CALDWELL

PARISH HAZARD MITIGATION UPDATE – 2016

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CALDWELL PARISH

HAZARD MITIGATION PLAN UPDATE

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Caldwell Parish

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ACKNOWLEDGMENTS

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

Unincorporated Caldwell Parish
Town of Clarks
Town of Columbia
Village of Grayson

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

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Chad Coates	Mayor of Clarks	Village of Clarks
Carmen Head	Mayor of Grayson	Village of Grayson
Liza Rowland	Clerk	Town of Columbia
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The 2016 Caldwell Parish Hazard Mitigation Plan Update was written by the Stephenson Disaster Management Institute, Louisiana State University. Further comments should be directed to the Caldwell Parish Office of Homeland Security and Emergency Preparedness: 201 Main Street, Suite 7, Columbia, LA, 71418.

Contents

1. Introduction

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

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

- Unincorporated Caldwell Parish
- Town of Clarks
- Town of Columbia
- Village of Grayson

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

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

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

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

with other goals and programs, preventing conflicts and reducing the costs of implementing each individual activity.

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

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

Location, Demography, and Economy

Location

Caldwell Parish is located in northeast Louisiana. Caldwell is on Highway 165, south of Monroe in Ouachita Parish, just below Interstate 20. It is strategically situated to serve the tri-state market region, which includes Louisiana, Mississippi and Arkansas. The Boeuf River forms the eastern border with Richland and Franklin Parishes. Ouachita Parish is to the north, and Jackson and Winn Parishes are to the west. To the south are LaSalle and Catahoula Parishes. The parish is approximately 541 miles square, with the Ouachita River meandering from north to south, dividing the alluvial lands on the east from the hill country to the west. However, both sections are heavily timbered. Pine forests dominate the hills and ridges west of the river, while the east banks forests feature gum, oak, hickory and cypress.

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

The main transportation arteries through Caldwell Parish are U. S. Highway 165 and State Highways 4, 126, 133, 559, and 850. Interstate I-20 runs north of Caldwell Parish in Richland and Ouachita Parish, but is easily accessed via U.S. Highway 165. U.S. Highway 165 runs north-south through the middle of the parish. State Highway 4 enters the parish from Jackson Parish on the northwest, runs through Columbia, and then eastward into Franklin Parish. This highway is well used and maintained for commercial traffic toward I-20 and the southern part of the state. State Highway 126 runs from Winn Parish through Grayson and south

into LaSalle Parish. State Highway 133 runs from northeast in Richland Parish, along the Boeuf River into Herbert, and then connects with State Highway 4. State Highway 559 runs south from State Highway 4 into Catahoula Parish in the southern portion of the parish. Some of these roadways are significant evacuation routes for Caldwell Parish, as well as surrounding parishes during states of emergency.

Caldwell Parish is served by the Union Pacific Railroad. The tracks run north-south through the central portion of the parish. The Union Pacific Railroad, with 23,300 miles of tracks in a 19-state area, serves many of America's most important agricultural, industrial, and distribution centers in the western two-thirds of the U. S. Rail rates in Louisiana for many commodities tend to be lower than those in the other states because of the competition from barge carriers. All lines handle a significant volume of containers, trailer on flat cars, and carload traffic between Louisiana and most of mid-America.

Caldwell Parish Airport, with a 3,500 foot paved, lighted runway, accommodates business jets. It is located just two miles from the downtown area of Columbia. The runway is lighted for night flying; fuel, storage and maintenance are available on premises.

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

As noted above, Caldwell Parish is located in the northeast region of Louisiana.

Figure 1-2: Louisiana Homeland Security Regions

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

	2010 Census	2014 Census	Current Year (If Available)	Percent Change 2010 - 2014
Total Population	10,132	9,894	____	-2.30%
Population Density (Pop/Sq. Mi.)	19.1	____	____	____
Total Households	4,994	5,022	____	____

Economy

Caldwell Parish, located in Northeast Louisiana, is strategically situated on four-lane LA Highway 165 to serve the tri-state market region, which includes Louisiana, Mississippi, and Arkansas. Its location ensures direct access for its products and services to a wide range of destinations. Although Caldwell Parish receives revenue from oil and gas production, farming and forestry have been cornerstones of the economy for generations. Cotton is still the dominant crop grown in the parish, but other crops include corn, soybeans, potatoes, and peanuts.

Caldwell Parish and Columbia have a long tradition of being a river port. Packet boats or steamers plied the Ouachita River during the cotton boom of the early 1880s and their usefulness rose again during the late part of the century until railroads and highways began to appear in the area. Today Caldwell has a new port, which can contribute significantly to the parish's economic potential. Industry data for business patterns in Caldwell Parish can be found in the table below:

Table 1-2: Business Patterns in Caldwell 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	285	27	6,334
Manufacturing	32	6	974
Health care, social assistance	642	26	20,458
Mining, Oil and Gas Extraction	20-99	2	___
Transportation / warehousing	20	6	1,076
Construction	20-99	7	___
Real estate, rental, leasing	0-19	3	___
Wholesale trade	20-99	4	___
Other services, except public administration	103	24	1,609
Accommodation, food services	140	9	1,542
Financial and insurance	97	10	3,623
Professional, scientific, technical services	20-99	30	2,106
Information	0-19	3	350
Arts, entertainment, recreation	0-19	3	1,542
Management of companies and enterprises	20-99	2	___

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 Caldwell Parish. Hazard Profiles (see Section Two) contain detailed information on the likelihood of occurrence, possible magnitude or intensity, areas of the parish that could be affected, and conditions that could influence the manifestation of the hazard.

Hazard Mitigation

To fully understand hazard mitigation efforts in Caldwell 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 Caldwell 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 Caldwell Hazard Mitigation Plan were as follows:

- Section One Table of Contents
- Section Two Executive Summary
- Section Three Context
- Section Four Adoption and Approval
- Section Five Planning Process
- Section Six Hazard Identification, Profiling, and Rank
- Section Seven Risk Assessment
- Section Eight Capability Assessment
- Section Nine Mitigation Action Plan
- Section Ten Plan Monitoring and Maintenance
- Appendices

This plan update now also coheres with the Plain Writing Act of 2010, which requires federal agencies to use clear communication that is accessible, consistent, understandable, and useful to the public. While the state of Louisiana and its political subdivisions are not required to meet such standards, the Act aligns with best practices in hazard mitigation. Since successful hazard mitigation relies on full implementation and cooperation at all levels of government and community, a successful hazard mitigation plan must also be easily used at all of these levels. Nevertheless, the Caldwell 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 Caldwell Parish Hazard Mitigation Plan. The current goals are as follows:

- Identify and pursue mitigation measures that will reduce future damages
- Enhance public awareness and understanding of disaster preparedness
- Reduce repetitive flood losses in the parish
- Facilitate sound development in the parish to reduce or eliminate the potential impact of hazards

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: Table of Contents	Section 1: Introduction
Section 2: Executive Summary	Section 1: Introduction
Section 3: Context	Section 1: Introduction
Section 4: Adoption and Approval	Appendix D: Plan Adoption
Section 5: Planning Process	Appendix A: Planning Process
Section 6: Hazard Identification, Profiling and Rank	Section 2: Risk Assessment
Section 7: Risk Assessment	Section 2: Risk Assessment
Section 8: Capability Assessment	Section 3: Capability Assessment
Section 9: Mitigation Action Plan	Section 4: Mitigation Strategy
Section 10: Plan Monitoring and Maintenance	Appendix B: Plan Maintenance
Appendices	Appendices

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

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

2. Hazard Identification and Parish-Wide Risk Assessment

This section assesses the various hazard risks that Caldwell 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 Caldwell Parish Hazard Mitigation Plan published in 2011, as well as the hazards that were identified in the State's 2014 Hazard Mitigation Plan that were considered to be of high or medium risk for the parish by the state. Those hazards identified as high or medium risk by the state or previously identified as a risk by the parish, have been determined to provide a risk to the parish and will be profiled in this section.

Table 2-1: Hazard Profile Summary

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

* Hazard was profiled but discounted
+ Data deficiency

Prevalent Hazards to the Community

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

was discounted due to it having no direct impact on the Caldwell Parish planning area. Dam failure and levee failure claim a data deficiency.

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

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

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

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

The potential destructive power of tropical cyclones and flooding were determined to be the most prevalent hazards to the parish. Fourteen of the sixteen Presidential Declarations Caldwell Parish has received resulted from either tropical cyclones (5 declarations) or flooding (9 declarations), which validates these as the most significant hazards. Therefore, the issues of hurricanes and floods will both serve as the main focus during the mitigation planning process. Hurricanes present risks from the potential for flooding, primarily resulting from storm surge, and high wind speeds. While storm surge is considered the hazard with the most destructive potential, the risk assessment will also asses non-storm surge flooding as well. Flooding can also occur from non-hurricane events, as flash floods are a common occurrence due to heavy rainfall.

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

Caldwell Parish is also susceptible to tornadoes. Tornadoes can spawn from tropical cyclones or severe weather systems that pass through Caldwell 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 Caldwell Parish since 1965. Information includes names, dates, and types of disaster.

Table 2-2: Caldwell Parish Major Disaster Declarations

Disaster Declaration Number	Date	Type of Disaster
208	9/10/1965	Tropical Cyclone – Hurricane Betsy
374	4/27/1973	Severe Storms and Flooding
418	2/23/1974	Flooding
3011	4/12/1975	Heavy Rains and Flooding
470	6/6/1975	Heavy Rains, Tornadoes, and Flooding
3031	2/22/1977	Drought and Freezing
675	1/11/1983	Severe Storms and Flooding
829	5/20/1989	Severe Storms and Flooding
904	5/3/1991	Severe Storms, Tornadoes, and Flooding
1437	10/3/2002	Tropical Cyclone – Hurricane Lili
1603	8/29/2005	Tropical Cyclone – Hurricane Katrina
1607	9/24/2005	Tropical Cyclone – Hurricane Rita
1668	11/2/2006	Severe Storms and Flooding
1786	9/2/2008	Tropical Cyclone – Hurricane Gustav
1863	12/10/2009	Severe Storms, Tornadoes, and Flooding

Probability of Future Hazard Events

The probability of a hazard event occurring in Caldwell 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			
	Caldwell Parish (Unincorporated)	Clarks	Columbia	Grayson
Drought	4%	4%	4%	4%
Earthquake	<1%	<1%	<1%	<1%
Flooding	20%	8%	20%	4%
Thunderstorms (Hail)	8%	8%	8%	8%
Thunderstorms (Lightning)	4%	4%	4%	4%
Thunderstorms (High Wind)	32%	32%	32%	32%
Tornadoes	20%	20%	20%	20%
Tropical Cyclones	12%	12%	12%	12%
Wildfires	<1%	<1%	<1%	<1%
Winter Storms	16%	16%	16%	16%
Dam Failure	<1%	<1%	<1%	<1%
Levee Failure	<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 (32%). Flood events for the unincorporated area of Caldwell Parish and the incorporated areas of Columbia have a 20% annual chance of occurrence. Flood events in the remaining incorporated areas have a slightly lower chance of occurring annually. Tornadoes have a 20% annual chance of reoccurrence, followed by winter storms (16%), tropical cyclones (12%), hail (8%), and lightning and drought (4%). Winter storms have the lowest annual chance of occurrence in Caldwell Parish with an annual chance of occurrence at less than 1%. Earthquakes were discounted since the annual chance of occurrence was calculated at less than 1% for the hazard and the hazard has no impact on the parish, while dam and levee failure claim 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 $7,800,395,000 in structures throughout the parish. The table on the next page provides the total estimated value for each type of structure by occupancy.

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

Occupancy	Caldwell Parish	Unincorporated Caldwell Parish	Clarks	Columbia	Grayson
Agricultural	$4,187,000	$4,085,000	$0	$0	$102,000
Commercial	$99,179,000	$44,867,000	$3,091,000	$4,348,000	$46,873,000
Government	$10,194,000	$5,122,000	$1,731,000	$893,000	$2,448,000
Industrial	$19,648,000	$10,236,000	$219,000	$72,000	$9,121,000
Religion	$23,870,000	$15,408,000	$3,623,000	$1,612,000	$3,227,000
Residential	$7,633,964,000	$7,520,017,000	$43,450,000	$23,208,000	$47,289,000
Education	$9,353,000	$7,463,000	$0	$0	$1,890,000
Total	$7,800,395,000	$7,607,198,000	$52,114,000	$30,133,000	$110,950,000

Essential Facilities of the Parish

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

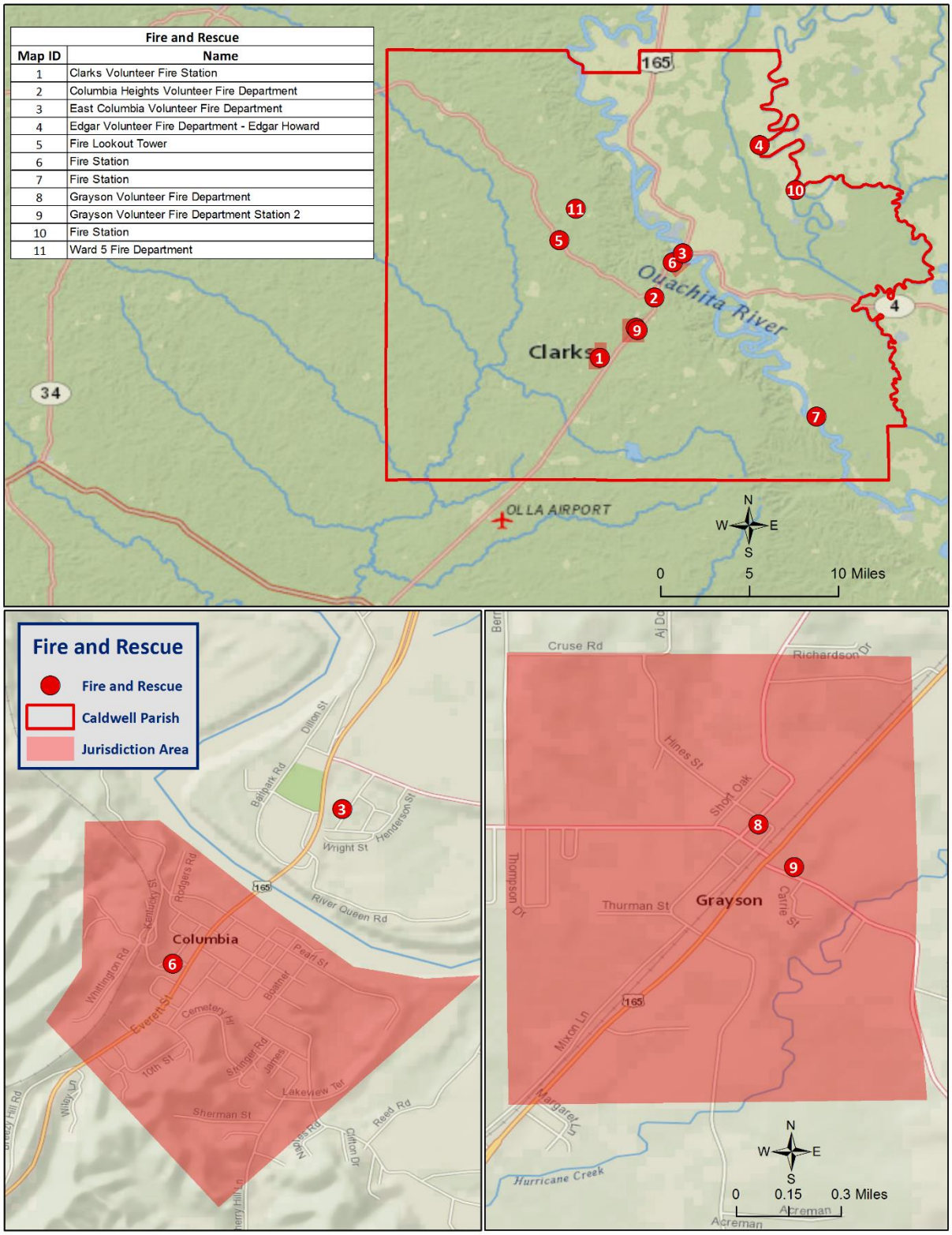
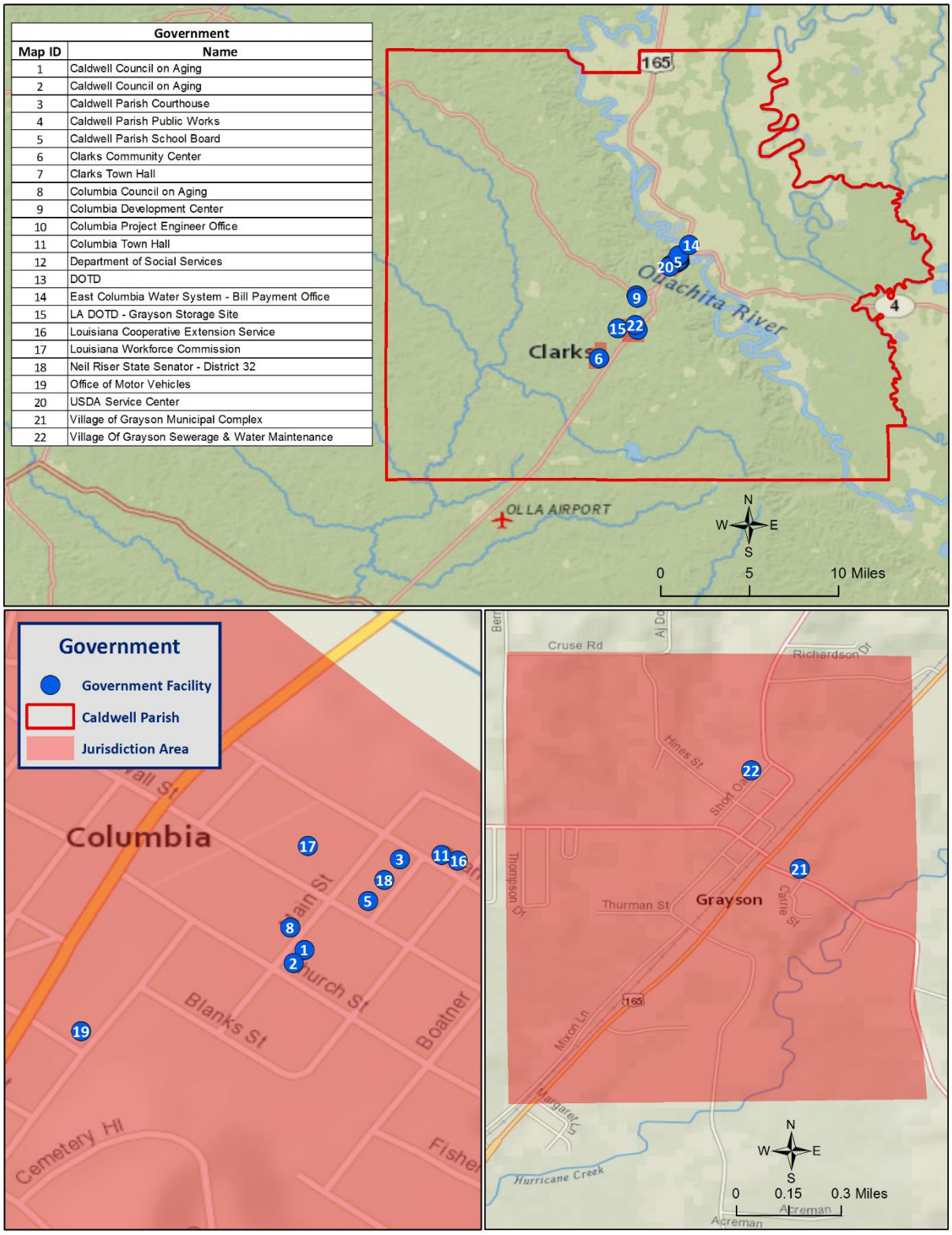


Figure 2-1: Fire and Rescue Buildings in Caldwell Parish



Government	
Map ID	Name
1	Caldwell Council on Aging
2	Caldwell Council on Aging
3	Caldwell Parish Courthouse
4	Caldwell Parish Public Works
5	Caldwell Parish School Board
6	Clarks Community Center
7	Clarks Town Hall
8	Columbia Council on Aging
9	Columbia Development Center
10	Columbia Project Engineer Office
11	Columbia Town Hall
12	Department of Social Services
13	DOTD
14	East Columbia Water System - Bill Payment Office
15	LA DOTD - Grayson Storage Site
16	Louisiana Cooperative Extension Service
17	Louisiana Workforce Commission
18	Neil Riser State Senator - District 32
19	Office of Motor Vehicles
20	USDA Service Center
21	Village of Grayson Municipal Complex
22	Village Of Grayson Sewerage & Water Maintenance

Figure 2-2: Government Buildings in Caldwell Parish

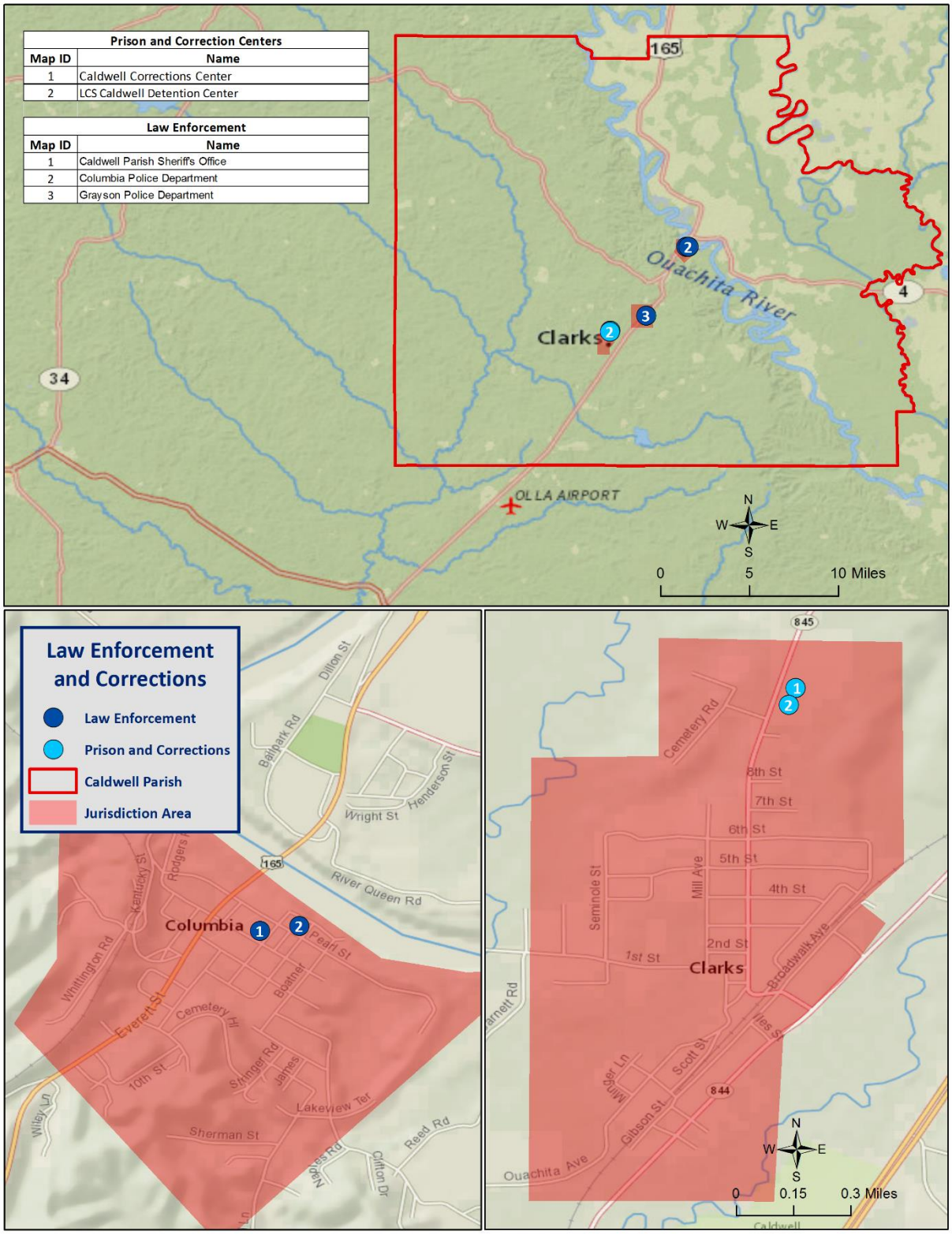


Figure 2-3: Law Enforcement and Correction Buildings in Caldwell Parish

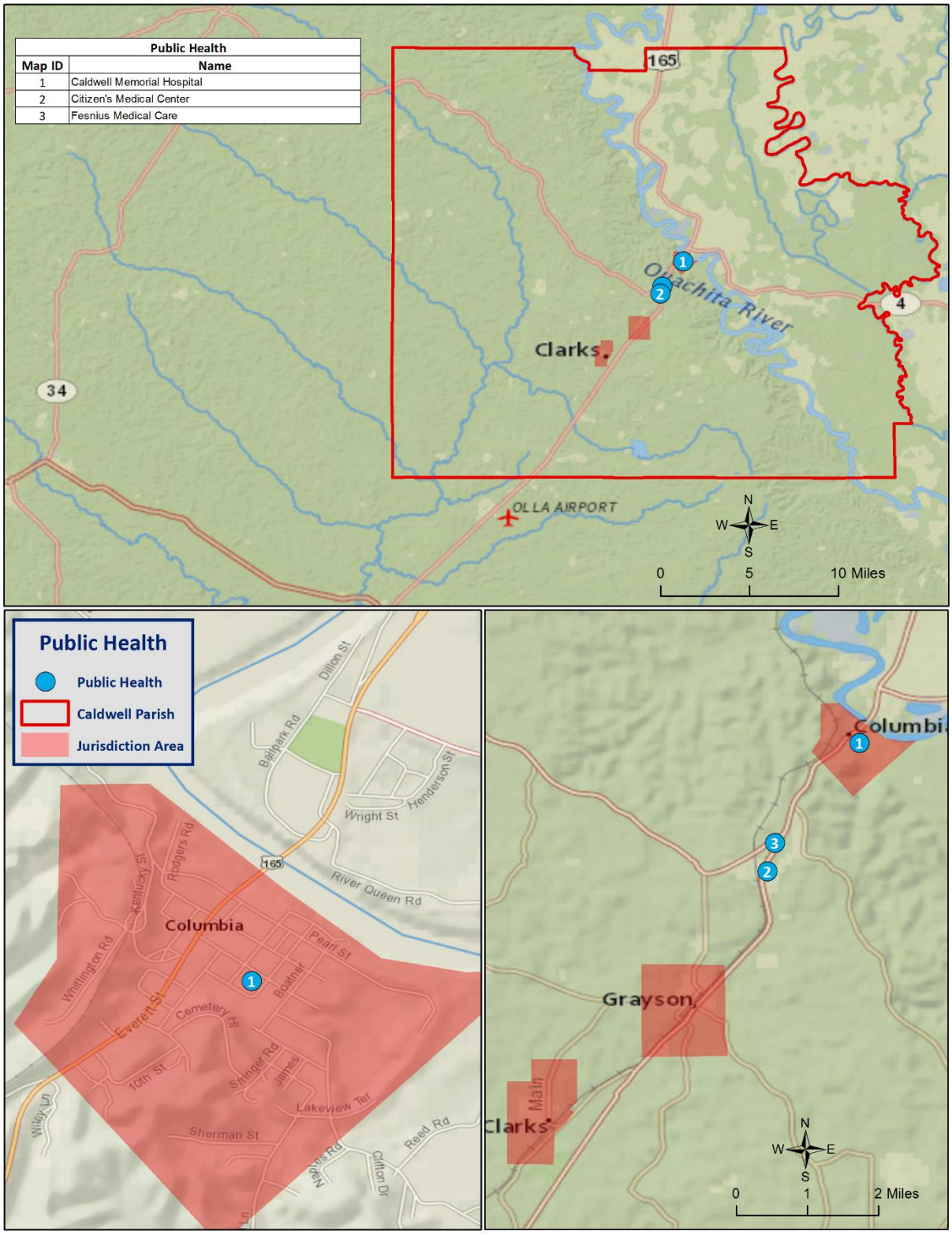


Figure 2-4: Public Health Buildings in Caldwell Parish

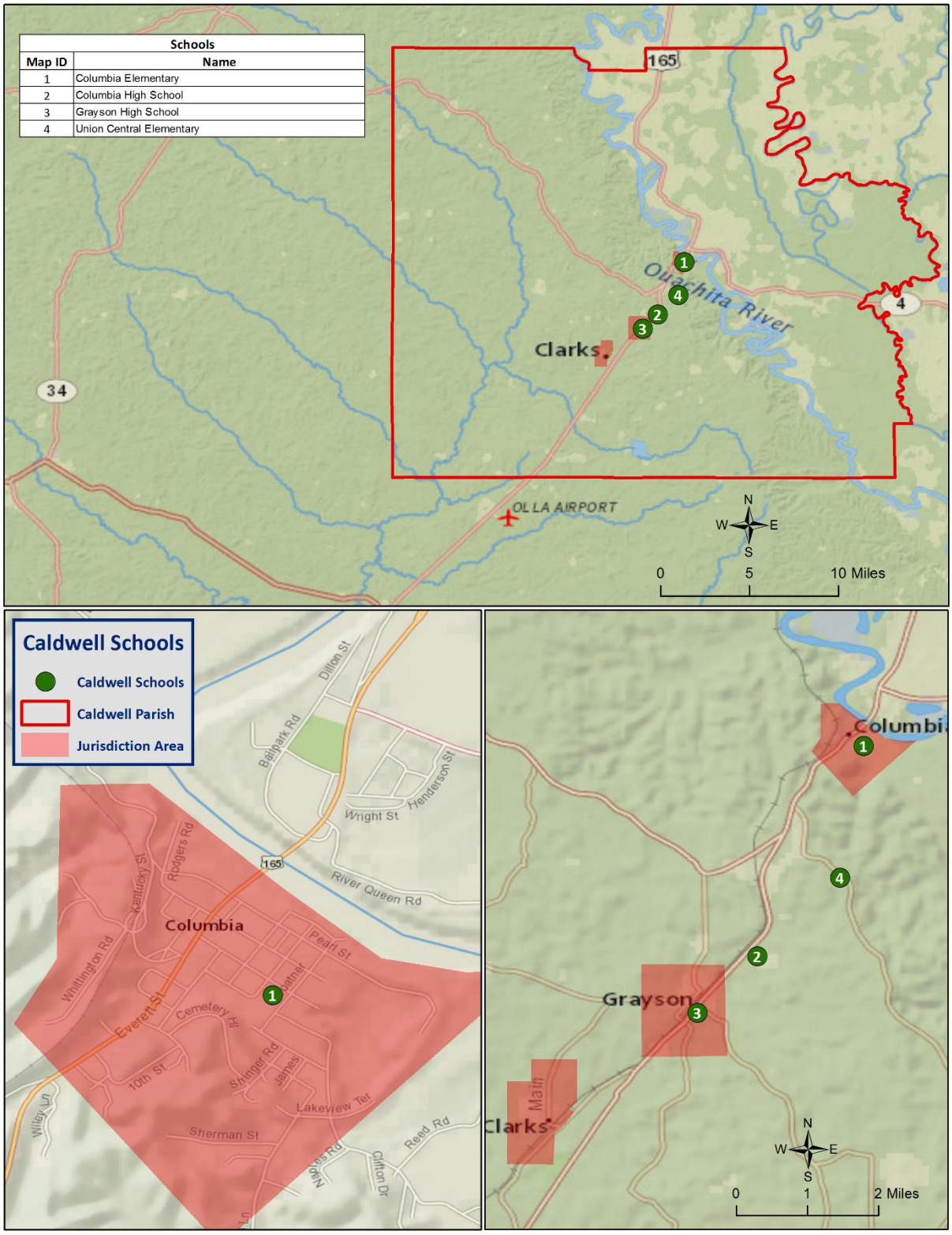


Figure 2-5: School Buildings in Caldwell Parish

Future Development Trends

Caldwell Parish experienced a decline in population and housing between the years of 2000 and 2014, falling from a population of 10,559 with 5,035 housing units in 2000 to a population of 9,894 with 5,005 housing units in 2014. This decline was largely in the incorporated area of Columbia from the years 2000 to 2010, and again in the incorporated area of Columbia 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 Caldwell Parish

Total Population	Caldwell Parish	Caldwell Parish (Unincorporated)	Clarks	Columbia	Grayson
1-Apr-00	10,559	8,457	1,067	489	546
1-Apr-10	10,119	8,182	1,016	390	531
1-Jul-14	9,894	7,997	1,000	379	518
Population Growth between 2000 – 2010	-4.2%	-3.3%	-4.8%	-20.2%	-2.7%
Average Annual Growth Rate between 2000 – 2010	-0.4%	-0.3%	-0.5%	-2.0%	-0.3%
Population Growth between 2010 – 2014	-2.2%	-2.3%	-1.6%	-2.8%	-2.4%
Average Annual Growth Rate between 2010 – 2014	-0.56%	-0.57%	-0.39%	-0.71%	-0.61%

Table 2-6: Housing Growth Rate for Caldwell Parish

Total Housing Units	Caldwell Parish	Caldwell Parish (Unincorporated)	Clarks	Columbia	Grayson
1-Apr-00	5,035	4,268	270	237	260
1-Apr-10	4,994	4,257	263	207	267
1-Jul-14	5,005	4,301	256	229	219
Housing Growth between 2000 – 2010	-0.8%	-0.3%	-2.6%	-12.7%	2.7%
Average Annual Growth Rate between 2000 – 2010	-0.1%	0.0%	-0.3%	-1.3%	0.3%
Housing Growth between 2010 – 2014	0.2%	1.0%	-2.7%	10.6%	-18.0%
Average Annual Growth Rate between 2010 – 2014	0.1%	0.3%	-0.7%	2.7%	-4.5%

As shown in the previous tables, Caldwell Parish has experienced a decline in both population and housing units. Population growth rates declined at -0.4% annually from 2000 to 2010, and at -0.56% annually from 2010 to 2014. Housing declined at a rate of -0.1% annually from 2000 to 2010, but grew at a rate of 0.1% annually from 2010 to 2014. From 2000 to 2010, the incorporated area of Columbia had the largest decline in population at -20.2%. Columbia led the decline again from 2010 to 2014 with population declining by -2.8% overall.

The incorporated area of Columbia experienced the largest decline in housing units from 2000 to 2010 at -12.7%. From 2010 to 2014, Columbia had the largest increase in housing units at 10.6%, followed by the unincorporated areas of Caldwell Parish at 1% overall. The incorporated area of Grayson had the largest decrease in housing units during this time period at -18%.

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 grow slightly within Caldwell 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	5,008	450	451	452
Value of Structures	$7,884,298,213	$708,123,902	$747,035,930	$779,699,543
# of People	9,904	890	894	898
Tropical Cyclones				
Structures	5,008	5,008	5,022	5,033
Value of Structures	$7,884,298,213	$7,884,298,213	$8,317,547,296	$8,681,226,116
# of People	9,904	9,904	9,954	9,993

Land Use

The Caldwell Parish Land Use table is provided below. Residential, commercial, and industrial areas account for only 5% of the parish's land use. Forested land is the largest category at 142,264 acres, accounting for 41% of parish land. At 99,328 acres, wetlands account for 29% of parish lands, while 79,224 acres of agricultural areas account for 23% of parish lands. The parish also consists of 9,289 acres of water areas, accounting for 3% of all parish lands.

Table 2-8: Caldwell Parish Land Use
(Source: USGS Land Use Map)

Land Use	Acres	Percentage
Agricultural Land, Cropland, and Pasture	79,224	23%
Wetlands	99,328	29%
Forest Land (not including forested wetlands)	142,264	41%
Urban/Development	16,152	5%
Water	9,289	3%

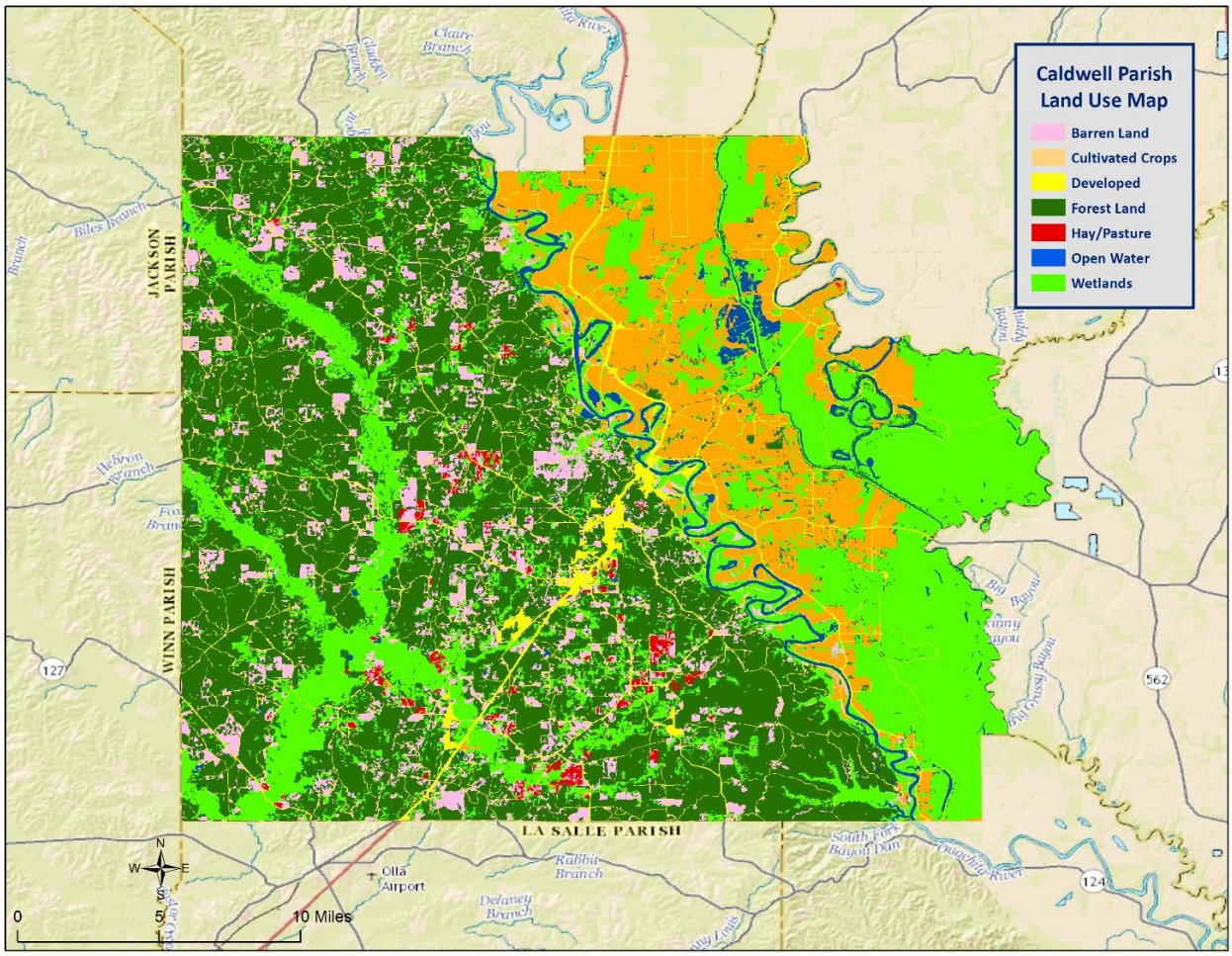


Figure 2-6: Caldwell Parish Land Use Map
(Source: USGS Land Use Map)

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 Wildfires 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 Caldwell Parish at the time this plan went to publication (*Figure 2-7*).

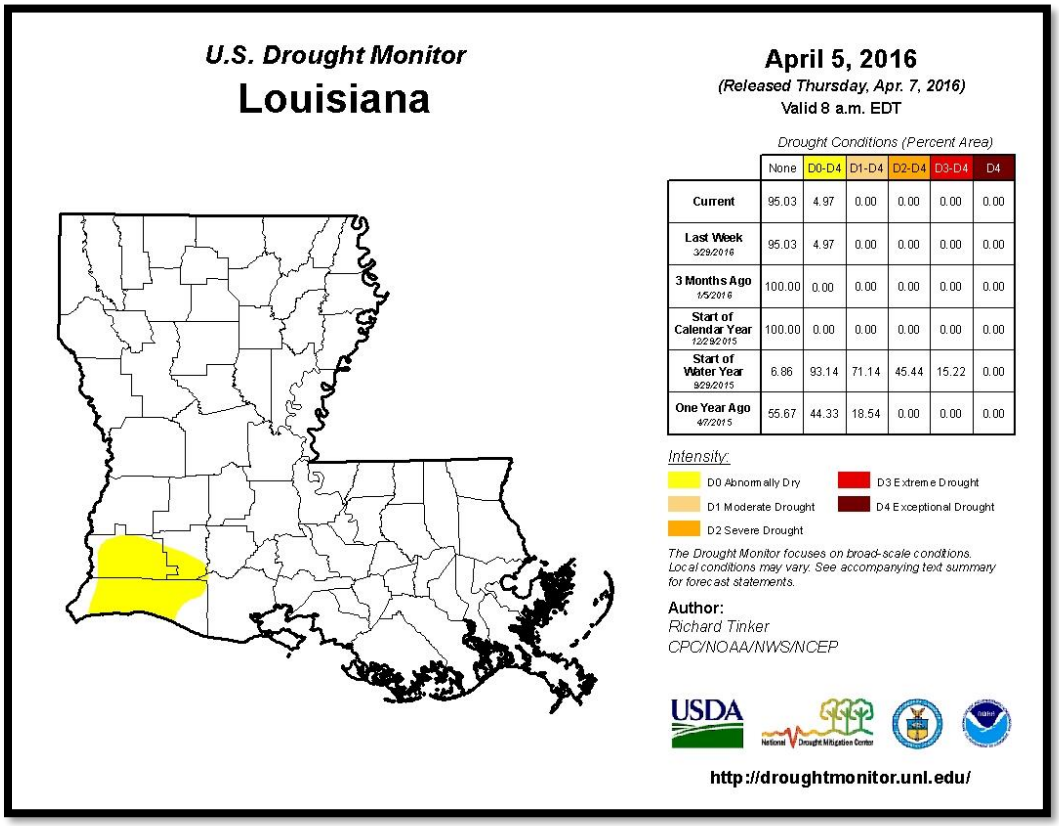


Figure 2-7: United States Drought Monitor for the State of Louisiana and its Parishes (Source: The National Drought Mitigation Center)

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 Caldwell Parish is on the agricultural community.

Previous Occurrences / Extents

The SHELDUS database reports a total of one drought event occurring within the boundaries of Caldwell 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 Caldwell Parish. Based on previous occurrences, and in accordance with the Palmer Drought Index, the worst case scenario for drought in Caldwell Parish would be a severe drought event.

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

Date	Crop Damage	Palmer Classification
June 1998	$1,281,497	Severe Drought

Frequency / Probability

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

Estimated Potential Losses

According to the SHELDUS database, there has been one drought event that has caused some level of crop damage. The total agricultural damage from this event is $1,281,497, with an average cost of $1,281,497 per drought event. When annualizing the total cost over the 25-year record, total annual losses based on drought is estimated to be $51,260. *Table 2-11* presents an analysis of agricultural exposure that is susceptible to drought by major crop type for Caldwell Parish.

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

Agricultural Exposure by Type for Drought						
Forestry	Soybeans	Corn	Cotton	Rice	Wheat	Total
$23,539,337	$5,402,700	$2,582,549	$1,297,728	$1,126,336	$570,484	$34,519,164

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

Earthquakes

An earthquake is a sudden motion or trembling of the Earth caused by an abrupt release of stored energy in the rocks beneath the Earth's surface. The energy released results in vibrations which are known as seismic waves. Ground motion from seismic waves is expressed as peak ground acceleration (PGA), the fastest measured change in speed for a particle at ground level that is moving because of an earthquake. PGA is commonly measured as a percentage of acceleration due to Earth's gravity (%g). This measurement is relied upon to determine seismic load engineering design and construction requirements. Earthquakes are typically described in terms of magnitude and intensity. Magnitude is the measure of the amplitude of the seismic wave and is often expressed by the Richter scale, and intensity is a measure of how strong the shock was felt at a particular location, indexed by the Modified Mercalli Intensity (MMI) scale. The Richter scale is a logarithmic measurement whereby an increase in the scale by one whole number represents a tenfold increase in measured ground motion of the earthquake (and an increase in energy released of more than 30 times). An increase by two whole numbers represents a 102 (or 100-fold) increase in ground motion, and thus more than 302 (or 900) times the energy released. *Table 2-12* shows the rough correlation between the Richter scale, PGA, and the MMI. The relationship between these is approximate and depends upon such specifics as the depth of the focus (the location of the actual rock movement) and distance from the epicenter (the location on the Earth's surface above the earthquake focus) of the earthquake.

Table 2-12: Comparison of Earthquake Magnitudes for PGA, Richter, and MMI (Source: USGS Earthquake Hazards Program)

COMPARISON OF EARTHQUAKE METRICS			
PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
<0.17	1.0 - 3.0	I	**I**. Not felt except by a very few under especially favorable conditions.
0.17 - 1.4	3.0 - 3.9	II - III	**II**. Felt only by a few persons at rest, especially on upper floors of buildings. **III**. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 - 9.2	4.0 - 4.9	IV - V	**IV**. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rock noticeably. **V**. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 - 5.9	VI - VII	**VI**. Felt by all. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. **VII**. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
34 - 124	6.0 - 6.9	VII - IX	**VIII**. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. **IX**. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
>124	7.0 and higher	**VIII** or higher	**X**. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. **XI**. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. **XII**. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

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

generated by the subsidence fault system in coastal Louisiana. A significant seismic event from the New Madrid seismic zone is more likely to have a greater impact on Louisiana than a seismic event from the subsidence fault system.

Location

An earthquake event is a geological hazard that occurs along fault lines. Caldwell Parish has no fault line running directly through the parish or in neighboring parishes (*Figure 2-8*).

Previous Occurrences / Extents

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

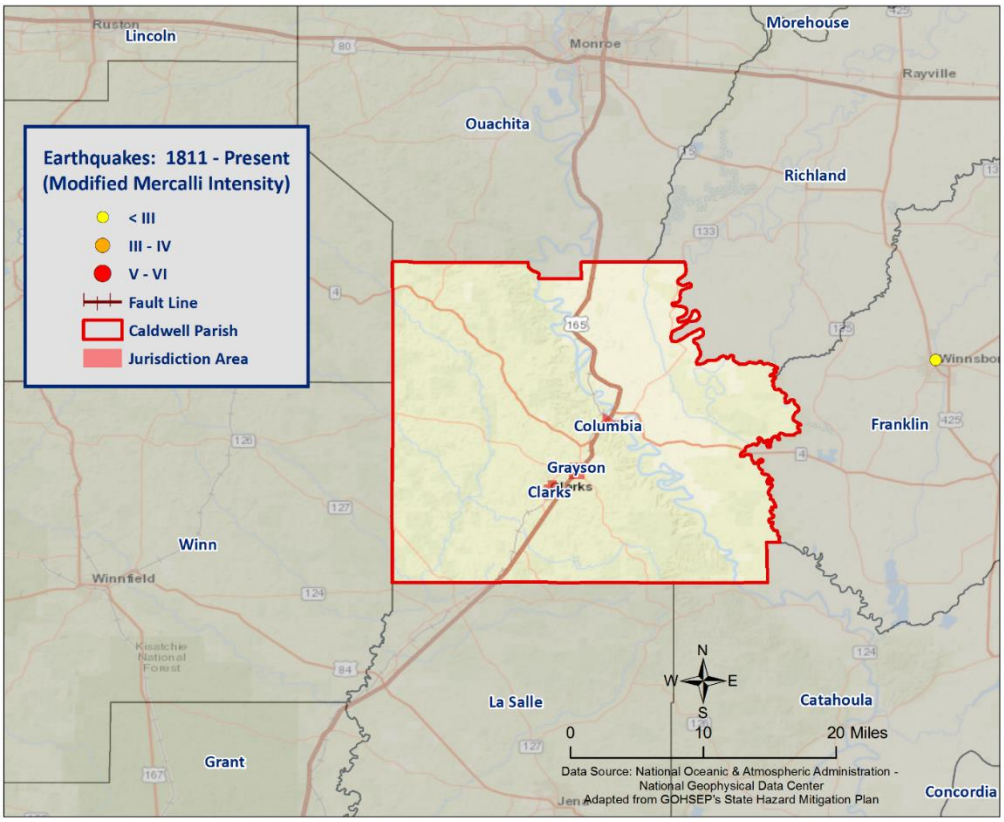


Figure 2-8: Location and Intensity (MMI) of Earthquakes in Caldwell Parish

Frequency / Probability

Earthquakes are an extremely rare occurrence in the State of Louisiana and Caldwell Parish, with no occurrences of an earthquake event within the boundaries of the parish from the years 1811 – 2014. Based on this historical record and Louisiana's State Hazard Mitigation Plan, it is determined that an earthquake event has less than a 1% annual chance of occurrence and it would have no impact in the Caldwell Parish planning area. As a result, earthquakes are not carried forward into risk assessment and are discounted.

Flooding

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

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

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

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

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

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

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

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

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

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

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

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

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

It is essential to understand that the magnitude of an X-year flood event for a particular area depends on the source of flooding and the area's location. The size of a specific flood event is defined through historic data of precipitation, flow, and discharge rates. Consequently, different 100-year flood events can have very

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

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

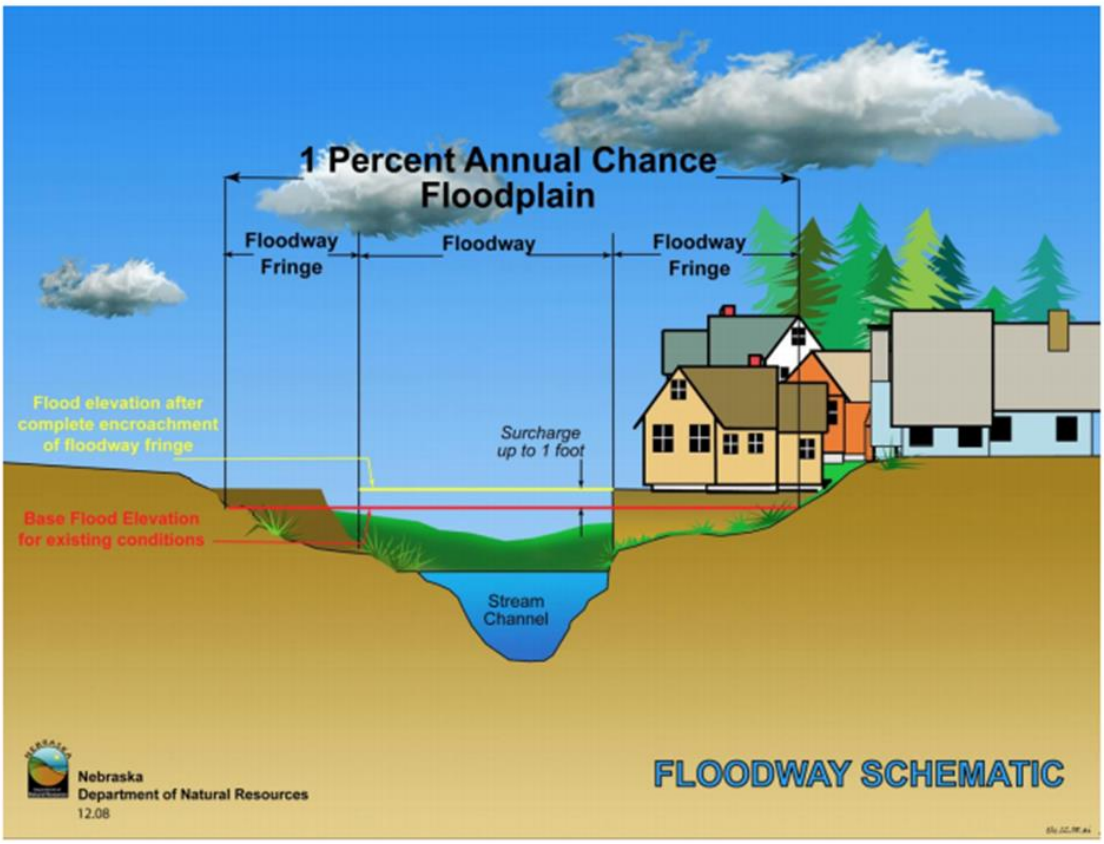


Figure 2-9: Schematic of 100-Year Floodplain. The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe.
(Source: Nebraska Department of Natural Resources)

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

Property Damage

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

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

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

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

Repetitive Loss Properties

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

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

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

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

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

Table 2-13: Repetitive Loss Structures for Caldwell Parish

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
Caldwell Parish (Unincorporated)	17	17	0	0	40	544,982	$13,625
Clarks	0	0	0	0	0	$0	$0
Columbia	2	0	2	0	6	$87,297	$14,550
Grayson	0	0	0	0	0	$0	$0
Total	19	17	2	0	46	$632,279	$13,745

Of the 19 repetitive loss structures, ten were able to be geocoded in order to provide an overview of where the repetitive loss structures were located throughout the parish. *Figure 2-10* shows the approximate location of the ten structures, while *Figure 2-11* shows where the highest concentration of repetitive loss structures are located. Through the repetitive loss map, it is clear that the primary concentrated area of repetitive loss structures is focused in the unincorporated areas of the parish.

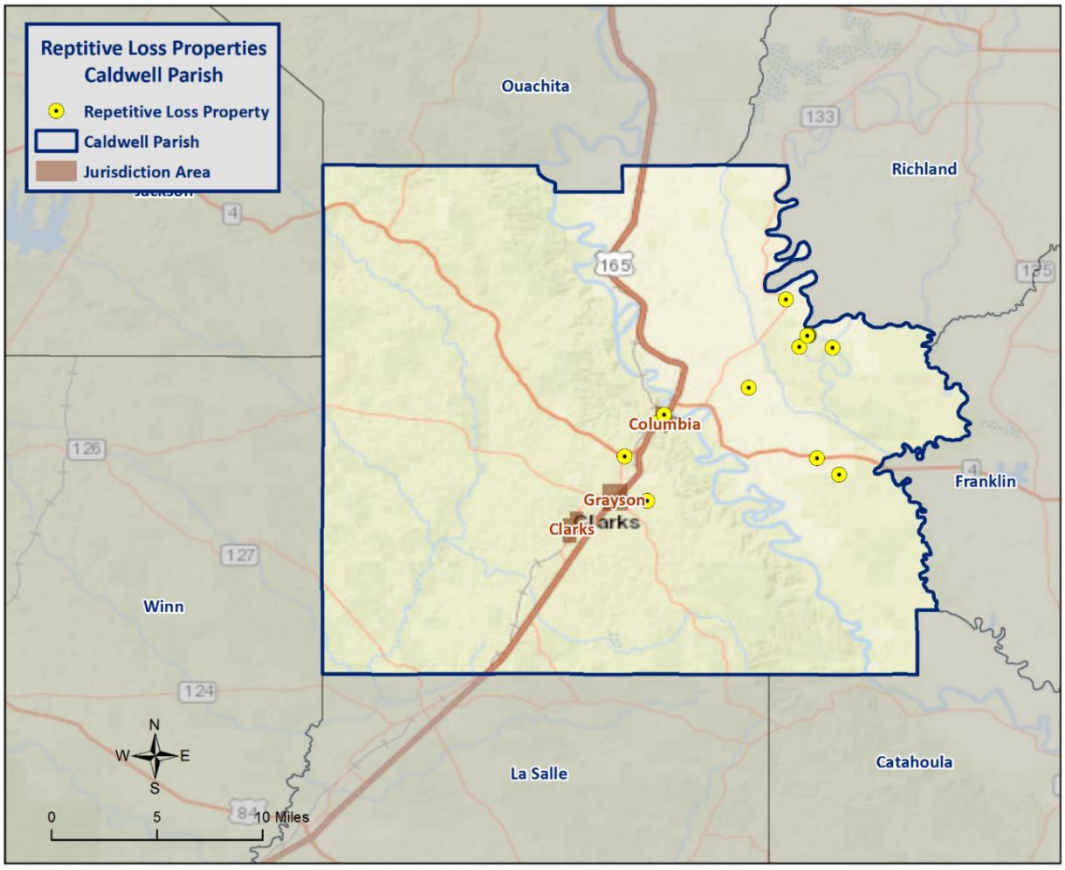


Figure 2-10: Repetitive Loss Properties in Caldwell Parish

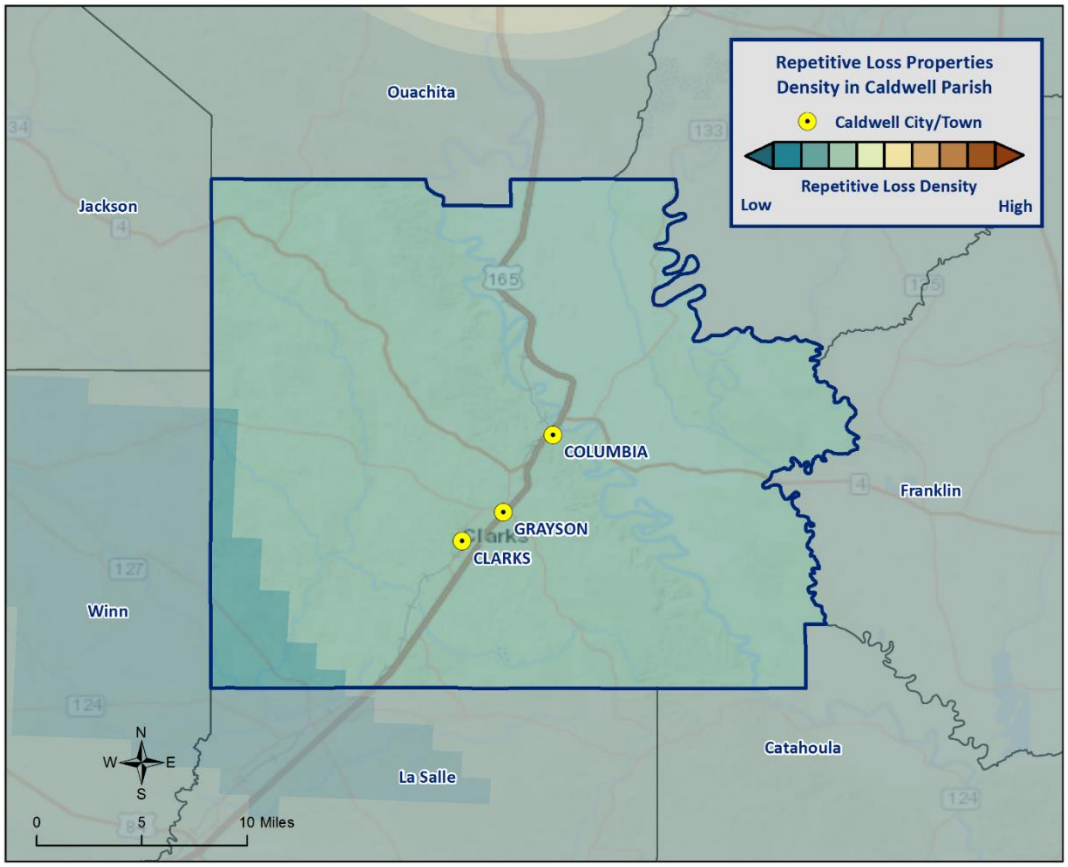


Figure 2-11: Repetitive Loss Property Densities in Caldwell Parish

National Flood Insurance Program

Flood insurance statistics indicate that Caldwell Parish has 424 flood insurance policies with the NFIP, with total annual premiums of $323,822. Caldwell Parish, and the incorporated areas of Clarks, Columbia, and Grayson are all participants in the NFIP. Caldwell 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 Caldwell Parish are provided in the tables on the next page

Caldwell 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 2-14: Summary of NFIP Policies for Caldwell Parish

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed Since 1978	Total Loss Payments
Caldwell Parish (Unincorporated)	404	$43,436,500	$312,944	475	$3,641,430
Clarks	3	$465,000	$801	1	$28,312
Columbia	14	$2,335,700	$9,245	16	$239,854
Grayson	3	$458,000	$832	0	$0
Total	424	$46,695,200	$323,822	492	$3,909,596

*While the unincorporated areas of Caldwell Parish, as well as the incorporated areas of Clarks, Columbia, and Grayson all have active NFIP policies, the jurisdictions will continue to promote NFIP participation through education and outreach.

Table 2-15: Summary of Community Flood Maps for Caldwell Parish

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Date Joined the NFIP	Tribal
220044#	Caldwell (Unincorporated)	-	4/3/1978	9/5/2012	4/3/1978	No
220320#	Clarks	8/15/1975	11/1/2010	9/5/2012	11/1/2010	No
220045#	Columbia	2/1/1974	6/1/1978	9/5/2012	6/1/1978	No
220329#	Grayson	8/13/1976	9/5/2012	9/5/2012	7/9/1981	No

According to the Community Rating System (CRS) list of eligible communities, Caldwell Parish and its incorporated areas 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 Caldwell 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 Caldwell Parish experiences.

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

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

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

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

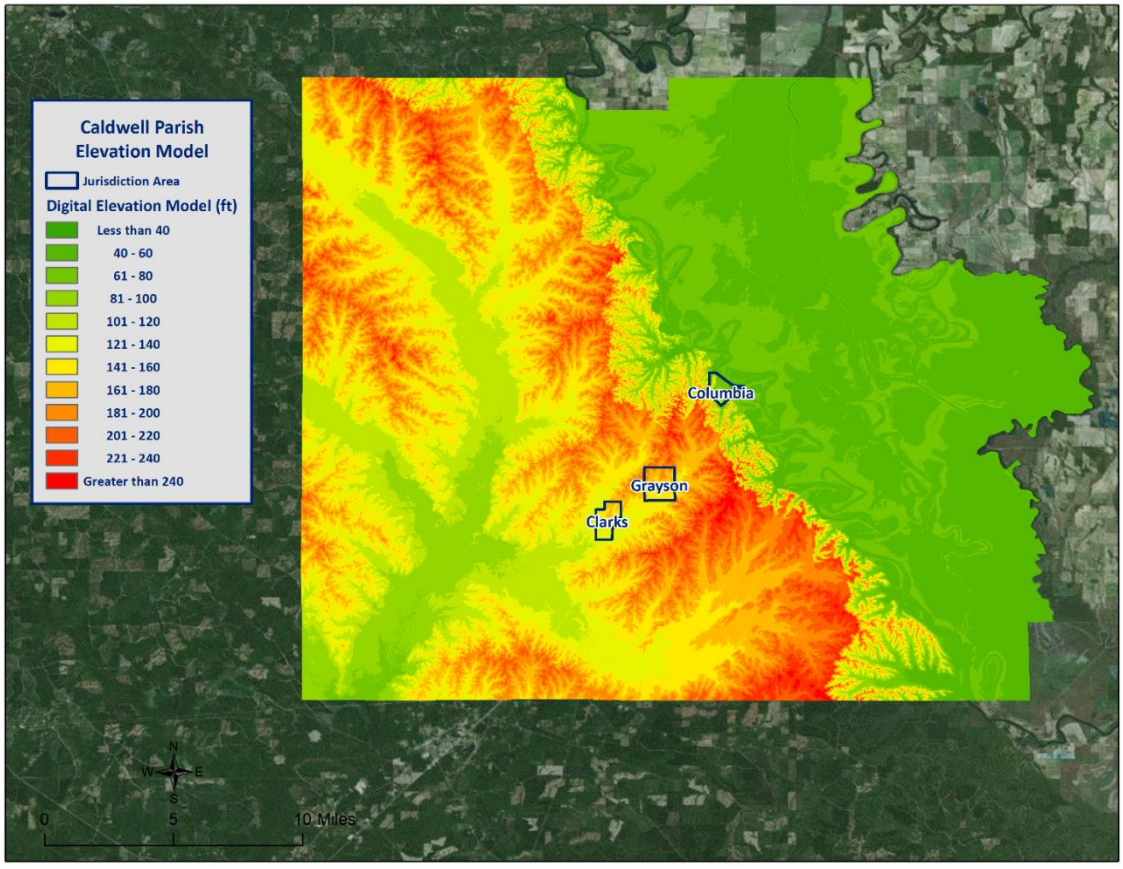


Figure 2-12: Elevation throughout Caldwell Parish

Looking at the digital elevation model (DEM) in the figure on the previous page for Caldwell Parish is instructive in visualizing where the low lying and high risk areas are for the parish. Elevations in the parish range from less than 40 feet to over 240 feet. The highest elevations in the parish are approximately 261 feet, located in the unincorporated areas of the parish. The incorporated areas range in elevation from 75 to 164 feet, with Columbia averaging 75 feet, Clarks averaging 141 feet, and Grayson averaging 164 feet. The lowest elevations of the parish are located in the eastern sections of the unincorporated areas of the parish.

Location

Caldwell Parish has experienced significant flooding in its history and can expect more in the future. One of the main contributors to flooding in Caldwell is the Ouachita River. During periods of excessive rainfall, the river will crest and cause riverine flooding to areas surrounding the river.

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

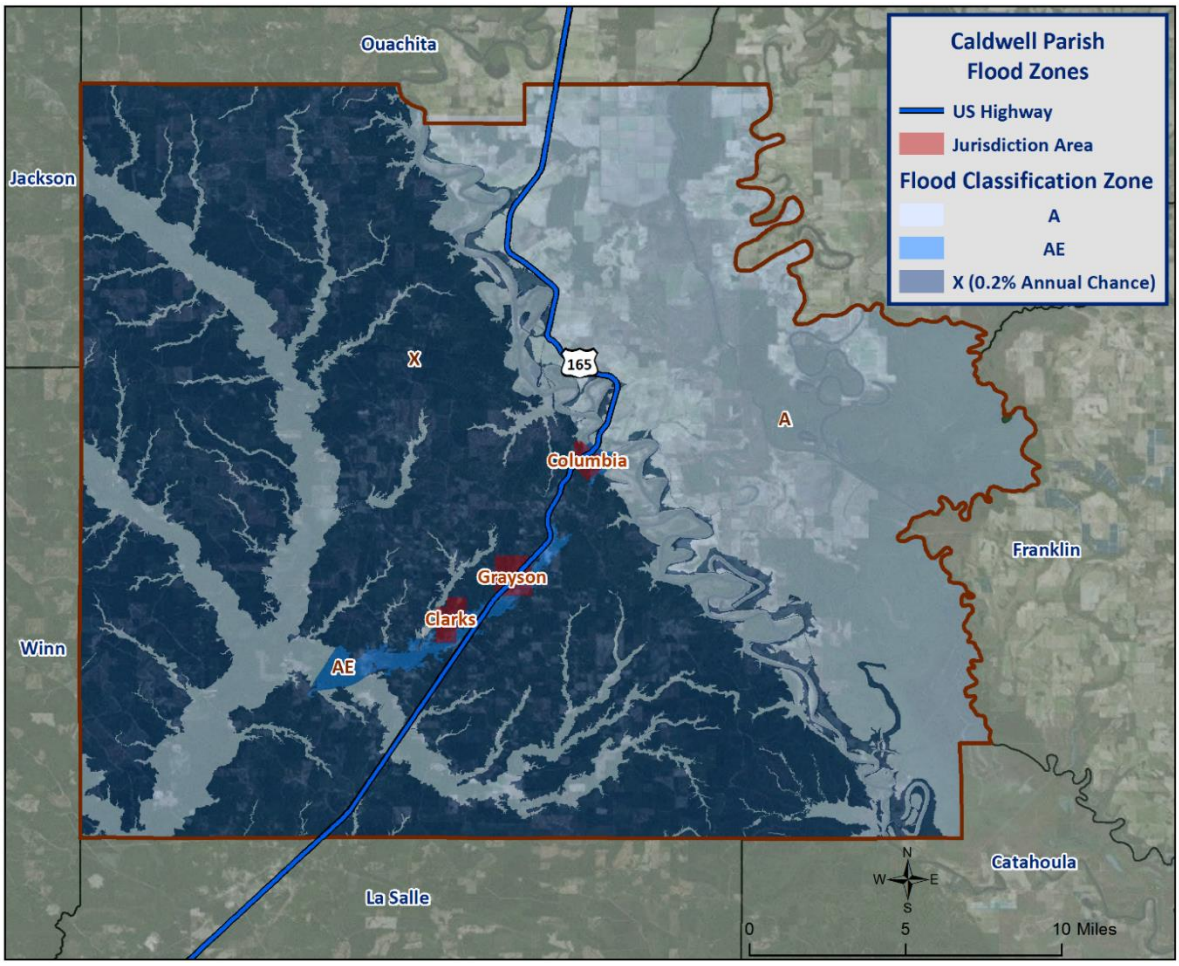


Figure 2-13: Caldwell Parish Areas within the Flood Zones

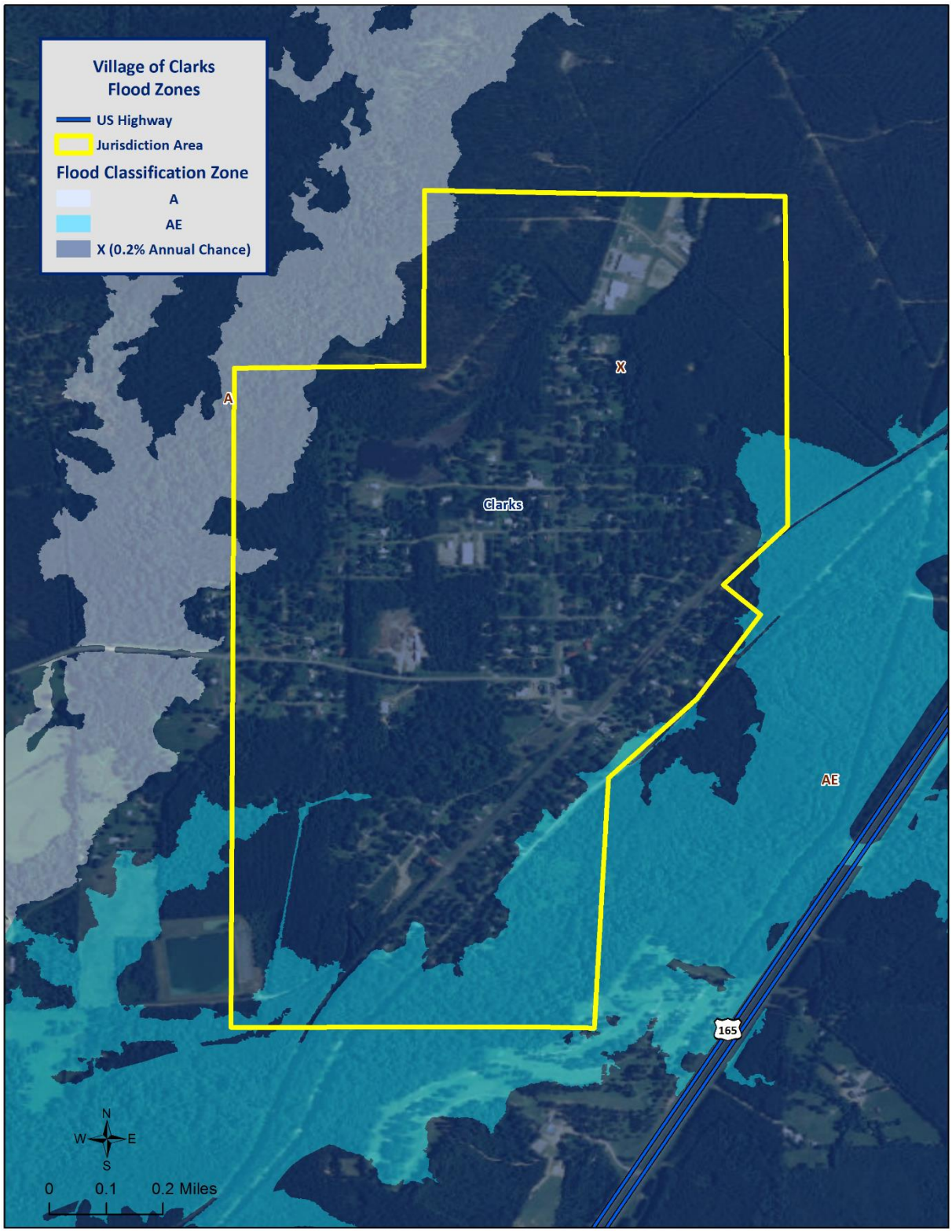


Figure 2-14: Village of Clarks Areas within the Flood Zones

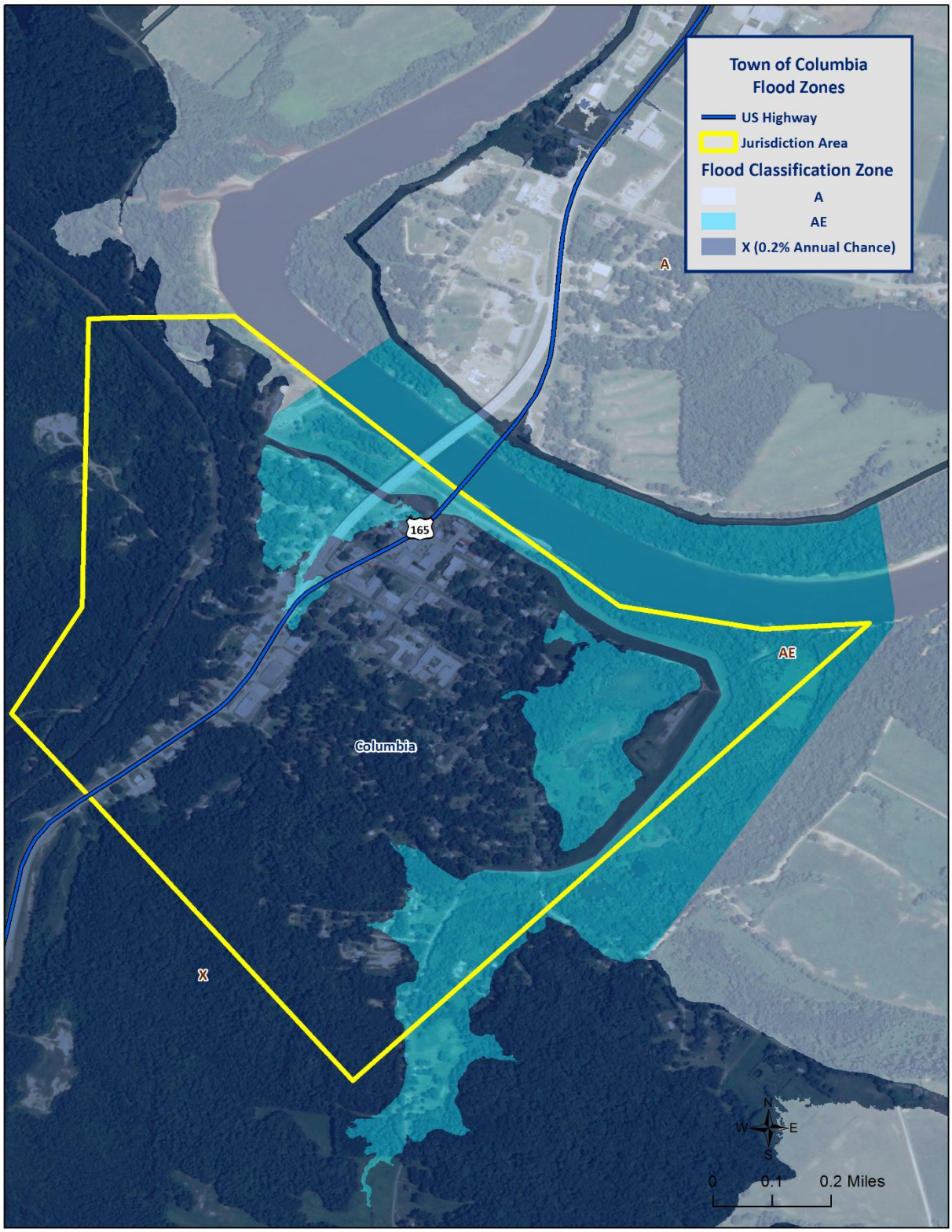


Figure 2-15: Town of Columbia Areas within the Flood Zones

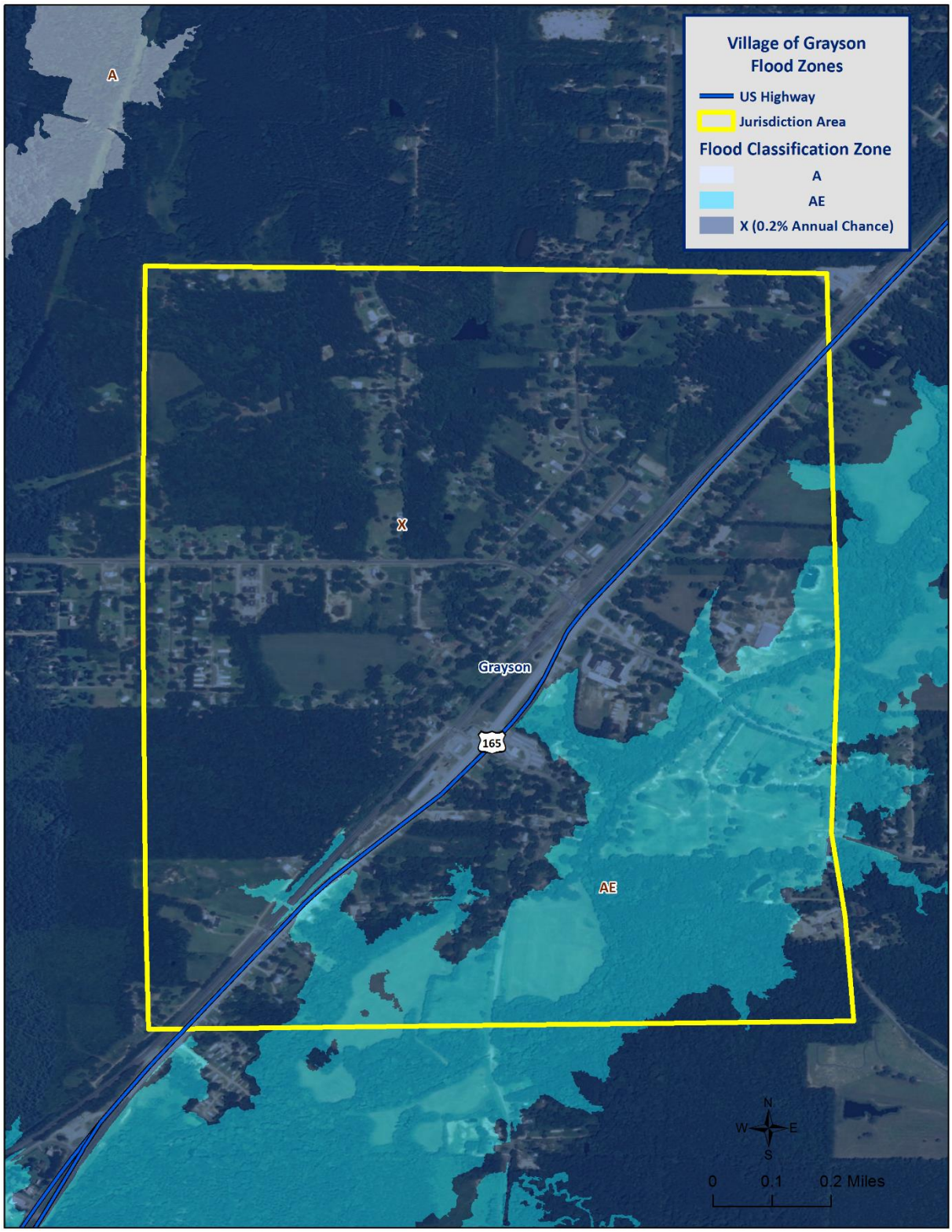


Figure 2-16: Village of Grayson Areas within the Flood Zones

Previous Occurrences / Extents

Historically, there have been 13 flooding events that have created significant flooding in Caldwell Parish between 1990 and 2015. Below is a brief synopsis of the two flooding events that have occurred since 2010, including flooding events that have occurred since the parish's last planning update.

Table 2-16: Historical Floods in Caldwell Parish with Locations from 2010 - 2015

Date	Extents	Type of Flooding	Estimated Damages	Location
May 18, 2015	Flooding was reported on Cory Road near Highway 165 north of Columbia.	Flash Flood	$0	BLANKSTON
May 18, 2015	Widespread flooding was reported across all of Caldwell Parish.	Flash Flood	$0	CLARKS

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

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 three feet can be expected in the unincorporated areas of the parish and the incorporated areas of Clarks, Columbia, and Grayson.

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 Caldwell Parish having multiple jurisdictions, it was necessary to assess the historical data found in the National Climatic Data Center for Caldwell Parish and its jurisdictions to properly determine probability for future flood events. The table below shows the probability and return frequency for each jurisdiction.

Table 2-17: Annual Flood Probabilities for Caldwell Parish

Jurisdiction	Annual Probability	Return Frequency
Caldwell Parish (Unincorporated)	20%	5 years
Clarks	8%	12 – 13 years
Columbia	20%	5 years
Grayson	4%	25 years

Based on historical record, the overall flooding probability for the entire Caldwell Parish planning area is 52%, with 13 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. On the next page, *Table 2-18* shows the total economic losses that would result from this occurrence.

Table 2-18: Estimated Losses in Caldwell Parish from a 100-Year Flood Event (Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Flood Event
Caldwell Parish (Unincorporated)	$14,148,000
Clarks	$784,000
Columbia	$31,000
Grayson	$4,259,000
Total	$19,222,000

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:

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

Caldwell Parish (Unincorporated)	Estimated Total Losses from 100-Year Flood Event
Agricultural	$51,000
Commercial	$1,660,000
Government	$30,000
Industrial	$220,000
Religious / Non-Profit	$135,000
Residential	$12,050,000
Schools	$2,000
Total	$14,148,000

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

Clarks	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$59,000
Government	$54,000
Industrial	$0
Religious / Non-Profit	$53,000
Residential	$618,000
Schools	$0
Total	$784,000

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

Columbia	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$28,000
Government	$0
Industrial	$0
Religious / Non-Profit	$0
Residential	$3,000
Schools	$0
Total	$31,000

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

Grayson	Estimated Total Losses from 100-Year Flood Event
Agricultural	$11,000
Commercial	$1,883,000
Government	$15,000
Industrial	$1,134,000
Religious / Non-Profit	$94,000
Residential	$920,000
Schools	$202,000
Total	$4,259,000

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**
Caldwell Parish (Unincorporated)	**8,193**	**744**	**9.1%**
Clarks	**1,017**	**87**	**8.6%**
Columbia	**390**	**3**	**0.8%**
Grayson	**532**	**76**	**14.3%**
Total	**10,132**	**910**	**9%**

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 Caldwell Parish (Source: Hazus 2.2)

Caldwell Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	744	9.1%
Persons Under 5 Years	46	6.2%
Persons Under 18 Years	128	17.2%
Persons 65 Years and Over	110	14.8%
White	603	81.1%
Minority	141	18.9%

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

Clarks		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	87	8.6%
Persons Under 5 Years	3	3.8%
Persons Under 18 Years	9	10.5%
Persons 65 Years and Over	8	8.7%
White	45	51.7%
Minority	42	48.3%

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

Columbia		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	3	0.8%
Persons Under 5 Years	0	6.2%
Persons Under 18 Years	0	14.6%
Persons 65 Years and Over	1	18.0%
White	2	66.4%
Minority	1	33.6%

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

Grayson		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	76	14.3%
Persons Under 5 Years	5	7.1%
Persons Under 18 Years	12	16.4%
Persons 65 Years and Over	13	16.5%
White	64	84.2%
Minority	12	15.8%

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 2-28: 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 2-29: 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 2-30: 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 wind**s** 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 2-31: 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 2-32: 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 Caldwell Parish is equally at risk for hailstorms.

Previous Occurrences / Extents

The SHELDUS database reports two significant hailstorm events occurring within the boundaries of Caldwell Parish between the years of 1990 - 2015. According to the National Climatic Data Center, hailstorm diameters experienced in Caldwell Parish have ranged from 0.75 inches to 1.75 inches since 1990. The most frequently recorded hail size has been 1 inch diameters. *Figure 2-17* displays the density of hailstorms in Caldwell Parish and adjacent parishes. Based on the National Climatic Data Center dataset, *Table 2-33* provides an overview of hailstorms that have impacted the Caldwell Parish planning area since 2010. Caldwell Parish can expect to experience hail up to 1.75 inches in diameter for future events.

Table 2-33: Previous Occurrences of Hailstorms in Caldwell Parish (Source: NCDC)

Date	Recorded Hail Size (inches)	Location
April 19, 2015	1.75	GRAYSON

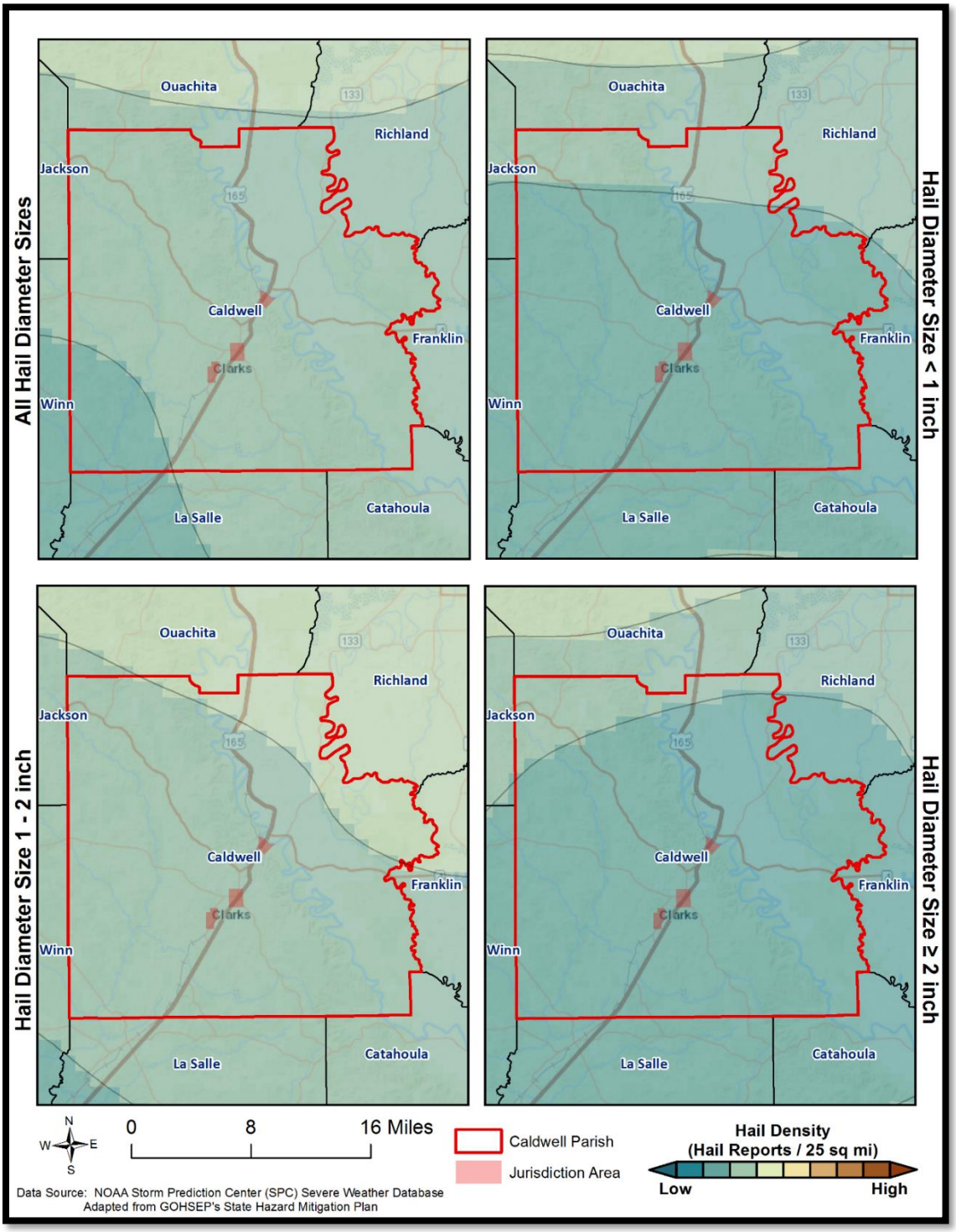


Figure 2-17: Density of Hailstorms by Diameter from 1950-2012
(Source: State of Louisiana Hazard Mitigation Plan 2014)

Since 2010, there have been no significant hailstorm events in the unincorporated areas of Caldwell Parish, as well as the incorporated areas of Clarks and Columbia.

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 8%. The probability was determined based on a review of significant hail data that has caused damages in the last 25 years, in which Caldwell Parish has had two recorded events.

Estimated Potential Losses

According to the SHELDUS database, property damage due to hailstorms in Caldwell Parish have totaled approximately $2,789 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 $112. *Table 2-34* provides an estimate of potential property losses for Caldwell Parish.

Table 2-34: Estimated Annual Property Losses in Caldwell Parish from Hailstorms

Estimated Annual Potential Losses from Hailstorms for Caldwell Parish			
Unincorporated Caldwell Parish (80.9% of Population)	Clarks (10.0% of Population)	Columbia (3.8% of Population)	Grayson (5.3% of Population)
$90	$11	$4	$6

There have been no deaths or injuries due to hailstorms from 1990 – 2015 in Caldwell 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 Caldwell Parish is equally at risk for high winds.

Previous Occurrences / Extents

The SHELDUS database reports a total of eight thunderstorm wind events occurring within the boundaries of Caldwell Parish between the years of 1990 to 2015. The significant thunderstorm wind events experienced in Caldwell Parish have ranged in wind speed from 59 mph to 81 mph. Caldwell Parish can expect to receive thunderstorm winds up to 81 mph for future high wind events. The table below provides an overview of significant high wind events over the last five years.

Table 2-35: Previous Occurrences for Thunderstorm High Wind Events

Location	Date	Recorded Wind Speeds (mph)	Property Damage	Crop Damage
COLUMBIA	July 23, 2014	60	$0	$0
COLUMBIA	July 23, 2014	59	$0	$0
BLANKSTON	January 3, 2015	63	$25,000	$0
GRAYSON	May 25, 2015	63	$0	$0

Since 2010, there have been no significant high wind events in the incorporated area of Clarks.

Frequency

High winds are a fairly common occurrence within Caldwell Parish, with an annual chance of occurrence calculated at 32%.

Estimated Potential Losses

Since 1990, there have been eight significant wind events that have resulted in property damages according to the SHELDUS database. The total property damages associated with those storms have totaled $88,247. To estimate the potential losses of a wind event on an annual basis, the total damages recorded for wind events was divided by the total number of years of available wind data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of $3,530. The following table provides an estimate of potential property losses for Caldwell Parish.

Table 2-36: Estimated Annual Property Losses in Caldwell Parish Resulting from High Winds

Estimated Annual Potential Losses from Thunderstorm Winds for Caldwell Parish			
Unincorporated Caldwell Parish (80.9% of Population)	Clarks (10.0% of Population)	Columbia (3.8% of Population)	Grayson (5.3% of Population)
$2,854	$354	$136	$185

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

Vulnerability

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

Lightning

Location

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

Previous Occurrences / Extents

The SHELDUS database reports a total of one lightning event occurring within the boundaries of Caldwell 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 Caldwell 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 on the next page provides an overview of significant lightning strikes over the last five years.

Table 2-37: Previous Occurrences of Significant Lightning Strikes in Caldwell Parish from 2010 – 2015 (Source: NCDC and SHELDUS)

Location	Date	Summary	Property Damage
COLUMBIA	July 20, 1991	Lightning strikes caused two trees to fall on top of power lines one mile south of Columbia.	$87

Since 2010, there have been no lightning events that have caused property damage or loss of life in the unincorporated areas of the parish, or the incorporated areas of Clarks and Grayson.

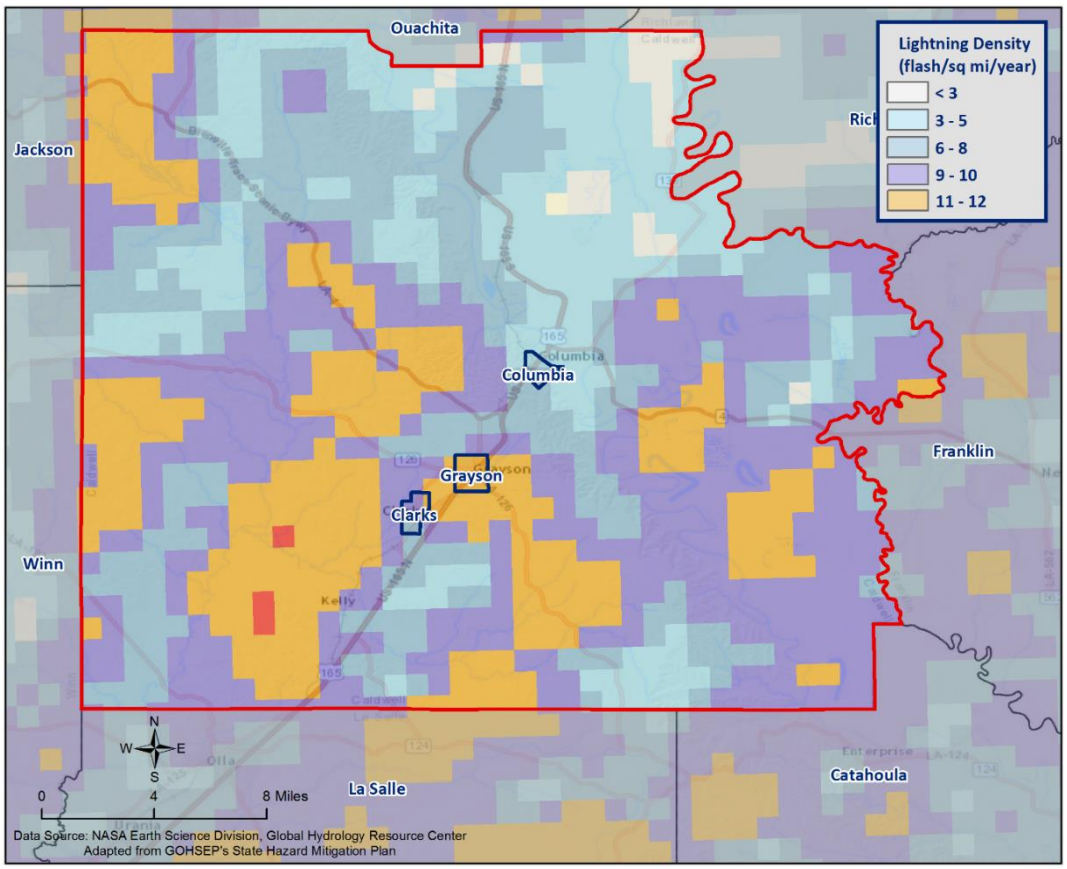


Figure 2-18: Lightning Density Reports for Caldwell Parish

Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in Caldwell 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 has been one lightning event that has caused property damages or injuries over the last 25 years, establishing an annual probability of 4%.

Estimated Potential Losses

Since 1990, there has been one significant lightning event that has resulted in property damages according to the SHELDUS database. The total property damages associated with lightning events totaled $87. 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 $3. The following table provides an estimate of potential property losses for Caldwell Parish.

Table 2-38: Estimated Annual Property Losses in Caldwell Parish from Lightning

Estimated Annual Potential Losses from Thunderstorm Lightning for Caldwell Parish			
Unincorporated Caldwell Parish (80.9% of Population)	Clarks (10.0% of Population)	Columbia (3.8% of Population)	Grayson (5.3% of Population)
$3	$0	$0	$0

There have been no reported injuries or fatalities in Caldwell 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 2-39* 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 2-39: Comparison of the Enhanced Fujita (EF) Scale to the Fujita (F) Scale

	Enhanced Fujita Scale					
	EF0	EF1	EF2	EF3	EF4	EF5
Wind Speed (mph)	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 2-40: 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 Caldwell Parish with actual locations, tornadoes in general are a climatological based hazard and have the same approximate probability of occurring in Caldwell Parish as all of its jurisdictions. Because a tornado has a similar probability of striking anywhere within the planning area for Caldwell Parish, all jurisdictions are equally at risk for tornadoes.

Previous Occurrences / Extents

SHELDUS reports a total of five tornadoes or waterspouts occurring within the boundaries of Caldwell Parish between the years of 1990 - 2015. The tornadoes experienced in Caldwell Parish have from ranged EF0 to EF1 on the EF scale, and ranged from F0 to F2 on the F scale. The worst case scenario Caldwell Parish can expect in the future is an EF1 tornado.

The tornado that caused the most damage to property occurred on November 23, 2004. Numerous trees were blown over and snapped at the Caldwell-La Salle Parish Line. The tornado then tracked northeast to the community of Spaulding where a few homes sustained roof damage. The tornado then tracked along Route 849 to Parish Road 730 where two mobile homes were blown 125 to 150 yards and demolished. In the town of Holum, several homes were heavily damaged where the roof separated from the home.

Table 2-41: Historical Tornadoes in Caldwell Parish with Locations from 1990 - 2015

Date	Impacts	Property Damage	Location	Magnitude
November 3, 1992	1 mile path with a width of 80 yards. Uprooted numerous trees and destroyed two fishing camps three miles west of Hebert.	$8,437	HEBERT	F1
March 30, 1993	4 mile path with a width of 150 yards. Damaged the roofs of 14 homes and destroyed numerous trees in Caldwell and Ouachita Parishes.	$40,958	VIXEN	F1
November 23, 2004	12 mile path with a width of 300 yards. Damaged the roofs of several homes. Snapped hundreds of trees. Destroyed two mobile homes.	$1,002,588	SPAULDING	F2
October 16, 2006	1.1 mile path with a width of 200 yards. Structural damage consisted of roof damage to a garage and workshop. Two boats, two fifth-wheel trailers, and one mobile home were destroyed. A pre-manufactured home was moved six feet laterally from its foundation.	$234,857	HEBERT	F0
March 21, 2012	3.96 mile path with a width of 400 yards. 20 homes were damaged and one mobile home was destroyed. Several outbuildings and sheds were also destroyed.	$515,554	GRAYSON	EF1

The incorporated areas of Clarks and Columbia as well as the unincorporated areas of the parish have not experienced a tornado event from 2010 to the present. Since 2011, the year in which the last update to this hazard mitigation plan was written, Caldwell Parish has had one tornado touchdown in Grayson. The following is a brief synopsis of this event:

March 21, 2012 – EF1 Tornado in Grayson

An EF1 tornado touched down in Caldwell Parish west of Grayson along State Route 845 snapping a few trees. The tornado moved north-northwest and intensified to EF1 intensity as it crossed Highway 126 and paralleled McCrary Road where most of the damage occurred. 20 homes were damaged and one mobile home was destroyed. The majority of the damage was due to falling trees as the area contained numerous large hardwood and softwood trees which were snapped or uprooted. Several outbuildings and sheds were also destroyed, primarily from falling trees. Other damage occurred to homes and structures along Highway 165 in the Columbia area was due to straight line winds or rear flank winds east of the tornado track.

Frequency / Probability

Tornadoes are a sporadic occurrence within Caldwell Parish, with an annual chance of occurrence calculated at 20% based on the records for the past 25 years (1990 - 2015). The figure on the next page displays the density of tornado touch downs in Caldwell Parish and neighboring parishes.

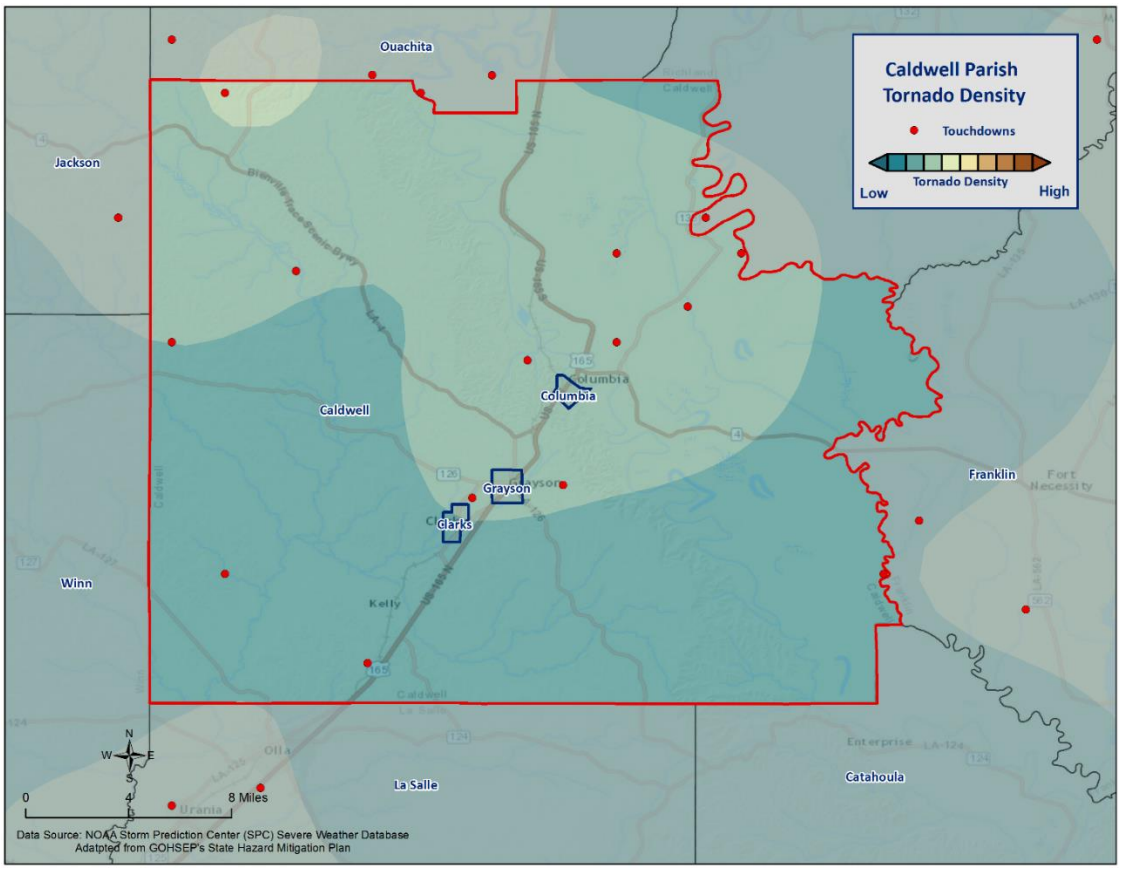


Figure 2-19: Location and Density of Tornadoes to Touch Down in Caldwell Parish (Source: NOAA/SPC Severe Weather Database)

Estimated Potential Losses

According to the SHELDUS database, there have been five tornadoes that have caused some level of property damage. The total damage from the actual claims for property is $1,802,393, with an average cost of $360,479 per tornado strike. When annualizing the total cost over the 25-year record, total annual loses based on tornadoes are estimated to be $72,096. To provide an estimated annual estimated potential loss per jurisdiction, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the table below provides an annual estimate of potential losses for Caldwell Parish.

Table 2-42: Estimated Annual Losses from Tornadoes in Caldwell Parish

Estimated Annual Potential Losses from Tornadoes for Caldwell Parish			
Unincorporated Caldwell Parish (80.9% of Population)	Clarks (10.0% of Population)	Columbia (3.8% of Population)	Grayson (5.3% of Population)
$58,298	$7,237	$2,775	$3,786

Table 2-43 presents an analysis of building exposure that is susceptible to tornadoes by general occupancy type for Caldwell Parish, along with the percentage of building stock that are mobile homes.

Table 2-43: Building Exposure by General Occupancy Type for Tornadoes in Caldwell 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 (%)
7,633,964	99,179	19,648	4,187	23,870	10,194	9,353	15.0%

The parish has not experienced any injuries or fatalities during this 25-year period.

In assessing the overall risk to population, the most vulnerable population throughout the parish are those residing in manufacturing housing. Approximately 15% of all housing in Caldwell Parish consists of manufactured housing. Based on location data collected in a previous hazard mitigation project, there are two known locations where manufactured housing is concentrated. Each of those two locations have an overall number of manufactured houses ranging from 15 to 25. The location and density of manufactured houses can be seen in *Figure 2-20*.

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 Caldwell Parish (*Table 2-44*). 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 2-44: Manufactured Home Distribution throughout Caldwell Parish

Location	Number of Manufactured Home Parks	% of Manufactured Home Parks
Unincorporated Area	2	100%
Clarks	0	0%
Columbia	0	0%
Grayson	0	0%

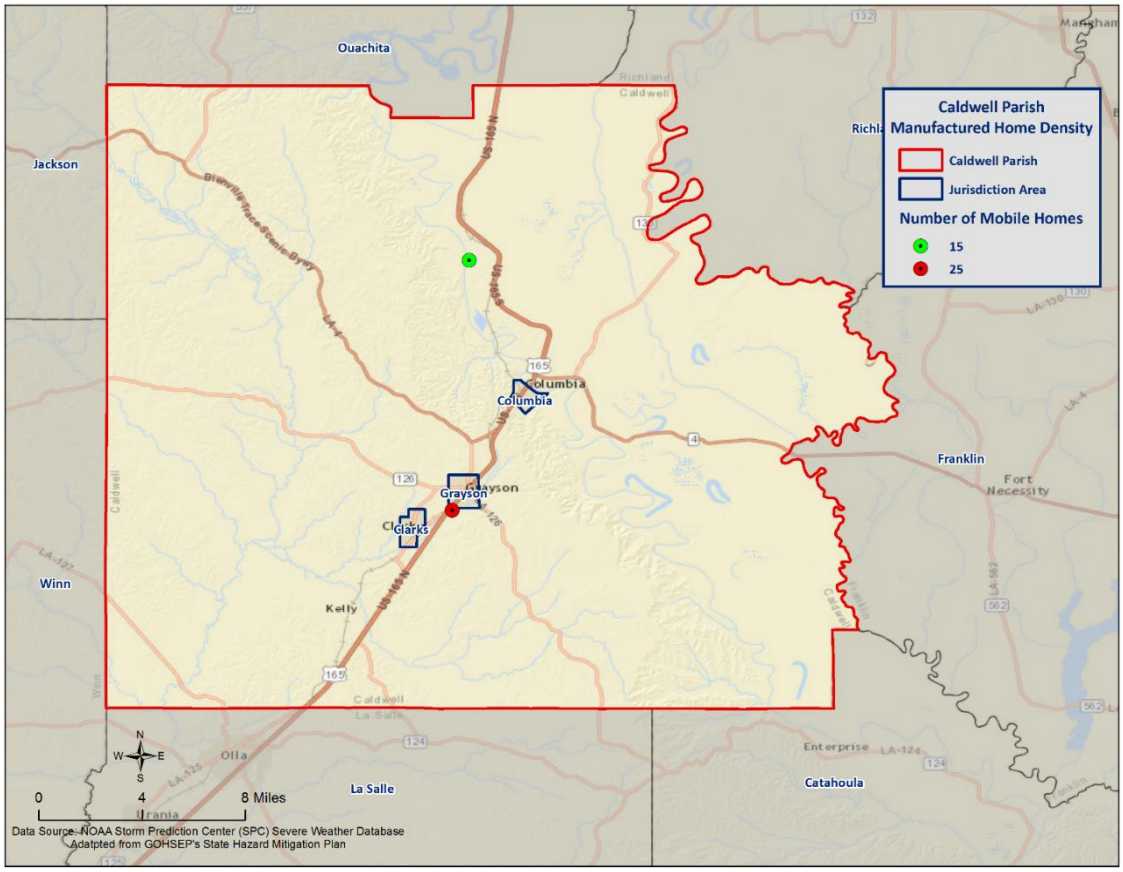


Figure 2-20: Location and Approximate Number of Units in Manufactured Housing Locations throughout Caldwell Parish

Vulnerability

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

Tropical Cyclones

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

Table 2-45: Saffir-Simpson Hurricane Wind Scale

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

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

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

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

Location

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

Previous Occurrences / Extents

The central Gulf of Mexico coastline is among the most hurricane-prone locations in the United States, and hurricanes can affect every part of the state. The SHELDUS database reports a total of three tropical cyclone events occurring within the boundaries of Caldwell Parish between the years 2002 and 2014 (*Table 2-46*). The tropical cyclone events experienced in Caldwell Parish include depressions, storms, and hurricanes. As a worst case scenario, Caldwell Parish can expect to experience hurricanes at the Category 1 level in the future.

Table 2-46: Historical Tropical Cyclone Events in Caldwell Parish from 2002 - 2015 (Source: SHELDUS)

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

Hurricane Gustav (2008)

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

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

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

In Caldwell Parish, Hurricane Gustav had a much smaller impact than Hurricane Ike, which came a few days later. Hurricane Gustav produced tropical storm force winds which resulted in widespread trees and power lines downed across the parish. There were also scattered power outages across the parish.

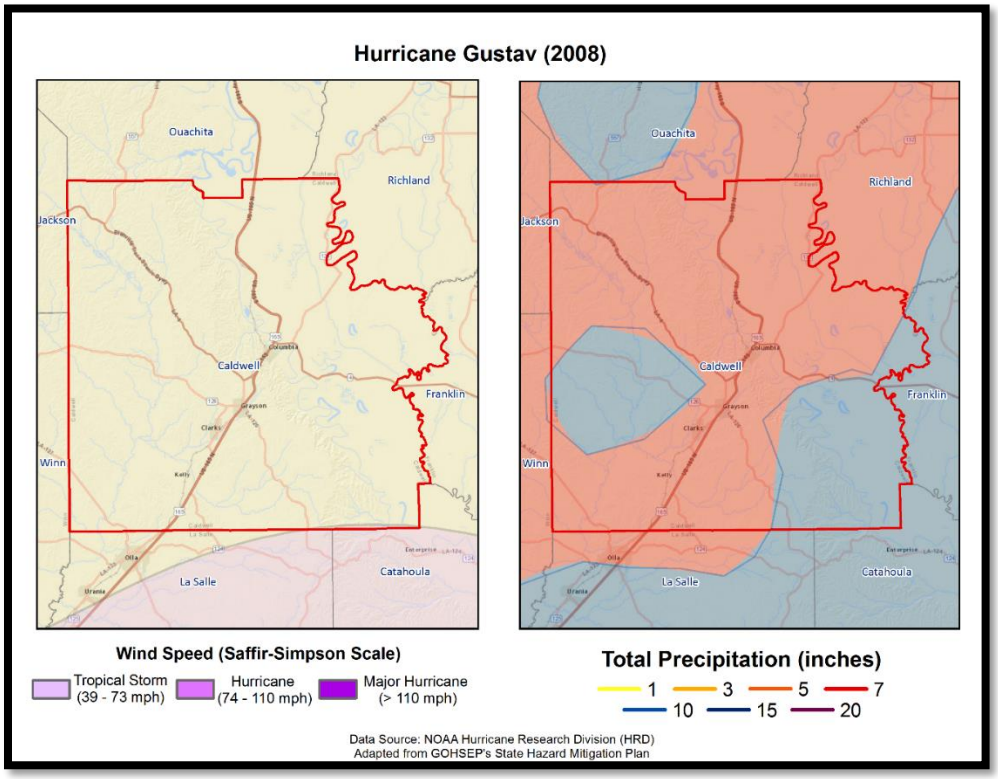


Figure 2-21: Wind Speed and Precipitation Totals in Caldwell Parish for Hurricane Gustav

Hurricane Ike (2008)

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

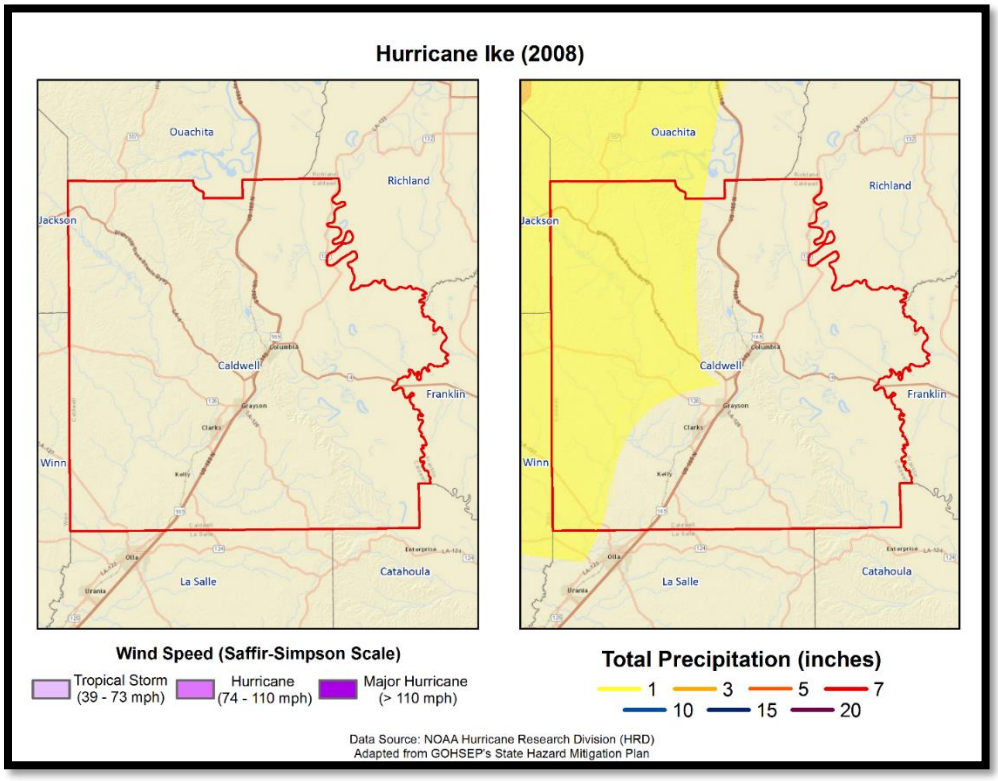


Figure 2-22: Wind Speed and Precipitation Totals in Caldwell Parish for Hurricane Ike

Tropical storm force winds buffeted all of Caldwell Parish on September 13th. The winds downed several trees and power lines throughout the parish. Scattered power outages were also reported during the height of the storm.

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 Caldwell Parish as well as other parishes in the northern part of the state. Numerous trees and power lines were downed across the entire parish as a result of Hurricane Isaac.

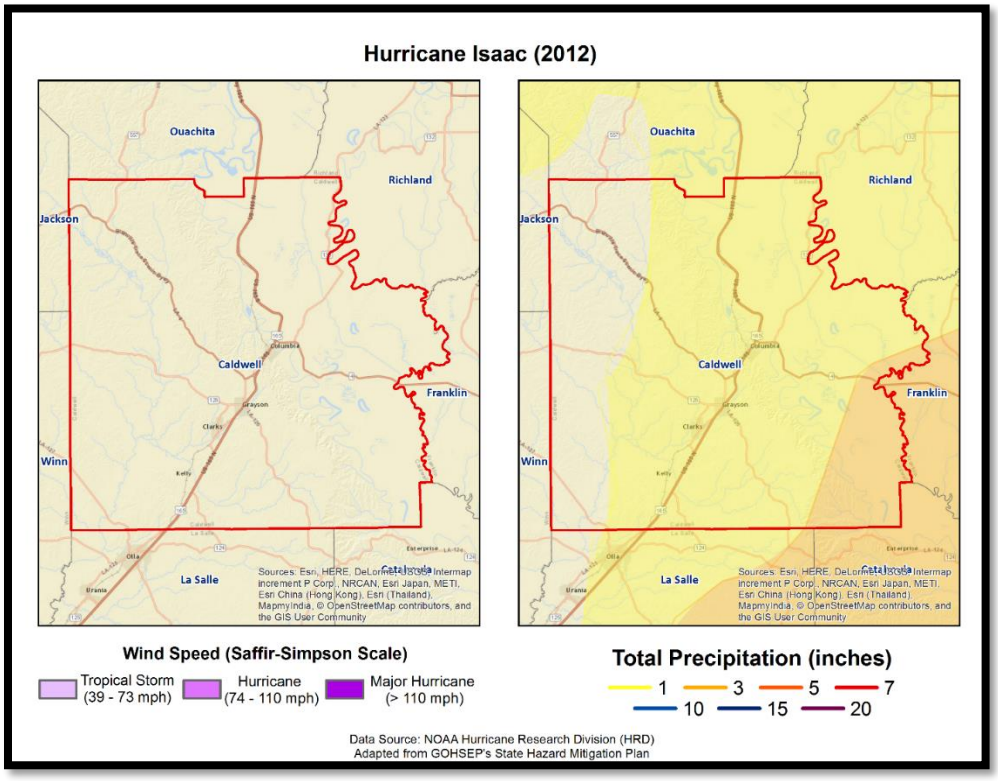


Figure 2-23: Wind Speed and Precipitation Totals in Caldwell Parish for Hurricane Isaac

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

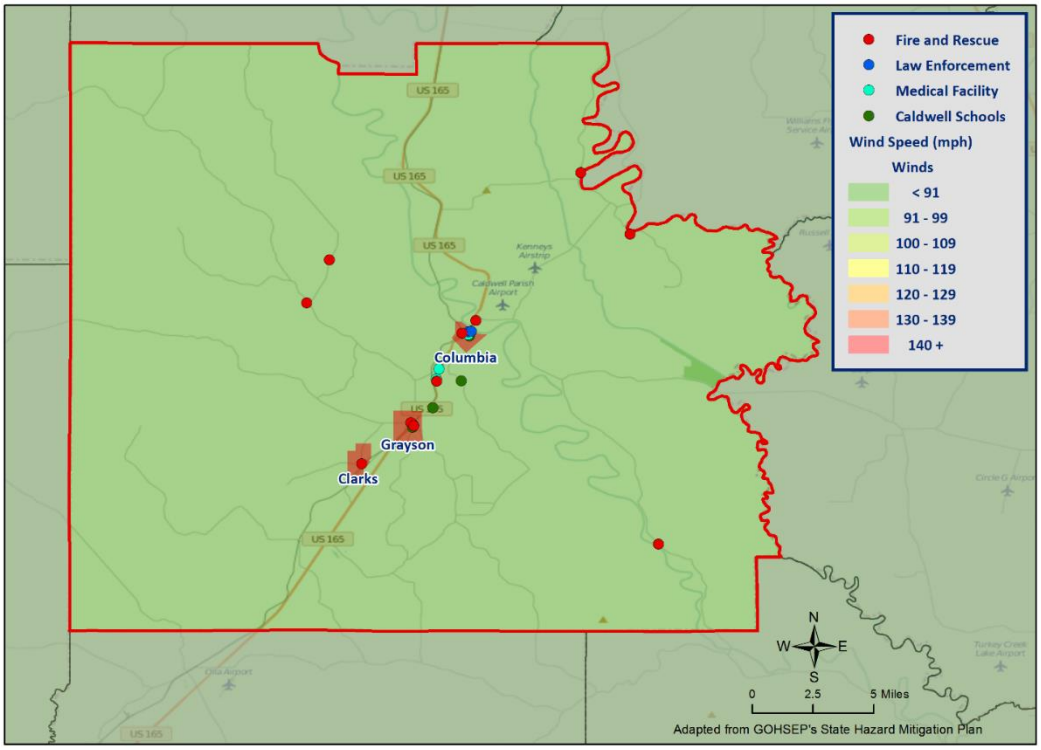


Figure 2-24: Winds Zones for Caldwell Parish in Relation to Critical Facilities

Frequency / Probability

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

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 below shows the total economic losses that would result from this occurrence.

Table 2-47: Total Estimated Losses for a 100-Year Hurricane Event (Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event
Caldwell Parish (Unincorporated)	$698,169
Clarks	$86,664
Columbia	$33,234
Grayson	$45,335
Total	$863,401

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 2-48: Ratio of Total Losses to Total Estimated Value of Assets for each Jurisdiction in Caldwell 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	$698,169	$7,607,198,000	0.0%
Clarks	$86,664	$52,114,000	0.2%
Columbia	$33,234	$30,133,000	0.1%
Grayson	$45,335	$110,950,000	0.0%

Based on the Hazus 2.2 Hurricane Model, estimated total losses range from less than 0.1% to 0.2% of the total estimated value of all assets for the unincorporated area of Caldwell Parish, and the incorporated areas of Columbia, Clarks, and Grayson.

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.

Table 2-49: Estimated Losses in Unincorporated Caldwell Parish for a 100-Year Hurricane Event (Source: Hazus 2.2)

Caldwell Parish (Unincorporated)	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$344
Commercial	$1,270
Government	$824
Industrial	$1,591
Religious / Non-Profit	$1,941
Residential	$691,442
Schools	$756
Total	$698,169

Table 2-50: Estimated Losses in Clarks for a 100-Year Hurricane Event (Source: Hazus 2.2)

Clarks	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$43
Commercial	$158
Government	$102
Industrial	$197
Religious / Non-Profit	$241
Residential	$85,829
Schools	$94
Total	$86,664

Table 2-51: Estimated Losses in Columbia for a 100-Year Hurricane Event (Source: Hazus 2.2)

Columbia	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$16
Commercial	$60
Government	$39
Industrial	$76
Religious / Non-Profit	$92
Residential	$32,914
Schools	$36
Total	$33,234

Table 2-52: Estimated Losses in Grayson for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Grayson	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$22
Commercial	$82
Government	$54
Industrial	$103
Religious / Non-Profit	$126
Residential	$44,898
Schools	$49
Total	$45,335

Threat to People

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

Table 2-53: Number of People Susceptible to a 100-Year Hurricane Event in Caldwell Parish
(Source: Hazus 2.2)

Number of People Exposed to Hurricane Hazards			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Parish (Unincorporated)	**8,193**	**8,193**	**100.0%**
Clarks	**1,017**	**1,017**	**100.0%**
Columbia	**390**	**390**	**100.0%**
Grayson	**532**	**532**	**100.0%**
Total	**10,132**	**10,132**	**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 2-54: Vulnerable Populations in Unincorporated Caldwell Parish for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Caldwell Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	8,193	100.0%
Persons Under 5 Years	511	6.2%
Persons Under 18 Years	1,920	23.4%
Persons 65 Years and Over	1,216	14.8%
White	6,641	81.1%
Minority	1,552	18.9%

Table 2-55: Vulnerable Populations in Clarks for a 100-Year Hurricane Event (Source: Hazus 2.2)

Clarks		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	1,017	100.0%
Persons Under 5 Years	39	3.8%
Persons Under 18 Years	146	14.4%
Persons 65 Years and Over	88	8.7%
White	526	51.7%
Minority	491	48.3%

Table 2-56: Vulnerable Populations in Columbia for a 100-Year Hurricane Event (Source: Hazus 2.2)

Columbia		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	390	100.0%
Persons Under 5 Years	24	6.2%
Persons Under 18 Years	81	20.8%
Persons 65 Years and Over	70	18.0%
White	259	66.4%
Minority	131	33.6%

Table 2-57: Vulnerable Populations in Grayson for a 100-Year Hurricane Event (Source: Hazus 2.2)

Grayson		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	532	100.0%
Persons Under 5 Years	38	7.1%
Persons Under 18 Years	125	23.5%
Persons 65 Years and Over	88	16.5%
White	448	84.2%
Minority	84	15.8%

Vulnerability

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

Wildfires

A Wildfires 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 Wildfires 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 Wildfires danger. *Figure 2-25* displays the areas of wildland-urban interaction in Caldwell 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 2-58: 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 Wildfires impacts. Location has a minimal chance of being directly impacted by a Wildfires.
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 Caldwell Parish and its jurisdictions.

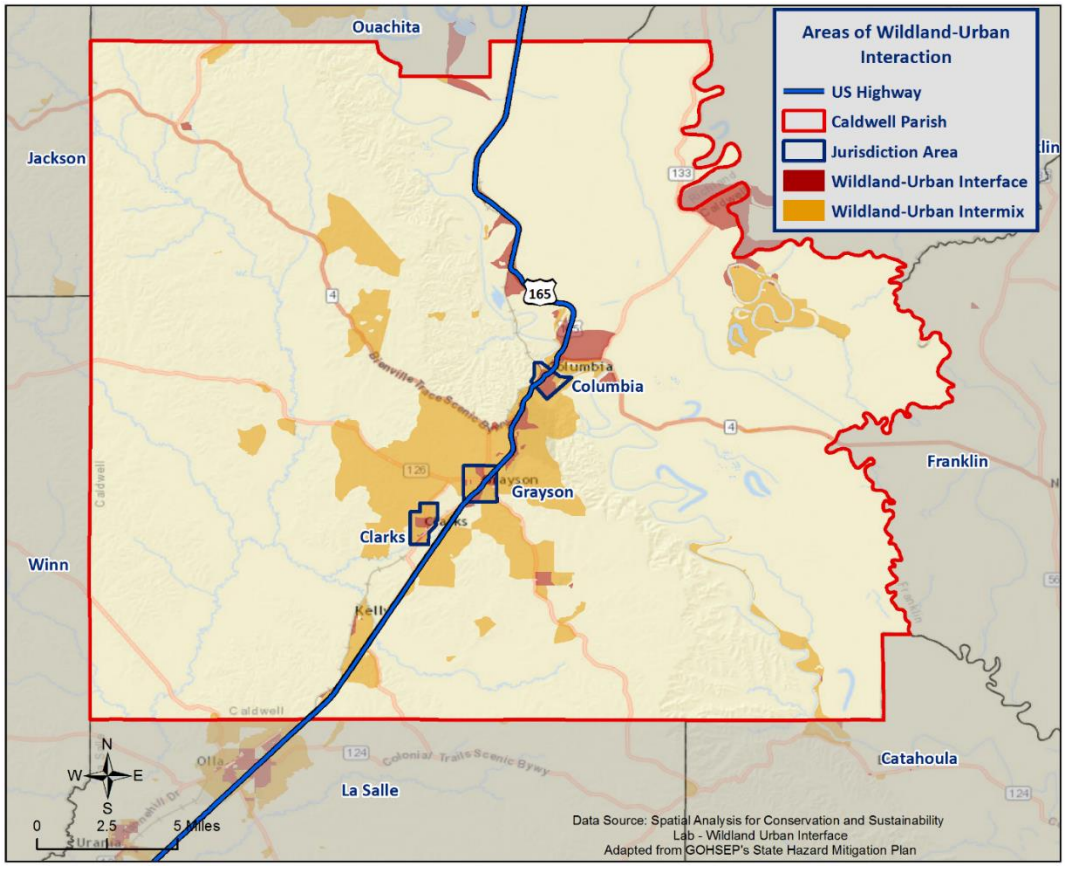


Figure 2-25: Wildland-Urban Interaction in Caldwell Parish

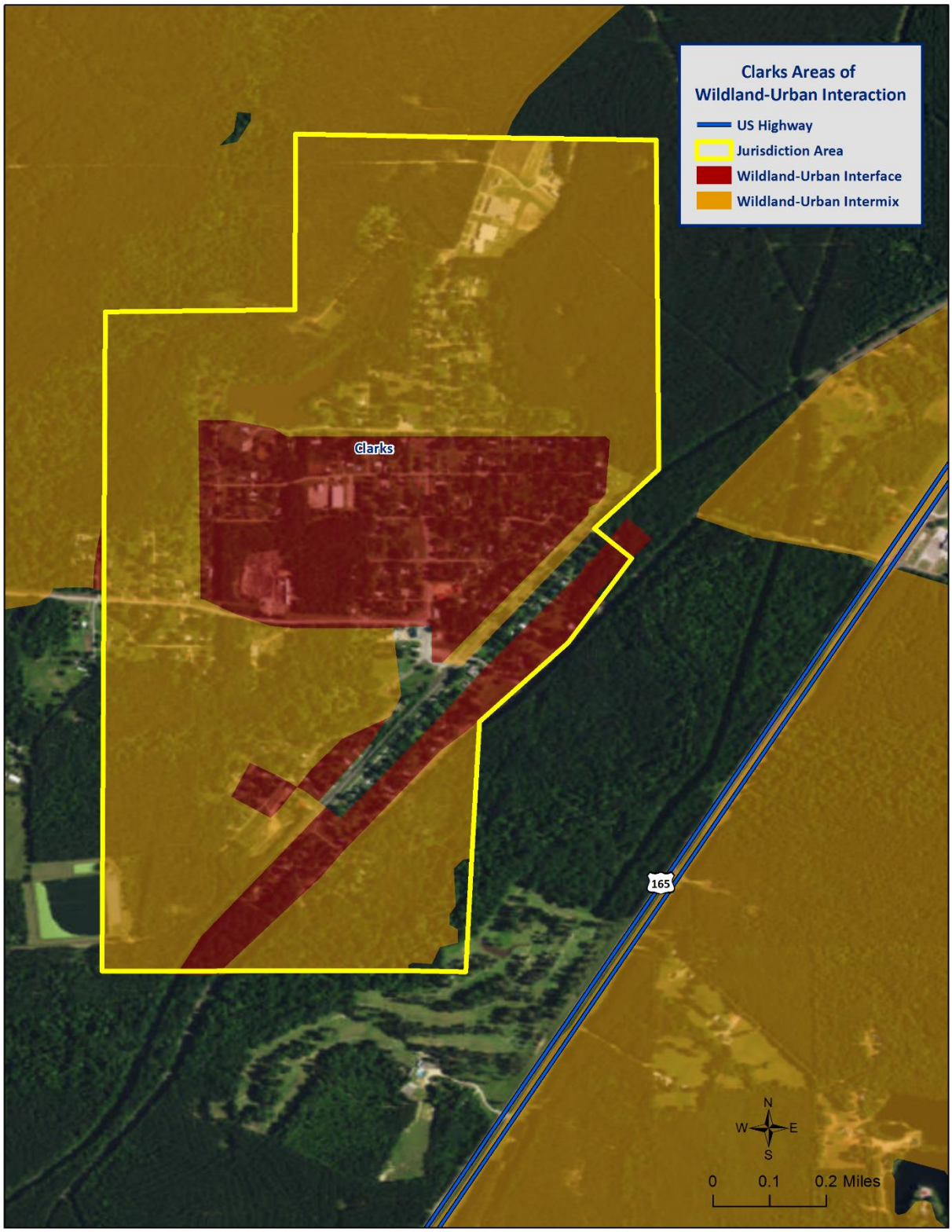


Figure 2-26: Wildland-Urban Interaction in Clarks

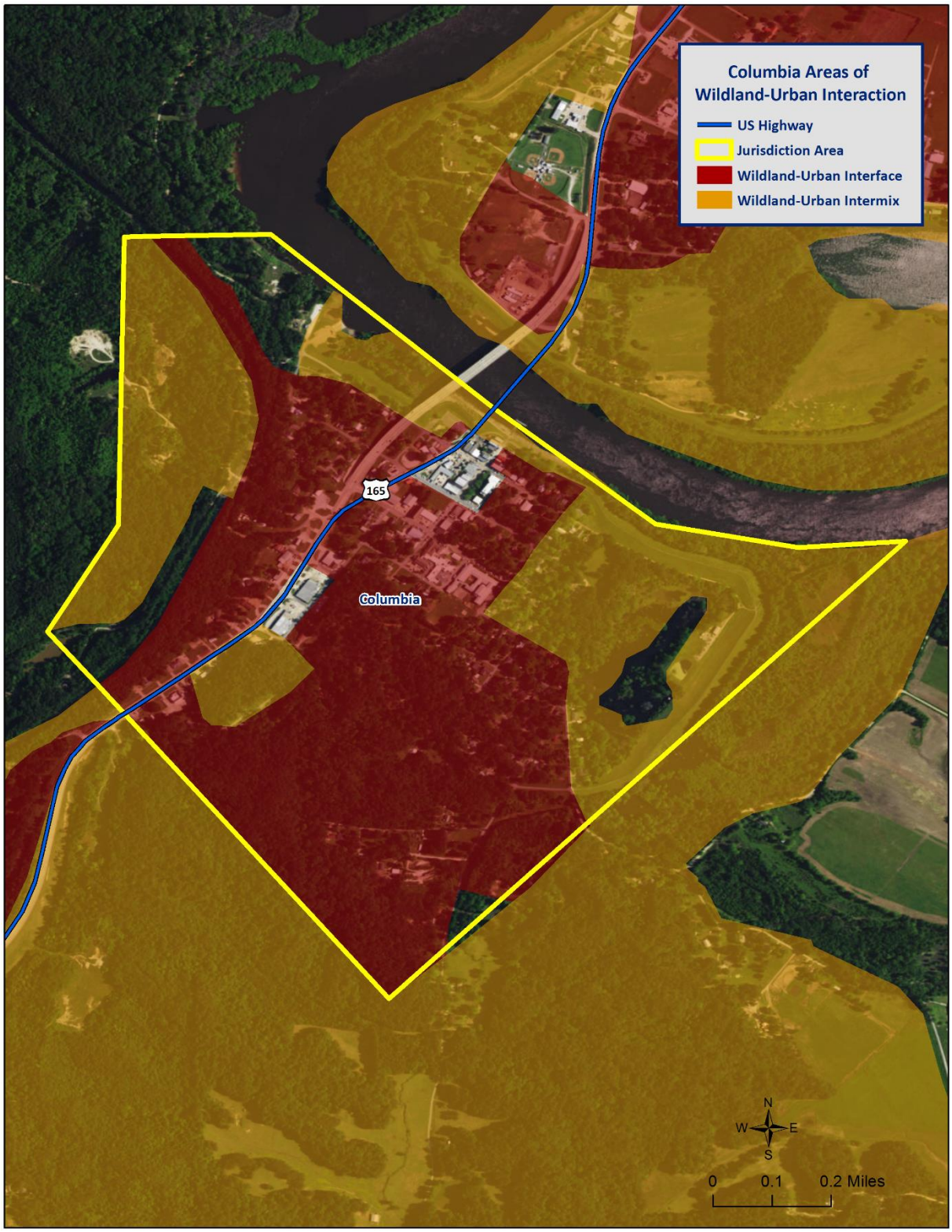


Figure 2-27: Wildland-Urban Interaction in Columbia

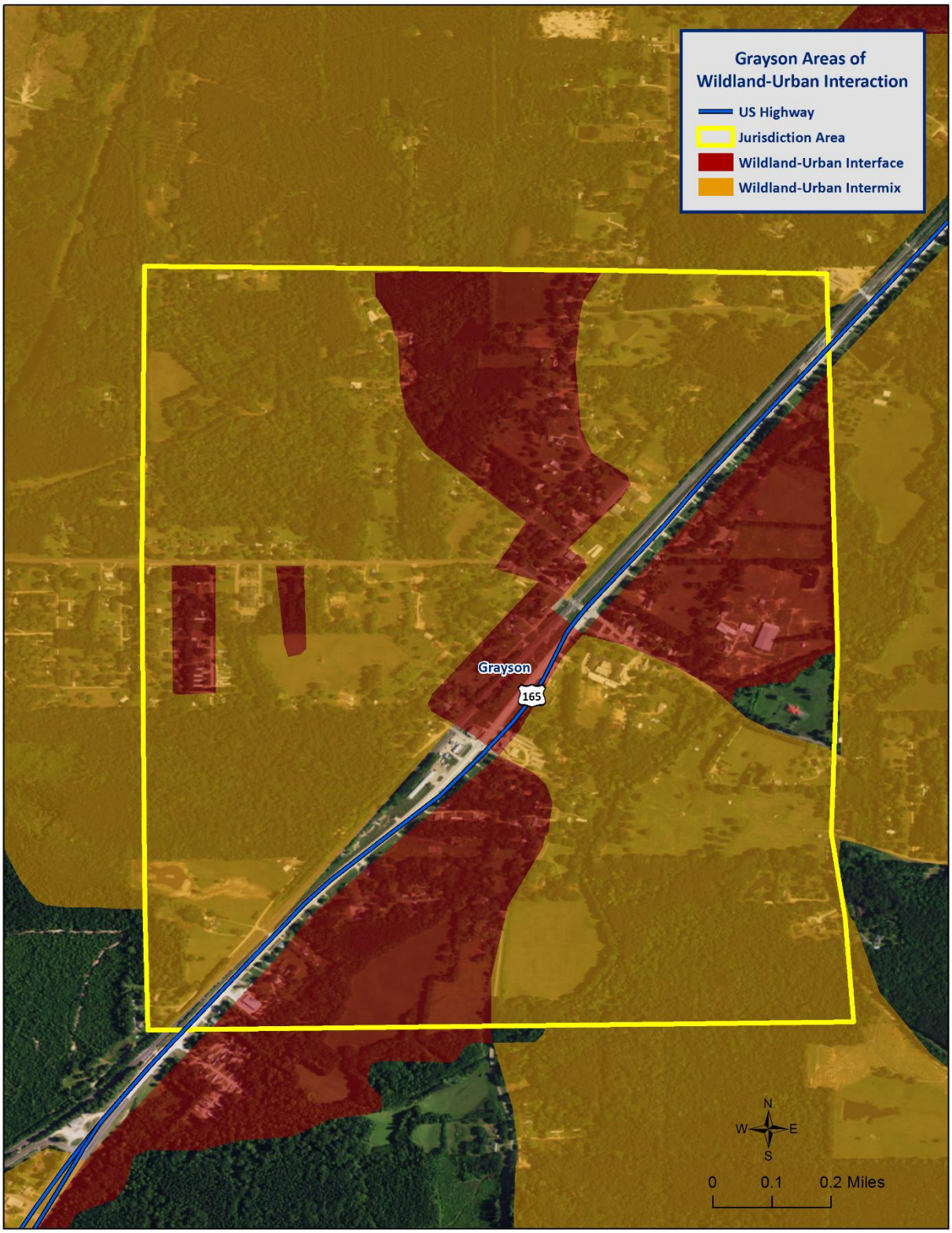


Figure 2-28: Wildland-Urban Interaction in Grayson

Previous Occurrences / Extents

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

Since 2010, there have been no reported Wildfires events in the incorporated areas of Clarks, Columbia, Grayson, and the unincorporated areas of Caldwell Parish.

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

Table 2-59: Potential Wildfire Intensity Levels for Caldwell Parish
(Source: Southern Wildfire Assessment Portal)

Potential Wildfire Intensity	
Caldwell Parish (Unincorporated)	Moderate Intensity Level 3
Clarks	Moderate Intensity Level 3
Columbia	Moderate to High Intensity Level 3.5
Grayson	Moderate to High Intensity Level 3.5

Frequency / Probability

With no recorded events in 25 years, Wildfires events within the boundaries of Caldwell Parish have an annual chance of occurrence calculated at less than 1% based on the SHELDUS dataset.

Estimated Potential Losses

There have been no Wildfires events that have caused property damage, crop damage, injuries, or fatalities in Caldwell 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 2-25* displays the areas of wildland-urban interaction in Caldwell Parish.

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

Table 2-60: Total Building Exposure by Wildland-Urban Interaction Areas
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Building Exposure
Caldwell Parish (Unincorporated)	$565,660,000
Clarks	$52,335,000
Columbia	$30,113,000
Grayson	$70,643,000
Total	$718,751,000

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:

Table 2-61: Estimated Exposure for Unincorporated Caldwell Parish by Sector (Source: Hazus 2.2)

Caldwell Parish (Unincorporated)	Estimated Total Building Exposure by Sector
Agricultural	$2,756,000
Commercial	$38,032,000
Government	$3,791,000
Industrial	$5,424,000
Religious / Non-Profit	$12,266,000
Residential	$496,150,000
Schools	$7,241,000
Total	$565,660,000

Table 2-62: Estimated Exposure for Clarks by Sector (Source: Hazus 2.2)

Clarks	Estimated Total Building Exposure by Sector
Agricultural	$0
Commercial	$3,312,000
Government	$1,731,000
Industrial	$219,000
Religious / Non-Profit	$3,623,000
Residential	$43,450,000
Schools	$0
Total	$52,335,000

Table 2-63: Estimated Exposure for Columbia by Sector (Source: Hazus 2.2)

Columbia	Estimated Total Building Exposure by Sector
Agricultural	$0
Commercial	$4,328,000
Government	$893,000
Industrial	$72,000
Religious / Non-Profit	$1,612,000
Residential	$23,208,000
Schools	$0
Total	$30,113,000

Table 2-64: Estimated Exposure for Grayson by Sector
(Source: Hazus 2.2)

Grayson	Estimated Total Building Exposure by Sector
Agricultural	$102,000
Commercial	$19,594,000
Government	$1,836,000
Industrial	$8,715,000
Religious / Non-Profit	$1,354,000
Residential	$37,152,000
Schools	$1,890,000
Total	$70,643,000

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 2-65: 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**
Caldwell Parish (Unincorporated)	**8,193**	**1,468**	**17.9%**
Clarks	**1,017**	**365**	**35.9%**
Columbia	**390**	**331**	**84.9%**
Grayson	**532**	**357**	**67.1%**
Total	**10,132**	**2,521**	**24.9%**

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

Table 2-66: Population in Unincorporated Caldwell Parish Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Caldwell Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	1,468	17.9%
Persons Under 5 Years	92	6.2%
Persons Under 18 Years	252	17.2%
Persons 65 Years and Over	218	14.8%
White	1,190	81.1%
Minority	278	18.9%

Table 2-67: Population in Clarks Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

Clarks		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	365	35.9%
Persons Under 5 Years	14	3.8%
Persons Under 18 Years	38	10.5%
Persons 65 Years and Over	32	8.7%
White	189	51.7%
Minority	176	48.3%

Table 2-68: Population in Columbia Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

Columbia		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	331	84.9%
Persons Under 5 Years	20	6.2%
Persons Under 18 Years	48	14.6%
Persons 65 Years and Over	59	18.0%
White	220	66.4%
Minority	111	33.6%

Table 2-69: Population in Grayson Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

Grayson		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	357	67.1%
Persons Under 5 Years	25	7.1%
Persons Under 18 Years	58	16.4%
Persons 65 Years and Over	59	16.5%
White	301	84.2%
Minority	56	15.8%

Vulnerability

See Appendix C for parish and municipality facilities that could potentially be exposed to a Wildfires hazard. Buildings were determined based on whether or not they fall within the Wildfires-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 2-70: 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 Caldwell Parish as all of the adjacent parishes, the entire planning area for Caldwell Parish is equally at risk for winter storms.

Previous Occurrences / Extents

According to SHELDUS, there have been four reported winter storm events that have occurred within the boundaries of Caldwell 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, Caldwell Parish can expect an ice damage index of 2 on the Sperry-Piltz Ice Accumulation Index.

Table 2-71: Previous Occurrences for Winter Storm Events

Date	Synopsis	Property Damage	Crop Damage
March 13, 1993	Temperatures fell into the upper teens across the northern parishes of Louisiana. Total agricultural losses are estimated to be about $8.9 million. Due to the relatively mild winter, many crops were in early bloom. The peach crop which is grown in the northern part of the state suffered a 60% loss valued around $2 million.	$0	$227,828
December 22, 1998	A shallow dome of arctic air spread across northern Louisiana while low pressure formed in the northern Gulf of Mexico pulled warm moist air northward over the top of the cold air. The result was widespread freezing rain, sleet, and freezing drizzle. The ice accumulated mainly across exposed surfaces such as trees and power lines as well as bridges and overpasses. Over a quarter million people were without power, some for over a week. I-20, I-220, and I-40 were shut down for a period.	$85,433	$0
January 7, 2010	Bitterly cold temperatures swept into the region during the evening hours of January 7th. Overnight and early morning low temperatures were well into the teens with daytime high temperatures struggling to make it to the freezing mark. The cold temperatures froze water pipes of many homes throughout the parish. Some city and parish water lines burst as well resulting in many residents either without water for a short period of time or with reduced water pressure.	$54,283	$0
February 10, 2014	A cold, shallow air mass moved into the region causing light freezing rain across portions of the area. Freezing rain accumulations in Caldwell Parish were near or less than a tenth of an inch of precipitation. The impacts were some slick spots reported on bridges and overpasses.	$0	$0

Based on previous winter storm events, the worst-case scenario for Caldwell is approximately one to two inches of snow accumulation and approximately one quarter to one half inch of ice accumulation.

Frequency / Probability

With three recorded events in 25 years, winter storm events within the boundaries of Caldwell Parish have an annual chance of occurrence calculated at 16% based on the SHELDUS dataset.

Estimated Potential Losses

Since 1990, there have been three 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 $139,717. 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 $5,589. 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 table below provides an estimate of potential property losses for Caldwell Parish based on the 2010 Census data.

Table 2-72: Estimated Annual Losses for Winter Weather Events in Caldwell Parish

Estimated Annual Potential Losses from Winter Weather for Caldwell Parish			
Unincorporated Caldwell Parish (80.9% of Population)	**Clarks (10.0% of Population)**	**Columbia (3.8% of Population)**	**Grayson (5.3% of Population)**
$4,519	$561	$215	$293

From 1990 to 2015, there have been no injuries or fatalities as a result of winter weather in Caldwell 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

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

Previous Occurrences / Extents

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

Levee Failure

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

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

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

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

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

Location

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

Previous Occurrences / Extents

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

Frequency / Probability

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

3. Capability Assessment

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

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

Policies, Plans, and Programs

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

Table 3-1: Caldwell Parish Planning and Regulatory Capabilities

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

Building Codes, Permitting, Land Use Planning and Ordinances

The Caldwell Parish Police Jury provides oversight for building permits and codes for the parish and all jurisdictions and all parish ordinances where applicable.

As of the 2016 update, Caldwell 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 Caldwell Parish Police Jury is also responsible for enforcing the Parish Ordinances relating to health and safety, property maintenance standards, and condemnation of unsafe structures.

The Caldwell 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, Caldwell Parish as a whole has a system in place to coordinate and share these capabilities through Caldwell 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, Caldwell 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 Caldwell Parish and its jurisdictions.

Table 3-2: Caldwell Parish Administrative and Technical Capabilities

Administration and Technical					
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions withou local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.					
	Caldwell Parish	Clarks	Columbia	Grayson	
Administration	Yes / No				
Planning Commission	No	No	No	No	
Mitigation Planning Committee	Yes	Yes	Yes	Yes	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	Yes	No	No	
Mutual Aid Agreements					
Staff	Yes / No; FT/PT; % Hazard Mitigation				
Chief Building Official	Yes	No	No	No	
Floodplain Administrator	Yes	No	No	No	
Emergency Manager	Yes	No	No	No	
Community Planner	No	No	No	No	
Civil Engineer	Yes	Yes	Yes	Yes	
GIS Coordinator	Yes	No	No	No	
Grant Writer	No	No	No	Yes	
Other					
Technical	Yes / No				
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	Yes	Yes	No	
Hazard Data & Information	No	No	No	No	
Grant Writing	No	No	No	No	
Hazus Analysis	No	No	No	No	

Financial capabilities are the resources that Caldwell 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 Caldwell Parish and its jurisdictions:

Table 3-3: Caldwell Parish Financial Capabilities

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

Education and Outreach

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

Caldwell 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 outlined in the table below.

Table 3-4: Caldwell 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.					
	Caldwell Parish	Clarks	Columbia	Grayson	
Program / Organization					Yes / No
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	No	No	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	No	No	No	
Natural Disaster or safety related school program	No	No	No	No	
Storm Ready certification	Yes	Yes	Yes	Yes	
Firewise Communities certification	No	No	No	No	
Public/Private partnership initiatives addressing disaster-related issues	No	No	No	No	

In some cases, the jurisdictions rely on Caldwell Parish OHSEP and/or Caldwell 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, Caldwell 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 Caldwell 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 Caldwell Parish
- Town of Clarks
- Town of Columbia
- Village of Grayson

Flood Insurance and Community Rating System

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

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

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

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

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

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

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

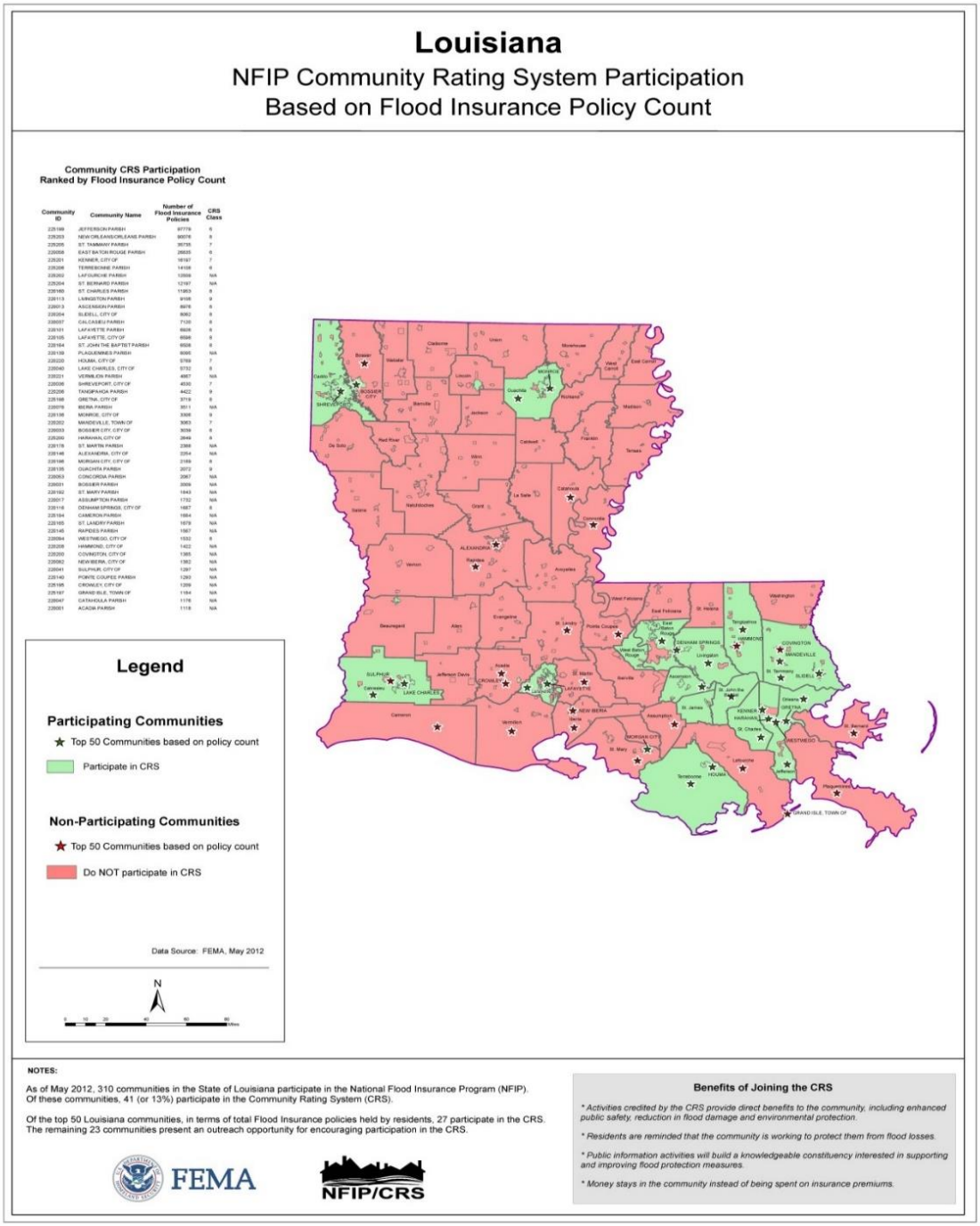


Figure 3-2: Louisiana CRS NFIP Participation
(Source: FEMA[2])

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

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

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

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

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

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

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

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

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

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

NFIP Worksheets

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

4. Mitigation Strategy

Introduction

Caldwell 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.

Caldwell 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 Caldwell Parish Hazard Mitigation Plan Steering Committee, under the coordination of the Caldwell 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 February 2016 – September 2016.

An online public opinion survey was conducted of Caldwell Parish residents between March and September 2016. The survey was designed to capture public perceptions and opinions regarding natural hazards in Caldwell 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 Caldwell 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 Caldwell Parish survey can be found at the following link:

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

During the public meeting in September, 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 focused on identifying and quantifying the risks faced by the residents and property owners in Caldwell Parish from natural 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, Caldwell 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 Caldwell Parish Hazard Mitigation Plan Update Steering Committee represent long-term commitments by the parish and its jurisdictions. After assessing these goals, the committee decided that the current four goals remain valid.

The goals are as follows:

- Identify and pursue mitigation measures that will reduce future damages
- Enhance public awareness and understanding of disaster preparedness
- Reduce repetitive flood losses in the parish
- Facilitate sound development in the parish to reduce or eliminate the potential impact of hazards

The Mitigation Action Plan focuses on actions to be taken by Caldwell 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 Caldwell Parish Hazard Mitigation Plan Steering Committee and participating jurisdictions each identified actions that would reduce and/or prevent future damage within Caldwell 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 table on the next page.

Caldwell 2011 Hazard Mitigation Action Update

Caldwell Parish-Unincorporated Areas					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C1: Public Awareness	Increase public awareness of hazards and hazardous areas. Distribute public awareness information regarding flood hazards, SFHA's, and potential mitigation measures using the local newspaper, utility bill inserts, inserts in the phone book, and parish hazards awareness website, and an educational program for school age children or "how to" classes in retrofitting by local merchants. Integrate "Disaster Resistance Education" into the public school curriculum. Provide public education on the importance of maintaining the ditches. Implement a public notification system, such as sirens or a call down system with a backup communication system.	Parish Budget, Grant Funding	Parish School Board and OHLSEP Director	All Hazards	In Progress
C2: Multi-Hazard Awareness	Sponsor a "Multi-Hazard Awareness Week", to educate the public on hurricanes, tornadoes and severe storms (sheltering in place, evacuation, emergency preparedness, and structural retrofitting), flooding (evacuation, emergency preparedness, retrofitting, and flood insurance), thunderstorms and lightning (emergency preparedness).	Parish and Town Budgets, Business and Industry	Mayors and OHLSEP Director	All Hazards	In Progress
C3: Master Drainage Plan	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best method of increasing drainage capacity. Implement recommended projects resulting from drainage plan.	Parish and/or Drainage Board Budget	Parish Engineer and/or Parish Department of Public Works	Flooding	In Progress
C4: Regulate New Development	Develop and pass ordinances to help regulate new development in the Parish, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages.	Parish Budget	Planning Director	All Hazards	Deleted

Caldwell Parish-Unincorporated Areas					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C5: Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	Parish Budget	OHSEP Director	All Hazards	Completed
C6: Community Rating System	Participate in the "Community Rating System (CRS)" of the NFIP. Inform the public about the CRS program and the fact that it could result in a discount in Flood Insurance Premiums. Review the existing floodplain ordinance and see how it could be augmented to increase CRS potential and further reduce the flood insurance premiums.	Parish Budget	Floodplain Manager	Flooding	In Progress
C7: Elevation, Acquisition, and Flood Proofing of Loss Structures	Pursue elevation/acquisition/flood proofing projects and structural solutions to flooding using available grant funding for the 15 repetitive loss structures and the one repetitive target structure. Annually review and correct the Repetitive Loss List by submitting correction worksheets to FEMA	Parish Budget	Floodplain Manager	Flooding	In Progress
C8: Interior Drainage Project	Investigate and implement a localized interior drainage project in the repetitive loss areas, and reduce its flood potential.	Community Development Block Grant (CDBG), Flood Mitigation Assistance (FMA) Project Funds, Hazard Mitigation Grant Program (HMGP), Small Business Administration (SBA), U.S. Army Corps of Engineers - Section 205, and State Capital Outlay, Local Drainage Funds	Parish and Town Floodplain Managers/ Public Works Director	Flooding	Carried Over

Caldwell Parish-Unincorporated Areas					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C9: Back Up Generators	Add back up power supply/generators and construct safe rooms at the Corey Fire Station, Sandy Bayou Fire Station, Eastside Fire Station and the Hebert Fire Station. Add back up power supply/generators at the East Columbia Water Tank and the Hebert Water Tank.	Parish Budget	OHLSEP Director	All Hazards	In Progress
C10: Improve Drainage	Improve drainage ways, along the Ouachita and Boeuf Rivers, by enlarging any inferior culverts and replacing any substandard bridges along the major drainage laterals.	Parish Budget	Parish Engineer and/or Parish Department of Public Works	All Hazards	In Progress
C11: Adopt International Building Codes	Adopt the current International Building Codes by ordinance, which would result in additional techniques to harden structures.	Parish Budget	Parish Police Jury	All Hazards	Completed
C12: Improve Drainage	Improve drainage ways along Hurricane Creek A- at Columbia Heights. Improve drainage ways along Hurricane Creek B- at Collins Road. Improve drainage ways along Hurricane Creek C- at Caldwell High School. Improve drainage ways along Hurricane Creek D- at LA 126 to Zeagler Road.	HMGP, PDM, Parish Budget	Parish Police Jury	Flooding, Dam/Levee Failure, Hurricane / Tropical System	In Progress
C13: Elevate Electrical Panels	Elevate Electrical Panels at the Columbia Heights Sewer Station to reduce future damages	HMGP, PDM, Parish Budget	Parish Police Jury	Flooding, Dam/Levee Failure, Hurricane / Tropical System	Completed
C14: Flood-Proofing	Flood proof the Sewer Lift Station at Gates Street. Flood proof the Sewer Lift Station at Holmes Street	HMGP, PDM, Parish Budget	Parish Police Jury	Flooding, Dam/Levee Failure, Hurricane / Tropical System	In Progress

Town of Clarks					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C1: Public Awareness	Implement a public education program	Town Budget, HMGP, Local Partnerships	OHSEP Director, Mayor's Office	All Hazards	Carried Over
C2: Warning System	Implement a warning system for the Town of Clarks (ie: NOAA all hazards radios or warning sirens)	Town Budget, HMGP	OHSEP Director, Mayor's Office	All Hazards	Completed
C3: Installation of Generators	Install a generator to fire station	Town Budget, HMGP	OHSEP Director, Clarks Fire Department	All Hazards	Deleted
C4: Installation of Generators	Install a generator to Town Hall	Town Budget, HMGP	OHSEP Director, Mayor's Office	All Hazards	Carried Over
C5: Installation of Generators	Procure mobile generators for sewer lift stations	Town Budget, HMGP	OHSEP Director, Public Works Department	All Hazards	Carried Over
C6: Installation of Generators	Install a generator for water system	Town Budget, HMGP	OHSEP Director, Public Works Department	All Hazards	Completed
C7: Installation of Generators	Install a generator at sewage treatment plants	Town Budget, HMGP	OHSEP Director, Public Works Department	All Hazards	Carried Over
C8: Emergency Plan	Encourage churches and community groups to assist person at risk during power outages and to develop an emergency plan	Local Partnerships	OHSEP Director, Mayor's Office, Volunteer Agencies	All Hazards	In Progress
C9: Drainage Project	Develop a drainage project for the Minger Lane area to reduce flooding	Town Budget, HMGP, FMA, PDM	OHSEP Director, Public Works Department	(flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
C10: Sewer Project	Develop sewer rehabilitation project	Town Budget, HMGP, FMA, PDM	OHSEP Director, Public Works Department	(flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over

Town of Clarks					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C11: Culvert Extension	Culvert extension project for the Sixth Street area at the north end of town	Town Budget, HMGP, FMA, PDM	OHSEP Director, Public Works Department	(flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
C12: Maintain Drainage	Maintain drainage ditch that runs past the fire station	Town Budget	OHSEP Director, Public Works Department	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
C13: Resize Culverts	Resize 4-5 culverts throughout town to reduce flooding	Town Budget, HMGP, PDM, FMA	OHSEP Director, Public Works Department	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
C14: EMS Training	Training for EMS Personnel	Town Budget, Grants	OHSEP Director, Mayor's Office	Hazardous Materials Incidents / Chemical Spills	In Progress
C15: Door Hardening	Harden bay doors of fire station	Town Budget, HMGP, PDM	OHSEP Director, Fire Department	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Deleted
C16: Retrofit Roof	Retrofit roof of Town Hall	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Carried Over
C17: Window Hardening	Harden Town Hall windows with shatter-resistant film	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Carried Over
C18: Removal of Debris	Remove trees and other potential debris from areas around water wells and Town Hall	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	In Progress

Town of Clarks					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C19: Safe Room	Construct public safe room	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Deleted
C20: Improve Drainage	Assist Parish to improve drainage ways, along the Ouachita and Boeuf Rivers, by enlarging any inferior culverts and replacing any substandard bridges along the major drainage laterals.	Parish Budget	Mayor, Parish Engineer and/or Parish Department of Public Works	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	In Progress
C21: Develop Master Drainage Plan	Assist Parish to develop a master drainage plan, which will evaluate drainage projects at major drainage laterals to determine best method of increasing drainage capacity. Implement recommended projects resulting from drainage plan	Parish and/or Drainage Board Budget	Mayor, Parish Engineer and/or Parish Department of Public Works	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	Carried Over
C22: Back Up Power Supply	Assist Parish to add back-up power supply/generators and construct safe rooms at the Corey Fire Station, Sandy Bayou Fire Station, Eastside Fire Station and the Hebert Fire Station. Add back up power supply/generators at the East Columbia Water Tank and the Hebert Water Tank. Benefits: Provide safety and a source of power during power outages to continue essential operations.	Parish Budget	Mayor, OHSEP Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	Deleted

Town of Clarks					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C23: Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	Town Budget	Mayor, Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	In Progress
C24: Public Awareness	Increase public awareness of hazards and hazardous areas. Distribute public awareness information regarding flood hazards, SFHA's, and potential mitigation measures using the local newspaper, utility bill inserts, inserts in the phone book, and parish hazards awareness website, and an educational program for school age children or "how to" classes in retrofitting by local merchants. Integrate "Disaster Resistance Education" into the public school curriculum. Provide public education on the importance of maintaining the ditches. Implement a public notification system, such as sirens or a call down system with a backup communication system.	Town Budget, Grant Funding	Mayors, Parish School Board, and Parish Emergency Manage	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	In Progress

Town of Clarks					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C25: Multi-Hazard Awareness	Assist Parish to sponsor a "Multi-Hazard Awareness Week", to educate the public on hurricanes, tornadoes and severe storms (sheltering in place, evacuation, emergency preparedness, and structural retrofitting), flooding (evacuation, emergency preparedness, retrofitting, and flood insurance), thunderstorms and lightning (emergency preparedness).	Parish and Town Budget; Businesses and Industry	Mayors and Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds), Tornadoes	Carried Over
C26: Flood Proofing Projects	Pursue elevation / acquisition / flood proofing projects and structural solutions to flooding using available grant funding for the 15 repetitive loss structures and the one repetitive target structure. Annually review and correct the Repetitive Loss List by submitting correction worksheets to FEMA.	CDBG, FMA, HMGP, SBA, USACE Section 205, and State Capital Outlay, Local Drainage Funds	Floodplain Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds),	Carried Over
C27: Interior Drainage Project	Investigate and implement a localized interior drainage project in the repetitive loss areas, and reduce its flood potential.	CDBG, FMA, HMGP, SBA, USACE Section 205, and State Capital Outlay, Local Drainage Funds	Parish and Town Floodplain Managers / Public Works Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds),	Carried Over

Town of Clarks					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C28: Community Rating System	Participate in the "Community Rating system (CRS)" of the NFIP. Inform the public about the CRS program and the fact that it could result in a discount in Flood Insurance Premiums. Review the existing floodplain ordinance and see how it could be augmented to increase CRS potential and further reduce the flood insurance premiums.	Town Budget	Mayor, Floodplain Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	Carried Over
C29: Adopt International Building Code	Adopt the current International Building Codes by ordinance, which would result in additional techniques to harden structures.	Town Budget	Mayor, Police Jury	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorm s with lightning and high winds)	Complet ed
C30: Regulate New Development	Develop and pass ordinances to help regulate new development in the Parish, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages.	Town Budget	Mayor, Planning Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning andhigh winds),	Carried Over

Town of Columbia					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C1: Public Education	Implement public education program	Town Budget, HMGP, Local Partnerships	OHSEP Director, Mayor's Office	All Hazards	In Progress
C2: Warning System	Implementing a warning system for the Town (i.e.: NOAA all hazards radios or warning sirens)	Town Budget, HMGP	OHSEP Director, Mayor's Office	All Hazards	Completed
C3: Installation of permanent generator	Install permanent generator for water system	Town Budget, HMGP	OHSEP Director, Public Works Department	All Hazards	Completed
C4: Portable Generators	Purchase portable generator(s) for lift stations	Town Budget, HMGP	OHSEP Director, Public Works Department	All Hazards	In Progress
C5: Installation of Permanent Generator	Install permanent generator for sewer system	Town Budget, HMGP	OHSEP Director, Public Works Department	All Hazards	In Progress
C6: Installation of Generator	Install generator at Town pump	Town Budget, HMGP	OHSEP Director, Public Works Department	All Hazards	In Progress
C7: At Risk Citizens Assist	Identify at-risk citizens; encourage churches and other community groups to assist them during power outages, and to develop emergency plans to provide shelter during power outages	Local Partnerships	OHSEP Director, Mayor's Office, Volunteer Agencies	All Hazards	Carried Over
C8: Flood Solution	Identify solution to Pearl Street flooding caused by poorly maintained drain on private property	Town Budget, Grants	OHSEP Director, Public Works Department	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
C9: Surface Level Solution	Identify issues associated with a potential 18" change in surface levels to the sump area, resulting from the Sherman Lake Cleanup Project	Town Budget, HMGP, FMA, PDM	OHSEP Director, Public Works Department	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	In Progress

Town of Columbia					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C10: New Pumps	Procure engineering study to consider size for new pumps	OHSEP Director, Public Works Department	Town Budget	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System,	In Progress
C11: Rehabilitate Drainage	Procure engineering study to determine solutions to storm water infiltration of sewer lines; Rehabilitate drainage structures to prevent storm water infiltration into sewer lines	OHSEP Director, Public Works Department	Town Budget, HMGP, FMA, PDM	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System,	In Progress
C12: Flooding Issues	Address flooding issues in Town Hall area	OHSEP Director, Public Works Department	Town Budget, HMGP, FMA, PDM	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System,	In Progress
C13:	Maintain Little Dove Creek	OHSEP Director, Public Works Department	Town Budget	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System,	Deleted
C14: Address Beaver Dams	Address beaver dams interfering with pump structures, possibly through use of dynamite	OHSEP Director, Public Works Department	Town Budget, Grants	(flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Deleted
C15: Resize Culverts	Resize existing 72” culverts to match 96” culverts installed by Highway Department along Highway 165	OHSEP Director, Public Works Department	Town Budget, HMGP, FMA, PDM	(flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
C16: Public Awareness	Educate the public about the hazardous materials to which they could be exposed, and help property owners identify the hazardous materials from which they are at risk	Town Budget, HMGP	OHSEP Director, Mayor’s Office	Hazardous Materials Incidents / Chemical Spills	Carried Over
C17: EMS Training	Provide additional training to EMS personnel	Town Budge	OHSEP Director, Mayor’s Office	Hazardous Materials Incidents / Chemical Spills	Deleted
C18: Retrofit Roof	Retrofit Town Hall roof	Town Budget, HMGP, PDM	OHSEP Director, Mayor’s Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	In Progress

Town of Columbia					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C19: Door Hardening	Harden bay doors of Fire Station	Town Budget, HMGP, PDM	OHSEP Director, Fire Department	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Deleted
C20: Safe Rooms	Construct or retrofit safe rooms into existing Town facilities	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Deleted
C21: Adopt Building Code	Adopt building codes that will improve resistance of new construction to high winds	Town Budget	OHSEP Director, Building Department	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Completed
C22: Assist in Drainage Improvement	Assist Parish to improve drainage ways, along the Ouachita and Boeuf Rivers, by enlarging any inferior culverts and replacing any substandard bridges along the major drainage laterals.	Parish Budget	Mayor, Parish Engineer and/or Parish Department of Public Works	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	In Progress
C23: Master Drainage Plan	Assist Parish to develop a master drainage plan, which will evaluate drainage projects at major drainage laterals to determine best method of increasing drainage capacity. Implement recommended projects resulting from drainage plan	Parish and/or Drainage Board Budget	Mayor, Parish Engineer and/or Parish Department of Public Works	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	Carried Over
C24: Back Up Generators	Assist Parish to add back-up power supply/generators and construct safe rooms at the Corey Fire Station, Sandy Bayou Fire Station, Eastside Fire Station and the Hebert Fire Station. Add back up power supply/generators at the East Columbia Water Tank and the Hebert Water Tank. Benefits: Provide safety and a source of power during power outages to continue essential operations.	Parish Budget	Mayor, OHSEP Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorm s with lightning and high winds)	Deleted

Town of Columbia					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C25: Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	Town Budget	Mayor, Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	Completed
C26: Public Awareness	Increase public awareness of hazards and hazardous areas. Distribute public awareness information regarding flood hazards, SFHA's, and potential mitigation measures using the local newspaper, utility bill inserts, inserts in the phone book, and parish hazards awareness website, and an educational program for school age children or "how to" classes in retrofitting by local merchants. Integrate "Disaster Resistance Education" into the public school curriculum. Provide public education on the importance of maintaining the ditches. Implement a public notification system, such as sirens or a call down system with a backup communication system.	Town Budget, Grant Funding	Mayors, Parish School Board, and Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds), Tornadoes	In Progress
C27: Multi-Hazard Awareness	Assist Parish to sponsor a "Multi-Hazard Awareness Week", to educate the public on hurricanes, tornadoes and severe storms (sheltering in place, evacuation, emergency preparedness, and structural retrofitting), flooding (evacuation, emergency preparedness, retrofitting, and flood insurance), thunderstorms and lightning (emergency preparedness)	Parish and Town Budges; Businesses and Industry	Mayors and Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds), Tornadoes	In Progress

Town of Columbia					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C28: Flood Proofing	Pursue elevation / acquisition / flood proofing projects and structural solutions to flooding using available grant funding for the 15 repetitive loss structures and the one repetitive target structure. Annually review and correct the Repetitive Loss List by submitting correction worksheets to FEMA.	CDBG, FMA, HMGP, SBA, USACE Section 205, and State Capital Outlay, Local Drainage Funds	Floodplain Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms)	In Progress
C29: Interior Drainage	Investigate and implement a localized interior drainage project in the repetitive loss areas, and reduce its flood potential.	CDBG, FMA, HMGP, SBA, USACE Section 205, and State Capital Outlay, Local Drainage Funds	Parish and Town Floodplain Managers / Public Works Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds), Tornadoes	In Progress
C30: Community Rating System	Participate in the "Community Rating system (CRS)" of the NFIP. Inform the public about the CRS program and the fact that it could result in a discount in Flood Insurance Premiums. Review the existing floodplain ordinance and see how it could be augmented to increase CRS potential and further reduce the flood insurance premiums.	Town Budget	Mayor, Floodplain Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds), Tornadoes	In Progress
C31: Adopt International Building Codes	Adopt the current International Building Codes by ordinance, which would result in additional techniques to harden structures.	Town Budget	Mayor, Police Jury	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorm s with lightning and high winds)	Completed

Town of Columbia					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C32: Regulate New Development	Develop and pass ordinances to help regulate new development in the Parish, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages.	Town Budget	Mayor, Planning Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	In Progress

Village of Grayson					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
G1: Warning System	Implementing a warning system for the Town (ie: NOAA all hazards radios or warning sirens)	Town Budget, HMGP	OHSEP Director, Mayor's Office	All Hazards	Carried Over
G2: Generator Installation	Install generator at Town Hall	Town Budget, HMGP	OHSEP Director, Mayor's Office	All Hazards	Carried Over
G3: Generator Installation	Install generators at 2 Fire Stations	Town Budget, HMGP	OHSEP Director, Fire Department	All Hazards	Carried Over
G4: Portable Generators	Procure portable generator(s) for sewer lift stations	Town Budget, HMGP	OHSEP Director, Public Works	All Hazards	Completed
G5: Drainage Project	Drainage project to resolve flooding issues during large rain events at private residence (Willow Creek and Highway 850 near Highway 126 area)	Town Budget, HMGP, FMA	OHSEP Director, Public Works Department	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	In Progress
G6: Elevation Project	Road elevation project for east end of Hines Street	Town Budget, HMGP, FMA	OHSEP Director, Public Works Department	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
G7: Resizing of Culvert	Resize culvert on Elmer Lane	Town Budget, HMGP, FMA	OHSEP Director, Mayor's Office, Volunteer Agencies	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
G8: Resizing of Culvert	Resize culvert on Mixon Road (gravel surface)	Town Budget, HMGP, FMA	OHSEP Director, Public Works Department	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System	Carried Over
G9: Public Education	Implement public education program specifically to address hazardous materials	Town Budget, HMGP	OHSEP Director, Public Works Department	Hazardous Materials Incidents / Chemical Spills	In Progress
G10: EMS Training	Additional training for EMS personnel	Town Budget	OHSEP Director, Mayor's Office	Hazardous Materials Incidents / Chemical Spills	Deleted

Village of Grayson					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
G11: Responding Equipment	Procure equipment to respond to hazardous materials incidents and chemical spills	Town Budget, Grants	OHSEP Director, Mayor's Office	Hazardous Materials Incidents / Chemical Spills	In Progress
G12: Roof Retrofitting	Retrofit roof of Town Hall	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	In Progress
G13: Door Hardening	Harden fire station bay doors by adding screens to reduce effects of extreme winds	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Deleted
G14: Wind Rods	Maintain wind rods on water wells	Town Budget	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	In Progress
G15: Town Hall Retrofitting	Retrofit Town Hall by hardening windows and doors	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Carried Over
G16: Safe Room	Retrofit safe room into existing Town Hall	Town Budget, HMGP, PDM	OHSEP Director, Mayor's Office	Thunderstorms Tornadoes Tropical Systems / Hurricanes	Carried Over
G17: Improve Drainage Way	Assist Parish to improve drainage ways, along the Ouachita and Boeuf Rivers, by enlarging any inferior culverts and replacing any substandard bridges along the major drainage laterals. Benefits: To ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	Parish Budget	OHSEP Director, Mayor's Office	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	Carried Over

Village of Grayson					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
G18: Master Drainage Plan	Assist Parish to develop a master drainage plan, which will evaluate drainage projects at major drainage laterals to determine best method of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at the final outfall.	Parish and/or Drainage Board Budget	Mayor, Parish Engineer and/or Parish Department of Public Works	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	In Progress
G19: Back-Up Generators	Assist Parish to add back-up power supply/generators and construct safe rooms at the Corey Fire Station, Sandy Bayou Fire Station, Eastside Fire Station and the Hebert Fire Station. Add back up power supply/generators at the East Columbia Water Tank and the Hebert Water Tank. Benefits: Provide safety and a source of power during power outages to continue essential operations.	Parish Budget	Mayor, OHSEP Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	Deleted
G20: Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	Town Budget	Mayor, Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds)	In Progress

Village of Grayson					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
G21: Public Awareness	Increase public awareness of hazards and hazardous areas. Distribute public awareness information regarding flood hazards, SFHA's, and potential mitigation measures using the local newspaper, utility bill inserts, inserts in the phone book, and parish hazards awareness website, and an educational program for school age children or "how to" classes in retrofitting by local merchants. Integrate "Disaster Resistance Education" into the public school curriculum. Provide public education on the importance of maintaining the ditches. Implement a public notification system, such as sirens or a call down system with a backup communication system.	Town Budget, Grant Funding	Mayors, Parish School Board, and Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds) Tornadoes	In Progress
G22: Multi-Hazard Awareness	Assist Parish to sponsor a "Multi-Hazard Awareness Week", to educate the public on hurricanes, tornadoes and severe storms (sheltering in place, evacuation, emergency preparedness, and structural retrofitting), flooding (evacuation, emergency preparedness, retrofitting, and flood insurance), thunderstorms and lightning (emergency preparedness).	Parish and Town Budget; Businesses and Industry	Mayors and Parish Emergency Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds) Tornadoes	In Progress

Village of Grayson					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
G23: Flood Solution Projects	Pursue elevation / acquisition / flood proofing projects and structural solutions to flooding using available grant funding for the 15 repetitive loss structures and the one repetitive target structure. Annually review and correct the Repetitive Loss List by submitting correction worksheets to FEMA.	CDBG, FMA, HMGP, SBA, USACE Section 205, and State Capital Outlay, Local Drainage Funds	Floodplain Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds),	In Progress
G24: Interior Drainage Project	Investigate and implement a localized interior drainage project in the repetitive loss areas, and reduce its flood potential	CDBG, FMA, HMGP, SBA, USACE Section 205, and State Capital Outlay, Local Drainage Funds	Parish and Town Floodplain Managers / Public Works Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds), Tornadoes	In Progress
G25: Community Rating System	Participate in the "Community Rating system (CRS)" of the NFIP. Inform the public about the CRS program and the fact that it could result in a discount in Flood Insurance Premiums. Review the existing floodplain ordinance and see how it could be augmented to increase CRS potential and further reduce the flood insurance premiums.	Town Budget	Mayor, Floodplain Manager	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds),	In Progress
G26: Adopt Building Codes	Adopt the current International Building Codes by ordinance, which would result in additional techniques to harden structures.	Town Budget	Mayor, Police Jury	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds),	Completed

Village of Grayson					
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
G27: Regulate New Development	Develop and pass ordinances to help regulate new development in the Parish, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages.	Town Budget	Mayor, Planning Director	Flooding (flash and riverine), Flooding (dam and levee failure), Hurricane / Tropical System, Severe Storms (winter storms, thunderstorms with lightning and high winds),	In Progress

Unincorporated Caldwell New Mitigation Actions

Caldwell Unincorporated - New Mitigation Actions							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	1,4	New
C2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,3,4	New
C3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,2,3,4	New
C4: Safe Room Projects	Construction of a safe room for first responders located in Caldwell Parish. Other locations will be identified based on funding availability.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	1	New

Caldwell Unincorporated - New Mitigation Actions							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, Tornadoes, Wildfires, thunderstorms (lightning, high wind, hail), Drought, and Dam and Levee failure, Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	1,2,3,4	New
C6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail)	1,2	New
C7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Lightning	1	New
C8: Warning Systems	Update/upgrade public warning system components throughout Caldwell Parish as necessary. Install audible and/or reverse 911 warning system(s).	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Levee Failure	1,2,3	New

Caldwell Unincorporated - New Mitigation Actions							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	1,2	New
C10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	1,2,3,4	New
C11: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP and Mayors	Dam Failure, Flooding	1,2,3,4	New
C12: Wildfire Ordinance	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 Years	Caldwell Parish OHSEP	Wildfire	1,4	New
C13: Drought Ordinance	Adopt ordinances requiring water-saving measures in time of Drought	FEMA HMGP, Local	1-5 Years	Caldwell Parish OHSEP	Drought	1,4	New

Town of Clarks - New Mitigation Actions

Town of Clarks							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	1,4	New
C2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,3,4	New
C3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,2,3,4	New

Town of Clarks							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C4: Safe Room Projects	Construction of a safe room for first responders located in Clarks. Other locations will be identified based on funding availability.	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	1	New
C5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Drought, and Dam and Levee failure, Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	1,2,3,4	New
C6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail)	1,2	New
C7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Lightning	1	New

Town of Clarks							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C8: Warning Systems	Update/upgrade public warning system components throughout Clarks as necessary. Install audible and/or reverse 911 warning system(s).	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure	1,2,3	New
C9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	1,2	New
C10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HGMP, Local	1-5 years	Town of Clarks/Caldwell Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	1,2,3,4	New
C11: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP and Mayors	Dam Failure, Flooding	1,2,3,4	New
C12: Wildfire Ordinance	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 Years	Town of Clarks/Caldwell Parish OHSEP	Wildfire	1,4	New
C13: Drought Ordinance	Adopt ordinances requiring water-saving measures in time of Drought	FEMA HMGP, Local	1-5 Years	Town of Clarks/Caldwell Parish OHSEP	Drought	1,4	New

Town of Columbia – New Mitigation Actions

Town of Columbia							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	1,4	New
C2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,3,4	New
C3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,2,3, 4	New

Town of Columbia							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C4: Safe Room Projects	Construction of a safe room for first responders located in Columbia. Other locations will be identified based on funding availability.	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	1	New
C5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Drought, and Dam and Levee failure, Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Flooding, Tropical Cyclone, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	1,2,3, 4	New
C6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail)	1,2	New
C7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Lightning	1	New

Town of Columbia							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
C8: Warning Systems	Update/upgrade public warning system components throughout Columbia as necessary. Install audible and/or reverse 911 warning system(s).	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure	1,2,3	New
C9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	1,2	New
C10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HGMP, Local	1-5 years	Town of Columbia/ Caldwell Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	1,2,3, 4	New
C11: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP and Mayors	Dam Failure, Flooding	1,2,3, 4	New
C12: Wildfire Ordinance	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 Years	Town of Columbia/ Caldwell Parish OHSEP	Wildfire	1,4	New
C13: Drought Ordinance	Adopt ordinances requiring water-saving measures in time of Drought	FEMA HMGP, Local	1-5 Years	Town of Columbia/ Caldwell Parish OHSEP	Drought	1,4	New

Village of Grayson – New Mitigation Actions

Village of Grayson							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
G1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	1,4	New
G2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,3,4	New
G3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Flooding, Tropical Cyclones	1,2,3,4	New
G4: Safe Room Projects	Construction of a safe room for first responders located in Grayson. Other locations	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	1	New

Village of Grayson							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
	will be identified based on funding availability.						
G5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclone, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Drought, and Dam and Levee failure, Winter Storm hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	1,2,3,4	New
G6: Generators for continuity of operations and government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail)	1,2	New
G7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Lightning	1	New
G8: Warning Systems	Update/upgrade public warning system components throughout Grayson as necessary. Install audible and/or reverse 911 warning system(s).	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure	1,2,3	New

Village of Grayson							
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
G9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	1,2	New
G10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HGMP, Local	1-5 years	Village of Grayson/Caldwell Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure	1,2,3,4	New
G11: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	FEMA HGMP, Local	1-5 years	Caldwell Parish OHSEP and Mayors	Dam Failure, Flooding	1,2,3,4	New
G12: Wildfire Ordinance	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 Years	Village of Grayson/Caldwell Parish OHSEP	Wildfire	1,4	New
G13: Drought Ordinance	Adopt ordinances requiring water-saving measures in time of Drought	FEMA HMGP, Local	1-5 Years	Village of Grayson/Caldwell Parish OHSEP	Drought	1,4	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 Caldwell 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, or political priorities within the past 5 years, with the methodology and prioritization process remaining the same.

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

Appendix A: Planning Process

Purpose

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

The Caldwell Parish Hazard Mitigation Plan Update

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

Caldwell Parish includes three incorporated municipalities that participated in the plan update process – the Town of Clarks, Town of Columbia, and Village of Grayson. Caldwell 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
1/22/2016	Initial Coordination	Telephone/ Email	No	Discuss with Parish HM coordinator and any Steering Committee members expectations and requirements of the project.
2/5/2016	Kick-Off Meeting	Columbia, LA	No	Discuss with the plan steering committee expectations and requirements of the project. Assign plan worksheets to jurisdictions.
9/14/2016	Risk Assessment Overview	Columbia, LA	No	Discuss and review the risk assessment with the steering committee discuss and review expectations for public meeting.
9/14/2016	Public Meeting	Columbia, 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 Caldwell 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 Caldwell 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/CaldwellParish
2 Week Period	Public Plan Review (Digital)		Yes	Parish Website and Caldwell 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
Plan Revision								
Data Collection								
Risk Assessment								
Public Input								
Mitigation Strategy and Actions								
Plan Review by GOHSEP and FEMA								
Plan Adoption								
Plan Approval								

Coordination

The Caldwell Parish OHSEP oversaw the coordination of the 2016 Hazard Mitigation Plan Update Steering Committee during the update process. The Caldwell 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:

- Caldwell Parish Police Jury
- Caldwell Office of Homeland Security and Emergency Preparedness
- Town of Clarks
- Town of Columbia
- Village of Grayson

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

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

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

Name	Title	Agency	Email	Address	Phone
Dale Powell	OHSEP Director	Caldwell OHSEP Office	caldwellohsep@bellsouth.net	P.O Box 1737 Columbia, LA 71418	(318) 649-3765
Richard Meredith	Mayor of Columbia	Town of Columbia	N/A	302 Pearl Street Columbia, LA 71418	(318) 649-6174
Chad Coates	Mayor of Clarks	Village of Clarks	N/A	1714 Hwy 845 Clarks, LA 71415	(318) 649-7218
Carmen Head	Mayor of Grayson	Village of Grayson	N/A	5228 Hwy 126 East Grayson, LA 71435	(318) 649-7148
Liza Rowland	Clerk	Town of Columbia	townofcolumbia@bellsouth.net	302 Pearl Street Columbia, LA 71418	(318) 649-6174
Wanda Stowe	Secretary/ Treasurer	Caldwell Police Jury	wandacppj@att.net	P.O Box 1737 Columbia, LA 71418	(318) 649-2681
Denita Temple	Assistant Administrator	Caldwell Parish E-911	caldwell911@bellsouth.net	6563 US Hwy 165 Columbia, LA 71418	(318) 649-6446
Joe Stewart	Regional Coordinator	GOHSEP	joe.stewart@la.gov	7667 Independence Blvd Baton Rouge, LA 70806	(225) 925-7500
Ellis Boothe	OHSEP Director	Catahoula OHSEP Office	catahoulaohsep@att.net	PO Box 258 Harrisonburg, LA 71340	(318) 744-5697
Dana Chapman	Assistant Director	LaSalle OHSEP Office	dchapman@lasalleso.com	North 1st Street Jena, LA 71342	(318) 992-0637

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 Caldwell 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 Caldwell 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's 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 Caldwell Parish.

Meeting #1: Coordination Discussion

Date: January 22, 2016

Location: Email

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

Public Initiation: No

Invitees Included: Caldwell Parish OHSEP, SDMI Staff

Meeting #2: Hazard Mitigation Plan Update Kick-Off

Date: February 5, 2016

Location: Columbia, 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	Email	Address	Phone
Dale Powell	OHSEP Director	Caldwell OHSEP Office	caldwellohsep@bellsouth.net	P.O Box 1737 Columbia, LA 71418	(318) 649-3765
Richard Meredith	Mayor of Columbia	Town of Columbia	N/A	302 Pearl Street Columbia, LA 71418	(318) 649-6174
Chad Coates	Mayor of Clarks	Village of Clarks	N/A	1714 Hwy 845 Clarks, LA 71415	(318) 649-7218
Carmen Head	Mayor of Grayson	Village of Grayson	N/A	5228 Hwy 126 East Grayson, LA 71435	(318) 649-7148
Liza Rowland	Clerk	Town of Columbia	townofcolumbia@bellsouth.net	302 Pearl Street Columbia, LA 71418	(318) 649-6174
Wanda Stowe	Secretary/ Treasurer	Caldwell Police Jury	wandacppj@att.net	P.O Box 1737 Columbia, LA 71418	(318) 649-2681
Denita Temple	Assistant Administrator	Caldwell Parish E-911	caldwell911@bellsouth.net	6563 US Hwy 165 Columbia, LA 71418	(318) 649-6446
Joe Stewart	Regional Coordinator	GOHSEP	joe.stewart@la.gov	7667 Independence Blvd Baton Rouge, LA 70806	(225) 925-7500
Ellis Boothe	OHSEP Director	Catahoula OHSEP Office	catahoulaohsep@att.net	PO Box 258 Harrisonburg, LA 71340	(318) 744-5697
Dana Chapman	Assistant Director	LaSalle OHSEP Office	dchapman@lasalleso.com	North 1st Street Jena, LA 71342	(318) 992-0637

Meeting #3: Risk Assessment Overview

Date: September 14, 2016

Location: Columbia, 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	Email	Address	Phone
Dale Powell	OHSEP Director	Caldwell OHSEP Office	caldwellohsep@bellsouth.net	P.O Box 1737 Columbia, LA 71418	(318) 649-3765
Richard Meredith	Mayor of Columbia	Town of Columbia	N/A	302 Pearl Street Columbia, LA 71418	(318) 649-6174
Chad Coates	Mayor of Clarks	Village of Clarks	N/A	1714 Hwy 845 Clarks, LA 71415	(318) 649-7218
Carmen Head	Mayor of Grayson	Village of Grayson	N/A	5228 Hwy 126 East Grayson, LA 71435	(318) 649-7148
Liza Rowland	Clerk	Town of Columbia	townofcolumbia@bellsouth.net	302 Pearl Street Columbia, LA 71418	(318) 649-6174
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Denita Temple	Assistant Administrator	Caldwell Parish E-911	caldwell911@bellsouth.net	6563 US Hwy 165 Columbia, LA 71418	(318) 649-6446
Joe Stewart	Regional Coordinator	GOHSEP	joe.stewart@la.gov	7667 Independence Blvd Baton Rouge, LA 70806	(225) 925-7500
Ellis Boothe	OHSEP Director	Catahoula OHSEP Office	catahoulaohsep@att.net	PO Box 258 Harrisonburg, LA 71340	(318) 744-5697
Dana Chapman	Assistant Director	LaSalle OHSEP Office	dchapman@lasalleso.com	North 1st Street Jena, LA 71342	(318) 992-0637

Meeting #4: Public Meeting

Date: September 14, 2016

Location: Columbia, 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 Caldwell Parish communities were provided for the meeting attendees to identify specific areas where localized hazards occur.

Public Initiation: Yes

Invitees Included:

Name	Title	Agency	Email	Address	Phone
Dale Powell	OHSEP Director	Caldwell OHSEP Office	caldwellohsep@bellsouth.net	P.O Box 1737 Columbia, LA 71418	(318) 649-3765
Richard Meredith	Mayor of Columbia	Town of Columbia	N/A	302 Pearl Street Columbia, LA 71418	(318) 649-6174
Chad Coates	Mayor of Clarks	Village of Clarks	N/A	1714 Hwy 845 Clarks, LA 71415	(318) 649-7218
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Dana Chapman	Assistant Director	LaSalle OHSEP Office	dchapman@lasalleso.com	North 1st Street Jena, LA 71342	(318) 992-0637

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

Meeting Public Notice

CALDWELL PARISH
OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

MEETING NOTICE – September 14, 2016

Caldwell Parish to hold Public Meetings for Hazard Mitigation Plan Update

Columbia, LA – Caldwell Parish Office of Homeland Security & Emergency Preparedness is in the process of updating the Caldwell Parish Hazard Mitigation Plan and are required to hold public meetings on the plan update. The Public meeting will be held on September 14, 2016 in the Caldwell Parish Courthouse Meeting Room located at 201 Main Street, Columbia, LA from 11:30AM to 12:30PM.

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

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

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

Caldwell Parish is in the beginning stages of updating its hazard mitigation plan. Public meeting will be held on September 14, 2016 for all citizens interested in learning about and participating in discussions concerning the Caldwell Parish Hazard Mitigation Plan.

Residents of Caldwell 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/CaldwellParish

For more information, please contact: Dale Powell, OHSEP Director – caldwellohsep@bellsouth.net

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

Outreach Activity #1: Public Opinion Survey

Date: Ongoing throughout planning process
Location: Web Survey
Public Initiation: Yes

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.

Public Plan Review Documentation

The Caldwell Parish Hazard Mitigation Draft Plan was placed on the Caldwell 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 was collected at this time.

Appendix B: Plan Maintenance

Purpose

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

Monitoring, Evaluating, and Updating the Plan

The Caldwell 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

Caldwell 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

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

- Ordinances, Resolutions, Regulations
- Floodplain Ordinances
- Emergency Operations Plan
- Comprehensive Master Plan
- Economic Development Plan
- Continuity of Operations Plan

Opportunities to integrate the requirements of this plan into other local planning mechanisms will continue to be identified through future meetings of the Caldwell 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

Caldwell Parish Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability within the parish.

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

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

On behalf of the jurisdictions of the Town of Clarks, Town of Columbia, and Village of Grayson, Caldwell 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:

Caldwell Unincorporated
Comprehensive Master Plan/Updated as needed/Caldwell Parish Police Jury
Economic Development Plan/Updated as needed/Caldwell Parish Police Jury
Local Emergency Operations Plan/Updated as needed/Caldwell Parish OHSEP
Continuity of Operations Plan/Updated as needed/Caldwell Parish OHSEP
Transportation Plan/Updated as needed/ Caldwell Parish Police Jury

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

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

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

Continued Public Participation

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

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

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Appendix C: Essential Facilities

Caldwell Parish Essential Facilities – All Jurisdictions

Caldwell Unincorporated Essential Facilities											
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfire	Winter Storms*	Dam Failure+
Fire and Rescue	Columbia Heights Volunteer Fire Dept			X	X	X	X	X	X		
	East Columbia Volunteer Fire Dept		X	X	X	X	X	X	X		
	Fire Station			X	X	X	X	X			
	Ward 5 Fire Department			X	X	X	X	X	X		
	Fire Station		X	X	X	X	X	X	X		
	Fire Lookout Tower			X	X	X	X	X	X		
	Edgar Volunteer Fire Department - Edgar Howard Memorial Station		X	X	X	X	X	X			
Government	Caldwell Parish Public Works			X	X	X	X	X	X		
	Columbia Development Center			X	X	X	X	X	X		
	Columbia Project Engineer Office		X	X	X	X	X	X	X		
	East Columbia Water System		X	X	X	X	X	X	X		
Schools	Columbia High School		X	X	X	X	X	X			
	Union Central Elementary			X	X	X	X	X			

Clarks Essential Facilities											
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfire	Winter Storms*	Dam Failure+
Fire and Rescue	Clarks Volunteer Fire Station			X	X	X	X	X	X		
Government	Clarks Community Center		X	X	X	X	X	X			
	Clarks Town Hall			X	X	X	X	X			

Columbia Essential Facilities											
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfire	Winter Storms*	Dam Failure+
Fire and Rescue	Fire Station			X	X	X	X	X	X		
Government	Caldwell Parish Courthouse			X	X	X	X	X			
	Columbia Town Hall			X	X	X	X	X	X		
	Caldwell Parish School Board			X	X	X	X	X			
Law Enforcement	Caldwell Parish Sheriff's Office			X	X	X	X	X			
	Columbia Police Department			X	X	X	X	X	X		
Public Health	Caldwell Memorial Hospital			X	X	X	X	X	X		
Schools	Columbia Elementary			X	X	X	X	X			

Grayson Essential Facilities											
Type	Name	Drought*	Flooding	Hail	Lightning	Wind	Tornadoes	Tropical Cyclones	Wildfire	Winter Storms*	Dam Failure+
Fire and Rescue	Grayson Volunteer Fire Department			X	X	X	X	X	X		
	Grayson Volunteer Fire Dept Station 2			X	X	X	X	X	X		
Government	Village of Grayson Municipal Complex		X	X	X	X	X	X	X		
	Village of Grayson Sewage and Water Maintenance			X	X	X	X	X	X		
Law Enforcement	Grayson Police Department			X	X	X	X	X	X		
Schools	Grayson High School		X	X	X	X	X	X			

* Hazard does not impact any critical facility

+ Unknown due to data deficiency

Appendix D: Plan Adoption

On motion by Lanny Dark, seconded by Kenneth Graham, the following resolution was offered:

RESOLUTION 16-139

BE IT RESOLVED BY the Police Jury of the Parish of Caldwell, State of Louisiana in regular session duly convened on this 17th day of November 2016 that this Police Jury does hereby agree to adopt the Caldwell Parish Hazard Mitigation Plan update 2016 as written.

Resolution adopted on this 17th day of November 2016 with the following vote recorded:

YEAS: 6

NAYS: 0

ABSENT: Manuel Escalon

Ben Clark
President

Wanda Stowe
Secretary-Treasurer

* * *

I, Wanda Stowe, Secretary/Treasurer of the Caldwell Parish Police Jury, do hereby certify that the above is a true and correct copy of minutes adopted by said Police Jury during a Public Hearing held on the 17th day of November 2016, in accordance with the laws of the State of Louisiana, Parish of Caldwell.

GIVEN UNDER MY HAND AND SEAL OF OFFICE ON THIS 18th DAY OF NOVEMBER 2016.

Wanda Stowe
Wanda Stowe Secretary/Treasurer

SEAL

(FAX) P.001/001

Alderman
Margie Fisher
Patsy Fisher
Jason Morris
Krissy Jolly
Shawn Guinn

TOWN OF CLARKS
1714 Hwy 845
P.O. Box 360
Clarks LA 71415
PH (318) 649-7218 - FAX (318) 649-7215
Email: dreamcity@bellsouth.net

Mayor
Chad Coates

Clerk
Carolyn May

RESOLUTION # 01 - 17

WHEREAS, The Town of Clarks has experienced severe damages from natural disasters on many occasions, resulting in property damage, loss of life, economic hardship, and threats to public health and safety: and

WHEREAS, a hazard mitigation plan has been developed after more than a year of research and work by the Town of Clarks: and

WHEREAS, the plan recommends many hazard mitigation actions that will protect both people and property affected by the hazards that threaten the Town of Clarks.

Passed and Approved by the Town of Clarks on March 14, 2017.

CHAD COATES
MAYOR

RESOLUTION

A RESOLUTION ADOPTING THE CALDWELL PARISH HAZARD MITIGATION PLAN 2016

WHEREAS, the Caldwell Parish Police Jury has prepared a multi-hazard mitigation plan hereby known as the CALDWELL PARISH HAZARD MITIGATION PLAN 2016 in accordance with the Disaster Mitigation Act of 2000; and

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

WHEREAS, the Town of Columbia is participating in the Hazard Mitigation Plan prepared by the Caldwell Parish Government under the oversight of a Steering Committee comprised of Parish-Wide Representatives;

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

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

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

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

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

Therefore, the Town of Columbia does hereby adopt the Caldwell Parish Hazard Mitigation Plan Update 2016.

Passed and Approved by the Town of Columbia on November 21, 2016.
Yeas: Penny Brown, Sonja Carroll, Bonnie Crockett, Hannah Springer and James Stuart.

Nays: None

Absent: None

Liza Rowland, Clerk

Richard Meredith, Mayor

Village of Grayson

Town Council
Wes Burns
Sandra Evans
Jimmy Whittington

Mayor
Carmen Head

Chief of Police
Mitch Bratton
Town Clerk
Ellen Scribner

RECEIVED MAR 21 2017

RESOLUTION

A RESOLUTION ADOPTING THE CALDWELL PARISH HAZARD MITIGATION PLAN 2016

WHEREAS, the Caldwell Parish Police Jury has prepared a multi-hazard mitigation plan hereby known as the CALDWELL PARISH HAZARD MITIGATIO PLAN 2016 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Village of Grayson has participated in the process to prepare a DMA complaint Hazard Mitigation Plan based on the FEMA guidance available in the How To Guides;

WHEREAS, the Village of Grayson is participating in the Hazard Mitigation Plan prepared by the Caldwell Parish Government under the oversight of a Steering Committee comprised of Parish-Wide Representatives;

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

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

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

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

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

Therefore, the Village of Grayson does hereby adopt the Caldwell Parish Hazard Mitigation Plan Update 2016.

Passed and Approved by the Village of Grayson on March 14, 2017.
Yeas: 2
Nays: 0
Absent: 1

Ellen Scribner, Clerk

Carmen Head, Mayor

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	Email	Address	Phone
Dale Powell	OHSEP Director	Caldwell OHSEP Office	caldwellohsep@bellsouth.net	P.O Box 1737 Columbia, LA 71418	(318) 649-3765
Richard Meredith	Mayor of Columbia	Town of Columbia	N/A	302 Pearl Street Columbia, LA 71418	(318) 649-6174
Chad Coates	Mayor of Clarks	Village of Clarks	N/A	1714 Hwy 845 Clarks, LA 71415	(318) 649-7218
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Dana Chapman	Assistant Director	LaSalle OHSEP Office	dchapman@lasalleso.com	North 1st Street Jena, LA 71342	(318) 992-0637

Capability Assessment

Caldwell Parish

Worksheet 4.1: Capability Assessment Worksheet		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
Planning and Regulatory		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
Caldwell Parish		
Plans	Yes/No	Comments
Comprehensive / Master Plan	Yes	
Capital Improvements Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	Yes	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)		
Building Code, Permitting and Inspections		
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
Land Use Planning and Ordinances		
Zoning Ordinance	No	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, Wildfires)	No	

Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	No	
Other		

Administration and Technical

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

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

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Stormwater Utility Fee	Yes	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	Yes	
Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	
Natural Disaster or safety related school program	No	
Storm Ready certification	Yes	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

Town of Clarks

Worksheet 4.1: Capability Assessment Worksheet

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

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

Clarks

Plans	Yes/No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
Building Code, Permitting and Inspections		
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
Land Use Planning and Ordinances		
Zoning Ordinance	Yes	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, Wildfires)	No	

Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	No	
Other		

Administration and Technical

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

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

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	Yes	
Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	Use parish
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	
Natural Disaster or safety related school program	No	
Storm Ready certification	Yes	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other		

Town of Columbia

Worksheet 4.1: Capability Assessment Worksheet

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to
implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

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

Columbia

Plans	Yes/No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
Building Code, Permitting and Inspections		
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
Land Use Planning and Ordinances		
Zoning Ordinance	Yes	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	

Natural Hazard Specific Ordinance (stormwater, steep slope, Wildfires)	No	
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	No	
Other		

Administration and Technical

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

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

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	Yes	
Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	Use Parish
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	
Natural Disaster or safety related school program	No	
Storm Ready certification	Yes	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

Village of Grayson

Worksheet 4.1: Capability Assessment Worksheet

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to
implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

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

Grayson

Plans	Yes/No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)		
Building Code, Permitting and Inspections		
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
Land Use Planning and Ordinances		
Zoning Ordinance	Yes	
Subdivision Ordinance		
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, Wildfires)	No	

Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	No	
Other		

Administration and Technical

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

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

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	Yes	
Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	
Natural Disaster or safety related school program	No	
Storm Ready certification	Yes	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	

Building Inventory

Critical Facility (If Yes, Mark X)	Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Const. Type
Caldwell									
X	Columbia Heights Volunteer Fire Department	Fire Search and Rescue		Kelly	32.07602626	-92.09431365	$26,700.00	1960	Metal
X	Grayson Volunteer Fire Department	Fire Search and Rescue		Kelly	32.05141905	-92.10960649	$18,375.00	1970	Metal
X	Clarks Volunteer Fire Station	Fire Search and Rescue		Clarks	32.02700265	-92.13891904	$20,250.00	1960	Metal
X	Caldwell Parish Sheriff	Law Enforcement	201 Main Street #2	Columbia	32.105359	-92.075365	$50,085.00	1960	
	Columbia Elementary	Education		Columbia	32.10304246	-92.07490878	$650,160.00	1975	metal
	Columbia High School	Education		Columbia	32.06021858	-92.09659859	$923,535.00	1970	metal
	Union Central Elementary	Education	649 Louisiana 849	Columbia	32.07621922	-92.07971745	$454,950.00	1970	metal
X	Fire Station	Fire Search and Rescue	500 Boyd	Columbia	32.10469495	-92.07928103	$11,100.00	1980	metal
X	East Columbia Volunteer Fire Department	Fire Search and Rescue	Nearby: 100-128 Community Center Street	Columbia	32.11220661	-92.07103857	$19,200.00	1980	metal
X	Ward 5 Fire Department	Fire Search and Rescue	Nearby: Louisiana 846	Columbia	32.1483687	-92.15815262	$11,700.00	1975	Metal
X	Edgar Volunter Fire Department - Edgar Howard Memorial Station	Fire Search and Rescue	Nearby: 434-442 Edgar Road	Columbia	32.20019765	-92.00882015	$21,975.00	1990	Metal
X	Fire Lookout Tower	Fire Search and Rescue	Nearby: 9400-9598 Louisiana 846	Columbia	32.12270226	-92.17168349	$525.00	1990	Metal
X	Caldwell Parish Courthouse	Civil Government	201 Main Street #1	Columbia	32.1056227	-92.07448223	$39,015.00	1960	Concrete
	Caldwell Parish School Board	Civil Government	Caldwell Parish School Board	Columbia	32.10511341	-92.0748678		1965	
X	Caldwell Parish Public Works	Civil Government	Nearby: Louisiana 4	Columbia	32.07767966	-92.10897856	$51,350.00	1970	metal
	Columbia Project Engineer Office	Civil Government	343 Ball Park Road	Columbia	32.11031621	-92.07439464	$15,255.00	1960	Concrete
	East Columbia Water System - Bill Payment Office	Civil Government		Columbia	32.11887432	-92.06599973	$485,775.00	1960	Metal
	Grayson High School	Education	Nearby: 148-174 Carrie Street	Grayson	32.04869332	-92.10877084	$478,710.00	1980	Concrete

X	Grayson Volunteer Fire Department Station 2	Fire Search and Rescue	Nearby: Highway 126	Grayson	32.04965792	-92.10812834	$15,075.00	1980	Concrete
X	Fire Station	Fire Search and Rescue	5228 Highway 126	Grayson	31.97914799	-91.96246522	$11,700.00	1975	Metal
Clarks									
X	Clarks Town Hall	Civil Government	Nearby: Main Street	Clarks	32.02650168	-92.13942249	$73,305.00	1950	Metal
	Clarks Community Center	Civil Government	Nearby: Main Street	Clarks	32.02657973	-92.13942754	$73,305.00	1975	Metal
Columbia									
X	Columbia Town Hall	Civil Government	Nearby: 302 Pearl Street	Columbia	32.10567612	-92.07397518	$31,590.00	1940	Concrete
	Village Of Grayson Sewerage & Water Maintenance	Civil Government	Nearby: 116-198 Short Oak	Columbia	32.05363974	-92.10989829	$24,300.00	1960	metal
Grayson									
X	Village of Grayson Municipal Complex	Civil Government	Nearby: Highway 126	Grayson	32.04956192	-92.10790742	$46,980.00	1945	Concrete

Vulnerable Populations

Vulnerable Populations Worksheet

Caldwell Parish

Name	Street	City	Zip Code	Latitude	Longitude
All Hospitals (Private or Public)					
Caldwell Memorial Hospital		Columbia	71418	32.103625	-92.07576005
Citizen's Medical Center	7939 U.S. 165	Columbia	71418	32.07746584	-92.0945458
Nursing Homes (Private or Public)					
Haven Nursing Center	7726 U.S. 165	Columbia	71418	32.08270495	-92.09367588
Mobile Home Parks					
Byrds Park	Nearby: 301-415 Margaret Lane	Grayson	71435	32.0385305	-92.11793899
Riverton Mobile Home Park	Nearby: 501 Riverton Camp Road	Columbia	71418	32.17883762	-92.10842833

National Flood Insurance Program (NFIP)

Caldwell Parish

ELEMENT F: STATE REQUIREMENT
National Flood Insurance Program (NFIP)

Jurisdiction: Caldwell

	Caldwell Parish	Clarks	Columbia	Grayson
Insurance Summary				
How many NFIP polices are in the community? What is the total premium and coverage?	404, $312,944 Premium, $43,436,500 Coverage	3, $801 Premiums, $465,000 Coverage	14, $9,245 Premium, $2,335,700 Coverage	3, $832 Premium, $458,000 Coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	475, $3,641,430, Unknown	1, $28,312, Unknown	16, $239,854, Unknown	None
How many structures are exposed to flood risk with in the community?	404	3	14	3
Describe any areas of flood risk with limited NFIP policy coverage.	None Known	None Known	None Known	None Known
Staff Resources				
Is the Community FPA or NFIP Coordinator certified?	Yes	Yes	Yes	Yes
Is flood plain management an auxiliary function?	Yes	Yes	Yes	Yes

Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	NFPI administration includes outreach and education, inspections, and permit review.	NFPI administration includes outreach and education, inspections, and permit review.	NFPI administration includes outreach and education, inspections, and permit review.	NFPI administration includes outreach and education, inspections, and permit review.
What are the barriers to running an effective NFIP program in the community, if any?	Funding and manpower	funding	staffing and funding	staffing and funding
Compliance History				
Is the community in good standing with the NFIP?	Yes	Yes	Yes	Yes
Are there any outstanding compliance issues(i.e., current violations)?	None Known	None Known	None Known	None Known
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact(CAC)?	Unknown	Unknown	Unknown	Unknown
Is a CAV or CAC scheduled or needed? If so when?	No	No	No	No
Regulation				
When did the community enter the NFIP?	4/3/1978	11/1/2010	6/1/1978	7/9/1981
Are the FIRMs digital or paper?	Both	Both	Both	Both
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meets Minimum	Meets Minimum	Meets Minimum	Meets Minimum
Community Rating System (CRS)				
Does the community participate in CRS?	No	No	No	No
What is the community's CRS Class Ranking?	N/A	N/A	N/A	N/A
Does the plan include CRS planning requirements?	N/A	N/A	N/A	N/A