally, providing social safety nets and support to vulnerable communities can aid in their recovery and reduce the long-term impacts of cyclones on their

well-being. Mitigating climate change by reducing greenhouse gas emissions is also vital to curbing the intensification of tropical cyclones and protecting both infrastructure and vulnerable populations from their devastating effects.

Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for tropical cyclones.

Table 2-62: National Risk Index (NRI) Summarization of Tropical Cyclone Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Very Low	Very Low

Estimated Impact and Potential Loss

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

Table 2-63: Total Estimated Losses for a 100-Year Hurricane Event (Source: Hazus)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event
Unincorporated Tensas Parish	$372,895
Newellton	$225,416
St. Joseph	$178,266
Waterproof	$116,261
Total	$892,838

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

Table 2-64: Ratio of Total Losses to Total Estimated Value of Assets for the Parish. (Source: Hazus)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event	Total Estimated Value of Assets	Ratio of Estimated Losses to Total Value
Unincorporated Tensas Parish	$372,895	$591,115,000	0.1%
Newellton	$225,416	$202,893,000	0.1%
St. Joseph	$178,266	$169,545,000	0.1%
Waterproof	$116,261	$124,576,000	0.1%

Based on the Hazus Hurricane Model, estimated total losses for the parish and the jurisdictions is 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 the parish by sector are listed in the table below.

Table 2-65: Estimated Losses in Unincorporated Area of the Parish for a 100-Year Hurricane Event (Source: Hazus)

Unincorporated Tensas Parish	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$813
Commercial	$2,124
Government	$177
Industrial	$737
Religious / Non-Profit	$782
Residential	$367,928
Schools	$334
Total	**$372,895**

Table 2-66: Estimated Losses in Newellton for a 100-Year Hurricane Event (Source: Hazus)

Newellton	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$491
Commercial	$1,284
Government	$107
Industrial	$446
Religious / Non-Profit	$473
Residential	$222,414
Schools	$202
Total	**$225,416**

Table 2-67: Estimated Losses in St. Joseph for a 100-Year Hurricane Event (Source: Hazus)

St. Joseph	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$389
Commercial	$1,015
Government	$85
Industrial	$352
Religious / Non-Profit	$374
Residential	$175,892
Schools	$159
Total	**$178,266**

Table 2-68: Estimated Losses in Waterproof for a 100-Year Hurricane Event (Source: Hazus)

Waterproof	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$253
Commercial	$662
Government	$55
Industrial	$230
Religious / Non-Profit	$244
Residential	$114,712
Schools	$104
Total	**$116,261**

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

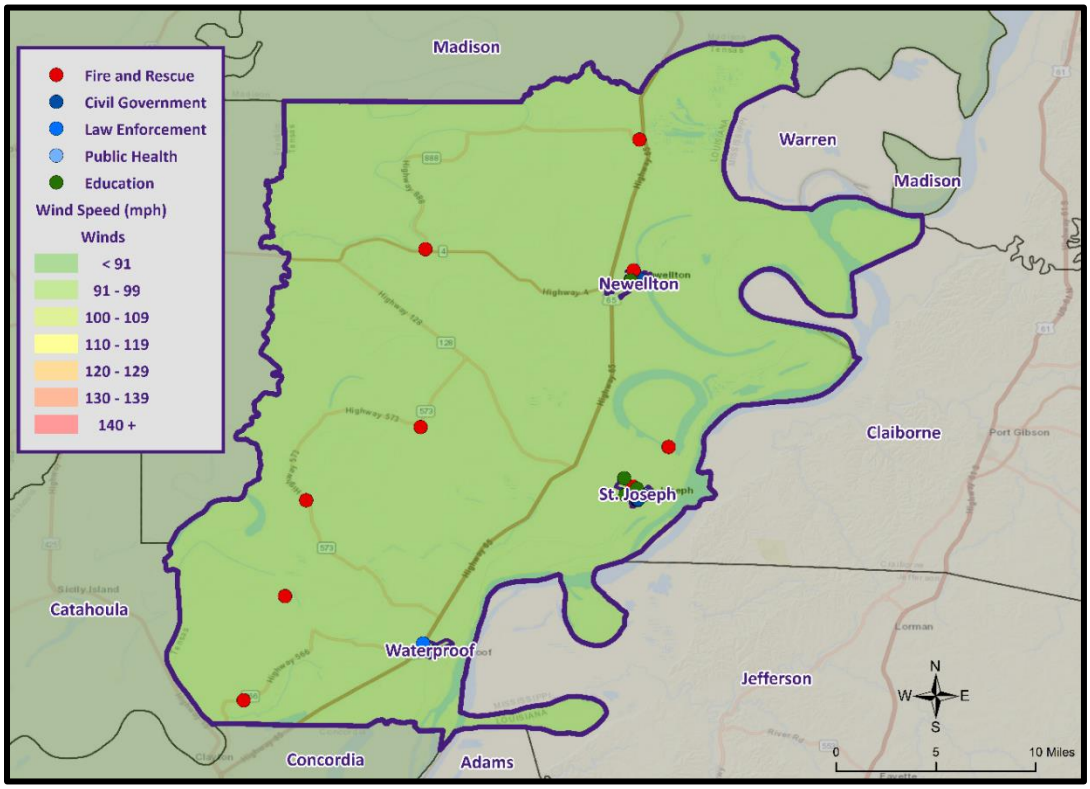


Figure 2-32: Winds Zones for the Parish in Relation to Critical Facilities

Vulnerable Population

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

Table 2-69: Number of People Susceptible to a 100-Year Hurricane Event in the Parish (Source: Hazus)

Number of People Exposed to Hurricane Hazards			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Unincorporated Tensas Parish	1,732	1,732	100%
Newellton	1,047	1,047	100%
St. Joseph	828	828	100%
Waterproof	540	540	100%
Total	**4,147**	**4,147**	**100%**

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

Table 2-70: Vulnerable Populations in Unincorporated Area of the Parish for a 100-Year Hurricane Event (Source: Hazus)

Unincorporated Tensas Parish		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	1,732	100.0%
Persons Under 5 Years	121	7.0%
Persons Under 18 Years	438	25.3%
Persons 65 Years and Over	300	17.3%
White	757	43.7%
Minority	975	56.3%

Table 2-71: Vulnerable Populations in Newellton for a 100-Year Hurricane Event (Source: Hazus)

Newellton		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	1,047	100.0%
Persons Under 5 Years	85	8.1%
Persons Under 18 Years	203	19.4%
Persons 65 Years and Over	174	16.6%
White	298	28.5%
Minority	749	71.5%

Table 2-72: Vulnerable Populations in St. Joseph for a 100-Year Hurricane Event (Source: Hazus)

St. Joseph		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	828	100.0%
Persons Under 5 Years	70	8.5%
Persons Under 18 Years	172	20.8%
Persons 65 Years and Over	94	11.4%
White	173	20.9%
Minority	655	79.1%

Table 2-73: Vulnerable Populations in Waterproof for a 100-Year Hurricane Event (Source: Hazus)

Waterproof		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	540	100.0%
Persons Under 5 Years	34	6.3%
Persons Under 18 Years	119	22.1%
Persons 65 Years and Over	89	16.4%
White	44	8.1%
Minority	496	91.9%

Vulnerability Score

The table below displays the vulnerability score for tropical cyclones within Tensas Parish.

Table 2-74: Tropical Cyclone Vulnerability Score for the Parish.

Tropical Cyclone Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	3	4	4	1	4	**3.3**

Wildfires

Profile

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 (e.g., leaves, small sticks) 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 aims 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).

The wildland-urban interface and intermix land cover surface, developed by the SILVIS Lab at the University of Wisconsin in Madison, can be used to determine areas at risk. Wildland-urban interface is defined as the zone of transition between unoccupied land and human development. This usually includes communities or areas of human development that are within 0.5 miles of the zone. Wildland-urban intermix is defined as areas in which human development is intermixed with wildland fuels. Intermix and interface areas are at risk of wildfires.

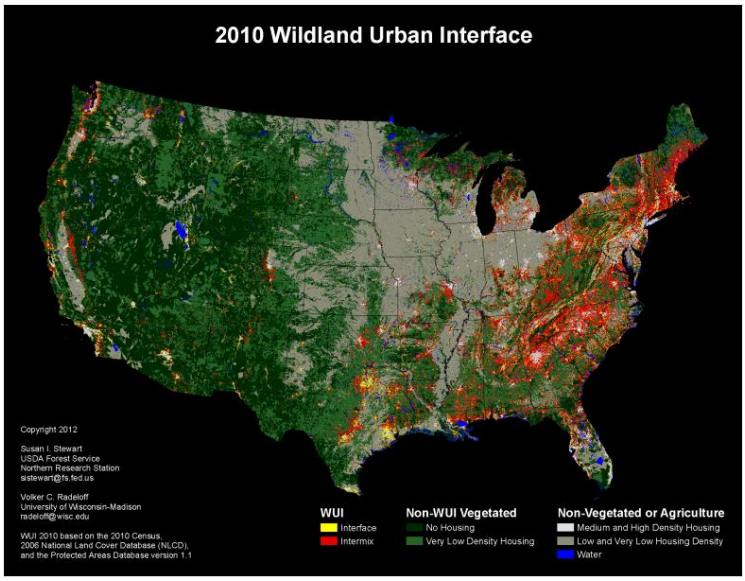


Figure 2-33: Contiguous USA Wildland Urban Interface Map.

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 2-75: 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.

Risk Assessment

Geographic Extent

Wildfires impact areas that are populated with forests and grasslands. The worst-case scenario for the unincorporated area of the parish is a level 5 and Newellton, St. Joseph, and Waterproof are a level 3. The figures on the following page display the areas of wildland-urban interface and intermix in the Parish and the jurisdictions.

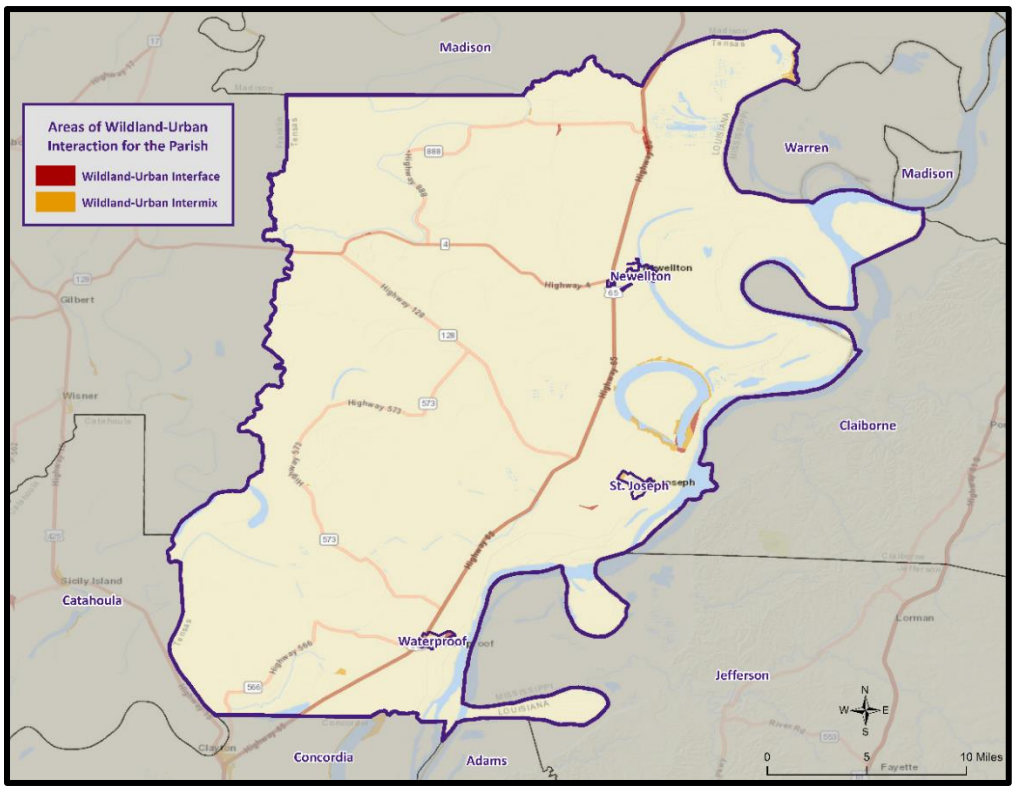


Figure 2-34: Wildland-Urban Interaction in the Parish.

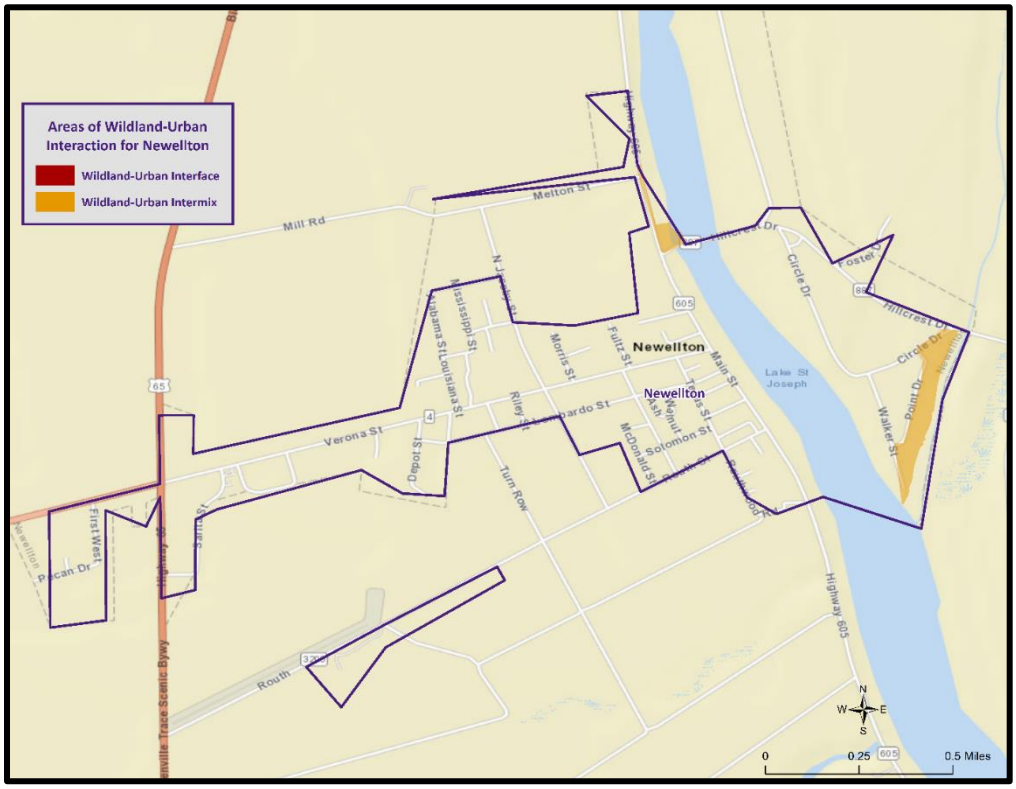


Figure 2-35: Wildland-Urban Interaction in Newellton.

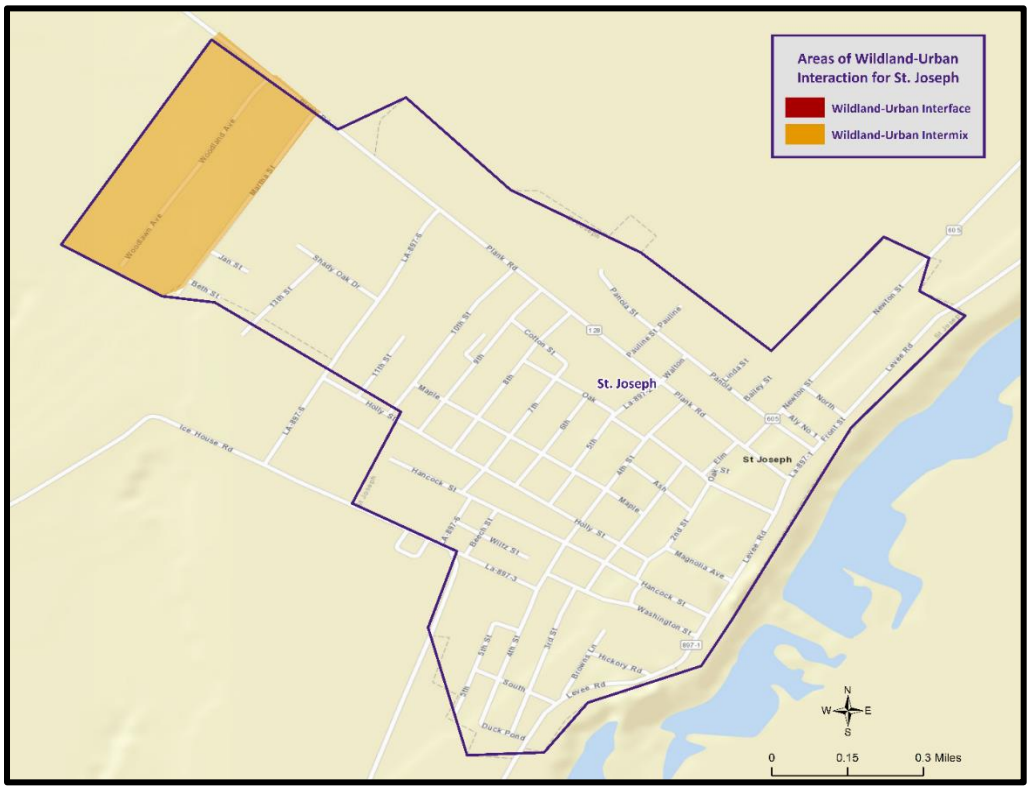


Figure 2-36: Wildland-Urban Interaction in St. Joseph.

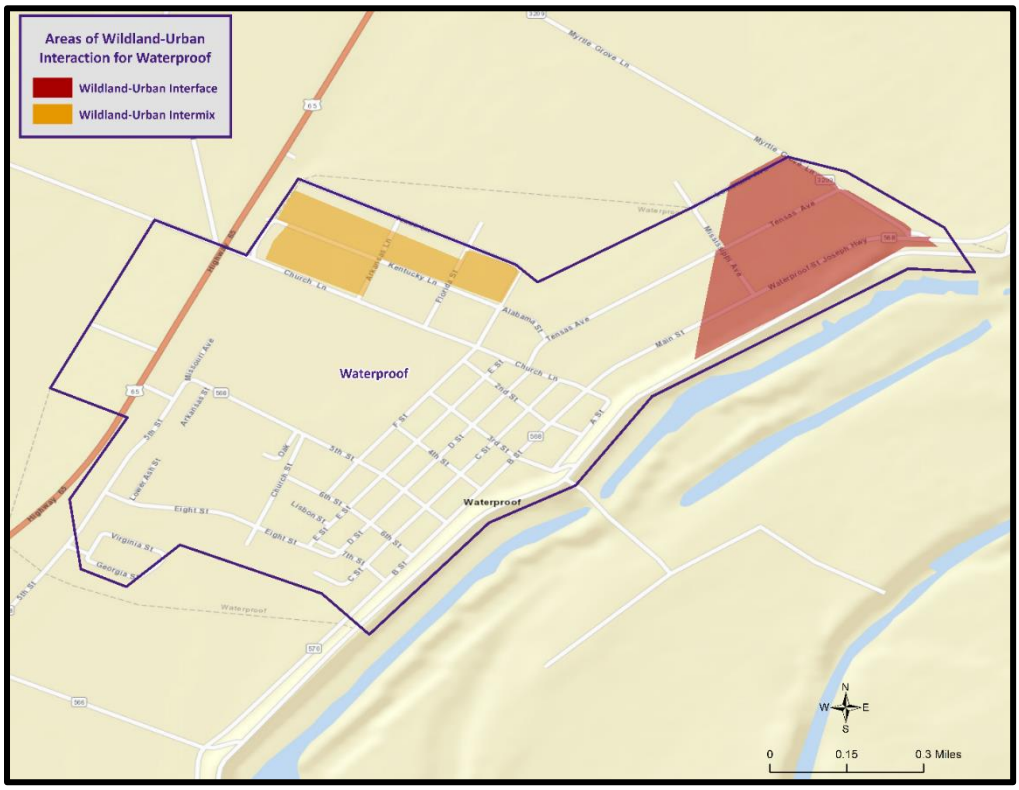


Figure 2-37: Wildland-Urban Interaction in Waterproof.

Previous Occurrences

The parish has experienced no significant wildfire occurrences between the years 1996 and 2023 per the NCEI Storm Events Database.

Probability

The annual return rate (frequency) for wildfire occurrences in the parish is less than 0.01 (< 1% annual probability) or 1 wildfire event approximately every 27 years.

Climate Change Impacts

The increasing probability and intensity of drought caused by climate change across Louisiana indicates that the risk of wildfires will also increase. The presence of drought or prolonged dry spells will lead to an increase in dry grasses, brush, and forests that act as fuel for fires.

Climate change is playing a significant role in the increasing frequency and severity of wildfires, resulting in substantial impacts on infrastructure and vulnerable populations. Rising temperatures, prolonged droughts, and altered precipitation patterns create ideal conditions for wildfires to ignite and spread rapidly. The destruction of critical infrastructure is one of the most profound consequences of wildfires. Roads, power lines, telecommunication networks, and water supply systems are vulnerable to damage, hindering emergency response efforts and disrupting access to essential services for communities affected by wildfires.

Vulnerable populations face unique challenges during wildfires. Those living in fire-prone areas often lack the means to adequately protect their homes and properties, making them more susceptible to property loss and displacement. Low-income communities may also have limited access to resources for evacuation and recovery, further exacerbating the impacts of wildfires on their well-being. Additionally, the elderly, children, and individuals with respiratory conditions are at heightened health risks due to poor air quality caused by wildfire smoke, which can lead to respiratory problems and other health issues.

Furthermore, wildfires can have long-term social and economic impacts on vulnerable populations. Displacement and property loss can force people to leave their homes and communities, leading to disruptions in education, employment, and social connections. The loss of livelihoods, particularly for those dependent on agriculture or tourism in affected regions, can exacerbate poverty and economic inequality.

To address the impacts of climate change on infrastructure and vulnerable populations concerning wildfires, various strategies are necessary. Investing in fire-resistant infrastructure and implementing better land use planning can help reduce the risk of infrastructure damage during wildfires. Creating and improving evacuation plans and warning systems can aid in ensuring the safety of vulnerable communities. Additionally, providing support and resources for those affected by wildfires, such as temporary housing, healthcare, and financial assistance, is essential for their recovery and well-being. To mitigate future wildfires and their impacts, it is imperative to take urgent action on climate change by reducing greenhouse gas emissions and implementing sustainable land management practices to protect both infrastructure and vulnerable populations from the increasing threats of wildfires.

Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for wildfires.

Table 2-76: National Risk Index (NRI) Summarization of Wildfire Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Very Low	Very Low

Estimated Impact and Potential Loss

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 2-77: Total Building Exposure by Wildland-Urban Interaction Areas. (Source: Hazus)

Jurisdiction	Estimated Total Building Exposure
Unincorporated Tensas Parish	$204,845,000
Newellton	$25,606,000
St. Joseph	$20,855,000
Waterproof	$61,526,000
Total	**$312,832,000**

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.

Table 2-78: Estimated Exposure for Unincorporated Area of the Parish by Sector. (Source: Hazus)

Unincorporated Tensas Parish	Estimated Total Building Exposure by Sector
Agricultural	$3,592,000
Commercial	$1,212,000
Government	$0
Industrial	$0
Religious / Non-Profit	$1,504,000
Residential	$198,537,000
Schools	$0
Total	**$204,845,000**

Table 2-79: Estimated Exposure for Newellton by Sector.
(Source: Hazus)

Newellton	Estimated Total Building Exposure by Sector
Agricultural	$136,000
Commercial	$1,848,000
Government	$0
Industrial	$0
Religious / Non-Profit	$3,562,000
Residential	$20,060,000
Schools	$0
Total	**$25,606,000**

Table 2-80: Estimated Exposure in St. Joseph Rouge by Sector.
(Source: Hazus)

St. Joseph	Estimated Total Building Exposure by Sector
Agricultural	$476,000
Commercial	$1,084,000
Government	$0
Industrial	$0
Religious / Non-Profit	$0
Residential	$19,295,000
Schools	$0
Total	**$20,855,000**

Table 2-81: Estimated Exposure for Waterproof by Sector.
(Source: Hazus)

Waterproof	Estimated Total Building Exposure by Sector
Agricultural	$18,510,000
Commercial	$9,338,000
Government	$1,102,000
Industrial	$0
Religious / Non-Profit	$3,040,000
Residential	$29,536,000
Schools	$0
Total	**$61,526,000**

Vulnerable Population

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

Table 2-82: Population Located within a Wildland-Urban Interaction Areas. (Source: 2020 U.S. Census Data)

Number of People Located in Wildland-Urban Interaction Areas			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Unincorporated Tensas Parish	1,732	75	4.3%
Newellton	1,047	31	3.0%
St. Joseph	828	162	19.6%
Waterproof	540	185	34.3%
Total	**4,147**	**453**	**10.9%**

The 2020 U.S. Census data was also extrapolated to provide an overview of populations located within wildland-urban interaction areas throughout the jurisdictions. The date is illustrated in the following tables:

Table 2-83: Population in Unincorporated Tensas Parish Located in a Wildland-Urban Interaction Area. (Source: 2020 Census Data)

Unincorporated Tensas Parish		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	75	4.3%
Persons Under 5 Years	5	7.0%
Persons Under 18 Years	19	25.3%
Persons 65 Years and Over	13	17.3%
White	33	43.7%
Minority	42	56.3%

Table 2-84: Population in Newellton Located within a Wildland-Urban Interaction Area. (Source: 2020 Census Data)

Newellton		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	31	3.0%
Persons Under 5 Years	3	8.1%
Persons Under 18 Years	6	19.4%
Persons 65 Years and Over	5	16.6%
White	9	28.5%
Minority	22	71.5%

Table 2-85: Population in St. Joseph Located within a Wildland-Urban Interaction Area. (Source: 2020 Census Data)

St. Joseph		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	162	19.6%
Persons Under 5 Years	14	8.5%
Persons Under 18 Years	34	20.8%
Persons 65 Years and Over	18	11.4%
White	34	20.9%
Minority	128	79.1%

Table 2-86: Population in Waterproof Located within a Wildland-Urban Interaction Area. (Source: 2020 Census Data)

Waterproof		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	185	34.3%
Persons Under 5 Years	12	6.3%
Persons Under 18 Years	41	22.1%
Persons 65 Years and Over	30	16.4%
White	15	8.1%
Minority	170	91.9%

Vulnerability Score

The table below displays the vulnerability score for wildfires within Tensas Parish.

Table 2-87: Wildfire Vulnerability Score for the Parish.

Wildfire Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	1	3	4	1	2	**2.25**

Winter Weather

Profile

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

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

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

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

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

Winter storm events occur throughout Louisiana usually during the colder calendar months of December, January, and February. Severe weather events do not occur with the same frequency across all parts of Louisiana. The northern quarter of Louisiana has historically experienced the most severe winter events between 1987 and 2012. The central, and to an even greater extent the southern parts of the state, such as Ascension Parish, have experienced the fewest severe winter events. The table on the following pages 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 2-88: 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.

Risk Assessment

Geographic Extent

All of the parish planning area is susceptible to the effects of winter storms. The worst-case scenario for winter storms is a 2 on the Sperry-Piltz Ice Accumulation Index.

Previous Occurrences

The parish has experienced 14 winter storm occurrences between the years 1996 and 2023 per the NCEI Storm Events Database. There have been three winter storm events since the 2019 update.

Table 2-89: Historical Winter Weather Occurrences in the Parish since the 2019 Update.

Date	Type	Property Damage	Crop Damage	Fatalities	Injuries
1/10/2021	Heavy Snow	$0	$0	0	0
2/15/2021	Sleet	$50,000	$0	0	0
2/17/2021	Winter Storm	$100,000	$0	0	0

Probability

The annual return rate (frequency) for winter storm occurrences in the parish is .50 (50% annual probability) or approximately 1 winter storm event every 2 years.

Climate Change Impacts

Winter weather is likely to become less frequent as the winter season decreases in length over the next century due to an increase in ambient and sea surface temperatures. By the end of the century, Louisiana is expected to experience a 5°F to 10°F increase in average ambient temperatures which will drastically reduce the number of days below freezing and lower the chance of winter weather. Precipitation is expected to increase during the winter months.

Climate change is influencing winter weather patterns, leading to significant impacts on both infrastructure and vulnerable populations. While it may seem counterintuitive, global warming can cause more frequent and intense winter storms. The warming of the Arctic and the disruption of the polar jet stream can result in polar vortex shifts, causing freezing temperatures and extreme winter conditions in regions that typically experience milder winters.

Winter weather impacts infrastructure in various ways. Freezing temperatures can damage roads, bridges, and other transportation networks, leading to increased maintenance costs and travel disruptions. Ice and snow accumulation on power lines can cause blackouts and outages, leaving communities without electricity and heating during frigid temperatures. Water supply systems can also be affected, as frozen pipes can burst, leading to water shortages and damage to properties.

Vulnerable populations are particularly at risk during severe winter weather events. Homeless individuals may struggle to find shelter and protection from the cold, leading to an increased risk of hypothermia and frostbite. Low-income households may face difficulties in affording heating costs, potentially exposing them to unsafe living conditions. The elderly and those with limited mobility may find it challenging to access essential services and resources during snowstorms, leading to isolation and health risks.

Moreover, winter storms can have economic consequences for vulnerable populations. Closures of schools and businesses during severe weather can lead to loss of income and educational disruptions, impacting families already facing financial challenges. In regions where winter tourism is vital, extreme winter weather can affect local economies, leading to job losses and reduced economic opportunities for vulnerable communities.

To address the impacts of climate change on infrastructure and vulnerable populations concerning winter weather, various measures are essential. Investing in winter-ready infrastructure, such as weather-resistant roads and insulated power lines, can help mitigate damage and improve resilience. Implementing programs to support vulnerable populations, such as providing emergency shelters, fuel assistance, and resources for winter preparedness, can protect them during extreme winter events. Climate change mitigation efforts to reduce greenhouse gas emissions are also crucial to addressing the root causes of extreme winter weather patterns, helping to protect both infrastructure and vulnerable populations from the adverse effects of winter storms in the long run.

Vulnerability Analysis

The NRI includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the county and Census tract level. The following table provides an overview of each category at the county level for winter storms.

Table 2-90: National Risk Index (NRI) Summarization of Winter Storm Occurrences for the Parish. (Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Estimated Impact and Potential Loss

Since 1996, there have been 14 significant winter storm occurrences per the NCEI Storm Events Database. The total property damage associated with these storms totaled approximately $1,500,000.

To estimate the potential losses on an annual basis, the total damages recorded were divided by the total number of years of available data in the NCEI Storm Events Database (1996 – 2023). This provides an annual estimated potential loss of $53,571 and $107,143 per event. The following table provides an estimate of potential property losses for the Parish:

Table 2-91: Estimated Annual Property Losses in the Parish resulting from Winter Weather Damage.

Estimated Annual Potential Losses			
Unincorporated Tensas Parish	**Newellton**	**St. Joseph**	**Waterproof**
$22,374	$13,525	$10,696	$6,976

Vulnerable Population

Per the NCEI Storm Events Database, there have been no reported fatalities or injuries as a result of winter weather. However, winter storms can have a significant impact the population. They can cause physical injuries and even fatalities. High winds, falling trees, and structural collapses can pose immediate risks to people's safety during a storm. These storms can displace individuals and families from their homes, either temporarily or permanently. In cases of extensive property damage, people may be forced to evacuate or seek emergency shelter. The displacement can result in temporary homelessness or the need for long-term housing solutions.

Winter storms can disrupt critical infrastructure such as transportation systems, power grids, and water supply networks. Disruption in these services could lead to health issues or the inability to access essential services that are needed to meet basic needs. This can lead to not only physical issues but psychological effects as well.

Everyone in the parish is vulnerable to the impacts of winter storms; however, they can have a disproportionate impact on vulnerable populations exacerbating existing social, economic, and health disparities. Vulnerable populations, including low-income individuals, the homeless, and those living in standardized housing, are often more susceptible to the effects of winter storms.

Vulnerability Score

The table below displays the vulnerability score for winter weather within Tensas Parish.

Table 2-92: Winter Weather Vulnerability Score for the Parish.

Winter Storm Vulnerability Score						
	Probability	**Impact**	**Spatial Extent**	**Warning Time**	**Duration**	**Risk Factor**
Risk Level	3	4	4	1	2	**3**

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, Tensas 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 Tensas 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

Capability Assessment Worksheet - Tensas 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.					
	Tensas Parish	Newellton	St. Joseph	Waterproof	Comments
Plans	**Yes / No**				
Comprehensive / Master Plan	Yes	No	No	No	
Capital Improvements Plan	Yes	No	No	No	
Economic Development Plan	Yes	No	No	No	
Local Emergency Operations Plan	Yes	No	No	No	
Continuity of Operations Plan	Yes	No	No	No	
Transportation Plan	Yes	No	No	No	
Stormwater Management Plan	No	No	No	No	
Community Wildfire Protection Plan	No	No	No	No	
Other plans (redevelopment, recovery, coastal zone management)	No	No	No	No	
Building Code, Permitting and Inspections	**Yes / No**				
Building Code	Yes	No	Yes	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	No	No	No	
Fire Department ISO/PIAL rating	7	5	5	5	
Site plan review requirements	No	No	Yes	Yes	
Land Use Planning and Ordinances	**Yes / No**				
Zoning Ordinance	No	No	Yes	Yes	
Subdivision Ordinance	Yes	No	Yes	Yes	
Floodplain Ordinance	Yes	Yes	Yes	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	No	Yes	No	
Flood Insurance Rate Maps	Yes	Yes	Yes	Yes	
Acquisition of land for open space and public recreation uses	No	No	No	No	
Other	No	No	No	No	

All jurisdictions within the Tensas 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

Tensas Parish Government provides oversight for building permits and codes, land use planning, and all parish ordinances.

As of the 2024 update, Tensas 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 Tensas Parish OHSEP is also responsible for enforcing the parish ordinances related to health and safety, property maintenance standards, and condemnation of unsafe structures.

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

Financial capabilities are the resources that Tensas 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 Tensas 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.					
	Tensas Parish	Newellton	St. Joseph	Waterproof	Comments
Funding Resource	**Yes / No**				
Capital Improvements project funding	Yes	No	Yes	Yes	
Authority to levy taxes for specific purposes	Yes	Yes	Yes	Yes	
Fees for water, sewer, gas, or electric services	Yes	Yes	Yes	Yes	
Impact fees for new development	No	No	No	No	
Stormwater Utility Fee	No	No	No	No	
Community Development Block Grant (CDBG)	Yes	No	Yes	Yes	
Other Funding Programs	Yes	No	No	No	

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 Tensas 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. Specifically, focusing on advising repetitive loss property owners of ways they can reduce their exposure to damage by repetitive flooding remains a priority for the entire parish. 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.					
	Tensas Parish	Newellton	St. Joseph	Waterproof	Comments
Program / Organization	**Yes / No**				
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	No	Yes	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	No	Yes	No	
Natural Disaster or safety related school program	Yes	Yes	Yes	No	
Storm Ready certification	No	No	No	No	
Firewise Communities certification	No	No	No	No	
Public/Private partnership initiatives addressing disaster-related issues	No	No	Yes	No	
Other	No	No	No	No	

As reflected with the above existing regulatory mechanisms, programs and resources within the parish, the jurisdictions within the Tensas Parish planning area remain committed to expanding and improving on the existing capabilities within the parish. Communities will work together along with Tensas 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 Tensas Parish.

Flood Insurance and Community Rating System

Participation in the CRS strengthens local capabilities by lowering flood insurance premiums for jurisdictions that exceed NFIP minimum requirements. As noted in the CRS Eligible Communities List effective October 1, 2023, neither the unincorporated areas of Tensas Parish nor the jurisdictions of Newellton, St. Joseph, or Waterproof participate in the CRS program.

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 October 2023, 318 communities in the State of Louisiana participate in the Federal Emergency Management Agency's National Flood Insurance Program (NFIP). Of these communities, 47 (or 13%) participate in the Community Rating System (CRS). Jefferson Parish leads the state with a rating of Class 5, followed by four cities with a rating of Class 6: the Cities of Gretna and Kenner in Jefferson Parish and the Cities of Mandeville and Slidell in St. Tammany Parish. Of the top fifty Louisiana communities, in terms of total flood insurance policies held by residents, 29 participate in the CRS. The remaining 21 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 2011[1], 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.

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.

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

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*.

4. Mitigation Strategy

Introduction

The Hazard Mitigation Strategy for Tensas 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 2024 HMP update are a product of analysis and review of the Tensas Parish Hazard Mitigation Plan Planning Committee under the coordination of the Tensas Parish Office of Homeland Security and Emergency Preparedness. The committee was presented a list of projects and actions, new and from the 2019 plan, for review from November 2023 – February 2024.

An online public opinion survey of Tensas Parish residents was conducted between November 2023 – March 2024. The survey was designed to capture public perceptions and opinions regarding natural hazards in the Tensas 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 Tensas Parish Hazard Mitigation Plan Planning Committee are representative of the outlook of the community at large. However, because there were no responses to the survey, this public feedback could not be incorporated into the plan. The full Tensas Parish survey can be found at the following link:

https://lsu.qualtrics.com/jfe/form/SV_3JXWOGpj2vFbqrc

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 Tensas 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, Tensas 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 Tensas 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. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact
2. Improve data collection, use, and sharing to reduce the impact of hazards
3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities
4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities

The Mitigation Action Plan focuses on actions to be taken by Tensas Parish and its communities. All of the activities in the Mitigation Action Plan will be 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 of environmental compatibility and technical feasibility.

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.

2024 Mitigation Actions and Update on Previous Plan Actions

The Tensas Parish Hazard Mitigation Plan Planning Committee identified new actions that would reduce and/or prevent future damage within the Tensas 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 addition of these new actions, coupled with any ongoing and/or carried over projects from their previous update, provide Tensas Parish with a solid mitigation strategy through which risk and losses will be reduced throughout the parish and its communities. 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.

Tensas Parish Mitigation Actions

Previous Action Update

Unincorporated Tensas Parish Mitigation Action Sheet						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
TEN1: 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.	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 1)
TEN2: 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.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Tensas Parish Mitigation Action 2)
TEN3: 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.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Tensas Parish Mitigation Action 3)
TEN4: Safe Room Projects	Construction of a safe room for first responders located in East Feliciana Parish. Other locations will be identified based on funding availability.	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 4)

TEN5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, 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.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 5)
TEN6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 6)
TEN7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property.	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Thunderstorms	Not Started - Carried Over (See Tensas Parish Mitigation Action 7)
TEN8: Warning Systems	Update/upgrade public warning system components throughout East Feliciana Parish as necessary. Install audible and/or reverse 911 warning system(s).	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Excessive Heat, Levee Failure, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 8)
TEN9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 9)
TEN10: Relocation Incentives	Offer relocation incentives to current flood hazard area residents and businesses to reduce repeated property damage and safety risks.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Levee Failure, Sinkholes, Tropical Cyclones, Wildfires	Not Started - Carried Over (See Tensas Parish Mitigation Action 10)

TEN11: Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a Levee failure	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Levee Failure	Not Started - Carried Over (See Tensas Parish Mitigation Action 11)
TEN12: 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).	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	Not Started - Carried Over (See Tensas Parish Mitigation Action 12)
TEN13 Flood Education	Continue and expand efforts to educate the public regarding floods, including direct mail, technical assistance, and development / implementation of general advertising campaign.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding	Deleted - Duplicate of TEN5 Action
TEN14: Business Mitigation	Work with location businesses to identify hazards to their business and mitigation actions that can be taken to protect Parish's economy.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Deleted - Duplicate of TEN29 Action
TEN15: Employee Hazard Mitigation	Work with parish and municipal employees to identify potential ways to mitigate the impact of hazards upon employees, assets and infrastructure	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Deleted - Duplicate of TEN29 Action
TEN16: Flooding Education Programs	Develop education programs and support the LA 5th Levee District funding initiatives with disaster education.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding	Deleted - Duplicate of TEN5 Action
TEN17: Tornado Education Programs	Develop disaster education programs and warning system implementation procedure for tornadoes	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Tornadoes	Deleted - Duplicate of TEN5 Action
TEN18: Hail proofing Education Programs	Develop disaster education programs and hail proof public buildings	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Thunderstorms	Deleted - Duplicate of TEN5 Action
TEN19: Winter Storm Education Programs	Develop disaster education programs for winter storms	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Winter Weather	Deleted - Duplicate of TEN5 Action

TEN20: Hurricane Education Programs	Develop disaster education programs for tropical systems / hurricanes	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Tropical Storms	Deleted - Duplicate of TEN5 Action
TEN21: Drought Education Programs	Develop disaster education programs for drought	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought	Deleted - Duplicate of TEN5 Action
TEN22: Mosquito Born Disease Education Programs	Develop disaster education programs for mosquito borne disease and implement / maintain new and existing mosquito abatement programs	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Mosquito Born Diseases	Deleted - Not a profiable action
TEN23: Wildfire Education Programs	Develop disaster education programs for wildfire	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Wildfires	Deleted - Duplicate of TEN5 Action
TEN24: Update Floodplain Regulations	Continue to update and implement mitigation requirements in floodplain development regulations	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	Deleted - Duplicate of TEN3 Action
TEN25: Vegetation Mitigation Programs	Identify and implement vegetation mitigation programs and methods.	HGMP, BRIC, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Excessive Heat, Wildfires	Not Started - Carried Over (See Tensas Parish Mitigation Action 13)
TEN26: Auxiliary Power Sources	Identify and prioritize auxiliary power sources for critical infrastructure	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Deleted - Duplicate of TEN6 Action
TEN27: Update Development Regulations	Update and implement floodplain development regulations, which limit the opportunity for new homes and businesses to be constructed in the floodplain	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding	Deleted - Duplicate of TEN3 Action
TEN28: COOP/COG Exercise	Conduct a COOP/COG exercise to identify challenges to operations from working from an alternate site	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Deleted - Duplicate of TEN5 Action

TEN29: Mitigation Coordination	Coordination of all preparedness and mitigation efforts; hosting disaster response drills; regular attendance at networking, and coordination meetings.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 14)
TEN30: Emergency Personnel Training	Work to provide training to emergency personnel Parish-wide in NIMS and ICS.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Deleted - Duplicate of TEN5 Action
TEN31: Emergency Monitoring Enhancement	Work to enhance emergency monitoring and communications systems to improve ability to predict and prepare for flood events	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	Not Started - Carried Over (See Tensas Parish Mitigation Action 15)
TEN32: Disaster Response Drills and Meetings	Coordination with Local Cities and Towns on all matters of disaster preparedness and mitigation. The Parish will host disaster response drills and attend regular networking and coordination meetings	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Deleted - Duplicate of TEN5 Action
TEN33: Flood Emergency Resources	Water Programs Emergency Resource Maintenance-- maintain the resources needed to respond to emergency flood situations.	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding	Not Started - Carried Over (See Tensas Parish Mitigation Action 16)
TEN34: International Building Codes	Implement and enforce International Building Codes	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Drought, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Not Started - Carried Over (See Tensas Parish Mitigation Action 17)
TEN35: Pump Removal Hoists and Emergency Generator Receptacles	Install pump removal hoists and emergency generator receptacles with disconnect boxes at all sewer pump stations	HGMP, BRIC, FMA, Local	1-5 years	Tensas Parish Police Jury/Tensas Parish OHSEP	Flooding	Deleted - Duplicate of TEN6 Action

New Mitigation Actions

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 1	Building Retrofits
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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 wind related events and helps assure that the public buildings can be used, occupied and operable during or after storms.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 2	Drainage Improvements
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
Action Description	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.
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 3	Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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, Natural System Protection
How Action Aligns with Risk Reduction	Eliminates flooding risk of repetitive and severe repetitive loss structures.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 4	Safe Room Projects
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Construction of a safe room for first responders located in Tensas Parish. Other locations will be identified based on funding availability.
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 5	Education and Outreach
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for dam and levee failure, drought, flooding, 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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 6	Generators for continuity of operations and government
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Installation of generators will allow public facilities to run accordingly and aid with local relief efforts
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 7	Lightning Mitigation
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
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 Projects
How Action Aligns with Risk Reduction	The installation of lightning rods and surge protectors in public buildings and critical infrastructure will reduce losses due to lightning strikes and surges in electricity.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Thunderstorms

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 8	Warning Systems
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Update/upgrade public warning system components throughout Tensas Parish as necessary. Install audible and/or reverse 911 warning system(s).
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 9	Potable Water
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Creating a redundancy of potable water for critical facilities will reduce downtime and allow for the continuity of essential operations during and after an event.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 10	Relocation Incentives
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Offer relocation incentives to current flood and other hazard prone area residents and businesses to reduce repeated property damage and safety risks.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Relocation incentives will entice property owners to consider relocation to reduce the risk to loss of life and property and reduce the amount of insurance claims
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Sinkholes, Tropical Cyclones, Wildfires

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 11	Levee Failure Working Group
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Create a working group in order to assess the extent and determine the possible impact of a levee failure and determine the locations of inundation zones within the parish.
Type of Mitigation Action	Natural System Protection
How Action Aligns with Risk Reduction	Creation of working group will allow dams and levees to be assessed and determine the possible outcomes during failure. This is a preventive measure that will allow the group to call upon others to reinforce structures if failure event is imminent.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 12	Promote Flood Insurance
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
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	Education and Awareness Programs
How Action Aligns with Risk Reduction	Educating the public on flood insurance will allow public to obtain insurance at a cost that's affordable to them and will help gain relief to their home and personal items during post-flood events
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 13	Vegetation Mitigation programs
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Identify and implement vegetation mitigation programs and methods.
Type of Mitigation Action	Education and Outreach Programs
How Action Aligns with Risk Reduction	Programming can educate the public on how to care for agriculture land and fire safety during excessive drought events.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Wildfires

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 14	Mitigation Coordination
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Coordination of all preparedness and mitigation efforts; hosting disaster response drills; regular attendance at networking, and coordination meetings.
Type of Mitigation Action	Local Plans and Regulations
How Action Aligns with Risk Reduction	Coordination of mitigation efforts will allow the parish and jurisdictions to confirm that actions taking place will not adversely affect the other.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 15	Emergency Monitor Enhancement
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Work to enhance emergency monitoring and communications systems to improve ability to predict and prepare for flood events.
Type of Mitigation Action	Local Plans and Regulations
How Action Aligns with Risk Reduction	Enhancing emergency monitoring will allow first responders to get imminent information out to the public as quickly as possible during a hazard event
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 16	Flood Emergency Resources
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Water Programs Emergency Resource Maintenance-- maintain the resources needed to respond to emergency flood situations.
Type of Mitigation Action	Maintaining resources used to help response efforts during hazard events will allow for an efficient response to said event
How Action Aligns with Risk Reduction	Natural Systems Protection
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TENSAS PARISH	
	DESCRIPTION
TENSAS PARISH MITIGATION ACTION 17	International Building Codes
LEAD AGENCY	Tensas Parish Police Jury
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Implement and enforce International Building Codes
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	International building codes will reduce the risk to loss of life and property
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather

Village of Newellton Mitigation Actions

Previous Action Update

Village of Newellton Mitigation Action Sheet						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
NEW1: 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.	HGMP, BRIC, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Newellton Mitigation Action 1)
NEW2: 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Newellton Mitigation Action 2)
NEW3: 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Newellton Mitigation Action 3)
NEW4: Safe Room Projects	Construction of a safe room for first responders located in East Feliciana Parish. Other locations will be identified based on funding availability.	HGMP, BRIC, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Newellton Mitigation Action 4)

NEW5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Drought, Excessive Heat, Flooding, Sinkholes, Thunderstorms Tornadoes, Tropical Cyclones, Wildfire, 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Sinkholes, Thunderstorms Tornadoes, Tropical Cyclones, Wildfire, Winter Weather	Not Started - Carried Over (See Newellton Mitigation Action 5)
NEW6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Newellton Mitigation Action 6)
NEW7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property.	HGMP, BRIC, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Thunderstorms	Not Started - Carried Over (See Newellton Mitigation Action 7)
NEW8: Warning Systems	Update/upgrade public warning system components throughout East Feliciana Parish as necessary. Install audible and/or reverse 911 warning system(s).	HGMP, BRIC, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Excessive Heat, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Newellton Mitigation Action 8)
NEW9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Not Started - Carried Over (See Newellton Mitigation Action 9)
NEW10: Relocation Incentives	Offer relocation incentives to current flood hazard area residents and businesses to reduce repeated property damage and safety risks.	HGMP, BRIC, FMA, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Sinkholes, Tropical Cyclone, Wildfires	Not Started - Carried Over (See Newellton Mitigation Action 10)
NEW11: Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a Levee failure	HGMP, BRIC, FMA, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure	Deleted – Action not applicable to Newellton
NEW12: 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).	HGMP, BRIC, FMA, Local	1-5 years	Village of Newellton Mayor's Office/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Newellton Mitigation Action 11)

New Mitigation Actions

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 1	Building Retrofits
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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 wind related events and helps assure that the public buildings can be used, occupied and operable during or after storms.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 2	Drainage Improvements
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
Action Description	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.
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 3	Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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, Natural System Protection
How Action Aligns with Risk Reduction	Eliminates flooding risk of repetitive and severe repetitive loss structures.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 4	Safe Room Projects
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Construction of a safe room for first responders located in Tensas Parish. Other locations will be identified based on funding availability.
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 5	Education and Outreach
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for drought, excessive heat, flooding, 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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 6	Generators for continuity of operations and government
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Installation of generators will allow public facilities to run accordingly and aid with local relief efforts
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 7	Lightning Mitigation
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
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 Projects
How Action Aligns with Risk Reduction	The installation of lightning rods and surge protectors in public buildings and critical infrastructure will reduce losses due to lightning strikes and surges in electricity.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Thunderstorms

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 8	Warning Systems
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Update/upgrade public warning system components throughout Tensas Parish as necessary. Install audible and/or reverse 911 warning system(s).
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Sinkholes, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 9	Potable Water
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Creating a redundancy of potable water for critical facilities will reduce downtime and allow for the continuity of essential operations during and after an event.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Sinkholes, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 10	Relocation Incentives
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Offer relocation incentives to current flood and other hazard prone area residents and businesses to reduce repeated property damage and safety risks.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Relocation incentives will entice property owners to consider relocation to reduce the risk to loss of life and property and reduce the amount of insurance claims
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Sinkholes, Tropical Cyclones, Wildfires

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF NEWELLTON	
	DESCRIPTION
VILLAGE OF NEWELLTON MITIGATION ACTION 11	Promote Flood Insurance
LEAD AGENCY	Village of Newellton Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
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	Education and Awareness Programs
How Action Aligns with Risk Reduction	Educating the public on flood insurance will allow public to obtain insurance at a cost that's affordable to them and will help gain relief to their home and personal items during post-flood events
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Tropical Cyclones

Village of St. Joseph Mitigation Actions

Previous Action Update

Village of St. Joseph Mitigation Action Sheet						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
SJ1: 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.	HGMP, BRIC, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See St. Joseph Mitigation Action 1)
SJ2: 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See St. Joseph Mitigation Action 2)
SJ3: 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See St. Joseph Mitigation Action 3)
SJ4: Safe Room Projects	Construction of a safe room for first responders located in East Feliciana Parish. Other locations will be identified based on funding availability.	HGMP, BRIC, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See St. Joseph Mitigation Action 4)

SJ5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms Tornadoes, Tropical Cyclones, Wildfire, Winter Weather	Not Started - Carried Over (See St. Joseph Mitigation Action 5)
SJ6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See St. Joseph Mitigation Action 6)
SJ7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property.	HGMP, BRIC, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Thunderstorms	Not Started - Carried Over (See St. Joseph Mitigation Action 7)
SJ8: Warning Systems	Update/upgrade public warning system components throughout East Feliciana Parish as necessary. Install audible and/or reverse 911 warning system(s).	HGMP, BRIC, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See St. Joseph Mitigation Action 8)
SJ9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Not Started - Carried Over (See St. Joseph Mitigation Action 9)
SJ10: Relocation Incentives	Offer relocation incentives to current flood hazard area residents and businesses to reduce repeated property damage and safety risks.	HGMP, BRIC, FMA, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure, Tropical Cyclone,	Not Started - Carried Over (See St. Joseph Mitigation Action 10)

SJ11: Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a Levee failure	HGMP, BRIC, FMA, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure	Not Started - Carried Over (See St. Joseph Mitigation Action 11)
SJ12: 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).	HGMP, BRIC, FMA, Local	1-5 years	Village of St. Joseph Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	Not Started - Carried Over (See St. Joseph Mitigation Action 12)

New Mitigation Actions

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 1	Building Retrofits
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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 wind related events and helps assure that the public buildings can be used, occupied and operable during or after storms.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 2	Drainage Improvements
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
Action Description	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.
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 3	Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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, Natural System Protection
How Action Aligns with Risk Reduction	Eliminates flooding risk of repetitive and severe repetitive loss structures.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 4	Safe Room Projects
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Construction of a safe room for first responders located in Tensas Parish. Other locations will be identified based on funding availability.
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 5	Education and Outreach
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for levee failure, drought, excessive heat, flooding, 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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 6	Generators for continuity of operations and government
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Installation of generators will allow public facilities to run accordingly and aid with local relief efforts
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 7	Lightning Mitigation
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
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 Projects
How Action Aligns with Risk Reduction	The installation of lightning rods and surge protectors in public buildings and critical infrastructure will reduce losses due to lightning strikes and surges in electricity.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Thunderstorms

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 8	Warning Systems
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Update/upgrade public warning system components throughout Tensas Parish as necessary. Install audible and/or reverse 911 warning system(s).
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 9	Potable Water
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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 Projects
How Action Aligns with Risk Reduction	Creating a redundancy of potable water for critical facilities will reduce downtime and allow for the continuity of essential operations during and after an event.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 10	Relocation Incentives
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Offer relocation incentives to current flood and other hazard prone area residents and businesses to reduce repeated property damage and safety risks.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Relocation incentives will entice property owners to consider relocation to reduce the risk to loss of life and property and reduce the amount of insurance claims
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones, Wildfires

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 11	Levee Failure Working Group
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Create a working group in order to assess the extent and determine the possible impact of a levee failure and determine the locations of inundation zones within the parish.
Type of Mitigation Action	Natural System Protection
How Action Aligns with Risk Reduction	Creation of working group will allow dams and levees to be assessed and determine the possible outcomes during failure. This is a preventive measure that will allow the group to call upon others to reinforce structures if failure event is imminent.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF ST. JOSEPH	
	DESCRIPTION
VILLAGE OF ST. JOSEPH MITIGATION ACTION 12	Promote Flood Insurance
LEAD AGENCY	Village of St. Joseph Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
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	Education and Awareness Programs
How Action Aligns with Risk Reduction	Educating the public on flood insurance will allow public to obtain insurance at a cost that's affordable to them and will help gain relief to their home and personal items during post-flood events
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Village of Waterproof Mitigation Actions

Previous Action Update

Village of Waterproof Mitigation Action Sheet						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
WAT1: 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.	HGMP, BRIC, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Waterproof Mitigation Action 1)
WAT2: 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Waterproof Mitigation Action 2)
WAT3: 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Waterproof Mitigation Action 3)
WAT4: Safe Room Projects	Construction of a safe room for first responders located in East Feliciana Parish. Other locations will be identified based on funding availability.	HGMP, BRIC, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Waterproof Mitigation Action 4)

WAT5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, 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.	HGMP, BRIC, FMA, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms Tornadoes, Tropical Cyclones, Wildfire, Winter Weather	Not Started - Carried Over (See Waterproof Mitigation Action 5)
WAT6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Waterproof Mitigation Action 6)
WAT7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property.	HGMP, BRIC, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Thunderstorms	Not Started - Carried Over (See Waterproof Mitigation Action 7)
WAT8: Warning Systems	Update/upgrade public warning system components throughout East Feliciana Parish as necessary. Install audible and/or reverse 911 warning system(s).	HGMP, BRIC, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Excessive Heat, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Waterproof Mitigation Action 8)
WAT9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather	Not Started - Carried Over (See Waterproof Mitigation Action 9)
WAT10: Relocation Incentives	Offer relocation incentives to current flood hazard area residents and businesses to reduce repeated property damage and safety risks.	HGMP, BRIC, FMA, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure, Tropical Cyclone,	Not Started - Carried Over (See Waterproof Mitigation Action 10)
WAT11: Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a Levee failure	HGMP, BRIC, FMA, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure	Not Started - Carried Over (See Waterproof Mitigation Action 11)

WAT12: 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).	HGMP, BRIC, FMA, Local	1-5 years	Village of Waterproof Mayor's Office/Tensas Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	Not Started - Carried Over (See Waterproof Mitigation Action 12)

New Mitigation Actions

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 1	Building Retrofits
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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 wind related events and helps assure that the public buildings can be used, occupied and operable during or after storms.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 2	Drainage Improvements
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
Action Description	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.
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 3	Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
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, Natural System Protection
How Action Aligns with Risk Reduction	Eliminates flooding risk of repetitive and severe repetitive loss structures.
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 4	Safe Room Projects
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Construction of a safe room for first responders located in Tensas Parish. Other locations will be identified based on funding availability.
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 5	Education and Outreach
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for levee failure, drought, excessive heat, flooding, 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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfire, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 6	Generators for continuity of operations and government
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Installation of generators will allow public facilities to run accordingly and aid with local relief efforts
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 7	Lightning Mitigation
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
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 Projects
How Action Aligns with Risk Reduction	The installation of lightning rods and surge protectors in public buildings and critical infrastructure will reduce losses due to lightning strikes and surges in electricity.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Thunderstorms

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 8	Warning Systems
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Update/upgrade public warning system components throughout Tensas Parish as necessary. Install audible and/or reverse 911 warning system(s).
Type of Mitigation Action	Structure and Infrastructure Projects
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	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 9	Potable Water
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.
Type of Mitigation Action	Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Creating a redundancy of potable water for critical facilities will reduce downtime and allow for the continuity of essential operations during and after an event.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Drought, Excessive Heat, Flooding, Levee Failure, Thunderstorms, Tropical Cyclones, Tornadoes, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 10	Relocation Incentives
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HMGP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Offer relocation incentives to current flood and other hazard prone area residents and businesses to reduce repeated property damage and safety risks.
Type of Mitigation Action	Local Plans and Regulations, Structure and Infrastructure Projects
How Action Aligns with Risk Reduction	Relocation incentives will entice property owners to consider relocation to reduce the risk to loss of life and property and reduce the amount of insurance claims
Current Status of Action	Not Started – Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones, Wildfires

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 11	Levee Failure Working Group
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	2. Improve data collection, use, and sharing to reduce the impact of hazards 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	Medium
Action Description	Create a working group in order to assess the extent and determine the possible impact of a levee failure and determine the locations of inundation zones within the parish.
Type of Mitigation Action	Natural System Protection
How Action Aligns with Risk Reduction	Creation of working group will allow dams and levees to be assessed and determine the possible outcomes during failure. This is a preventive measure that will allow the group to call upon others to reinforce structures if failure event is imminent.
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS VILLAGE OF WATERPROOF	
	DESCRIPTION
VILLAGE OF WATERPROOF MITIGATION ACTION 12	Promote Flood Insurance
LEAD AGENCY	Village of Waterproof Mayor's Office
SUPPORTING AGENCIES	Tensas Parish OHSEP
TIMELINE	1-5 years
COST ESTIMATE	Unknown
POSSIBLE FUNDING SOURCE(S)	HGMP, BRIC, FMA, Local
ASSOCIATED GOALS	1. Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact 3. Improve capabilities, coordination, and opportunities at municipal and parish level to plan and implement hazard mitigation projects, programs, and activities 4. Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities
PRIORITY	High
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	Education and Awareness Programs
How Action Aligns with Risk Reduction	Educating the public on flood insurance will allow public to obtain insurance at a cost that's affordable to them and will help gain relief to their home and personal items during post-flood events
Current Status of Action	Not Started - Carried Over from 2019 Plan
Hazard Addressed	Flooding, Levee Failure, Tropical Cyclones

Action Prioritization

During the prioritization process, the planning 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 planning committee prioritized the possible activities that could be pursued. Planning 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. The planning committee met internally for mitigation action meetings to review and approve mitigation actions for Tensas Parish incorporated jurisdictions of Newellton, St. Joseph, and Waterproof. 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.

Tensas 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 planning 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 Tensas Parish Hazard Mitigation Plan Update

The Tensas Parish Hazard Mitigation Plan Update process began in August 2023 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
10/12/2023	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.
11/8/2023	Initial Planning Committee Meeting	St. Joseph, LA	No	Discuss with Tensas Parish Hazard Mitigation Planning Committee the process and expectations of plan participants. Discuss timeline and action items for parish and each jurisdiction.
2/27/2024	Planning Committee Risk Assessment Review	St. Joseph, LA	Yes	Presentation of Risk Assessment and profiled hazards to Planning Committee.
2/27/2024	Public Meeting	St. Joseph, LA	Yes	Presentation of Risk Assessment s and profiled hazards to public. Presentation also includes current mitigation project highlights within communities and public survey discussion.
Ongoing during the planning process	Public Opinion Survey	Online	Yes	This survey asked participants about public perceptions and opinions regarding natural hazards in Tensas Parish. In addition, questions covered the methods and techniques preferred for reducing the risks and losses associated with these hazards. Survey Results: https://lsu.qualtrics.com/jfe/form/SV_3JXWOGpj2vFbqrc

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 and Actions											
Plan Review by GOHSEP and FEMA											
FEMA APA											
Plan Adoptions Start											
Final Plan Approval											

Coordination

The Tensas Parish Office of Homeland Security and Emergency Preparedness (OHSEP) oversaw the coordination of the 2024 Hazard Mitigation Plan Update Planning Committee during the update process. The parish OHSEP was responsible for identifying members for the committee. Representatives of relevant local and parish government departments were invited for inclusion in the planning process via email from SDMI and the Tensas Parish OHSEP Director. Tensas Parish and their jurisdictions identified and reached out, via email, to representatives of non-profits, local business and organization owner/managers, and private organizations that provide for the betterment and benefit of populations identified as socially vulnerable and work directly with communities that are deemed as underserved so that they could be involved in the entirety of this plan update process and participate as key stakeholders. Some Directors of organizations contacted included the Council of Aging, and the local American Red Cross chapter. A representative from the Tensas Parish Council on Aging was present at meetings and involved during the update of the hazard mitigation plan. There are no higher education institutions in Tensas Parish; therefore, no members of academia could be included in the planning process on a parish level. However, SDMI is an institution under the Louisiana State University system, so this plan update received constant feedback from academia personnel on LSU's campus. Therefore, LSU was able to be included for academic participation during the plan update process.

The OHSEP Director was responsible for inviting the planning committee and key stakeholders to scheduled meetings and activities via phone call and/or email. SDMI assisted the OHSEP 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 2019 update
- Risk Assessment review
- Plan document draft review
- Formal adoption of the Hazard Mitigation Plan

The Concordia Parish OHSEP Director was invited to attend the Initial Planning and Risk Assessment Meetings for Tensas Parish in an effort to coordinate mitigation efforts where possible as neighboring communities. The Concordia OHSEP Director was invited via email and phone call to participate in an effort to collaborate with neighboring communities. SDMI assisted Tensas Parish with encouraging the collaboration with these neighboring communities via email by extending an invitation to the Tensas 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 2024 Hazard Mitigation Plan Update Planning Committee consisted of representatives from the following parish, municipal or community stakeholders. Below is a detailed list of the 2024 HMPU Planning Committee:

Tensas Parish Hazard Mitigation Planning Committee			
Name	**Title**	**Agency**	**Email**
Kiley Sanders	Director	Tensas Parish OHSEP	kiley@tensasoep.org
Rick Foster	Assistant Director	Tensas Parish OHSEP	tensasoep@gmail.com
Timothy Turner	Mayor	Village of Newellton	townofnewellton@att.net
Matthew Alexander	Mayor	Village of St. Joseph	tosjmo@bellsouth.net
Jarrod Bottley	Mayor	Village of Waterproof	townofwaterproof@yahoo.com
Ricky Jones	Sheriff	Tensas Parish Sheriff's Office	rjones@tensasso.org
Danny Lance	Deputy Chief	Tensas Parish Fire District 1	dlance@tensasfire.org
Clifford Walker	Office Clerk	Tensas Parish Council on Aging	tenscoa@yahoo.com
Bubba Rushing	Police Juror, District 6	Tensas Parish Police Jury	bubbarushing@icloud.com
Kellon Lee		Tensas Water Association	
Todd Merriett	Road Supervisor	Tensas Parish Police Jury	tensastodd@bellsouth.net
Pauline Doyle	Secretary Treasurer	Tensas Parish Police Jury	paulinedoyle@tppj.org
Ann Fortenberry		Tensas Parish OHSEP	ann.fortenberry@gmail.com
Rob Rushing	Chief Criminal Deputy	Tensas Parish Sheriff's Office	rrushing@tensasso.org
Tim Vanier	Director	Concordia Parish OHSEP	oep@conppj.org

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 Tensas 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.

Since the last update in 2019, Tensas Parish has used the hazard mitigation plan as a reference point to various projects and mitigation strategies that take place throughout the planning area. Along with the mitigation actions outlined for each parish, Tensas has used vulnerability statistics and integration strategies within the plan to help guide their mitigation practices. The strategies and practices in this plan update build upon the practices that have been used since the previous update. Those strategies and practices can be found in various sections throughout the risk assessment that address climate change, vulnerable populations, and future development trends. Furthermore, the parish has held and will continue to hold annual meetings to discuss any changes that have occurred within the parish that could alter the vulnerability of Tensas, and how to combat any issues that have arisen within the means and regulations of the hazard mitigation plan.

Tensas 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 Tensas 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 2019 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
- Stormwater Management 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: October 12, 2023

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:

Tensas Parish Hazard Mitigation Planning Committee		
Name	**Title**	**Agency**
Kiley Sanders	Director	Tensas Parish OHSEP
Chris Rippetoe	Program Manager	LSU-SDMI
Jason Martin	Emergency Management Analyst	LSU-SDMI

Meeting #2: Hazard Mitigation Plan Update Initial Planning Committee Meeting

Date: November 8, 2023

Location: St. Joseph, LA

Purpose: Discuss the expectations and requirements of the hazard mitigation plan update process and establish an initial project timeline with the Parish's Hazard Mitigation Plan Planning Committee. Assign each individual tasks related to the parish data collection for the plan update.

Public Invitation: No

Meeting Invitees:

Tensas Parish Hazard Mitigation Planning Committee		
Name	**Title**	**Agency**
Kiley Sanders	Director	Tensas Parish OHSEP
Rick Foster	Assistant Director	Tensas Parish OHSEP
Timothy Turner	Mayor	Village of Newellton
Matthew Alexander	Mayor	Village of St. Joseph
Jarrod Bottley	Mayor	Village of Waterproof
Ricky Jones	Sheriff	Tensas Parish Sheriff's Office
Danny Lance	Deputy Chief	Tensas Parish Fire District 1
Clifford Walker	Office Clerk	Tensas Parish Council on Aging
Bubba Rushing	Police Juror, District 6	Tensas Parish Police Jury
Kellon Lee		Tensas Water Association
Todd Merriett	Road Supervisor	Tensas Parish Police Jury
Pauline Doyle	Secretary Treasurer	Tensas Parish Police Jury
Ann Fortenberry		Tensas Parish OHSEP
Rob Rushing	Chief Criminal Deputy	Tensas Parish Sheriff's Office
Tim Vanier	Director	Concordia Parish OHSEP

Meeting #3: Hazard Mitigation Plan Update Planning Committee Risk Assessment Review

Date: February 27, 2024

Location: St. Joseph, LA

Purpose: Presentation of Risk Assessment hazards and maps to Planning Committee.

Public Invitation: No

Meeting Invitees:

Tensas Parish Hazard Mitigation Planning Committee		
Name	**Title**	**Agency**
Kiley Sanders	Director	Tensas Parish OHSEP
Rick Foster	Assistant Director	Tensas Parish OHSEP
Timothy Turner	Mayor	Village of Newellton
Matthew Alexander	Mayor	Village of St. Joseph
Jarrod Bottley	Mayor	Village of Waterproof
Ricky Jones	Sheriff	Tensas Parish Sheriff's Office
Danny Lance	Deputy Chief	Tensas Parish Fire District 1
Clifford Walker	Office Clerk	Tensas Parish Council on Aging
Bubba Rushing	Police Juror, District 6	Tensas Parish Police Jury
Kellon Lee		Tensas Water Association
Todd Merriett	Road Supervisor	Tensas Parish Police Jury
Pauline Doyle	Secretary Treasurer	Tensas Parish Police Jury
Ann Fortenberry		Tensas Parish OHSEP
Rob Rushing	Chief Criminal Deputy	Tensas Parish Sheriff's Office
Tim Vanier	Director	Concordia Parish OHSEP

Meeting #4: Hazard Mitigation Plan Update Public Meeting

Date: February 27, 2024

Location: St. Joseph, LA

Purpose: The Public Meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Presentation also included highlights of current mitigation projects highlights, as well as public survey discussion. The public meeting notice on the following page was presented to stakeholders as well as the general public, including those in underserved communities and those populations deemed as socially vulnerable. This notice was distributed via email as well as posted on the front door of the courthouse, published in the local newspaper, and posted via social media. This public meeting was also open to many different representatives from private, local community-based organizations and businesses, and non-profits that provide for the betterment of socially vulnerable populations and those areas that have been deemed as underserved. The parish and jurisdictions involved in the plan update were in charge of identifying these specific organizations so that they may be invited to participate at this public meeting and in the plan update process as a whole. This effort was carried out by Tensas Parish, their jurisdictions, and with assistance from SDMI.

Public Invitation: Yes

Meeting Invitees:

Tensas Parish Hazard Mitigation Planning Committee		
Name	**Title**	**Agency**
Kiley Sanders	Director	Tensas Parish OHSEP
Rick Foster	Assistant Director	Tensas Parish OHSEP
Timothy Turner	Mayor	Village of Newellton
Matthew Alexander	Mayor	Village of St. Joseph
Jarrod Bottley	Mayor	Village of Waterproof
Ricky Jones	Sheriff	Tensas Parish Sheriff's Office
Danny Lance	Deputy Chief	Tensas Parish Fire District 1
Clifford Walker	Office Clerk	Tensas Parish Council on Aging
Bubba Rushing	Police Juror, District 6	Tensas Parish Police Jury
Kellon Lee		Tensas Water Association
Todd Merriett	Road Supervisor	Tensas Parish Police Jury
Pauline Doyle	Secretary Treasurer	Tensas Parish Police Jury
Ann Fortenberry		Tensas Parish OHSEP
Rob Rushing	Chief Criminal Deputy	Tensas Parish Sheriff's Office
Tim Vanier	Director	Concordia Parish OHSEP

Meeting Announcement:

TENSAS PARISH OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

PUBLIC MEETING ANNOUNCEMENT

Tensas Parish and its partners are seeking community input for the 2024 Tensas Parish Hazard Mitigation Plan update!

Tensas Parish OHSEP, 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 Tensas Parish Hazard Mitigation Multi-Jurisdictional Plan describes the **naturally occurring** risks to the region and 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 Tuesday, February 27th, for a public meeting at 9AM to learn more about the plan and share your input on the risks and vulnerabilities that most impact you and your community.

Meeting Location:
Tensas Parish Police Jury Building
212 Hancock St.
St. Joseph, LA 71366

Residents of Tensas 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://lsu.qualtrics.com/jfe/form/SV_3JXWOGpj2vFbqrc

The Parish appreciates your input.

If you have questions, please contact: Tensas Parish OHSEP
Kiley Sanders 318-557-8983

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 Tensas Parish residents was conducted between November 2023 – March 2024. The survey was designed to capture public perceptions and opinions regarding natural hazards in Tensas 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 March 1, 2024 there have been zero responses to the hazard mitigation public survey so no public input could be incorporated into this plan update. The full survey can be found here: https://lsu.qualtrics.com/jfe/form/SV_3JXWOGpj2vFbqrc

Outreach Activity #2: Public Meeting Activity - Incident Questionnaire

Date: February 27, 2024
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 Tensas 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.

Outreach Activity #3: 2024 Tensas Parish Hazard Mitigation Plan Public Review

Date: Ongoing
Location: SDMI Hazard Mitigation Website
Public Initiation: Yes

After an initial review by the Tensas Parish Planning Committee was completed, the 2024 Tensas 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/tensas

TENSAS PARISH PUBLIC MEETING

PUBLIC ACTIVITY: INCIDENT/ ISSUE QUESTIONNAIRE

1. HAZARD TYPE(S):

A. DROUGHT
B. EXCESSIVE HEAT
C. FLOODING
D. LEVEE FAILURE
E. SINKHOLES
F. THUNDERSTORMS
G. TORNADOES
H. TROPICAL CYCLONES
I. WILDFIRES
J. WINTER WEATHER

2. DESCRIBE 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/DIDTHE 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?

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."

Implementing, Monitoring, Evaluating, and Updating the Plan

The Tensas Parish Hazard Mitigation Planning Committee will be responsible for implementing, 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 and jurisdictions' other plans where applicable. 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 and the SDMI HM website. This section describes the update process as a whole, which includes the following:

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

Responsible Parties

Tensas Parish has developed a method to ensure that a regular review and update of this 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 planning 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

Tensas Parish has developed a method to ensure implementation, monitoring, evaluating, and updating of the HMP occurs during the five-year cycle of the plan. Implementation will be accomplished through constant and transparent efforts to network and highlight the multi-objective, win-win benefits of each project proposed in the *Mitigation Strategy* section. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe and resilient community. The planning committee will seek to become a permanent body and will be responsible for monitoring, evaluating, and

updating of the plan. The planning committee meeting will be held annually in order to monitor, evaluate, and update the plan. The Tensas 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 reduced/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 planning committee will be responsible for updating the HMP. The OHSEP Director will be the lead person for the

HMP update. The HMP update process will commence at least one year prior to the expiration of the plan. The HMP will be updated after a major disaster if an annual evaluation of the plan 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 Tensas 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 SDMI HM website.

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.

2024 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 2024 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 Tensas Parish Hazard Mitigation Plan Planning Committee and participating jurisdictions to determine additional implementation procedures when appropriate. This may include integrating the requirements of the Tensas Parish Hazard Mitigation Plan into each jurisdiction's planning documents, processes, or mechanisms as follows:

- Ordinances, Resolutions, Regulations
- Floodplain Ordinances
- Master Plans
- Capital Improvement Plans
- Economic Development Plans
- Emergency Operations Plans
- Continuity of Operations Plans
- Debris Removal Plan
- Transportation Plan
- Stormwater Management Plan

Opportunities to integrate the requirements of this plan into other local planning mechanisms will continue to be identified through future meetings of the Tensas Parish Hazard Mitigation Planning 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.).

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 planning 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 Newellton, Village of St. Joseph, Village of Waterproof, and the Unincorporated areas of Tensas Parish, have 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 planning committee member and jurisdiction representation throughout the planning process as described above:

Tensas Parish

Comprehensive Master Plan	Updated as needed	Tensas Parish OHSEP	✓
Capital Improvements Plan	Updated as needed	Tensas Parish OHSEP	✓
Continuity of Operations Plan	Updated as needed	Tensas Parish OHSEP	✓
Local Emergency Operations Plan	Updated as needed	Tensas Parish OHSEP	✓
Transportation Plan	Updated as needed	Tensas Parish OHSEP	✓
Economic Development Plan	Updated as needed	Tensas Parish OHSEP	✓

Town of Newellton

There are no additional plans within this jurisdiction for the Hazard Mitigation Plan to be integrated.

Town of St. Joseph

There are no additional plans within this jurisdiction for the Hazard Mitigation Plan to be integrated.

Town of Waterproof

There are no additional plans within this jurisdiction for the Hazard Mitigation Plan to be integrated.

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.

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Appendix C: Critical Facilities

Critical Facilities within the Tensas Parish Planning Area

Tensas Parish Planning Area Critical Facilities											
Type	**Name**	**Drought**	**Excessive Heat**	**Flooding**	**Levee Failure**	**Sinkholes**	**Thunderstorms**	**Tornadoes**	**Tropical Cyclones**	**Wildfires**	**Winter Weather**
Civil Government	Newellton Village Hall	X	X	X		X	X	X	X		X
	St. Joseph Village Hall	X	X	X			X	X	X		X
	Tensas Parish Clerk of Court	X	X	X			X	X	X		X
	Tensas Parish Courthouse Annex	X	X	X			X	X	X		X
	Tensas Parish Emergency Operations Center	X	X	X			X	X	X		X
	Tensas Parish Police Jury	X	X	X			X	X	X		X
	Waterproof Village Hall	X	X	X			X	X	X		X
Fire & SAR	Highway 4 Fire Station	X	X				X	X	X		X
	Holly Ridge Fire Station	X	X				X	X	X		X
	Lake Bruin Fire Station	X	X				X	X	X		X
	Loamland Fire Station	X	X				X	X	X		X
	Mayflower Fire Station	X	X				X	X	X		X
	Newellton Fire Station	X	X			X	X	X	X		X
	Somerset Fire Station	X	X				X	X	X		X
	St. Joseph Fire Station	X	X	X			X	X	X		X

	Tullonia Fire Station	X	X				X	X	X		X
Law Enforcement	Newellton Police Station	X	X	X		X	X	X	X		X
	St. Joseph Police Station	X	X	X			X	X	X		X
	Tensas Detention Facility	X	X	X			X	X	X		X
	Tensas Parish Sherrif's Office	X	X	X			X	X	X		X
	Waterproof Police Station	X	X	X			X	X	X		X
Public Health	Tensas Community Health Clinic	X	X	X			X	X	X		X
	Franklin Medical Rural Health	X	X	X		X	X	X	X		X
Schools	Newellton Elementary School	X	X	X		X	X	X	X		X
	Tensas Academy	X	X				X	X	X		X
	Tensas Elementary School	X	X				X	X	X		X
	Tensas High School	X	X	X			X	X	X		X

Appendix D: Plan Adoption

FEMA Approval Letter

WILL UPDATE ONCE APPROVAL PROCESS IS COMPLETED

GOHSEP Approval Letter

WILL UPDATE ONCE APPROVAL PROCESS IS COMPLETED

Unincorporated Tensas Parish

WILL UPDATE ONCE JURISDICTIONS FORMALLY ADOPT HMP AFTER FEMA REVIEW

Village of Newellton

Village of St. Joseph

Village of Waterproof

Appendix E: State Required Worksheets

During the planning process (Appendix A: Planning Process), the Hazard Mitigation Plan Update Planning 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

Tensas Parish Hazard Mitigation Planning Committee		
Name	**Title**	**Agency**
Kiley Sanders	Director	Tensas Parish OHSEP
Rick Foster	Assistant Director	Tensas Parish OHSEP
Timothy Turner	Mayor	Village of Newellton
Matthew Alexander	Mayor	Village of St. Joseph
Jarrod Bottley	Mayor	Village of Waterproof
Ricky Jones	Sheriff	Tensas Parish Sheriff's Office
Danny Lance	Deputy Chief	Tensas Parish Fire District 1
Clifford Walker	Office Clerk	Tensas Parish Council on Aging
Bubba Rushing	Police Juror, District 6	Tensas Parish Police Jury
Kellon Lee		Tensas Water Association
Todd Merriett	Road Supervisor	Tensas Parish Police Jury
Pauline Doyle	Secretary Treasurer	Tensas Parish Police Jury
Ann Fortenberry		Tensas Parish OHSEP
Rob Rushing	Chief Criminal Deputy	Tensas Parish Sheriff's Office
Tim Vanier	Director	Concordia Parish OHSEP

Capability Assessment

Unincorporated Tensas Parish

Capability Assessment Worksheet - Unincorporated Tensas 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	Yes	
Capital Improvements Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	Yes	
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	7	
Site plan review requirements	No	
Land Use Planning and Ordinances	**Yes/No**	**Comments**
Zoning Ordinance	No	
Subdivision Ordinance	Yes	
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	No	

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

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	Delta Recovery Authroity

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	No	

Village of Newellton

Capability Assessment Worksheet - Newellton		
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	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
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	No	Police Jury Building Inspect
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	5	
Site plan review requirements	No	
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	No	
Other	No	

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

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

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)	No	
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	No	

Village of St. Joseph

Capability Assessment Worksheet - St. Joseph		
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	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
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	Parish Buildign Codes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	5	
Site plan review requirements	Yes	
Land Use Planning and Ordinances	**Yes/No**	**Comments**
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	No	
Other	No	

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

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	No	

Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	**Yes/No**	**Comments**
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	
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	Yes	
Other	No	

Village of Waterproof

Capability Assessment Worksheet - Waterproof		
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	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
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	5	
Site plan review requirements	Yes	
Land Use Planning and Ordinances	**Yes/No**	**Comments**
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
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	No	

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

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	No	

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)	No	
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	No	

Building Inventory

Tensas Parish Owned Building Information								
Unincorporated Tensas Parish								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Tensas Community Center	Education	107 Arts Dr	Saint Joseph	31.9490384	-91.2252306	400,000.00	2005	concrete
Tensas Academy	Education	418 Louisiana 128	Saint Joseph	31.92994357	-91.24690325	350,000.00	1973	metal
Tensas High School	Education	720 Plank Road	Saint Joseph	31.92264293	-91.23794599	568,215.00	1940	concrete
Tensas Elementary School	Education	192 Highway 897-6	Saint Joseph	31.91786837	-91.24615812	473,985.00	1960	concrete
Tensas Parish EMS Station	Emergency Medical Services	1233 Plank Road	Saint Joseph	31.95944732	-91.27132393	65,000.00	2005	metal
Tensas Parish Communication District	Emergency Operations Center	Nearby: 3rd Street	Saint Joseph	31.91545708	-91.23732296	450,000.00	2005	concrete
Tensas Parish Maintenance Unit	Civil Government	Nearby: Louisiana 128	Saint Joseph	31.93201998	-91.25248907	20,000.00	1960	metal
USDA Service Center	Civil Government	1000 Asu Drive #539	Saint Joseph	31.92594016	-91.24386801	Unknown	1991	concrete
Tensas Parish Department of Health and Hospitals	Civil Government	Nearby: LA 897-6	Saint Joseph	31.92348204	-91.24410773	Unknown	2004	concrete
Tensas Parish School Board Special Services Center	Civil Government	720 Plank Road	Saint Joseph	31.92332823	-91.23912936	Unknown	1962	concrete
Tensas Parish Educational Materials Center	Civil Government	512 Plank Road	Saint Joseph	31.92186629	-91.23731784	Unknown	1962	concrete
Tensas Parish School Board	Civil Government	720 Plank Road	Saint Joseph	31.92097998	-91.23633242	80,000.00	1962	concrete
Tensas Parish Courthouse	Civil Government	124 Hancock Street	Saint Joseph	31.91426542	-91.23695532	72,495.00	1905	concrete
District Attorney's Office	Civil Government	124 Hancock Street	Saint Joseph	31.91414875	-91.23617631	28,620.00	1940	
Sixth District Court Judge John D. Crigler	Civil Government	Nearby: 2nd Street	Saint Joseph	31.91463538	-91.23650916	24,435.00	1940	
Tensas Parish Department of Motor Vehicles Office	Civil Government	Nearby: 200-298 Hancock Street	Saint Joseph	31.91459326	-91.23695519	30,000.00	1950	concrete
Tensas Parish Office of Voter Registration	Civil Government	Nearby: 200-298 Hancock Street	Saint Joseph	31.91461705	-91.23700753	Unknown	1950	concrete
Tensas Community Development Center	Civil Government	107 Arts Dr	Saint Joseph	31.9178495	-91.23304363	40,000.00	2000	metal

Tensas Parish Health Unit	Hospital or Medical Center	1115 Levee Street	Saint Joseph	31.91830333	-91.23185966	76,000.00	2002	concrete
Tensas Detention Facility	Prisons and Correctional Facilities	8606 U.S. 65	Waterproof	31.81043401	-91.39239989	175,000.00	1995	concrete
Tensas Fire District	Fire Search and Rescue	1104 Plank Road	Saint Joseph	31.92410575	-91.24036659	23,700.00	1999	metal
Newellton Fire Department	Fire Search and Rescue	Nearby: 101-126 Melton Street	Newellton	32.08065213	-91.23979314	60,000.00	2012	Metal
Fire Station	Fire Search and Rescue	Nearby: Louisiana 575	Newellton	32.17546318	-91.23553493	35,000.00	2001	Metal
Fire Station	Fire Search and Rescue	Nearby: Louisiana 888	Newellton	32.09607144	-91.39069092	35,000.00	2001	Metal
St Joseph Fire Department	Fire Search and Rescue	1104 Plank Road	Saint Joseph	31.80451204	-91.38346859	23,700.00	2001	metal
Hwy 573 Fire Station	Fire Search and Rescue	State Route 573	Saint Joseph	31.91417026	-91.47722779	35,000.00	2001	metal
Hwy 892 Fire Station	Fire Search and Rescue	Louisiana 892	Saint Joseph	31.96721224	-91.39426852	45,000.00	2001	metal
Hwy 571 Fire Station	Fire Search and Rescue	Louisiana 571	Waterproof	31.84476011	-91.49257837	25,000.00	2002	metal
Hwy 566 Fire Station	Fire Search and Rescue	Louisiana 566	Waterproof	31.76932936	-91.52253159	30,000.00	2002	metal
Lake Bruin Fire Station	Fire Search and Rescue	Hwy 606	Saint Joseph	31.9528112	-91.2144218	12,150.00	2001	metal
Tensas Parish Council on Aging	Civil Government	114 Plank Road	Saint Joseph	31.917848	-91.23253619	Unknown	1940	concrete
Newellton Elementary School	Education	400 Verona Street	Newellton	32.07334998	-91.24196216	387,045.00	1959	Metal
Tensas Parish Council on Aging	Civil Government	Nearby: 1822 Louisiana 605	Newellton	32.07472848	-91.23501423	30,000.00	1940	concrete

Village of Newellton

Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Newellton Police Department	Law Enforcement	628 Verona Street	Newellton	32.07394465	-91.23463125	60,000.00	1960	Metal
Housing Authority of the Village of Newellton	Civil Government	Nearby: 1822 Louisiana 605	Newellton	32.07324743	-91.23370567	Unkown	1998	
Newellton Chamber of Commerce	Civil Government	Nearby: 1822 Louisiana 605	Newellton	32.07359446	-91.23441054	50,000.00	1945	concrete
Exodus Behavioral Health Center	Hospital or Medical Center	605 South Main Street	Newellton	32.07368133	-91.23444023	Unknown	2000	
Franklin Medical Center - Newellton Health Clinic	Hospital or Medical Center	Nearby: 100-118 Verona Street	Newellton	32.07434003	-91.23557124	50,000.00	1980	Metal

Village of St. Joseph								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
St. Joseph Police Station	Law Enforcement	127 Plank Road	Saint Joseph	31.9177877	-91.23301293	65,000.00	1950	concrete
St. Joseph City Hall	Civil Government	125 Plank Road	Saint Joseph	31.91781791	-91.23298053	50,000.00	1940	concrete
Village of St. Joseph Mayor's Office	Civil Government	125 Plank Road	Saint Joseph	31.91783219	-91.23303407	40,000.00	1940	concrete
Franklin Medical Center	Hospital or Medical Center	Nearby: 435-441 Newton Road	Saint Joseph	31.92286968	-91.22828285	80,000.00	1980	concrete
Village of Waterproof								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Waterproof Police Station	Law Enforcement	342 Main Street	Waterproof	31.80442977	-91.38446269	28,000.00	1960	concrete
Waterproof Village Hall	Civil Government	311 Main Street	Waterproof	31.80449884	-91.38347991	80,000.00	1960	concrete

Vulnerable Populations

Vulnerable Populations Worksheet					
Tensas Parish					
All Hospitals (Private or Public)	Address	City	Zip Code	Latitude	Longitude
Exodus Behavioral Health Center	605 South Main Street	Newellton	71357	32.07368133	-91.23444023
Franklin Medical Center - Newellton Health Clinic	Nearby: 100-118 Verona Street	Newellton	71357	32.07434003	-91.23557124
Tensas Parish Health Unit	1115 Levee Street	Saint Joseph	71366	31.91830333	-91.23185966
Franklin Medical Center	Nearby: 435-441 Newton Road	Saint Joseph	71366	31.92286968	-91.22828285
Nursing Homes (Private or Public)	Address	City	Zip Code	Latitude	Longitude
Mobile Home Parks	Address	City	Zip Code	Latitude	Longitude

National Flood Insurance Program (NFIP)

National Flood Insurance Program (NFIP)				
	Tensas Parish	**Newellton**	**St. Joseph**	**Waterproof**
Insurance Summary				
How many NFIP polices are in the community? What is the total premium and coverage?	# of Policies: 212; Total Premiums: $61,245; Total Coverage: $60,304,000	# of Policies: 12; Total Premiums: $4,193; Total Coverage: $3,064,000	# of Policies: 14; Total Premiums: $4,018; Total Coverage: $4,615,000	# of Policies: 2; Total Premiums: $586; Total Coverage: $541,000
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?	# of paid claims: 250; Total amount of paid claims: $3,141,095; Substantial Damage: 57	# of paid claims: 27; Total amount of paid claims: $397,136; Substantial Damage: 8	# of paid claims: 12; Total amount of paid claims: $56,277; Substantial Damage: 0	# of paid claims: 1; Total amount of paid claims: $608; Substantial Damage: 0
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?				
Is flood plain management an auxiliary function?				
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?				
Compliance History				
Is the community in good standing with the NFIP?	Yes	Yes	Yes	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No	No	No	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact(CAC)?	**CAV:** 11/29/2023; **CAC:** 11/03/2004	**CAV:** 09/30/2004; **CAC:** 12/04/2007	**CAV:** 02/12/2003; **CAC:** 12/29/2006	**CAV:** 04/23/2008; **CAC:** 11/14/2006
Is a CAV or CAC scheduled or needed? If so when?	No	No	No	No

Regulation				
When did the community enter the NFIP?	**E** = 09/06/1974; **R** = 04/03/1978	**E** = 05/16/1973; **R** = 03/16/1982	**E** = 05/16/1973; **R** = 08/26/1977	**E** = 05/14/1973; **R** = 06/21/1977
Are the FIRMs digital or paper?				
When did the community adopt the FIRM's?	4/3/1978	3/16/1982	NSFHA	11/27/1979
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meets	Meets	Meets	Meets
Community Rating System (CRS)				
Does the community participate in CRS?	No	No	No	No
What is the community's CRS Class Ranking?	N/A	N/A	N/A	N/A
Does the plan include CRS planning requirements?				