



SABINE

PARISH HAZARD MITIGATION

UPDATE – 2016



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SABINE PARISH

HAZARD MITIGATION PLAN UPDATE

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Sabine Parish



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Unincorporated Sabine Parish
 Village of Converse
 Village of Fisher
 Village of Florien
 Town of Many
 Village of Noble
 Village of Pleasant Hill
 Town of Zwolle

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Location, Demography, and Economy

Location

Sabine Parish is located in west-central Louisiana, just west of the Mississippi River and the industrial corridor that stretches along the river between Baton Rouge and New Orleans. The parish is surrounded by DeSoto Parish to the north; Natchitoches Parish to the east; Vernon Parish to the south; and Shelby and Sabine Counties, Texas to the east. Toledo Bend Reservoir Lake spans the entire western border of the parish. Sabine Parish covers approximately 1,012 square miles, of which 867 square miles is land and 145 square miles is water.

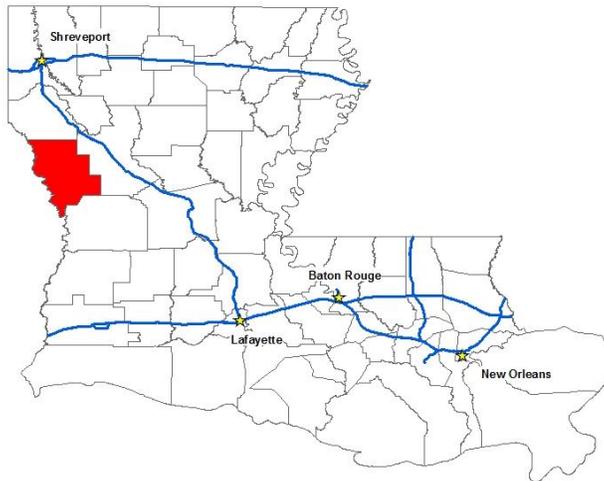


Figure 1-1: Location of Sabine Parish within the State of Louisiana

Sabine Parish lies in the valley of the Sabine River for which it is named. The parish is popularly referred to as Toledo Bend Country, for its 186,000-acre man-made reservoir filled with bass, bream, crappie and catfish. Most of Sabine Parish is covered in forest land but there are significant portions that are covered with water and used for agricultural purposes. Topography for most of the parish is best described as rolling hills.

Hodges Gardens State Park, famous for its botanical gardens and located along U.S. Highway 171 between Many and Leesville, is a popular recreation spot in Sabine Parish. The parish is also home to Toledo Bend State Park, as well as the Sabine Wildlife Management Area.

Sabine Parish is located in Louisiana Governor’s Office of Homeland Security and Emergency Preparedness (GOHSEP) Region 6.

As noted above, Sabine Parish is located in the west-central region of Louisiana.



Figure 1-2: Louisiana Homeland Security Regions

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

	2010 Census	2013 Census	(Current Yr) Estimate	Percent Change 2010 -2013	Percent Change 2010 -(Current Year)
Total Population	24,233	24,257	24,199	0.10%	-0.10%
Population Density (Pop/Sq Mi)	28	—	—	—	—
Total Households	9,175	9,175	—	—	—

Economy

Connected by rail, air, three nearby ports and access to Interstate 49, Sabine Parish appeals to a wide range of commercial and manufacturing establishments. Sabine Parish has become known as the Land of Green Gold, since timber and forestry represents the area's most prominent industry of more than a century. The poultry and livestock industries are also major contributors to the Sabine Parish economy. However, due to the abundance of recreational facilities located within the parish, the tourism industry within Sabine Parish is growing rapidly.

Industry data for business patterns in Sabine Parish can be found in the table below:

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

Business Description	Number of Employees	Number of Establishments	Annual Payroll (\$1,000)
Retail Trade	877	82	19,874
Manufacturing	798	18	38,129
Health Care and Social Assistance	845	46	21,214
Mining, Quarrying, Oil and Gas Extraction	20-99	14	—
Transportation and Warehousing	100-249	21	5,308
Construction	246	44	6,516
Administration and Support and Waste Management and Remediation Services	20-99	10	855
Real Estate and Rental and Leasing	20-99	13	814
Wholesale Trade	144	15	4,336
Other Services (except Public Administration)	212	57	4,284
Accommodation and Food Services	262	24	3,069
Financial and Insurance	250-499	36	—

Professional, Scientific, and Technical Services	257	56	17,014
Information	20-99	5	—
Educational Services	0-19	1	—
Arts, Entertainment, and Recreation	0-19	2	—
Management of Companies and Enterprises	0-19	1	—
Agriculture, Forestry, Fishing and Hunting	210	33	8,736
Utilities	20-99	3	—

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

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

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

- Unincorporated Sabine Parish
- Village of Converse
- Village of Fisher
- Village of Florien
- Town of Many
- Village of Noble
- Village of Pleasant Hill
- Town of Zwolle

Although the Choctaw-Apache Tribe of Ebarb participated in the 2011 Hazard Mitigation Plan, the tribe has chosen to not participate in the 2016 Hazard Mitigation Plan update process.

The Federal Emergency Management Agency (FEMA), now under the Department of Homeland Security, has made reducing losses from natural disasters one of its primary goals. The Hazard Mitigation Plan (HMP) and subsequent implementation of recommended projects, measures, and policies is the primary means to

achieving these goals. Mitigation planning and project implementation has become even more significant in a post-Katrina and Rita environment in south Louisiana.

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

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

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

Planning is one of the best ways to correct these shortcomings and produce a program of activities that will best mitigate the impact of local hazards and meet other local needs. A well-prepared plan will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most appropriate and efficient solutions. It can also ensure that activities are coordinated with each other and with other goals and programs, preventing conflicts and reducing the costs of implementing each individual activity.

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

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

Hazard Mitigation

To fully understand hazard mitigation efforts in Sabine Parish and throughout Louisiana, it is first crucial to understand how hazard mitigation relates to the broader concept of emergency management. In the early 1980s, the newly-created Federal Emergency Management Agency (FEMA) was charged with developing a structure for how the federal, state, and local governments would respond to disasters. FEMA developed the *four phases of emergency management*, an approach which can be applied to all disasters.

The four phases are as follows:

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

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

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



Figure 1-3: The Four Phases of Emergency Management and their Relation to Future Hazard Mitigation

(Source: Louisiana State Hazard Mitigation Plan 2014)

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

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

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

General Strategy

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

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

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

- Section One Introduction
- Section Two Planning Process
- Section Three Risk Assessment
- Section Four Mitigation Strategy
- Section Five Plan Maintenance Procedures
- Section Six Conclusion
- Appendices

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

2016 Plan Update

This 2016 plan update proceeds with the previous goals of the Sabine Parish Hazard Mitigation Plan, although they were amended slightly in order to reflect this plan's focus on natural hazards. The revised goals are as follows:

- Mitigate impacts from loss of electricity and telephone service due to severe winter storms, tornados, windstorms, and hurricanes

- Improve communication capabilities for emergency agencies and vehicles before, during, and after severe winter storms, tornados, windstorms, and hurricanes
- Minimize losses to existing and future structures and infrastructure from flooding
- Provide for functioning and reestablishment of government in the event of tornados, windstorms, hurricanes, and severe winter storms
- Lessen the impact on life and safety due to flooding, tornados, windstorms, hurricanes, severe winter storms, and drought
- Develop public education programs for dealing with flooding, tornados, windstorms, hurricanes, severe winter storms, and drought

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

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

Table 1-4: Plan Crosswalk

2011 Plan	Revised Plan (2016)
Section 1: Introduction	Section 1: Introduction
Section 2: Planning Process	Appendix A: Planning Process
Section 3: Risk Assessment	Section 2: Hazard Identification and Risk Assessment
Section 4: Mitigation Strategy	Section 4: Mitigation Strategy
Section 5: Plan Maintenance Procedures	Appendix B: Plan Maintenance
Section 6: Conclusion	Section 1: Introduction
Appendices	Appendices

Despite changes in this plan update, the plan remains consistent in its emphasis on the few types of hazards that pose the most risk to loss of life, injury, and property in Sabine Parish and its municipalities. The extent

of this risk is dictated primarily by its geographic location. Most significantly, Sabine Parish remains at high risk of water inundation from various sources, including severe winter storms, 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 Sabine 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 Sabine Parish Hazard Mitigation Plan published in 2011, as well as the hazards that were identified in the State's 2014 Hazard Mitigation Plan that were considered to be of high or medium risk for the parish by the state. Those hazards identified as high or medium risk by the state or previously identified as a risk by the parish, have been determined to provide a risk to the parish and will be profiled in this section.

Table 2-1: Hazard Profile Summary

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

+ Data deficiency

Prevalent Hazards to the Community

While many of the hazards identified in *Table 2-1* occur in the parish, their occurrence was not merited for further study by the planning committee. The determination was made to focus attention and resources on the most prevalent hazards, which include the hazards previously profiled. Dam failure hazard claims a data deficiency.

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

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

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)
- High wind damage most commonly resulting from hurricanes, thunderstorms, and tornadoes
- Property and crop damage resulting from drought and wildfires

The potential destructive power of tropical cyclones determined to be the most prevalent hazards to the parish. Five of the eleven Presidential Declarations that Sabine Parish has received resulted from tropical cyclones, which validates this as the most significant hazard. Therefore, the issue of hurricanes 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 fairly common occurrences, and resultant wind damage is of utmost concern. Damage from high winds can include roof damage, destruction of homes and commercial buildings, downed trees and power lines, and damage and disruption to services caused by heavy debris. A wind map for Sabine Parish is included in the hurricane risk assessment.

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

Previous Occurrences

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

Table 2-2: Sabine Parish Major Disaster Declarations

Disaster Declaration Number	Date	Type of Disaster
3031	2/22/1977	Drought and Freezing
829	5/20/1989	Severe Storms and Flooding
835	7/17/1989	Tropical Cyclone - Tropical Storm Allison
1264	1/21/1999	Severe Ice Storm
2337	9/11/2000	LA – Western Louisiana Fire Complex
3172	2/1/2003	Loss of Space Shuttle Columbia
1603	8/19/2005	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
1792	9/13/2008	Tropical Cyclone – Hurricane Ike

Probability of Future Hazard Events

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

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

Table 2-3: Probability of Future Hazard Reoccurrence

Hazard	Probability							
	Sabine Parish (Unincorporated)	Converse	Fisher	Florien	Many	Noble	Pleasant Hill	Zwolle
Drought	8%	8%	8%	8%	8%	8%	8%	8%
Flooding	24%	20%	4%	8%	44%	8%	8%	12%
Thunderstorms (Hail)	28%	28%	28%	28%	28%	28%	28%	28%
Thunderstorms (Lightning)	16%	16%	16%	16%	16%	16%	16%	16%
Thunderstorms (Wind)	100%	100%	100%	100%	100%	100%	100%	100%
Tornadoes	28%	28%	28%	28%	28%	28%	28%	28%
Tropical Cyclones	16%	16%	16%	16%	16%	16%	16%	16%
Wildfires	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Winter Storms	40%	40%	40%	40%	40%	40%	40%	40%
Dam Failure	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

As shown in *Table 2-3*, thunderstorm winds for the entire planning area have the highest annual chance of occurrence in the parish (100%), followed by flooding for the incorporated area Many (44%). Flood events in the remaining incorporated areas and unincorporated area have a slightly lower chance of occurring annually. Winter storms have a 40% annual chance of reoccurrence, followed by tornadoes and hail (28%), tropical cyclones and lightning (16%), and drought (8%). Wildfires have the lowest chance of occurrence in Sabine Parish calculated at less than 1%. The hazard of dam failure claims a data deficiency.

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 \$3,656,522,000 in structures throughout the parish. The tables on the following page provide the total estimated value for each type of structure by occupancy.

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

Occupancy	Sabine Parish	Unincorporated Sabine	Converse	Fisher	Florien
Agricultural	\$13,566,000	\$12,304,000	\$0	\$0	\$0
Commercial	\$532,123,000	\$198,614,000	\$3,388,000	\$4,844,000	\$14,224,000
Government	\$45,427,000	\$11,093,000	\$470,000	\$168,000	\$1,782,000
Industrial	\$104,401,000	\$91,382,000	\$1,231,000	\$0	\$1,499,000
Religion	\$140,088,000	\$95,408,000	\$922,000	\$830,000	\$3,808,000
Residential	\$2,783,297,000	\$2,163,955,000	\$39,626,000	\$0	\$60,450,000
Education	\$37,620,000	-\$10,472,000	\$3,810,000	\$21,320,000	\$0
Total	\$3,656,522,000	\$2,562,284,000	\$49,447,000	\$27,162,000	\$81,763,000

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

Occupancy	Many	Noble	Pleasant Hill	Zwolle
Agricultural	\$1,092,000	\$0	\$170,000	\$0
Commercial	\$213,657,000	\$4,000	\$86,835,000	\$10,557,000
Government	\$30,280,000	\$0	\$874,000	\$760,000
Industrial	\$6,607,000	\$600,000	\$0	\$3,082,000
Religion	\$28,034,000	\$0	\$5,988,000	\$5,098,000
Residential	\$269,505,000	\$26,005,000	\$65,375,000	\$158,381,000
Education	\$13,168,000	\$0	\$5,270,000	\$4,524,000
Total	\$562,343,000	\$26,609,000	\$164,512,000	\$182,402,000

Essential Facilities of the Parish

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

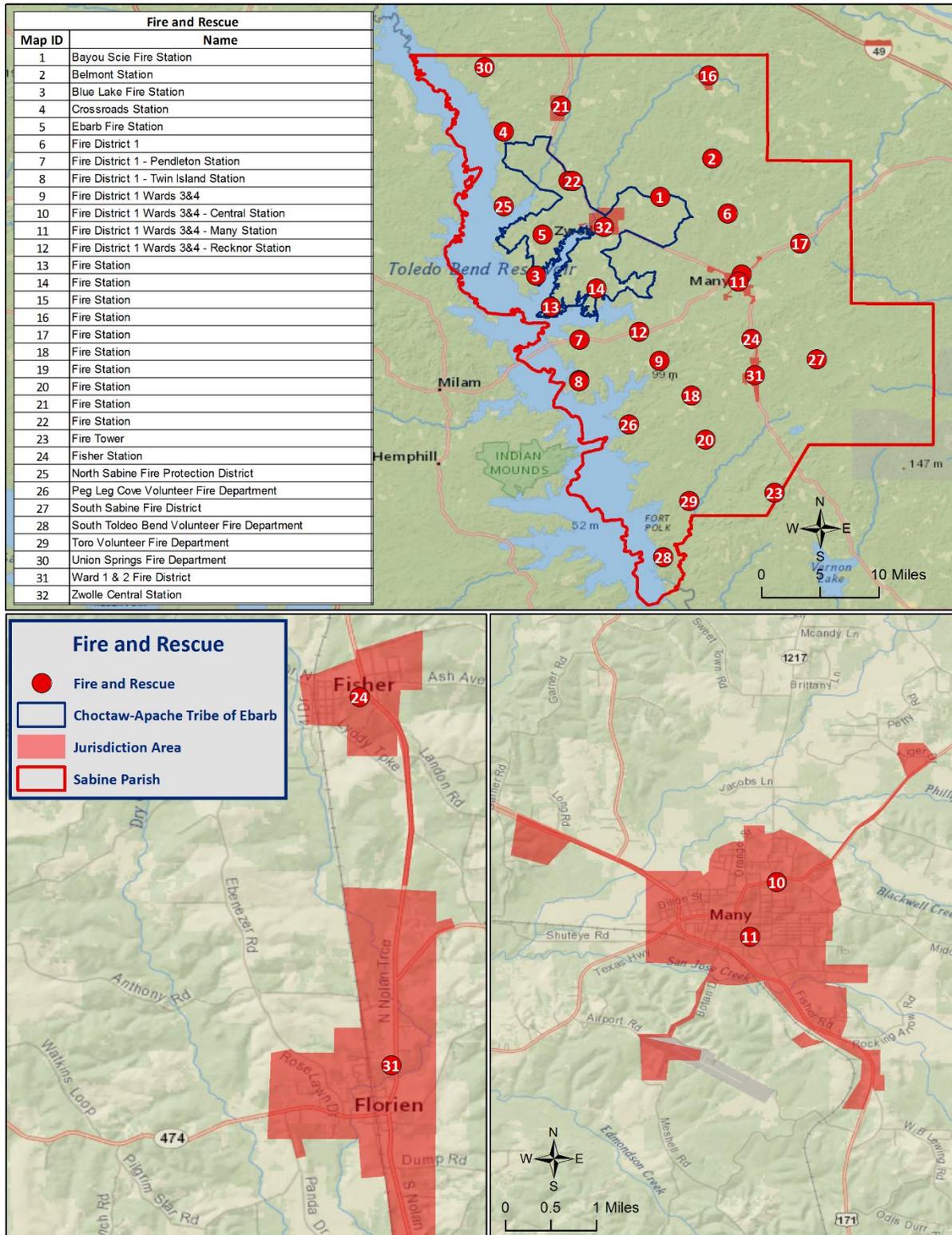
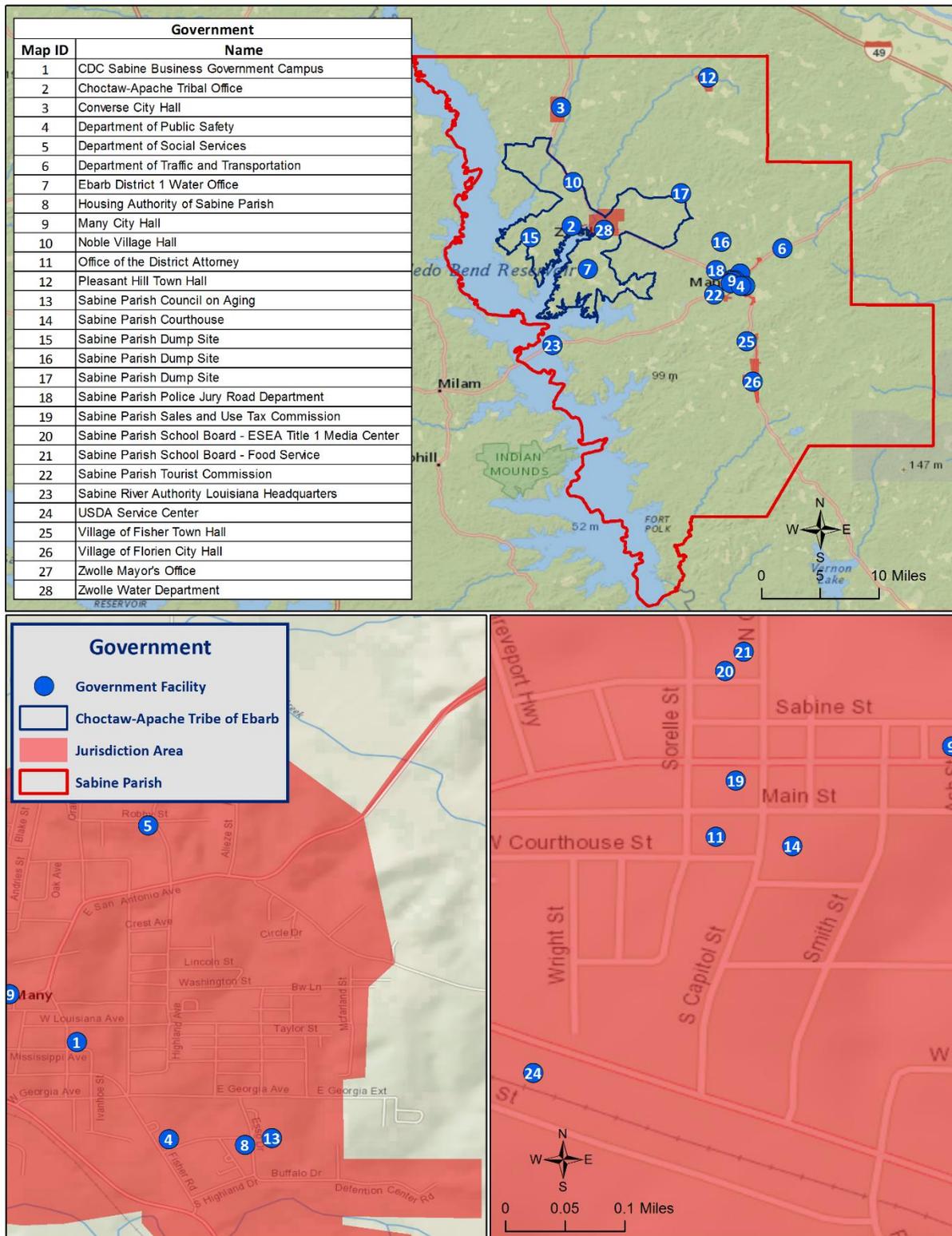


Figure 2-1: Fire and Rescue Buildings in Sabine Parish



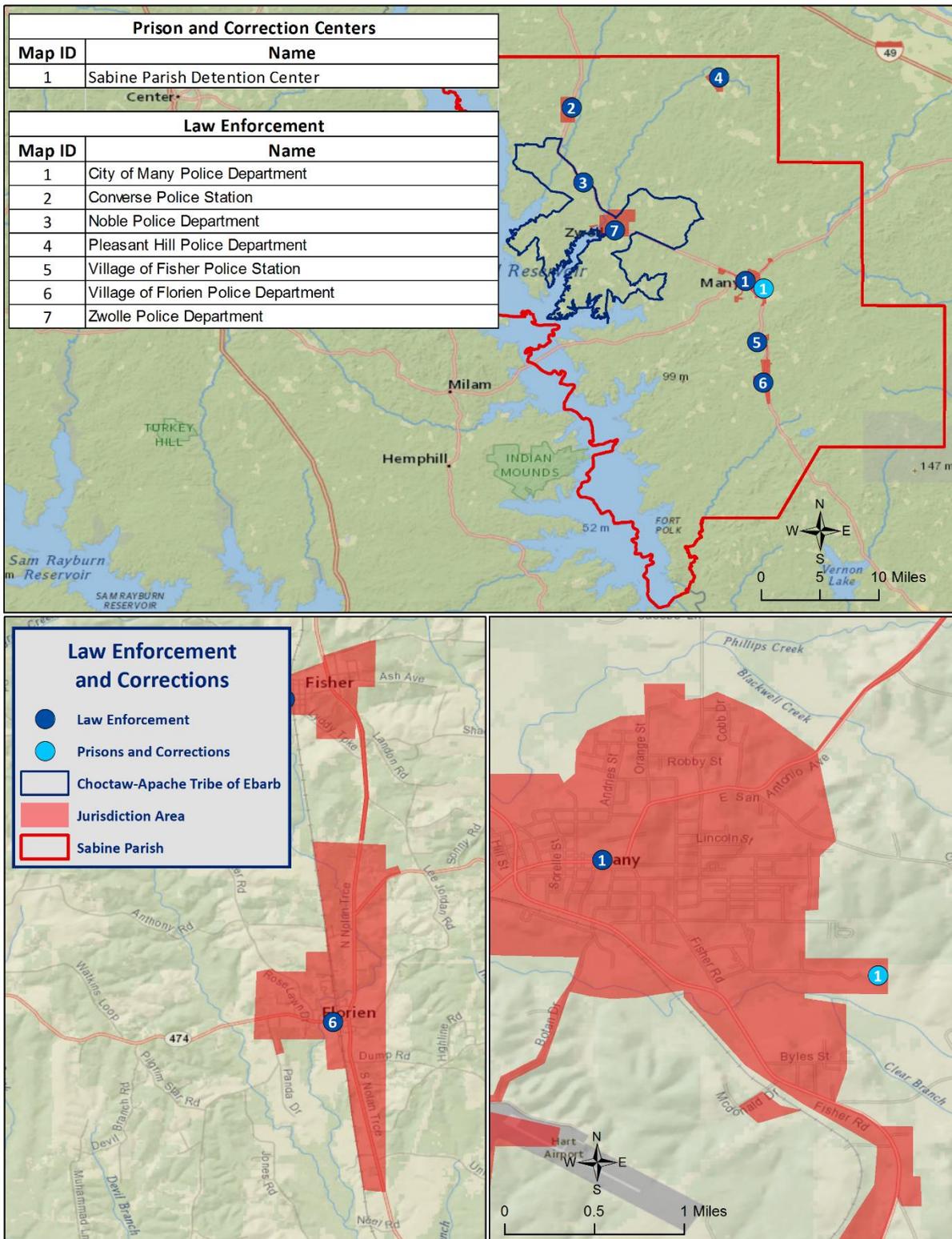


Figure 2-3: Law Enforcement and Correction Buildings in Sabine Parish

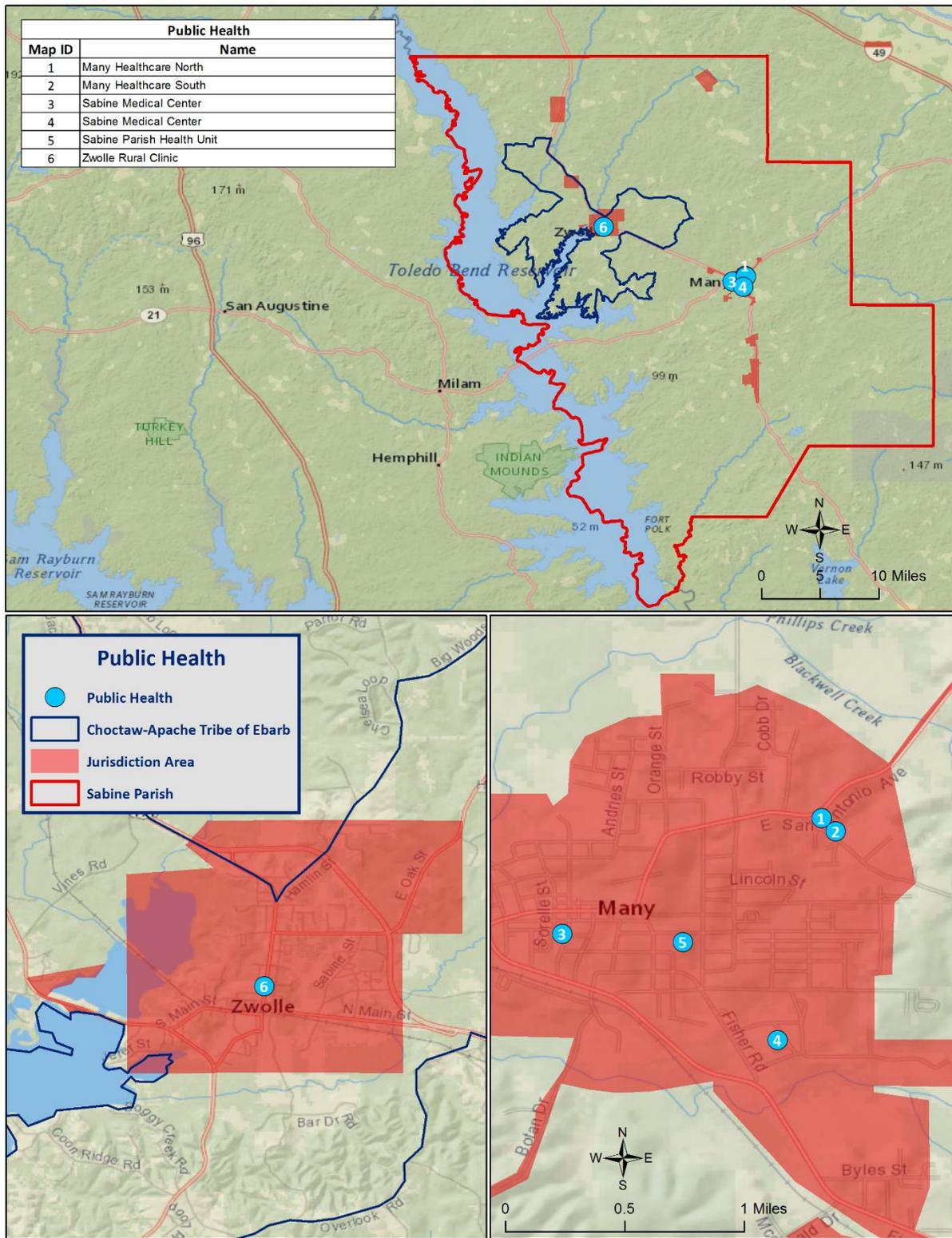


Figure 2-4: Public Health Buildings in Sabine Parish

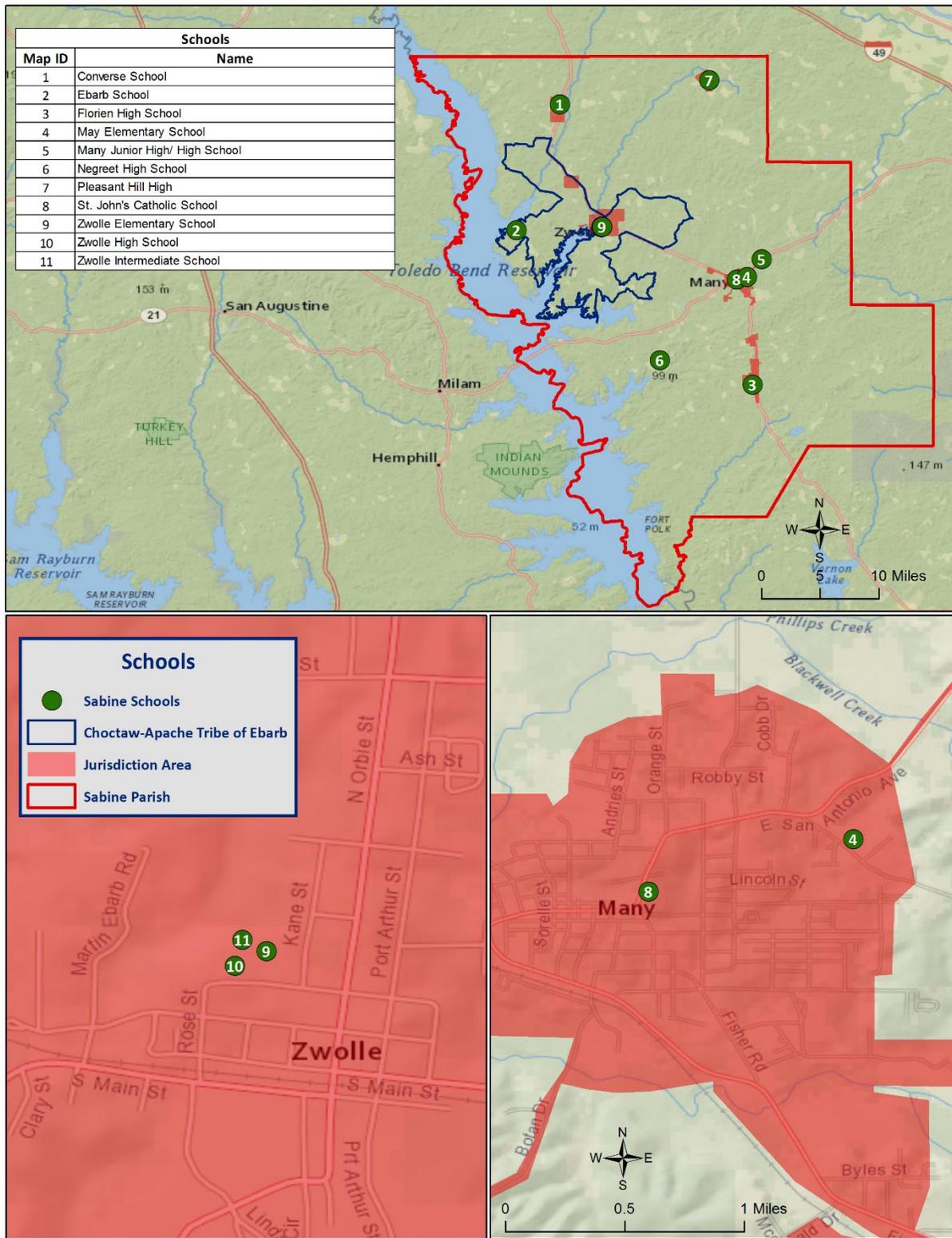


Figure 2-5: School Buildings in Sabine Parish

Future Development Trends

Sabine Parish experienced a small growth in population and housing between the years of 2000 and 2014, growing from a population of 23,475 with 13,671 housing units in 2000 to a population of 24,199 with 14,284 housing units in 2014. This growth was largely in the incorporated area of Converse from the years 2000 to 2010, and in the incorporated area of Zwolle from 2010 to 2014. The future population and number of buildings can be estimated using U.S. Census Bureau housing and population data. The following tables show population and housing unit estimates from 2000 to 2014:

Table 2-5: Population Growth Rate for Sabine Parish

Total Population	Sabine Parish	Sabine Unincorporated	Converse	Fisher	Florien	Many	Noble	Pleasant Hill	Zwolle
1-Apr-00	23,475	16,353	405	268	715	2,970	255	773	1,736
1-Apr-10	24,229	17,340	440	230	633	2,852	252	723	1,759
1-Jul-14	24,199	17,160	440	228	630	2,797	251	718	1,975
Population Growth between 2000 – 2010	3.2%	6.0%	8.6%	-14.2%	-11.5%	-4.0%	-1.2%	-6.5%	1.3%
Average Annual Growth Rate between 2000 – 2010	0.3%	0.6%	0.9%	-1.4%	-1.1%	-0.4%	-0.1%	-0.6%	0.1%
Population Growth between 2010 – 2014	-0.1%	-1.0%	0.0%	-0.9%	-0.5%	-1.9%	-0.4%	-0.7%	12.3%
Average Annual Growth Rate between 2010 – 2014	-0.03%	-0.26%	0.0%	-0.22%	-0.12%	-0.48%	-0.10%	-0.17%	3.07%

Table 2-6: Housing Growth Rate for Sabine Parish

Total Housing Units	Sabine Parish	Sabine Unincorporated	Converse	Fisher	Florien	Many	Noble	Pleasant Hill	Zwolle
1-Apr-00	13,671	10,612	202	107	312	1,272	104	337	725
1-Apr-10	14,130	11,056	196	108	304	1,194	109	362	801
1-Jul-14	14,284	11,068	196	96	264	1,296	114	379	871
Housing Growth between 2000 – 2010	3.4%	4.2%	-3.0%	0.9%	-2.6%	-6.1%	4.8%	7.4%	10.5%
Average Annual Growth Rate between 2000 – 2010	0.3%	0.4%	-0.3%	0.1%	-0.3%	-0.6%	0.5%	0.7%	1.0%
Housing Growth between 2010 – 2014	1.1%	0.1%	0.0%	-11.1%	-13.2%	8.5%	4.6%	4.7%	8.7%
Average Annual Growth Rate between 2010 – 2014	0.3%	0.0%	0.0%	-2.8%	-3.3%	2.1%	1.1%	1.2%	2.2%

As shown in the previous tables, Sabine Parish has experienced slight growth in both population and housing units. Housing growth rates grew at 0.3% annually from 2000 to 2010, and at 0.3% annually from 2010 to 2014. Population growth rates for the parish were at 0.3% annually from 2000 to 2010, and declined at a rate of -0.03% annually from 2010 to 2014. From 2000 to 2010, the incorporated area of Converse had the largest increase in population at 8.6%, followed by the unincorporated areas of Sabine Parish at 6%. The incorporated area of Fisher had the largest decrease in population during this time period at -14.2%. From 2010 to 2014, Zwolle experienced the largest growth in population at 12.3%.

The incorporated area of Zwolle experienced the largest increase in housing units from 2000 to 2010 at 10.5%, followed by the incorporated area of Pleasant Hill at 7.4%. The only areas in Sabine Parish to experience a decline in housing units during this time period were Many and Converse at -6.1% and -3% respectively. From 2010 to 2014, the incorporated area of Zwolle continued to lead in housing growth with an annual growth rate of 2.2%.

Future Hazard Impacts

Hazard impacts were estimated for five years and ten years in the future (2019 and 2024). Yearly population and housing growth rates were applied to parish inventory assets for composite flood and tropical cyclones. Based on a review of available information, it is assumed that population and housing units will continue to grow slightly within Sabine Parish from the present until 2024. 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%. No changes in development have impacted the community's vulnerability since the plans last update.

Table 2-7: Estimated Future Impacts, 2019-2024

(Source: Hazus, US Census Bureau)

Hazard / Impact	Total in Parish (2014)	Hazard Area (2014)	Hazard Area (2019)	Hazard Area (2024)
Flood Damage				
Structures	14,284	3,621	3,671	3,721
Value of Structures	\$3,656,522,000	926918443.7	988523294.6	1054222527
# of People	24,199	6,134	6,125	6,115
Tropical Cyclone Damage				
Structures	14,284	14,284	14,480	14,678
Value of Structures	\$3,656,522,000	\$3,656,522,000	\$3,899,541,755	\$4,158,713,088
# of People	24,199	24,199	24,162	24,124

Land Use

The Sabine Parish Land Use table is provided below. Residential, commercial, and industrial areas account for only 4% of the parish's land use. Forested land is the largest category at 310,131 acres, accounting for 61% of parish land. At 81,359 acres, water areas account for 16% of parish lands, while 71,999 acres of wetlands account for 14% of parish lands. The parish also consists of 25,569 acres of agricultural areas, accounting for 5% of all parish lands.

Table 2-8: Sabine Parish Land Use

(Source: USGS Land Use Map)

Land Use	Acres	Percentage
Agricultural Land, Cropland, and Pasture	25,569	5%
Wetlands	71,999	14%
Forest Land (not including forested wetlands)	310,131	61%
Urban/Development	21,892	4%
Water	81,359	16%

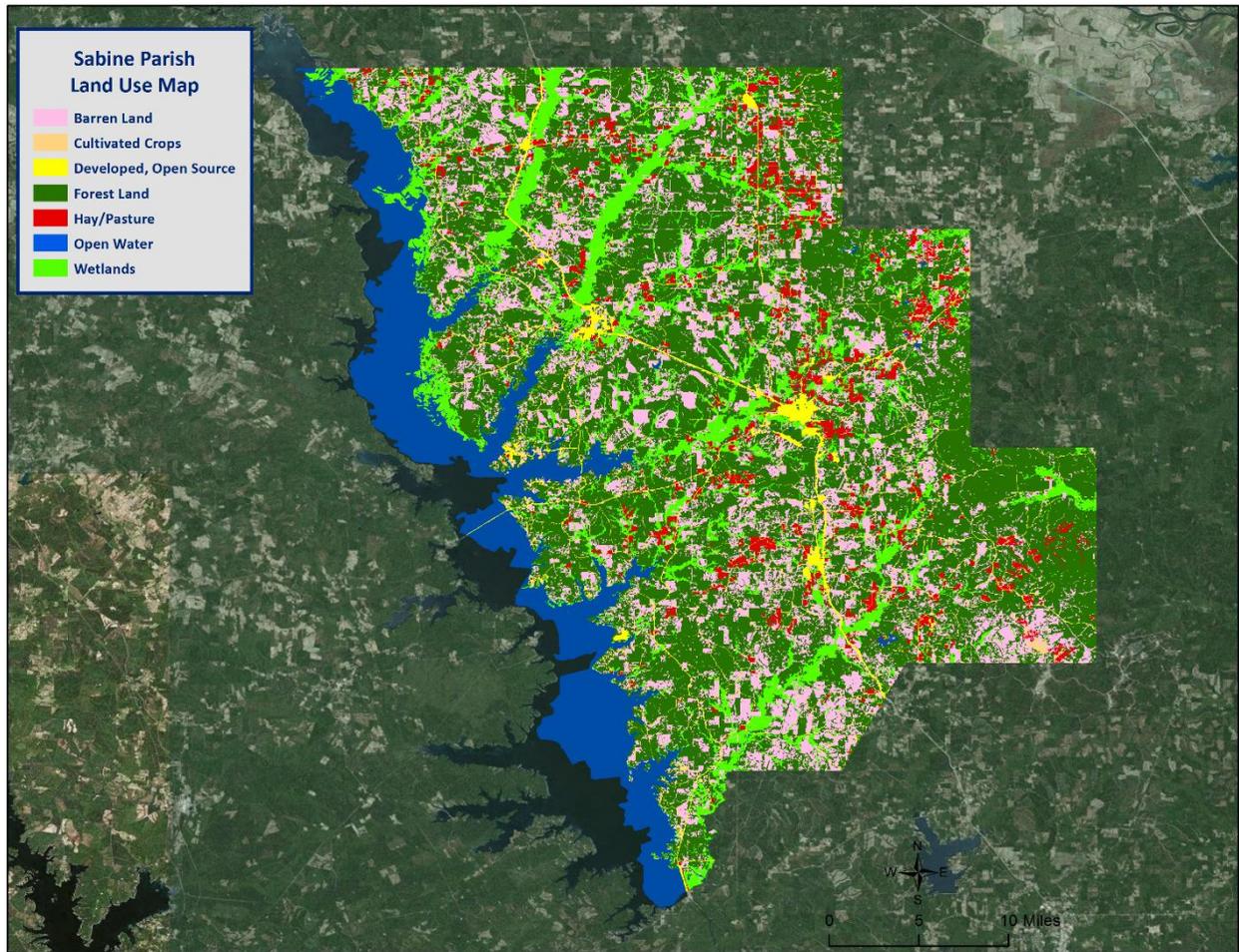


Figure 2-6: Sabine Parish Land Use Map
(Source: USGS Land Use Map)

Hazard Identification

Drought

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

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

This hazard is often measured using the Palmer Drought Severity Index (PDSI, also known operationally as the Palmer Drought Index). The PDSI, first developed by Wayne Palmer in a 1965 paper for the U.S. Weather Bureau, measures drought through recent precipitation and temperature data with regard to a basic supply-and-demand model of soil moisture. It is most effective in long-term calculations. Three other indices used to measure drought are the Palmer Hydrologic Drought Index (PHDI), the Crop Moisture Index (CMI), which is derived from the PDSI, and the Keetch-Byram Drought Index (KBDI), created by John Keetch and George Byram in 1968 for the U.S. Forest Service. The KBDI is used mainly for predicting the likelihood of wildfire outbreaks. As a compromise, the PDSI is used most often for droughts since it is a medium-response drought indicator. The objective of the PDSI is to provide measurements of moisture conditions that are standardized so that comparisons using the index can be made between locations and between months. [Table 2-9](#) displays the range and Palmer classifications of the PDSI index. [Figure 2-7](#) displays the current drought monitor for the state of Louisiana and its parishes.

Table 2-9: 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 normal conditions exist in Sabine Parish at the time this plan went to publication (Figure 2-7).

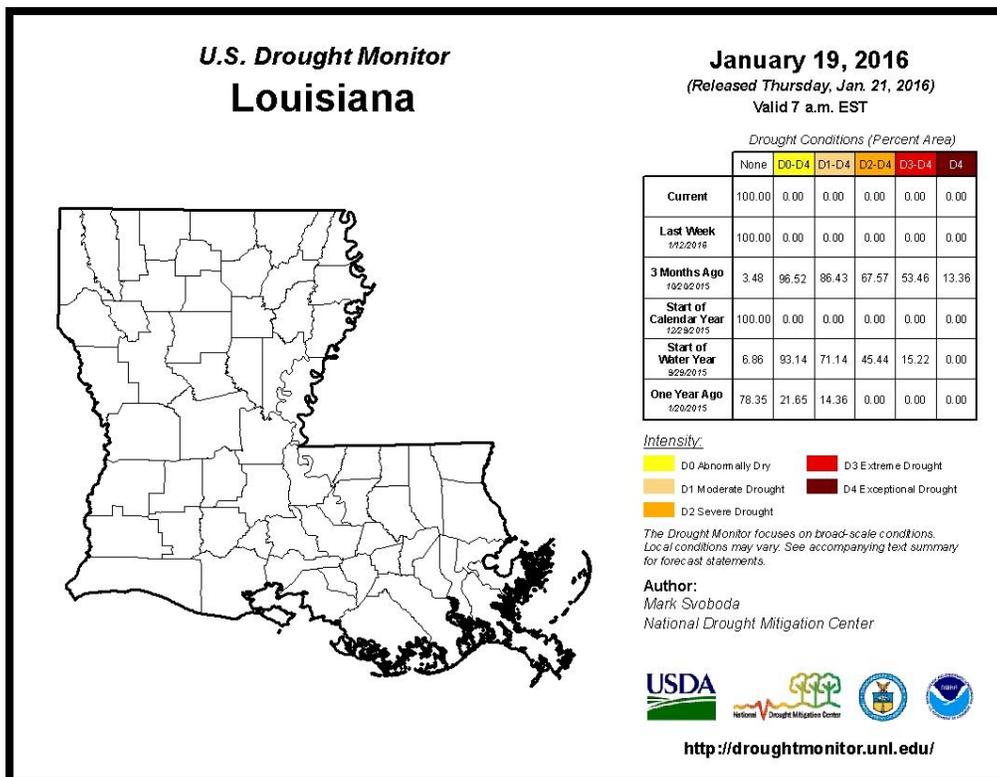


Figure 2-7: United States Drought Monitor for the State of Louisiana and its Parishes (Source: The National Drought Mitigation Center)

Location

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

Previous Occurrences / Extents

The SHELDUS database reports a total of two drought events occurring within the boundaries of Sabine Parish between the years of 1990 to 2015. *Table 2-10* identifies the date of occurrence, estimated crop damage, and severity of the events that have occurred in Sabine Parish. Based on previous occurrences, and in accordance with the Palmer Drought Index, the worst case scenario for drought in Sabine Parish would be a severe drought event.

*Table 2-10: Drought Events with Crop Damage Totals for Sabine Parish
(Source: SHELDUS)*

Date	Crop Damage	Palmer Classification
May 1996	\$1,484,748	Severe Drought
June 1998	\$1,261,041	Severe Drought

Frequency / Probability

Based on previous occurrences of two drought events in 25 years, the probability of drought occurrence in the planning area in any given year is 8%.

Estimated Potential Losses

According to the SHELDUS database, there have been two drought events that have caused some level of crop damage. The total agricultural damage from these events is \$2,745,789, with an average cost of \$1,372,895 per drought event. When annualizing the total cost over the 25-year record, total annual losses based on drought is estimated to be \$109,832. *Table 2-11* presents an analysis of agricultural exposure that is susceptible to drought by major crop type for Sabine Parish.

*Table 2-11: Agricultural Exposure by Crop Type for Droughts in Sabine Parish
(Source: LSU Ag Center 2014 Parish Totals)*

Agricultural Exposure by Type for Drought						
Forestry	Garden Plants	Figs	Hay	Muscadines	Mayhaws	Total
\$57,931,798	\$1,365,000	\$272,250	\$176,800	\$108,000	\$46,125	\$59,899,973

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

Flooding

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

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

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

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

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

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

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

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

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

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

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

- **Flood Categories**
 - Minor Flooding: Minimal or no property damage, but possibly some public threat.
 - Moderate Flooding: Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.
 - Major Flooding: Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
 - Record Flooding: Flooding which equals or exceeds the highest stage or discharge at a given site during the period of record keeping.
- **Flood Warning**
 - Issued along larger streams when there is a serious threat to life or property.
- **Flood Watch**
 - Issued when current and developing hydrometeorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.

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

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

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

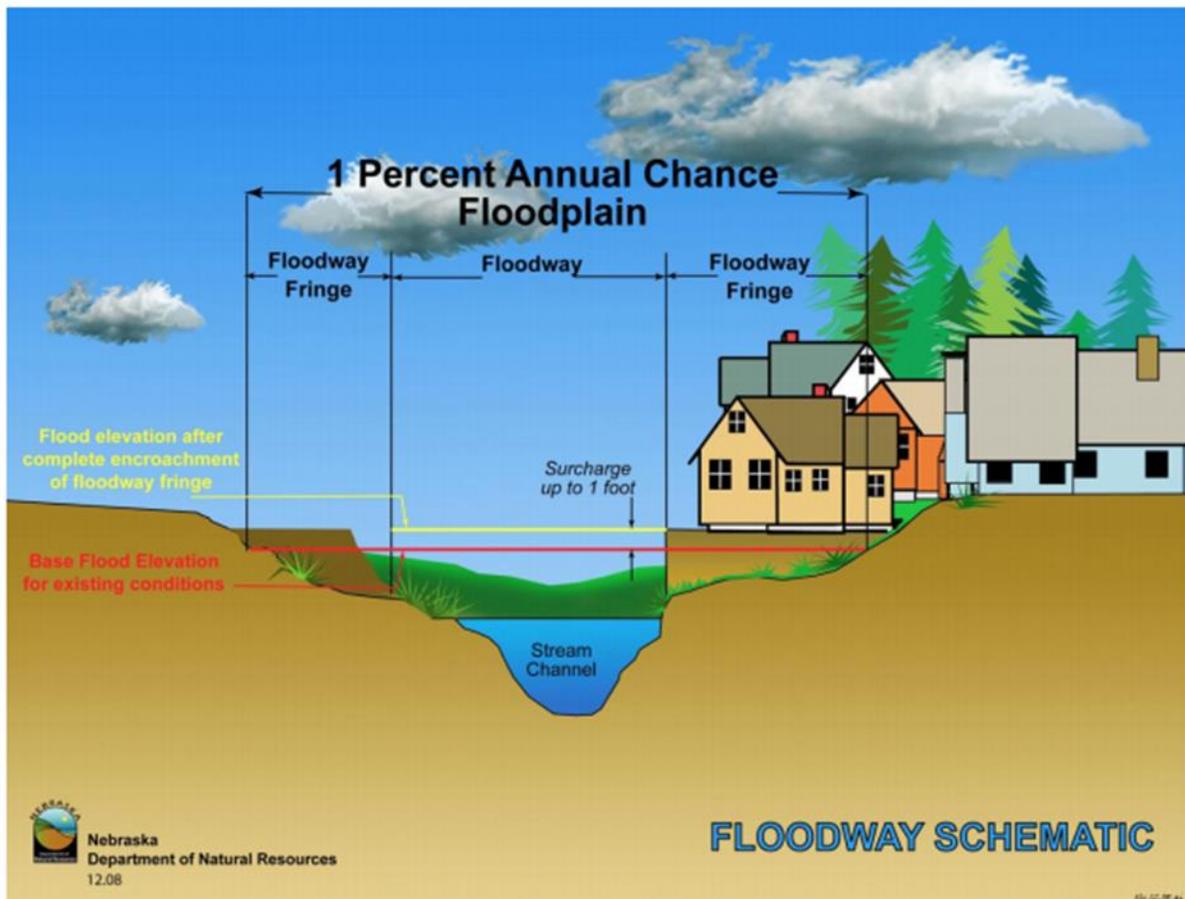


Figure 2-8: Schematic of 100-Year Floodplain. The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe.

(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 are usually not salvageable. Electrical appliances and gasoline engines will flood, making them worthless until they are professionally dried and cleaned.

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

Repetitive Loss Properties

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

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

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

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

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

Table 2-12: Repetitive Loss Structures for Sabine Parish

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
Sabine Parish Unincorporated	0	0	0	0	0	\$0	\$0
Converse	0	0	0	0	0	\$0	\$0
Fisher	0	0	0	0	0	\$0	\$0
Florien	0	0	0	0	0	\$0	\$0
Many	0	0	0	0	0	\$0	\$0
Noble	0	0	0	0	0	\$0	\$0
Pleasant Hill	0	0	0	0	0	\$0	\$0
Zwolle	1	1	0	0	2	\$10,969	\$5,485
Total	1	1	0	0	2	\$10,969	\$5,485

The one repetitive loss structure was able to be geocoded in order to provide an overview of where the repetitive loss structure is located. *Figure 2-9* shows the approximate location of the structure, while *Figure 2-10* shows where the highest concentration of repetitive loss structures are located. Through the repetitive loss map, it is clear that the primary concentrated area of repetitive loss structures is focused in the incorporated of Zwolle.

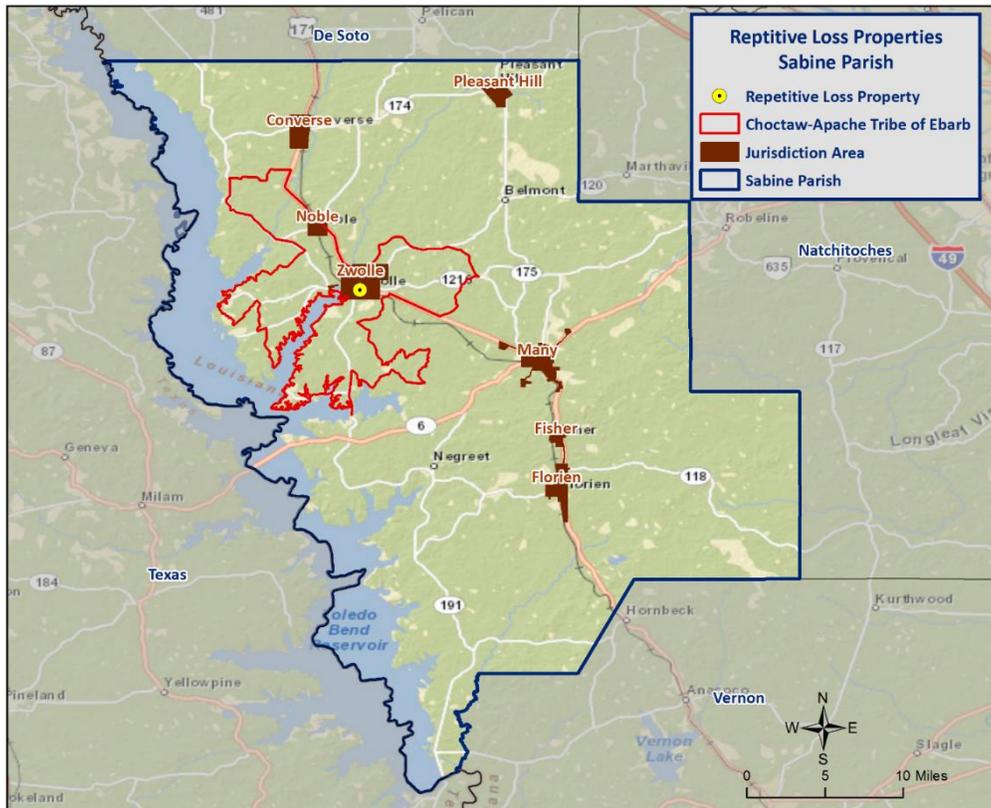


Figure 2-9: Repetitive Loss Properties in Sabine Parish

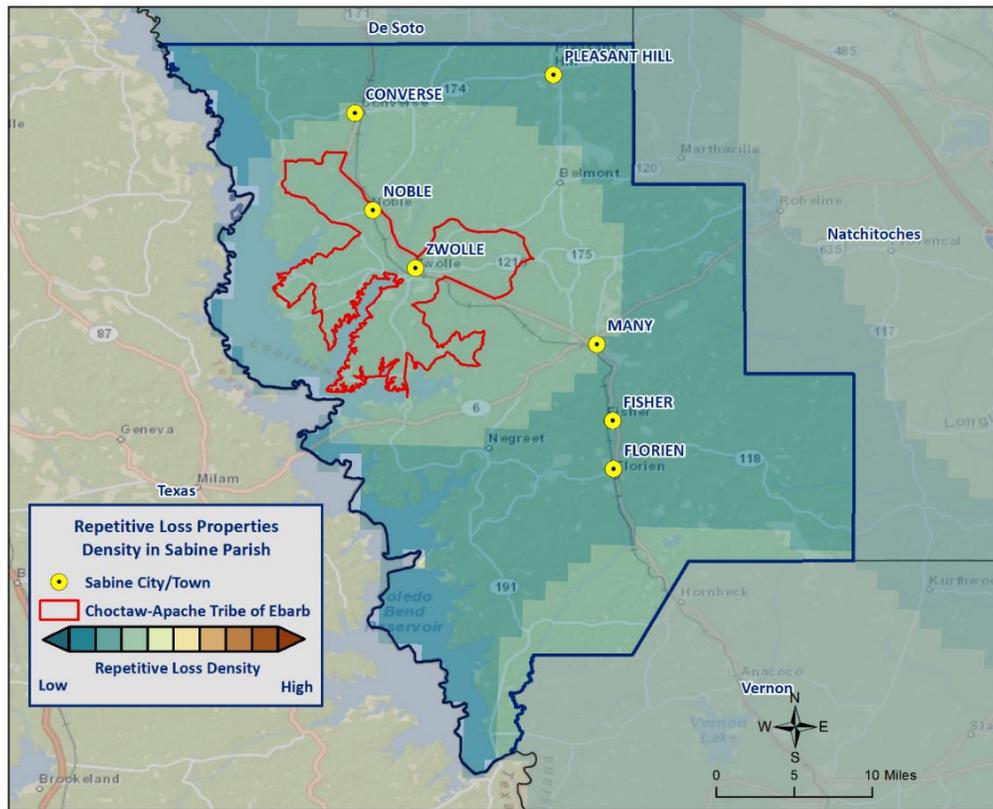


Figure 2-10: Repetitive Loss Property Densities in Sabine Parish

National Flood Insurance Program

Flood insurance statistics indicate that Sabine Parish has 77 flood insurance policies with the NFIP, with total annual premiums of \$41,682. Sabine Parish and the incorporated areas of Florien, Many, and Zwolle are participants in the NFIP. Sabine Parish and each of the incorporated jurisdictions will continue to adopt and enforce floodplain management requirements, including regulating new construction Special Flood Hazard Areas, and will continue to monitor activities including local requests for new map updates. Flood insurance statistics and additional NFIP participation details for Sabine Parish are provided in the tables to follow.

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

Table 2-13: Summary of NFIP Policies for Sabine Parish

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed Since 1978	Total Loss Payments
Sabine Parish (Unincorporated)	50	\$9,306,400	\$25,677	5	\$54,220
Converse	0	\$0	\$0	0	\$0
Fisher	0	\$0	\$0	0	\$0
Florien	7	\$583,800	\$7,534	4	\$57,546
Many	20	\$1,007,500	\$8,471	5	\$7,749
Noble	0	\$0	\$0	0	\$0
Pleasant Hill	0	\$0	\$0	0	\$0
Zwolle	0	\$0	\$0	0	\$0
Total	77	\$10,897,700	\$41,682	14	\$119,515

*While the Village of Converse, Village of Fisher, Village of Noble, and Village of Pleasant Hill do not participate in the NFIP, the Parish will continue to promote NFIP participation through education and outreach.

Table 2-14: Summary of Community Flood Maps for Sabine Parish

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Date Joined the NFIP	Tribal
220368#	Sabine Parish	1/24/1978	8/5/1991	8/5/1991	8/5/1991	No
220268#	Converse	8/29/1975	8/5/1991	8/5/1991	Not in NFIP Sanctioned	No
-	Fisher	-	-	-	Not in NFIP	-
220326#	Florien	7/25/1975	3/15/1982	8/5/1991	7/14/1989	No
220158#	Many	4/5/1974	6/15/1988	8/5/1991	6/15/1988	No
220301#	Noble	8/13/1976	8/5/1991	8/5/1991	Not in NFIP Sanctioned	No
220344#	Pleasant Hill	7/25/1975	8/5/1991	8/5/1991	Not in NFIP Sanctioned	No
220353#	Zwolle	8/15/1975	7/18/1985	8/5/1991	7/18/1985	No

According to the Community Rating System (CRS) list of eligible communities, Sabine Parish and its jurisdictions do not participate in the CRS.

Threat to People

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

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

Flooding in Sabine 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 Sabine Parish experiences.

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

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

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

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

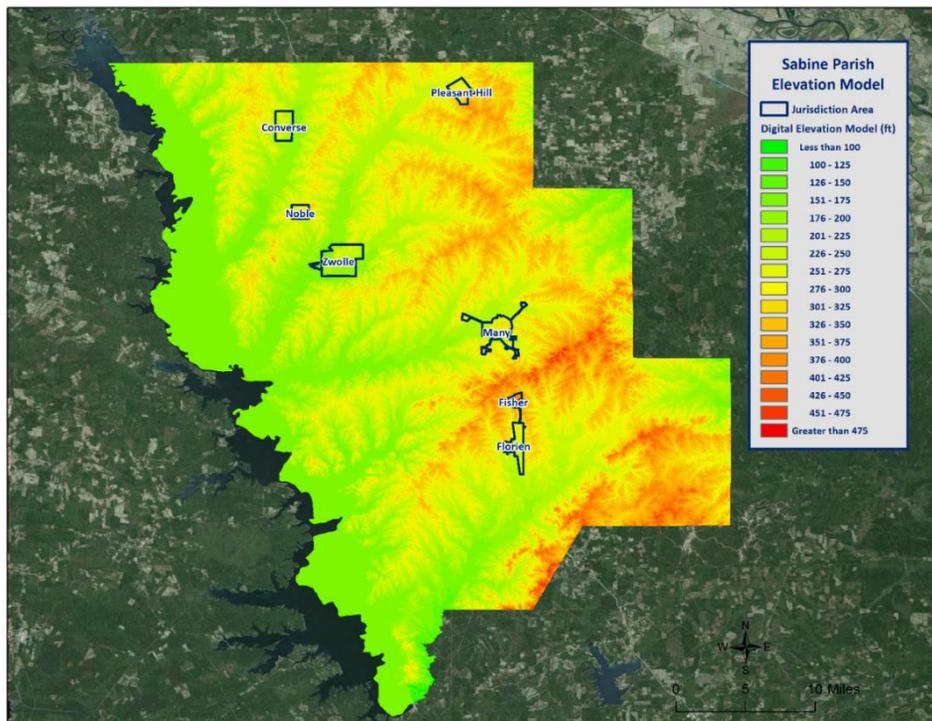


Figure 2-11: Elevation throughout Sabine Parish

Looking at the digital elevation model (DEM) for Sabine Parish on the previous page is instructive in visualizing where the low lying and high risk areas are for the parish. Elevations in the parish range from less than 100 feet to over 475 feet. The highest elevations in the parish are approximately 475 feet, located in the unincorporated area. The incorporated areas range in elevation from 203 to 344 feet, with Zwolle averaging 203 feet, Converse averaging 213 feet, Noble averaging 269 feet, Florien averaging 272 feet, Many averaging 276 feet, Pleasant Hill averaging 285 feet, Fisher averaging 344 feet, and the Choctaw-Apache Tribe of Ebarb averaging 300 feet.

Location

Sabine Parish has experienced significant flooding in its history and can expect more in the future. An area of increased vulnerability to riverine flooding in Sabine Parish is the Sabine River Basin. The Sabine River forms the western boundary of the parish. It flows for 555 miles and has a total drainage basin area of 9,756 square miles (2,330 square miles in Louisiana). The river's basin is characterized by flat slopes and wide, timbered floodplains, and the extreme southern portion of the river is subject to coastal flooding. High rainfall rates produce frequent flooding of low-lying areas and large floods occur on average every five years. During a flooding event, the lowest part of the basin usually remains inundated for many days and sometimes for several weeks. While jurisdictions within Sabine Parish might not have SHFAs within their boundaries, recent events throughout the state have demonstrated that even areas outside of SFHAs can be susceptible to flooding. For example, the jurisdictions of Fisher and Noble do not have any SFHAs located within their boundaries and the jurisdiction of Converse only has SFHAs in unincorporated areas. However, localized street flooding can be expected in the area south of Franklin Drive and north of Hubier Street in the jurisdiction of Converse, in the area south of Fisher Cemetery Road and north of Lyddy Turnpike in the jurisdiction of Fisher, and in the area south of Knott Drive and north of Helem Road in the jurisdiction of Noble.

The following are enlarged maps of the incorporated areas showing the areas within each jurisdiction that are at risk of flooding:

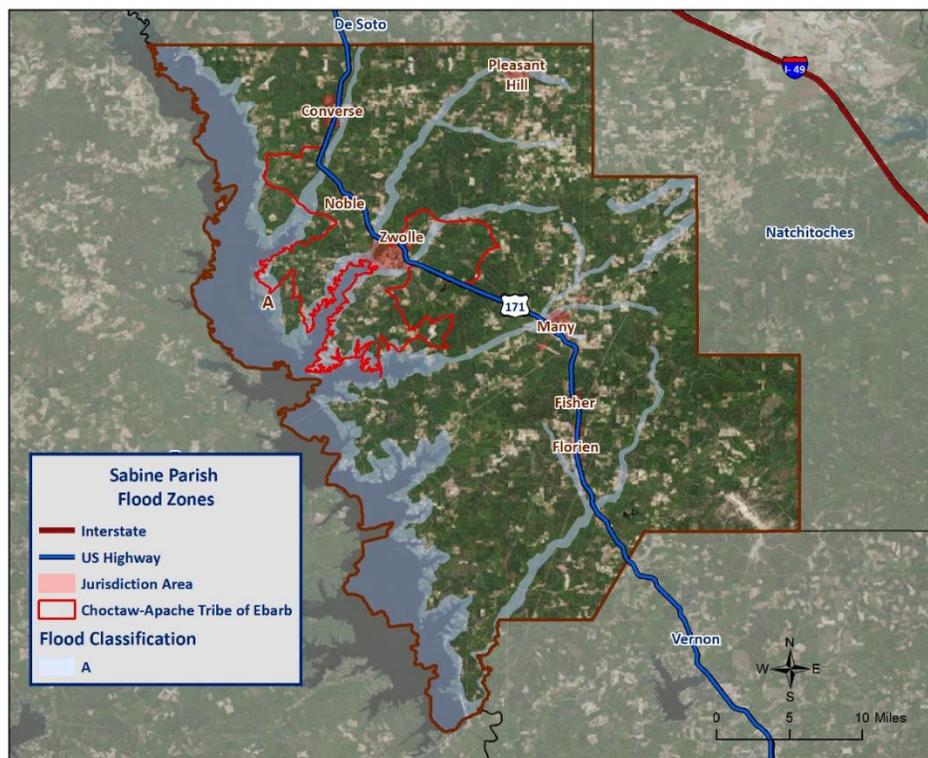


Figure 2-12: Sabine Parish Areas within the Flood Zones



Figure 2-13: Village of Converse Areas within the Flood Zones

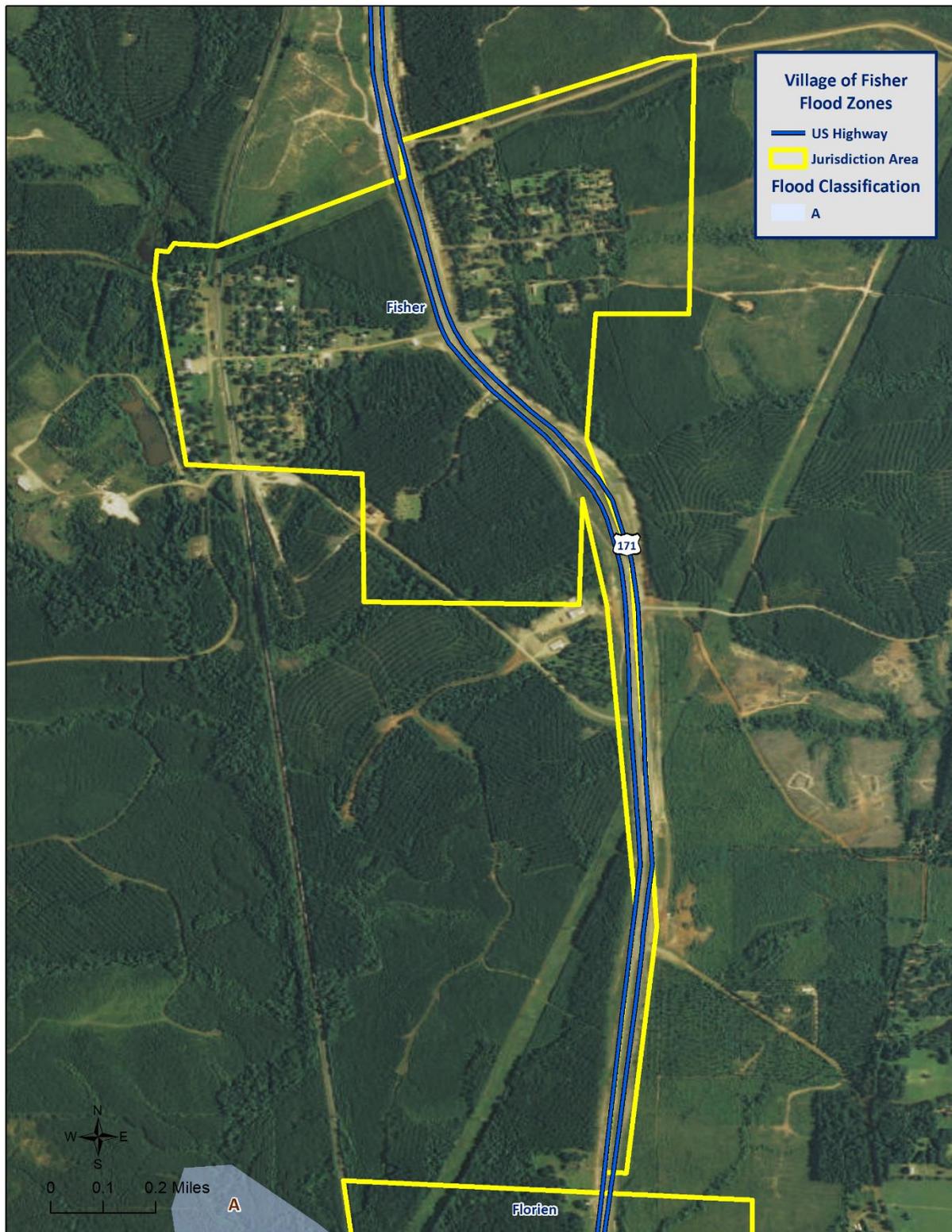


Figure 2-14: Village of Fisher Areas within the Flood Zones

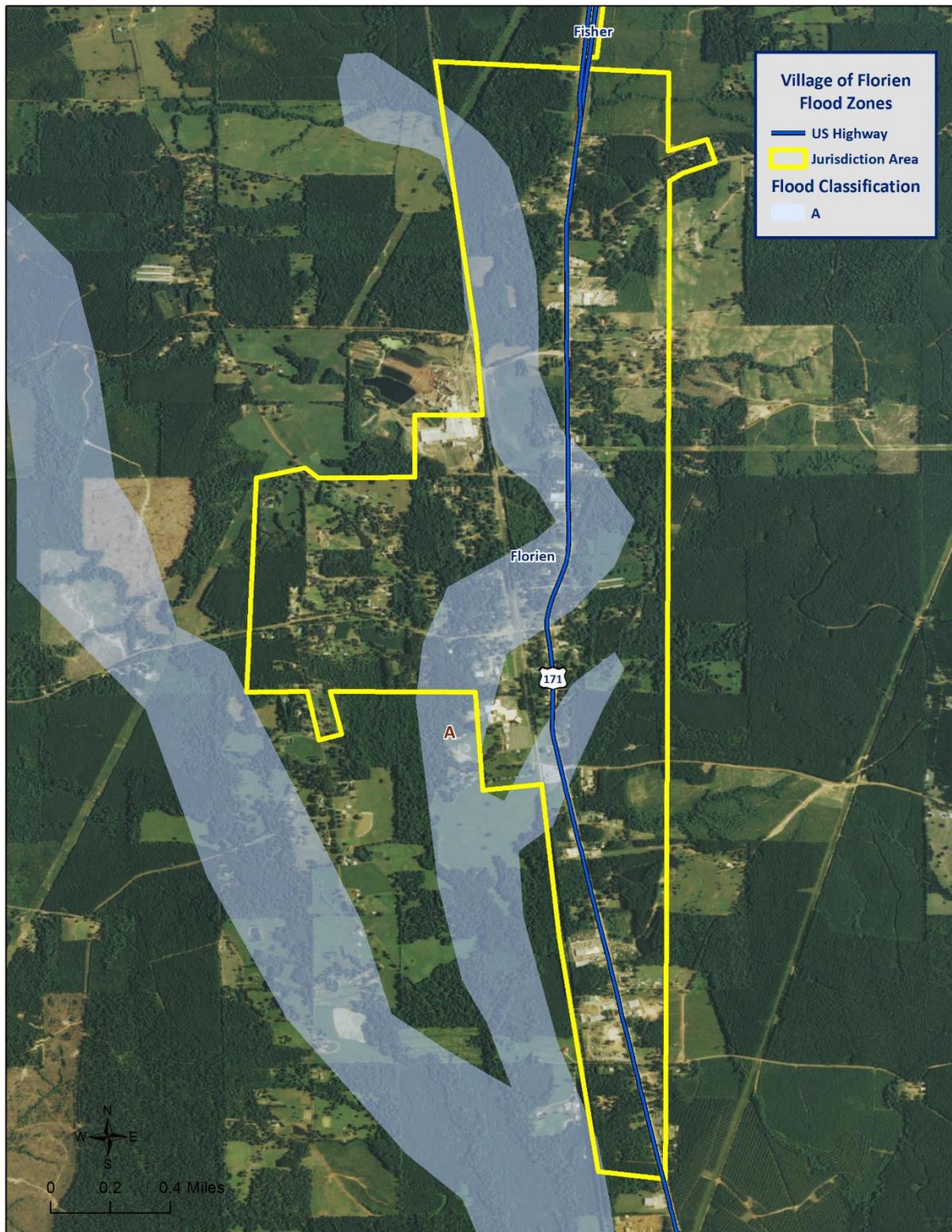


Figure 2-15: Village of Florien Areas within the Flood Zones

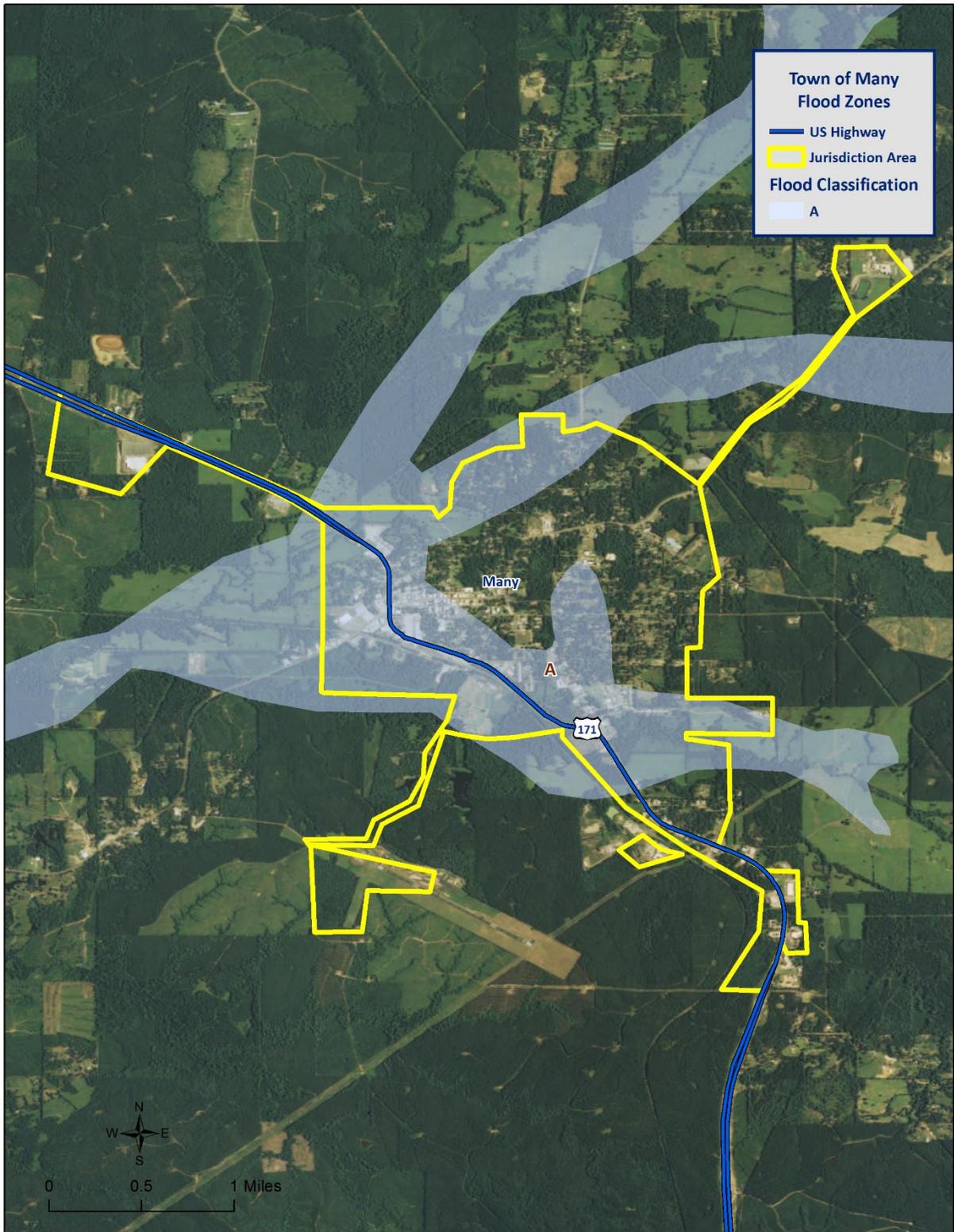


Figure 2-16: Town of Many Areas within the Flood Zones

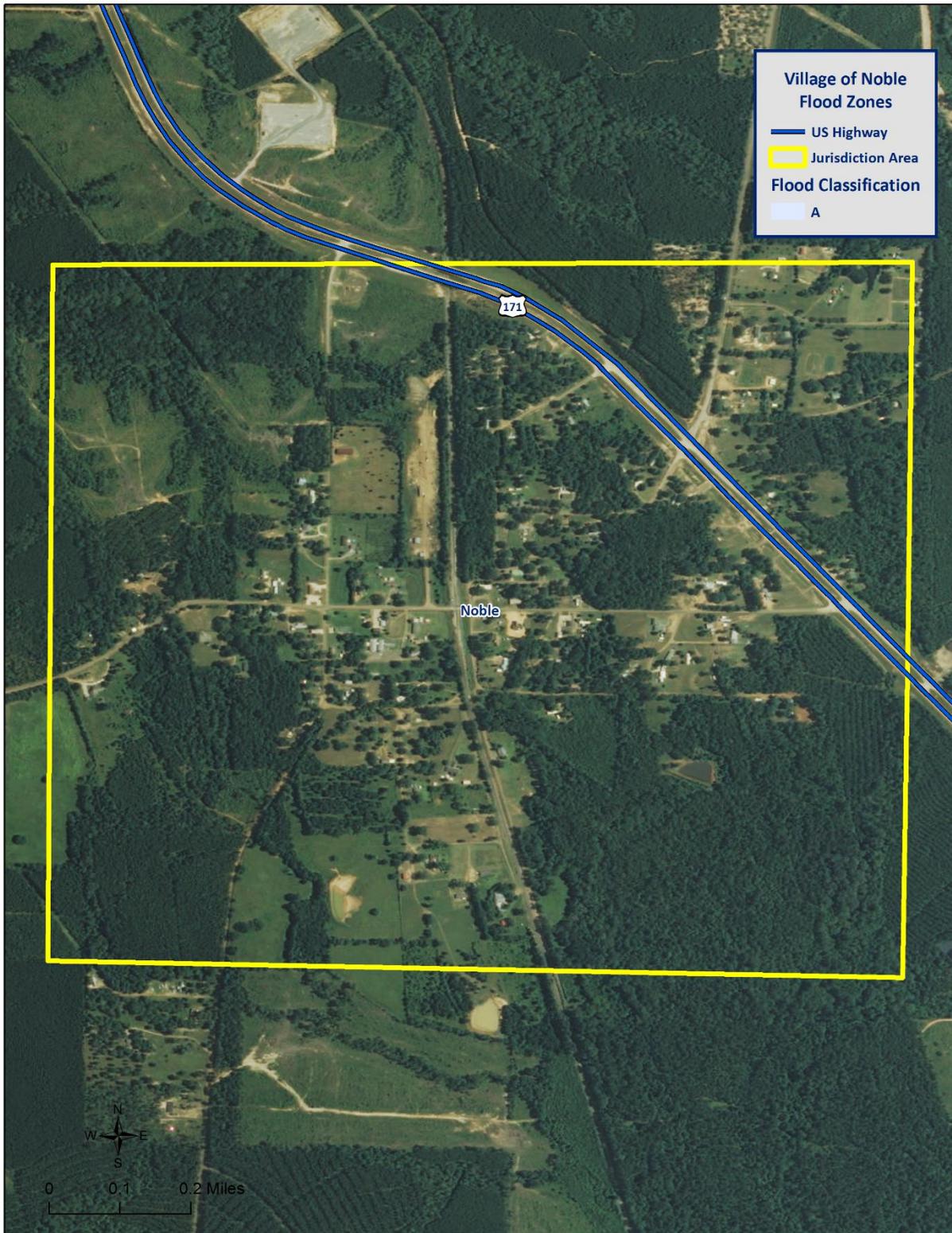


Figure 2-17: Village of Noble Areas within the Flood Zones

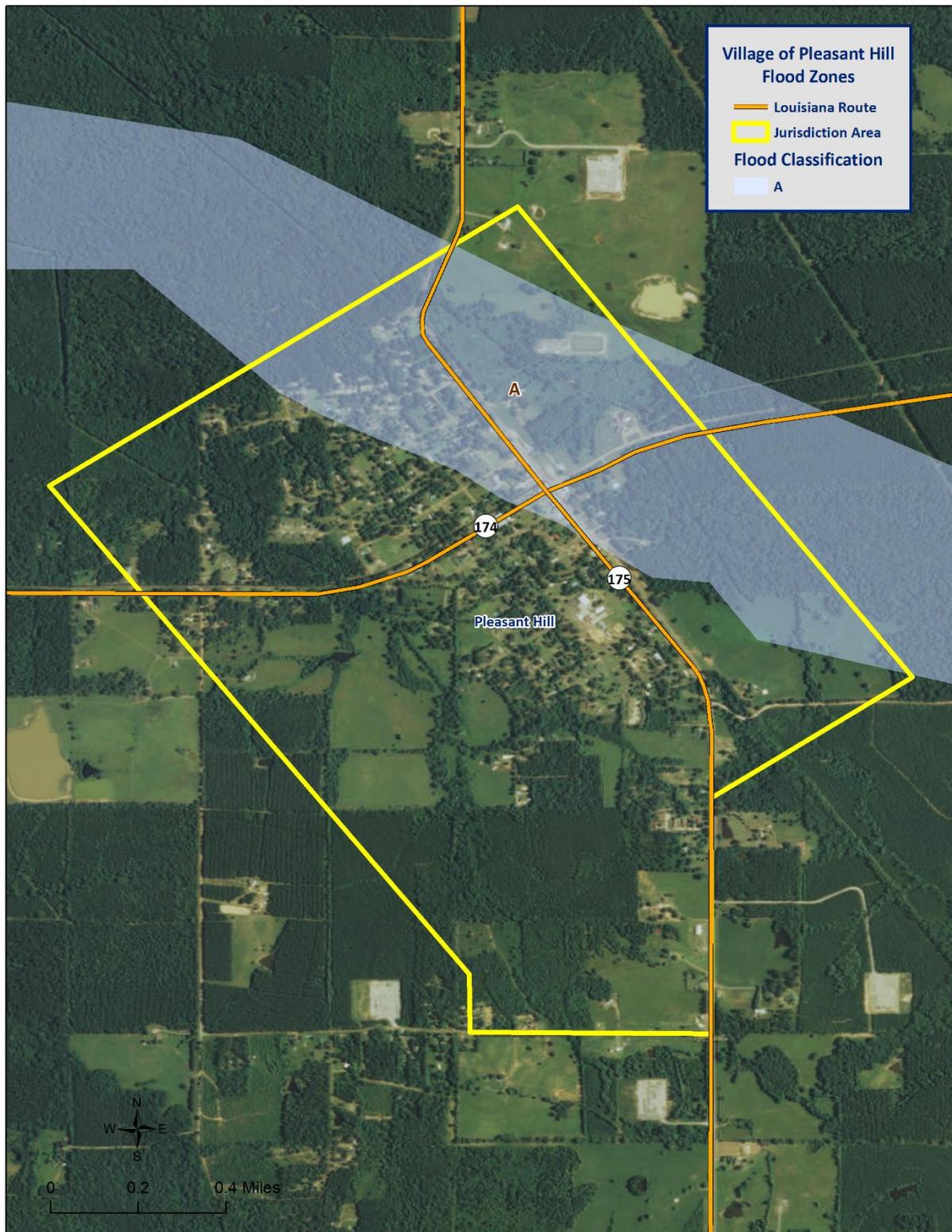


Figure 2-18: Village of Pleasant Hill Areas within the Flood Zones

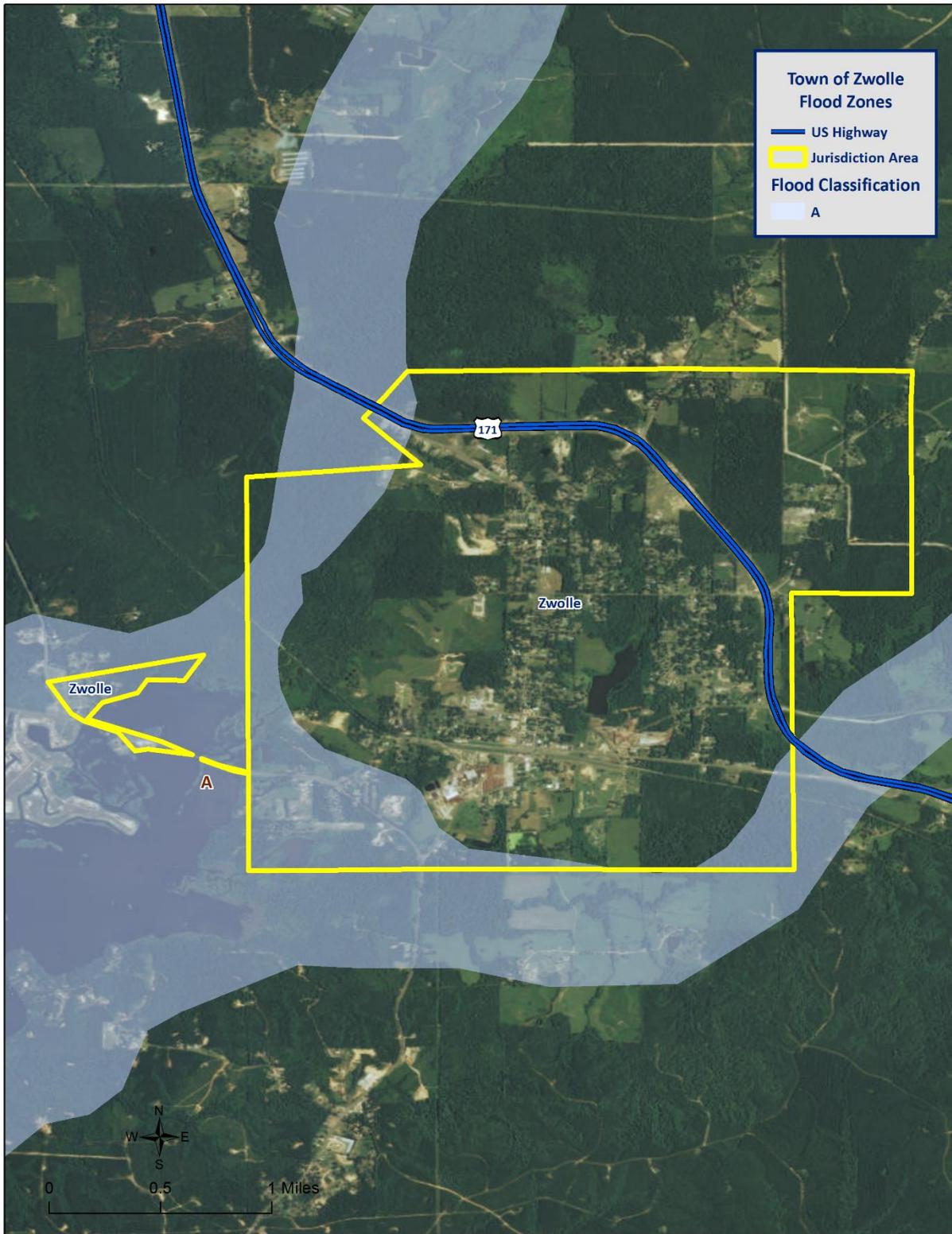


Figure 2-19: Town of Zwolle Areas within the Flood Zones

Previous Occurrences / Extents

Historically, there have been 17 flooding events that have created significant flooding in Sabine Parish between 1990 and 2015. Below is a brief synopsis of the four flooding events that have occurred since 2010, including flooding events that have occurred since the parish's last planning update.

Table 2-15: Historical Floods in Sabine Parish with Locations from 2009 - 2014

Date	Extents	Type of Flooding	Estimated Damages	Location
March 20, 2012	Water covered Highway 118 near Peason, Highway 175 near Belmont, Highway 171 in Many, and Old Pleasant Hill Road near Noble.	Flash Flood	\$0	PEASON DAM, BELMONT, AND MANY
October 31, 2013	Nearly 4 feet of water was reported at the mill in Zwolle. A truck was almost completely submerged. A bridge washed out on Carter's Ferry Road near Zwolle. Two homes were flooded in Many and numerous vehicles were stalled in high water.	Flash Flood	\$137,353	LORING, ZWOLLE, AND MANY
June 10, 2014	Plainview Road was washed out where it intersects with a creek that runs east southeast from Hodges Gardens State Park just north of the Vernon Parish line.	Flash Flood	\$0	SANDEL
May 18, 2015	Highway 171 north and south of Converse was closed to one lane due to flash flooding.	Flash Flood	\$0	UNINCORPORATED AREA

Since 2010, there have been no significant flooding events in the incorporated areas of Fisher, Florien, Noble, and Pleasant Hill.

The worst-case scenarios are based on several different types of flooding events. Storm water excesses and riverine flooding primarily affect the low-lying areas of the parish, and flood depths of up to six feet can be expected in the unincorporated areas of the parish and in the incorporated areas of Florien, Many, and Pleasant Hill. The incorporated areas of Converse, Fisher, Noble, and Zwolle can expect flood depths of one to three feet.

Frequency / Probability

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

Table 2-16: Annual Flood Probabilities for Sabine Parish

Jurisdiction	Annual Probability	Return Frequency
Sabine Parish (Unincorporated)	24%	4 – 5 years
Converse	20%	5 years
Fisher	4%	25 years
Florien	8%	12 – 13 years
Many	44%	2 – 3 years
Noble	8%	12 – 13 years
Pleasant Hill	8%	12 – 13 years
Zwolle	12%	8 – 9 years

Based on historical record, the overall flooding probability for the entire Sabine Parish planning area is 68%, with 17 events occurring over a 25-year period.

Estimated Potential Losses

Using the Hazus 2.2 Flood Model, along with the Parish DFIRM, the 100-year flood scenario was analyzed to determine losses from this worst-case scenario. *Table 2-17* shows the total economic losses that would result from this occurrence. Modeled results for the jurisdictions of Converse, Noble, and Fisher indicated no buildings will incur flood damage from a 100-year flood event. However, localized street flooding can be expected in the area south of Franklin Drive and north of Hubier Street in the jurisdiction of Converse, in the area south of Fisher Cemetery Road and north of Lyddy Turnpike in the jurisdiction of Fisher, and in the area south of Knott Drive and north of Helem Road in the jurisdiction of Noble, resulting in area streets becoming impassible by many vehicles.

Table 2-17: Estimated Losses in Sabine Parish from a 100-Year Flood Event
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Flood Event
Sabine Parish (Unincorporated)	\$37,188,000
Converse	\$0
Fisher	\$0
Florien	\$64,000
Many	\$1,632,000
Noble	\$0
Pleasant Hill	\$54,000
Zwolle	\$4,183,000
Total	\$43,121,000

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

Table 2-18: Estimated 100-Year Flood Losses for Unincorporated Sabine Parish by Sector
(Source: Hazus 2.2)

Sabine Parish (Unincorporated)	Estimated Total Losses from 100-Year Flood Event
Agricultural	\$399,000
Commercial	\$6,116,000
Government	\$182,000
Industrial	\$4,267,000
Religious / Non-Profit	\$2,004,000
Residential	\$24,215,000
Schools	\$5,000
Total	\$37,188,000

Table 2-19: Estimated 100-Year Flood Losses for Florien by Sector
(Source: Hazus 2.2)

Florien	Estimated Total Losses from 100-Year Flood Event
Agricultural	\$0
Commercial	\$5,000
Government	\$15,000
Industrial	\$0
Religious / Non-Profit	\$0
Residential	\$44,000
Schools	\$0
Total	\$64,000

Table 2-20: Estimated 100-Year Flood Losses for Many by Sector
(Source: Hazus 2.2)

Many	Estimated total Losses from 100-Year Flood Event
Agricultural	\$16,000
Commercial	\$199,000
Government	\$22,000
Industrial	\$100,000
Religious / Non-Profit	\$0
Residential	\$1,295,000
Schools	\$0
Total	\$1,632,000

Table 2-21: Estimated 100-Year Flood Losses for Pleasant Hill by Sector
(Source: Hazus 2.2)

Pleasant Hill	Estimated total Losses from 100-Year Flood Event
Agricultural	\$0
Commercial	\$9,000
Government	\$0
Industrial	\$0
Religious / Non-Profit	\$13,000
Residential	\$32,000
Schools	\$0
Total	\$54,000

Table 2-22: Estimated 100-Year Flood Losses for Zwolle by Sector
(Source: Hazus 2.2)

Zwolle	Estimated total Losses from 100-Year Flood Event
Agricultural	\$0
Commercial	\$113,000
Government	\$0
Industrial	\$209,000
Religious / Non-Profit	\$0
Residential	\$3,861,000
Schools	\$0
Total	\$4,183,000

Threat to People

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

Table 2-23: Vulnerable Populations Susceptible to a 100-Year Flood Event
(Source: Hazus 2.2)

Number of People Exposed to Flood Hazards			
Location	# in Community	# in Hazard Area	% in Hazard Area
Sabine Parish (Unincorporated)	14,641	5,139	35.1%
Converse	440	0	0.0%
Fisher	230	0	0.0%
Florien	633	17	2.7%
Many	2,853	387	13.6%
Noble	252	0	0.0%
Pleasant Hill	723	4	0.6%
Zwolle	1,759	596	33.9%
Total	24,233	6,143	25.3%

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

*Table 2-24: Vulnerable Populations Susceptible to a 100-Year Flood Event in Unincorporated Sabine Parish
(Source: Hazus 2.2)*

Sabine Parish (Unincorporated)		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	5,139	35.1%
Persons Under 5 Years	349	6.8%
Persons Under 18 Years	1,254	24.4%
Persons 65 Years and Over	951	18.5%
White	3,613	70.3%
Minority	1,526	29.7%

*Table 2-25: Vulnerable Populations Susceptible to a 100-Year Flood Event in Florien
(Source: Hazus 2.2)*

Florien		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	17	2.7%
Persons Under 5 Years	1	6.6%
Persons Under 18 Years	4	21.5%
Persons 65 Years and Over	3	15.3%
White	11	66.5%
Minority	6	33.5%

*Table 2-26: Vulnerable Populations Susceptible to a 100-Year Flood Event in Many
(Source: Hazus 2.2)*

Many		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	387	13.6%
Persons Under 5 Years	28	7.2%
Persons Under 18 Years	62	16.0%
Persons 65 Years and Over	75	19.5%
White	180	46.6%
Minority	207	53.4%

*Table 2-27: Vulnerable Populations Susceptible to a 100-Year Flood Event in Pleasant Hill
(Source: Hazus 2.2)*

Pleasant Hill		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	4	0.6%
Persons Under 5 Years	0	5.5%
Persons Under 18 Years	1	22.0%
Persons 65 Years and Over	0	12.5%
White	2	55.1%
Minority	2	45.0%

*Table 2-28: Vulnerable Populations Susceptible to a 100-Year Flood Event in Zwolle
(Source: Hazus 2.2)*

Zwolle		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	596	33.9%
Persons Under 5 Years	65	11.0%
Persons Under 18 Years	134	22.5%
Persons 65 Years and Over	58	9.8%
White	179	30.0%
Minority	417	70.0%

Vulnerability

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

Thunderstorms

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

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

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

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

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

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

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

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

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

Hazard Description

Hailstorms

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

Table 2-29: 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 2-30: Spectrum of Hailstone Diameters and their Everyday Description

(Source: National Weather Service)

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

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

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

High Winds

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

*Table 2-31: High Winds Categorized by Source, Frequency, and Duration
(Source: Making Critical Facilities Safe from High Wind, FEMA)*

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

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

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

*Table 2-32: Beaufort Wind Scale
(Source: NOAA's SPC)*

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

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

Lightning

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

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

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

Table 2-33: Lightning Activity Level (LAL) Grids

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

Hazard Profile

Hailstorms

Location

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

Previous Occurrences / Extents

The SHELDUS database reports seven significant hailstorm events occurring within the boundaries of Sabine Parish between the years of 1990-2015. According to the National Climatic Data Center, hailstorm diameters experienced in Sabine Parish have ranged from 0.50 inches to 2.50 inches since 1990. The most frequently recorded hail size has been 1.00 inch diameters. *Figure 2-20* displays the density of hailstorms in Sabine Parish and adjacent parishes. Based on the National Climatic Data Center dataset, *Table 2-34* provides an overview of hailstorms that have impacted the Sabine Parish planning area since 2010. Sabine Parish can expect to experience hail up to 2.50 inches in diameter for future events.

*Table 2-34: Previous Occurrences of Hailstorms in Sabine Parish
(Source: NCDC)*

Date	Recorded Hail Size (inches)	Location
April 6, 2014	1	MT CARMEL
April 19, 2015	1.75	MANY
April 19, 2015	1.50	CONVERSE

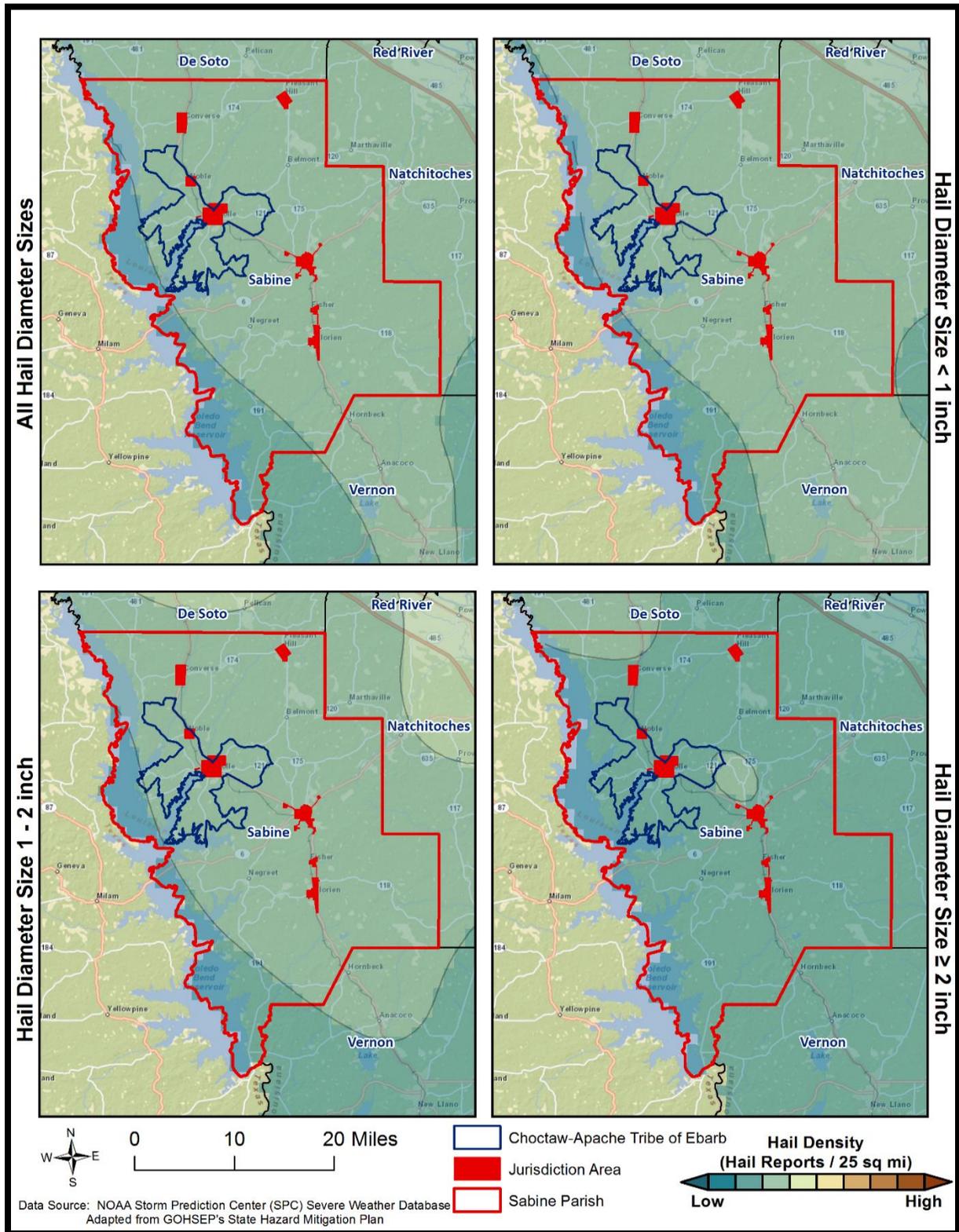


Figure 2-20: Density of Hailstorms by Diameter from 1950-2012
(Source: State of Louisiana Hazard Mitigation Plan 2014)

Since 2010, there have been no significant hailstorm events in the incorporated areas of Fisher, Florian, Noble, Pleasant Hill, and Zwolle.

Frequency

Based on historical data from SHELDUS for the past 25 years, it is estimated the probability of occurrence for a significant hailstorm event is approximately 28%. The probability was determined based on a review of significant hail data that has caused damages in the last 25 years, in which Sabine Parish has had seven recorded events.

Estimated Potential Losses

According to the SHELDUS database, property damage due to hailstorms in Sabine Parish have totaled approximately \$17,649 since 1990. To estimate the potential losses of a hail event on an annual basis, the total damages recorded for hail events was divided by the total number of years of available hail data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of \$706.

Table 2-35: Estimated Annual Property Losses in Sabine Parish from Hailstorms

Estimated Annual Potential Losses from Hailstorms for Sabine Parish			
Unincorporated Sabine Parish (71.6% of Population)	Converse (1.8% of Population)	Fisher (0.9% of Population)	Florien (2.6% of Population)
\$505	\$13	\$7	\$18

Table 2-36: Estimated Annual Property Losses in Sabine Parish from Hailstorms (Continued)

Estimated Annual Potential Losses from Hailstorms for Sabine Parish			
Many (11.8% of Population)	Noble (1.0% of Population)	Pleasant Hill (3.0% of Population)	Zwolle (7.3% of Population)
\$83	\$7	\$21	\$51

There have been no deaths or injuries due to hailstorms from 1989 – 2014 in Sabine Parish.

Vulnerability

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

High Winds

Location

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

Previous Occurrences / Extents

The SHELDUS database reports a total of 46 thunderstorm wind events occurring within the boundaries of Sabine Parish between the years of 1990 to 2015. The significant thunderstorm wind events experienced in Sabine Parish have ranged in wind speed from 58 mph to 115 mph. Sabine Parish can expect to receive thunderstorm winds up to 87 mph for future high wind events. The table on the next page provides an overview of significant high wind events over the last five years.

Table 2-37: Previous Occurrences for Thunderstorm High Wind Events

Location	Date	Recorded Wind Speeds (mph)	Property Damage	Crop Damage
MANY	March 31, 2013	66	\$20,000	\$0
MANY	March 28, 2014	66	\$0	\$0
MANY	October 12, 2014	61	\$0	\$0
MANY	October 12, 2014	61	\$0	\$0
MANY	January 3, 2015	62	\$0	\$0

Since 2010, there have been no significant thunderstorm wind events in the unincorporated areas of Sabine Parish and the incorporated areas of Converse, Fisher, Florien, Noble, Pleasant Hill, and Zwolle.

Frequency

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

Estimated Potential Losses

Since 1990, there have been 46 significant wind events that have resulted in property damages according to the SHELDUS database. The total property damages associated with those storms have totaled \$4,738,688. 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 SHELDUS (1990-2015). This provides an annual estimated potential loss of \$189,548. The following table provides an estimate of potential property losses for Sabine Parish:

Table 2-38: Estimated Annual Property Losses in Sabine Parish Resulting from High Winds

Estimated Annual Potential Losses from Thunderstorm Winds for Sabine Parish			
Unincorporated Sabine Parish (71.6% of Population)	Converse (1.8% of Population)	Fisher (0.9% of Population)	Florien (2.6% of Population)
\$135,655	\$3,442	\$1,799	\$4,951

Table 2-39: Estimated Annual Property Losses in Sabine Parish Resulting from High Winds (Continued)

Estimated Annual Potential Losses from Thunderstorm Winds for Sabine Parish			
Many (11.8% of Population)	Noble (1.0% of Population)	Pleasant Hill (3.0% of Population)	Zwolle (7.3% of Population)
\$22,316	\$1,971	\$5,655	\$13,759

There have been three reported injuries and three fatalities as a result of a thunderstorm wind event over the 25-year record.

Vulnerability

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

Lightning

Location

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

Previous Occurrences / Extents

The SHELDUS database reports a total of four lightning events occurring within the boundaries of Sabine Parish between the years of 1990-2015. The SHELDUS database only records lightning events that cause death, injuries, crop damage, and/or property damage, so these numbers do not accurately reflect the number of lightning events in Sabine Parish, which occur on a nearly monthly basis. The planning area can expect to have a lightning density of 11-12 flashes per sq. mile per year. The table below provides an overview of significant lightning strikes over the last five years:

Table 2-40: Previous Occurrences of Significant Lightning Strikes in Sabine Parish from 2010 – 2015
(Source: NCDC and SHELDUS)

Location	Date	Summary	Property Damage
NEGREET	July 4, 2015	Lightning struck a tree at the Cypress Bend Park Resort on Toledo Bend. Six people were struck adjacent to the tree.	\$10,000

Since 2010, there have been no lightning events that have caused property damage or loss of life in the incorporated areas Converse, Fisher, Florien, Many, Noble, Pleasant Hill, or Zwolle.

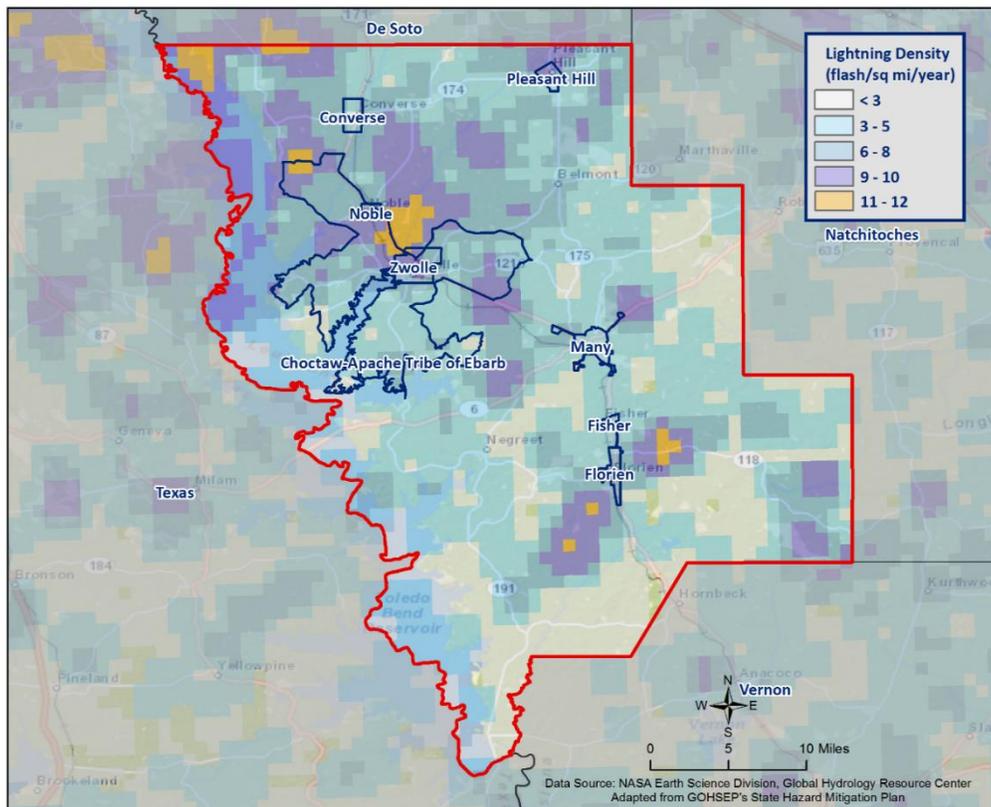


Figure 2-21: Lightning Density Reports for Sabine Parish

Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in Sabine Parish is high. However, lightning that meets the definition that is used by SHELDUS and the NCDC that actually results in damages to property and injury or death is a less likely event. According to SHELDUS, there have been four lightning events that have caused property damages or injuries over the last 25 years, establishing an annual probability of 16%.

Estimated Potential Losses

Since 1990, there have been four significant lightning events that have resulted in property damages according to the SHELDUS database. The total property damages associated with lightning events totaled \$10,726. To estimate the potential losses of a lightning event on an annual basis, the total damages recorded for lightning events was divided by the total number of years of available major lightning strike data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of \$429. The following table provides an estimate of potential property losses for Sabine Parish:

Table 2-41: Estimated Annual Property Losses in Sabine Parish from Lightning

Estimated Annual Potential Losses from Lightning for Sabine Parish			
Unincorporated Sabine Parish (71.6% of Population)	Converse (1.8% of Population)	Fisher (0.9% of Population)	Florien (2.6% of Population)
\$307	\$8	\$4	\$11

Table 2-42: Estimated Annual Property Losses in Sabine Parish from Lightning (Continued)

Estimated Annual Potential Losses from Lightning for Sabine Parish			
Many (11.8% of Population)	Noble (1.0% of Population)	Pleasant Hill (3.0% of Population)	Zwolle (7.3% of Population)
\$51	\$4	\$13	\$31

There have been eight reported injuries and no fatalities in Sabine Parish as a result of a lightning strikes over the 25-year record.

Vulnerability

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

Tornadoes

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

Since February 1, 2007, the Enhanced Fujita (EF) Scale has been used to classify tornado intensity. The EF Scale classifies tornadoes based on their damage pattern rather than wind speed; wind speed is then derived and estimated. This contrasts with the Saffir-Simpson scale used for hurricane classification, which is based on measured wind speed. *Table 2-43* 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 2-43: 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 2-44: Fujita and Enhanced Fujita Tornado Damage Scale

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

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

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

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

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

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

Location

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

Previous Occurrences / Extents

SHELDUS reports a total of seven tornadoes or waterspouts occurring within the boundaries of Sabine Parish between the years of 1990-2015. The tornadoes experienced in Sabine Parish have from ranged EF0 to EF2 on the EF scale, and ranged from F0 to F2 on the F scale. The worst case scenario Sabine Parish can expect in the future is an EF2 tornado.

The tornado that caused the most property damage occurred on April 26, 2011. The tornado first touched down along CR 3229 knocking over trees and destroying a shed. The storm continued east crossing Highway 191 where a 200 foot communications tower was bent to the ground. Further east along Highway 171, two homes were completely destroyed. One was destroyed by a large tree while the other was by the wind alone. Maximum winds are estimated at 110-120 mph.

Table 2-45: Historical Tornadoes in Sabine Parish with Locations from 1990-2015

Date	Impacts	Property Damage	Location	Magnitude
March 14, 1990	0.8 mile path with a width of 30 yards. Several mobile homes and a house were damaged by fallen trees.	\$8,912	UNINCORPORATED AREA	F1
May 12, 1990	2 mile path with a width of 123 yards. Most wind damage was confined to trees and power lines.	\$891	UNINCORPORATED AREA	F1
April 14, 1993	10 mile path with a width of 125 yards. Three people were injured.	\$483,648	MANY	F2
March 30, 2008	0.82 mile path with a width of 50 yards. A large shed was destroyed and shingles were scattered across several lawns.	\$16,230	FISHER	EF0
February 1, 2011	6.03 mile path with a width of 50 yards. A small outbuilding was damaged by falling limbs.	\$1,036	MANY	EF0
April 26, 2011	17.45 mile path with a width of 300 yards. A 200 foot communications tower was bent to the ground. Two homes were completely destroyed.	\$1,035,645	ZWOLLE	EF2
January 25, 2012	2.31 mile path with a width of 150 yards. Several outbuildings suffered roof damage. Two chicken houses had portions of their metal roofs completely removed and other sections where the metal had been peeled back.	\$50,732	PEASON DAM	EF0

The incorporated areas of Converse, Fisher, Florien, Noble, and Pleasant Hill and the Choctaw-Apache Tribe of Ebarb have not experienced a tornado event from 2010 to the present. Since 2010, the year in which the last update to this hazard mitigation plan was written, Sabine Parish has had three tornadoes touch down in Many, Zwolle, and the unincorporated areas of the parish. The following is a brief synopsis of these events:

February 1, 2011 – EF0 Tornado in Many

Numerous trees were snapped or uprooted along a 6 mile track which started along Hwy. 175 north of Many. The tornado bounced up and down along the track which crossed Brumley Road and paralleled Primm Road and Cedar Grove Road in Sabine Parish. The most damage occurred near the end of the path where numerous trees were split, topped or snapped next to several homes. One small outbuilding was damaged by falling limbs. The width of the tornado is estimated at 50 yards. Maximum winds were 70-75 mph.

April 26, 2011 – EF2 Tornado in Zwolle

The National Weather Service conducted a storm survey from Zwolle, Louisiana eastward to north of Many, Louisiana and concluded damage was the result of an EF2 tornado. The tornado first touched down along CR 3229 knocking over trees and destroying a shed. The storm continued east crossing Hwy 191 where a 200 foot communications tower was bent to the ground and trees were snapped

and uprooted near some homes. Further east along Hwy 171 two homes were completely destroyed. One home was destroyed by a large tree while the other was by the wind alone. The tornado continued east along Parish Road 1216 snapping trees and damaging roofs to homes. A few homes had their roof peeled back. At least a dozen homes sustained damage along 1216. What appears to be a downburst occurred near the intersection of 1216 and 175 feeding northeast into the tornado track which continued along Cedar Grove Road. The tornado began to occlude near the area around Cedar Grove Road and Rocky Springs Road. Maximum winds are estimated at 110-120 mph.

January 25, 2012 – EF0 Tornado in Peason Dam

The National Weather Service conducted a storm survey in Sabine Parish and concluded that damage was the result of an EF0 tornado. The tornado first touched down northwest of Peason near the intersection of Bridges Road and Hwy 118. The tornado tracked southeast generally parallel to Hwy 118. Damage consisted mostly of numerous tree branches being snapped. Near the intersection of Hwy 118 and Peason Road, several outbuildings suffered roof damage. Two chicken houses had portions of their metal roofs completely removed and other sections where the metal had been peeled back. Owner of the property reported that he heard the tornado. The tornado continued southeast causing sporadic tree damage before lifting along Hwy 118 west of the Sabine/Natchitoches Parish Line. The maximum winds are estimated at 65-75 mph.

Frequency / Probability

Tornadoes are a sporadic occurrence within Sabine Parish, with an annual chance of occurrence calculated at 28% based on the records for the past 25 years (1990-2015). The following figure displays the density of tornado touch downs in Sabine Parish and neighboring parishes.

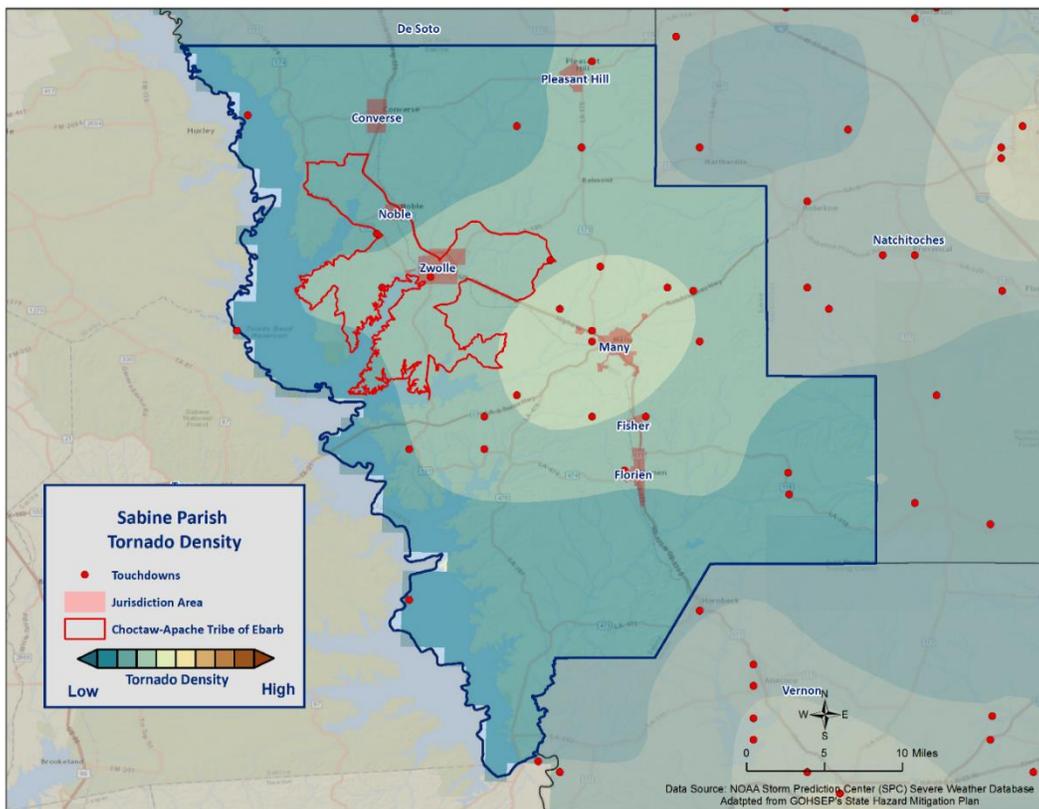


Figure 2-22: Location and Density of Tornadoes to Touch Down in Sabine Parish
(Source: NOAA/SPC Severe Weather Database)

Estimated Potential Losses

According to the SHELUS database, there have been seven tornadoes that have caused some level of property damage. The total damage from the actual claims for property is \$1,597,094, with an average cost of \$228,156 per tornado strike. When annualizing the total cost over the 25-year record, total annual losses based on tornadoes are estimated to be \$63,884. To provide an estimated annual estimated potential loss per jurisdiction, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the following tables provides an annual estimate of potential losses for Sabine Parish.

Table 2-46: Estimated Annual Losses from Tornadoes in Sabine Parish

Estimated Annual Potential Losses from Tornadoes for Sabine Parish			
Unincorporated Sabine Parish (71.6% of Population)	Converse (1.8% of Population)	Fisher (0.9% of Population)	Florien (2.6% of Population)
\$45,720	\$1,160	\$606	\$1,669

Table 2-47: Estimated Annual Losses from Tornadoes in Sabine Parish (Continued)

Estimated Annual Potential Losses from Tornadoes for Sabine Parish			
Many (11.8% of Population)	Noble (1.0% of Population)	Pleasant Hill (3.0% of Population)	Zwolle (7.3% of Population)
\$7,521	\$664	\$1,906	\$4,637

Table 2-48 presents an analysis of building exposure that is susceptible to tornadoes by general occupancy type for Sabine Parish, along with the percentage of building stock that are mobile homes.

Table 2-48: Building Exposure by General Occupancy Type for Tornadoes in Sabine Parish (Source: FEMA’s Hazus 2.2)

Building Exposure by General Occupancy Type for Tornadoes							
Exposure Types (\$1,000)							
Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Mobile Homes (%)
2,783,297	532,123	104,401	13,566	140,088	45,427	37,620	20.1%

Sabine Parish has suffered through a total of one day in which tornadoes or waterspouts have accounted for three injuries and no fatalities during this 25-year period (*Table 2-49*). The average number of injuries per event for Sabine Parish is 0.43 per tornado, with an average of 0.12 per year for the 25-year period.

Table 2-49: Tornadoes in Sabine Parish by Magnitude that Caused Injuries or Deaths

Date	Magnitude	Deaths	Injuries
April 14, 1993	F2	0	3

In assessing 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 Sabine Parish consists of manufactured housing. Based on location data collected in a previous hazard mitigation project, there are 21 known locations where manufactured housing is concentrated. Each of those 21 locations have an overall number of manufactured houses ranging from two to 56. The location and density of manufactured houses can be seen in *Figure 2-23*.

Manufactured housing is more likely to sustain damage from a tornado than any other residential structure. The highest concentration of manufactured home parks is located in the unincorporated area of Sabine Parish (*Table 2-50*). However, this does not influence the risk associated with a tornado event since they strike at random, making all structures and population within the planning area equally vulnerable.

Table 2-50: Manufactured Home Distribution throughout Sabine Parish

Location	Number of Manufactured Home Parks	% of Manufactured Home Parks
Unincorporated Area	18	85.7%
Converse	0	0.0%
Fisher	0	0.0%
Florien	0	0.0%
Many	0	0.0%
Noble	0	0.0%
Pleasant Hill	0	0.0%
Zwolle	3	14.3%

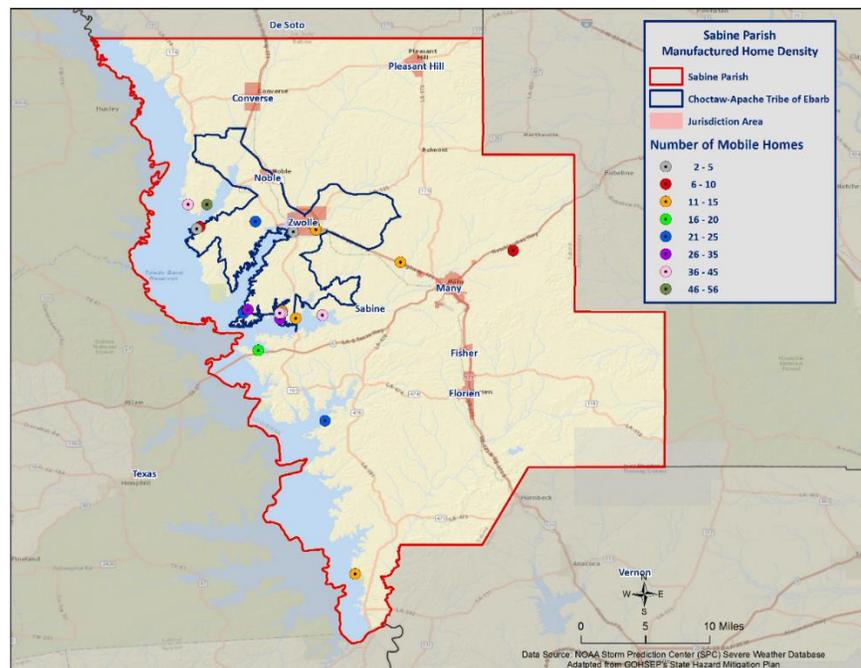


Figure 2-23: Location and Approximate Number of Units in Manufactured Housing Locations throughout Sabine Parish.

Vulnerability

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

Tropical Cyclones

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

Table 2-51: Saffir-Simpson Hurricane Wind Scale

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

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

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

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

Location

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

Previous Occurrences / Extents

The central Gulf of Mexico coastline is among the most hurricane-prone locations in the United States, and hurricanes can affect every part of the state. The SHELDUS database reports a total of four tropical cyclone events occurring within the boundaries of Sabine Parish between the years 2002 and 2015 (*Table 2-52*). The tropical cyclone events experienced in Sabine Parish include depressions, storms, and hurricanes. As a worst case scenario, Sabine Parish can expect to experience hurricanes at the Category 1 level in the future.

Table 2-52: Historical Tropical Cyclone Events in Sabine Parish from 2002- 2014

(Source: SHEL DUS)

Date	Name	Storm Type At Time of Impact
September 24, 2005	Rita	Hurricane – Category 1
September 1, 2008	Gustav	Tropical Storm
September 12, 2008	Ike	Tropical Storm
August 30, 2012	Isaac	Tropical Storm

Hurricane Rita (2005)

While Hurricane Katrina and resulting levee failures captured headlines worldwide, lesser known (but just as destructive) Hurricane Rita wreaked havoc on southwestern Louisiana less than a month later. The storm made landfall as a Category 3 hurricane in Cameron Parish. Across southeast Louisiana, the main effect from Hurricane Rita was the substantial storm surge flooding that occurred in low lying communities across coastal areas of southern Terrebonne, southern Lafourche, and southern Jefferson Parishes, where numerous homes and businesses were flooded. Some of the most substantial damage occurred in southern Terrebonne Parish, where storm surge of five to seven feet above normal overtopped or breached local drainage levees, inundating many small communities. Newspaper accounts indicated that approximately 10,000 structures were flooded in Terrebonne Parish. Lafitte and other communities in lower Jefferson Parish also suffered extensive storm surge flooding. Storm surge flooding also occurred in areas adjacent to Lake Pontchartrain and Lake Maurepas, affecting homes and businesses from Slidell to Mandeville and Madisonville. Approximately 1,500 structures were reported as flooded in Livingston Parish near Lake Maurepas. Repaired levees damaged by Hurricane Katrina in late August were overtopped or breached along the Industrial Canal in New Orleans, resulting in renewed flooding in adjacent portions of New Orleans and St. Bernard Parish. However, the flooding was much more limited in scope than during Hurricane Katrina.

Hurricane Rita was the most powerful hurricane to impact southwestern Louisiana since Hurricane Audrey in 1957. Estimated damages in southwest Louisiana totaled near \$4 billion, with the majority of those losses occurring in Cameron and Calcasieu Parishes. Entire towns were destroyed in Cameron Parish, including downtown Cameron, Creole, Holly Beach, and Grand Chenier. An estimated 90 to 95 percent of the homes in the parish were severely damaged or destroyed. Storm surge values were estimated around 15 feet in parts of Cameron Parish.

Hurricane Rita retained much of its strength as it made its way inland. In Sabine Parish, peak winds of 80 to 100 mph were reported in the southwestern portion of the parish while the entire parish experienced peak winds upwards of 50 mph. Widespread tree and power line damage was reported across the parish. The National Weather Service office in Shreveport, Louisiana reported that over 175,000 people in its jurisdiction had lost power at the height of Hurricane Rita. This figure includes residents of Sabine Parish.

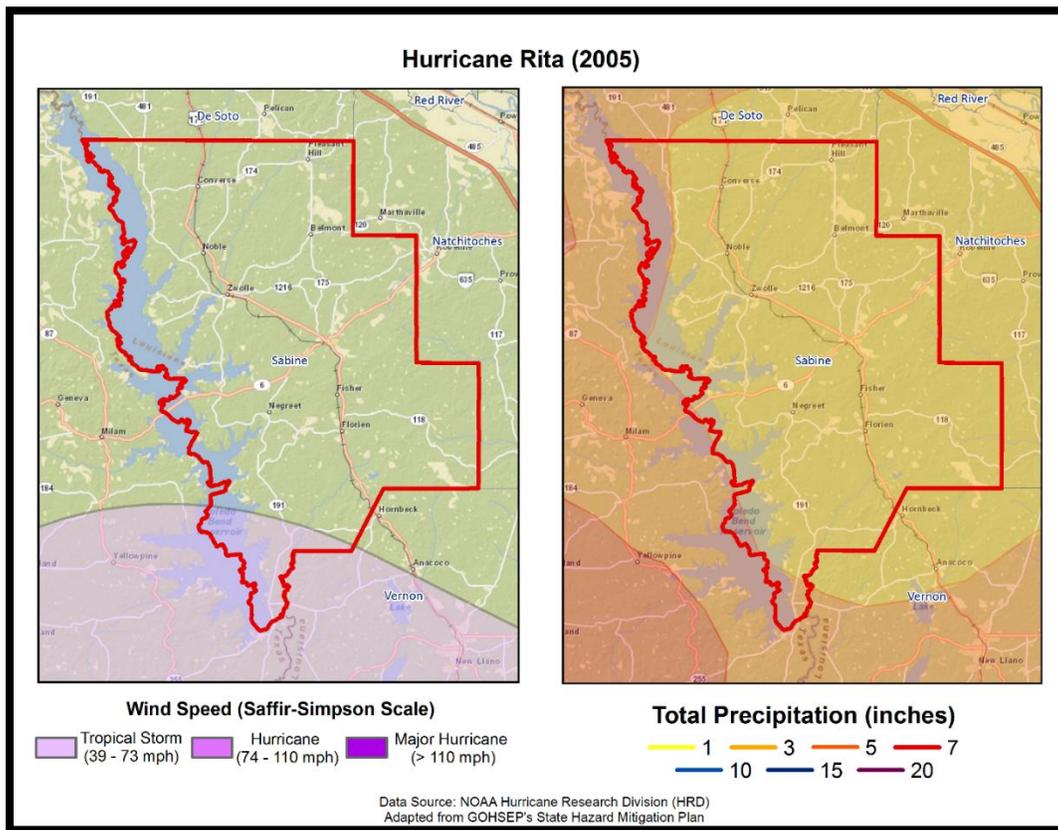


Figure 2-24: Wind Speed and Precipitation Totals in Sabine Parish for Hurricane Rita

Hurricane Gustav (2008)

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

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

Gustav produced widespread wind damage across southeast Louisiana, especially in the area from Houma and Thibodaux through the greater Baton Rouge area. Hurricane force wind gusts occurred also across the inland areas, including the Baton Rouge area and surrounding parishes. A peak wind gust of 91 mph was recorded at the Baton Rouge (Ryan Field) Airport at 1:12 PM CST. This was only one mph less than the highest wind gust recorded during Hurricane Betsy in 1965. After the storm, the electric utility serving most of southeast Louisiana reported 75 to 100 percent of utility customers were without power, in areas ranging

from Lafourche and Terrebonne Parishes northwest through the Baton Rouge area to central Louisiana and southwest Mississippi. Considerable damage occurred to many houses and structures as large tree limbs and trees were toppled by the hurricane force winds. Preliminary estimates from the American Red Cross indicated that around 13,000 single family dwellings were damaged by the hurricane in southeast Louisiana, and several thousand more apartments and mobile homes were also damaged. Early estimates from Louisiana Economic Development indicated that Gustav caused at least \$4.5 billion in property damage in Louisiana, including insured and uninsured losses.

Tropical storm force winds resulted in widespread trees and power lines downed across the entirety of Sabine Parish. Numerous parish and secondary roads were impassable during the height of the storm from fallen debris and fallen trees. Nearly all of the parish was without power during the storm as well. The storm resulted in the death of a woman in Bentley, Louisiana when a tree hit her home. Three other people were injured when trees fell across other homes across the parish. The other injuries were not considered life-threatening. The roof was torn off a school administration building in Colfax, Louisiana.

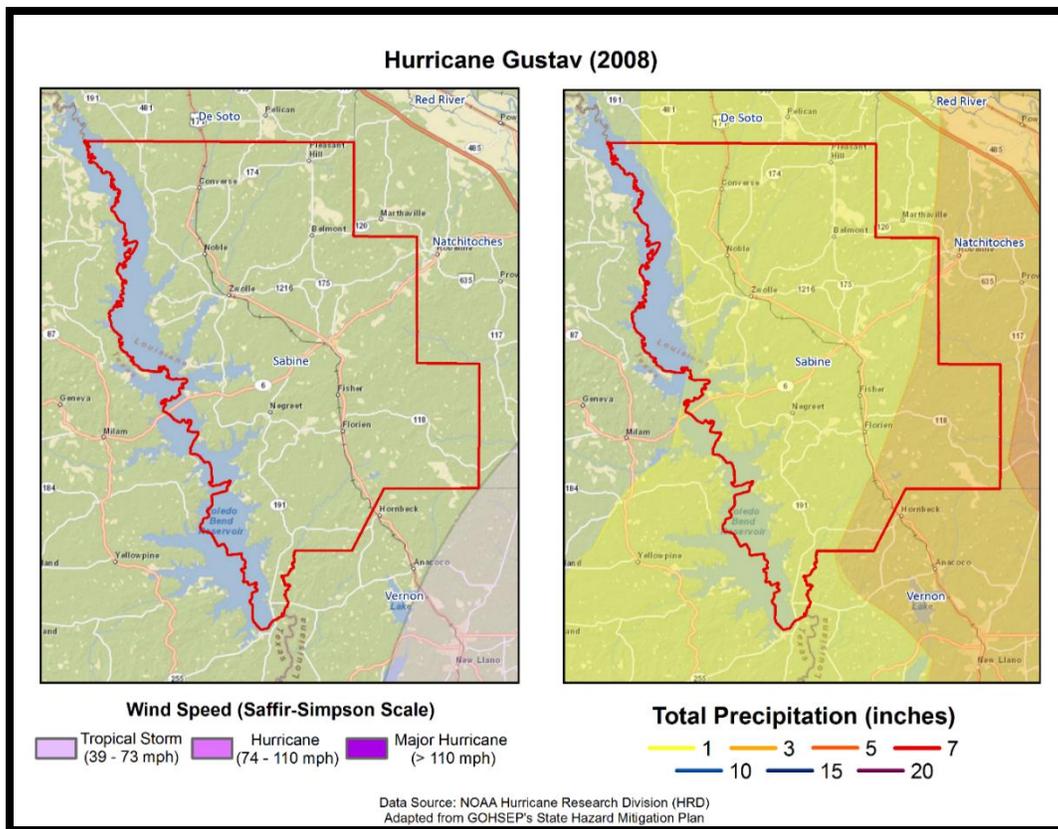


Figure 2-25: Wind Speed and Precipitation Totals in Sabine Parish for Hurricane Gustav

Hurricane Ike (2008)

Hurricane Ike caused wind damage, storm surge flooding, and tornadoes across southwest Louisiana. Ike made landfall near Galveston, TX early in the morning on September 13, 2008, as a strong category 2 hurricane. Sustained hurricane force winds were confined to extreme western Cameron Parish. The highest recorded winds in southwest Louisiana were experienced at Lake Charles Regional Airport, with sustained winds of 53 mph (46 kts) and gusts of 77 mph (67 kts). The lowest pressure reading occurred at Southland Field near Sulphur, LA, with a low of 994.6 millibars. Several tornadoes were reported across southwest

Louisiana. The most significant one was near Mamou, where ten to fifteen homes were damaged, including one that lost its roof. Storm surge was a significant event. Water levels ranged from 14 feet in western Cameron Parish, to eight feet in St. Mary Parish. This resulted in widespread flooding of the same areas that flooded during Hurricane Rita in 2005. Most of Cameron Parish was under water. Over 3,000 homes were flooded. This extended north into Calcasieu Parish, where another 1,000 homes flooded in Lake Charles, Westlake, and Sulphur. In Vermilion Parish, at least 1,000 homes flooded in Pecan Island, Forked Island, Intracoastal City, and Henry. This extended east into Iberia Parish, where another 1,000 homes flooded south of Highway 14 and Highway 90. In St. Mary Parish, some of the worst flooding occurred in Franklin, where a man-made levee failed, flooding over 450 homes. Maximum storm total rainfall ranged from six to eight inches across Cameron, Calcasieu, and Beauregard Parishes. No fatalities were reported in southwest Louisiana. Total property damages, however, were high. Losses were estimated to be almost \$420 million across southwest Louisiana. Agricultural losses were over \$225 million.

In Sabine Parish, tropical storm force winds resulted in widespread trees and power lines downed. Power outages were widespread as well with numerous residents without power during the height of the storm and well after the storm.

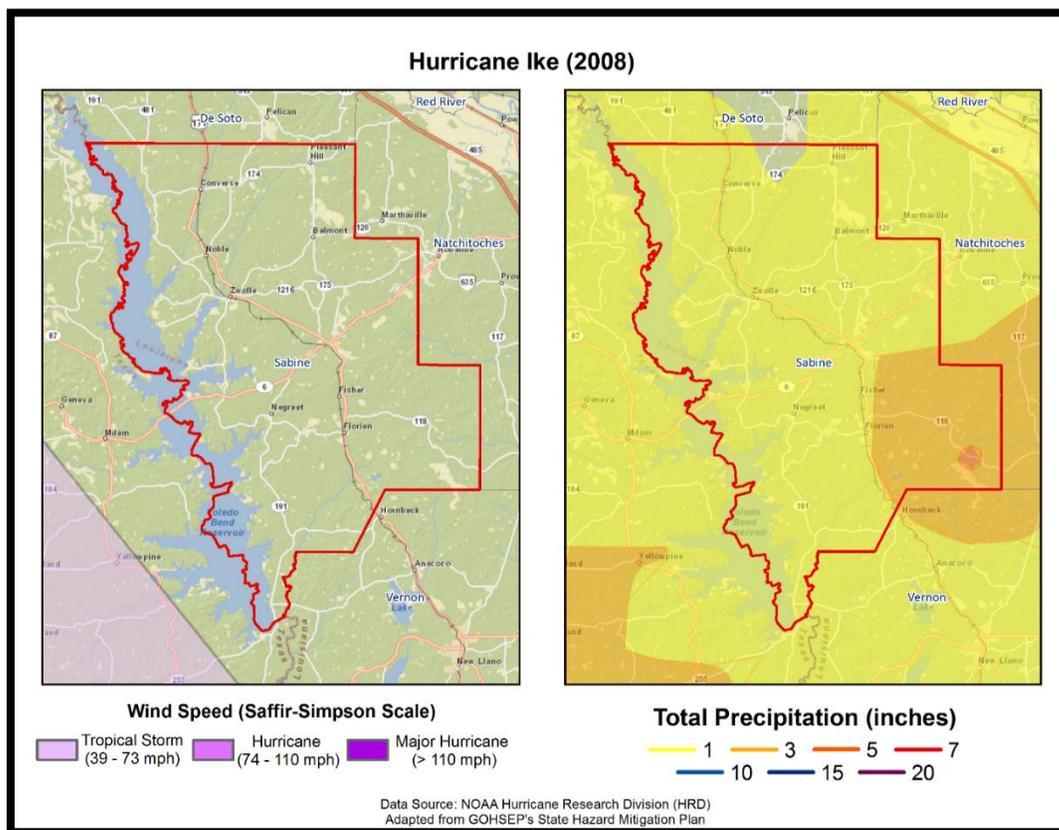


Figure 2-26: Wind Speed and Precipitation Totals in Sabine Parish for Hurricane Ike

Hurricane Isaac (2012)

Hurricane Isaac made its second landfall during the predawn hours of August 29th across Southeast Louisiana. This hurricane moved very slowly north and east and was downgraded to a tropical storm later that same afternoon but due to its slow northeast movement...tropical storm force winds were not felt across portions of East Central and Northeast Louisiana until the early morning hours of August 30th. These winds

estimated to be sustained at 35 to 50 mph with gusts as high as 70 mph produced winds that downed multiple trees across a few parishes. Excessive heavy rainfall also resulted well after the storm moved north into Arkansas with flash flooding being reported across portions of the region on August 31 with the remnants to Isaac. Tropical Storm force winds were felt in Grant, Jackson, La Salle, Jackson, Caldwell and Ouachita Parishes.

By the time Hurricane Isaac had started to affect Sabine Parish, the storm had weakened considerably. No noticeably strong winds were reported within the parish. Several trees and power lines were downed, resulting in widespread power outages.

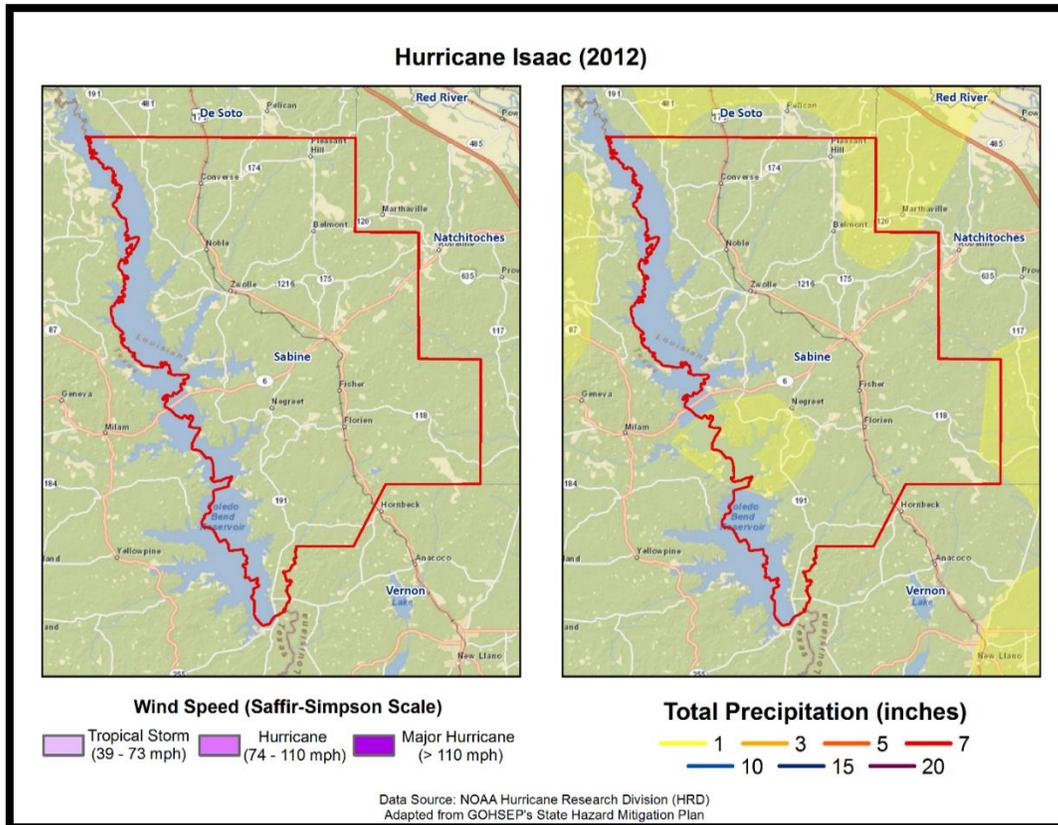


Figure 2-27: Wind Speed and Precipitation Totals in Sabine Parish for Hurricane Isaac

By the time Hurricane Isaac had started to affect Sabine Parish, the storm had weakened considerably. No noticeably strong winds were reported within the parish. Several trees and power lines were downed, resulting in widespread power outages.

The figure on the next page displays the wind zones that affect Sabine Parish in relation to critical facilities throughout the parish.

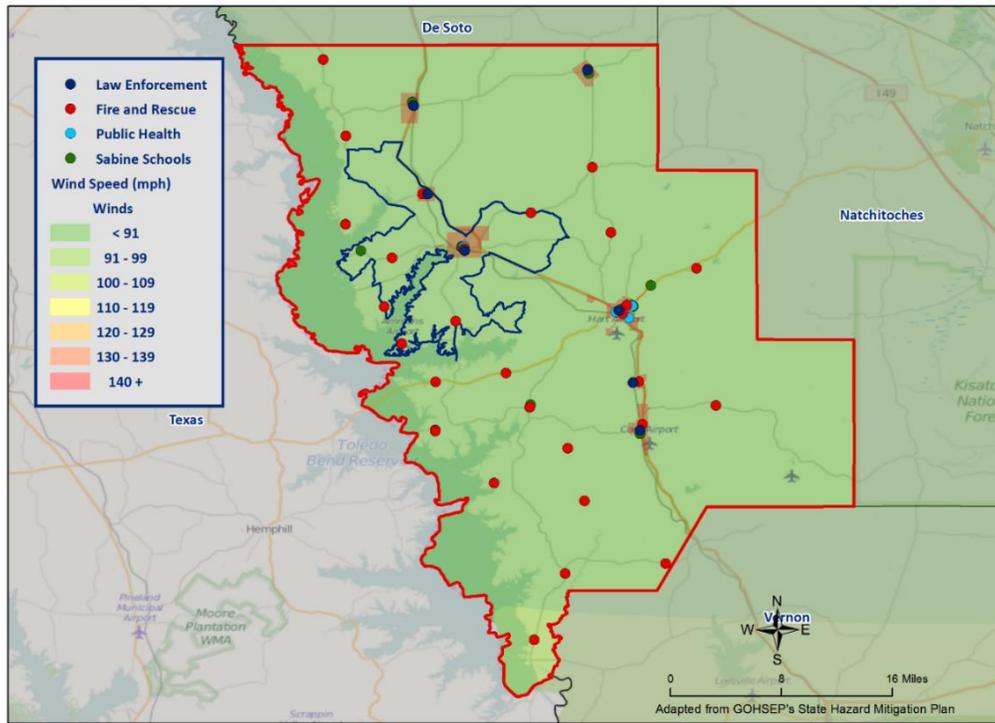


Figure 2-28: Winds Zones for Sabine Parish in Relation to Critical Facilities

Frequency / Probability

Tropical cyclones are large natural hazard events that regularly impact Sabine Parish. The annual chance of occurrence for a tropical cyclone is estimated at 16% for Sabine Parish and its municipalities, with two events occurring within 25 years. The tropical cyclone season for the Atlantic Basin is from June 1st through November 30th, with most of the major hurricanes (Saffir-Simpson Categories 3, 4, & 5) occurring between the months of August and October

Estimated Potential Losses

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

Table 2-53: Total Estimated Losses for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event
Sabine Parish (Unincorporated)	\$2,739,801
Converse	\$82,338
Fisher	\$43,040
Florien	\$118,455
Many	\$533,888
Noble	\$47,157
Pleasant Hill	\$135,297
Zwolle	\$329,165
Total	\$4,029,142

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

*Table 2-54: Ratio of Total Losses to Total Estimated Value of Assets for each Jurisdiction in Sabine Parish
(Source: Hazus 2.2)*

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event	Total Estimated Value of Assets	Ratio of Estimated Losses to Total Value
Unincorporated	\$2,739,801	\$2,562,284,000	0.1%
Converse	\$82,338	\$49,447,000	0.2%
Fisher	\$43,040	\$27,162,000	0.2%
Florien	\$118,455	\$81,763,000	0.1%
Many	\$533,888	\$562,343,000	0.1%
Noble	\$47,157	\$26,609,000	0.2%
Pleasant Hill	\$135,297	\$164,512,000	0.1%
Zwolle	\$329,165	\$182,402,000	0.2%

Based on the Hazus 2.2 Hurricane Model, estimated total losses range from 0.1% to 0.2% of the total estimated value of all assets for the unincorporated area of Sabine Parish, and the incorporated areas of Converse, Fisher, Florien, Many, Noble, Pleasant Hill, and Zwolle.

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

*Table 2-55: Estimated Losses in Unincorporated Sabine Parish for a 100-Year Hurricane Event
(Source: Hazus 2.2)*

Sabine Parish (Unincorporated)	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$700
Commercial	\$34,133
Government	\$2,302
Industrial	\$4,465
Religious / Non-Profit	\$7,322
Residential	\$4,240,020
Schools	\$1,997
Total	\$2,739,801

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

Converse	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$13
Commercial	\$655
Government	\$44
Industrial	\$86
Religious / Non-Profit	\$141
Residential	\$81,361
Schools	\$38
Total	\$82,338

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

Fisher	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$7
Commercial	\$342
Government	\$23
Industrial	\$45
Religious / Non-Profit	\$73
Residential	\$42,530
Schools	\$20
Total	\$43,040

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

Florien	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$19
Commercial	\$942
Government	\$64
Industrial	\$123
Religious / Non-Profit	\$202
Residential	\$117,049
Schools	\$55
Total	\$118,455

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

Many	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$87
Commercial	\$4,247
Government	\$286
Industrial	\$556
Religious / Non-Profit	\$911
Residential	\$527,552
Schools	\$248
Total	\$533,888

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

Noble	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$8
Commercial	\$375
Government	\$25
Industrial	\$49
Religious / Non-Profit	\$80
Residential	\$46,598
Schools	\$22
Total	\$47,157

*Table 2-61: Estimated Losses in Pleasant Hill for a 100-Year Hurricane Event
(Source: Hazus 2.2)*

Pleasant Hill	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$22
Commercial	\$1,076
Government	\$73
Industrial	\$141
Religious / Non-Profit	\$231
Residential	\$133,691
Schools	\$63
Total	\$135,297

Table 2-62: Estimated Losses in Zwolle for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Zwolle	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	\$54
Commercial	\$2,618
Government	\$177
Industrial	\$343
Religious / Non-Profit	\$562
Residential	\$325,259
Schools	\$153
Total	\$329,165

Threat to People

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

Table 2-63: Number of People Susceptible to a 100-Year Hurricane Event in Sabine Parish
(Source: Hazus 2.2)

Number of People Exposed to Hurricane Hazards			
Location	# in Community	# in Hazard Area	% in Hazard Area
Sabine Parish (Unincorporated)	14,641	14,641	100.0%
Converse	440	440	100.0%
Fisher	230	230	100.0%
Florien	633	633	100.0%
Many	2,853	2,853	100.0%
Noble	252	252	100.0%
Pleasant Hill	723	723	100.0%
Zwolle	1,759	1,759	100.0%
Total	24,233	24,233	100.0%

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

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

Sabine Parish (Unincorporated)		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	14,641	100.0%
Persons Under 5 Years	996	6.8%
Persons Under 18 Years	3,572	24.4%
Persons 65 Years and Over	2,709	18.5%
White	10,293	70.3%
Minority	4,348	29.7%

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

Converse		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	440	100.0%
Persons Under 5 Years	40	9.1%
Persons Under 18 Years	129	29.3%
Persons 65 Years and Over	74	16.8%
White	352	80.0%
Minority	88	20.0%

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

Fisher		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	230	100.0%
Persons Under 5 Years	11	4.8%
Persons Under 18 Years	44	19.1%
Persons 65 Years and Over	31	13.5%
White	148	64.4%
Minority	82	35.7%

*Table 2-67: Vulnerable Populations in Florien for a 100-Year Hurricane Event
(Source: Hazus 2.2)*

Florien		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	633	100.0%
Persons Under 5 Years	42	6.6%
Persons Under 18 Years	178	28.1%
Persons 65 Years and Over	97	15.3%
White	421	66.5%
Minority	212	33.5%

*Table 2-68: Vulnerable Populations in Many for a 100-Year Hurricane Event
(Source: Hazus 2.2)*

Many		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	2,853	100.0%
Persons Under 5 Years	206	7.2%
Persons Under 18 Years	663	23.2%
Persons 65 Years and Over	555	19.5%
White	1,329	46.6%
Minority	1,524	53.4%

*Table 2-69: Vulnerable Populations in Noble for a 100-Year Hurricane Event
(Source: Hazus 2.2)*

Noble		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	252	100.0%
Persons Under 5 Years	18	7.1%
Persons Under 18 Years	58	23.0%
Persons 65 Years and Over	35	13.9%
White	154	61.1%
Minority	98	38.9%

*Table 2-70: Vulnerable Populations in Pleasant Hill for a 100-Year Hurricane Event
(Source: Hazus 2.2)*

Pleasant Hill		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	723	100.0%
Persons Under 5 Years	40	5.5%
Persons Under 18 Years	199	27.5%
Persons 65 Years and Over	90	12.5%
White	398	55.1%
Minority	325	45.0%

*Table 2-71: Vulnerable Populations in Zwolle for a 100-Year Hurricane Event
(Source: Hazus 2.2)*

Zwolle		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,759	100.0%
Persons Under 5 Years	193	11.0%
Persons Under 18 Years	588	33.4%
Persons 65 Years and Over	172	9.8%
White	527	30.0%
Minority	1,232	70.0%

Vulnerability

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

Wildfires

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

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

According to the State of Louisiana Forestry Division, most forest fires in Louisiana are caused by intentional acts (arson) or carelessness and negligence committed by people, exacerbated by human confrontation with nature. The wildland–urban interface is the area in which development meets wildland vegetation, where both vegetation and the built environment provide fuel for fires. As development near wildland settings continues, more people and property are exposed to wildfire danger. [Figure 2-29](#) displays the areas of wildland-urban interaction in Sabine Parish.

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

Table 2-72: Southern Group of State Foresters Wildfire Risk Assessment Fire Intensity Scale
(Source: Southern Wildfire Assessment Portal)

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

Location

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

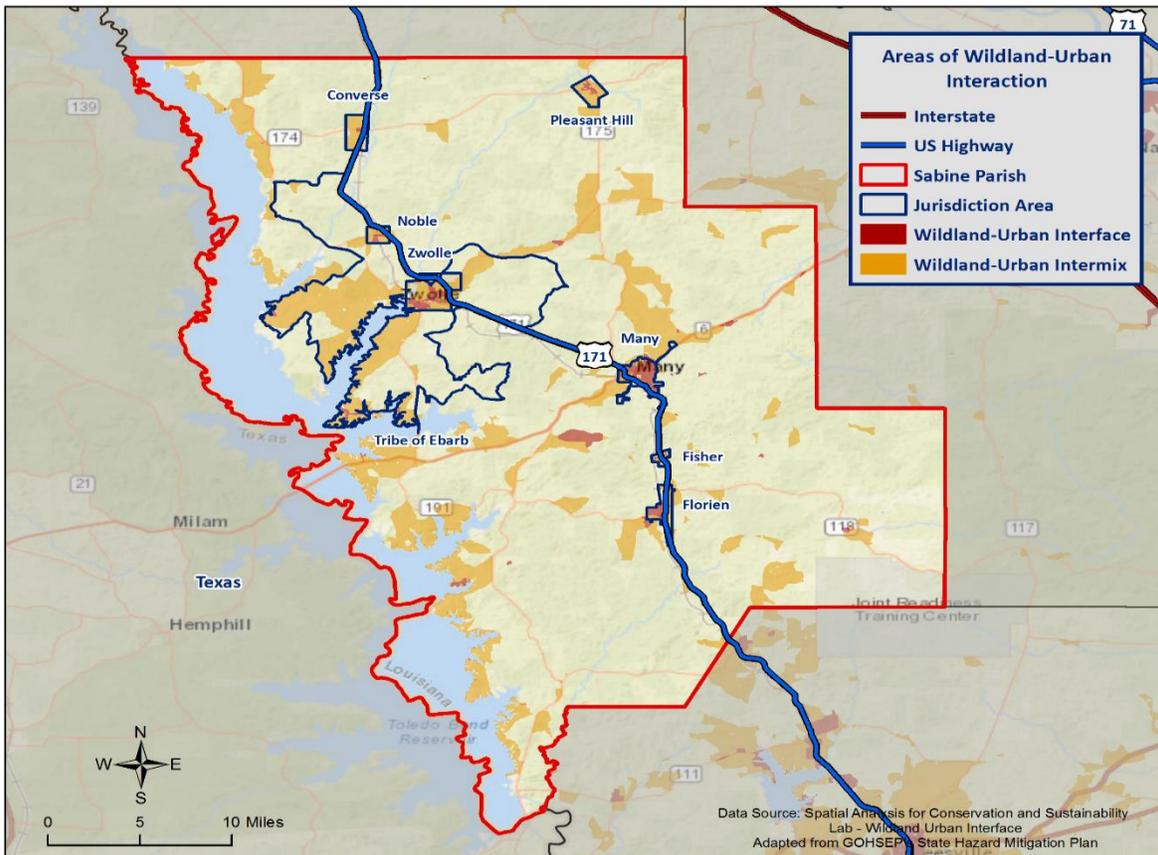


Figure 2-29: Wildland-Urban Interaction in Sabine Parish

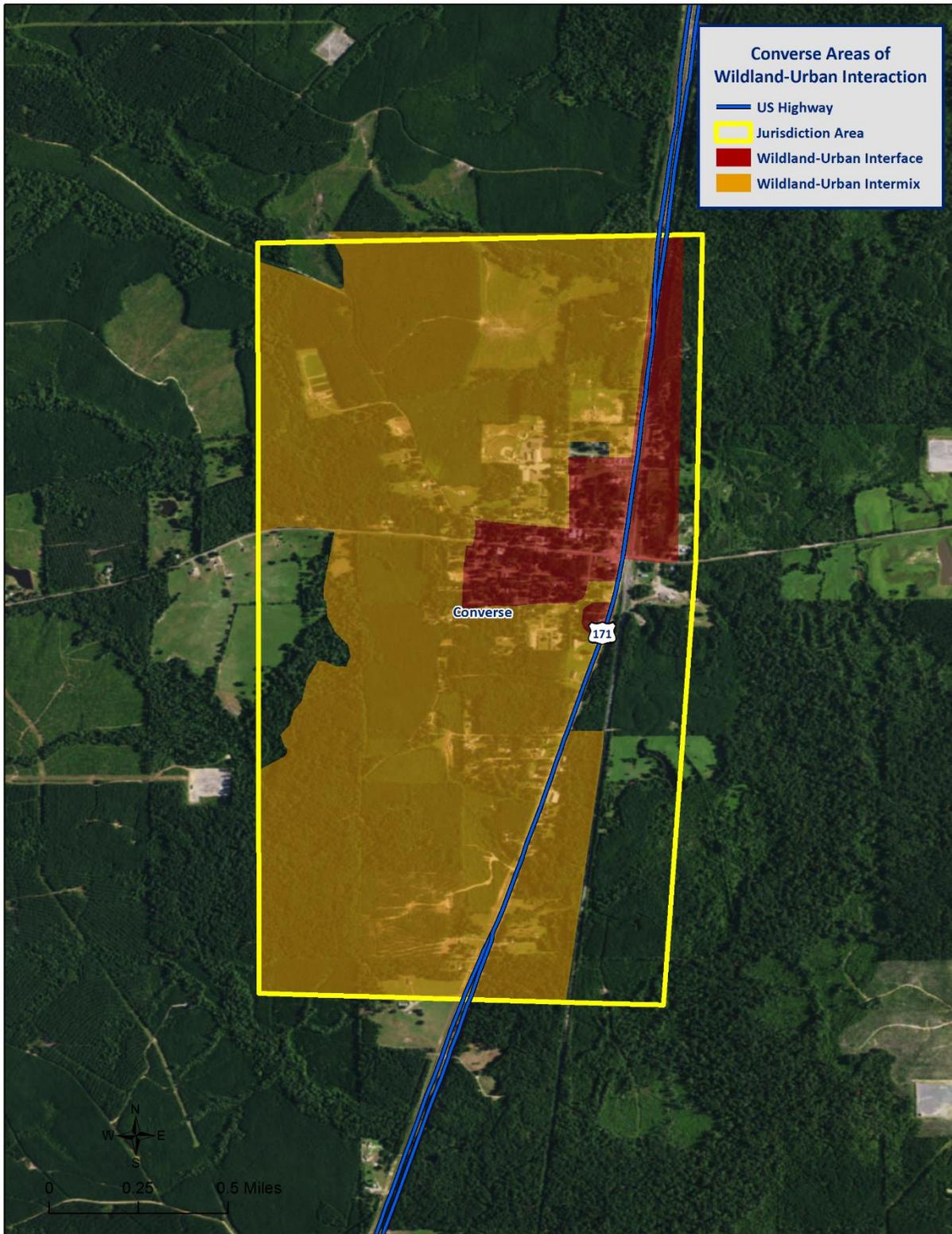


Figure 2-30: Wildland-Urban Interaction in Converse

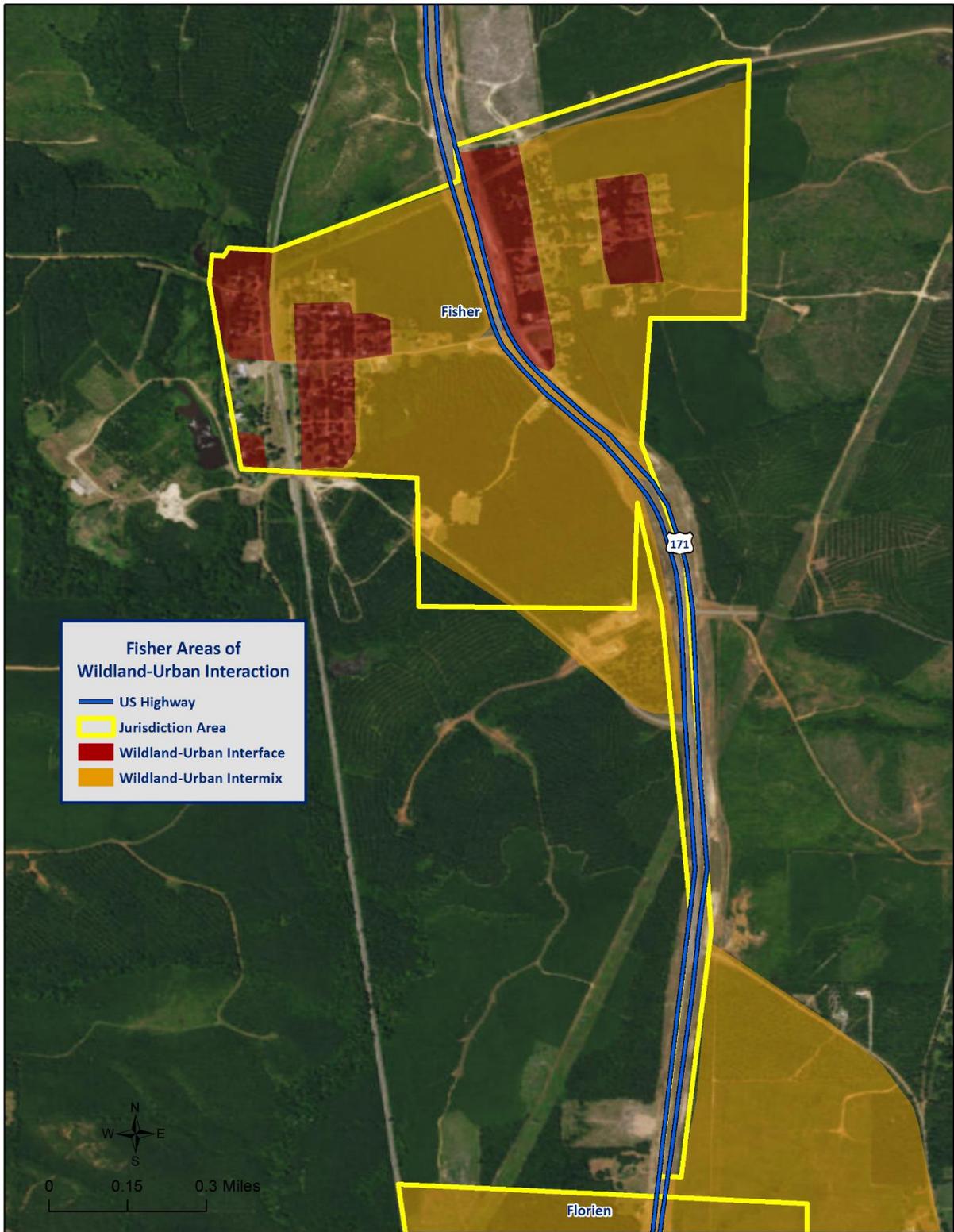


Figure 2-31: Wildland-Urban Interaction in Fisher

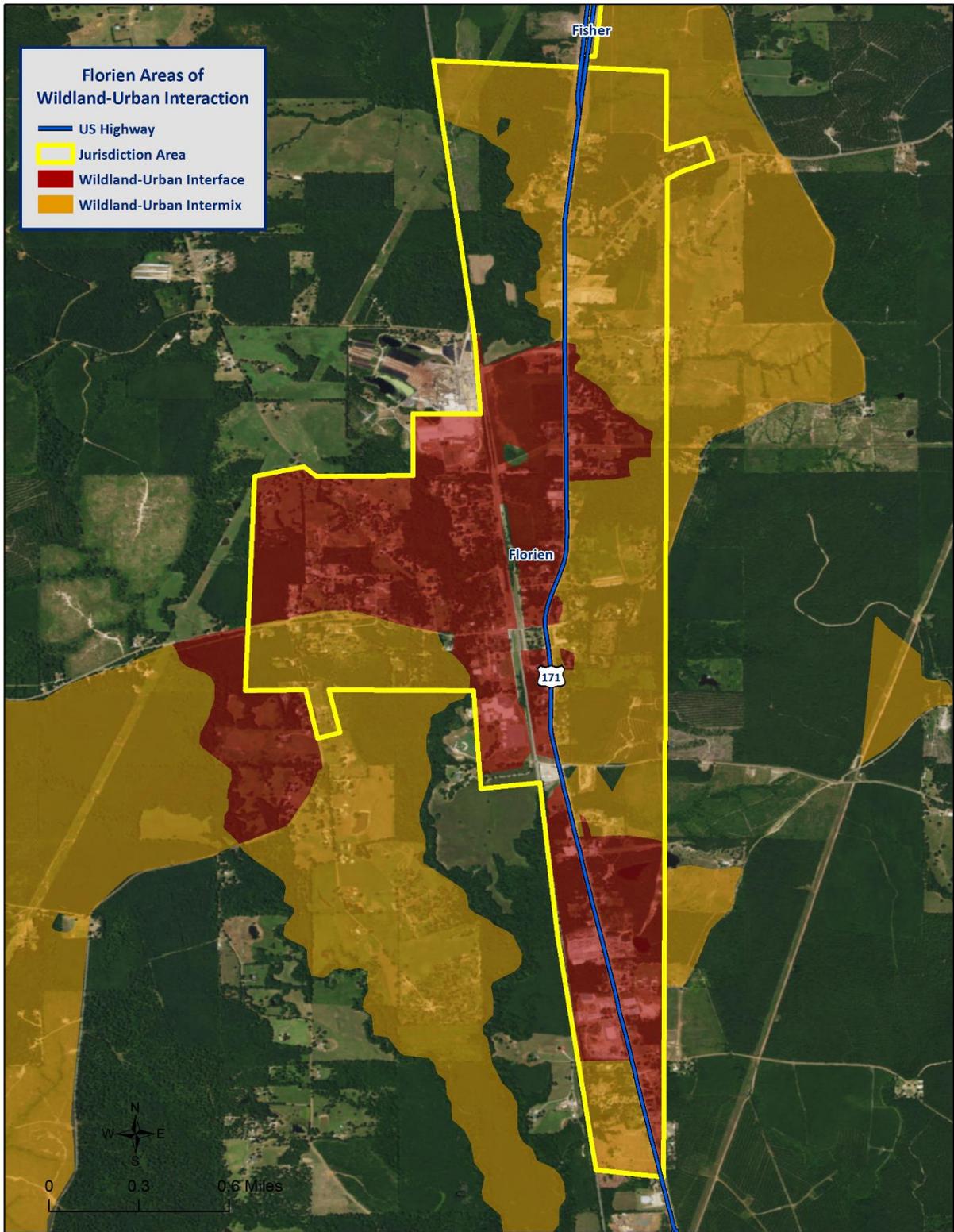


Figure 2-32: Wildland-Urban Interaction in Florien

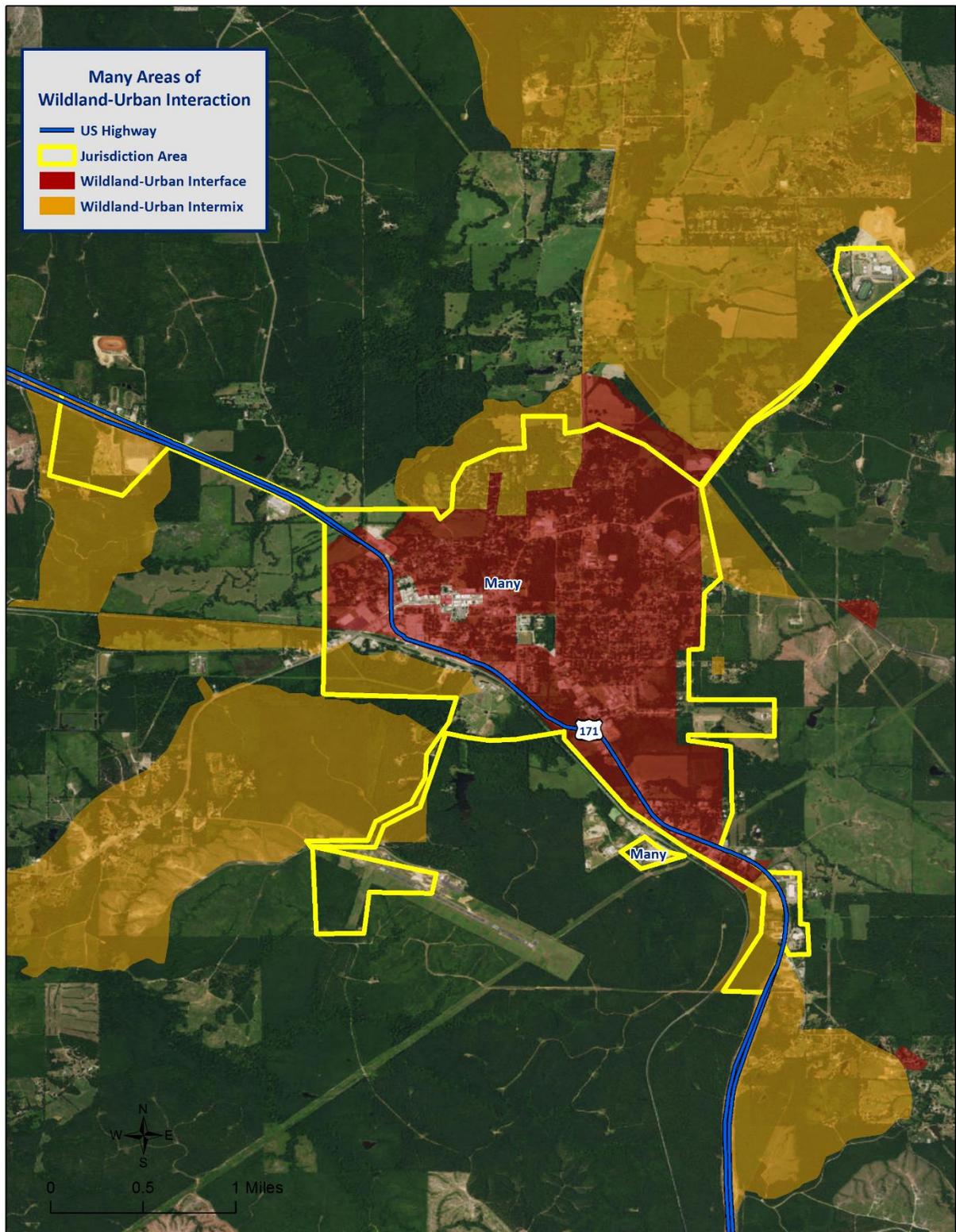


Figure 2-33: Wildland-Urban Interaction in Many

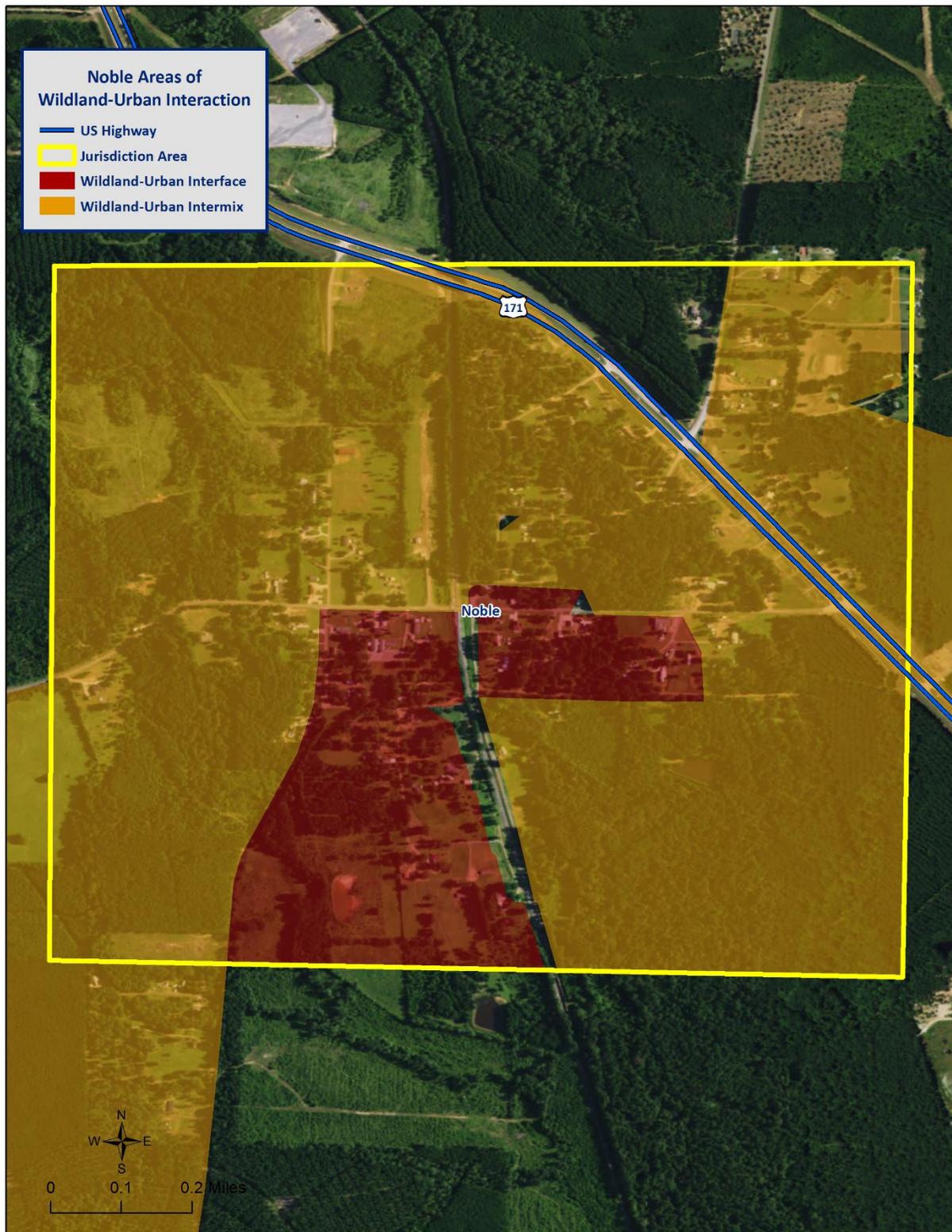


Figure 2-34: Wildland-Urban Interaction in Noble

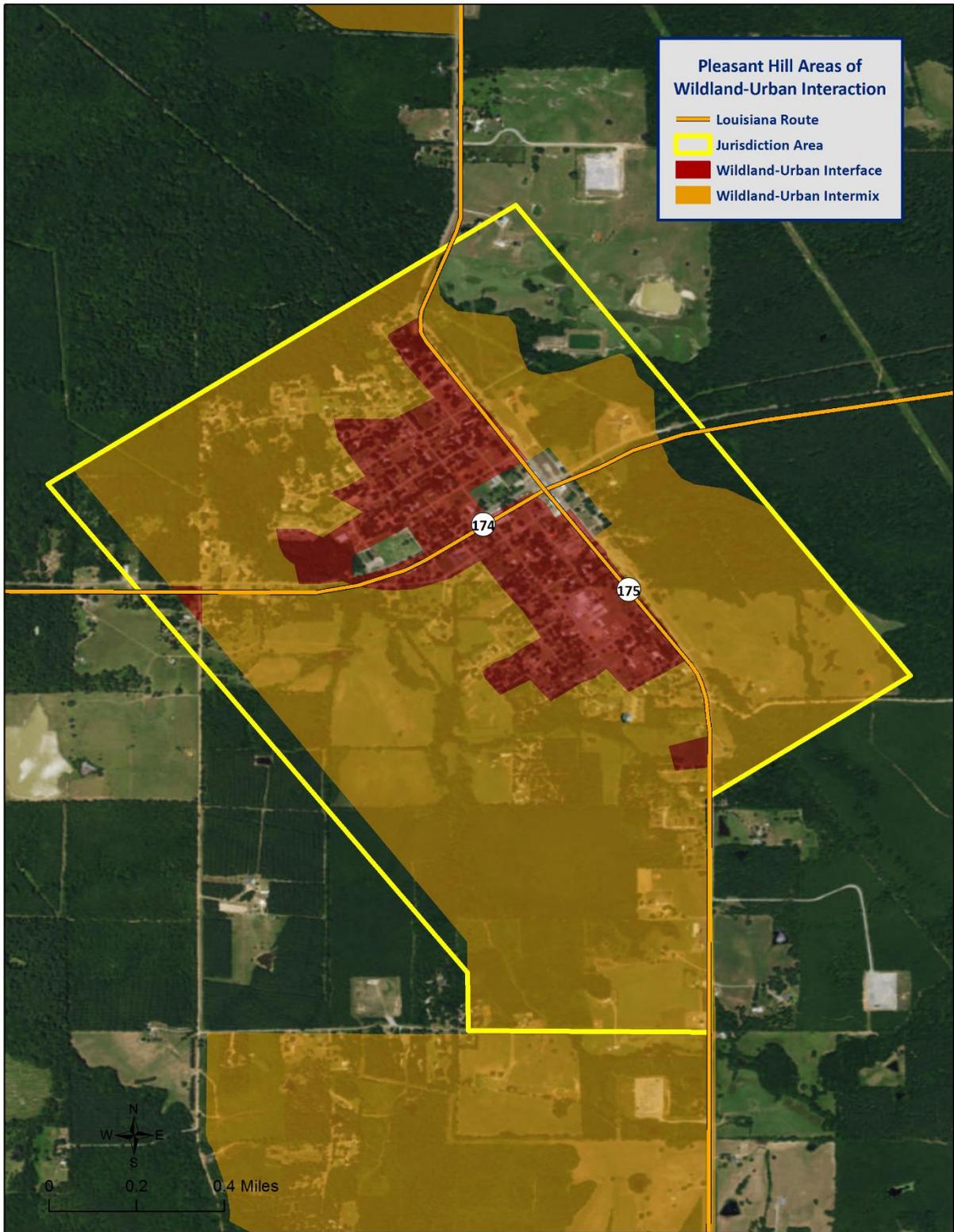


Figure 2-35: Wildland-Urban Interaction in Pleasant Hill

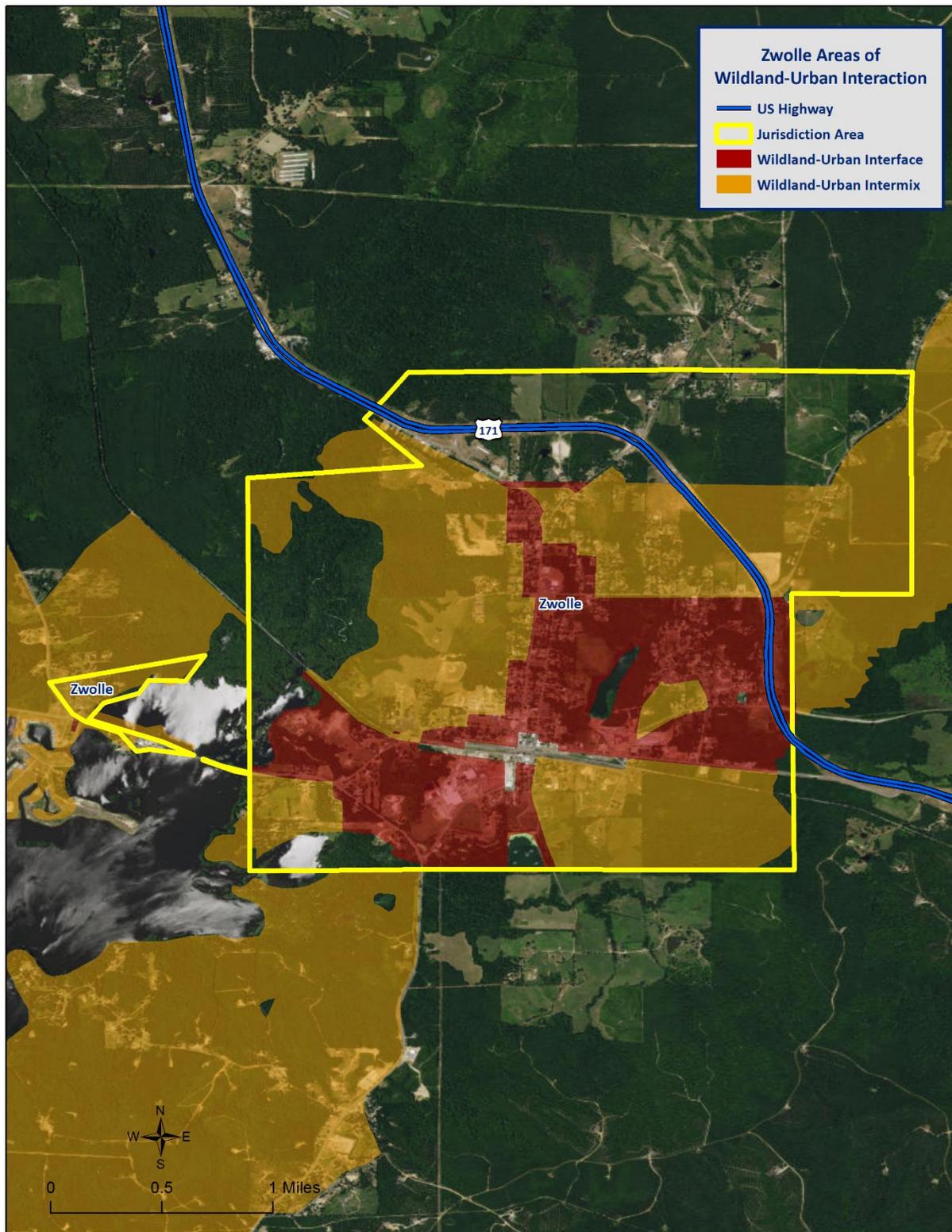


Figure 2-36: Wildland-Urban Interaction in Zwolle

Previous Occurrences / Extents

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

Since 2010, there have been no reported wildfire events in the incorporated areas of Converse, Fisher, Florien, Many, Noble, Pleasant Hill, Zwolle, and the unincorporated areas of Sabine Parish.

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

*Table 2-73: Potential Wildfire Intensity Levels for Sabine Parish
(Source: Southern Wildfire Assessment Portal)*

Potential Wildfire Intensity	
Sabine Parish (Unincorporated)	Highest Intensity Level 5
Converse	Moderate to High Intensity Level 3.5
Fisher	Low Intensity Level 2
Florien	Moderate to High Intensity Level 3.5
Many	Low Intensity Level 2
Noble	Moderate Intensity Level 3
Pleasant Hill	Moderate Intensity Level 3
Zwolle	Moderate Intensity Level 3

Frequency / Probability

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

Estimated Potential Losses

There have been no wildfire events that have caused property damage, crop damage, injuries, or fatalities in Sabine Parish. In assessing the overall risk to population, the most vulnerable population throughout the parish consists of those residing in areas of wildland-urban interaction. [Figure 2-29](#) displays the areas of wildland-urban interaction in Sabine Parish.

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

*Table 2-74: Total Building Exposure by Wildland-Urban Interaction Areas
(Source: Hazus 2.2)*

Jurisdiction	Estimated Total Building Exposure
Sabine Parish (Unincorporated)	\$2,263,639,000
Converse	\$50,979,000
Fisher	\$26,988,000
Florien	\$84,411,000
Many	\$553,455,000
Noble	\$30,732,000
Pleasant Hill	\$165,950,000
Zwolle	\$183,064,000
Total	\$3,359,218,000

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

*Table 2-75: Estimated Exposure for Unincorporated Sabine Parish by Sector
(Source: Hazus 2.2)*

Sabine Parish (Unincorporated)	Estimated Total Building Exposure by Sector
Agricultural	\$9,536,000
Commercial	\$174,644,000
Government	\$10,013,000
Industrial	\$75,571,000
Religious / Non-Profit	\$71,930,000
Residential	\$1,914,737,000
Schools	\$7,208,000
Total	\$2,263,639,000

*Table 2-76: Estimated Exposure for Converse by Sector
(Source: Hazus 2.2)*

Converse	Estimated Total Building Exposure by Sector
Agricultural	\$0
Commercial	\$4,008,000
Government	\$470,000
Industrial	\$1,231,000
Religious / Non-Profit	\$922,000
Residential	\$40,538,000
Schools	\$3,810,000
Total	\$50,979,000

*Table 2-77: Estimated Exposure for Fisher by Sector
(Source: Hazus 2.2)*

Fisher	Estimated Total Building Exposure by Sector
Agricultural	\$0
Commercial	\$4,490,000
Government	\$0
Industrial	\$766,000
Religious / Non-Profit	\$830,000
Residential	\$20,902,000
Schools	\$0
Total	\$26,988,000

*Table 2-78: Estimated Exposure for Florien by Sector
(Source: Hazus 2.2)*

Florien	Estimated Total Building Exposure by Sector
Agricultural	\$0
Commercial	\$14,224,000
Government	\$1,782,000
Industrial	\$2,099,000
Religious / Non-Profit	\$4,564,000
Residential	\$61,362,000
Schools	\$380,000
Total	\$84,411,000

*Table 2-79: Estimated Exposure for Many by Sector
(Source: Hazus 2.2)*

Many	Estimated Total Building Exposure by Sector
Agricultural	\$1,092,000
Commercial	\$208,349,000
Government	\$30,280,000
Industrial	\$6,607,000
Religious / Non-Profit	\$28,034,000
Residential	\$267,967,000
Schools	\$11,126,000
Total	\$553,455,000

*Table 2-80: Estimated Exposure for Noble by Sector
(Source: Hazus 2.2)*

Noble	Estimated Total Building Exposure by Sector
Agricultural	\$0
Commercial	\$4,000
Government	\$0
Industrial	\$750,000
Religious / Non-Profit	\$0
Residential	\$29,978,000
Schools	\$0
Total	\$30,732,000

*Table 2-81: Estimated Exposure for Pleasant Hill by Sector
(Source: Hazus 2.2)*

Pleasant Hill	Estimated Total Building Exposure by Sector
Agricultural	\$170,000
Commercial	\$87,363,000
Government	\$874,000
Industrial	\$0
Religious / Non-Profit	\$5,988,000
Residential	\$66,285,000
Schools	\$5,270,000
Total	\$165,950,000

*Table 2-82: Estimated Exposure for Zwolle by Sector
(Source: Hazus 2.2)*

Zwolle	Estimated Total Building Exposure by Sector
Agricultural	\$0
Commercial	\$10,557,000
Government	\$760,000
Industrial	\$3,092,000
Religious / Non-Profit	\$5,098,000
Residential	\$159,033,000
Schools	\$4,524,000
Total	\$183,064,000

Threat to People

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

*Table 2-83: Populations Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Number of People Located in Wildland-Urban Interaction Areas			
Location	# in Community	# in Area	% in Area
Sabine (Unincorporated)	14,641	8,940	61.1%
Converse	440	400	90.9%
Fisher	230	220	95.7%
Florien	633	577	91.2%
Many	2,853	2,390	83.8%
Noble	252	241	95.6%
Pleasant Hill	723	691	95.6%
Zwolle	1,759	1,433	81.5%
Total	24,233	14,892	61.5%

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

*Table 2-84: Population in Unincorporated Sabine Parish Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Sabine Parish Unincorporated		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	8,940	61.1%
Persons Under 5 Years	608	6.8%
Persons Under 18 Years	2,181	24.4%
Persons 65 Years and Over	1,654	18.5%
White	6,285	70.3%
Minority	2,655	29.7%

*Table 2-85: Population in Converse Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Converse		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	400	90.9%
Persons Under 5 Years	36	9.1%
Persons Under 18 Years	81	20.2%
Persons 65 Years and Over	67	16.8%
White	320	80.0%
Minority	80	20.0%

*Table 2-86: Population in Fisher Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Fisher		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	220	95.7%
Persons Under 5 Years	11	4.8%
Persons Under 18 Years	32	14.4%
Persons 65 Years and Over	30	13.5%
White	142	64.4%
Minority	78	35.7%

*Table 2-87: Population in Florien Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Florien		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	577	91.2%
Persons Under 5 Years	38	6.6%
Persons Under 18 Years	124	21.5%
Persons 65 Years and Over	88	15.3%
White	384	66.5%
Minority	193	33.5%

*Table 2-88: Population in Many Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Many		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	2,390	83.8%
Persons Under 5 Years	173	7.2%
Persons Under 18 Years	383	16.0%
Persons 65 Years and Over	465	19.5%
White	1,113	46.6%
Minority	1,277	53.4%

*Table 2-89: Population in Noble Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Noble		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	241	95.6%
Persons Under 5 Years	17	7.1%
Persons Under 18 Years	38	15.9%
Persons 65 Years and Over	33	13.9%
White	147	61.1%
Minority	94	38.9%

*Table 2-90: Population in Pleasant Hill Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Pleasant Hill		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	691	95.6%
Persons Under 5 Years	38	5.5%
Persons Under 18 Years	152	22.0%
Persons 65 Years and Over	86	12.5%
White	380	55.1%
Minority	311	45.0%

*Table 2-91: Population in Zwolle Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)*

Zwolle		
Category	Total Numbers	Percentage of People in Wildland-Urban Interaction Area
Number in Hazard Area	1,433	81.5%
Persons Under 5 Years	157	11.0%
Persons Under 18 Years	322	22.5%
Persons 65 Years and Over	140	9.8%
White	429	30.0%
Minority	1,004	70.0%

Vulnerability

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

Winter Storms

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

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

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

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

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

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

Table 2-92: 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 Sabine Parish as all of the adjacent parishes, the entire planning area for Sabine Parish is equally at risk for winter storms.

Previous Occurrences / Extents

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

Table 2-93: Previous Occurrences for Winter Storm Events

Date	Synopsis	Property Damage	Crop Damage
March 14, 1993	A widespread, damaging freeze occurred as temperatures fell into the upper teens and 20s. Due to the relatively mild winter, many crops were in early bloom. Severe damage occurred to the strawberry, peach, blueberry, citrus, tomato, and ryegrass crops.	\$0	\$224,191
December 22, 1998	A shallow dome of arctic air caused widespread freezing rain, sleet, and freezing drizzle. The ice accumulated mainly across exposed surfaces such as trees and powerlines as well as bridges and overpasses. Over a quarter million people were without power, some for over a week.	\$84,070	\$0
January 1, 2010	A prolonged cold snap, caused by a couple of strong arctic air masses, affected the ArkLaMiss region during the first two weeks of January. The first ten days of 2010 were the coldest first ten days of any year on record. Due to the duration of the cold, a great deal of damage occurred to the water line infrastructure around the region. A few rural homes around the parish country side reported some water line issues due to the cold weather.	\$40,063	\$0
January 5, 2014	An arctic airmass infiltrated the region producing falling temperatures and strong northwest winds. Wind chill values near zero to ten degrees above zero were witnessed the night of the 5th. Low temperatures persisting through the morning of the 7th were some of the coldest temperatures Northwest Louisiana had seen since 1996.	\$0	\$0
January 23, 2014	A strong ridge of arctic high pressure produced sleet and snow flurries in Northern Louisiana. Snow came down moderately heavy at times reducing visibilities to near one mile. Snow totals in Florien reached 3 inches while Many experienced 1 inch of snow.	\$0	\$0
January 28, 2014	Another arctic cold front moved into the region on the 27th, resulting in very cold temperatures across the region. An upper level disturbance moving atop the air mass resulted in areas of snow, sleet, and freezing rain for the second time in less than a week. Florien experienced 2 inches of snowfall due to this storm.	\$0	\$0
February 11, 2014	An upper level storm system moved out of the Texas Hill Country and into Northwest Louisiana. During the onset of precipitation, a mixture of rain and sleet was the predominant precipitation type with some sleet accumulations. During the evening and overnight hours, the transition turned to predominantly freezing rain with accumulations near one tenth of an inch.	\$0	\$0
February 23, 2015	A cold dome of arctic air spilled into the Lower Mississippi Valley. Embedded disturbances provided the necessary lift to generate widespread winter precipitation in the form of freezing rain and sleet. As temperatures fell during the day, the precipitation fell as freezing rain mixed with sleet. Accumulations were mainly less than one tenth of an inch.	\$0	\$0

Date	Synopsis	Property Damage	Crop Damage
February 25, 2015	Cold arctic air remained in place across the region from the intrusion of arctic air earlier in the week. An upper level trough moved into the Texas Hill Country and developed precipitation. The mixed winter precipitation moved out of the region during the late afternoon. Precipitation was minimal across the region during the event.	\$0	\$0
March 4, 2015	Disturbances embedded in an arctic airmass produced the lift needed for precipitation. On the night of the 4th, precipitation fell predominantly as sleet. During the morning hours, the precipitation was a mixture of sleet and snow. Freezing rain amounts were mainly less than one tenth of an inch with sleet amounts near one half to one inch and snow amounts from trace amounts to near one inch accumulations	\$0	\$0

Based on previous winter storm events, the worst-case scenario for the unincorporated area of Sabine Parish and the incorporated areas of Converse, Fisher, Florian, Many, Noble, Pleasant Hill, and Zwolle is approximately three inches of snow accumulation and approximately one tenth to one quarter inch of ice accumulation

Frequency / Probability

With ten recorded events in 25 years, winter storm events within the boundaries of Sabine Parish have an annual chance of occurrence calculated at 40% based on the SHELDUS dataset.

Estimated Potential Losses

Since 1990, there have been five reported winter weather events that have resulted in property and/or crop damages according to the SHELDUS database. The total property damages associated with these storms have totaled \$124,132. To estimate the potential losses of a winter weather event on an annual basis, the total damage recorded for winter weather events was divided by the total number of years of available winter weather data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of \$4,965. To assess potential losses to the participating jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. The following tables provides an estimate of potential property losses for Sabine Parish based on the 2010 Census data:

Table 2-94: Estimated Annual Losses for Winter Weather Events in Sabine Parish

Estimated Annual Potential Losses from Winter Storms for Sabine Parish			
Unincorporated Sabine Parish (71.6% of Population)	Converse (1.8% of Population)	Fisher (0.9% of Population)	Florien (2.6% of Population)
\$3,554	\$90	\$47	\$130

Table 2-95: Estimated Annual Losses for Winter Weather Events in Sabine Parish (Continued)

Estimated Annual Potential Losses from Winter Storms for Sabine Parish			
Many (11.8% of Population)	Noble (1.0% of Population)	Pleasant Hill (3.0% of Population)	Zwolle (7.3% of Population)
\$585	\$52	\$148	\$360

From 1990 - 2015, there have been no injuries or fatalities as a result of winter weather in Sabine Parish.

Vulnerability

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

Dam Failure

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

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

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

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

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

Location

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

Previous Occurrences / Extents

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

Frequency / Probability

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

Building Codes, Permitting, Land Use Planning and Ordinances

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

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

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

The Sabine 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, Sabine Parish as a whole has a system in place to coordinate and share these capabilities through Sabine Parish Government and through this Parish Hazard Mitigation Plan.

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

Administration, Technical, and Financial

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

Table 3-2: Sabine Parish Administrative and Technical Capabilities

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

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

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

Table 3-3: Sabine Parish Financial Capabilities

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

Education and Outreach

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

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

Table 3-4: Sabine Parish Education and Outreach Capabilities

Education and Outreach									
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.									
	Sabine Parish	Converse	Fisher	Florien	Many	Noble	Pleasant Hill	Zwolle	
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	No	No	No	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	No	No	No	No	No	No	No	
Natural Disaster or safety related school program	Yes	No	No	No	No	No	No	No	
Storm Ready certification	Yes	No	No	No	No	No	No	No	
Firewise Communities certification	No	No	No	No	No	No	No	No	
Public/Private partnership initiatives addressing disaster-related issues	Yes	No	No	No	No	No	No	No	
Other	N/A	No	No	N/A	No	No	N/A	No	

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

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

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

- Unincorporated Sabine Parish
- Village of Converse
- Village of Fisher
- Village of Florien
- Town of Many
- Village of Noble
- Village of Pleasant Hill
- Town of Zwolle

Flood Insurance and Community Rating System

Sabine Parish is not a participant in the Community Rating System (CRS), nor are any of its jurisdictions. Obtaining the CRS rating for the parish and participating jurisdictions is recognized as an eventual goal by the Hazard Mitigation Steering Committee. Participation in the CRS strengthens local capabilities by lowering flood insurance premiums for jurisdictions that exceed NFIP minimum requirements.

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

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

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

During the last update, 38 Louisiana communities participated. Mandeville, Shreveport, and Jefferson and East Baton Rouge Parishes had the best classifications in the state, class 7. As of the 2016 update, Jefferson, East Baton Rouge, and Terrebonne Parishes all lead the state with best classifications, class 6.

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

SFHA (Zones A, AE, A1-A30, V, V1-V30, AO, and AH): Discount varies depending on class.
 SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO): 10% discount for Classes 1-6; 5% discount for Classes 7-9.*
 Non-SFHA (Zones B, C, X, D): 10% discount for Classes 1-6; 5% discount for Classes 7-9.

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

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

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

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

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

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

In 2011¹, the National Flood Insurance Program (NFIP) completed a comprehensive review of the Community Rating System that will result in the release of a new CRS Coordinator’s Manual.

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

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

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

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

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

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

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

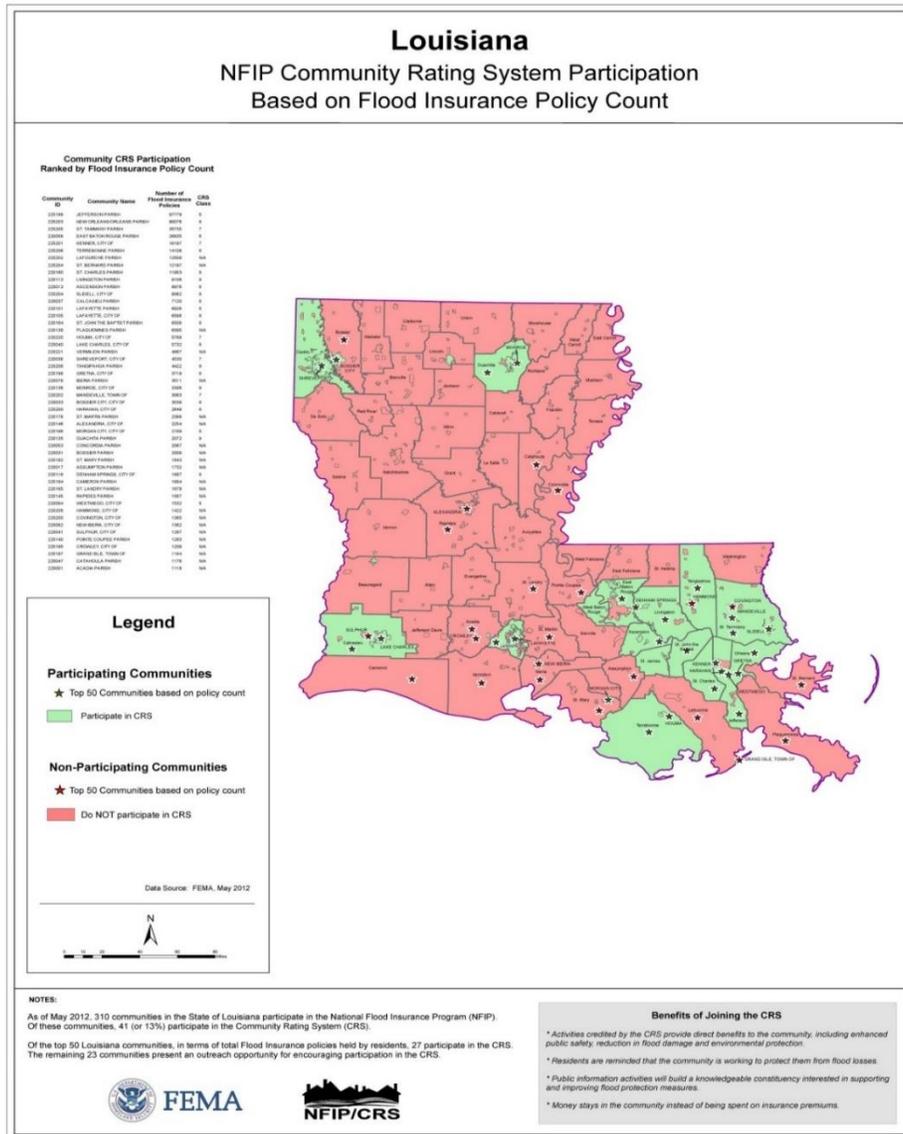


Figure 3-2: Louisiana CRS NFIP Participation
(Source: FEMA²)

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

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

1. The activities credited by the CRS provide direct benefits to residents, including:
 - Enhanced public safety
 - A reduction in damage to property and public infrastructure
 - Avoidance of economic disruption and losses
 - Reduction of human suffering
 - Protection of the environment
2. A community's flood programs will be better organized and more formal. Ad hoc activities, such as responding to drainage complaints rather than an inspection program, will be conducted on a sounder, more equitable basis.
3. A community can evaluate the effectiveness of its flood programs against a nationally recognized benchmark.
4. Technical assistance in designing and implementing a number of activities is available at no charge from the Insurance Services Office.
5. The public information activities will build a knowledgeable constituency interested in supporting and improving flood protection measures.
6. A community would have an added incentive to maintain its flood programs over the years. The fact that its CRS status could be affected by the elimination of a flood related activity or a weakening of the regulatory requirements for new developments would be taken into account by the governing board when considering such actions.
7. Every time residents pay their insurance premiums, they are reminded that the community is working to protect them from flood losses, even during dry years.

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

NFIP Worksheets

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

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4. Mitigation Strategy

Introduction

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

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

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

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

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

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

Goals

The goals represent the guidelines that the parish and its communities want to achieve with this plan update. To help implement the strategy and adhere to the mission of the Hazard Mitigation Plan, the preceding section of the plan update was focused on identifying and quantifying the risks faced by the residents and property owners in Sabine 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, Sabine Parish and its jurisdictions can make progress toward reducing identified risks.

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

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

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

The goals are as follows:

- Mitigate impacts from loss of electricity and telephone service due to severe winter storms, tornados, windstorms, and hurricanes
- Improve communication capabilities for emergency agencies and vehicles before, during, and after severe winter storms, tornados, windstorms, and hurricanes
- Minimize losses to existing and future structures and infrastructure from flooding
- Provide for functioning and reestablishment of government in the event of tornados, windstorms, hurricanes, and severe winter storms
- Lessen the impact on life and safety due to flooding, tornados, windstorms, hurricanes, severe winter storms, and drought
- Develop public education programs for dealing with flooding, tornados, windstorms, hurricanes, severe winter storms, and drought

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

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

[2016 Mitigation Actions and Update on Previous Plan Actions](#)

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

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

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

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

Sabine Parish 2011 Hazard Mitigation Action Update

Sabine-Unincorporated Area Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
S1: Retrofit of Critical Facilities	Retrofit critical facilities including but not limited to the Emergency Operations Center for Sabine Parish. The Emergency Operations Center (EOC) should provide a secure location for local government officials and department heads to determine situational status coordinate action and make critical decisions during large-scale emergencies and disaster situations.	FEMA, Sabine Parish Police Jury	Director, Sabine Parish Office of Emergency Preparedness	Severe winter storms, tornados, thunderstorms/ windstorms, hurricanes, flooding, hazardous materials	Carried Over
S2: Mobile Electric Generators	Determine electricity requirements of each parish water system, sanitation system, nursing home, and designated emergency shelter with respect to use generators. Purchase mobile generators that could be moved to facilities in need of electricity and plugged into the electrical system to provide power as needed. Modify facilities to be able to accept the new generators.	FEMA, Sabine Parish Police Jury	Secretary-Treasurer, Sabine Parish Police Jury	Severe winter storms, tornados, windstorms, and hurricanes	Carried Over

Sabine-Unincorporated Area Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
S3: Sabine Bridge and Roadway Flood Protection Program	Determine which bridges and sections of roadways are most susceptible to washouts and which are most likely to be affected from flooding. Making improvements necessary to protect those roadways (raising roadbed elevation in selected areas) and bridges (replacement with new structures) from being washed out or otherwise damaged by floodwaters. DOTD uses a cost per square foot amount for the Federal-Off System Bridge Replacement Program. A similar method could be used for this program under DOTD guidance.	FEMA, Louisiana Department of Transportation and Development, Federal Off System Bridge Replacement program administered by DOTD, Louisiana Capital Outlay, Louisiana Community Development Block Grant Program, State of Louisiana General Appropriations.	Sabine Parish Road Superintendent	Flooding, hurricanes	Carried Over
S4: Mitigation Public Awareness Program	Increased public awareness and support for projects designed to mitigate hazards. Develop and/or use existing handouts describing the articles that a person should have at home and in his/her vehicle to handle the various emergency situations that could arise in Sabine Parish. Have the handouts printed and distributed and provide copies to existing civic, recreation, and religious organizations for distribution to their members and/or those with whom they have regular contact. Distribute to schools also. Have the information published regularly in local newspapers. Develop "spots" for airing on local radio stations.	State of Louisiana, FEMA	Sabine Parish Police Jury, Emergency Planning Committee	Flooding, Severe Winter Storms, Tornados, Thunderstorms/ Winter storms, Hurricanes	Ongoing
S5: Minimization of Exposure to Hazardous Materials	(1) Determine businesses and industries in Sabine Parish that use significant amounts of hazardous materials. (2) Establish contacts with the industries determined in step 1 and a contact with the railroad. (3) Meet one-on-one with each contact to determine what hazardous chemicals are being used, stored, or transported, what mitigation efforts are already in place, and what mitigation efforts could be undertaken by the Parish. (4) Bring the contacts together in one or more meetings to coordinate and finalize needed hazardous materials mitigation measures (5) Present the measures to the Sabine Parish Police Jury, along with recommendations for undertaking the measures. (6) Incorporate the measures into the next update of the Sabine Parish Hazard Mitigation Plan.	State of Louisiana	Director of the Sabine Parish Office of Emergency Preparedness (or his/her appointed representative), and the Sheriff of Sabine Parish	Hazardous Materials	Deleted

Sabine-Unincorporated Area Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
S6: Assessment of Water Systems, Electricity & Generator Capabilities and Needs	<p>1) Develop a list of all water systems supplying potable water to the citizens in Sabine Parish to include point of contact and day/night phone numbers</p> <p>2) List the number of wells, their locations, whether there are generators in place, and if so what percentage of service will be restored from those generators.</p> <p>3)List the pump capacity of the wells to determine the size of generator needed to meet the demand of those systems without a generator or partial-water restoration</p> <p>4)Vigorously encourage water systems to purchase generators or apply for grants to enable the purchase of generators in order to maintain service to the citizens in Sabine Parish</p> <p>5) The "Water System Needs" list is to be maintained in the Office of Emergency Preparedness and updated as needed</p> <p>6) Develop a procedure for requesting a generator during an emergency to ensure minimal interruption of service to the citizens within their water system during an extended power outage</p>	State of Louisiana, Sabine Parish Police Jury	Sabine Parish Police Jury	Severe winter storms, tornados, hurricanes, and windstorms	Complete
S7: Damage Mitigation During Electrical Outages	<p>List all emergency services by activity, address, contact person, telephone number, and other pertinent information. Determine each facility's electricity needs to maintain various levels of service. Determine the existing emergency electricity generation capacity of each facility. Determine what equipment would be needed at each facility to efficiently reestablish electricity at various levels. Determine the cost for meeting the described needs at each facility, Prioritize needs. Suggest possible sources of funding.</p>	State of Louisiana, FEMA, Sabine Parish Police Jury	Director of the Sabine Parish Office of Emergency Preparedness (or his/her appointed representative)	Severe winter storms, tornados, hurricanes and windstorms	Complete
S8: Adopt and Enforce Louisiana State Building Codes	<p>Adopt the building codes, which were adopted by the Louisiana Legislature in 2006. This will ensure maximum protection of buildings against natural hazards. This action will reduce the effects of hazards on existing and new buildings</p>	Sabine Parish Police Jury, FEMA, and State of Louisiana	President, Sabine Parish Police Jury	Tornados	Complete

Village of Converse Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
C1: Adopt and Enforce Louisiana State Building Codes	Adopt the building codes, which were adopted by the Louisiana Legislature in 2006. This will ensure maximum protection of buildings against natural hazards. This action will reduce the effects of hazards on existing and new buildings	FEMA, State of Louisiana	Mayor, Village of Converse	Tornados, windstorms, and hurricanes	Complete
C2: Converse Emergency Preparedness Public Awareness Program	Develop or adopt existing handouts describing the actions which a person should take, and the articles which a person should have at home and in his/her vehicle to handle the various emergency situations from the above-listed hazards that could occur in Converse. Have the handouts printed and distributed and provide copies to existing civic, recreation, and religious organizations for distribution to the members and/or those whom they have regular contact. Have the information available for distribution at the local library and in the Village Hall.	FEMA, State of Louisiana	mayor, Village of Converse	Flooding, severe winter storms, tornados, thunderstorms/ windstorms, hurricanes	Ongoing
C3: Elevated Audible Public Alarm System	Construct an elevated, outdoor early warning siren system to alert the public in case of a tornado. The siren could be activated from remote locations by telephone or other communications device. upon issuance of a tornado warning the siren would sound to alert local citizens that a tornado is in the area	FEMA, State of Louisiana	Converse Village Hall	Tornados, Hurricanes	Carried Over
C4: New Standby Generators for the Converse Water and sewer Systems	Purchase a new standby generator for use by the Village of Converse water system so that the system's well can continue to operate in the event that power is lost due to an ice storm, hurricane, or a tornado	FEMA, State of Louisiana	Mayor, Village of Converse	Severe winter storms, tornados, and hurricanes	Carried Over

Village of Fisher Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
F1: Elevated Audible Public Alarm System	Construct an elevated, outdoor early warning siren system to alert the public in case of a tornado. The siren could be activated from remote locations by telephone or other communications device. upon issuance of a tornado warning the siren would sound to alert local citizens that a tornado is in the area	FEMA, State of Louisiana	Mayor, Village of Fisher	Tornados	Carried Over
F2: Fisher Community Education and Outreach Program	Develop or adopt existing handouts describing the actions which a person should take, and the articles which a person should have at home and in his/her vehicle to handle the various emergency situations from the above-listed hazards that could occur in Fisher. Have the handouts printed and distributed and provide copies to existing civic, recreation, and religious organizations for distribution to thie members and/or those whom they have regular contact. Have the information available for distribution at the local library and in the Fisher Town Hall.	FEMA, State of Louisiana	Mayor, Village of Fisher	Tornados, windstorms, hurricanes, and severe winter storms	Ongoing
F3: New Standby Generators for the Fisher Water System	Purchase a new standby generator for use by the Village of Fisher water system so that the system's well can continue to operate in the event that power is lost due to an ice storm, hurricane, or a tornado	FEMA, State of Louisiana	Mayor, Village of Fisher	Severe winter storms, tornados, hurricanes	Complete

Village of Florien Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
F1: New Standby Generators for the Florien Water and Sewer System	Purchase two standby generators for use by the Village of Florien water and sewer systems so that the systems' well and lift stations can continue to operate in the event that power is lost due to an ice storm, hurricane or a tornado	FEMA and State of Louisiana	Mayor, Village of Florien	Severe winter storms, tornados, and hurricanes	Carried Over
F2: Community Education and Outreach Program	Develop or adopt existing handouts describing the actions which a person should take, and the articles which a person should have at home and in his/her vehicle to handle the various emergency situations from the above-listed hazards that could occur in Florien. Have the handouts printed and distributed and provide copies to existing civic, recreation, and religious organizations for distribution to thie members and/or those whom they have regular contact. Have the information available for distribution at the local library and in the Village Hall.	FEMA and State of Louisiana	Mayor, Village of Florien	Tornados, windstorms, hurricanes, and severe winter storms	Ongoing

Town of Many Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
M1: Many Emergency Preparedness Public Awareness Program	Develop or adopt existing handouts describing the actions which a person should take, and the articles which a person should have at home and in his/her vehicle to handle the various emergency situations from the above-listed hazards that could occur in Many. Have the handouts printed and distributed and provide copies to existing civic, recreation, and religious organizations for distribution to the members and/or those whom they have regular contact. Have the information available for distribution at the local library and in the Many Town Hall.	FEMA and State of Louisiana	Mayor, Town of Many	Tornados, windstorms, hurricanes, and severe winter storms	Ongoing
M2: New Standby Generators for the Many Water and Sewer System	Purchase three standby generators for use by the Town of Many water and sewer systems so that the systems' well and lift stations can continue to operate in the event that power is lost due to an ice storm, hurricane or a tornado	FEMA and State of Louisiana	Mayor, Town of Many	Severe winter storms, tornados, and hurricanes	Carried Over
M3: Elevated Audible Public Alarm System	Construct an elevated, outdoor early warning siren system to alert the public in case of a tornado. The siren could be activated from remote locations by telephone or other communications device. upon issuance of a tornado warning the siren would sound to alert local citizens that a tornado is in the area	FEMA and State of Louisiana	Mayor, Town of Many	Tornados, Hurricanes	Carried Over
M4: Acquisition and Elevation of Repetitive Loss Structures	Elevate of acquire flood prone structures within the City of Many to avoid future losses from flooding	FEMA and State of Louisiana	Mayor, Town of Many	Flood	Ongoing
M5: Stream Stabilization to Prevent Flooding of Major Roads	Stabilize several key stream banks to help improve water flow under and around roadways and bridges	FEMA and State of Louisiana	Mayor, Town of Many	Flood, Thunderstorm/Wind, Hurricane	Carried Over
M6: Adopt and Enforce Louisiana State Building Codes	Adopt the building codes, which were adopted by the Louisiana Legislature in 2006. This will ensure maximum protection of buildings against natural hazards. This action will reduce the effects of hazards on existing and new buildings	FEMA and State of Louisiana	Mayor, Town of Many	Tornados, windstorms, and hurricanes	Completed

Village of Noble					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
N1: Noble Emergency Preparedness Public Awareness Program	Develop or adopt existing handouts describing the actions which a person should take, and the articles which a person should have at home and in his/her vehicle to handle the various emergency situations from the above-listed hazards that could occur in Noble. Have the handouts printed and distributed and provide copies to existing civic, recreation, and religious organizations for distribution to the members and/or those whom they have regular contact. Have the information available for distribution at the local library and in the Noble Village Hall	FEMA, State of Louisiana	Mayor, Village of Noble	Tornados, windstorms, hurricanes, and severe winter storms	Ongoing
N2: Elevated Audible Public Alarm System	Construct an elevated, outdoor early warning siren system to alert the public in case of a tornado. The siren could be activated from remote locations by telephone or other communications device. upon issuance of a tornado warning the siren would sound to alert local citizens that a tornado is in the area	FEMA, State of Louisiana	Mayor, Village of Noble	Tornados, Hurricanes	Carried Over

Village of Pleasant Hill Action Update					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
P1: Pleasant Hill Emergency Preparedness Public Awareness Program	Develop or adopt existing handouts describing the actions which a person should take, and the articles which a person should have at home and in his/her vehicle to handle the various emergency situations from the above-listed hazards that could occur in Pleasant Hill. Have the handouts printed and distributed and provide copies to existing civic, recreation, and religious organizations for distribution to the members and/or those whom they have regular contact. Have the information available for distribution at the local library and in the Pleasant Hill Village Hall.	FEMA, State of Louisiana	Mayor, Village of Pleasant Hill	Tornados, windstorms, hurricanes, and severe winter storms	Ongoing
P2: Elevated Audible Public Alarm System	Construct an elevated, outdoor early warning siren system to alert the public in case of a tornado. The siren could be activated from remote locations by telephone or other communications device. upon issuance of a tornado warning the siren would sound to alert local citizens that a tornado is in the area	FEMA, State of Louisiana	Mayor, Village of Pleasant Hill	Tornados	Carried Over
P3: New Standby Generators for the Many Water and Sewer System	Purchase three standby generators for use by the Village of Pleasant Hill water and sewer systems so that the systems' well and lift stations can continue to operate in the event that power is lost due to an ice storm, hurricane or a tornado	FEMA and State of Louisiana	Mayor, Village of Pleasant Hill	Severe winter storms, tornados, and hurricanes	Carried Over

Town of Zwolle					
Jurisdiction-Specific Action	Action Description	Funding Source	Responsible Party, Agency, or Department	Hazard	Status
Z1: Adopt and Enforce Louisiana State Building Codes	Adopt the building codes, which were adopted by the Louisiana Legislature in 2006. This will ensure maximum protection of buildings against natural hazards. This action will reduce the effects of hazards on existing and new buildings	FEMA and State of Louisiana	Mayor, Town of Zwolle	Tornados, windstorms, and hurricanes	Ongoing
Z2: Elevated Audible Public Alarm System	Construct an elevated, outdoor early warning siren system to alert the public in case of a tornado. The siren could be activated from remote locations by telephone or other communications device. upon issuance of a tornado warning the siren would sound to alert local citizens that a tornado is in the area	FEMA, State of Louisiana	Mayor, Town of Zwolle	Tornados, Hurricanes	Carried Over

Unincorporated Sabine New Mitigation Actions

Sabine Unincorporated - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	High Wind, Tropical Cyclones, Tornadoes, Hail	New
S2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual 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	Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S4: Safe Room Projects	Construction of a safe room for first responders located in Sabine Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Tornadoes, High Winds, Tropical Cyclones	New
S5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, and Dam Failure 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	Sabine Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure	New

Sabine Unincorporated - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Sabine Parish OHSEP	Wildfires	New

Village of Converse - New Mitigation Actions

Village of Converse - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	High Wind, Tropical Cyclones, Tornadoes, Hail	New
S2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual 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	Village of Converse/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S4: Safe Room Projects	Construction of a safe room for first responders located in Sabine Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Tornadoes, High Winds, Tropical Cyclones	New
S5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, and Dam Failure 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	Village of Converse/Sabine Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure	New

Village of Converse - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Village of Converse/Sabine Parish OHSEP	Wildfires	New

Village of Fisher – New Mitigation Actions

Village of Fisher - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	High Wind, Tropical Cyclones, Tornadoes, Hail	New
S2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual 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	Village of Fisher/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S4: Safe Room Projects	Construction of a safe room for first responders located in Sabine Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Tornadoes, High Winds, Tropical Cyclones	New
S5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, and Dam Failure 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	Village of Fisher/Sabine Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure	New

Village of Fisher - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Village of Fisher/Sabine Parish OHSEP	Wildfires	New

Village of Florien – New Mitigation Actions

Village of Florien - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	High Wind, Tropical Cyclones, Tornadoes, Hail	New
S2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual 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	Village of Florien/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S4: Safe Room Projects	Construction of a safe room for first responders located in Sabine Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Tornadoes, High Winds, Tropical Cyclones	New
S5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, and Dam Failure 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	Village of Florien/Sabine Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure	New

Village of Florien - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Village of Florien/Sabine Parish OHSEP	Wildfires	New

Town of Many – New Mitigation Actions

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

Town of Many - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Town of Many/Sabine Parish OHSEP	Wildfires	New

Village of Noble – New Mitigation Actions

Village of Noble - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	High Wind, Tropical Cyclones, Tornadoes, Hail	New
S2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual 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	Village of Noble/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S4: Safe Room Projects	Construction of a safe room for first responders located in Sabine Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Tornadoes, High Winds, Tropical Cyclones	New
S5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, and Dam Failure 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	Village of Noble/Sabine Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure	New

Village of Noble - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Village of Noble/Sabine Parish OHSEP	Wildfires	New

Village of Pleasant Hill – New Mitigation Actions

Village of Pleasant Hill - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	High Wind, Tropical Cyclones, Tornadoes, Hail	New
S2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual 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	Village of Pleasant Hill/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Flooding, Tropical Cyclones	New
S4: Safe Room Projects	Construction of a safe room for first responders located in Sabine Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Tornadoes, High Winds, Tropical Cyclones	New
S5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, and Dam Failure 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	Village of Pleasant Hill/Sabine Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure	New

Village of Pleasant Hill - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Village of Pleasant Hill/Sabine Parish OHSEP	Wildfires	New

Town of Zwolle – New Mitigation Actions

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

Town of Zwolle - New Mitigation Actions						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
S6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure	New
S7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Lightning	New
S8: Warning Systems	Update/upgrade public warning system components throughout Sabine Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Dam Failure	New
S9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
S10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Tropical Cyclones, Flooding	New
S11: Flood Control Measures	Install and/or upgrade minor flood control structures including berms and floodwalls to protect critical facilities.	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S12: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	New
S13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Drought	New
S14: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances.	FEMA HMGP, Local	1-5 years	Town of Zwolle/Sabine Parish OHSEP	Wildfires	New

Action Prioritization

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

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

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

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

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Appendix A: Planning Process

Purpose

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

The Sabine Parish Hazard Mitigation Plan Update

The Sabine Parish Hazard Mitigation Plan Update process began in August 2015 with a series of meetings and collaborations between the contractor (SDMI) and the participating jurisdictions. Update activities were intended to give each jurisdiction the opportunity to shape the plan to best fit their community's goals. Community stakeholders and the general public were invited to attend and contribute information to the planning process during specific time periods or meetings.

Sabine Parish includes seven incorporated municipalities that participated in the plan update process – the Village of Converse, Village of Fisher, Village of Florien, Town of Many, Village of Noble, Village of Pleasant Hill, and Town of Zwolle. Sabine Parish Office of Homeland Security and Emergency Preparedness (OHSEP) invited communities' representatives to meetings, where they supplied critical infrastructure data and reviewed work-in-progress for the plan update.

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

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

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

Date	Meeting or Outreach	Location	Public Invited	Purpose
8/2015	Initial Coordination	Telephone/ Email	No	Discuss with Parish HM coordinator and any Steering Committee members expectations and requirements of the project.
1/7/2016	Kick-Off Meeting	Many, LA	No	Discuss with the plan steering committee expectations and requirements of the project. Assign plan worksheets to jurisdictions.
1/7/2016	Risk Assessment Overview	Many, LA	No	Discuss and review the risk assessment with the steering committee discuss and review expectations for public meeting.
8/11/2016	Public Meeting	Many, LA	Yes	The public meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Maps of the Sabine Parish communities were provide for the meeting attendees to identify specific areas where localized hazards occur.
Ongoing	Public Survey Tool	Online	Yes	This survey asked participants about public perceptions and opinions regarding natural hazards in Sabine Parish. In addition, we asked about the methods and techniques preferred for reducing the risks and losses associated with these hazards. Survey Results: https://www.surveymonkey.com/r/SabineParish
2 Week Period	Public Plan Review (Digital)		Yes	Parish Website and Sabine Parish OHSEP

Planning

The plan update process consisted of several phases:

Phase	Month 1-2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Plan Revision	Grey										
Data Collection	Grey										
Risk Assessment	Grey										
Public Input	Grey										
Mitigation Strategy and Actions							Grey				
Plan Review by GOHSEP and FEMA										Grey	
Plan Adoption											Yellow
Plan Approval											Green

Coordination

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

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

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

Neighboring Community, Local and Regional Planning Process Involvement

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

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

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

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

- Sabine Parish Police Jury
- Sabine Office of Homeland Security and Emergency Preparedness
- Village of Converse
- Village of Fisher
- Village of Florien
- Town of Many
- Village of Noble
- Village of Pleasant Hill
- Town of Zwolle

The Vernon Parish OHSEP Director was invited by the Sabine Parish OHSEP to participate in all meetings and activities as well in an effort to collaborate with neighboring communities. In addition, the participation of the GOHSEP Region 6 Coordinator during the process also contributed to neighboring community representation.

As part of the coordination and planning process, each jurisdiction was provided the State Required Hazard Mitigation Plan Update Worksheet. Jurisdictions with the capability to complete and return these worksheets returned them to assist with the 2016 update.

Below is a detailed list of the 2016 Hazard Mitigation Plan Update Steering Committee:

Name	Title	Agency	Address	Phone
Kenneth Freeman	Mayor of Many	Town of Many	965 San Antonio Ave Many, LA	(318) 256-3651
G.J. Martinez	Mayor of Zwolle	Town of Zwolle	952 S. Main St. P.O. Box 1038 Zwolle, LA	(318) 645-6150
Troy H. Terrell	Mayor of Converse	Village of Converse	209 W. Port Arthur Avenue Converse, LA	(318) 567-3312
Susan Slay	Mayor of Fisher	Village of Fisher	679 4 L Drive Fisher, LA	(318) 256-2001
Eddie Jones, Jr.	Mayor of Florien	Village of Florien	237 West Port Arthur Avenue Florien, LA	(318) 586-7286
Gary Rivers	Mayor of Noble	Village of Noble	423 Highway 1218, Noble, LA	(318) 645-6900
Bill Thomas	Mayor of Pleasant Hill	Village of Pleasant Hill	8336 Pearl St. Pleasant Hill, LA	(318) 796-3680
David Davis	OHSEP Director	Sabine Parish OHSEP	Many, LA	(318) 256-9652
Kenneth Moore	OHSEP Director	Vernon Parish OHSEP	Leesville, LA	(337) 238-9025
Teresa Basco	GOHSEP Region 6 Coordinator	GOHSEP	7667 Independence Blvd	(225) 925-7500
Keneth Ebarb	Police Jury President	Sabine Parish Police Jury	Many, LA	N/A

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 Sabine Parish programs and planning.

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

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

The members of the Sabine Parish Hazard Mitigation Steering Committee will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the parish. Existing plans, studies, and technical information were incorporated in the planning process. Examples include flood data from FEMA, the U.S. Army Corps of Engineers (USACE or Corps), and the U.S. Geological Survey. Much of this data was incorporated into the risk assessment component of the plan relative to plotting historical events and the magnitude of damages that occurred. The parish's 2005 Hazard Mitigation Plan was also used in the planning process. Other existing parish and jurisdiction data and plans reviewed and/or incorporated into the planning process include those listed below:

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

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

Meeting Documentation and Public Outreach Activities

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

Meeting #1: Coordination Discussion

Date: August 2015

Location: Email

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

Public Initiation: No

Invitees Included: Sabine Parish OHSEP, SDMI Staff

Meeting #2: Hazard Mitigation Plan Update Kick-Off

Date: January 7, 2016**Location:** Many, Louisiana

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

Public Initiation: No**Invitees Included:**

Name	Title	Agency	Address	Phone
Kenneth Freeman	Mayor of Many	Town of Many	965 San Antonio Ave Many, LA	(318) 256-3651
G.J. Martinez	Mayor of Zwolle	Town of Zwolle	952 South Main St. P.O. Box 1038 Zwolle, LA	(318) 645-6150
Troy H. Terrell	Mayor of Converse	Village of Converse	209 West Port Arthur Avenue Converse, LA	(318) 567-3312
Susan Slay	Mayor of Fisher	Village of Fisher	679 4 L Drive Fisher, LA	(318) 256-2001
Eddie Jones, Jr.	Mayor of Florien	Village of Florien	237 West Port Arthur Avenue Florien, LA	(318) 586-7286
Gary Rivers	Mayor of Noble	Village of Noble	423 Highway 1218, Noble, LA	(318) 645-6900
Bill Thomas	Mayor of Pleasant Hill	Village of Pleasant Hill	8336 Pearl St. Pleasant Hill, LA	(318) 796-3680
David Davis	OHSEP Director	Sabine Parish OHSEP	Many, LA	(318) 256-9652
Kenneth Moore	OHSEP Director	Vernon Parish OHSEP	Leesville, LA	(337) 238-9025
Teresa Basco	GOHSEP R6 Coordinator	GOHSEP	7667 Independence Blvd	(225) 925-7500
Keneth Ebarb	Police Jury President	Sabine Parish Police Jury	Many, LA	N/A

Meeting #3: Risk Assessment Overview

Date: August 11, 2016**Location:** Many, LA

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

Public Initiation: No**Invitees Included:**

Name	Title	Agency	Address	Phone
Kenneth Freeman	Mayor of Many	Town of Many	965 San Antonio Ave Many, LA	(318) 256-3651
G.J. Martinez	Mayor of Zwolle	Town of Zwolle	952 South Main St. P.O. Box 1038 Zwolle, LA	(318) 645-6150
Troy H. Terrell	Mayor of Converse	Village of Converse	209 West Port Arthur Avenue Converse, LA	(318) 567-3312
Susan Slay	Mayor of Fisher	Village of Fisher	679 4 L Drive Fisher, LA	(318) 256-2001
Eddie Jones, Jr.	Mayor of Florien	Village of Florien	237 West Port Arthur Avenue Florien, LA	(318) 586-7286
Gary Rivers	Mayor of Noble	Village of Noble	423 Highway 1218, Noble, LA	(318) 645-6900
Bill Thomas	Mayor of Pleasant Hill	Village of Pleasant Hill	8336 Pearl St. Pleasant Hill, LA	(318) 796-3680
David Davis	OHSEP Director	Sabine Parish OHSEP	Many, LA	(318) 256-9652
Kenneth Moore	OHSEP Director	Vernon Parish OHSEP	Leesville, LA	(337) 238-9025
Teresa Basco	GOHSEP R6 Coordinator	GOHSEP	7667 Independence Blvd	(225) 925-7500
Keneth Ebarb	Police Jury President	Sabine Parish Police Jury	Many, LA	N/A

Meeting #4: Public Meeting

Date: August 11, 2016**Location:** Many, LA

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

Public Initiation: Yes**Invitees Included:**

Name	Title	Agency	Address	Phone
Kenneth Freeman	Mayor of Many	Town of Many	965 San Antonio Ave Many, LA	(318) 256-3651
G.J. Martinez	Mayor of Zwolle	Town of Zwolle	952 South Main St. P.O. Box 1038 Zwolle, LA	(318) 645-6150
Troy H. Terrell	Mayor of Converse	Village of Converse	209 West Port Arthur Avenue Converse, LA	(318) 567-3312
Susan Slay	Mayor of Fisher	Village of Fisher	679 4 L Drive Fisher, LA	(318) 256-2001
Eddie Jones, Jr.	Mayor of Florien	Village of Florien	237 West Port Arthur Avenue Florien, LA	(318) 586-7286
Gary Rivers	Mayor of Noble	Village of Noble	423 Highway 1218, Noble, LA	(318) 645-6900
Bill Thomas	Mayor of Pleasant Hill	Village of Pleasant Hill	8336 Pearl St. Pleasant Hill, LA	(318) 796-3680
David Davis	OHSEP Director	Sabine Parish OHSEP	Many, LA	(318) 256-9652
Kenneth Moore	OHSEP Director	Vernon Parish OHSEP	Leesville, LA	(337) 238-9025
Teresa Basco	GOHSEP R6 Coordinator	GOHSEP	7667 Independence Blvd	(225) 925-7500
Keneth Ebarb	Police Jury President	Sabine Parish Police Jury	Many, LA	N/A

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

Meeting Public Notice

SABINE OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

MEETING NOTICE – August 11, 2016

Sabine Parish to hold Public Meetings for Hazard Mitigation Plan Update

Many, LA – Sabine Parish Office of Homeland Security & Emergency Preparedness is in the process of updating the Sabine Parish Hazard Mitigation Plan and are required to hold public meetings on the plan update. The Public meeting will be held on August 11, 2016 in the Sabine OHSEP EOC at 10:30am.

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

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

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

Sabine Parish is in the final stages of updating its hazard mitigation plan. Public meeting will be held on August 11th for all citizens interested in learning about and participating in discussions concerning the Sabine Parish Hazard Mitigation Plan.

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

For more information, please contact: Sabine Parish OHSEP

Outreach Activity #1: Public Opinion Survey

Date: Ongoing throughout planning process

Location: Web Survey

Public Initiation: Yes

Outreach Activity #2: Incident Questionnaire

Date: Public Meeting Activity

Location: Public Meeting

Public Initiation: Yes

The public was asked to provide information regarding which types of hazards concerned them the most. No public elected to participate in this activity, therefore no feedback was collected at this time.

Outreach Activity #3: Mapping Activities

Public meeting attendees were asked to identify areas on jurisdictional maps provided that were “problem areas”. They were also asked to indicate any areas of new development. This activity gave the public an opportunity to interact with SDMI’s GIS Mapping section, as well as provide valuable input on areas that may flood repeatedly during rain events that may not get reported to local emergency managers as significant events. No feedback was collected at this time.

Public Plan Review Documentation

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

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

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

Responsible Parties

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

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

Methods for Monitoring and Evaluating the Plan and Plan Evaluation Criteria

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

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

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

- 1) Whether the action was implemented and reasons, if the action was not implemented
- 2) What were the results of the implemented action
- 3) Were the outcomes as expected, and reasons if the outcomes were not as expected
- 4) Did the results achieve the stated goals and objectives
- 5) Was the action cost-effective
- 6) What were the losses avoided after completion of the project
- 7) In case of a structural project, did it change the hazard profile

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

- 1) Any local staffing changes that would warrant inviting different members to the planning committee
- 2) Any new organizations that would be valuable in the planning process or project implementation need to be included in the planning committee
- 3) Are there any procedures that can be done more efficiently
- 4) Are there more ways to gain more diverse and widespread cooperation
- 5) Are there any different or additional funding sources available for mitigation planning and implementation

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

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

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

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

2016 Plan Version Plan Method and Schedule Evaluation

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

Incorporation into Existing Planning Programs

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

- Ordinances, Resolutions, Regulations
- Comprehensive Master Plan
- Capital Improvements Plan
- Economic Development Plan
- Local Emergency Operations Plan
- Continuity of Operations Plan
- Transportation Plan
- Floodplain Ordinances

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

local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Sabine Parish Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability within the parish.

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

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

On behalf of the jurisdictions of Unincorporated Sabine Parish, Village of Converse, Village of Fisher, Village of Florien, Town of Many, Village of Noble, Village of Pleasant Hill, and Town of Zwolle, Sabine Parish has the authority to incorporate the contents of the Hazard Mitigation Plan into the parish's existing regulatory mechanisms. Agreements are currently in place with jurisdictions to allow for the parish incorporation mechanisms to take place.

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

Unincorporated Sabine Parish

Comprehensive Master Plan/Updated as needed/Sabine Parish Police Jury
Capital Improvements Plan/Updated as needed/Sabine Parish Police Jury
Economic Development Plan/Updated as needed/Sabine Parish Police Jury
Local Emergency Operations Plan/Updated as needed/Sabine Parish OHSEP
Transportation Plan/Updated as needed/Sabine Parish Police Jury

Village of Converse

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

Village of Fisher

Local Emergency Operations Plan/Updated as needed/Sabine Parish OHSEP and Mayor of Fisher

Village of Florien

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

Town of Many

Comprehensive Master Plan/Updated as needed/Sabine Parish Police Jury and Mayor of Many
Capital Improvements Plan/Updated as needed/Sabine Parish Police Jury and Mayor of Many
Economic Development Plan/Updated as needed/Sabine Parish Police Jury and Mayor of Many
Local Emergency Operations Plan/Updated as needed/Sabine Parish OHSEP and Mayor of Many
Continuity of Operations Plan/Update as needed/ Sabine Parish OHSEP and Mayor of Many
Transportation Plan/Updated as needed/Sabine Parish Police Jury and Mayor of Many

Village of Noble

Local Emergency Operations Plan/Updated as needed/Sabine Parish OHSEP and Mayor of Noble

Village of Pleasant Hill

Economic Development Plan/Updated as needed/Sabine Parish Police Jury and Mayor of Pleasant Hill

Town of Zwolle

Local Emergency Operations Plan/Updated as needed/Sabine Parish OHSEP and Mayor of Zwolle

Continued Public Participation

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

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

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	South Sabine Fire District			X	X	X	X	X		
	South Toldeo Bend Volunteer Fire Dept			X	X	X	X	X	X	
	Toro Volunteer Fire Department			X	X	X	X	X		
	Union Springs Fire Department			X	X	X	X	X		
Government	Department of Traffic and Transport			X	X	X	X	X	X	
	Ebarb District 1 Water Office			X	X	X	X	X	X	
	Sabine Parish Dump Site			X	X	X	X	X	X	
	Sabine Parish Dump Site			X	X	X	X	X	X	
	Sabine Parish Dump Site			X	X	X	X	X	X	
	Sabine Parish Police Jury Road Dept			X	X	X	X	X	X	
	Sabine Parish Tourist Commission			X	X	X	X	X	X	
	Sabine River Authority LA Headquarters		X	X	X	X	X	X	X	
Corrections	Sabine Parish Detention Center			X	X	X	X	X		
Schools	Ebarb School			X	X	X	X	X	X	
	Many Junior High / High School			X	X	X	X	X	X	
	Negreet High School			X	X	X	X	X		

Converse Essential Facilities										
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*
Fire and Rescue	Fire Station			X	X	X	X	X		
Government	Converse City Hall			X	X	X	X	X	X	
Law Enforcement	Converse Police Station			X	X	X	X	X	X	
Schools	Converse School			X	X	X	X	X	X	

Fisher Essential Facilities										
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*
Fire and Rescue	Fisher Station			X	X	X	X	X	X	
Government	Village of Fisher Town Hall			X	X	X	X	X		
Law Enforcement	Village of Fisher Police Station			X	X	X	X	X		

Florien Essential Facilities										
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*
Fire and Rescue	Ward 1 and 2 Fire District		X	X	X	X	X	X	X	
Government	Village of Florien City Hall		X	X	X	X	X	X	X	
Law Enforcement	Village of Florien Police Department		X	X	X	X	X	X	X	
Schools	Florien High School			X	X	X	X	X	X	

Many Essential Facilities										
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*
Fire and Rescue	Fire District 1 Wards 3&4-Central Stat			X	X	X	X	X	X	
	Fire District 1 Wards 3&4-Many Station			X	X	X	X	X		
Government	CDC Sabine Business Government Comp			X	X	X	X	X		
	Department of Public Safety		X	X	X	X	X	X	X	
	Department of Social Services			X	X	X	X	X	X	
	Housing Authority		X	X	X	X	X	X	X	
	Many City Hall			X	X	X	X	X		
	Office of District Attorney		X	X	X	X	X	X		
	Sabine Parish Council on Aging			X	X	X	X	X	X	
	Sabine Parish Courthouse		X	X	X	X	X	X		
	Sabine Parish Sales and Use Tax		X	X	X	X	X	X	X	
	Sabine Parish School Board Media Cent				X	X	X	X	X	X
	Sabine Parish School Board Food Service				X	X	X	X	X	X
USDA Service Center		X	X	X	X	X	X	X		
Law Enforcement	City of Many Police Department			X	X	X	X	X		
Public Health	Many Healthcare North			X	X	X	X	X	X	
	Many Healthcare South			X	X	X	X	X	X	
	Sabine Medical Center		X	X	X	X	X	X	X	
	Sabine Medical Center		X	X	X	X	X	X	X	
	Sabine Parish Health Unit			X	X	X	X	X		
Schools	Many Elementary School			X	X	X	X	X	X	
	St. John's Catholic School			X	X	X	X	X	X	

Noble Essential Facilities										
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*
Fire and Rescue	Fire Station			X	X	X	X	X		
	Fire Station			X	X	X	X	X		
Government	Noble Village Hall			X	X	X	X	X		
Law Enforcement	Noble Police Department			X	X	X	X	X	X	

Pleasant Hill Essential Facilities										
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*
Fire and Rescue	Fire Station			X	X	X	X	X		
Government	Pleasant Hill Town Hall		X	X	X	X	X	X	X	
Law Enforcement	Pleasant Hill Police Department		X	X	X	X	X	X	X	
Schools	Pleasant Hill High			X	X	X	X	X	X	

Zwolle Essential Facilities										
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfires	Winter Storms*
Fire and Rescue	Zwolle Central Station			X	X	X	X	X	X	
Government	Zwolle Mayor's Office			X	X	X	X	X	X	
	Zwolle Water Department			X	X	X	X	X	X	
Law Enforcement	Zwolle Police Department			X	X	X	X	X		
Public Health	Zwolle Rural Clinic			X	X	X	X	X	X	
Schools	Zwolle Elementary School			X	X	X	X	X	X	
	Zwolle High School			X	X	X	X	X	X	
	Zwolle Intermediate School			X	X	X	X	X	X	

Appendix D: Plan Adoption

Sabine Parish

Resolution No. 7901

A RESOLUTION ADOPTING THE
PARISH-WIDE HAZARD MITIGATION PLAN FOR
SABINE PARISH

WHEREAS, the Sabine Parish Police Jury has received funds from the Federal Emergency Management Agency, through the Governor's Office of Homeland Security and Emergency Preparedness, for the update of a Hazard Mitigation Plan; and,

WHEREAS, Sabine Parish has participated in the process to update a DMA compliant Hazard Mitigation Plan based on FEMA guidance available in the How to Guides; and,

WHEREAS, Sabine Parish wishes to participate in the Hazard Mitigation Plan Update prepared by the Sabine Parish governing authority under the oversight of a Steering Committee comprised of Parish-wide representatives; and,

WHEREAS, Sabine Parish and local representatives and governments have participated in the mitigation planning process; and,

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

WHEREAS, the updated Plan has been recommended for adoption by the Steering Committee; and,

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

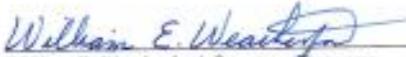
- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Grant Program
- Severe Repetitive Loss
- Repetitive Flood Claims

THEREFORE, BE IT RESOLVED, that Sabine Parish through its governing authority, the Sabine Parish Police Jury, hereby adopts the Sabine Parish Hazard Mitigation Plan Update on this the 19th day of July 2017.

The foregoing resolution having been offered upon a motion by Ruffin and seconded by Bison was then submitted to an official vote and the vote thereupon was recorded as follows to wit:

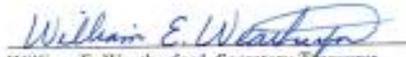
Yeas: 8 Nays: 0 Absent: 1

Therefore, the foregoing resolution was declared duly adopted on the 19th day of July 2017, at which meeting a quorum was present.


William E. Weatherford, Secretary-Treasurer

PARISH OF SABINE
STATE OF LOUISIANA

I, William E. Weatherford, Secretary-Treasurer of the Police Jury of Sabine Parish, Louisiana, hereby certify that this is a true copy of a resolution adopted in legal session, with a quorum present, on the 19th day of July 2017.


William E. Weatherford, Secretary-Treasurer

Village of Converse

VILLAGE OF CONVERSE

RESOLUTION 01-2019

A RESOLUTION ADOPTING THE
PARISH-WIDE HAZARD MITIGATION PLAN

WHEREAS, the Village of Converse has received funds from the Federal Emergency Management Agency, through the Governor's Office of Homeland Security and Emergency Preparedness, for the update of a Hazard Mitigation Plan, and,

WHEREAS, The Village of Converse has participated in the process to update a DMA complaint Hazard Mitigation Plan based on the FEMA guidance available in the How to Guide; and,

WHEREAS, The Village of Converse wishes to participated in the Hazard Mitigation Plan Update prepared by the Sabine Parish governing authority under the oversight of a Steering Committee comprised of Parish-wide representatives; and,

WHEREAS, The Village of Converse and local representatives and governments have participated in the mitigation planning process; and,

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

WHEREAS, The updated Plan has been recommended for adoption by the Steering Committee; and,

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

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Grant Program
- Severe Repetitive Loss
- Repetitive Flood Claims

Therefore, Be It Resolved, that The Village of Converse through its governing authority, the Sabine Parish Police Jury, hereby adopts the Sabine Parish Hazard Mitigation Plan Update on this 6th day of May 2019.



Sonya Ryan, Clerk



Troy H. Terrell, Mayor

Village of Fisher

VILLAGE OF FISHER
RESOLUTION APRIL 9, 2018A RESOLUTION ADOPTING THE
PARISH-WIDE HAZARD MITIGATION PLAN

WHEREAS, the Village of Fisher has received funds from the Federal Emergency Management Agency, through the Governor's Office of Homeland Security and Emergency Preparedness, for the update of a hazard Mitigation Plan and,

WHEREAS, The Village of Fisher has participated in the process to update a DMA compliant Hazard Mitigation Plan based on the FEMA guidance available in the How to Guides; and,

WHEREAS, The Village of Fisher wishes to participate in the Hazard Mitigation Plan Update prepared by the Sabine Parish governing authority under the oversight of a Steering Committee comprised of Parish-wide representatives; and,

WHEREAS, Sabine Parish and local representatives and governments have participated in the mitigation planning process; and,

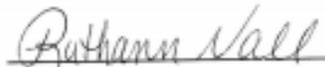
WHEREAS, Appropriate opportunity for the input by public and community officials has been provided through press releases, open meetings and availability of draft documents; and,

WHEREAS, The updated Plan has been recommended for adoption by the Steering Committee; and,

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

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Grant Program
- Severe Repetitive Loss
- Repetitive Flood Claims

Therefore, Be it Resolved, that The Village of Fisher through its governing authority, The Council Members of The Village of Fisher, hereby adopts the Sabine Parish Hazard Mitigation Plan Update on this 9th day of April 2018.


Clerk

PREPARED
APR 12 2018

Village of Florien

**VILLAGE OF FLORIEN
RESOLUTION #2021-5**

PARISH-WIDE HAZARD MITIGATION PLAN

WHEREAS, The Village of Florien has received funds from the Federal Emergency Management Agency, through the Governor's Office of Homeland Security and Emergency Preparedness, for the update of a Hazard Mitigation Plan; and,

WHEREAS, The Village of Florien has participated in the process to update a DMA compliant Hazard Mitigation Plan based on the FEMA guidance available in the How to Guides; and,

WHEREAS, The Village of Florien wished to participate in the Hazard Mitigation Plan Update prepared by the Sabine Parish governing authority under the oversight of a Steering Committee comprised of Parish-Wide representatives; and,

WHEREAS, Sabine Parish and local representatives and governments have participated in the mitigation planning process; and,

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

WHEREAS, the updated plan has been recommended for adoption by the Steering Committee; and,

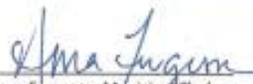
WHEREAS, Adoption of the updated plan is required prior to further consideration of FEMA funding under the following programs:

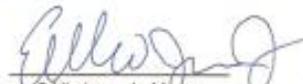
- *Pre-Disaster Mitigation*
- *Hazard Mitigation Grant Program*
- *Flood Grant Mitigation Program*
- *Severe repetitive loss*
- *Repetitive Flood Claims*

NOW THEREFOR BE IT RESOLVED, the Village of Florien through its governing authority, the Village of Florien, hereby adopts the Sabine Parish Hazard Mitigation Plan Update on the this 10th day of August 2021.

Yays: 3 Nays: Absent:
 Tanja Charles
 Suzanne Williams
 Bradley Marr

Given under my official signature and seal of office on this the 10th day of August in 2021.


 Anna Ferguson, Municipal Clerk


 Eddie Jones, Jr., Mayor

Town of Many

**TOWN OF MANY
RESOLUTION #2 of 2018**

A RESOLUTION ADOPTING THE PARISH-WIDE HAZARD MITIGATION PLAN

WHEREAS, the Town of Many has received funds from the Federal Emergency Management Agency, through the Governor's Office of Homeland Security and Emergency Preparedness, for the update of a Hazard Mitigation Plan, and,

WHEREAS, the Town of Many has participated in the process to update a DMA compliant Hazard Mitigation Plan based on the FEMA guidance available in the How to Guides, and,

WHEREAS, the Town of Many wishes to participate in the Hazard Mitigation Plan Update prepared by the Sabine Parish governing authority under the oversight of a Steering Committee comprised of Parish-wide representatives, and,

WHEREAS, Sabine Parish and local representation and governments have participated in the mitigation planning process, and,

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

WHEREAS, the updated Plan has been recommended for adoption by the Steering Committee, and,

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

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Grant Program
- Severe Repetitive Loss
- Repetitive Flood Claims

THEREFORE, BE IT FURTHER RESOLVED, that the Town of Many hereby adopts the Sabine Parish Hazard Mitigation Plan Update with a motion by Darwitz, seconded by Kennedy on this 17th day of March 2018.

YEAS:	Darwitz, Kennedy, Carley, Jackson, Penrose
NAYS:	None
ABSENT:	None
ABSTAIN:	None


Kenneth A. Fineman, Mayor


Anie Brown, Clerk

Village of Noble

RESOLUTION 2-17-2022

VILLAGE OF NOBLE

RESOLUTION ADOPTING THE PARISH WIDE HAZARD MITIGATION PLAN

WHEREAS, THE VILLAGE OF NOBLE WISHES TO PARTICIPATE IN THE HAZARD MITIGATION PLAN UPDATE PREPARED BY THE SABINE PARISH GOVERNING AUTHORITY UNDER THE OVERSIGHT OF A STEERING COMMITTEE COMPRISED OF PARISH WIDE REPRESENTATIVES; AND

WHEREAS, SABINE PARISH AND LOCAL REPRESENTATIVES AND GOVERNMENTS HAVE PARTICIPATED IN THE MITIGATION PLANNING PROCESS; AND

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

WHEREAS, THE UPDATED PLAN HAS BEEN RECOMMENDED FOR ADOPTION BY THE STEERING COMMITTEE AND,

WHEREAS, ADOPTION OF THE UPDATED PLAN IS REQUIRED PRIOR TO FURTHER CONSIDERATION FOR FEMA FUNDING UNDER THE FOLLOWING PROGRAMS;

- PRE-DISASTER MITIGATION
- HAZARD MITIGATION GRANT PROGRAM
- FOOD MITIGATION GRANT PROGRAM
- SEVERE PEPETITIVE LOSS
- REPETITIVE FLOOD CLAIMS

THEREFORE, BE IT RESOLVED THAT THE VILLAGE OF NOBLE THROUGH ITS GOVERNING AUTHORITY, THE SABINE PARISH POLICE JURY, HEREBY ADOPTS THE SABINE PARISH HAZARD MITIGATION PLAN UPDATE ON THIS THE 17TH DAY OF FEBUARY 2022

Lynn Mon + gowery
Lynn Mon + gowery
MAYOR

VILLAGE OF NOBLE

THE VILLAGE OF NOBLE DECLINES PARTICIPATION IN THE SABINE PARISH WIDE UPDATE OF HAZARD MITIGATION PLAN.

N/A

MAYOR, VILLAGE OF NOBLE

Village of Pleasant Hill



BARBARA T. CAMPBELL
MAYOR

Village of Pleasant Hill

8336 PEARL STREET
P.O. BOX 125
PLEASANT HILL, LOUISIANA 71065
TELEPHONE 338/796-3480
FAX 338/796-3366

ALDERMAN
EDWARD G. ARNOLD
"RAY" BLIFER
CAROL C. PATTISON

CHIEF OF POLICE
TOMMY RAY WILLIAMS

VILLAGE OF PLEASANT HILL

RESOLUTION JULY 12, 2017

A RESOLUTION ADOPTING THE PARISH-WIDE HAZARD MITIGATION PLAN

WHEREAS, the Village of Pleasant Hill has received funds from the Federal Emergency Management Agency, through the Governor's Office of Homeland Security and Emergency Preparedness, for the update of a Hazard Mitigation Plan, and,

WHEREAS, Village of Pleasant Hill has participated in the process to update a DMA compliant Hazard Mitigation Plan based on the FEMA guidance available in the How to Guides; and,

WHEREAS, Village of Pleasant Hill wishes to participate in the Hazard Mitigation Plan Update prepared by the Sabine Parish governing authority under the oversight of a Steering Committee comprised of Parish-wide representatives; and,

WHEREAS, Sabine Parish and local representatives and governments have participated in the mitigation planning process; and,

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

WHEREAS, The updated Plan has been recommended for adoption by the Steering Committee; and,

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

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Grant Program
- Severe Repetitive Loss
- Repetitive Flood Claims

Therefore, Be it Resolved, that the Village of Pleasant Hill through its governing authority, the Sabine Parish Police Jury, hereby adopts the Sabine Parish Hazard Mitigation Plan Update on this 12th day of July 2017.

Clerk

Barbara Campbell

Mayor, Village of Pleasant Hill

An Equal Opportunity Employer

Town of Zwolle

**A RESOLUTION ADOPTING THE
PARISH-WIDE HAZARD MITIGATION PLAN**

WHEREAS, the Town of Zwolle has received funds from the Federal Emergency Management Agency, through the Governor's Office of Homeland Security and Emergency Preparedness, for the update of a Hazard Mitigation Plan, and,

WHEREAS, the Town of Zwolle has participated in the process to update a DMA compliant Hazard Mitigation Plan based on the FEMA guidance available in the How to Guides; and,

WHEREAS, the Town of Zwolle wished to participate in the Hazard Mitigation Plan Update prepared by the Sabine Parish governing authority under the oversight of a Steering Committee comprised of Parish-wide representatives; and,

WHEREAS, Sabine Parish and local representatives and governments have participated in the mitigation planning process; and,

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

WHEREAS, the updated plan has been recommended for adoption by the Steering Committee; and,

WHEREAS, Adoption of the updated plan is required prior to further consideration of FEMA funding under the following programs:

- Pre-Disaster Mitigation
- Hazard Mitigation Grant Program
- Flood Mitigation Grant Program
- Severe repetitive Loss
- Repetitive Flood Claims

Therefore, Be it Resolved, that the Town of Zwolle through its governing authority, the Town of Zwolle, hereby adopts the Sabine Parish Hazard Mitigation Plan Update on this 12th day of April 2018.


Town Clerk


Mayor Martine

Appendix E: State Required Worksheets

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

Mitigation Planning Team

Name	Title	Agency	Address	Phone
Kenneth Freeman	Mayor of Many	Town of Many	965 San Antonio Ave Many, LA	(318) 256-3651
G.J. Martinez	Mayor of Zwolle	Town of Zwolle	952 South Main St. P.O. Box 1038 Zwolle, LA	(318) 645-6150
Troy H. Terrell	Mayor of Converse	Village of Converse	209 West Port Arthur Avenue Converse, LA	(318) 567-3312
Susan Slay	Mayor of Fisher	Village of Fisher	679 4 L Drive Fisher, LA	(318) 256-2001
Eddie Jones, Jr.	Mayor of Florien	Village of Florien	237 West Port Arthur Avenue Florien, LA	(318) 586-7286
Gary Rivers	Mayor of Noble	Village of Noble	423 Highway 1218, Noble, LA	(318) 645-6900
Bill Thomas	Mayor of Pleasant Hill	Village of Pleasant Hill	8336 Pearl St. Pleasant Hill, LA	(318) 796-3680
David Davis	OHSEP Director	Sabine Parish OHSEP	Many, LA	(318) 256-9652
Kenneth Moore	OHSEP Director	Vernon Parish OHSEP	Leesville, LA	(337) 238-9025
Teresa Basco	GOHSEP R6 Coordinator	GOHSEP	7667 Independence Blvd	(225) 925-7500
Keneth Ebarb	Police Jury President	Sabine Parish Police Jury	Many, LA	N/A

Capability Assessment

See Section 3 – Capability Assessment

Building Inventory

Critical Facility (If Yes, Mark X)	Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Const. type
Sabine									
	South Toledo Bend Volunteer Fire Department	Fire Search and Rescue	Louisiana 111	Anacoco	31.22507951	-93.57019548	100,000	unknown	Reinforced Masonry
	Fire Station	Fire Search and Rescue	168 Powell Road	Hornbeck	31.42474964	-93.53519534	50,000	unknown	Reinforced Masonry
	Toro Volunteer Fire Department	Fire Search and Rescue	527 Hammond Street	Hornbeck	31.29413596	-93.53813242	75,000	unknown	Reinforced Masonry
	Union Springs Fire Department	Fire Search and Rescue	13595 U.S. 84	Logansport	31.82997213	-93.79043931	100,000	unknown	Reinforced Masonry
	Robeline Fire Dept	Fire Search and Rescue	7740 Oak Street	Robeline	31.69423638	-93.33849863	100,000	unknown	Reinforced Masonry
Converse									
	Converse School	Education	400 Wildcat Drive	Converse	31.78548104	-93.6975572	1,800,000	1960	Reinforced Masonry
	Crossroads Station	Fire Search and Rescue	Nearby: 7153-7437 Louisiana 191	Converse	31.75026006	-93.76682	150,000	2000	Reinforced Masonry
	Fire Station	Fire Search and Rescue	Nearby: West Port Arthur Avenue	Converse	31.78184276	-93.69631471	150,000.00	1990	Reinforced Masonry
	Converse Police Station	Law Enforcement	Nearby: West Port Arthur Avenue	Converse	31.78178688	-93.69594218	150,000.00	1986	Reinforced Masonry
	Converse City Hall	Civil Government	209 West Port Arthur Avenue	Converse	31.78178688	-93.69600737	250,000.00	1981	Reinforced Masonry
Fisher									
	Village of Fisher Police Station	Law Enforcement	Nearby: 4 L Drive	Fisher	31.49299988	-93.46736603	250,000	1948	Wood
	Village of Fisher Town Hall	Civil Government	679 4 L Drive	Fisher	31.49303493	-93.46739919	250,000	1948	Wood
	Village of Fisher Commissary	Commissary		Fisher			1,000,000	1948	Wood

Florien									
	Florien High School	Education	500 High School Drive	Florien	31.43963993	-93.45976275	7,000,000	2000	Reinforced Masonry
	South Sabine Fire District	Fire Search and Rescue	Nearby: 100-198 Tallow Lane	Florien	31.46936643	-93.38058102	200,000	2005	Metal
	Ward 1 & 2 Fire District	Fire Search and Rescue	Nearby: North Nolan Trce	Florien	31.44952381	-93.45714789	150,000	1999	Steel
	Fisher Station	Fire Search and Rescue	712 North Nolan Trce	Florien	31.49416832	-93.46098032	150,000	1999	Reinforced Masonry
	Fire Tower	Fire Search and Rescue	Nearby: 8367 Louisiana 473	Florien	31.3045503	-93.43299416	250,000	1960	Steel
	Village of Florien Police Department	Law Enforcement	237 W Port Arthur Ave	Florien	31.44323839	-93.45988117	150,000	2000	Wood
	Village of Florien City Hall	Civil Government	237 W Port Arthur Ave	Florien	31.44320032	-93.45988307	150,000	2000	Reinforced Masonry
Many									
	Sabine Career Academy	Education	910 West Mississippi Avenue	Many	31.56551054	-93.48320095	3,000,000	1960	Reinforced Masonry
	Many Elementary School	Education	265 Middle Creek Road	Many	31.57268643	-93.46694306	7,000,000	2015	Steel
	Many Junior High / High School	Education	1801 Natchitoches Highway	Many	31.5943261	-93.44847402	5,000,000	2006	Reinforced Masonry
	Negreet High School	Education	4129 Louisiana 476	Many	31.46989233	-93.57410186	5,000,000	1997	Reinforced Masonry
	Sabine Parish Office of Homeland Security and Emergency Preparedness	Emergency Operations Center	Nearby: 1700-1798 San Antonio Avenue	Many	31.57383572	-93.47216342	500,000	1959	Reinforced Masonry
	Zwolle Central Station	Fire Search and Rescue	505 San Antonio Avenue	Many	31.63268656	-93.64323351	375,000	1998	Steel
	Fire District 1	Fire Search and Rescue	1710 San Antonio Avenue	Many	31.64937802	-93.4903377	250,000	1998	Steel
	Ebarb Fire Station	Fire Search and Rescue	15091 Texas Highway	Many	31.6232678	-93.71874521	150,000	2000	Steel
	Fire District 1 Wards 3&4 - Central Station	Fire Search and Rescue	Nearby: 1700-1798 San Antonio Avenue	Many	31.57373134	-93.47339923	350,000	1996	Steel
	Fire District 1 Wards 3&4 - ManyStation	Fire Search and Rescue	Nearby: 300-398 Ivanhoe Street	Many	31.5650337	-93.47766059	175,000	1998	Reinforced Masonry
	Fire Station	Fire Search and Rescue	1710 San Antonio Avenue	Many	31.61210249	-93.40103828	150,000	1963	Reinforced Masonry
	Peg Leg Cove Volunteer Fire Department	Fire Search and Rescue	Nearby: 100-302 Peg Leg Lane	Many	31.38856717	-93.61237548	150,000	2005	Steel
	Fire District 1 - Twin Island Station	Fire Search and Rescue	Nearby: Cypress Bend Drive	Many	31.44233864	-93.67371669	150,000	2000	Reinforced Masonry

Fire District 1 - Pendleton Station	Fire Search and Rescue	15091 Texas Highway	Many	31.49360989	-93.673139	175,000	2000	Reinforced Masonry
Fire District 1 Wards 3&4	Fire Search and Rescue	Nearby: Zion Hill Road	Many	31.46727852	-93.57481293	150,000	2002	Reinforced Masonry
Fire District 1 Wards 3&4 - Recknor Station	Fire Search and Rescue	Nearby: 8243 Texas Highway	Many	31.50311077	-93.59981755	180,000	2007	Steel
City of Many Police Department	Law Enforcement	Nearby: 965 San Antonio Avenue	Many	31.56850042	-93.48201232	475,000	1961	Reinforced Masonry
Sabine Parish Detention Center	Prisons and Correctional Facilities	Nearby: 398 Detention Center Road	Many	31.55917589	-93.45975668	3,000,000	2001	Reinforced Masonry
Sabine Parish Police Jury Road Department	Civil Government	400 South Capitol Street # 101	Many	31.58080739	-93.50469731	300,000	2000	Metal
Sabine Parish Dump Site	Civil Government	955 Sabine Landfill Road	Many	31.61569704	-93.49844838	2,000,000	1997	
Sabine Parish Sales & Use Tax Commission	Civil Government	Nearby: 670 San Antonio Avenue	Many	31.56810915	-93.48448428	230,000	2000	Reinforced Masonry
Sabine Parish School Board - ESEA Title 1 Media Center	Civil Government	Nearby: 601-699 Peterson Street	Many	31.56943671	-93.48460977	500,000	1969	Reinforced Masonry
Sabine Parish School Board - Food Service	Civil Government	Nearby: 801-899 North Capitol Street	Many	31.56967243	-93.48438752	500,000	1981	Reinforced Masonry
Sabine River Authority Louisiana Headquarters	Civil Government	15091 Texas Highway	Many	31.48851979	-93.70665402	475,000	2005	Reinforced Masonry
Many City Hall	Civil Government	Nearby: 965 San Antonio Avenue	Many	31.56852443	-93.48185864	275,000	1961	Reinforced Masonry
Sabine Parish Courthouse	Civil Government	657 Main Street	Many	31.56731262	-93.48379591	7,000,000	1959	Reinforced Masonry
Sabine Parish Tourist Commission	Civil Government	1601 Texas Highway	Many	31.55047539	-93.50727923	675,000	2005	Reinforced Masonry
Sabine Parish Health Unit	Hospital or Medical Center	1230 West Louisiana Avenue	Many	31.56644835	-93.47726449	1,000,000	1997	Reinforced Masonry
Many Healthcare North	Hospital or Medical Center	120 Natchitoches Highway	Many	31.57395021	-93.46886342	1,000,000	1976	wood
Sabine Medical Center	Hospital or Medical Center	240 Highland Drive	Many	31.5669341	-93.48458327	6,000,000	1964	Reinforced Masonry
Many Healthcare South	Hospital or Medical Center	255 Middle Creek Road	Many	31.57316531	-93.46800966	675,000	2000	Reinforced Masonry
Sabine Medical Center	Hospital or Medical Center	240 Highland Drive	Many	31.56051093	-93.47154574			
Hart Memorial Airport	Airports and Airfields	Nearby: Hart Airport	Many	31.54494956	-93.48515026	875,000	1967	

	Court House Annex	Government	415 S Capitol	Many			179,000	2003	wood
	Clerk of Court Annex	Government	176 Natchitoches Hwy	Many			175,000	2006	metal
Noble									
	Ebarb School	Education	5340 Louisiana 482	Noble	31.63041848	-93.75127804	5,000,000	1961	Reinforced Masonry
	North Sabine Fire Protection District	Fire Search and Rescue	Nearby: Fowler Road	Noble	31.65793461	-93.76710623	150,000	2000	Metal
	Noble Police Department	Law Enforcement	462 Morning Glory Lane	Noble	31.68972367	-93.68138655	150,000	2000	Reinforced Masonry
	Sabine Parish Dump Site	Civil Government	Nearby: 200-722 Big Sepulvado Loop	Noble	31.62140361	-93.73382276	7,000,000	2000	
	Noble Village Hall	Civil Government	952 South Main Street	Noble	31.68972394	-93.68140382	150,000	1989	Wood
Pleasant Hill									
	Pleasant Hill High	Education	2601 West 2nd Street	Pleasant Hill	31.81553634	-93.51334821	5,000,000	1960	Reinforced Masonry
	Belmont Station	Fire Search and Rescue	2360 West Main Street	Pleasant Hill	31.71738075	-93.50975103	125,000	1985	Metal
	Fire Station	Fire Search and Rescue	83 Rains Street	Pleasant Hill	31.81975573	-93.51416155	125,000	2000	Metal
	Pleasant Hill Police Department	Law Enforcement	8336 Pearl Street	Pleasant Hill	31.81894567	-93.51474202	150,000	1999	Reinforced Masonry
	Pleasant Hill Town Hall	Civil Government	Nearby: 8348-8398 Pearl Street	Pleasant Hill	31.81893173	-93.51477534	150,000	1967	Reinforced Masonry
Zwolle									
	Zwolle High School	Education	None	Zwolle	31.63419913	-93.64621044	3,000,000	1963	Reinforced Masonry
	Zwolle Intermediate School	Education	Nearby: Championship Dr	Zwolle	31.63485983	-93.64602021	1,900,000	1980	Reinforced Masonry
	Zwolle Elementary School	Education	743 Championship Drive	Zwolle	31.63457346	-93.64540656	2,000,000	1990	Reinforced Masonry
	Bayou Scie Fire Station	Fire Search and Rescue	Nearby: 1501-1521 Russell Road	Zwolle	31.66996404	-93.57385344	150,000	1989	Steel
	Blue Lake Fire Station	Fire Search and Rescue	Nearby: Parkside Drive	Zwolle	31.57241989	-93.72683209	150,000	1996	Steel
	Fire Station	Fire Search and Rescue	919 Hammond Street	Zwolle	31.68948821	-93.68158062	200,000	2001	Steel
	Zwolle Police Department	Law Enforcement	Nearby: 952 South Main Street	Zwolle	31.63062079	-93.64293771	175,000	1967	Wood

	Zwolle Mayor's Office	Civil Government	Nearby: 952 South Main Street	Zwolle	31.63060792	-93.64303747	175,000	1967	Wood
	Zwolle Water Department	Civil Government	952 South Main Street	Zwolle	31.63060792	-93.64315332	150,000	1970	Wood
	Choctaw-Apache Tribal Office	Civil Government	35 Lonnie Road	Zwolle	31.63548039	-93.68294034	150,000	1999	Reinforced Masonry
	Sabine Parish Dump Site	Civil Government	Sabine Landfill Rd	Zwolle	31.67599834	-93.54840101	4,000,000	1996	
	Ebarb District 1 Water Office	Civil Government	23387 Louisiana 191	Zwolle	31.58217818	-93.66328967	150,000	2000	Wood
	Zwolle Rural Clinic	Hospital or Medical Center	2026 Obrie Street	Zwolle	31.63461039	-93.643494	650,000	2009	Reinforced Masonry
	Ammons Airport	Airports and Airfields	Nearby: 258-264 Flying Jenny Drive	Zwolle	31.52959995	-93.70775253	785,000	1989	

Vulnerable Populations

Vulnerable Populations

Sabine Parish

Name	Street	City	Zip Code	Latitude	Longitude
All Hospitals (Private or Public)					
Zwolle Rural Clinic	2026 Obrie Street	Zwolle	71486	31.63461039	-93.643494
Sabine Parish Health Unit	1230 West Louisiana Avenue	Many	71449	31.56644835	-93.47726449
Many Healthcare North	120 Natchitoches Highway	Many	71449	31.57395021	-93.46886342
Sabine Medical Center	240 Highland Drive	Many	71449	31.5669341	-93.48458327
Many Healthcare South	255 Middle Creek Road	Many	71449	31.57316531	-93.46800966
Sabine Medical Center	240 Highland Drive	Many	71449	31.56051093	-93.47154574
Nursing Homes (Private or Public)					
Toledo Retirement & Rehabilitation	Nearby: 15100-15264 Obrie Street	Zwolle	71486	31.65000537	-93.64475753
Sabine Retirement & Rehabilitation	Nearby: 1000-1298 U.S. 171	Many	71449	31.54706056	-93.45851388
Mobile Home Parks					
C&J RV Park	Nearby: 474-998 Quail Road	Converse	71419	31.81924065	-93.78126144
Pirate's Cove RV Park	1567 Caribbean Drive	Florien	71429	31.27966298	-93.57355833
Shadows Landing	Shadows Rd	Florien	71449	31.4158472	-93.61862473
Big Bass Marina	363 Big Bass Lane	Florien	71449	31.38319314	-93.61685997
Holly Pointe Trailer Park	139 Lakeshore Drive	Noble	71462	31.6583308	-93.75141411
Unknown Trailer Park	Nearby: 126 Amanda Lane	Noble	71462	31.65847702	-93.77290577
Unknown Trailer Park	Nearby: 385-545 Berts Road	Noble	71462	31.63351258	-93.75964021
Woodruff's Permanent Trailer Park	Nearby: 433-449 Sepulvado Landing Road	Noble	71462	31.63098733	-93.76315378
Solan Camp RV Park	Nearby: 2-26 Solan Camp Road	Noble	71462	31.62242405	-93.76612183
Evening Shade Mobile Homes	Nearby: 2-98 Caleb Lane	Pleasant Hill	71449	31.60659311	-93.40690493
Acorn Hill RV Ranch	Nearby: 7574 Natchitoches Highway	Robeline	71469	31.63738916	-93.37026372
Happy Trails RV Park	23 Circle R Road	Toledo	71449	31.47756923	-93.66386594

Shamrock Mobile Park	Nearby: 130-168 Southern Leisure Road	Toledo	71449	31.49463948	-93.69378413
Paradise RV	Nearby: Louisiana 392	Toro	71403	31.20392225	-93.55222871
Toledo Bend Resort	350 Toledo Resort Drive	Toro	71403	31.22471906	-93.57578753
Red's Point	Reds Point Rd	Toro	71429	31.24385195	-93.58484731
Unknown Trailer Park	Nearby: 42 Raymond Street	Zwolle	71486	31.6277365	-93.65424571
Unknown RV Park	2907 North Toledo Park Road	Zwolle	71486	31.62636684	-93.65576994
Toledo Bend RV Park	390 Bragg Drive	Zwolle	75959	31.63324048	-93.65529108
Unknown Trailer Park	Nearby: 2062-2077 Horton Street	Zwolle	71486	31.63506851	-93.63142676
Unknown Trailer Park	Nearby: 1891-1899 North Main Street	Zwolle	71486	31.63030788	-93.62915224
Peach Tree Trailer Park	12870 U.S. 171	Zwolle	71462	31.63937118	-93.69717343
Unknown Park	2907 North Toledo Park Road	Zwolle	71486	31.52639542	-93.69945506
Friend's RV Park	None	Zwolle		31.53343909	-93.70847631
AA RV Park	Nearby: 8-40 Perch Loop	Zwolle	71486	31.52593096	-93.71263819
Hide Away RV Park	294 Rhodes Road	Zwolle	71449	31.52334502	-93.71138531
Unknown Trailer Park	Nearby: 1-199 Acadian Haven Drive	Zwolle	71486	31.53648344	-93.71035444
J&H Lakewood Properties	Nearby: 2-290 Shenandoah Trce	Zwolle	71486	31.54026203	-93.70554866
Unknown RV Park	294 Rhodes Road	Zwolle	71449	31.56765768	-93.69207906
Unknown RV Park	294 Rhodes Road	Zwolle	71449	31.56356994	-93.70446567
Lanan Park RV Park	Nearby: 1-199 Lanan Park Road	Zwolle	71449	31.5252638	-93.6523883
Bar-B Campground and RV Park	Nearby: 27351-27479 Louisiana 191	Zwolle	71449	31.52677612	-93.65115
Grand Oaks Mobile Home Park	Nearby: 200-298 Alliance Loop	Zwolle	71449	31.5305312	-93.65174937
Lloyd's Trailer Park	Nearby: Lees Drive	Zwolle	71449	31.5388969	-93.66714274
Pine Thicket Mobile Home Subdivision	Nearby: 660-998 Pine Thicket Road	Zwolle	71449	31.52996255	-93.66946121
Unknown Trailer Park	Nearby: 1-99 East Sunrise Lane	Zwolle	71449	31.53653097	-93.66756143
Sunset Marina Trailer Park	3000 Farm to Market 276	Zwolle	75959	31.53655626	-93.66959318
Tranquility Bay RV Park	79 Tranquility Lane	Zwolle	71486	31.53370969	-93.6783613
Jayd's Haven	Nearby: Simone Lane	Zwolle	71449	31.53404209	-93.62179743
Ranchwood Trailer Park	25 Ranchwood Drive	Zwolle	71449	31.59351712	-93.53383342

