# 2023 RICHLAND MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

UNINCORPORATED RICHLAND PARISH,
TOWN OF RAYVILLE,
TOWN OF DELHI,
TOWN OF MANGHAM

# RICHLAND PARISH
# MULTI-JURISDICTIONAL
# HAZARD MITIGATION PLAN UPDATE

***Prepared for:***

**Richland Parish**

***Prepared by:***

**Stephenson Disaster Management Institute**

**Mr. Brant Mitchell, CEM**
**Mrs. Lauren Morgan, MEPP**
**Mr. Chris Rippetoe, CFM**
**Dr. Joseph B. Harris, PhD**
**Ms. Ashleigh Dozier**
**Mr. Jason Martin**

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

***This Page Left Intentionally Blank***

## ACKNOWLEDGMENTS

This 2023 Richland Parish Hazard Mitigation Plan Update was coordinated by the Richland 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 Richland Parish
Town of Rayville
Town of Delhi
Town of Mangham

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

| | |
|---|---|
| Dawn Williams | Richland Parish OHSEP |
| Todd Smith | GOHSEP |
| Perry Fleming | Town of Mangham |
| Harry Lewis | Town of Rayville |
| Jesse Washington | Town of Delhi |
| James Mardis | Morehouse Parish OHSEP |

The 2023 Richland Parish Hazard Mitigation Plan Update was written by the Stephenson Disaster Management Institute, Louisiana State University. Further comments should be directed to the Richland Parish Office of Homeland Security and Emergency Preparedness: 35 Lynn Gayle Robertson Rd, Rayville, LA.

# Contents

***This Page Left Intentionally Blank***

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

- Unincorporated Richland Parish
- Town of Rayville
- Town of Delhi
- Town of Mangham

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

## Geography, Population and Economy

### Geography

Richland Parish is located in northeast Louisiana in the area known as the North Louisiana Delta County. It lies in the center of a circle of seven parishes with similar geographic characteristics. Starting with Morehouse to the north, and proceeding clockwise, the parishes are West Carroll, East Carroll, Madison, Franklin, and Caldwell, ending with Ouachita Parish to the west. While Richland Parish offers all of the business amenities and services that appeal to commercial establishments, it also affords its residents a high quality of life with good schools, low crime rates and abundant recreational opportunities.


*Figure 1-1: Location of Richland Parish in the State of Louisiana*

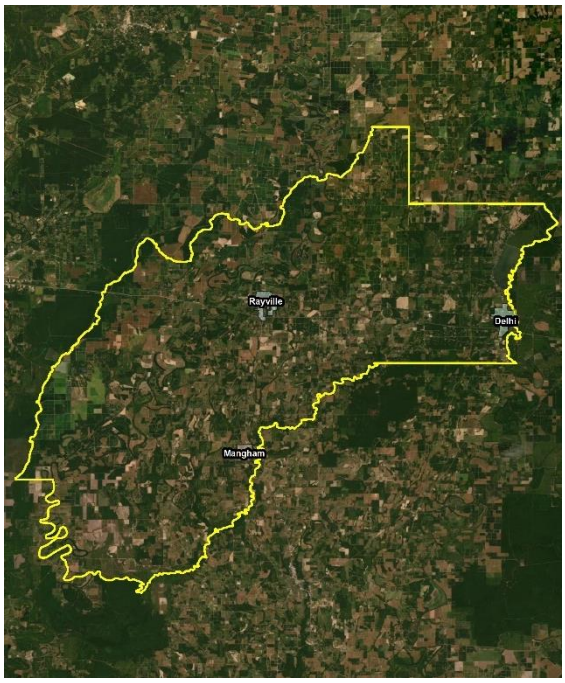


*Figure 1-2: Incorporated Jurisdictions within Richland Parish*

Richland Parish has a humid subtropical climate (Cfa). 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 Richland Parish in particular, the summer months are usually quite warm, with an average daily maximum temperature in July and August of 93°F. Winters are typically mild. Snowfall averages less than one inch per year. Average annual rainfall for the area is 57 inches. Richland Parish is susceptible to the normal weather dangers, such as thunderstorms and flooding. Even though Richland is about 200 miles North of the Gulf of Mexico, the states' proximity to the gulf makes the parish susceptible to tropical cyclones. Hurricane season lasts from June 1st to November 30th, with most hurricanes forming in August, September, and October.

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

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


*Figure 1-3: Louisiana Homeland Security Regions*

## Population

The population of Richland Parish is estimated at 20,043 (2020 census) with a population percent change from April 1, 2010 – April 1, 2020, of -3.40%%.

| | 2010 Census | 2014 Estimate | 2020 Census | Percent Change 2010 - 2020 |
|---|---|---|---|---|
| **Total Population** | 20,725 | 20,740 | 20,043 | -3.40% |
| **Population Density (Pop/Sq. Mi.)** | 37.1 | | 36.1 | -2.77% |
| **Total Households** | 8,621 | 8,833 | 7,459 | -15.58% |
| **Persons Per Household** | | | 2.59 | ------- |

*Table 1-1: Richland Parish Population*
*(Source: US Census)*

## Economy

The economic base of Richland Parish consists of companies in the garment manufacturing, cotton processing, livestock, and lumber production industries. Its hard-working labor force, excellent transportation network, abundant raw materials, and land for commercial and industrial development make Richland Parish an ideal prospect for business investment. It is also home to the Franklin Farms Mega Site that consists of 1,440 acres and is located on I-20. Industry data for business patterns in Richland Parish can be found in the table below.

| Business Description | Number of Establishments | Number of Employees | Annual Payroll ($1,000) |
|---|---|---|---|
| **Retail Trade** | 63 | 767 | 19,828 |
| **Manufacturing** | 7 | 640 | 31,627 |
| **Health Care and Social Assistance** | 75 | 1,787 | 58,652 |
| **Transportation and Warehousing** | 22 | 136 | 8,070 |
| **Construction** | 34 | 311 | 12,456 |
| **Administration/Support and Waste Management/Remediation Services** | 11 | 97 | 2,620 |
| **Real Estate and Rental and Leasing** | 20 | 174 | 3,507 |
| **Wholesale Trade** | 23 | 244 | 12,688 |
| **Other Services (except Public Administration)** | 37 | 148 | 3,012 |
| **Accommodation and Food Services** | 24 | 342 | 4,652 |
| **Financial and Insurance** | 32 | 312 | 24,333 |
| **Professional, Scientific, and Technical Services** | 28 | 100 | 3,861 |
| **Agriculture, Forestry, Fishing and Hunting** | 8 | 24 | 1,239 |
| **Mining, quarrying, and oil and gas extraction** | 4 | 46 | 3,038 |
| **Utilities** | 5 | 20 | 1,077 |
| **Arts, entertainment, and recreation** | 6 | 12 | 183 |
| **Educational services** | 3 | 213 | 6,561 |
| **Information** | 9 | 28 | 1,082 |

Table 1-2: Richland Parish Business Patterns

(Source: US Census, CBP)

## Hazard Mitigation

To fully understand hazard mitigation efforts in Richland 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


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

United States prompted a new level of planning and engagement related to disaster response, recovery, and hazard mitigation. Hurricanes Katrina and Rita hit three weeks apart and together caused astonishing damage to human life and to property. The two storms highlighted a hurricane season that spawned 28 storms—unparalleled in American history. The 2005 hurricane season confirmed Louisiana's extreme exposure to natural disasters and both the positive effects and the concerns resulting from engineered flood-protection solutions. More recently, the historically impactful 2020 hurricane season reinforced the need for proper planning and mitigation strategies.

The catastrophic tropical events of 2005 and 2020, coupled with the unprecedented flooding events of 2016 have had profound impacts on emergency management and hazard mitigation throughout Louisiana. As detailed later in this document, significant funding has been made available to the State of Louisiana and its parishes for the purpose of hazard mitigation planning. The storms also raised awareness of the importance of hazard mitigation among decision-makers and the general population, which has been particularly important since natural hazards will likely be increasing in frequency, magnitude, and impact in the coming years due to climate change.

## 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 2023 Richland Parish Hazard Mitigation Plan (HMP) maintains much of the information from the 2016 plan version, but it now incorporates the order and methodologies of the 2019 Louisiana State Hazard Mitigation Plan.

The sections in the 2023 Richland 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 Richland 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 2023 update. This plan update remains coherent with those documents, retaining language and content when needed, deleting it when appropriate, and augmenting it when constructive.

## 2023 Plan Update

This 2023 plan update proceeds with the previous goals of the Richland Parish Hazard Mitigation Plan. The current goals are as follows:

1. Identify and pursue preventative measures that will reduce future damages from hazards
2. Enhance public awareness and understanding of disaster preparedness
3. Reduce repetitive flood losses in the parish and towns
4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages
5. Improve data collection, use, and sharing.

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 2023 plan update is organized in the same format as the 2016 update, with one minor change to this 2023 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: 2023 Plan Update Crosswalk*

| Plan Update Crosswalk | |
|---|---|
| **2016 Update** | **2023 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 changes in this plan update, the plan remains consistent in its emphasis on the few types of hazards that pose the most risk to loss of life, injury, and property in Richland Parish and its municipalities. The extent of this risk is dictated primarily by its geographic location. Most significantly, Richland Parish remains at high risk of water inundation from various sources, including flooding, tornadoes, and tropical cyclone activity. All of the parish is also at high risk of damages from high winds and wind-borne debris caused by various meteorological phenomena. Other hazards threaten the parish and/or its municipalities, although not to such great degrees and not in such widespread ways. In all cases, the relative social vulnerability of areas threatened and affected plays a significant role in how governmental agencies and their partners (local, parish, state, and federal) prepare for and respond to disasters.

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

# 2. Hazard Identification and Parish-Wide Risk Assessment

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

The table below provides an overview of the hazards that had been previously profiled in the Richland Parish Hazard Mitigation Plan published in 2016, as well as the hazards that were identified in the state's 2019 Hazard Mitigation Plan that were of high or medium risk for the parish by the state. Those hazards identified as high or medium risk by the state or previously identified as a risk by the parish, have been determined to provide a risk to the parish and will be profiled in this section.

*Table 2-1: Hazard Profile Summary.*

| Hazard | Profiled in Last Plan | Considered Medium or High Risk in the State's HM Plan | Profiled in the 2023 Update |
|---|---|---|---|
| **Drought** | X | | X |
| **Flooding** | X | X | X |
| **Thunderstorms (Hail, Lightning, & Wind)** | X | X | X |
| **Tornadoes** | X | X | X |
| **Tropical Cyclones** | X | X | X |
| **Winter Weather** | X | | X |
| **Dam Failure** | X | | * |
| **Levee Failure** | X | | + |

* Data deficiency; + Hazard discounted

## Prevalent Hazards to the Community

While many of the hazards identified in *Table 2-1* occur in the parish, their occurrence was not merited for further study by the planning committee. The determination was made to focus attention and resources on the most prevalent hazards, which include the hazards previously profiled. The following hazards have been selected to be included in this risk assessment:

a) Dam Failure
b) Drought
c) Flooding
d) Thunderstorms (Hail, Lightning, Wind)
e) Tornadoes
f) Tropical Cyclones
g) Winter Weather

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

- Flooding from rivers and waterways, rainstorms, tropical cyclones, and hurricanes in the following forms:
    a) Riverine
    b) Stormwater
    c) Surge
    d) Backwater flooding (as the result of river flooding and surge)
    e) Coastal
- High wind damage most commonly resulting from hurricanes, thunderstorms, and tornadoes
- Property damage resulting from all profiled natural hazards

The potential destructive power of tropical cyclones and floods were determined to be the most prevalent hazard to the parish. Twenty-four of the twenty-nine disaster declarations Richland Parish has received resulted from either flooding (10) or tropical cyclones (14), which validates these as the most significant hazards. Therefore, the issues of hurricanes will serve as the main focus during the mitigation planning process. Hurricanes present risks from the potential for flooding, primarily resulting from storm surge, and high wind speeds. While storm surge is considered the hazard with the most destructive potential, the risk assessment will also assess non-storm surge flooding as well. Flooding can also occur from non-hurricane events, as flash floods are a common occurrence due to heavy rainfall.

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

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

## Previous Occurrences

On the next page, *Table 2-2* summarizes federal disaster declarations for Richland Parish since 1965. Information includes names, dates, and types of disaster.

*Table 2-2: Richland Parish Major Disaster Declarations.*

| Disaster Number | Year | Declaration |
|---|---|---|
| 208 | 9/10/1965 | Tropical Cyclone – Hurricane Betsy |
| 374 | 4/27/1973 | Severe Storms and Flooding |
| 3031 | 2/22/1977 | Drought and Freezing |
| 565 | 9/20/1978 | Severe Storms and Flooding |
| 675 | 1/11/1983 | Severe Storms and Flooding |
| 829 | 5/20/1989 | Severe Storms and Flooding |
| 904 | 5/3/1991 | Severe Storms, Tornadoes, and Flooding |
| 1264 | 1/21/1999 | Severe Ice Storm |
| 1314 | 2/15/2000 | Severe Winter Storm |
| 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 |
| 4080 | 8/29/2012 | Tropical Cyclone – Hurricane Isaac |
| 4345 | 10/16/2017 | Tropical Cyclone – TS Harvey |
| 4458 | 8/27/2019 | Tropical Cyclone – Hurricane Barry |
| 4484 | 3/24/2020 | COVID-19 Pandemic |
| 3527 | 6/7/2020 | Tropical Cyclone – TS Cristobal |
| 3538 | 8/23/2020 | Tropical Cyclones – TS 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 | 10/27/20 | Tropical Cyclone – TS Zeta |

## Probability of Future Hazard Events

The probability of a hazard event occurring in Richland Parish is estimated in the table on the following page. The percent chance of an event happening during any given year was calculated by posting past events and dividing by the time period. Unless otherwise indicated, the time period used to access probability followed the method used in the State of Louisiana's most current Hazard Mitigation Plan. The primary source for historical data used throughout the plan is the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information's (NCEI) Storm Events Database, which provides historical hazard data from 1950 to 2023. In staying consistent with the state plan, the Storm Events Database was evaluated for the last thirty-three years (1990 – 2023) to determine future probability of a hazard occurring. While the 30-year record used by the State was adopted for the purpose of determining the overall probability, to assist with determining estimated losses, unless otherwise stated, the full 70-year record was used when Hazus was not available to determine losses. This full record was used to provide a more extensive record to determine losses. All assessed damages were adjusted for inflation in order to reflect the equivalent amount of damages with the value of the U.S. dollar today.

The following table shows the annual probability for each hazard occurring across the parish:

*Table 2-3: Probability of Future Hazard Reoccurrence.*

| Hazard | Probability | | | |
|---|---|---|---|---|
| | Richland Parish (Unincorporated) | Delhi | Mangham | Rayville |
| **Drought** | 17% | 17% | 17% | 17% |
| **Flooding** | 40% | 23% | 17% | 47% |
| **Thunderstorms – Hail** | 100% | 100% | 100% | 100% |
| **Thunderstorms – Lightning** | 7% | 7% | 7% | 7% |
| **Thunderstorms – Winds** | 100% | 100% | 100% | 100% |
| **Tornadoes** | 63% | 63% | 63% | 63% |
| **Tropical Cyclones** | 39% | 39% | 39% | 39% |
| **Winter Storms** | < 1% | < 1% | < 1% | < 1% |
| **Dam Failure** | < 1% | < 1% | < 1% | < 1% |

*There is a 100% annual probability that a flooding event will occur at some location within the Richland Parish Planning Area

As shown in the above tables, hailstorms and thunderstorm winds have the highest chance of occurrence in the parish (100%). These are followed by tornadoes (63%), flooding in the incorporated area of Rayville (47%), flooding in the unincorporated area (40%), tropical cyclones (39%), flooding in the incorporated area of Delhi (23%), flooding the incorporated area of Mangham and drought (17%), and lightning (7%). The hazards of dam failure and winter storms have less than a one percent chance of occurrence. Levee failure was discounted and not carried forward into the risk assessment.

## Inventory of Assets for the Entire Parish

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

Within the entire planning area, there is an estimated value of $1,793,669,000 in structures throughout the parish. The table below provides the total estimated value for each type of structure by occupancy.

*Table 2-4: Estimated Total of Potential Losses throughout Richland Parish.*

| Occupancy | Richland Parish | Unincorporated Area | Delhi | Mangham | Rayville |
|---|---|---|---|---|---|
| Agricultural | $42,630,000 | $33,944,000 | $1,580,000 | $746,000 | $6,360,000 |
| Commercial | $377,652,000 | $177,593,000 | $73,981,000 | $9,395,000 | $116,683,000 |
| Government | $36,501,000 | $10,319,000 | $4,841,000 | $1,418,000 | $19,923,000 |
| Industrial | $112,434,000 | $68,523,000 | $15,195,000 | $6,405,000 | $22,311,000 |
| Religion | $125,500,000 | $75,340,000 | $18,038,000 | $3,228,000 | $28,894,000 |
| Residential | $2,116,303,000 | $1,354,907,000 | $334,580,000 | $61,048,000 | $365,768,000 |
| Education | $31,456,000 | $8,254,000 | $5,202,000 | $2,234,000 | $15,766,000 |
| **Total** | **$2,842,476,000** | **$1,728,880,000** | **$453,417,000** | **$84,474,000** | **$575,705,000** |

## Critical Facilities of the Parish

The figures on the following pages show the locations and names of the critical facilities within the parish.

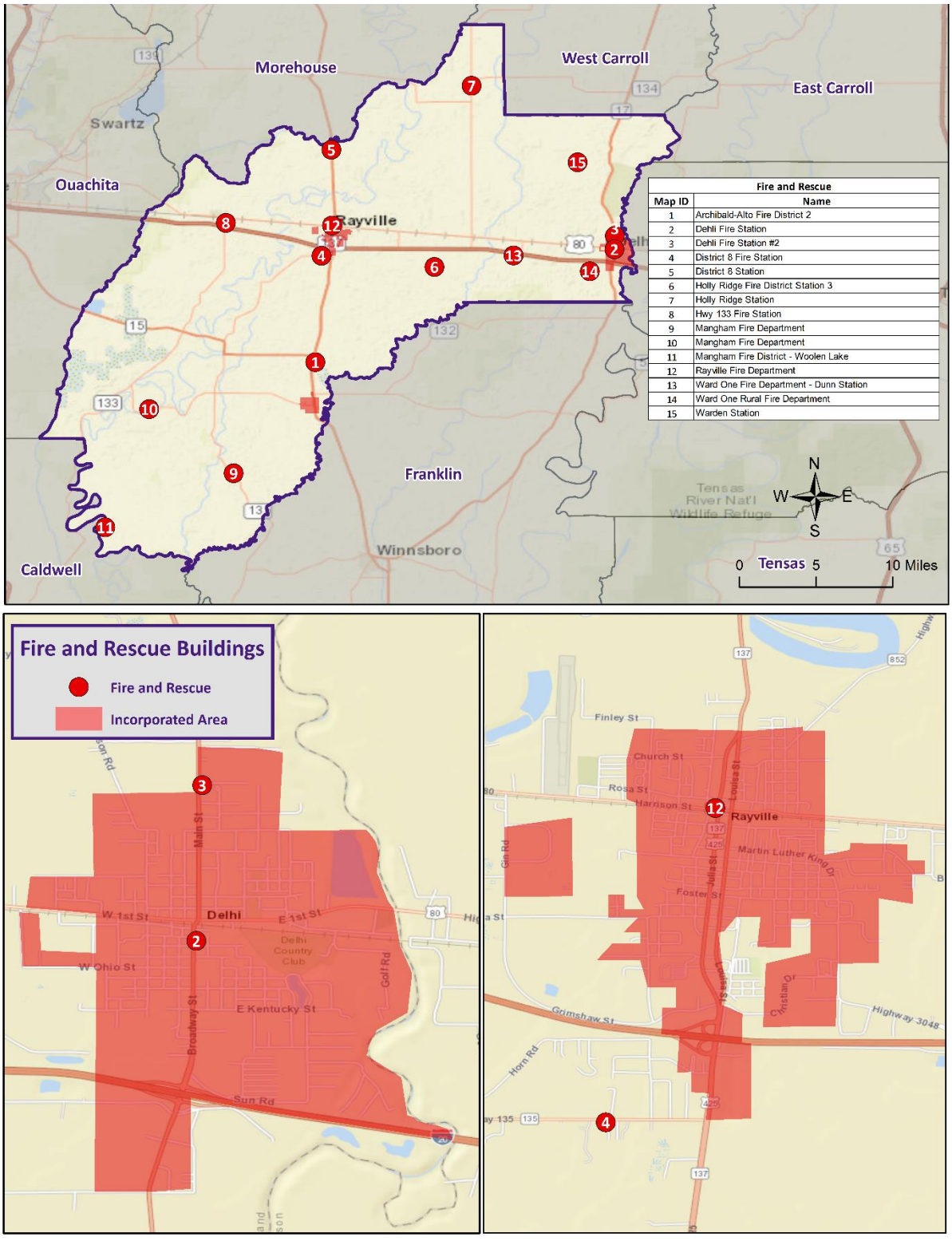


*Figure 2-1: Fire and Rescue Facilities in Richland Parish.*

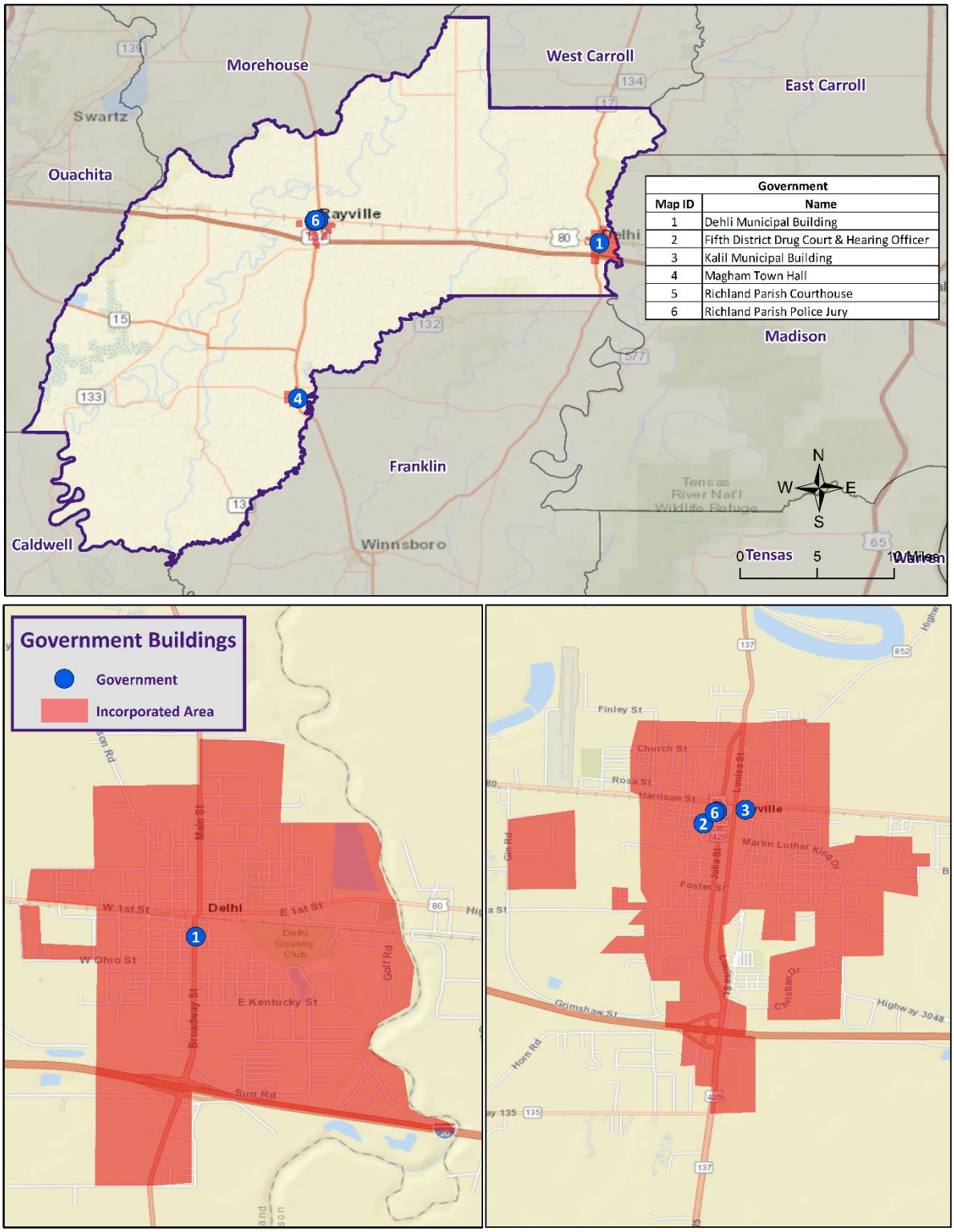


*Figure 2-2: Government Buildings in Richland Parish.*

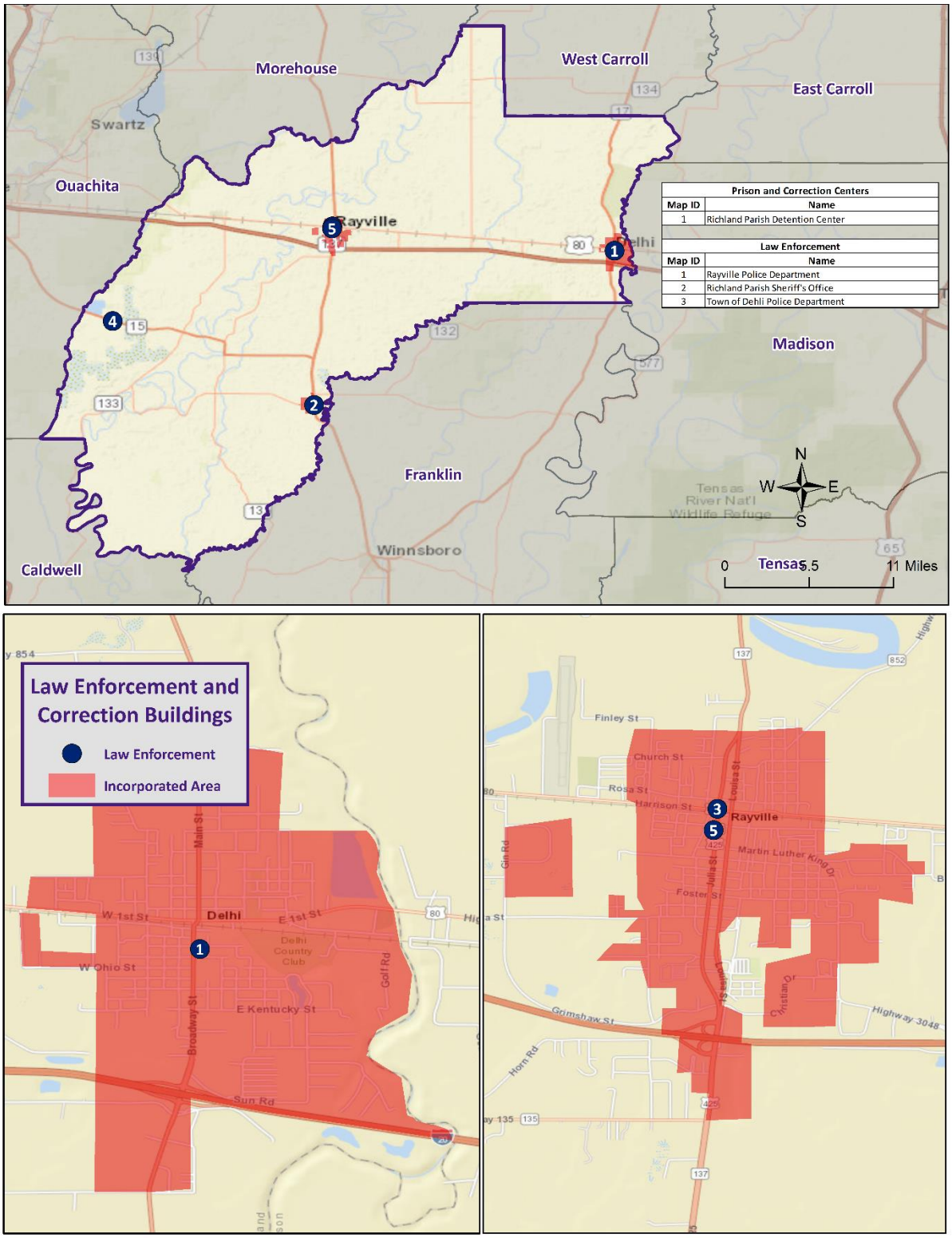


*Figure 2-3: Law Enforcement in Richland Parish.*

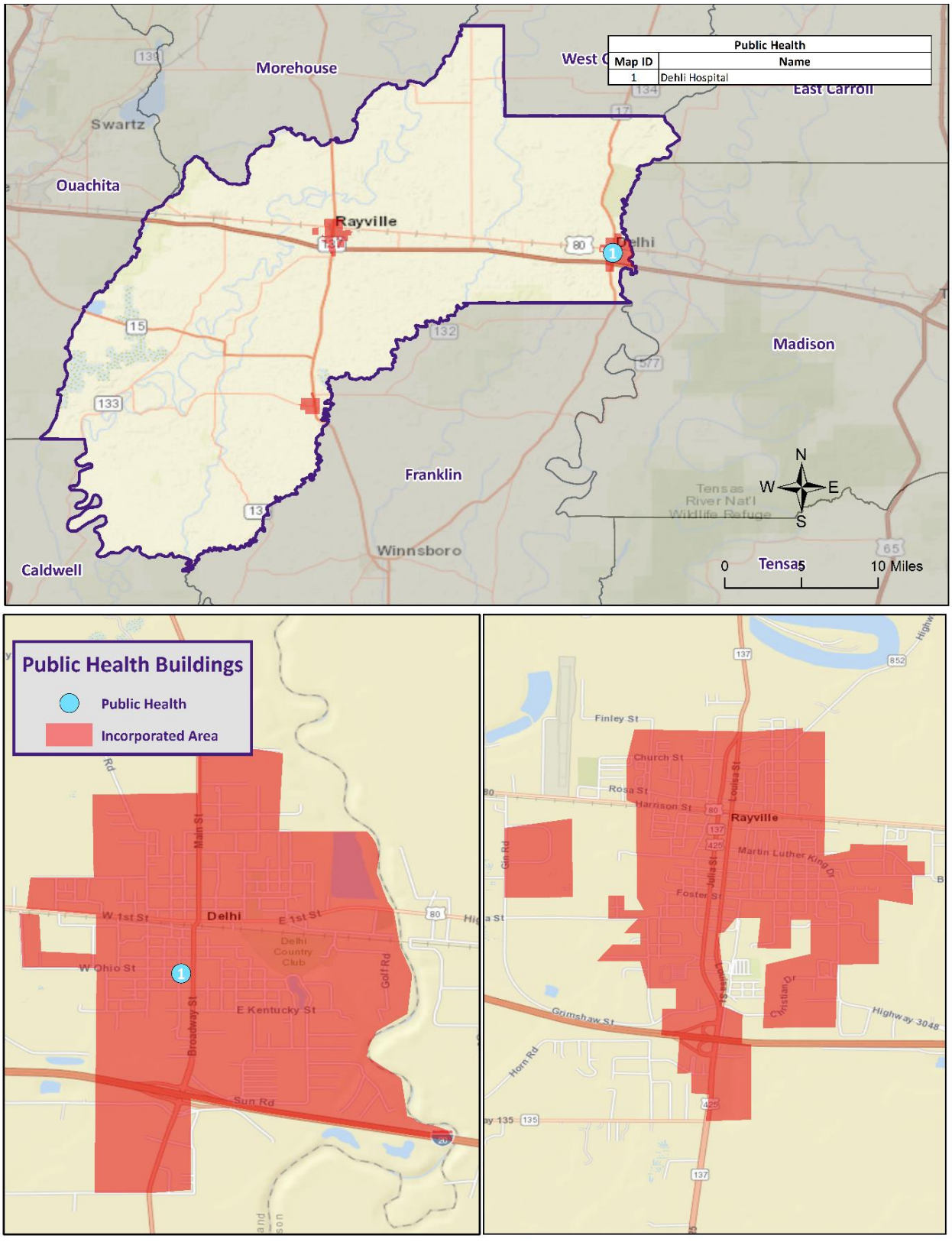


*Figure 2-4: Public Health Facilities in Richland Parish.*

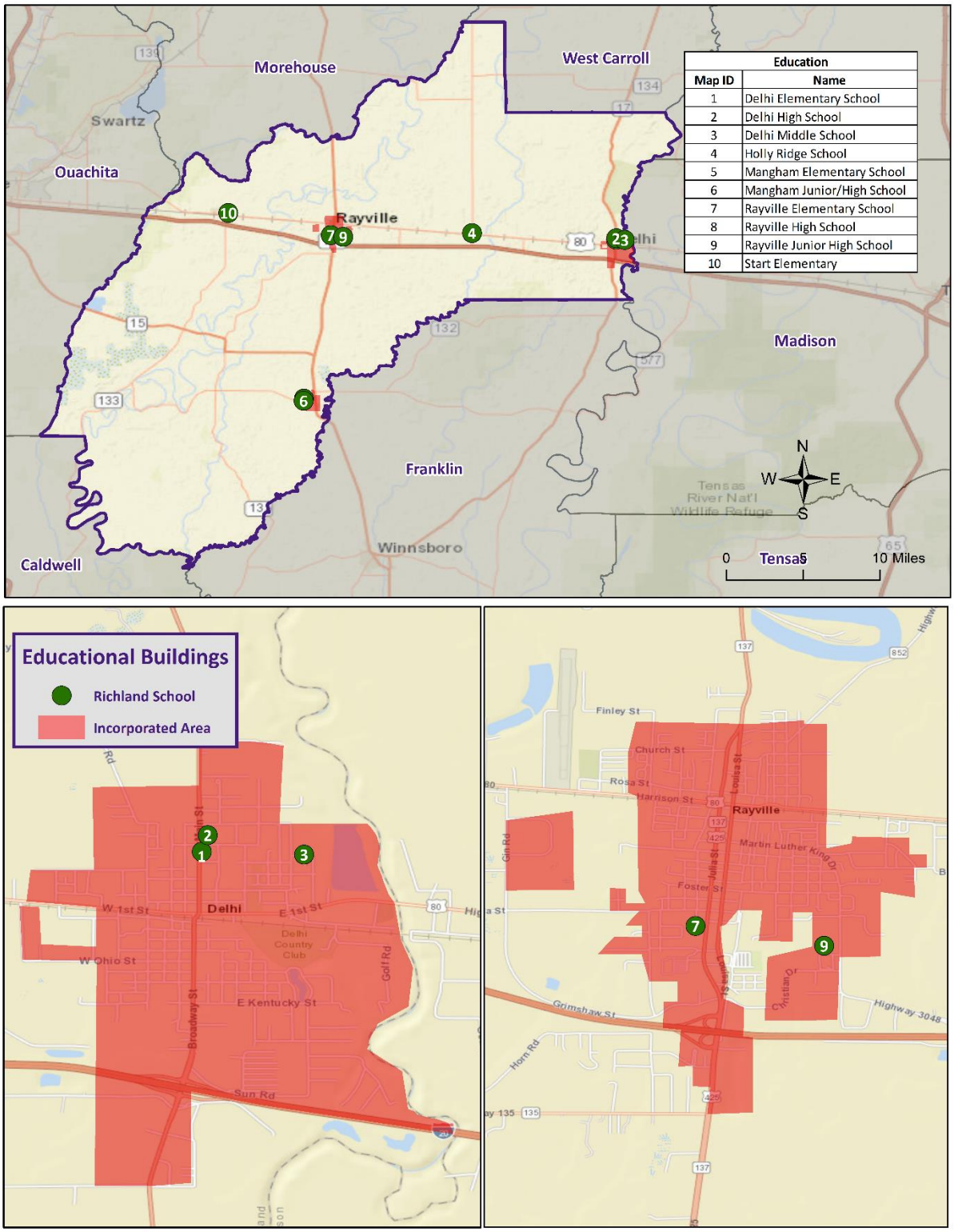


*Figure 2-5: Educational Facilities in Richland Parish*

## Assessing Vulnerability Overview

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

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

## Quantitative Methodology

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

## Qualitative Methodology

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

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

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

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

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

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

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

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

*Table 2-7: Risk Assessment for Richland Parish*

| Hazard | Probability | Impact | Spatial Extent | Warning Time | Duration | Overall Risk |
|---|---|---|---|---|---|---|
| Drought | 3 | 2 | 4 | 2 | 3 | 2.8 |
| Flooding | 3 | 4 | 3 | 4 | 3 | 3.4 |
| Thunderstorms – Hail | 4 | 2 | 3 | 3 | 1 | 2.7 |
| Thunderstorms – Lightning | 2 | 2 | 2 | 3 | 1 | 2 |
| Thunderstorms – Winds | 4 | 2 | 3 | 3 | 1 | 2.7 |
| Tornadoes | 3 | 3 | 2 | 4 | 3 | 2.95 |
| Tropical Cyclones | 3 | 4 | 4 | 1 | 4 | 3.3 |
| Winter Weather | 1 | 2 | 2 | 4 | 2 | 2.05 |
| Dam Failure | 1 | 2 | 1 | 4 | 2 | 1.85 |

## Future Development Trends

Richland Parish experienced a decline in population from the years of 2000 and 2020, declining in population from 20,935 in the year 2000 to a population of 20,043 in the year 2020. The incorporated area of Delhi experienced the largest population decline within the parish falling from a populace of 2,921 in 2010 to 2,622 in 2020 (10.2% overall decline) which is then followed by the incorporated area of Rayville (9.5% overall decline), the incorporated area of Mangham (7.1% overall decline), and the unincorporated area of the parish (< 1% overall decline).

Rayville experienced the largest decline in housing units from 2010 to 2019 with a 0.5% annual decline followed by the incorporated area of Delhi with a 30.3% annual decline. The unincorporated area of the parish and the incorporated area of Mangham experienced an increase in housing during this time period.

The following tables show population (2000 to 2020) and housing unit (2000 to 2020) estimates:

*Table 2-8: Population Growth Rate for Richland Parish*

| Total Population | Richland Parish | Unincorporated Area | Delhi | Mangham | Rayville |
|---|---|---|---|---|---|
| 1-Apr-00 | 20,935 | 12,867 | 3,229 | 616 | 4,223 |
| 1-Apr-10 | 20,736 | 13,446 | 2,921 | 672 | 3,697 |
| 1-Apr-20 | 20,043 | 13,450 | 2,622 | 624 | 3,347 |
| Population Growth between 2000 – 2010 | -1.0% | 4.5% | -9.5% | 9.1% | -12.5% |
| Average Annual Growth Rate between 2000 – 2010 | -0.1% | 0.4% | -1.0% | 0.9% | -1.2% |
| Population Growth between 2010 – 2020 | -3.3% | 0.0% | -10.2% | -7.1% | -9.5% |
| Average Annual Growth Rate between 2010 – 2020 | -0.33% | 0.00% | -1.02% | -0.71% | -0.95% |

*Table 2-9: Housing Growth Rate for Richland Parish.*

| Total Housing Units | Richland Parish | Unincorporated Area | Delhi | Mangham | Rayville |
|---|---|---|---|---|---|
| 1-Apr-00 | 8,335 | 5,485 | 1,253 | 268 | 1,329 |
| 1-Apr-10 | 8,621 | 5,568 | 1,215 | 283 | 1,555 |
| 1-Jul-20 | 8,628 | 5,690 | 1,175 | 284 | 1,479 |
| Housing Growth between 2000 – 2010 | 3.4% | 1.5% | -3.0% | 5.6% | 17.0% |
| Average Annual Growth Rate between 2000 – 2010 | 0.3% | 0.2% | -0.3% | 0.6% | 1.7% |
| Housing Growth between 2010 – 2020 | 0.1% | 2.2% | -3.3% | 0.4% | -4.9% |
| Average Annual Growth Rate between 2010 – 2020 | 0.0% | 0.2% | -0.3% | 0.0% | -0.5% |

## Future Hazard Impacts

Hazard impacts were estimated for five years and ten years in the future (2025 and 2030). Yearly population and housing growth rates were applied to parish inventory assets for composite flood and tropical cyclones. Based on a review of available information, it is assumed that population and housing units will grow within Richland Parish from the present until 2030. A summary of estimated future impacts is shown in the table below. Dollar values are expressed in future costs and assume an annual rate of inflation of 1.02%.

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

| Hazard / Impact | Total in Parish (2018) | Hazard Area (2018) | Hazard Area (2025) | Hazard Area (2030) |
|---|---|---|---|---|
| **Flood Damage** | | | | |
| **Structures** | 8,629 | 3,984 | 3,985 | 3,986 |
| **Value of Structures** | $2,871,702,410 | $1,325,742,773 | $1,395,315,438 | $1,453,593,272 |
| **# of People** | 20,243 | 9,346 | 9,822 | 10,221 |
| **Tropical Cyclone Damage** | | | | |
| **Structures** | 8,629 | 8,629 | 8,632 | 8,635 |
| **Value of Structures** | $2,871,702,410 | $2,871,702,410 | $3,022,404,336 | $3,148,640,435 |
| **# of People** | 20,243 | 20,243 | 21,276 | 22,140 |

Population within Richland Parish has decreased over the last 20 years which, in return, has had little effect to the growth of housing development, which has remained steady over that period of time. Richland Parish is extremely vigilant in offsetting the rapid development seen 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 Richland Parish. Strict enforcement of building codes for all new development is an additional step taken by the parish in its effort to decrease its vulnerability and increase the resiliency of the parish against natural hazards. The development that has occurred since 2016 has not in any knowing way altered the jurisdiction's vulnerability to natural hazards.

## Land Use

The Richland Parish Land Use table is provided below. Residential, commercial, and industrial areas account for only 7% of the parish's land use. Agricultural land at 251,519 acres is the largest category accounting for 70% of land in the parish. The parish also consists of wetlands (16%), forested areas (6%), and water areas (2%).

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

| Land Use | Acres | Percentage |
|---|---|---|
| Agricultural Land, Cropland, and Pasture | 251,519 | 70% |
| Wetlands | 59,223 | 16% |
| Forest Land (Not including forested wetlands) | 19,984 | 6% |
| Urban/Development | 24,389 | 7% |
| Water | 6,327 | 2% |

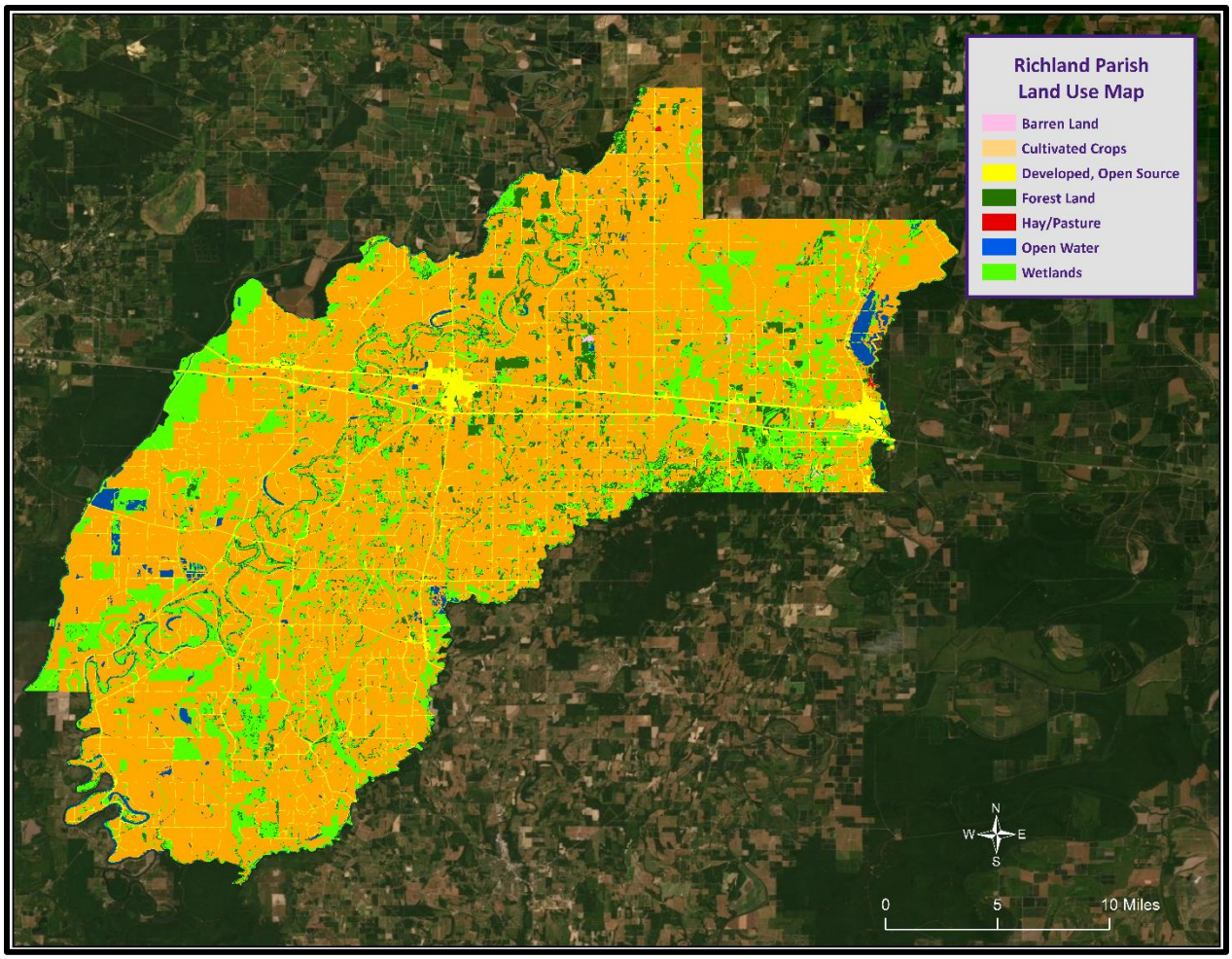


*Figure 2-6: Richland Parish Land Use Map.*
*(Source: USGS Land Use Map)*

## Hazard Identification

### Dam Failure

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

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

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

- **High**: Dams assigned the high hazard potential classification are those where failure or mis operation will probably cause loss of human life.
- **Significant**: Dams assigned the significant hazard potential classification are those dams where failure or mis operation results in no probable loss of human life, but can case economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas, but could be located in areas with population and significant infrastructure.
- **Low**: Dams assigned the low hazard potential classification are those where failure or mis operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

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

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

- Landslides into reservoirs, which cause surges that result in overtopping;
- High winds, which can cause significant wave action and result in substantial erosion; and
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments that can weaken entire structures.

In Louisiana, there are 513 dams included in the Army Corps of Engineers National Inventory of Dams. Of these, 41 are considered high hazard, 63 are significant hazard, and 409 are low hazard potential dams.

*Location*

According to the National Inventory of Dams, Richland Parish has one low hazard dam located in the unincorporated area of Richland Parish adjacent to the incorporated area of Delhi. Dam hazards pose no threat to the incorporated areas of Mangham or Rayville. The dams located in Richland Parish are shown in the following figures:

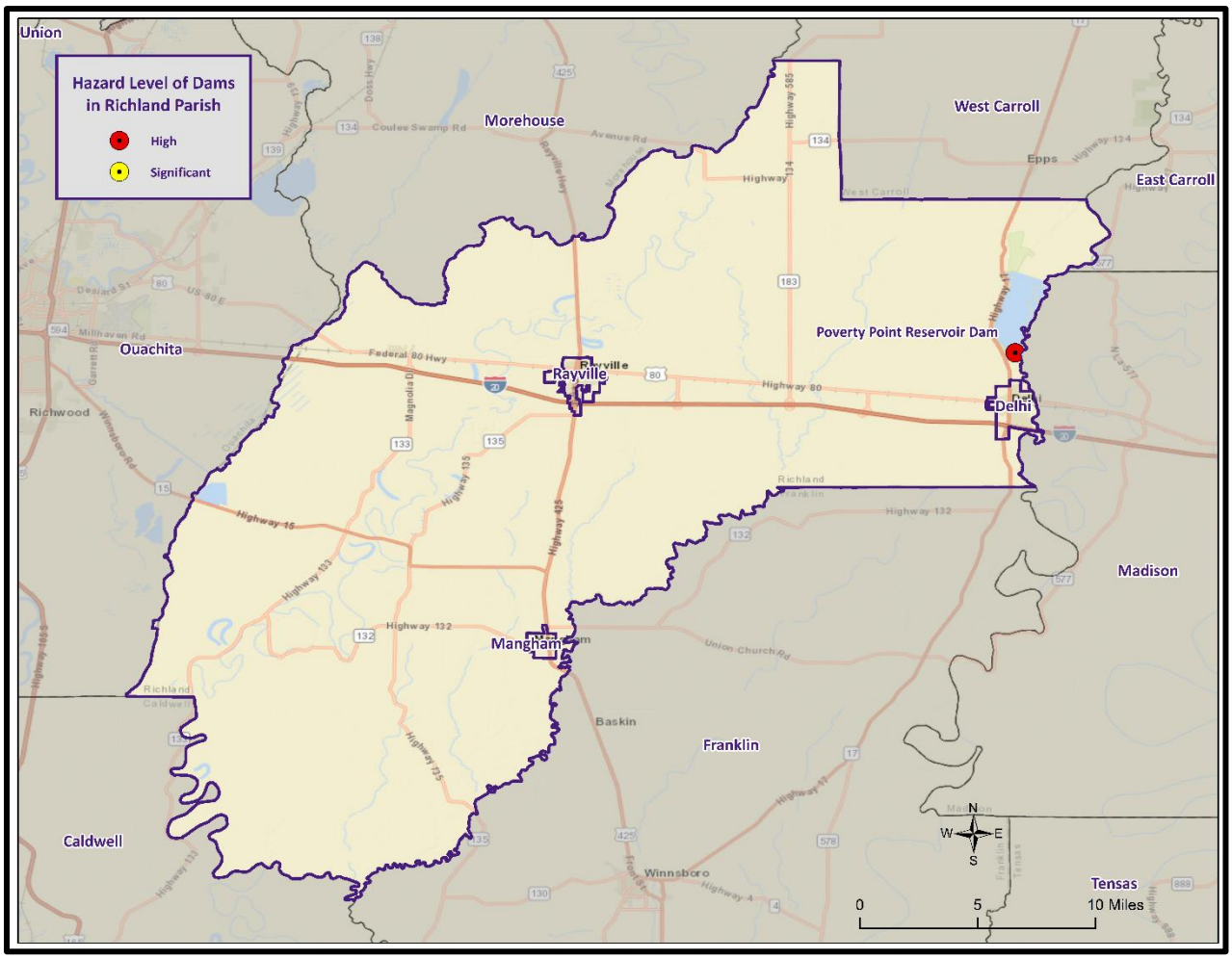


*Figure 2-24: National Inventory of Dam Locations in Richland Parish.*

*Previous Occurrences / Extents*

The National Performance of Dams Program (NPDP), a database of dam incidents maintained by Stanford University, lists one dam incident in Louisiana, which occurred in Kisatchie Lake Dam in Grant Parish in 1991. However, there have been no dam failures within the boundaries of Richland Parish and its jurisdictions. The parish claims a data deficiency on the extent of dam failure for Poverty Point Reservoir Dam. Richland Parish will continue to develop an extent for this dam.

*Frequency / Probability*

It is nearly impossible to predict and model dam failure and its impacts on Richland Parish. Due to the unpredictability of dam failures, it is calculated that the probability of a dam failure is less than 1% annually for the unincorporated areas of Richland Parish and its jurisdictions.

*Estimated Potential Loses*

Determining the annualized loss as a result of a dam failure is difficult in Richland Parish due to availability of data on past dam failure events. The National Inventory of Dams was utilized to determine the dams within Richland Parish, the risk level, and storage capacity of the reservoir. The NLD is a congressional authorized database that documents dams in the United States and its territories and is maintained by the U.S. Army Corps of Engineers (USACE). The following table provides an extensive list of the dams in Richland Parish with the risk associated with each system.

*Table 2-12: Dams and Risk Associated with each in Richland Parish.*
*(Source: National Inventory of Dams)*

| System | Rating | Height (ft) | Storage (Acre-Feet) | Dam Type | Last Inspection Date |
|---|---|---|---|---|---|
| Poverty Point Reservoir Dam | High | 42 | 31,000 | Earth | 7/9/2020 |

*Vulnerability*

See *Appendix C* for parish and municipality building exposure to dam failures.

## Drought

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

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

This hazard is often measured using the Palmer Drought Severity Index (PDSI, also known operationally as the Palmer Drought Index). The PDSI, first developed by Wayne Palmer in a 1965 paper for the U.S. Weather Bureau, measures drought through recent precipitation and temperature data with regard to a basic supply-and-demand model of soil moisture. It is most effective in long-term calculations. Three other indices used to measure drought are the Palmer Hydrologic Drought Index (PHDI), the Crop Moisture Index (CMI), which is derived from the PDSI, and the Keetch-Byram Drought Index (KBDI), created by John Keetch and George Byram in 1968 for the U.S. Forest Service. The KBDI is used mainly for predicting the likelihood of wildfire outbreaks. As a compromise, the PDSI is used most often for droughts since it is a medium-response drought indicator. The objective of the PDSI is to provide measurements of moisture conditions that are standardized so that comparisons using the index can be made between locations and between months. *Table 2-12* displays the range and Palmer classifications of the PDSI index while *Figure 2-7* displays the current drought monitor for the state of Louisiana and its parishes.

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

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

The PDSI best measures the duration and intensity of drought-inducing circulation patterns at a somewhat long-term time scale, although not as long-term as the PHDI. Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns in addition to the effects of cumulative patterns of previous months. Although weather patterns can change almost overnight from a long-term drought pattern to a long-term wet pattern, as a medium-response indicator, the PDSI responds relatively rapidly. Data compiled by the National Drought Mitigation Center indicates extreme drought in the northern portion of the parish and severe drought in the southern portion.

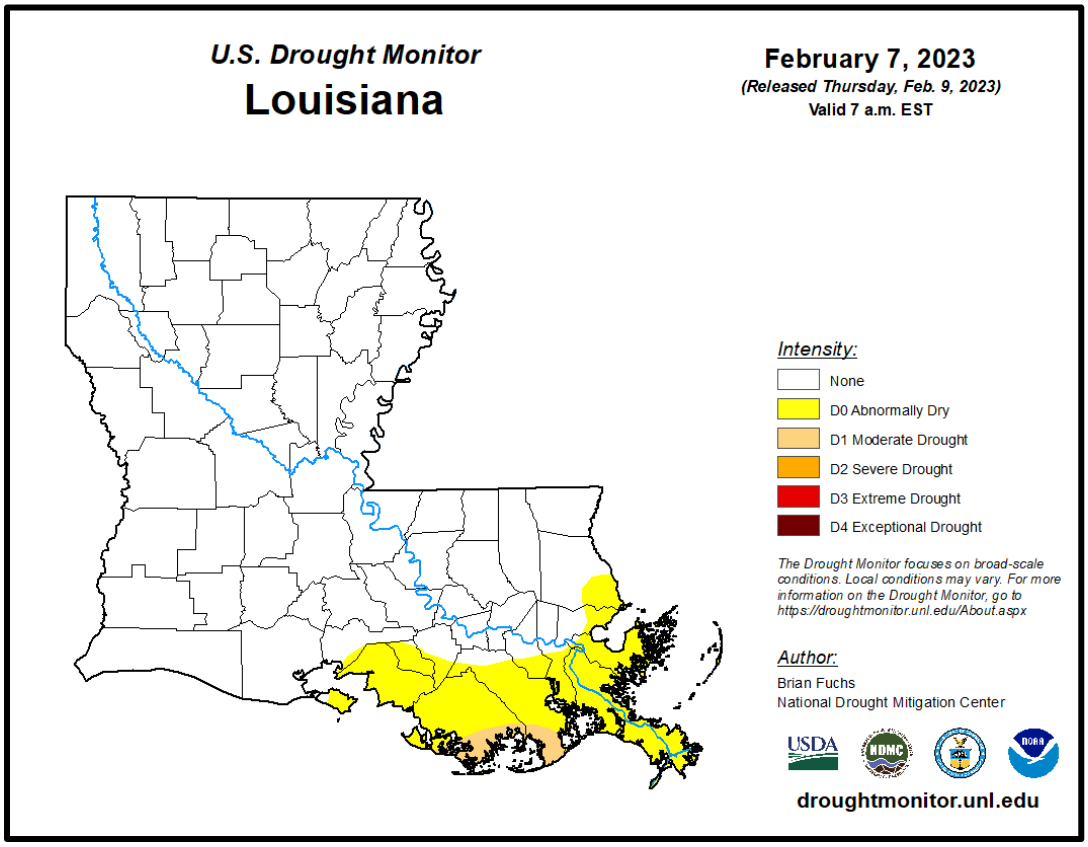


*Figure 2-7: United States Drought Monitor for the State of Louisiana and its Parishes. (Source: The National Drought Mitigation Center)*

*Location*

Drought typically impacts a region and not one specific parish or jurisdiction. While the entire planning area can experience drought, the major impact of a drought event in Richland Parish is on the agricultural community. The worst-case drought scenario for Richland Parish would be an extreme drought (D3).

*Previous Occurrences / Extent*

Historically, there have been five drought incidents in Richland Parish. Drought events have ranged from Mild to Extreme per the National Climatic Data Center. Since the last update in 2016, there have been four drought events within the boundaries of Richland Parish. Below is a brief synopsis of that event:

*Table 2-14: Historical Droughts in Richland Parish since the 2016 Richland Parish HMP Update.*

| Date | Extents | Drought Magnitude | Estimated Damages |
|---|---|---|---|
| **October 2006** | D3 drought conditions disappeared from the CWA and the D2 area contracted to a small portion of the Yazoo Delta Region. Borderline D2 conditions continued from Central Mississippi to East Central Mississippi where only half its normal 3 to 4 inches rainfall occurred during the month. The first half of October started off with high pressure in control and little or no rainfall over most areas. The second half of October closed out the D2 drought conditions in the CWA when well above normal rainfall occurred. October rainfall ranged from 4 inches in East Central Mississippi to 19 inches over Northeast Louisiana. | D2 | $1,000,000 |
| **June – October 2010** | Rainfall was 2 to 3 inches below normal for the month over much of the parish, with extreme drought conditions persisting for most of the parish. Some rain affected the parish toward the end of the month which brought some brief relief to the drought conditions. | D3 | $1,700,000 |
| **November – December 2016** | Very dry conditions continued into December, which resulted in an area of severe drought (D2). Crops were put under more stress from the dry conditions. The drought eased by the middle to end of the month. | D2 | $150,000 |
| **November 2017** | Lack of rainfall across the region has led to a severe drought across portions of Louisiana. This includes severe drought (D2) level in Richland Parish. | D2 | $10,000 |

*Frequency / Probability*

Based on five drought events since 1990, the annual chance of occurrence of a drought event occurring within a given year is calculated at 17% for Richland Parish.

*Estimated Potential Losses*

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

*Table 2-15: Agricultural Exposure by Crop Type for Droughts in Richland Parish. (Source: LSU AG Center 2018 Parish Totals)*

| Agricultural Exposure by Type for Drought | | | | | |
|---|---|---|---|---|---|
| **Corn** | **Cotton** | **Hay** | **Rice** | **Soybeans** | **Wheat** |
| $26,811,821 | $4,768,306 | $13,901,010 | $6,701,107 | $52,156,041 | $7,111,201 |

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

*Vulnerability*

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

## Flooding

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

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

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

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

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

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

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

- **Backwater flooding** occurs when water slowly rises from a normally unexpected direction where protection has not been provided. A model example is the flooding that occurred in LaPlace during Hurricane Isaac in 2012. Although the town was protected by a levee on the side facing the Mississippi River, floodwaters from Lake Maurepas and Lake Pontchartrain crept into the community on the side of town opposite the Mississippi River.
- **Urban flooding** is similar to flash flooding but is specific to urbanized areas. It takes place when storm water drainage systems cannot keep pace with heavy precipitation, and water accumulates on the surface. Most urban flooding is caused by slow-moving thunderstorms or torrential rainfall.
- **Coastal flooding** can appear similar to any of the other flood types, depending on its cause. It occurs when normally dry coastal land is flooded by seawater but may be caused by direct inundation (when the sea level exceeds the elevation of the land), overtopping of a natural or artificial barrier, or the breaching of a natural or artificial barrier (i.e., when the barrier is broken down by the sea water). Coastal flooding is typically caused by storm surge, tsunamis, or gradual sea level rise.

Historically, in Richland Parish, all types of flooding events have historically been observed except for coastal flooding. For purposes of this assessment, ponding, flash flood, and urban flooding are considered to be flooding as a result of storm water from heavy precipitation thunderstorms

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

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

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

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

Floods are measured mainly by probability of occurrence. A 10-year flood event, for example, is an event of small magnitude (in terms of stream flow or precipitation) but with a relatively high annual probability of recurrence (10%). A 100-year flood event is larger in magnitude, but it has a smaller chance of recurrence (1%). A 500-year flood is significantly larger than both a 100-year event and a 10-year event, but it has a lower probability than both to occur in any given year (0.2%). It is important to understand that an X-year flood event does not mean an event of that magnitude occurs only once in X years. Instead, it means that on average, we can expect a flood event of that magnitude to occur once every X years.

Given that such statistical probability terms are inherently difficult for the general population to understand, the Association of State Floodplain Managers (ASFPM) promotes the use of more tangible expressions of flood probability. As such, the ASFPM also expresses the 100-year flood event as having a 25% chance of occurring over the life of a 30-year mortgage.

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

The 100-year flood event is of particular significance since it is the regulatory standard that determines the obligation (or lack thereof) to purchase flood insurance. Flood insurance premiums are set depending on the flood zone, as modeled by National Flood Insurance Program (NFIP) Rate Maps. The NFIP and FEMA suggest insurance rates based on Special Flood Hazard Areas (SFHAs), as diagrammed in *Figure 2-8*.

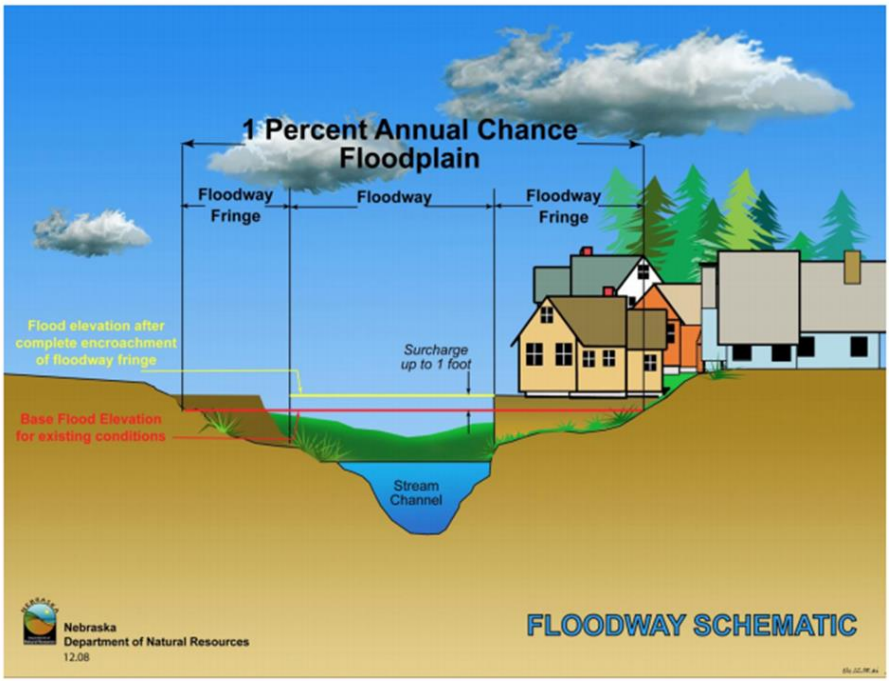


*Figure 2-8: Schematic of 100-year Floodplain. The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe.*
*(Source: Nebraska Department of Natural Resources)*

A SFHA is the land area covered by the floodwaters of the base flood (red line in *Figure 2-8*), where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

### *Property Damage*

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

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

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

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

### *Repetitive Loss Properties*

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

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

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

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

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

*Table 2-16: Repetitive Loss Structures for Richland Parish.*

| Jurisdiction | Number of Structures | Residential | Commercial | Government | Total Claims | Total Claims Paid | Average Claim Paid |
|---|---|---|---|---|---|---|---|
| **Richland Parish (Unincorporated)** | 45 | 44 | 1 | 0 | 122 | $4,251,959 | $34,852 |
| **Delhi** | 4 | 3 | 1 | 0 | 12 | $62,285 | $5,190 |
| **Mangham** | 0 | 0 | 0 | 0 | 0 | $0 | $0 |
| **Rayville** | 40 | 40 | 0 | 0 | 91 | $3,341,292 | $36,717 |
| **Total** | **89** | **87** | **2** | **0** | **225** | **$7,655,536** | **$34,025** |

All 89 repetitive loss structures were geocoded in order to provide an overview of where the repetitive loss structure was located. *Figure 2-9* shows the approximate location of the structure, while *Figure 2-10* shows where the highest concentration of repetitive loss structures is located. Through the repetitive loss map, it is clear the primary concentrated area of repetitive loss structures is focused in and around the incorporated area of Rayville.

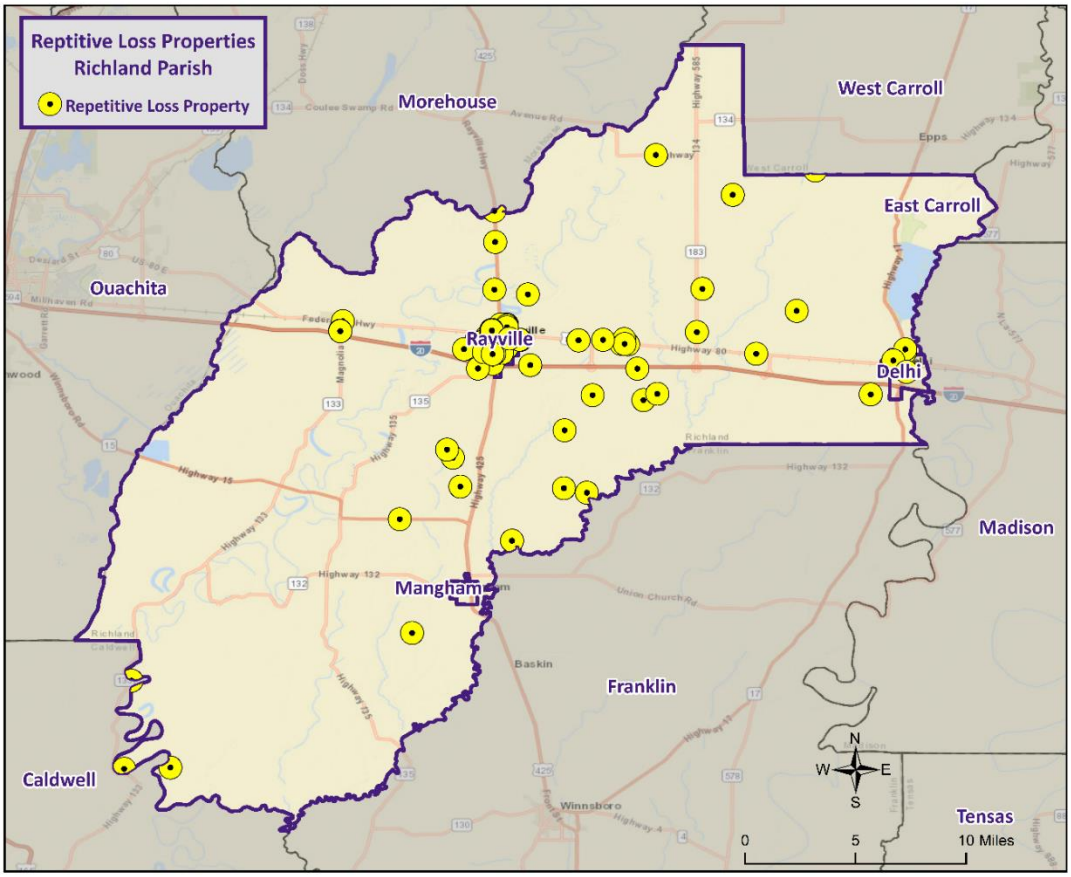


*Figure 2-9: Repetitive Loss Properties in Richland Parish*

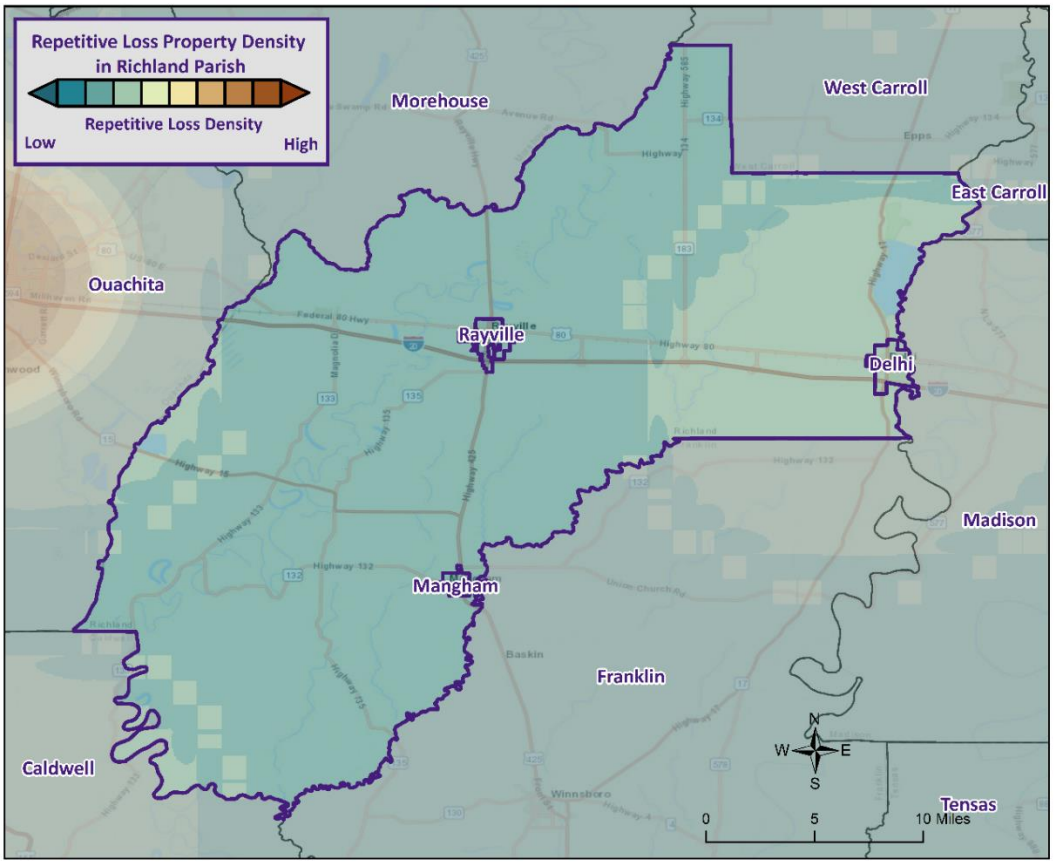


*Figure 2-10: Repetitive Loss Property Densities in Richland Parish.*

### *National Flood Insurance Program*

Flood insurance statistics indicate that Richland Parish has 231 flood insurance policies with the NFIP, with total annual premiums of $188,518. Richland Parish and the jurisdictions of Delhi, Mangham, and Rayville are all participants in the NFIP. Richland Parish and all of its jurisdictions will continue to adopt and enforce floodplain management requirements, including regulating new construction Special Flood Hazard Areas, and will continue to monitor activities including local requests for new map updates. Flood insurance statistics and additional NFIP participation details for Richland Parish and its jurisdictions is provided in the tables to follow.

*Table 2-17: Summary of NFIP Policies for Richland Parish*

| Location | No. of Insured Structures | Total Insurance Coverage Value | Annual Premiums Paid | Insurance Claims Filed Since 1978 | Total Loss Payments |
|---|---|---|---|---|---|
| **Richland Parish** | 87 | $17,809,500 | $59,223 | 48 | $1,443,316 |
| **Delhi** | 7 | $2,182,000 | $2,884 | 7 | $24,815 |
| **Mangham** | 11 | $2,137,900 | $13,037 | 1 | $72,493 |
| **Rayville** | 126 | $18,197,600 | $113,374 | 177 | $4,247,596 |
| **Total** | **231** | **$40,327,000** | **$188,518** | **233** | **$5,788,220** |

*Table 2-18: Summary of Community Flood Maps for Richland Parish.*

| CID | Community Name | Initial FHBM Identified | Initial FIRM Identified | Current Effective Map Date | Date Joined the NFIP | Tribal |
|---|---|---|---|---|---|---|
| 220071# | Richland Parish | 6/28/1977 | 8/1/1987 | 9/18/2013 | 8/1/1987 | No |
| 220072# | Delhi | 3/29/1974 | 1/8/1980 | 9/18/2013 | 1/8/1980 | No |
| 220073# | Mangham | 12/7/1973 | 10/9/1979 | 9/18/2013 | 10/9/1979 | No |
| 220074# | Rayville | 5/10/1974 | 9/3/1980 | 9/18/2013 | 9/3/1980 | No |

According to the Community Rating System (CRS) list of eligible communities dated October 1, 2021, Richland Parish and incorporated areas of Delhi, Mangham, and Rayville 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 waters can also infiltrate sewer lines and inundate wastewater treatment plants, causing sewage to backup and creating a breeding ground for dangerous bacteria. This infiltration may also cause water supplies to become contaminated and undrinkable.

### *Flooding in Richland Parish*

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

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

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

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

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

The digital elevation model (DEM) in the figure below for Richland 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 over 110 feet (NAVD88). The highest elevations in the parish is approximately 125 feet (NAVD88), located in the in the northeast section of the unincorporated area of the parish and in the incorporated area of Delhi. The incorporated areas range in elevation from an average of 75 to 89 feet (NAVD88) with the incorporated area of Delhi having an average elevation of approximately 89 feet (NAVD88), Mangham having an average elevation of 75 feet (NAVD88), and Rayville having an average elevation of 82 feet (NAVD88).

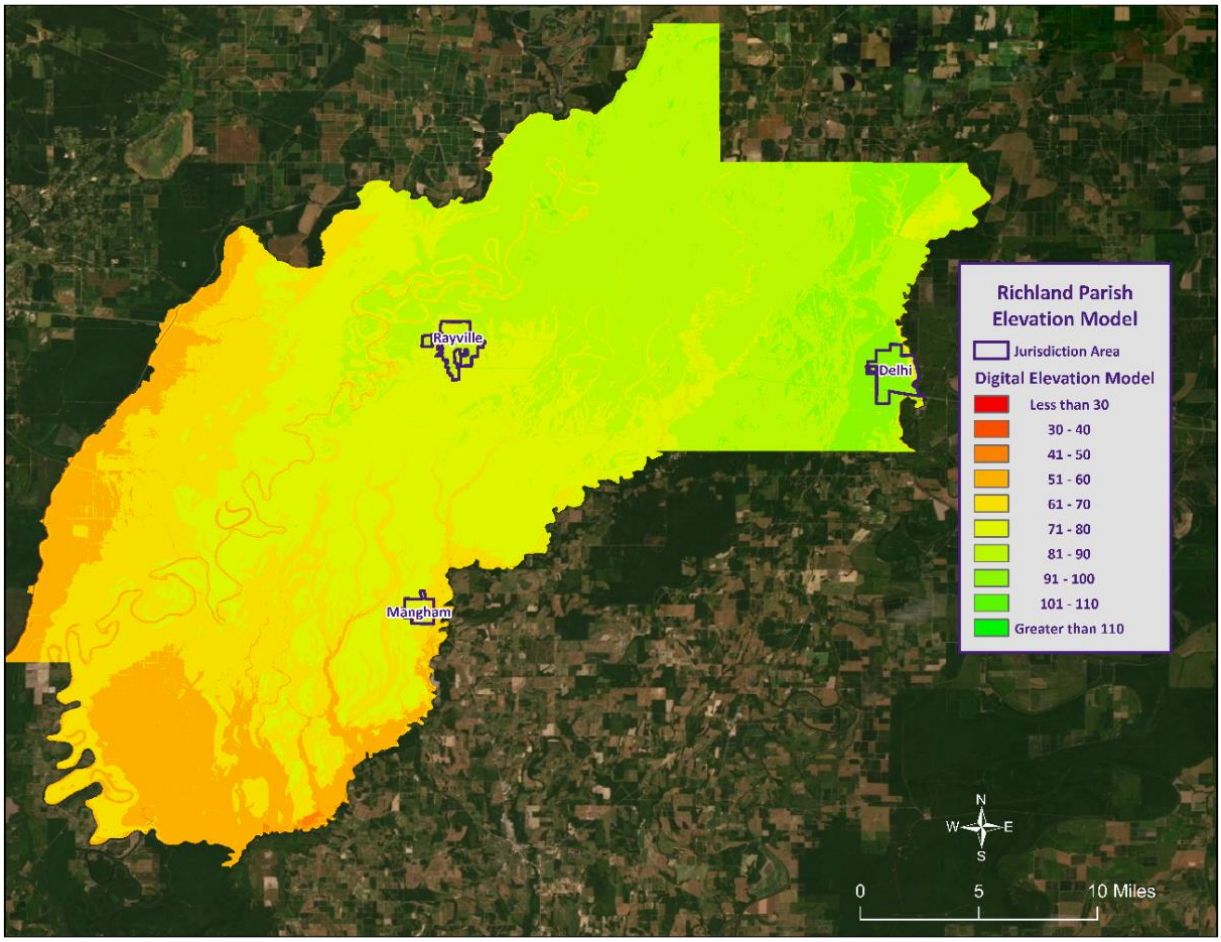


*Figure 2-11: Elevation throughout Richland Parish*

## Location

Richland Parish has experienced significant flooding in its history and can expect more in the future. Many parts of the parish are located in the 100-year floodplain. Frequent flooding of agriculture occurs throughout Richland Parish. Increased agricultural development within the bottomland areas of the parish have caused several problems – higher vulnerability to damage from flood events, increases in peak discharges in local streams caused by increased water runoff, and greater demand on local drainage capacity. Areas with inadequate drainage capacity may be at an increased risk of structural and agricultural flooding.

Based on previous flood events, the worst-case scenarios are based on several different types of flooding events. Storm water excesses and riverine flooding primarily affect the low-lying areas of the parish, and flood depths of up to four feet can be expected in the unincorporated areas of the parish and in the incorporated area of Rayville. The incorporated areas of Delhi and Mangham can expect flood depths from three to five feet.

The following is a flood zone map displaying 100- and 500-year flood zones for Richland Parish:

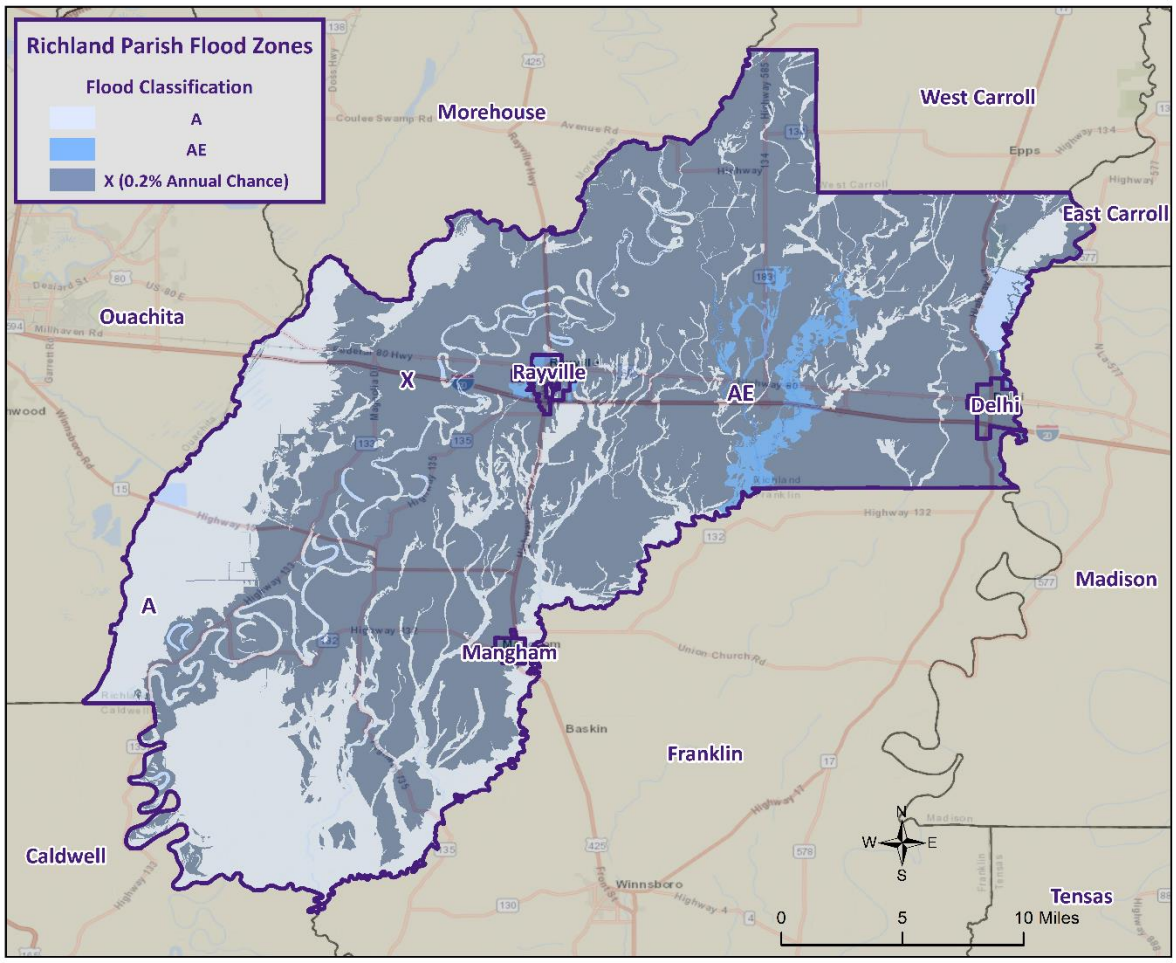


*Figure 2-12: Richland Parish Areas within the Flood Zones.*

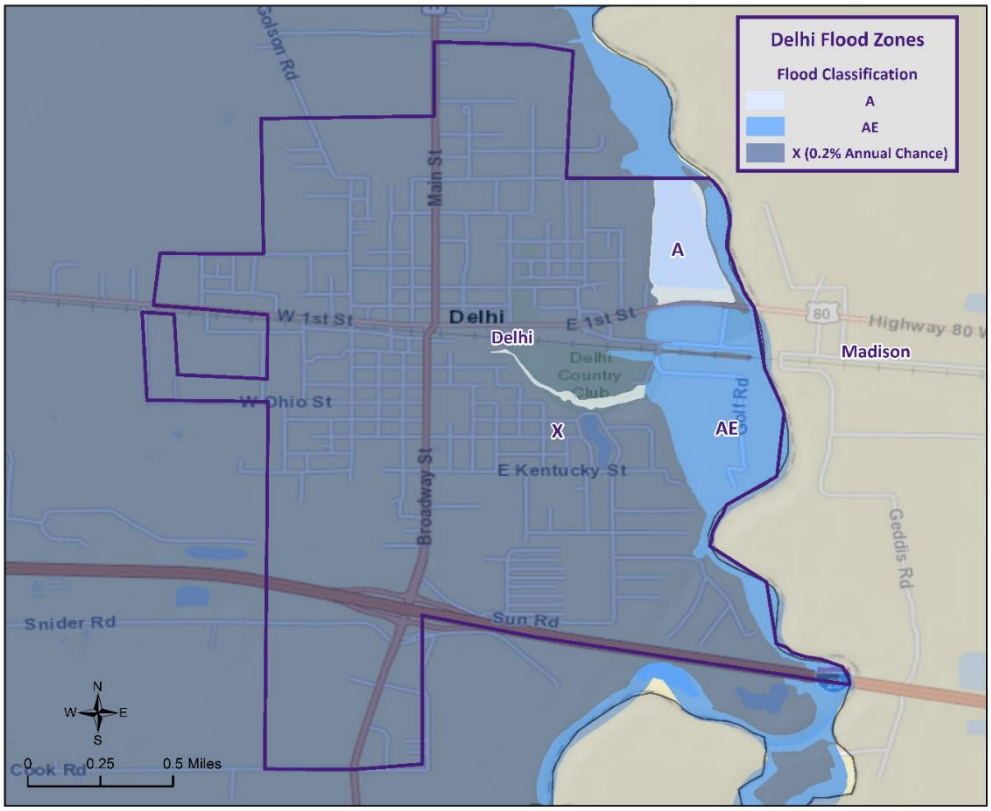


*Figure 2-13: Delhi Areas within the Flood Zones.*

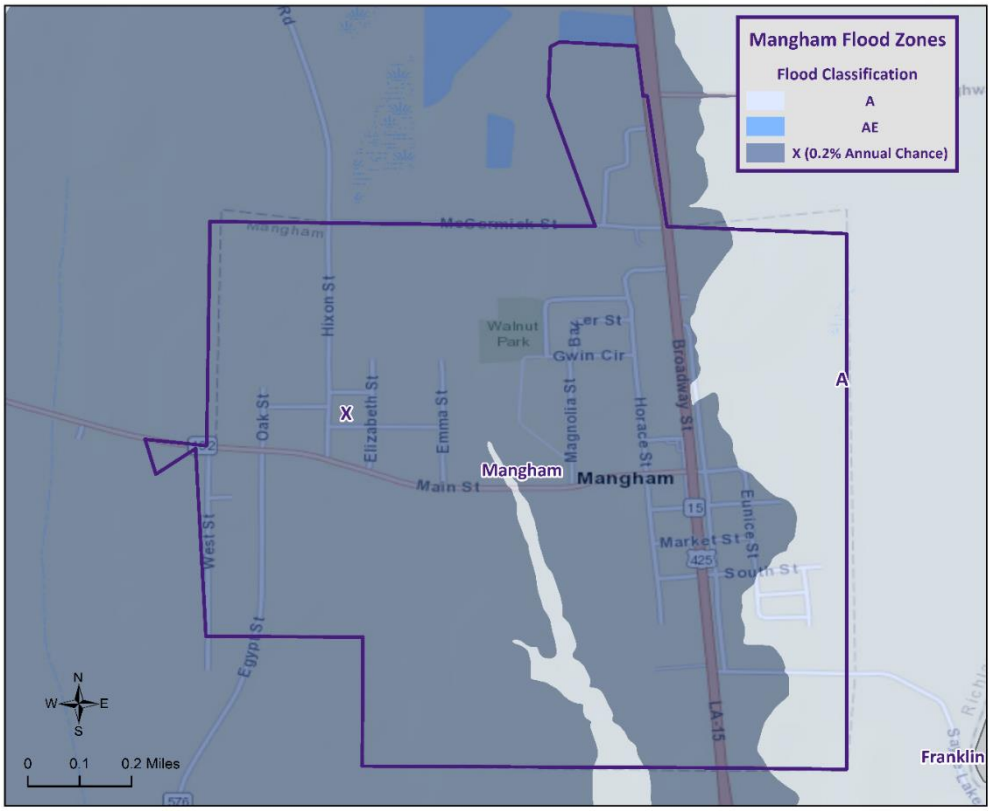


*Figure 2-14: Mangham Areas within the Flood Zones.*

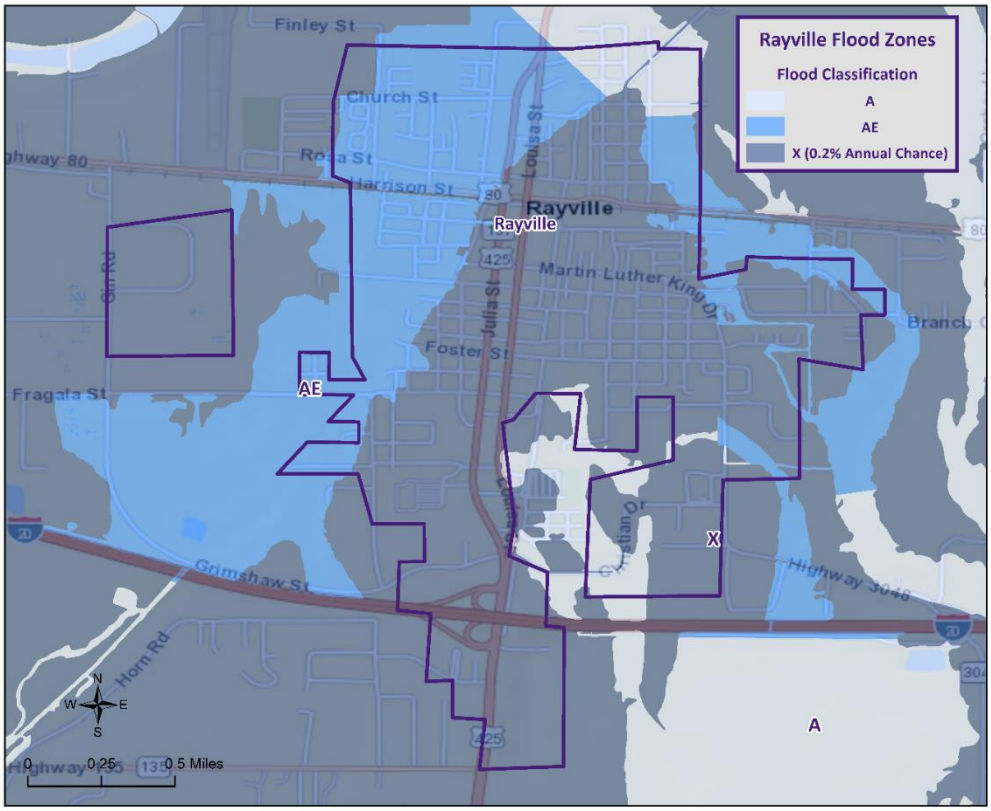


*Figure 2-15: Rayville Areas within the Flood Zones.*

## Previous Occurrences / Extents

Historically, there have been 39 flooding events that have caused significant flooding in Richland Parish and its jurisdictions between 1990 and 2020. Below is a brief synopsis of the flooding events which occurred since the last Richland Parish HMP Update in 2016.

*Table 2-19: Historical Floods in Richland Parish with Locations since the 2016 Richland Parish HMP Update.*

| Date | Extents | Type of Flooding | Estimated Damages | Location |
|---|---|---|---|---|
| **June 23, 2017** | Flooding occurred at Collins Drive and McHand Drive. | Flash Flood | $2,000 | WARDEN |
| **February 22, 2018** | Flooding occurred on several roads in the parish. Some roads that had water on them included: McCain Road, Johnston Road, John Crocker Road, Sugar Hill Road, Walker Road, Augustus Road, McLemore Road, Twiner Road, Collins Road, China Grove Road and Patty Road. | Flash Flood | $75,000 | NEW LIGHT |
| **February 22, 2018** | Flood waters receded but a few roads in the parish remained flooded. | Flood | $12,000 | NEW LIGHT |
| **April 6, 2018** | Several streets were flooded in Delhi. | Flash Flood | $5,000 | DELHI |
| **January 14, 2020** | A few roads were flooded between Epps and Delhi. Rainfall measured at the marina in Poverty Point was 4.7 inches. | Flash Flood | $5,000 | DUNN |

### Frequency / Probability

The NCEI Storm Events Database identified 39 flooding events within the Richland Parish planning area since 1990. The table below shows the probability and return frequency for each jurisdiction.

*Table 2-20: Annual Flood Probabilities for Richland Parish*

| Jurisdiction | Annual Probability | Return Frequency |
|---|---|---|
| **Richland Parish (Unincorporated)** | 40% | 1 event every 2 to 3 years |
| **Delhi** | 23% | 1 event every 4 to 5 years |
| **Mangham** | 17% | 1 event every 6 years |
| **Rayville** | 47% | 1 event every 2 to 3 years |

Based on historical record, the overall flooding probability for the entire Richland Parish Planning area is 100% with 39 events occurring over a 30-year period.

### Estimated Potential Losses

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

*Table 2-21: Estimated Losses in Richland Parish from a 100-year Flood Event.*
*(Source: Hazus)*

| Jurisdiction | Estimated Total Losses from 100-Year Flood Event |
|---|---|
| **Richland Parish (Unincorporated Area)** | $10,490,000 |
| **Delhi** | $306,000 |
| **Mangham** | $24,000 |
| **Rayville** | $4,398,000 |
| **Total** | **$15,218,000** |

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

*Table 2-22: Estimated 100-year Flood Losses for Richland Parish by Sector.*
*(Source: Hazus)*

| Richland Parish (Unincorporated) | Estimated Total Losses from 100-Year Flood Event |
|---|---|
| **Agricultural** | $285,000 |
| **Commercial** | $1,091,000 |
| **Government** | $3,000 |
| **Industrial** | $187,000 |
| **Religious / Non-Profit** | $952,000 |
| **Residential** | $7,926,000 |
| **Schools** | $22,000 |
| **Total** | **$10,466,000** |

*Table 2-23: Estimated 100-year Flood Losses for Delhi by Sector.*
*(Source: Hazus)*

| Delhi | Estimated Total Losses from 100-Year Flood Event |
|---|---|
| Agricultural | $2,000 |
| Commercial | $57,000 |
| Government | $0 |
| Industrial | $0 |
| Religious / Non-Profit | $0 |
| Residential | $247,000 |
| Schools | $0 |
| Total | $306,000 |

*Table 2-24: Estimated 100-year Flood Losses for Mangham by Sector.*
*(Source: Hazus)*

| Mangham | Estimated Total Losses from 100-Year Flood Event |
|---|---|
| Agricultural | $1,000 |
| Commercial | $2,000 |
| Government | $9,000 |
| Industrial | $2,000 |
| Religious / Non-Profit | $1,000 |
| Residential | $8,000 |
| Schools | $1,000 |
| Total | $24,000 |

*Table 2-25: Estimated 100-year Flood Losses for Rayville by Sector.*
*(Source: Hazus)*

| Rayville | Estimated Total Losses from 100-Year Flood Event |
|---|---|
| Agricultural | $80,000 |
| Commercial | $670,000 |
| Government | $14,000 |
| Industrial | $22,000 |
| Religious / Non-Profit | $695,000 |
| Residential | $2,917,000 |
| Schools | $0 |
| Total | $4,398,000 |

### Threat to People

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

*Table 2-26: 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** |
| **Richland Parish (Unincorporated)** | 13,450 | 7,415 | 55.1% |
| **Delhi** | 2,622 | 197 | 7.5% |
| **Mangham** | 624 | 21 | 3.4% |
| **Rayville** | 3,347 | 1,620 | 48.4% |
| **Total** | **20,043** | **9,253** | **46.2%** |

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

*Table 2-27: Vulnerable Populations Susceptible to a 100-year Flood Event in Richland Parish*
*(Source: Hazus)*

| Richland Parish (Unincorporated) | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 7,415 | 55.1% |
| **Persons Under 5 Years** | 460 | 6.2% |
| **Persons Under 18 Years** | 1,720 | 23.2% |
| **Persons 65 Years and Over** | 1,312 | 17.7% |
| **White** | 4,360 | 58.8% |
| **Minority** | 3,055 | 41.2% |

*Table 2-28: Vulnerable Populations Susceptible to a 100-year Flood Event in Delhi.*
*(Source: Hazus)*

| Delhi | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 197 | 7.5% |
| **Persons Under 5 Years** | 7 | 3.6% |
| **Persons Under 18 Years** | 50 | 25.3% |
| **Persons 65 Years and Over** | 34 | 17.1% |
| **White** | 60 | 30.6% |
| **Minority** | 137 | 69.4% |

*Table 2-29: Vulnerable Populations Susceptible to a 100-year Flood Event in Mangham. (Source: Hazus)*

| Mangham | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 21 | 3.4% |
| **Persons Under 5 Years** | 2 | 10.1% |
| **Persons Under 18 Years** | 5 | 24.1% |
| **Persons 65 Years and Over** | 6 | 27.0% |
| **White** | 12 | 56.6% |
| **Minority** | 9 | 43.4% |

*Table 2-30: Vulnerable Populations Susceptible to a 100-year Flood Event in Rayville. (Source: Hazus)*

| Rayville | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 1,620 | 48.4% |
| **Persons Under 5 Years** | 134 | 8.3% |
| **Persons Under 18 Years** | 488 | 30.1% |
| **Persons 65 Years and Over** | 235 | 14.5% |
| **White** | 355 | 21.9% |
| **Minority** | 1,265 | 78.1% |

### Vulnerability

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

## Levee Failure

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

The northern half of Louisiana is protected by levees on the Ouachita River, under the authority of the Vicksburg District of the United States Army Corp of Engineers (USACE). The Vicksburg District encompasses 68,000 $mi^2$ 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,

### *Location*

Per the National Levee Database, sponsored by FEMA and the USACE, there are no levees located within the boundaries of Richland Parish. Therefore, it is concluded there is no risk of levee failure to impact Richland Parish. The hazard has been discounted and will not be carried forward into the risk assessment.

## Thunderstorms

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

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

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

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

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

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

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

- Hail of 1 inch in diameter or larger
- Wind gusts to 58 mph or greater
- One or more tornadoes

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

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

### *Hazard Description*

#### Hailstorms

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

*Table 2-31: 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 2-32: Spectrum of Hailstone Diameters and their Everyday Equivalent.*
*(Source: National Weather Service)*

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

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

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

### High Winds

In general, high winds can occur in a number of different ways, within and without thunderstorms. The Federal Emergency Management Agency (FEMA) distinguishes these as shown in *Table 2-32*.

*Table 2-33: High Winds Categorized by Source, Frequency, and Duration.*
*(Source: Making Critical Facilities Safe from High Wind, FEMA)*

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

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

*Table 2-33* 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 2-34: Beaufort Wind Scale.*
*(Source: NOAA's SPC)*

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

Major damage directly caused by thunderstorm winds is relatively rare, while minor damage is common and pervasive, and most noticeable when it contributes to power outages. These power outages can have major negative impacts such as increased tendency for traffic accidents, loss of revenue for businesses, increased vulnerability to fire, food spoilage, and other losses that might be sustained by a loss of power.

Power outages may pose a health risk for those requiring electric medical equipment and/or air conditioning.

### Lightning

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

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

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

*Table 2-35: Lightning Activity Level (LAL) Grids.*

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

## *Hazard Profile*

### Hailstorms

#### Location

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

#### Previous Occurrences / Extents

Historically, there have been 80 hail incidents in Richland Parish. Hailstorm diameters have ranged from 0.75 inches to 2.75 inches per the National Climatic Data Center since 1990. The most frequently recorded hail sizes have been 1-inch in diameter. There have been four significant hailstorm events in Richland Parish since the 2016 Richland Parish HMP update. Below is a brief synopsis of those events.

*Table 2-36: Previous Occurrences for Hailstorm Events since the 2016 Hazard Mitigation Plan Update. (Source: NCEI Storm Events Database)*

| Date | Hail Size (inches) | Property Damage | Crop Damage |
|---|---|---|---|
| April 2, 2017 | 1.75 | $15,000 | $0 |
| April 6, 2018 | 1.75 | $3,000 | $0 |
| April 6, 2018 | 1.75 | $5,000 | $0 |
| May 26, 2018 | 1 | $0 | $0 |
| June 22, 2018 | 1 | $1,000 | $5,000 |
| April 4, 2019 | 1.25 | $3,000 | $0 |
| April 7, 2019 | 1.5 | $5,000 | $0 |
| November 30, 2019 | 1 | $0 | $0 |
| March 28, 2020 | 1 | $0 | $0 |

## Frequency

Hailstorms occur frequently within Richland Parish with an annual chance of occurrence calculated at 100% based on the records for the past 30 years (1990 – 2020). *Figure 2-16* displays the density of hailstorm events in Richland Parish, while *Figure 2-17* provides an overview of hailstorm size based on location.

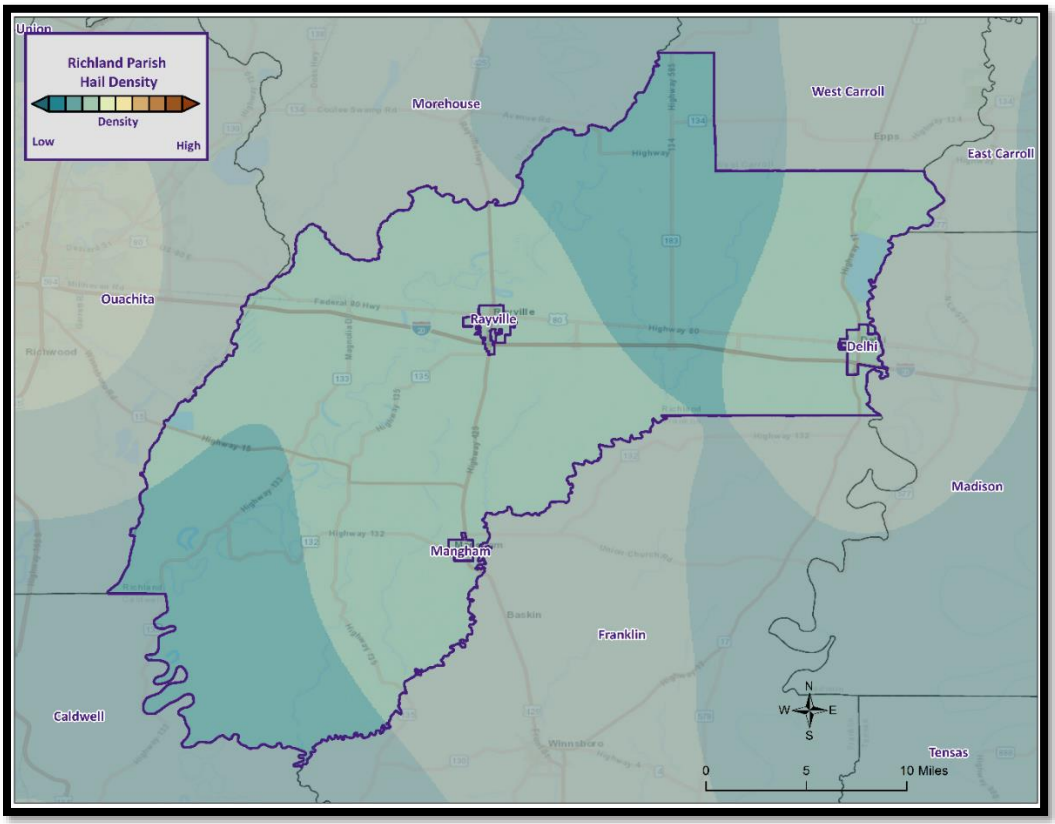


*Figure 2-16: Density of Hailstorms by Diameter from 1950-2020.*

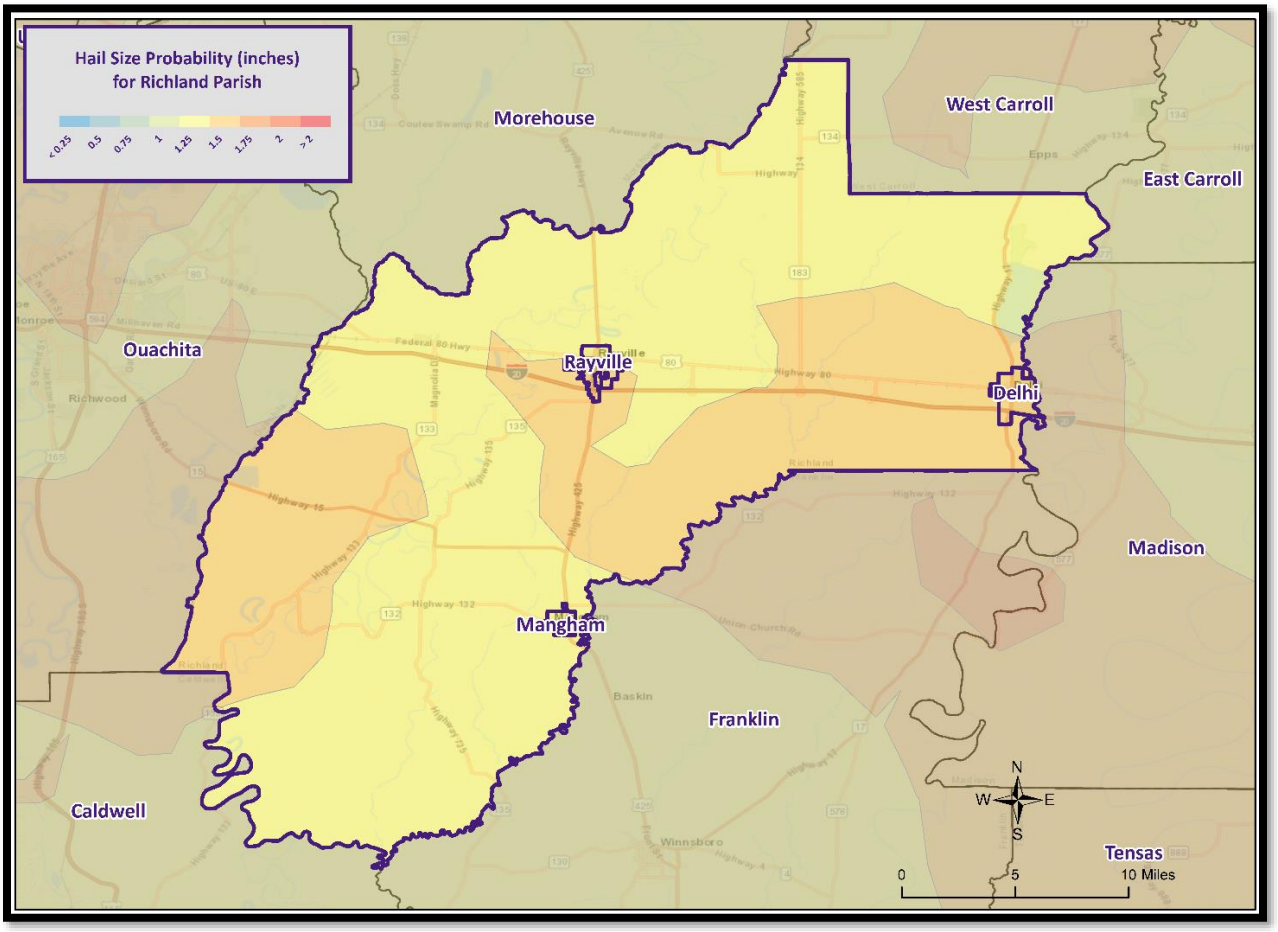


*Figure 2-17: Hail Size Probability in Inches for Richland Parish.*

## Estimated Potential Losses

Since 1990, there have been 80 significant hail events that have resulted in property damages according to NCEI Storm Events Database. The total property damages associated with those storms have totaled approximately $670,000. To estimate the potential losses of a hailstorm event on an annual basis, the total damages recorded for hail events was divided by the total number of years of available hail data in the NCEI Storm Events Database (1990 – 2020). This provides an annual estimated potential loss of $22,333 and $8,375 per event. The following table provides an estimate of potential property losses for Richland Parish:

*Table 2-37: Estimated Annual Losses for Richland Parish Resulting from Hailstorms.*

| Estimated Potential Annual Losses from Hailstorms | | | |
|---|---|---|---|
| **Unincorporated Area** | **Delhi** | **Mangham** | **Rayville** |
| $14,987 | $2,922 | $695 | $3,729 |

There have been no reported injuries or fatalities as a result of a hail events over the 30-year record.

## Vulnerability

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

### High Winds

#### Location

Because high winds are a meteorological phenomenon that can occur anywhere, the entire planning area for Richland Parish is equally at risk from high winds. The worst-case scenario for thunderstorm high wind is wind speeds of approximately 100 mph.

#### Previous Occurrences / Extents

Historically, there have been 142 thunderstorm high wind events in Richland Parish. The high wind events ranged in windspeeds between 50 mph and 96 mph per the National Climatic Data Center since 1990. There have been 22 high wind speed events which impacted the Richland Parish Planning area since the 2016 Richland Parish HMP update. Below is a brief synopsis of those events.

*Table 2-38: Previous Occurrences for Thunderstorm High Wind Events since the 2016 Hazard Mitigation Plan Update.*
*(Source: NCEI Storm Events Database)*

| Date | Wind Speed (mph) | Property Damage | Crop Damage |
|---|---|---|---|
| March 29, 2017 | 58 | $0 | $0 |
| April 26, 2017 | 64 | $0 | $0 |
| April 3, 2018 | 58 | $0 | $0 |
| April 3, 2018 | 90 | $0 | $0 |
| April 3, 2018 | 58 | $0 | $0 |
| April 3, 2018 | 58 | $0 | $0 |
| April 6, 2018 | 58 | $0 | $0 |
| April 6, 2018 | 58 | $0 | $0 |
| April 13, 2018 | 58 | $0 | $0 |
| April 7, 2019 | 58 | $0 | $0 |
| April 13, 2019 | 58 | $0 | $0 |
| May 8, 2019 | 69 | $0 | $0 |
| May 8, 2019 | 63 | $0 | $0 |
| May 19, 2019 | 63 | $0 | $0 |
| September 9, 2019 | 69 | $0 | $0 |
| September 9, 2019 | 96 | $0 | $0 |
| January 11, 2020 | 58 | $0 | $0 |
| March 28, 2020 | 58 | $0 | $0 |
| April 12, 2020 | 58 | $0 | $0 |
| April 12, 2020 | 58 | $0 | $0 |

#### Frequency

High winds are a fairly common occurrence within Richland Parish and its jurisdictions with an annual chance of occurrence calculated at 100% based on the records for the past 30 years (1990 – 2020). *Figure 2-17* displays the thunderstorm wind speed probability for Richland Parish and its jurisdictions.

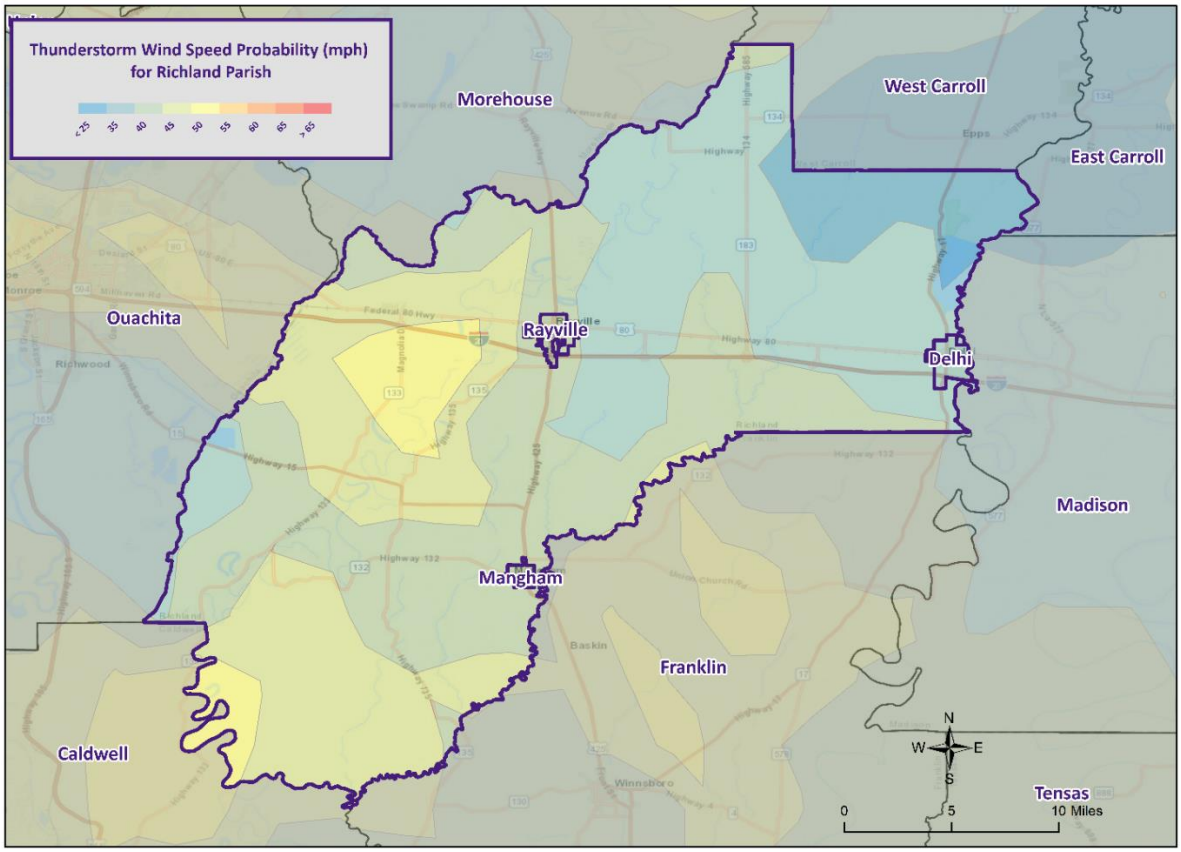


*Figure 2-18: Thunderstorm High Wind Speed Probability in Miles Per Hour for Richland Parish.*

### Estimated Potential Losses

Since 1990, there have been 142 significant wind events that have resulted in property damages according to NCEI Storm Events Database. The total property damage associated with these storms totaled approximately $2,781,000. To estimate the potential losses of a wind event on an annual basis, the total damages recorded for wind events were divided by the total number of years of available wind data in the NCEI Storm Events Database (1990 – 2020). This provides an annual estimated potential loss of $92,700 and $19,585 per event. The following table provides an estimate of potential property losses for Richland Parish:

*Table 2-39:* Estimated Annual Property Losses for Richland Parish Area resulting from Wind Damage.

| Estimated Potential Annual Losses from High Winds | | | |
|---|---|---|---|
| **Unincorporated Area** | **Delhi** | **Mangham** | **Rayville** |
| $62,207 | $12,127 | $2,886 | $15,480 |

There have been no injuries or fatalities as a result of a thunderstorm high wind event over the 30-year record.

### Vulnerability

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

## Lightning

### Location

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

### Previous Occurrences / Extent

Historically, there have been two lightning events in Richland Parish and its jurisdictions between the years 1990 and 2020. Since the last HMP update, there has been one significant lighting event within the boundaries of Richland Parish. Below is a brief synopsis of this event.

*Table 2-40: Previous Occurrences for Lightning Events since the 2016 Hazard Mitigation Plan Update. (Source: NCEI Storm Events Database)*

| Location | Date | Property Damage | Crop Damage |
|---|---|---|---|
| June 20, 2019 | RAYVILLE | $50,000 | $0 |

### Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in Richland Parish is high. However, lightning that meets the definition that is used by the NCEI Storm Events Database that results in damages to property and injury or death to people is a less likely event. Richland Parish experienced two significant lightning events between the years 1990 and 2020 resulting in a 7% annual chance of occurrence.

### Estimated Potential Losses

Since 1990, there have been two significant lightning event that has resulted in property damages according to NCEI Storm Events Database. The total property damages associated with this storm has totaled approximately $150,000. To estimate the potential losses of a lightning event on an annual basis, the total damages recorded for lightning events was divided by the total number of years of available lightning data in the NCEI Storm Events Database (1990 – 2020). This provides an annual estimated potential loss of $5,000 and $75,000 per event. The following table provide an estimate of potential property losses for Richland Parish:

*Table 2-41:* Estimated Annual Property Losses for Richland Parish resulting from Lightning Damage.

| Estimated Potential Annual Losses from Lightning | | | |
|---|---|---|---|
| **Unincorporated Area** | **Delhi** | **Mangham** | **Rayville** |
| $55,549 | $6,817 | $6,259 | $1,427 |

Per the NCEI Storm Events Database, there have been no fatalities and two injuries as a result of lightning in Richland Parish

### Vulnerability

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

## Tornadoes

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

Since February 1, 2007, the Enhanced Fujita (EF) Scale has been used to classify tornado intensity. The EF Scale classifies tornadoes based on their damage pattern rather than wind speed; wind speed is then derived and estimated. This contrasts with the Saffir-Simpson scale used for hurricane classification, which is based on measured wind speed. *Table 2-41* shows the EF scale in comparison with the old Fujita (F) Scale, which was used prior to February 1, 2007. When discussing past tornadoes, the scale used at the time of the hazard is used. Damage and adjustment between scales can be made using the following tables.

*Table 2-42: 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 2-43: Fujita and Enhanced Fujita Tornado Damage Scales.*

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

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

- ***Tornado Watch***: Issued to alert people to the possibility of a tornado developing in the area. A tornado has not been spotted but the conditions are favorable for tornadoes to occur.

- ***Tornado Warning***: Issued when a tornado has been spotted or when Doppler radar identifies a distinctive "hook-shaped" area within a thunderstorm line.

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

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

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

### *Location*

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

### *Previous Occurrences / Extent*

The NCEI Storm Events Database reports a total of 19 tornadoes or waterspouts occurring within the boundaries of Richland Parish since 1990 ranging in extent from F0 to F1 under the Fujita Scale and EF0 to EF1 on the Enhanced Fujita Scale. Richland Parish can expect future tornadoes up to an EF1 under the Enhanced Fujita Scale as a worst-case scenario.

The most destructive tornado to impact Richland Parish was an EF1 tornado which occurred on April 2, 2017. The tornado was responsible for over $200,000 in damage. The tornado touched down along Newlight Road where it snapped a few large branches. The tornado continued north where it destroyed a mobile home and took shingles off another. Since the 2016 HMP Update, seven tornadoes have occurred within the boundaries of Richland Parish. Below is a list and brief description of the impact for the event.

*Table 2-44: Tornadoes Within the Richland Parish since the 2016 Update.*

| Date | Impacts | Property Damage | Location | Magnitude |
|---|---|---|---|---|
| April 2, 2017 | 4.24 mile path with a width of 1,232 yards. This tornado touched down just to the west in Caldwell Parish before crossing into western Franklin Parish. A tornadic debris signature (TDS) was noted from the KULM radar. The tornado was quite wide at this point, nearly 1200 yards or three-quarters of a mile. It crossed Highway 4, snapping numerous trees in the path and tearing tin off the roof of a home. The tornado continued north-northeast back into Caldwell Parish. Wooded area prevented further access to this region but damage was seen through the distance. The TDS was still noted from the KULM radar through this area. The tornado continued north-northeast, moving back into Richland Parish, crossing LR Hatton Road, before crossing into a wooded area and the Franklin-Richland Parish line. The tornado continued north-northeast over Maple Ridge Road, Sligo Road and Goldmine Road. Numerous large trees were snapped and uprooted all through this area. The tornado then crossed LA Highway 135, where a couple of trees were snapped, before lifting shortly after crossing the road. Maximum winds were 110 mph. | $15,000 | NEW LIGHT | EF1 |
| April 2, 2017 | 3.69 mile path with a width of 300 yards. This tornado touched down along Parish Road 576 close to the intersection of Parish Road 135. Several trees were uprooted and snapped. At the intersection, a metal building was damaged and a cyclone fence was taken out. The tornado continued along Parish Road 576 and downed and snapped numerous trees. The tornado crossed Little Creek and then Parish Road 622 where it began to weaken. It then crossed Bill Taylor Road where a couple more trees were damaged and some minor roof damage occurred to a home and shed. The tornado dissipated at Middle Road where some limbs were broken. Max winds were estimated around 105 mph. | $75,000 | NEW LIGHT | EF1 |
| April 2, 2017 | 3.78 mile path with a width of 880 yards. This tornado started off of Newlight Road in Richland Parish where it snapped a few large branches. The tornado continued north along Newlight Road where it continued to snap trees along the way. | $220,000 | NEW LIGHT | EF1 |

| Date | Impacts | Property Damage | Location | Magnitude |
|---|---|---|---|---|
| | The tornado turned northeast towards Highway 425 where it snapped a power pole along with a few more trees. The tornado continued northeast across Sayre Lake Road snapping trees. This tornado continued northeast into Franklin Parish where it crossed Punchard Road and destroyed a mobile home and also snapped more trees. The tornado continued across the intersection of Punchard Road and LA Highway 132 where it took the shingles off of a mobile home. The tornado ended just north of LA Highway 132, snapping a couple of more trees. | | | |
| March 28, 2018 | 1.74 mile path with a width of 400 yards. This tornado crossed the Boeuf River into Richland Parish from Caldwell Parish along Highway 561 at Hebert. Tin from a shed in Caldwell Parish was blown across the river onto the eastern bank. Along Highway 561, multiple trees were snapped or uprooted, and a mobile home sustained damage to its deck and skirting. The tornado continued along the south end of Woolen Lake, downing additional trees and large tree limbs, some of which damaged sheds, houses and campers. A fence was also blown down in this area. The tornado lifted shortly thereafter. The maximum estimated winds were 95mph. | $100,000 | BUCKNER | EF1 |
| March 28, 2018 | 4.05 mile path with a width of 650 yards. This tornado began around the intersection of Bill Taylor Road and Augustus Road. The tornado was videoed as it continued east northeast across a field north of Bill Taylor Road, where it overturned an irrigation pivot. The tornado then crossed Middle Road, flipping a mobile home on its side and atop a vehicle. Four occupants of the mobile home sustained minor injuries. Numerous trees were snapped at this location as well. The tornado reached its widest point as it continued eastward across Newlight Road, causing minor damage to two mobile homes and a shed, and damaging the roof of another house. The tornado then crossed Big Creek into Franklin Parish, and ended as it crossed US Highway 425 just north of Baskin. Here, trees were damaged and a home sustained minor damage. The maximum estimated wind speed of the entire path was 105mph. | $200,000 | NEW LIGHT | EF1 |

| Date | Impacts | Property Damage | Location | Magnitude |
|---|---|---|---|---|
| April 6, 2018 | 7.85 mile path with a width of 50 yards. This weak tornado began just east of Bayou Lafourche before crossing Highway 133, where numerous large tree limbs were broken. The tornado then crossed Highway 132 and traveled through mainly rural areas of open agricultural fields and stands of trees where the tornado reached peak intensity of 75mph, snapping a few small pine trees. The tornado crossed Highway 135 just south of Alto, downing a few more large tree limbs before dissipating over a wooded area. | $15,000 | BUCKNER | EF0 |
| April 13, 2018 | 3.19 mile path with a width of 400 yards. This weak tornado began along Venable Road near Old River Road and caused mostly minor tree damage. It continued northeast crossing I-20 at the Boeuf River, snapping several large tree branches at the Boeuf River Country Club. The tornado lifted as it crossed US 80 just west of Rayville, again snapping several large tree branches along Lewis Road and Insurance Road. Maximum estimated wind speed was 75 mph. | $25,000 | GIRARD | EF0 |
| May 8, 2019 | 8.89 mile path with a width of 200 yards. A weak tornado touched down in a wooded area off Horace Moore Road and tracked northeast through the town of Start, generally along the bayou, and then dissipated a few miles northeast of Start. Before reaching Start, this tornado moved through open fields but did down some trees on the field edges. After the tornado crossed I-20, more concentrated trees were snapped and uprooted along Overland Stage Road and by the railroad track. Here, a metal shed was destroyed. Additional snapped and a few uprooted trees were noted along Highway 80 and Trister Road, Crewlake Loop, Graves Trail, and Trister Lane. There were also three homes with shingle damage and two metal carports that were thrown. From here, the tornado continued northeast, generally along the bayou and downed several more trees. A more focused area of trees were damaged along Conley Road. Damage became more limited from here, but some tree damage was noted along field edges west of Highway 133. The maximum estimated winds were 86 mph. | $180,000 | CREW LAKE | EF1 |

| Date | Impacts | Property Damage | Location | Magnitude |
|---|---|---|---|---|
| May 8, 2019 | 7.88 mile path with a width of 300 yards. This tornado touched down along Scales Road, crossed Adcock Road and the Boeuf River and then moved northeast generally along the Boeuf River before it dissipated. The tornado mainly caused damage to trees where many were snapped and uprooted. The tornado peaked in intensity as it moved across private farm land at the back end of Trio Road. The land owner provided access and here numerous trees were snapped and uprooted. More solid tree damage was noted at the back end of Freeland Road and then again as the tornado crossed Highway 134. The tornado weakened and the last damage was some large limbs broken right at the river with no visible damage on the other side. Maximum estimated winds were 97 mph. | $50,000 | JONESBURG | EF1 |
| May 19, 2019 | 18.67 mile path with a width of 700 yards. This tornado touched down southwest of Mangham near Walter Nobles Road and MS Highway 576 and tracked northeast into the town of Mangham. A large oak tree was blown down near Mangham United Methodist Church, and many trees along US Highway 425 on the north side of town were snapped, uprooted, or had large limbs downed. The tornado turned northeast from there and tracked near Big Creek along the remainder of its path. It continued to produce sporadic tree damage including several snapped or uprooted trees and downed tree branches. Along Crawford Road, a few large trees were snapped and minor damage occurred to several outbuildings. The tornado reached its widest along Little Road south of the Dunn community. The tornado began to narrow as it crossed Interstate 20 at Dunn, snapping mostly the tops of a few trees before dissipating along Weems Road. Maximum wind speed was 95 mph. | $100,000 | NEW LIGHT | EF1 |
| April 12, 2020 | 1.91 mile path with a width of 150 yards. This tornado began in northern Richland Parish along Goose Hollow Rd. It traveled northeastward crossing Lingefelt Rd and then Mitchiner Rd, where it crossed into southwestern West Carroll Parish. The tornado then crossed Guice Rd, then lifted along LA Highway 134 just east of the | $9,000 | CUTHBERT | EF1 |

| Date | Impacts | Property Damage | Location | Magnitude |
|---|---|---|---|---|
| | damage path of another tornado that was occurring simultaneously in the same area. Along the path, multiple trees were uprooted and an irrigation pivot was flipped. The total path length was 4.65 miles. The maximum estimated winds in Richland Parish were 100mph and the overall tornado was rated an EF1. | | | |
| April 12, 2020 | 1.28 mile path with a width of 50 yards. This tornado began in far northern Richland Parish east of the intersection of LA Highways 134 and 183. It crossed into southwestern West Carroll Parish, crossing Fusilier Rd, Gwin Rd, LA Highway 134, Duckworth Rd, and Sharplin Rd before crossing and ending just northeast of Waller Rd. Along the path, several trees were uprooted and multiple irrigation pivots were flipped. The total path length was 6.18 miles. The maximum winds estimated in Richland Parish was 70mph and rated an EF0, while the maximum rating and winds of EF1 and 105 mph occurred in West Carroll Parish. | $1,000 | CUTHBERT | EF0 |
| April 12, 2020 | 1.01 mile path with a width of 500 yards. This tornado began in far southeastern Morehouse Parish near the intersection of Trails End Rd and Bingham Ranch Rd, crossing the Boeuf River into far northern Richland Parish, where it crossed LA Highway 585. It then crossed Wiles Rd into western West Carroll Parish again crossing LA Highway 585, Henry Jones Rd, and then LA Highway 585 for a third time. The tornado crossed Smith Rd, Clay Rd, and Clear Lake Rd before ending along Copes Rd. Along the path, a few homes sustained minor roof damage, a couple mobile homes received minor damage, a motor home was overturned, a couple sheds were damaged, and several trees were snapped or uprooted. The tornado was strongest as it crossed LA Highway 585 near the intersection of Self Rd where five utility poles were snapped, several trees were snapped or uprooted, and a home was damaged by a fallen tree. The maximum estimated winds were 88mph in Richland Parish. | $3,000 | BOEUFF RIVER | EF1 |

*Frequency / Probability*

Tornadoes occur frequently within Richland Parish and its jurisdictions with an annual chance of occurrence calculated at 63% based on the records for the past 30 years (1990 – 2020). *Figure 2-19* displays the density of tornado touchdowns in Richland Parish and neighboring parishes.

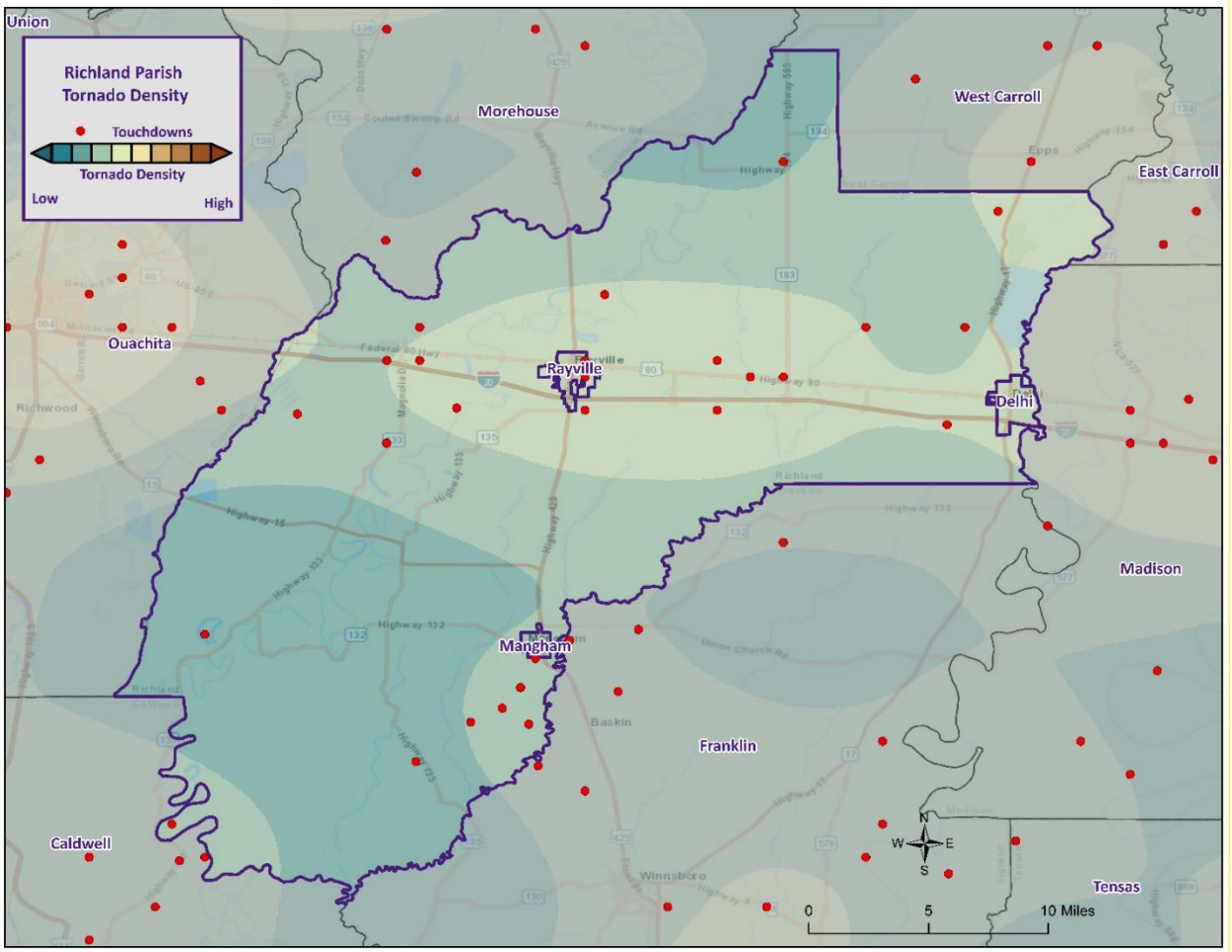


*Figure 2-19: Location and Density of Tornadoes to Touchdown in Richland Parish. (Source: NOAA/SPC Severe Weather Database)*

*Estimated Potential Loses*

According to the NCEI Storm Events Database, there have been 19 tornadoes that have caused some level of property damage. The total damage from the actual claims for property is approximately $1,003,000 with an average cost of $52,789 per tornado event. When annualizing the total cost over the 30-year record, total annual loses based on tornadoes are estimated to be $33,433. The following tables provide an annual estimate of potential losses for Richland Parish.

*Table 2-45 Estimated Annual Losses for Tornadoes Within Richland Parish.*

| Estimated Potential Annual Losses from Tornadoes | | | |
|---|---|---|---|
| **Unincorporated Area** | **Delhi** | **Mangham** | **Rayville** |
| $22,436 | $4,374 | $1,041 | $5,583 |

Below, *Table 2-45* presents an analysis of building exposure that are susceptible to tornadoes by general occupancy type along with the percentage of building stock that are mobile homes.

*Table 2-46: Building Exposure by General Occupancy Type for Tornadoes in Richland Parish. (Source: Hazus)*

| Building Exposure by General Occupancy Type for Tornadoes ($1,000) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Residential** | **Commercial** | **Industrial** | **Agricultural** | **Religion** | **Government** | **Education** | **Mobile Homes (%)** |
| 2,116,303 | 377,652 | 112,434 | 42,630 | 125,500 | 36,501 | 31,456 | 20.1% |

The Parish has suffered through a total of 19 events in which tornadoes or waterspouts have accounted for five injuries and no fatalities during this 30-year period.

In accessing the overall risk to population, the most vulnerable population throughout the parish are those residing in manufacturing housing. Approximately 20.1% of all housing in Richland Parish consists of manufactured housing. The location and density of manufactured houses can be seen in *Figure 2-20.*

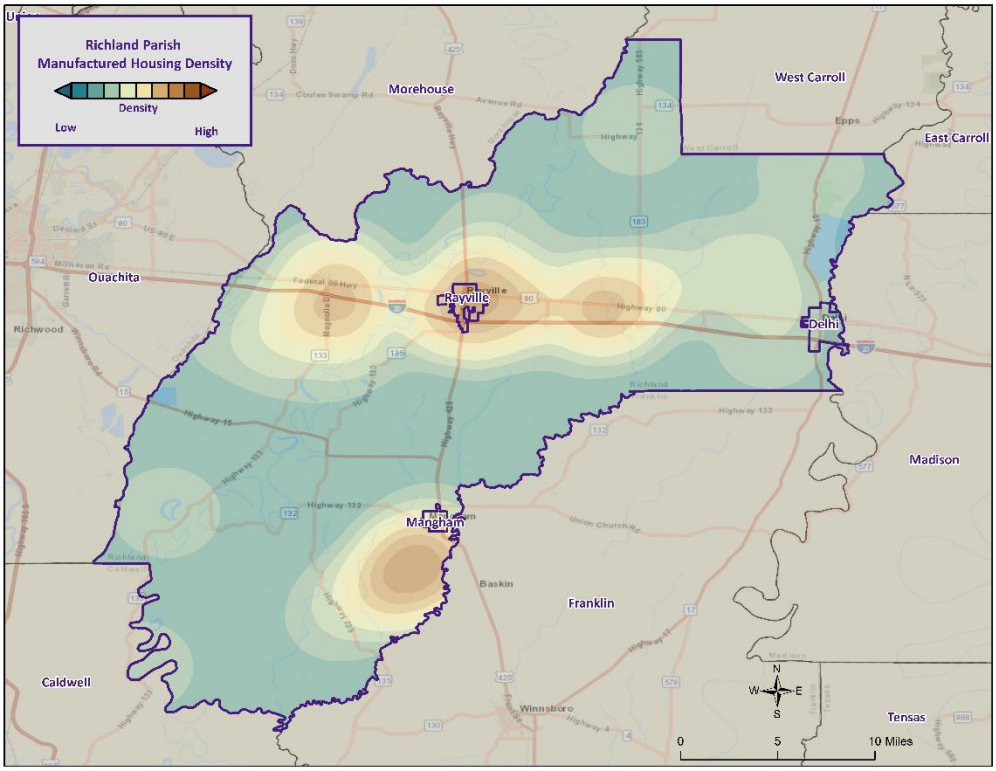


*Figure 2-20: Density of Manufactured Housing throughout the Richland Parish Planning Area.*

*Vulnerability*

See *Appendix C* for parish and municipality building exposure to tornadoes.

## Tropical Cyclones

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

*Table 2-47: Saffir-Simpson Hurricane Wind Scale.*

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

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

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

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

### *Location*

Hurricanes are the single biggest threat to 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 Richland Parish planning area. The worst-case scenario for a tropical cyclone event in Richland Parish is a Category 1 Hurricane.

### *Previous Occurrences / Extents*

Richland Parish has experienced seven major tropical cyclone events since 2002. The following table provides a list of tropical cyclones which have impacted Richland Parish since 2002.

*Table 2-48: Historical Tropical Cyclone Events in the Richland Parish Planning Area from 2002 – 2020.*

| Date | Name | Storm Type at Time of Impact |
|---|---|---|
| 2005 | Katrina | Hurricane |
| 2005 | Rita | Hurricane |
| 2007 | Humberto | Tropical Depression |
| 2008 | Gustav | Tropical Storm |
| 2012 | Isaac | Tropical Storm |
| 2020 | Laura | Tropical storm |
| 2020 | Delta | Tropical Storm |

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

### Tropical Storm Laura (2020)

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

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

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

With little change in strength, Laura made landfall at Cameron, Louisiana around 1 AM CDT August 27th, with sustained winds of 150 mph (130 knots) and a minimum central pressure of 938 millibars (27.70 inches of mercury). Laura was the strongest hurricane to strike Southwest Louisiana since records began in 1851. Laura slowly weakened after landfall but maintained major hurricane status throughout its passage across Cameron, Calcasieu, and southern Beauregard Parishes, and category 2 status across northern Beauregard and Richland 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 Richland Parishes where the core of the hurricane passed.

The National Weather Service in Lake Charles, Louisiana recorded a station record highest peak wind gust of 116 knots (133 mph) at 1:42 AM CDT before the Automated Surface Observing System (ASOS) wind equipment failed. However, the ASOS barometer sensor that was safely within the NWS building (which received very little damage) recorded a station record minimum sea level pressure of 956 millibars (28.23 inches of mercury) at 2:20 AM CDT when the eye of Hurricane Laura passed nearly overhead.

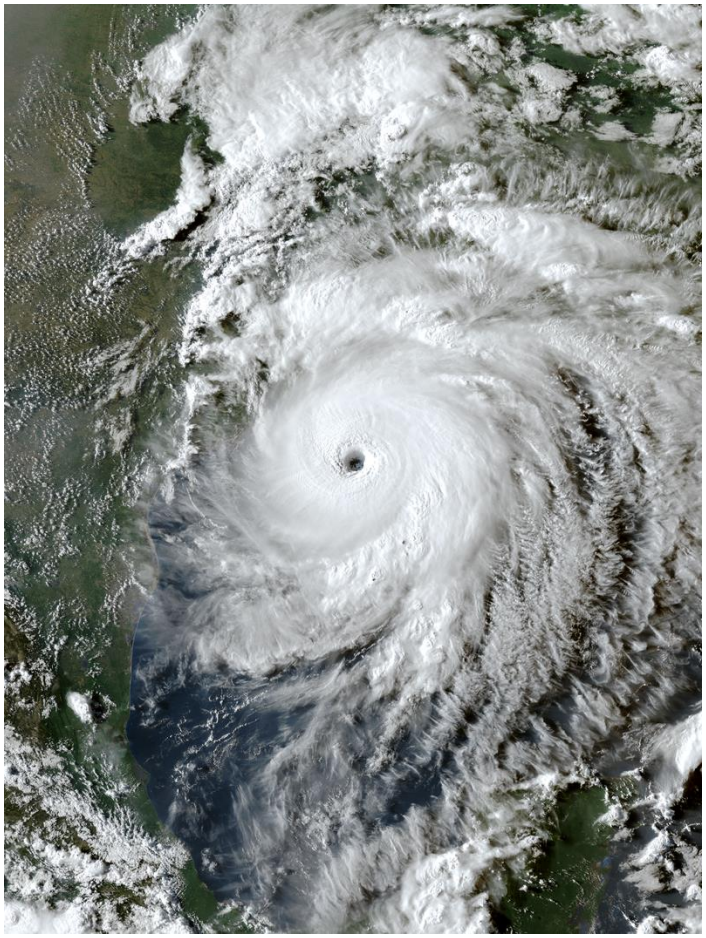

*Figure 2-21: Hurricane Laura in the Gulf Coast Area. (Source: NOAA)*

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

In Richland Parish, numerous trees, powerlines, and poles were downed. A few tress fell onto homes throughout the parish.

### Tropical Storm Delta (2020)

Hurricane Delta was the record-tying fourth named storm of 2020 to strike Louisiana, as well as the record-breaking tenth named storm to strike the United States in that year. The twenty-sixty tropical cyclone, twenty-fifth named storm, ninth hurricane, and third major hurricane of the record breaking 2020 Atlantic hurricane season, Delta formed from a tropical wave which was first monitored by the National Hurricane Center on October 1. As it tracked across the western Caribbean, it rapidly intensified into a Category 4 hurricane. In fact, intensifying from tropical depression to Category strength in 40 hours is the fastest rate of intensification of any storm on record in the Atlantic Basin and accomplished by Delta. Delta quickly weakened to a category 1 hurricane after making its first landfall on the Yucatan Peninsula. It gradually recurved north towards the Louisiana coastline, fluctuating in intensity between category 2 and 3.

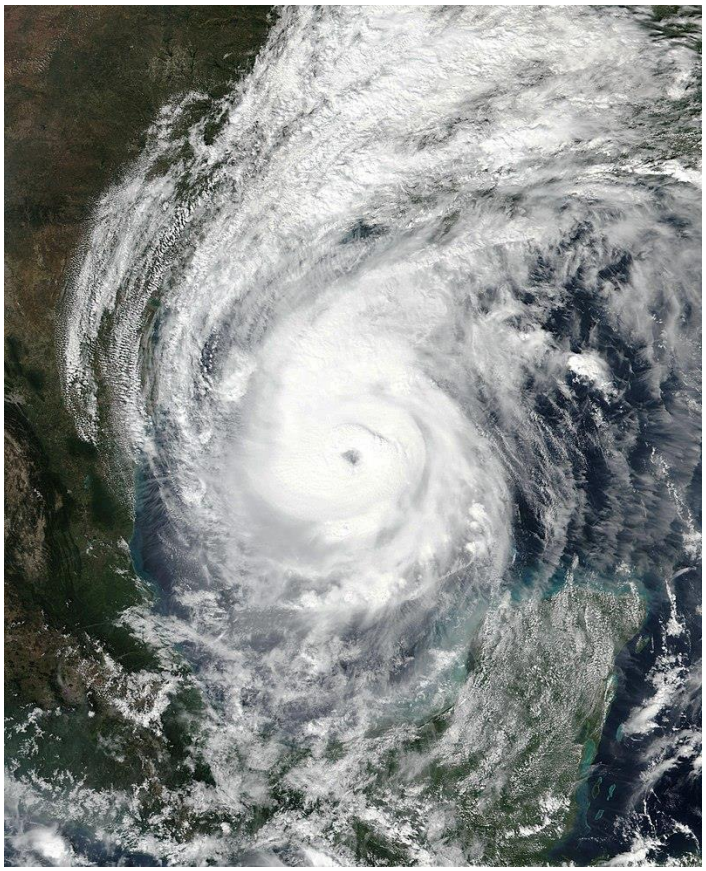

*Figure 2-22: Hurricane Delta in the Gulf Coast Area.*
*(Source: NOAA)*

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

In Richland Parish, tropical storm force winds caused widespread trees and power lines to be blown down across the parish with a few trees falling on homes. A personal weather station two miles south of Start measured a peak wind gust of 57 mph at 12:30 a.m. CDT.

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

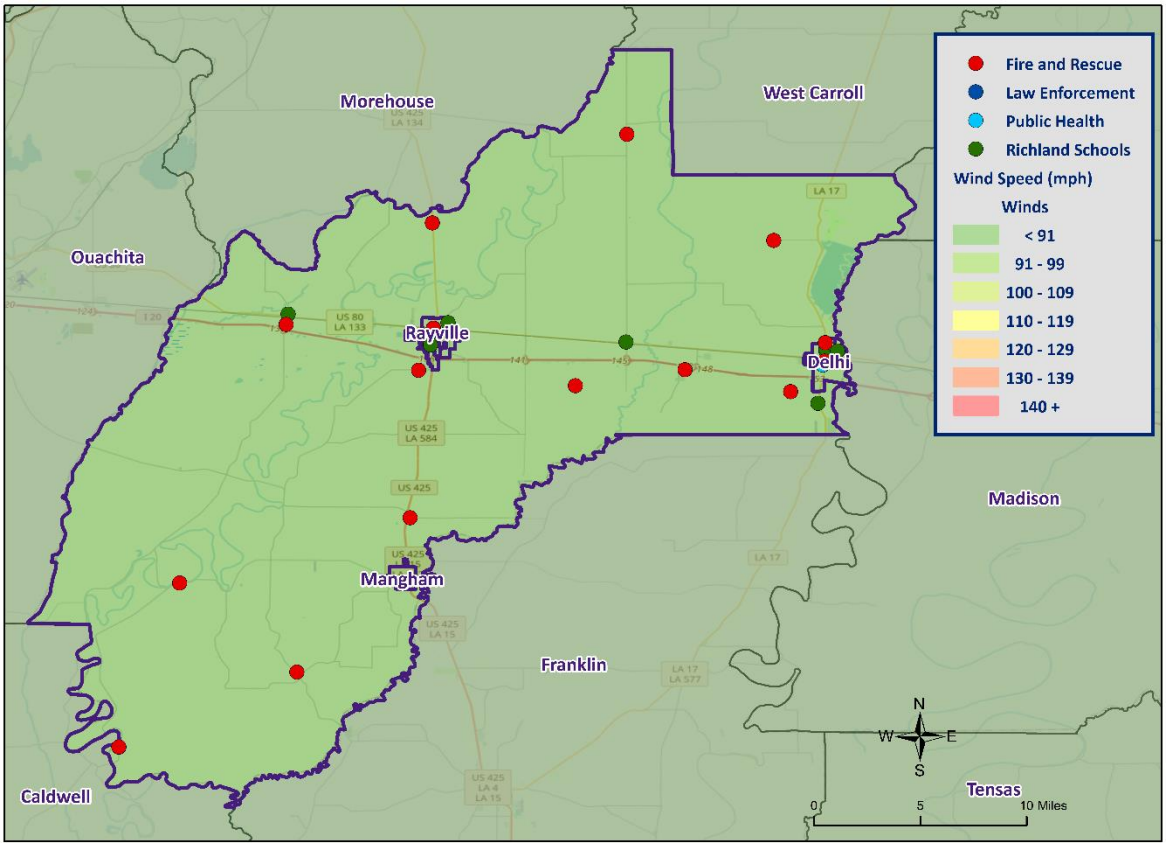


*Figure 2-23: Winds Zones for Richland Parish in Relation to Critical Facilities*

### *Frequency / Probability*

Tropical cyclones are large natural hazard events that regularly impact Richland Parish. The annual chance of occurrence for a tropical cyclone is estimated at 39% for Richland Parish with seven events occurring within 18 years (2002 to 2020). The tropical cyclone season for the Atlantic Basin is from June 1st through November 30th, with most of the major hurricanes (Saffir-Simpson Categories 3, 4, & 5) occurring between the months of August and October. Based on geographical location alone Richland Parish and its jurisdictions are highly vulnerable to tropical cyclones. This area has experienced several tropical cyclone events in the past and can expect more in the future.

### *Estimated Potential Losses*

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

*Table 2-49: Total Estimated Losses for a 100-Year Hurricane Event*
*(Source: Hazus)*

| Jurisdiction | Estimated Total Losses from 100-Year Hurricane Event |
|---|---|
| **Richland Parish (Unincorporated)** | $1,028,820 |
| **Delhi** | $200,563 |
| **Mangham** | $47,731 |
| **Rayville** | $256,019 |
| **Total** | **$1,533,134** |

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

*Table 2-50: Ratio of Total Losses to Total Estimated Value of Assets for Richland Parish.*
*(Source: Hazus)*

| Jurisdiction | Estimated Total Losses from 100-Year Hurricane Event | Total Estimated Value of Assets | Ratio of Estimated Losses to Total Value |
|---|---|---|---|
| **Richland Parish (Unincorporated)** | $1,028,820 | $1,728,880,000 | 0.1% |
| **Delhi** | $200,563 | $453,417,000 | < 0.1% |
| **Mangham** | $47,731 | $84,474,000 | 0.1% |
| **Rayville** | $256,019 | $575,705,000 | < 0.1% |

Based on the Hazus Hurricane Model, estimated total losses for Richland Parish and its jurisdictions was 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 Richland Parish by sector are listed in the table below.

*Table 2-51: Estimated Losses Richland Parish for a 100-Year Hurricane Event*
*(Source: Hazus)*

| Richland Parish (Unincorporated) | Estimated Total Losses from 100-Year Hurricane Event |
|---|---|
| **Agricultural** | $1,107 |
| **Commercial** | $15,483 |
| **Government** | $1,235 |
| **Industrial** | $4,566 |
| **Religious / Non-Profit** | $4,531 |
| **Residential** | $1,000,910 |
| **Schools** | $989 |
| **Total** | **$1,028,820** |

*Table 2-52: Estimated Losses in Delhi for a 100-Year Hurricane Event (Source: Hazus)*

| Delhi | Estimated Total Losses from 100-Year Hurricane Event |
|---|---|
| Agricultural | $216 |
| Commercial | $3,018 |
| Government | $241 |
| Industrial | $890 |
| Religious / Non-Profit | $883 |
| Residential | $195,122 |
| Schools | $193 |
| **Total** | **$200,563** |

*Table 2-53: Estimated Losses in Mangham for a 100-Year Hurricane Event (Source: Hazus)*

| Mangham | Estimated Total Losses from 100-Year Hurricane Event |
|---|---|
| Agricultural | $51 |
| Commercial | $718 |
| Government | $57 |
| Industrial | $212 |
| Religious / Non-Profit | $210 |
| Residential | $46,436 |
| Schools | $46 |
| **Total** | **$47,731** |

*Table 2-54: Estimated Losses in Rayville for a 100-Year Hurricane Event (Source: Hazus)*

| Rayville | Estimated Total Losses from 100-Year Hurricane Event |
|---|---|
| Agricultural | $275 |
| Commercial | $3,853 |
| Government | $307 |
| Industrial | $1,136 |
| Religious / Non-Profit | $1,127 |
| Residential | $249,074 |
| Schools | $246 |
| **Total** | **$256,019** |

*Threat to People*

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

*Table 2-55: Number of People Susceptible to a 100-Year Hurricane Event within Richland Parish (Source: Hazus)*

| Number of People Exposed to Hurricane Hazards | | | |
|---|---|---|---|
| **Location** | **# in Community** | **# in Hazard Area** | **% in Hazard Area** |
| **Richland Parish (Unincorporated)** | 13,450 | 13,450 | 100% |
| **Delhi** | 2,622 | 2,622 | 100% |
| **Mangham** | 624 | 624 | 100% |
| **Rayville** | 3,347 | 3,347 | 100% |
| **Total** | **20,043** | **20,043** | **100%** |

The Hazus Hurricane Model was also extrapolated to provide an overview of vulnerable populations throughout Richland Parish. These populations are illustrated in the following tables:

*Table 2-56: Vulnerable Populations in Richland Parish for a 100-Year Hurricane Event (Source: Hazus)*

| Richland Parish (Unincorporated) | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 13,450 | 100.0% |
| **Persons Under 5 Years** | 834 | 6.2% |
| **Persons Under 18 Years** | 3,120 | 23.2% |
| **Persons 65 Years and Over** | 2,381 | 17.7% |
| **White** | 7,909 | 58.8% |
| **Minority** | 5,541 | 41.2% |

*Table 2-57: Vulnerable Populations in Delhi for a 100-Year Hurricane Event (Source: Hazus)*

| Delhi | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 2,622 | 100.0% |
| **Persons Under 5 Years** | 94 | 3.6% |
| **Persons Under 18 Years** | 663 | 25.3% |
| **Persons 65 Years and Over** | 448 | 17.1% |
| **White** | 802 | 30.6% |
| **Minority** | 1,820 | 69.4% |

*Table 2-58: Vulnerable Populations in Mangham for a 100-Year Hurricane Event (Source: Hazus)*

| Mangham | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 7,526 | 100.0% |
| **Persons Under 5 Years** | 618 | 8.2% |
| **Persons Under 18 Years** | 1,311 | 17.4% |
| **Persons 65 Years and Over** | 910 | 12.1% |
| **White** | 4,024 | 53.5% |
| **Minority** | 3,502 | 46.5% |

*Table 2-59: Vulnerable Populations in Rayville for a 100-Year Hurricane Event (Source: Hazus)*

| Rayville | | |
|---|---|---|
| **Category** | **Total Numbers** | **Percentage of People in Hazard Area** |
| **Number in Hazard Area** | 3,347 | 100.0% |
| **Persons Under 5 Years** | 278 | 8.3% |
| **Persons Under 18 Years** | 1,007 | 30.1% |
| **Persons 65 Years and Over** | 485 | 14.5% |
| **White** | 733 | 21.9% |
| **Minority** | 2,614 | 78.1% |

*Vulnerability*

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

## Winter Weather

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

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

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

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

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

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

*Table 2-60: Sperry-Piltz Ice Accumulation Index*

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

### *Location*

Because a winter storm is a climatological based hazard and has the same probability of occurring in Richland Parish as all of the adjacent parishes, the entire planning area for Richland Parish is equally at risk for winter storms. The worst case scenario for winter storms in Richland Parish is a 2 on the Sperry-Piltz Ice accumulation index.

### *Previous Occurrences / Extents*

The NCEI Storm Events Database reports no winter weather events occurring within the boundaries of Richland Parish between the years 1990 and 2020. Since the last Richland Parish HMP Update in 2016, there have been no winter weather events which have occurred within the boundaries of Richland Parish.

### *Frequency / Probability*

Based on historical records, there has been no significant winter weather events within the boundaries of Richland Parish and the jurisdictions of Delhi, Mangham, and Rayville; therefore, the annual chance of occurrence for winter weather is estimated at less than 1%.

### *Estimated Potential Loses*

Since 1990, there has been no winter weather events that have resulted in property damages according to NCEI Storm Events Database. There have been no reported injuries or fatalities as a result of winter weather over the 30-year record.

### *Vulnerability*

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

# 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, Richland 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 Richland 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 | | | | | |
|---|---|---|---|---|---|
| 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. | | | | | |
| | Richland Parish | Delhi | Mangham | Rayville | Comments |
| **Plans** | **Yes / No** | | | | |
| Comprehensive / Master Plan | Yes | No | No | No | |
| Capital Improvements Plan | Yes | No | No | Yes | |
| EcoNomic Development Plan | Yes | No | No | Yes | |
| Local Emergency Operations Plan | Yes | No | No | Yes | |
| Continuity of Operations Plan | Yes | No | No | Yes | |
| Transportation Plan | Yes | Yes | Yes | Yes | |
| Stormwater Management Plan | No | No | No | No | |
| Community Wildfire Protection Plan | No | No | No | No | |
| Other plans (redevelopment, recovery, coastal zone management) | Yes | No | No | No | |
| **Building Code, Permitting and Inspections** | **Yes / No** | | | | |
| Building Code | Yes | No | No | Yes | |
| Building Code Effectiveness Grading Schedule (BCEGS) Score | Yes | No | No | Yes | |
| Fire Department ISO/PIAL rating | Yes | Yes | Yes | 4,5 | |
| Site plan review requirements | Yes | No | No | Yes | |
| **Land Use Planning and Ordinances** | **Yes / No** | | | | |
| Zoning Ordinance | Yes | Yes | Yes | Yes | |
| Subdivision Ordinance | Yes | No | No | Yes | |
| Floodplain Ordinance | Yes | Yes | Yes | Yes | |
| Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire) | No | No | No | No | |
| Flood Insurance Rate Maps | Yes | Yes | Yes | Yes | |
| Acquisition of land for open space and public recreation uses | No | Yes | Yes | Yes | |
| Other | No | No | No | No | |

All jurisdictions within the Richland 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

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

As of the 2023 update, Richland 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 Richland Parish Police Jury is also responsible for enforcing the parish ordinances related to health and safety, property maintenance standards, and condemnation of unsafe structures.

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

While local capabilities for mitigation can vary from community to community, the jurisdictions within the Richland 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 Richland 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 | Richland Parish | Delhi | Mangham | Rayville | Comments |
|---|---|---|---|---|---|
| **Administration** | **Yes / No** | | | | |
| Planning Commission | Yes | Yes | Yes | Yes | |
| Mitigation Planning Committee | Yes | Yes | Yes | Yes | |
| Maintenance programs to reduce risk (tree trimming, clearing drainage systems) | Yes | Yes | No | Yes | |
| **Staff** | **Yes / No** | | | | |
| Chief Building Official | Yes | No | No | Yes | |
| Floodplain Administrator | Yes | No | Yes | Yes | |
| Emergency Manager | Yes | Yes | Yes | Yes | |
| Community Planner | No | Yes | No | Yes | |
| Civil Engineer | Yes | No | No | Yes | |
| GIS Coordinator | Yes | 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 | No | Yes | Yes | |
| Hazard Data & Information | Yes | Yes | Yes | Yes | |
| Grant Writing | No | Yes | Yes | No | |
| Hazus Analysis | Yes | No | No | No | |
| Other | No | No | No | No | |

Financial capabilities are the resources that Richland 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 Richland Parish planning area:

*Table 3-3: Financial Capabilities*

| Financial | Richland Parish | Delhi | Mangham | Rayville | Comments |
|---|---|---|---|---|---|
| **Funding Resource** | **Yes / No** | | | | |
| Capital Improvements project funding | Yes | Yes | Yes | Yes | |
| Authority to levy taxes for specific purposes | Yes | Yes | Yes | Yes | |
| Fees for water, sewer, gas, or electric services | No | Yes | Yes | Yes | |
| Impact fees for new development | No | No | No | No | |
| Stormwater Utility Fee | No | No | No | No | |
| Community Development Block Grant (CDBG) | No | Yes | Yes | No | |
| Other Funding Programs | No | 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 Richland 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 | | | | | |
|---|---|---|---|---|---|
| | Richland Parish | Delhi | Mangham | Rayville | Comments |
| Program / Organization | Yes / No | | | | |
| Local citizen groups or Non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. | Yes | No | No | No | |
| Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education) | Yes | No | No | Yes | |
| Natural Disaster or safety related school program | Yes | No | No | Yes | |
| Storm Ready certification | Yes | No | No | No | |
| Firewise Communities certification | Yes | No | No | No | |
| Public/Private partnership initiatives addressing disaster-related issues | Yes | No | No | Yes | |
| Other | No | No | No | No | |

As reflected with the above existing regulatory mechanisms, programs and resources within the parish, the jurisdictions within the Richland Parish planning area remain committed to expanding and improving on the existing capabilities within the parish. Communities will work together along with Richland 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 Richland 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, 2022, neither Richland Parish nor any of its jurisdictions 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 2022, 352 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

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

likely that some communities with marginal CRS Class 9 programs have to identify new CRS credits in order to remain in the CRS class. Most notably, as it relates to this hazard mitigation plan, more credit was made available for Activity 410 Floodplain Mapping.

Typically, CRS communities do not request credit for all the activities they are currently implementing unless it would earn enough credit to advance the community to a higher CRS Class. A community that finds itself losing CRS credit with the 2017 manual could likely identify activities deserving credit they had not previously received. Due to the changes in both activities and CRS points, community CRS coordinators should speak with their ISO/CRS Specialist to understand how the 2017 manual will impact their community and when.

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

The other benefits that are more difficult to measure in dollars include:

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

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

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

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

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

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

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

## NFIP Worksheets

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

# 4. Mitigation Strategy

## Introduction

The Hazard Mitigation Strategy for Richland 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 2023 HMP update are a product of analysis and review of the Richland Parish Hazard Mitigation Plan Planning Committee under the coordination of the Richland Parish Office of Homeland Security and Emergency Preparedness. The committee was presented a list of projects and actions, new and from the 2016 plan, for review from October 2022 – February 2023.

An online public opinion survey of Richland Parish residents was conducted between January 2023 – February 2023. The survey was designed to capture public perceptions and opinions regarding natural hazards in the Richland 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. However, because there were no responses to the survey, this public feedback could not be incorporated into the plan. The full Richland Parish survey can be found at the following link:

https://www.surveymonkey.com/r/RichlandHM2022

## 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 Richland 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, Richland 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 Richland 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. Identify and pursue preventative measures that will reduce future damages from hazards
2. Enhance public awareness and understanding of disaster preparedness
3. Reduce repetitive flood losses in the parish and towns
4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages
5. Improve data collection, use, and sharing

The Mitigation Action Plan focuses on actions to be taken by Richland 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.

## 2023 Mitigation Actions and Update on Previous Plan Actions

The Richland Parish Hazard Mitigation Plan Planning Committee identified new actions that would reduce and/or prevent future damage within the Richland 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 Richland 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.

## Richland Parish Mitigation Actions

*Previous Action Update*

| Unincorporated Richland Parish Mitigation Action Plan | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Jurisdiction-Specific Action** | **Action Description** | **Funding Source** | **Target Completion Date** | **Responsible Party, Agency, or Department** | **Hazard** | **Goal** | **Status** |
| RIC1: Building Retrofits | Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms. | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,4 | Not Started - Carried Over (See Richland Parish Mitigation Action 1) |
| RIC2: Drainage Improvement | Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods. | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Flooding, Thunderstorms, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Richland Parish Mitigation Action 2) |
| RIC3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures | Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties. . | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Richland Parish Mitigation Action 3) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIC4: Safe Room Projects | Construction of a safe room for first responders located in Richland Parish. Other locations will be identified based on funding availability. | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,4 | Not Started - Carried Over (See Richland Parish Mitigation Action 4) |
| RIC5: Education and Outreach | Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, tornados, thunderstorms (lightning, high wind, hail), drought, dam and levee failure and winter storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities. | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3,4, 5 | Not Started - Carried Over (See Richland Parish Mitigation Action 5) |
| RIC6: Generators for continuity of operations and government | Procurement and Installation of generators at public facilities to ensure continued operations during and after events. | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2 | Not Started - Carried Over (See Richland Parish Mitigation Action 6) |
| RIC7:Lightning Mitigation | Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Thunderstorms | 1,2 | Not Started - Carried Over (See Richland Parish Mitigation Action 7) |
| RIC8: Warning Systems | Update/upgrade public warning system components throughout Richland Parish as necessary. Install audible and/or reverse 911 warning system(s) | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3 | Not Started - Carried Over (See Richland Parish Mitigation Action 8) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIC9: Potable Water | Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations. | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2 | Not Started - Carried Over (See Richland Parish Mitigation Action 9) |
| RIC10: Promote Flood Insurance | Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP). | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3 | Not Started - Carried Over (See Richland Parish Mitigation Action 10) |
| RIC11: Dam and Levee Failure Working Group | Create a working group in order to assess the extent and determine the possible effects of a dam or levee failure. | FEMA HGMP, Local | 1-5 years | Richland Parish OHSEP and Mayors | Dam Failure, Flooding, Levee Failure | 1,2,3,4 | Not Started - Carried Over (See Richland Parish Mitigation Action 11) |
| RIC12: Implement an all-hazard education program into all Richland Parish's school curriculums | Disaster and emergency preparedness education for Richland Parish's youth population is an important tool for reducing hazard vulnerability in Richland Parish. Richland Parish School Board shall integrate an all-hazard education program into all grade levels. The Red Cross program "Masters of Disaster" is a useful program model for establishing the curriculum-based education program for Richland Parish's schools. | Local Budget, State Grants, Hazard Mitigation Grant Program (HMGP), and Additional Grant Sources | | Richland Parish Superintendant | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Deleted (Duplicate Action of RIC5) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIC13: Identify and pursue preventative measures that will reduce future damages from hazards. | Send Richland Parish Office of Emergency Preparedness representative to relevant State and National hazard mitigation meetings to identify and pursue grants and project funding sources and measures that will mitigate future damages from hazards. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Office of Emergency Preparedness | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Not Started - Carried Over (See Richland Parish Mitigation Action 12) |
| RIC14:Install new generators at all existing and new shelters and critical facilities. | Install new generators at all existing and new shelters and critical facilities to mitigate risk associated with power outages during hazard events. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Office of Emergency Preparedness and Richland Parish Manager | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Deleted (Duplicate Action of RIC6) |
| RIC15: Develop and pass ordinances to help regulate new development in the Parish, such as requiring proper drainage with adequate sloping, stormwater retention ponds, dikes, levees, and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation in flood-prone areas. | This ordinance reduces the risk of flood damage to structures within Richland Parish through evaluating and expanding inadequate drainage capacity in development areas. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Police Jury | Dam Failure, Flooding, Levee Failure | | Not Started - Carried Over (See Richland Parish Mitigation Action 13) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIC16: Pursue elevation / acquisition / flood-proofing projects for Repetitive Loss structures and Pilot Reconstruction. | Elevate, acquire, or flood proof Repetitive Loss structures throughout the Parish. | State Grants, HMGP, FMA, and Additional Grant Sources | | Richland Parish Police Jury | Dam Failure, Flooding, Levee Failure | | Deleted (Duplicate Action of RIC1) |
| RIC17: Replace all school windows with shatterproof windows. | Replace all school windows with shatterproof windows to reduce damages and injury from wind related hazards. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Superintendant | Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Deleted (Duplicate Action of RIC3) |
| RIC18: Add generators to all existing and new water and sewer district plants in Rayville, Delhi, Mangham, and unincorporated Richland Parish. | Installing generators to all water and sewer district plants would reduce the risk of water and sewer infrastructure down-time during power outages. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Manager and Engineer | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Deleted (Duplicate Action of RIC6) |
| RIC19: Structurally harden all existing and future critical facilities to withstand strong winds in Rayville, Delhi, Mangham, and unincorporated Richland Parish. | The hardening of critical facilities will mitigate potential damages associated with high wind events, including thunderstorms, tornadoes, and hurricanes/tropical storms. Hardening can include shatter-proof windows, reinforced walls, and reinforced foundations. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Manager and Engineer | Thunderstorms, Tornadoes, Tropical Storm, Winter Weather | | Deleted (Duplicate Action of RIC1) |
| RIC20: Investigate and implement localized interior drainage projects, especially along U.S. Highway 80 near Delhi and Rayville, Carson Drive, Greer Road and Rosa Street, which are Repetitive Loss areas. | Localized interior drainage projects can begin mitigate property damage associate by flood by increasing the drainage capacity within high risk areas. Projects should be prioritized based on the Master Drainage Plan (Hazard Mitigation Action 16). | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Manager and Engineer | Flooding, Dam Failure, Levee Failure | | Deleted (Duplicate Action of RIC2) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIC21: Establish a documented program to maintain and improve drainage ways along Bayou Macon in the Delhi area and along Burns Bayou in the Rayville vicinity and Big and Colewa Creeks and the Steep Bayou area, by enlarging any inferior culverts and replacing any substandard bridges along the major drainage laterals. | A program that will continue to maintain and improve drainage ways along Bayou Macon in the Delhi area and along Burns Bayou in the Rayville vicinity and Big and Colewa Creeks and the Steep Bayou area will mitigate the potential flood damages within these areas. This program can be implemented through the Capital Improvement Program and the Master Drainage Plan (Hazard Mitigation Action 16). | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Manager and Engineer | Flooding, Dam Failure, Levee Failure | | Not Started - Carried Over (See Richland Parish Mitigation Action 14) |
| RIC22: Distribute information regarding flood hazards, including information on NFIP, flood mitigation measures, CRS, and flood insurance. | Distribute information regarding flood hazard to residents throughout the Parish. This general advertising campaign will inform the public about flood risks, activities, and programs that could mitigate flood damage risk. Library resources and other educational outreach resources should be utilized in implementing Action 13. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Office of Emergency Preparedness | Flooding, Dam Failure, Levee Failure | | Deleted (Duplicate Action of RIC5) |
| RIC23: Apply for and improve participation in the Community Rating System (CRS). | Apply for enrollment and improve participation once within the CRS to reduce flood insurance rates for all flood insurance holders within Richland Parish. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Office of Emergency Preparedness | Flooding, Dam Failure, Levee Failure | | Not Started - Carried Over (See Richland Parish Mitigation Action 15) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIC24: Implement a Master Drainage Plan | Implement a Master Drainage Plan that will evaluate drainage projects at major drainage laterals to determine the best method to increase drainage capacity. The Master Drainage Plan will be used to prioritize drainage projects based on engineer's expertise on drainage capacity needs. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Office of Emergency Preparedness | Flooding, Dam Failure, Levee Failure | | Deleted (Duplicate Action of RIC21) |
| RIC25: Obtain all-hazard community warning sirens to alert the community during all hazard events. | Obtain and implement all-hazard community warning sirens in all Towns to alert residents about impending hazard events and the need to seek shelter or evacuate. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Manager and Sheriff's Office | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Deleted (Duplicate Action of RIC8) |
| RIC26: Meet the guidelines and apply for the National Weather Service's "Storm Ready Program". | The National Weather Service "Storm Ready Program" provides a framework to assist communities in enhancing their ability to monitor storm damage and alert the public of imminent disasters. | Local Budget, State Grants, HMGP, and Additional Grant Sources | | Richland Parish Office of Emergency Preparedness | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Not Started - Carried Over (See Richland Parish Mitigation Action 16) |
| RIC27: Outreach to Agriculture Landowners on information regarding benefits of the Farm Service Agency's Noninsured Crop Disaster Assistance. | The Farm Service Agency's Noninsured Crop Disaster Assistance Program insures crops that will not be insured by the private sector. This includes crops grown for food, livestock, consumption, cotton, flax, and seeds. | No potential funding source can be readily identified | | Richland Parish Office Emergency Preparedness and LSU Ag Center | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | | Not Started - Carried Over (See Richland Parish Mitigation Action 17) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIC28: Construct a Community Wind Shelter. | Community Wind Shelters are usually built near large public buildings to protect residents who lack shelter. Community Wind Shelters can withstand 250-mph winds and are intended to house people for up to 36 hours. | State Grants, HMGP, and Additional Grant Sources | | Richland Parish Manager and Engineer | Thunderstorms, Tornadoes, Tropical Weather | | Not Started - Carried Over (See Richland Parish Mitigation Action 18) |

*New Mitigation Actions*

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 1** | Building Retrofits |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 2** | Drainage Improvements |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 3** | Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 4** | Safe Room Projects |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Construction of a safe room for first responders located in Richland 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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 5** | Education and Outreach |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages<br>5. Improve data collection, use, and sharing |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 6** | Generators for continuity of operations and government |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards.<br>2. Enhance public awareness and understanding of disaster preparedness. |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 7** | Lightning Mitigation |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards |
| **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 2016 Plan |
| **Hazard Addressed** | Thunderstorms |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 8** | Warning Systems |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **PRIORITY** | Medium |
| **Action Description** | Update/upgrade public warning system components throughout Richland 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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 9** | Potable Water |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness |
| **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 2016 Plan |
| **Hazard Addressed** | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 10** | Promote Flood Insurance |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 11** | Dam and Levee Failure Working Group |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | US Army Corps of Engineers, Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Create a working group in order to assess the extent and determine the possible impact of a dam or levee failure. |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 12** | Identify and pursue preventative measures that will reduce future damages from hazards. |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | Local Budget, State Grants, HMGP, and Additional Grant Sources |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Send Richland Parish Office of Emergency Preparedness representative to relevant State and National hazard mitigation meetings to identify and pursue grants and project funding sources and measures that will mitigate future damages from hazards. |
| **Type of Mitigation Action** | Local Plans and Regulations |
| **How Action Aligns with Risk Reduction** | Will allow for loss in the community to decrease when hazards become prevalent |
| **Current Status of Action** | Not Started – Carried Over from 2016 Plan |
| **Hazard Addressed** | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 13** | Develop and pass ordinances to help regulate new development in the Parish, such as requiring proper drainage with adequate sloping, stormwater retention ponds, dikes, levees, and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation in flood-prone areas. |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | Local Budget, State Grants, HMGP, and Additional Grant Sources |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | This ordinance reduces the risk of flood damage to structures within Richland Parish through evaluating and expanding inadequate drainage capacity in development areas. |
| **Type of Mitigation Action** | Local Plans and Regulations, Structure and Infrastructure Projects |
| **How Action Aligns with Risk Reduction** | New ordinances will allow for flooding to decrease within the parish, especially in development areas where financial loss will likely be higher |
| **Current Status of Action** | Not Started – Carried Over from 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 14** | Establish a documented program to maintain and improve drainage ways along Bayou Macon in the Delhi area and along Burns Bayou in the Rayville vicinity and Big and Colewa Creeks and the Steep Bayou area, by enlarging any inferior culverts and replacing any substandard bridges along the major drainage laterals. |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | Local Budget, State Grants, HMGP, and Additional Grant Sources |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Unknown |
| **Action Description** | A program that will continue to maintain and improve drainage ways along Bayou Macon in the Delhi area and along Burns Bayou in the Rayville vicinity and Big and Colewa Creeks and the Steep Bayou area will mitigate the potential flood damages within these areas. This program can be implemented through the Capital Improvement Program and the Master Drainage Plan (Hazard Mitigation Action 16). |
| **Type of Mitigation Action** | Local Plans and Regulations, Structure and Infrastructure Projects |
| **How Action Aligns with Risk Reduction** | Program will allow for improvement to nearby drainage systems preventing flooding (i.e., backwater flooding) |
| **Current Status of Action** | Not Started – Carried Over from 2016 Plan |
| **Hazard Addressed** | Flooding, Dam Failure, Levee Failure |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 15** | Apply for and improve participation in the Community Rating System (CRS). |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | Local Budget, State Grants, HMGP, and Additional Grant Sources |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Apply for enrollment and improve participation once within the CRS to reduce flood insurance rates for all flood insurance holders within Richland Parish. |
| **Type of Mitigation Action** | Education and Awareness Programs, Local Plans and Regulations |
| **How Action Aligns with Risk Reduction** | CRS program can result in flood insurance premium discounts allowing the public to invest in flood insurance or to have other items covered. |
| **Current Status of Action** | Not Started - Carried Over from 2016 Plan |
| **Hazard Addressed** | Flooding, Dam Failure, Levee Failure |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 16** | Meet the guidelines and apply for the National Weather Service's "Storm Ready Program" |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | Local Budget, State Grants, HMGP, and Additional Grant Sources |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards.<br>2. Enhance public awareness and understanding of disaster preparedness. |
| **PRIORITY** | Medium |
| **Action Description** | The National Weather Service "Storm Ready Program" provides a framework to assist communities in enhancing their ability to monitor storm damage and alert the public of imminent disasters. |
| **Type of Mitigation Action** | Local Plans and Regulations |
| **How Action Aligns with Risk Reduction** | Will allow for public to be aware of imminent disasters and be equipped with the information on how to deal with said disasters |
| **Current Status of Action** | Not Started – Carried Over from 2016 Plan |
| **Hazard Addressed** | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 17** | Outreach to Agriculture Landowners on information regarding benefits of the Farm Service Agency's Noninsured Crop Disaster Assistance. |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury, LSU Agricultural Center |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | No potential funding source can be readily identified |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards. |
| **PRIORITY** | Medium |
| **Action Description** | The Farm Service Agency's Noninsured Crop Disaster Assistance Program insures crops that will not be insured by the private sector. This includes crops grown for food, livestock, consumption, cotton, flax, and seeds. |
| **Type of Mitigation Action** | Natural System Protection |
| **How Action Aligns with Risk Reduction** | Insurance on crops will allow for loss of crops to be accounted for and reimbursed |
| **Current Status of Action** | Not Started – Carried Over from 2016 Plan |
| **Hazard Addressed** | Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>RICHLAND PARISH | |
|---|---|
| | **DESCRIPTION** |
| **RICHLAND PARISH MITGATION ACTION 18** | Construct a Community Wind Shelter |
| **LEAD AGENCY** | Richland Parish OHSEP |
| **SUPPORTING AGENCIES** | Richland Parish Police Jury |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | State Grants, HMGP, and Additional Grant Sources |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Community Wind Shelters are usually built near large public buildings to protect residents who lack shelter. Community Wind Shelters can withstand 250-mph winds and are intended to house people for up to 36 hours. |
| **Type of Mitigation Action** | Structure and Infrastructure Projects |
| **How Action Aligns with Risk Reduction** | Will allow residents that lack sturdy structure during hazards to take shelter and ensure their safety |
| **Current Status of Action** | Not Started – Carried Over from 2016 Plan |
| **Hazard Addressed** | Thunderstorms, Tornadoes, Tropical Weather |

**Additional Supporting Information:**

## Town of Delhi Mitigation Actions

*Previous Action Update*

| Town of Delhi | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Jurisdiction-Specific Action** | **Action Description** | **Funding Source** | **Target Completion Date** | **Responsible Party, Agency, or Department** | **Hazard** | **Goal** | **Status** |
| DEL1: Building Retrofits | Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms. | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,4 | Not Started - Carried Over (See Town of Delhi Mitigation Action 1) |
| DEL2: Drainage Improvement | Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods. | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Flooding, Thunderstorms, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Town of Delhi Mitigation Action 2) |
| DEL3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures | Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties. . | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Town of Delhi Mitigation Action 3) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DEL4: Safe Room Projects | Construction of a safe room for first responders located in Richland Parish. Other locations will be identified based on funding availability. | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,4 | Not Started - Carried Over (See Town of Delhi Mitigation Action 4) |
| DEL5: Education and Outreach | Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, tornados, thunderstorms (lightning, high wind, hail), drought, dam and levee failure and winter storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities. | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3,4,5 | Not Started - Carried Over (See Town of Delhi Mitigation Action 5) |
| DEL6: Generators for continuity of operations and government | Procurement and Installation of generators at public facilities to ensure continued operations during and after events. | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2 | Not Started - Carried Over (See Town of Delhi Mitigation Action 6) |
| DEL7:Lightning Mitigation | Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Thunderstorms | 1,2 | Not Started - Carried Over (See Town of Delhi Mitigation Action 7) |
| DEL8: Warning Systems | Update/upgrade public warning system components throughout Richland Parish as necessary. Install audible and/or reverse 911 warning system(s) | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3 | Not Started - Carried Over (See Town of Delhi Mitigation Action 8) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DEL9: Potable Water | Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations. | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones | 1,2 | Not Started - Carried Over (See Town of Delhi Mitigation Action 9) |
| DEL10: Promote Flood Insurance | Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP). | FEMA HMGP, Local | 1-5 years | Town of Delhi/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3 | Not Started - Carried Over (See Town of Delhi Mitigation Action 10) |
| DEL11: Dam and Levee Failure Working Group | Create a working group in order to assess the extent and determine the possible effects of a dam or levee failure. | FEMA HMGP, Local | 1-5 years | Richland Parish OHSEP and Mayors | Dam Failure, Flooding, Levee Failure | 1,2,3,4 | Not Started - Carried Over (See Town of Delhi Mitigation Action 11) |

*New Mitigation Actions*

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 1** | Building Retrofits |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 2** | Drainage Improvements |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 3** | Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 4** | Safe Room Projects |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Construction of a safe room for first responders located in Richland 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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 5** | Education and Outreach |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages<br>5. Improve data collection, use, and sharing |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 6** | Generators for continuity of operations and government |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 7** | Lightning Mitigation |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards |
| **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 2016 Plan |
| **Hazard Addressed** | Thunderstorms |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 8** | Warning Systems |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **PRIORITY** | Medium |
| **Action Description** | Update/upgrade public warning system components throughout Richland 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 2016 Plan |
| **Hazard Addressed** | Flooding, Dam Failure, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 9** | Potable Water |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness |
| **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 2016 Plan |
| **Hazard Addressed** | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 10** | Promote Flood Insurance |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF DELHI | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF DELHI MITGATION ACTION 11** | Dam and Levee Failure Working Group |
| **LEAD AGENCY** | Town of Delhi Mayor's Office |
| **SUPPORTING AGENCIES** | US Army Corps of Engineers, Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Create a working group in order to assess the extent and determine the possible impact of a dam or levee failure. |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure |

**Additional Supporting Information:**

## Town of Mangham Mitigation Actions

*Previous Action Update*

| Town of Mangham | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Jurisdiction-Specific Action** | **Action Description** | **Funding Source** | **Target Completion Date** | **Responsible Party, Agency, or Department** | **Hazard** | **Goal** | **Status** |
| MAN1: Building Retrofits | Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms. | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,4 | Not Started - Carried Over (See Town of Mangham Mitigation Action 1) |
| MAN2: Drainage Improvement | Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods. | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Flooding, Thunderstorms, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Town of Mangham Mitigation Action 2) |
| MAN3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures | Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties. . | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Town of Mangham Mitigation Action 3) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MAN4: Safe Room Projects | Construction of a safe room for first responders located in Richland Parish. Other locations will be identified based on funding availability. | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,4 | Not Started - Carried Over (See Town of Mangham Mitigation Action 4) |
| MAN5: Education and Outreach | Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, tornados, thunderstorms (lightning, high wind, hail), drought, dam and levee failure and winter storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities. | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3,4, 5 | Not Started - Carried Over (See Town of Mangham Mitigation Action 5) |
| MAN6: Generators for continuity of operations and government | Procurement and Installation of generators at public facilities to ensure continued operations during and after events. | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2 | Not Started - Carried Over (See Town of Mangham Mitigation Action 6) |
| MAN7: Lightning Mitigation | Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Thunderstorms | 1,2 | Not Started - Carried Over (See Town of Mangham Mitigation Action 7) |
| MAN8: Warning Systems | Update/upgrade public warning system components throughout Richland Parish as necessary. Install audible and/or reverse 911 warning system(s) | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3 | Not Started - Carried Over (See Town of Mangham Mitigation Action 8) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MAN9: Potable Water | Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations. | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2 | Not Started - Carried Over (See Town of Mangham Mitigation Action 9) |
| MAN10: Promote Flood Insurance | Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP). | FEMA HMGP, Local | 1-5 years | Town of Mangham/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3 | Not Started - Carried Over (See Town of Mangham Mitigation Action 10) |
| MAN11: Dam and Levee Failure Working Group | Create a working group in order to assess the extent and determine the possible effects of a dam or levee failure. | FEMA HMGP, Local | 1-5 years | Richland Parish OHSEP and Mayors | Dam Failure, Flooding, Levee Failure | 1,2,3,4 | Not Started - Carried Over (See Town of Mangham Mitigation Action 11) |

*New Mitigation Actions*

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 1** | Building Retrofits |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 2** | Drainage Improvements |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 3** | Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 4** | Safe Room Projects |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Construction of a safe room for first responders located in Richland 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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 5** | Education and Outreach |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages<br>5. Improve data collection, use, and sharing |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 6** | Generators for continuity of operations and government |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 7** | Lightning Mitigation |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards |
| **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 2016 Plan |
| **Hazard Addressed** | Thunderstorms |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 8** | Warning Systems |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **PRIORITY** | Medium |
| **Action Description** | Update/upgrade public warning system components throughout Richland 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 2016 Plan |
| **Hazard Addressed** | Flooding, Dam Failure, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 9** | Potable Water |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness |
| **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 2016 Plan |
| **Hazard Addressed** | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 10** | Promote Flood Insurance |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF MANGHAM | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF MANGHAM MITGATION ACTION 11** | Dam and Levee Failure Working Group |
| **LEAD AGENCY** | Town of Mangham Mayor's Office |
| **SUPPORTING AGENCIES** | US Army Corps of Engineers, Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Create a working group in order to assess the extent and determine the possible impact of a dam or levee failure. |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure |

**Additional Supporting Information:**

## Town of Rayville Mitigation Actions

*Previous Action Update*

| Town of Rayville | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Jurisdiction-Specific Action** | **Action Description** | **Funding Source** | **Target Completion Date** | **Responsible Party, Agency, or Department** | **Hazard** | **Goal** | **Status** |
| RAY1: Building Retrofits | Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms. | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,4 | Not Started - Carried Over (See Town of Rayville Mitigation Action 1) |
| RAY2: 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 propertyowners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods. | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Flooding, Thunderstorms, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Town of Rayville Mitigation Action 2) |
| RAY3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures | Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties. . | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3,4 | Not Started - Carried Over (See Town of Rayville Mitigation Action 3) |
| RAY4: Safe Room Projects | Construction of a safe room for first responders located in Richland Parish. Other locations will be identified based on funding availability. | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,4 | Not Started - Carried Over (See Town of Rayville Mitigation Action 4) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RAY5: Education and Outreach | Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, tornados, thunderstorms (lightning, high wind, hail), drought, dam and levee failure and winter storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities. | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3,4,5 | Not Started - Carried Over (See Town of Rayville Mitigation Action 5) |
| RAY6: Generators for continuity of operations and government | Procurement and Installation of generators at public facilities to ensure continued operations during and after events. | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2 | Not Started - Carried Over (See Town of Rayville Mitigation Action 6) |
| RAY7:Lightning Mitigation | Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Thunderstorms | 1,2 | Not Started - Carried Over (See Town of Rayville Mitigation Action 7) |
| RAY8: Warning Systems | Update/upgrade public warning system components throughout Richland Parish as necessary. Install audible and/or reverse 911 warning system(s) | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tornadoes, Tropical Cyclones, Winter Weather | 1,2,3 | Not Started - Carried Over (See Town of Rayville Mitigation Action 8) |
| RAY9: Potable Water | Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations. | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather | 1,2 | Not Started - Carried Over (See Town of Rayville Mitigation Action 9) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RAY10: Promote Flood Insurance | Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP). | FEMA HMGP, Local | 1-5 years | Town of Rayville/Richland Parish OHSEP | Dam Failure, Flooding, Levee Failure, Tropical Cyclones | 1,2,3 | Not Started - Carried Over (See Town of Rayville Mitigation Action 10) |
| RAY11: Dam and Levee Failure Working Group | Create a working group in order to assess the extent and determine the possible effects of a dam or levee failure. | FEMA HMGP, Local | 1-5 years | Richland Parish OHSEP and Mayors | Dam Failure, Flooding, Levee Failure | 1,2,3,4 | Not Started - Carried Over (See Town of Rayville Mitigation Action 11) |

*New Mitigation Actions*

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 1** | Building Retrofits |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 2** | Drainage Improvements |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 3** | Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 4** | Safe Room Projects |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HMGP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Construction of a safe room for first responders located in Richland 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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 5** | Education and Outreach |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages<br>5. Improve data collection, use, and sharing |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Drought, Flooding, Levee Failure Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 6** | Generators for continuity of operations and government |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards.<br>2. Enhance public awareness and understanding of disaster preparedness. |
| **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 2016 Plan |
| **Hazard Addressed** | Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 7** | Lightning Mitigation |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards |
| **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 2016 Plan |
| **Hazard Addressed** | Thunderstorms |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 8** | Warning Systems |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **PRIORITY** | Medium |
| **Action Description** | Update/upgrade public warning system components throughout Richland 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 2016 Plan |
| **Hazard Addressed** | Flooding, Dam Failure, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 9** | Potable Water |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness |
| **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 2016 Plan |
| **Hazard Addressed** | Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 10** | Promote Flood Insurance |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure, Tropical Cyclones |

**Additional Supporting Information:**

| IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS<br>TOWN OF RAYVILLE | |
|---|---|
| | **DESCRIPTION** |
| **TOWN OF RAYVILLE MITGATION ACTION 11** | Dam and Levee Failure Working Group |
| **LEAD AGENCY** | Town of Rayville Mayor's Office |
| **SUPPORTING AGENCIES** | US Army Corps of Engineers, Richland Parish OHSEP |
| **TIMELINE** | 1-5 years |
| **COST ESTIMATE** | Unknown |
| **POSSIBLE FUNDING SOURCE(S)** | FEMA HGMP, Local |
| **ASSOCIATED GOALS** | 1. Identify and pursue preventative measures that will reduce future damages from hazards<br>2. Enhance public awareness and understanding of disaster preparedness<br>3. Reduce repetitive flood losses in the parish and towns<br>4. Facilitate sound development in the parish and towns to reduce or eliminate hazard damages |
| **PRIORITY** | Medium |
| **Action Description** | Create a working group in order to assess the extent and determine the possible impact of a dam or levee failure. |
| **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 2016 Plan |
| **Hazard Addressed** | Dam Failure, Flooding, Levee Failure |

**Additional Supporting Information:**

## 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 Richland Parish Police Jury and the incorporated jurisdictions. 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.

Richland 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.

***This Page Left Intentionally Blank***

# 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 Richland Parish Hazard Mitigation Plan Update

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

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

| Date | Meeting or Outreach | Location | Public Invited | Purpose |
|---|---|---|---|---|
| 10/10/2022 | Kick Off Meeting | Zoom Call | No | Discuss with the Parish OHSEP Director expectations and requirements of the project. Discuss meeting schedules, committee make up, and next steps. |
| 11/09/2022 | Initial Planning Committee Meeting | Rayville, LA | No | Discuss with Richland Parish Hazard Mitigation Planning Committee the process and expectations of plan participants. Discuss timeline and action items for parish and each jurisdiction. |
| 2/14/2023 | Planning Committee Risk Assessment Review | Rayville, LA | Yes | Presentation of Risk Assessment and profiled hazards to Planning Committee. |
| 2/14/2023 | Public Meeting | Rayville, 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. |
| 1/4/2023 – 2/15/2023 | Public Opinion Survey | Online | Yes | This survey asked participants about public perceptions and opinions regarding natural hazards in Richland Parish. In addition, questions covered the methods and techniques preferred for reducing the risks and losses associated with these hazards. However, because there were no responses to the survey, this public feedback could not be incorporated into the plan. The survey can be found here: https://www.surveymonkey.com/r/RichlandHM2022 |

## Planning

The plan update process consisted of several phases:

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

## Coordination

The Richland Parish Office of Homeland Security and Emergency Preparedness (OHSEP) oversaw the coordination of the 2023 Hazard Mitigation Plan Update Planning Committee during the update process. The parish OHSEP was responsible for identifying members for the committee.

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

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

## Neighboring Community, Local and Regional Planning Process Involvement

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

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

- Participation in Hazard Mitigation planning meetings at the local and parish level

- Sharing local data and information with jurisdictions
- Incorporation of other planning documents, studies and efforts
- Action item development and action progress from 2016 update
- Risk Assessment review
- Plan document draft review
- Formal adoption of the Hazard Mitigation Plan

The Richland Parish OHSEP Director was invited to attend the Initial Planning and Risk Assessment Meetings for Richland Parish in an effort to coordinate mitigation efforts where possible as neighboring communities. The Richland Parish OHSEP Director was invited via email and phone call to participate in an effort to collaborate with neighboring communities. SDMI assisted Richland Parish with encouraging the collaboration with these neighboring communities via email by extending an invitation to the Richland 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 2023 Hazard Mitigation Plan Update Planning Committee consisted of representatives from the following parish, municipal or community stakeholders. Below is a detailed list of the 2023 HMPU Planning Committee:

| Richland Parish Hazard Mitigation Planning Committee | | | |
|---|---|---|---|
| **Name** | **Title** | **Agency** | **Email** |
| Dawn Williams | Director | Richland Parish OHSEP | dwilliams@richlandso.org |
| Todd Smith | Regional | GOHSEP | Todd.smith@la.gov |
| Perry Fleming | Chief of Police | Town of Mangham | manghampd@inetsouth.com |
| Harry Lewis | Mayor | Town of Rayville | mayor@townofrayville.com |
| Jesse Washington | Mayor | Town of Delhi | jwashington@thetownofdelhi.com |
| James Mardis | Director | Morehouse Parish OHSEP | jmardis@mpso.net |

## Program Integration

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

Richland 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 Richland Parish Hazard Mitigation Planning Committee will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their communities or agencies are consistent with the goals and actions of the Hazard Mitigation Plan and will not contribute to increased hazard vulnerability in the parish. Existing plans, studies, and technical information were incorporated in the planning process. Examples include flood data from FEMA and the U. S. Geological Survey. Much of this data was incorporated into the Risk Assessment component of the plan relative to plotting historical events and the magnitude of damages that occurred. The parish's 2016 Hazard Mitigation Plan was also used in the planning process. Other existing data and plans used in the planning process include those listed below.

- Parish Emergency Operations Plan
- 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 10, 2022
**Location:** Zoom 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:**

| Parish Hazard Mitigation Planning Committee | | |
|---|---|---|
| **Name** | **Title** | **Agency** |
| Dawn Williams | Director | Richland Parish OHSEP |
| Todd Smith | Regional | GOHSEP |
| Chris Rippetoe | Program Manager | LSU-SDMI |
| Ashleigh Dozier | Emergency Management Specialist | LSU-SDMI |
| Mary Kincannon | Business Office Coordinator | LSU-SDMI |

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

**Date:** November 9, 2022

**Location:** Rayville, 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:**

| Richland Parish Hazard Mitigation Planning Committee | | |
|---|---|---|
| **Name** | **Title** | **Agency** |
| Dawn Williams | Director | Richland Parish OHSEP |
| Todd Smith | Regional Coordinator | GOHSEP |
| Perry Fleming | Chief of Police | Town of Mangham |
| Harry Lewis | Mayor | Town of Rayville |
| Jesse Washington | Mayor | Town of Delhi |

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

**Date:** February 14, 2023

**Location:** Rayville, LA

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

**Public Invitation:** No

**Meeting Invitees:**

| Richland Parish Hazard Mitigation Planning Committee | | |
|---|---|---|
| **Name** | **Title** | **Agency** |
| Dawn Williams | Director | Richland Parish OHSEP |
| Todd Smith | Regional Coordinator | GOHSEP |
| Perry Fleming | Chief of Police | Town of Mangham |
| Harry Lewis | Mayor | Town of Rayville |
| Jesse Washington | Mayor | Town of Delhi |

Meeting #4 Hazard Mitigation Plan Update Public Meeting

**Date:** February 14, 2023

**Location:** Rayville, 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.

**Public Invitation:** Yes

**Meeting Invitees:**

| Richland Parish Hazard Mitigation Planning Committee | | |
|---|---|---|
| **Name** | **Title** | **Agency** |
| Dawn Williams | Director | Richland Parish OHSEP |
| Todd Smith | Regional Coordinator | GOHSEP |
| Perry Fleming | Chief of Police | Town of Mangham |
| Harry Lewis | Mayor | Town of Rayville |
| Jesse Washington | Mayor | Town of Delhi |

RICHLAND PARISH OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

**PUBLIC MEETING ANNOUNCEMENT**

**Richland Parish and its partners are seeking community input for the 2023 Richland Parish Hazard Mitigation Plan update!**

Richland 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 Richland 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 February 14 for a public meeting at 3:00pm to learn more about the plan and share your input on the risks and vulnerabilities that most impact you and your community.

**Meeting Details:**
Richland Parish Sheriff's Office
810 Louisa Street
Rayville, LA 71269

Residents of Richland Parish are asked to participate in a survey about public perceptions and opinions regarding natural hazards in the parish. The survey results will be used in the development of the plan. This short web-based survey can be found at the following link:

https://www.surveymonkey.com/r/RichlandHM2022

The Parish appreciates your input.

If you have questions, please contact the Richland OHSEP Office

**Meeting Announcement:**

### 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 Richland Parish residents was conducted between January and February 2023. The survey was designed to capture public perceptions and opinions regarding natural hazards in Richland 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 February 15th, 2023 because there were no responses to the survey, this public feedback could not be incorporated into the plan. The full Richland Parish survey can be found at the following link: https://www.surveymonkey.com/r/RichlandHM2022

### Outreach Activity #2: Public Meeting Activity - Incident Questionnaire

**Date:** February 14, 2023
**Location:** Public Meeting – Rayville, LA
**Public Invitation:** Yes

An incident/issue questionnaire was provided at the public meeting in an effort to collect additional information from residents of Richland 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: 2023 Richland Parish Hazard Mitigation Plan Public Review

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

After an initial review by the Richland Parish Planning Committee was completed, the 2023 Richland Parish Hazard Mitigation Plan was made available for public review and comment. The plan was hosted on SDMI's Hazard Mitigation website: http://hmplans.sdmi.lsu.edu/Home/Parish/richland

# RICHLAND PARISH PUBLIC MEETING

## PUBLIC ACTIVITY: INCIDENT/ ISSUE QUESTIONNAIRE

### 1. HAZARD TYPE(S):

A. DAM FAILURE
B. DROUGHT
C. FLOODING
D. LEVEE FAILURE
E. THUNDERSTORMS
F. TORNADOES
G. TROPICAL CYCLONES
H. WINTER WEATHER

### F. OTHER:

### 2. DESCRIBE INCIDENT OR ISSUE:

### 3. LOCATION:

A. CITY:

B. ADDRESS OR AREA:

C. LOCALIZED OR DISPERSED:

### 4. INTENSITY

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

B. WIND STRENGTH:

### 5. RE-OCCURING OR ONE-TIME

A. IF RE-OCCURRING, 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 PROBLEM OR IMPACT BE PREVENTED, FIXED OR ALLEVIATED?

***This Page Left Intentionally Blank***

# Appendix B: Plan Maintenance

## Purpose

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

## Monitoring, Evaluating, and Updating the Plan

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

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

## Responsible Parties

Richland 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

Richland Parish has developed a method to ensure monitoring, evaluating, and updating of the HMP occurs during the five-year cycle of the plan. The planning committee will 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 Richland Parish OHSEP Director will be responsible for conducting the annual planning committee meetings.

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

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

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

2) What were the results of the implemented action

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

4) Did the results achieve the stated goals and objectives

5) Was the action cost-effective

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

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

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

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

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

3) Any new or existing procedures that can be done more efficiently

4) Any additional ways to gain more diverse and widespread cooperation

5) Any different or additional funding sources available for mitigation planning and implementation

The HMP will be updated every five years to remain eligible for continued HMGP funding. The 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 Richland 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 Hazard Mitigation 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.

## 2023 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 2023 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 Richland Parish Hazard Mitigation Plan Planning Committee and participating jurisdictions to determine additional implementation procedures when appropriate. This may include integrating the requirements of the Richland Parish Hazard Mitigation Plan into each jurisdiction's planning documents, processes, or mechanisms as follows:

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

Opportunities to integrate the requirements of this plan into other local planning mechanisms will continue to be identified through future meetings of the Richland 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.). While there have been no instances of the mitigation strategy being incorporated into other planning documents since the adoption of the 2016 Richland Hazard Mitigation Plan, the committee members

recognize the importance of a holistic approach across all planning efforts and will use their standing to integrate the mitigation strategy outlined in the 2023 Richland Hazard Mitigation Plan into other planning documents when appropriate. Most notably, Richland Parish is in the process of updating their Master Plan and will incorporate the mitigation strategy from this FEMA approved hazard mitigation plan into the Master Plan process and document.

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 Town of Delhi, Town of Mangham, and Town of Rayville, Richland Parish has the authority to incorporate the contents of the Hazard Mitigation Plan into the parish's existing regulatory mechanisms. Agreements are currently in place with jurisdictions to allow for the parish incorporation mechanisms to take place.

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

**Richland Parish**

| | | | |
|---|---|---|---|
| *Comprehensive Master Plan* | Updated as needed | Richland Parish Police Jury | ✓ |
| *Capital Improvements Plan* | Updated as needed | Richland Parish Police Jury | ✓ |
| *Continuity of Operations Plan* | Updated as needed | Richland Parish OHSEP | ✓ |
| *Local Emergency Operations Plan* | Updated as needed | Richland Parish OHSEP | ✓ |
| *Transportation Plan* | Updated as needed | Richland Parish Police Jury | ✓ |
| *Economic Development Plan* | Updated as needed | Richland Parish Police Jury | ✓ |
| | | | ✓ |

**Town of Delhi**

| | | | |
|---|---|---|---|
| *Transportation Plan* | Updated as needed | Town of Delhi Mayor's Office | ✓ |

**Town of Mangham**

| | | | |
|---|---|---|---|
| *Transportation Plan* | Updated as needed | Town of Mangham Mayor's Office | ✓ |

**Town of Rayville**

| | | | |
|---|---|---|---|
| *Capital Improvements Plan* | Updated as needed | Town of Rayville Mayor's Office | ✓ |
| *Economic Development Plan* | Updated as needed | Town of Rayville Mayor's Office | ✓ |
| *Local Emergency Operations Plan* | Updated as needed | Richland Parish OHSEP | ✓ |
| *Continuity of Operations Plan* | Updated as needed | Richland Parish OHSEP | ✓ |
| *Transportation Plan* | Updated as needed | Town of Rayville Mayor's Office | ✓ |

## 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.

***This Page Left Intentionally Blank***

# Appendix C: Critical Facilities

## Critical Facilities within the Richland Parish Planning Area

| Richland Parish Planning Area Critical Facilities | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **Name** | **Flooding** | **Drought** | **Thunderstorms** | **Tornadoes** | **Tropical Cyclones** | **Winter Storms** | **Dam Failure** | **Latitude** | **Longitude** |
| **Civil Government** | Dehli Municipal Building | | x | x | x | x | x | | 32.45520158 | -91.49271101 |
| | Fifth District Drug Court & Hearing Officer | x | x | x | x | x | x | | 32.47576681 | -91.76038341 |
| | Kalil Municipal Building | | x | x | x | x | x | | 32.47701165 | -91.75657469 |
| | Magham Town Hall | | x | x | x | x | x | | 32.309064 | -91.775956 |
| | Richland Parish Courthouse | | x | x | x | x | x | | 32.47686753 | -91.75914869 |
| | Richland Parish Police Jury | | x | x | x | x | x | | 32.4767796 | -91.7593602 |
| **Fire & SAR** | Archibald-Alto Fire District 2 | | x | x | x | x | x | | 32.34900009 | -91.77470802 |
| | Dehli Fire Station #2 | | x | x | x | x | x | | 32.46809769 | -91.49209462 |
| | Delhi Fire Station | | x | x | x | x | x | | 32.4554098 | -91.492652 |
| | District 8 Fire Station | | x | x | x | x | x | | 32.44930919 | -91.76890254 |
| | DIstrict 8 Station | | x | x | x | x | x | | 32.54941192 | -91.75956134 |
| | Holly Ridge Fire District Station 3 | | x | x | x | x | x | | 32.43875713 | -91.66221001 |
| | Holly Ridge Station | | x | x | x | x | x | | 32.60977132 | -91.62715731 |
| | Hwy 133 Fire Station | | x | x | x | x | x | | 32.48039927 | -91.85902891 |
| | Mangham Fire Department | | x | x | x | x | x | | 32.24420976 | -91.8517206 |
| | Mangham Fire Department | | x | x | x | x | x | | 32.30472477 | -91.93152575 |
| | Mangham Fire District - Woolen Lake | | x | x | x | x | x | | 32.19322094 | -91.97290433 |
| | Rayville Fire Department | | x | x | x | x | x | | 32.47786782 | -91.75893939 |
| | Ward One Fire Department - Dunn Station | | x | x | x | x | x | | 32.5381566 | -91.5183461 |
| | Ward One Rural Fire Department | | x | x | x | x | x | | 32.4495127 | -91.5877201 |
| | Warden Station | | x | x | x | x | x | | | |
| **Law Enforcement** | Delhi Police Station | | x | x | x | x | x | | 32.45478966 | -91.49229258 |
| | Mangham Police Station | | x | x | x | x | x | | 32.309046 | -91.776039 |
| | Rayville Police Department | | x | x | x | x | x | | 32.47782813 | -91.75876206 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Richland Parish Detention Center | x | x | x | x | x | x | | 32.38828454 | -91.96634724 |
| | Richland Parish Sheriff's Office - Criminal and Narcotics Investigations Unit | | x | x | x | x | x | | 32.47588557 | -91.75910092 |
| **Public Health** | Richland Parish Hospital - Delhi | | x | x | x | x | x | | 32.4531028 | -91.4981287 |
| **Schools** | Delhi Elementary School | | x | x | x | x | x | | 32.46214958 | -91.4921692 |
| | Delhi High School | | x | x | x | x | x | | 32.46350064 | -91.49168774 |
| | Delhi Middle School | | x | x | x | x | x | | 32.46192779 | -91.48385972 |
| | Holly Ridge School | | x | x | x | x | x | | 32.46847217 | -91.62772647 |
| | Mangham Elementary School | | x | x | x | x | x | | 32.312369 | -91.786213 |
| | Mangham Junior/High School | | x | x | x | x | x | | 32.310274 | -91.786534 |
| | Rayville Elementary School | | x | x | x | x | x | | 32.46657005 | -91.76087612 |
| | Rayville High School | | x | x | x | x | x | | 32.4647701 | -91.7492187 |
| | Rayville Junior High School | | x | x | x | x | x | | 32.4647701 | -91.7492187 |
| | Start Elementary | | x | x | x | x | x | | 32.4874434 | -91.85762285 |

# Appendix D: Plan Adoption

## Richland Parish

***WILL UPDATE ONCE JURISDICTIONS FORMALLY ADOPT HMP AFTER FEMA REVIEW***

Town of Delhi

Town of Mangham

Town of Rayville

# 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

| Richland Parish Hazard Mitigation Planning Committee | | | |
|---|---|---|---|
| **Name** | **Title** | **Agency** | **Email** |
| Dawn Williams | Director | Richland Parish OHSEP | dwilliams@richlandso.org |
| Todd Smith | Regional Coordinator | GOHSEP | Todd.smith@la.gov |
| Perry Fleming | Chief of Police | Town of Mangham | manghampd@inetsouth.com |
| Harry Lewis | Mayor | Town of Rayville | mayor@townofrayville.com |
| Jesse Washington | Mayor | Town of Delhi | jwashington@thetownofdelhi.com |
| James Mardis | Director | Morehouse Parish OHSEP | jmardis@mpso.net |

## Capability Assessment

### Unincorporated Richland Parish

| Capability Assessment Worksheet - Richland 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) | Yes | |
| **Building Code, Permitting and Inspections** | **Yes/No** | **Comments** |
| Building Code | Yes | |
| Building Code Effectiveness Grading Schedule (BCEGS) Score | Yes | |
| Fire Department ISO/PIAL rating | Yes | |
| Site plan review requirements | Yes | |
| **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 | Yes | |
| Mitigation Planning Committee | Yes | |
| Maintenance programs to reduce risk (tree trimming, clearing drainage systems) | Yes | |
| **Staff** | **Yes/No** | **Comments** |
| Chief Building Official | Yes | |
| Floodplain Administrator | Yes | |
| Emergency Manager | Yes | |
| Community Planner | No | |
| Civil Engineer | Yes | |
| GIS Coordinator | Yes | |
| 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 | Yes | |
| 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 | No | |
| 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. | 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 | Yes | |
| Firewise Communities certification | Yes | |
| Public/Private partnership initiatives addressing disaster-related issues | Yes | |
| Other | No | |

## Town of Delhi

| Capability Assessment Worksheet - Delhi | | |
|---|---|---|
| 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 | Small Town |
| Capital Improvements Plan | No | " |
| Economic Development Plan | No | " |
| Local Emergency Operations Plan | No | " |
| Continuity of Operations Plan | No | " |
| Transportation Plan | Yes | Relies on parish capabilities |
| 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 | Small Town |
| Building Code Effectiveness Grading Schedule (BCEGS) Score | No | " |
| Fire Department ISO/PIAL rating | Yes | " |
| Site plan review requirements | No | " |
| **Land Use Planning and Ordinances** | **Yes/No** | **Comments** |
| Zoning Ordinance | Yes | Small Town |
| Subdivision Ordinance | No | " |
| Floodplain Ordinance | Yes | " |
| Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire) | No | " |
| Flood Insurance Rate Maps | Yes | Relies on parish capabilities |
| Acquisition of land for open space and public recreation uses | Yes | |

| Administration and Technical | | |
|---|---|---|
| Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments. | | |
| **Administration** | **Yes/No** | **Comments** |
| Planning Commission | Yes | Relies on parish capabilities |
| Mitigation Planning Committee | Yes | Relies on parish capabilities |
| Maintenance programs to reduce risk (tree trimming, clearing drainage systems) | Yes | |
| **Staff** | **Yes/No** | **Comments** |
| Chief Building Official | No | |
| Floodplain Administrator | Yes | Relies on parish capabilities |
| Emergency Manager | Yes | Relies on parish capabilities |
| Community Planner | No | |
| Civil Engineer | No | |
| GIS Coordinator | No | |
| Grant Writer | No | |
| Other | | |
| **Technical** | **Yes/No** | **Comments** |
| Warning Systems / Service (Reverse 911, outdoor warning signals) | No | |
| Hazard Data & Information | Yes | |
| Grant Writing | Yes | |
| 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 | |

## Town of Mangham

| Capability Assessment Worksheet - Mangham | | |
|---|---|---|
| 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 | Small Town |
| Capital Improvements Plan | No | " |
| Economic Development Plan | No | " |
| Local Emergency Operations Plan | No | " |
| Continuity of Operations Plan | No | " |
| Transportation Plan | Yes | Relies on parish capabilities |
| 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 | Small Town |
| Building Code Effectiveness Grading Schedule (BCEGS) Score | No | " |
| Fire Department ISO/PIAL rating | Yes | " |
| Site plan review requirements | No | " |
| **Land Use Planning and Ordinances** | **Yes/No** | **Comments** |
| Zoning Ordinance | Yes | Small Town |
| Subdivision Ordinance | No | " |
| Floodplain Ordinance | Yes | " |
| Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire) | No | " |
| Flood Insurance Rate Maps | Yes | Relies on parish capabilities |
| Acquisition of land for open space and public recreation uses | Yes | |
| 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 | Yes | Relies on parish capabilities |
| Mitigation Planning Committee | Yes | Relies on parish capabilities |
| Maintenance programs to reduce risk (tree trimming, clearing drainage systems) | No | |
| **Staff** | **Yes/No** | **Comments** |
| Chief Building Official | No | |
| Floodplain Administrator | Yes | Relies on parish capabilities |
| Emergency Manager | Yes | Relies on parish capabilities |
| Community Planner | No | |
| Civil Engineer | No | |
| GIS Coordinator | No | |
| Grant Writer | No | |
| Other | | |
| **Technical** | **Yes/No** | **Comments** |
| Warning Systems / Service (Reverse 911, outdoor warning signals) | Yes | Alert FM |
| Hazard Data & Information | Yes | |
| Grant Writing | Yes | |
| 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 | |

## Town of Rayville

| Capability Assessment Worksheet - Rayville | | |
|---|---|---|
| Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible. | | |
| **Planning and Regulatory** | | |
| Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place. | | |
| **Plans** | **Yes/No** | **Comments** |
| Comprehensive / Master Plan | No | |
| Capital Improvements Plan | Yes | |
| Economic Development Plan | Yes | |
| Local Emergency Operations Plan | Yes | |
| 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 | Yes | |
| Fire Department ISO/PIAL rating | 4,5 | |
| 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 | Yes | |
| 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 | Yes | |
| 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 | Yes | |
| 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) | 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) | 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 | |

## Building Inventory

| Richland Parish and Jurisdiction Owned Building Information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unincorporated Richland Parish** | | | | | | | | |
| **Name of Building** | **Purpose of Building** | **Address** | **City** | **Latitude** | **Longitude** | **Assessed Value** | **Date Built** | **Construction Type** |
| Start Elementary | Education | 883 Charleston Drive | Start | 32.4874434 | -91.85762285 | | 1960 | Concrete |
| Mangham Fire District - Woolen Lake | Fire Search and Rescue | Nearby: 2816 Louisiana 561 | Columbia | 32.19322094 | -91.97290433 | | 2000 | Metal |
| DIstrict 8 Station | Fire Search and Rescue | Nearby: U.S. 425 | Oak Ridge | 32.54941192 | -91.75956134 | | 2000 | Metal |
| **Town of Delhi** | | | | | | | | |
| **Name of Building** | **Purpose of Building** | **Address** | **City** | **Latitude** | **Longitude** | **Assessed Value** | **Date Built** | **Construction Type** |
| Delhi Fire Station | Fire Search and Rescue | 209 Broadway Street | Delhi | 32.4554098 | -91.492652 | | 1970 | Concrete |
| Delhi Town Hall | Civil Government | 210 Broadway Street | Delhi | 32.45520158 | -91.49271101 | | 1950 | Concrete |
| Delhi Police Station | Law Enforcement | 304 East Tennessee Street | Delhi | 32.45478966 | -91.49229258 | | 1950 | Unreinforced Masonry |
| Delhi High School | Education | 413 Main Street | Delhi | 32.46350064 | -91.49168774 | | 1960 | Concrete |
| Delhi Elementary School | Education | 509 Main Street | Delhi | 32.46214958 | -91.4921692 | | 1960 | Concrete |
| Delhi Middle School | Education | 106 Toombs Street | Delhi | 32.46192779 | -91.48385972 | | 1960 | Concrete |
| **Town of Mangham** | | | | | | | | |
| **Name of Building** | **Purpose of Building** | **Address** | **City** | **Latitude** | **Longitude** | **Assessed Value** | **Date Built** | **Construction Type** |
| Mangham Fire Station | Fire Search and Rescue | 511 Horace Street | Mangham | 32.308368 | -91.776896 | | 1960 | Metal |
| Mangham Town Hall | Civil Government | 306 Main Street | Mangham | 32.309064 | -91.775956 | | 1950 | Concrete |
| Mangham Police Station | Law Enforcement | 306 Main Street | Mangham | 32.309046 | -91.776039 | | 1950 | Concrete |
| Mangham Junior/High School | Education | 810 McConnel Street | Mangham | 32.310274 | -91.786534 | | 1960 | Concrete |
| Mangham Elementary School | Education | 419 Hixon Street | Mangham | 32.312369 | -91.786213 | | 1960 | Concrete |
| Mangham Fire Department | Fire Search and Rescue | Nearby: Louisiana 135 | Mangham | 32.24420976 | -91.8517206 | | 1950 | Concrete |
| **Town of Rayville** | | | | | | | | |
| **Name of Building** | **Purpose of Building** | **Address** | **City** | **Latitude** | **Longitude** | **Assessed Value** | **Date Built** | **Construction Type** |
| Rayville Elementary School | Education | #1 Learning Place | Rayville | 32.46657005 | -91.76087612 | | 1950 | Concrete |
| Holly Ridge School | Education | Nearby: State Route 183 | Rayville | 32.46847217 | -91.62772647 | | 1960 | Concrete |
| District 8 Fire Station | Fire Search and Rescue | Nearby: Louisiana 135 | Rayville | 32.44930919 | -91.76890254 | | 1980 | Metal |
| Archibald-Alto Fire District 2 | Fire Search and Rescue | Nearby: Long Street | Rayville | 32.34900009 | -91.77470802 | | 1980 | Metal |
| Holly Ridge Fire District Station 3 | Fire Search and Rescue | Nearby: Mengel Road | Rayville | 32.43875713 | -91.66221001 | | 1980 | Metal |
| Rayville Fire Department | Fire Search and Rescue | 902 Harrison Street | Rayville | 32.47786782 | -91.75893939 | | 1950 | Concrete |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Dehli Fire Station #2 | Fire Search and Rescue | Nearby: Superior Drive | Rayville | 32.46809769 | -91.49209462 | | 1960 | Concrete |
| Holly Ridge Station | Fire Search and Rescue | Nearby: 72 Clack Road | Rayville | 32.60977132 | -91.62715731 | | 1980 | Metal |
| Mangham Fire Department | Fire Search and Rescue | Nearby: Louisiana 132 | Rayville | 32.30472477 | -91.93152575 | | 1980 | Metal |
| Hwy 133 Fire Station | Fire Search and Rescue | 37 Solon Bennett Rd | Rayville | 32.48039927 | -91.85902891 | | 1980 | Metal |
| Rayville Police Department | Law Enforcement | Nearby: 900 Harrison Street | Rayville | 32.47782813 | -91.75876206 | | 1950 | Concrete |
| Richland Parish Sheriff's Office - Criminal and Narcotics Investigations Unit | Law Enforcement | Nearby: 822-898 U.S. 425 | Rayville | 32.47588557 | -91.75910092 | | 2002 | Concrete |
| Richland Parish Detention Center | Prisons and Correctional Facilities | Nearby: Louisiana 15 | Rayville | 32.38828454 | -91.96634724 | | 1950 | Concrete |
| Richardson Medical Center | Hospital or Medical Center | 254 LA Hwy 3048 | Rayville | 32.463187 | -91.749179 | | 1940 | Concrete |
| Fifth District Drug Court & Hearing Officer | Civil Government | Nearby: 613 South Eugene Street | Rayville | 32.47576681 | -91.76038341 | | 2000 | Concrete |
| Richland Parish Police Jury | Civil Government | 708 Julia Street Ste 402 | Rayville | 32.48008518 | -91.76698362 | | 1930 | Concrete |
| Richland Voluntary Council on Aging | Civil Government | Nearby: 901-909 Spruce Street | Rayville | 32.4777495 | -91.75355697 | | 1990 | concrete |
| Kalil Municipal Building | Civil Government | Nearby: 706 Harrison Street | Rayville | 32.47701165 | -91.75657469 | | 1980 | concrete |
| Richland Parish Courthouse | Civil Government | 708 Julia Street | Rayville | 32.47686753 | -91.75914869 | | 1930 | concrete |

## Vulnerable Populations

| Vulnerable Populations Worksheet | | | | | |
|---|---|---|---|---|---|
| **Richland Parish and Jurisdictions** | | | | | |
| **All Hospitals (Private or Public)** | **Street** | **City** | **Zip Code** | **Latitude** | **Longitude** |
| Richland Parish Hospital | 407 Cincinnati Street | Delhi | 71232 | 32.45377118 | -91.49397701 |
| Richardson Medical Center | 254 LA Hwy 3048 | Rayville | 71269 | 32.463187 | -91.749179 |
| **Nursing Homes (Private or Public)** | **Street** | **City** | **Zip Code** | **Latitude** | **Longitude** |
| Deerfield Nursing Home | 522 Main Street | Delhi | 71232 | 32.46043865 | -91.49252862 |
| Richardson Medical Center Homecare | 1612 Julia St. | Rayville | 71269 | 32.46304086 | -91.76068832 |
| Richland Centre I - Elderly Housing | Nearby: 401-423 Madeline Street | Rayville | 71269 | 32.4759503 | -91.75676946 |
| Richland Hospice LLC | 403 Spencer Street # B | Rayville | 71269 | 32.47206991 | -91.75823528 |
| Richardson Medical Center Home Care | 1612 Julia St. | Rayville | 71269 | 32.46732099 | -91.76006972 |
| **Mobile Home Parks** | **Street** | **City** | **Zip Code** | **Latitude** | **Longitude** |
| Broadway Street Mobile Home Park | 916 Broadway Street | Delhi | 71232 | 32.44728428 | -91.49302885 |
| Chicago Street Mobile Home Park | 406 Chicago Street | Delhi | 71232 | 32.45385266 | -91.49669006 |
| Second Street Mobile Home Park | 102 Second Steet | Delhi | 71232 | 32.45821848 | -91.48882583 |

## National Flood Insurance Program (NFIP)

| National Flood Insurance Program (NFIP) | | | | |
|---|---|---|---|---|
| | **Richland Parish** | **Town of Delhi** | **Town of Mangham** | **Town of Rayville** |
| **Insurance Summary** | | | | |
| How many NFIP polices are in the community? What is the total premium and coverage? | 282, $125,245.00, $61,325,500.00 | 15, $5,488.00, $4,776,200.00 | 9, $3,379.00, $2,056,000.00 | 105, $62,225.00, $16,621,100.00 |
| How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage? | 219, $6,143,805.00, 38 | 29, $189,021.00, 3 | 1, $72,493.00, 1 | 179, $4,260,554.00, 28 |
| 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? | Yes | Yes | Yes | Yes |
| 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-10/3/2018, CAC-6/2/2004 | CAV-5/18/2005 CAC-4/25/2012 | CAV-5/18/2005, CAC-3/17/2022 | CAV-5/19/2005, CAC-10/13/2022 |
| Is a CAV or CAC scheduled or needed? If so when? | No | No | No | No |
| **Regulation** | | | | |
| When did the community enter the NFIP? | E-5/14/1973, R-8/1/1987 | E-3/6/1975 R-1/8/1980 | E-8/2/1974, R-10/9/1979 | E-5/14/1973, R-9/3/1980 |
| Are the FIRMs digital or paper? | Digital | Digital | Digital | Digital |
| 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? | | No | No | |