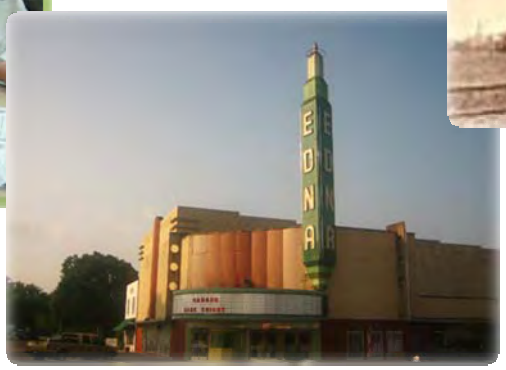
JACKSON COUNTY

HAZARD MITIGATION PLAN UPDATE

2011 - 2016



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INTRODUCTION

Background

Jackson County is considered one of the original counties of Texas, formed on March 17, 1836 from the old Mexican municipality of Jackson. Both the municipality and county were named after President Andrew Jackson and were settled predominantly by American colonists. Jackson County sits on the Gulf-Coast region of Texas and is known for its heritage, culture, and tourism.

Jackson County is committed to providing the highest level of service to its citizens, and planning is integral in realizing this goal.

While it is impossible to prevent a hazard event from occurring, the impact of hazards can be lessened in terms of their effect on people and property. This concept is known as hazard mitigation, which is defined by the Federal Emergency Management Agency (FEMA) as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*[1]. Communities participate in hazard mitigation by developing hazard mitigation plans. The Texas Division of Emergency Management (TDEM) and FEMA have authority to review and approve of hazard mitigation plans through the Disaster Mitigation Act of 2000.

Jackson County is sponsoring the development of a county-wide, multi-jurisdictional Hazard Mitigation Plan Update ("Plan Update" or "Plan") that addresses natural hazards that could potentially affect the area by conducting an update of the 2004, FEMA-approved Hazard Mitigation Plan. The purpose of the Plan Update is to revise mitigation actions and the risk assessment for the county. The Plan will also be an opportunity to evaluate successful mitigation actions and to explore other means of avoiding future disaster loss. Once approved, the Plan will

[1] www.fema.gov

allow the County and participating jurisdictions to leverage funding under FEMA grant programs.

Scope

This Hazard Mitigation Action Plan Update for Jackson County includes the following planning participants:

- Jackson County
- City of Edna
- City of Ganado
- City of La Ward
- Edna Independent School District
- Industrial Independent School District
- Jackson County Hospital District
- Lavaca-Navidad River Authority (LNRA)

The Plan is intended as a blueprint for future hazard mitigation for the communities that are participating in the Plan Update that took part in the initial, 2004 Plan (Edna, Ganado, La Ward and the LNRA), as well as those entities for which this will be an initial mitigation plan: Edna ISD, Industrial ISD, and the Jackson County Hospital District. This Plan is designed to help maintain a sustainable community that, when confronted by natural disasters, will sustain fewer losses and recover more quickly.

The focus of the Plan is to mitigate those hazards classified as "high" or "moderate" risk as determined through a detailed hazard risk assessment conducted for Jackson County. Hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables mitigation actions to be prioritized based on hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes all unincorporated areas within Jackson County.

Purpose

The overarching goal of the Plan Update is to minimize or eliminate long-term risks to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. The purpose is twofold: to protect people and structures, and to minimize the costs of disaster response and recovery.

Through this Plan Update, the participating entities seek to:

- Create a comprehensive HMAP Update;
- Minimize disruption following a disaster;
- Streamline disaster recovery by articulating actions to be taken before a disaster strikes to reduce or eliminate future damage;
- Demonstrate a firm local commitment to hazard mitigation principles;
- Serve as a basis for future funding that may become available through grant and technical assistance programs offered by the State or Federal government; and
- Ensure that planning participants maintain their eligibility for the full range of future Federal disaster relief.

Authority

The Plan will be tailored specifically for Jackson County and the Cities of Edna, Ganado, and La Ward and their planning partners: Edna ISD, Industrial ISD, the LNRA, and the Jackson County Hospital District. When complete, the Plan Update will comply with all requirements promulgated by the TDEM and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). It will also comply with FEMA's February 26, 2002 Interim Final Rule ("the Rule") at 44 CFR Part 201 which specifies the criteria for approval of mitigation plans required in Section 322 of the DMA 2000, and follow the guidelines established in FEMA's "Local Multi-Hazard Mitigation Planning Guidance" dated July 1, 2008. The updated plan will also be developed in accordance with FEMA's Community Rating System (CRS) Floodplain Management Plan standards and policies.

Summary of Sections

Sections 1 and 2 of the Plan outline the purpose and the process of development. Section 3 describes Jackson County region in terms of population and demographics among other subjects. This section is designed to provide a snapshot of the community and planning area to assist officials in recognizing factors that play a role in determining community vulnerability to hazards.

Section 4 begins the Risk Assessment and identifies the hazards facing the participating communities. Sections 5 and 6 complete the Risk and Vulnerability Assessment by profiling, analyzing and assessing the natural hazards that present an overall risk to Jackson County.

Section 7 discusses mitigation strategy and consists of broad mitigation goal statements as well as an analysis of hazard mitigation techniques for the county to consider in reducing hazard vulnerabilities. The specific local mitigation actions are found in Section 8.

Section 9 identifies plan maintenance procedures. This includes the measures that each jurisdiction will take to ensure the continuous long-term implementation of the Plan. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

Appendix A contains the results of public survey results and documentation and meeting notices are found in Appendix B.

Planning Process

Plan Preparation and Development

Mitigation planning involves bringing together multiple components and players to create a more disaster-resistant community. This section provides an overview of the planning process, highlighting key steps as well as providing a detailed description of how stakeholders and the public were involved.

Overview of the Plan Update

Jackson County received funding in 2010 to update the 2004 Hazard Mitigation Plan for the County and participating jurisdictions and entities. The purpose of this

Plan Update (hereinafter referred to as "Plan" or "Plan Update") is to meet FEMA's requirement to provide updated hazard mitigation plans every five (5) years.

Although many of the natural hazards that affect Jackson County are the same as those identified in the 2004 Plan, an update is necessary to take into account all modified or revised data from the past five years, including evolving demographics and mitigation strategies. This Plan Update began in January of 2011. The County solicited bids and hired the consultant team of H2O Partners, Inc. In developing the Plan the consultant team used the July 2008 "*Local Multi-Hazard Mitigation Planning Guidance*" to exceed the Interim Final Rule for Local Mitigation Planning found in 44 CFR 201.6. According to 44 CFR §201.6(d)(3), the updated plan must contain a description of the process used to revise each section of the plan.

At the workshops held throughout the planning process described herein, the following factors were taken into consideration when reviewing and updating the 2004 Plan:

- Whether the goals address current and expected conditions;
- If the nature/magnitude of risks have changed;
- If there are current resources appropriate for implementing the Plan;
- Whether implementation problems, such as technical, political, legal or coordination issues hinder development;
- If outcomes have occurred as expected; and
- How communities, agencies and partners participated in the implementation process.

Planning Process

Planning Team

The planning team was established using a direct representation model. Key members of H2O Partners, Inc. developed the plan, corresponding with the county who acted as Direct Representatives for participants from each participating

jurisdictions. These planning team members as well as a list of stakeholders can be found in Table 2-1.

Table 2-1. Planning Team Members

Planning Participant	Office Responsible
Jackson County	Emergency Management Coordinator / County Auditor
City of Edna	Chief of Police
City of Ganado	City Administrator
City of La Ward	Mayor
Lavaca-Navidad River Authority	Emergency Manager
Edna Independent School District	Superintendent
Industrial Independent School District	Chief Administrator
Jackson County Hospital District	Director

Some of the responsibilities of the planning team included: providing input regarding the identification of hazards, revising mitigation goals to reflect modified conditions, and developing new mitigation strategies. Planning team members completed Hazard Ranking sheets, prioritizing hazards identified in the Plan Update. This task enabled Planning Team members to begin developing projects and mitigation actions to include in the plan based on their ranking of natural hazards facing the Jackson County area. New to the discussion of mitigation actions for the Jackson County Plan Update is the dual-purpose community safe room/shelter initiative at Edna ISD. The primary objective of the safe room is to protect students and the public in the event of a hurricane, which is one of the top hazards facing this inner coastal County.

For the Plan Update, renewed emphasis was placed on developing mitigation actions pertaining to wildfire and drought, with this region experiencing record-breaking drought and ongoing concern for local and county-wide fire threat. Each planning team member is also responsible for ensuring that their jurisdiction formally adopts the plan update pending FEMA approval.

Representatives from each jurisdiction were chosen based on their role in the community. Generally, members' experience and background include emergency service and support, administrative, and decision-making personnel in the community. These key positions may extend to and include those individuals involved in code enforcement, floodplain management, building inspections, planning and development, utility services, road and bridge, permitting, and public works. Many times these roles overlap and stakeholders are tasked with more than one of the above-mentioned duties, particularly in smaller jurisdictions. These ancillary roles are critical to the planning process since these individuals interface directly with residents, through permitting or utility customer service, for example, affording the opportunity to assess problems and needs as a result of natural hazards affecting the community.

Planning Process

The process used to prepare this Plan included four major steps that were applied beginning in January 2011. Each of these planning steps resulted in critical work products and outcomes that collectively make up the updated plan. Documentation for participation at each workshop is found in Appendix B.

Kickoff Workshop

The initial Kickoff Meeting was held at the Jackson County Office of Emergency Management in Edna, Texas on January 27, 2011. This initial meeting was an opportunity to not only inform participating communities that were involved in the initial 2004 Plan about the planning process and their distinct roles and responsibilities, but also to involve stakeholder groups such as Industrial and Edna Independent School Districts and Jackson County Hospital, that were new to the planning process. In addition to the Kickoff presentation, all communities present received presentation folders with the following information:

- background paperwork about the plan update;
- public participation survey for distribution; and
- capability assessment survey for completion

Hazard Identification

At the close of the Kickoff Meeting, the Planning Team conducted preliminary hazard identification. The group reviewed and considered a full range of natural and man-caused hazards, then narrowed the list to significant hazards by reviewing the 2004 Plan, the State of Texas Hazard Mitigation Plan, and initial results from reputable sources such as federal and state agencies. Based on this initial analysis, the team identified a total of seven natural hazards that could affect the area.

Risk Assessment

An initial risk assessment for the County was completed in February 2011. The results of the assessment were presented at workshop for the county held on February 24, 2011. Participants and stakeholder groups were invited to the Risk Assessment Workshop. At this workshop, the characteristics and consequences of each hazard were evaluated to determine how much of the area would be affected, in terms of potential danger to property and citizens.

Planning Team Members attend a Kickoff Workshop on 1/27/11

Each planning team member was also given a risk ranking sheet at the Risk Assessment Workshops in order to reflect unique and varied risks among jurisdictions. Participants ranked hazards in terms of the probability or frequency of occurrence, extent of spatial impact, and magnitude of impact.

The assessments were also used to set priorities for mitigation based on potential dollar losses and loss of lives. A hazard profile and vulnerability analysis for each of the seven hazards can be found in Sections 4-6 of this Plan Update.

Mitigation Review and Development

The mitigation strategy development for the Plan Update involved revising mitigation goals included in the 2004 Plan, providing analyses for past actions and developing new mitigation actions. A Mitigation Workshop was held at the County

Emergency Operations Center in conjunction with the Risk Workshop on February 24, 2011. Stakeholders and the general public were invited to a public meeting the same evening.

At the Mitigation Workshop, after an initial presentation regarding types and examples of actions and the importance of mitigation planning, participants were asked to review the mitigation goals and objectives from the 2004 Plan and determine what changes, if any, should be made. At the workshop the consensus among participants was to retain mitigation goals and objectives from the 2004 Plan, but to vary the order in which the goals are presented in terms of priority. For a detailed review of the mitigation goals and objectives please see Section 7.

Each participant that was involved with the 2004 Plan received a copy of their mitigation actions submitted for the 2004 Plan, and provided an analysis for the 2011 Update. This analysis included stating whether each past action had been completed or would be deferred for the next five years. If an action was determined impracticable or unattainable, comments were included to delete the action. The analysis of each action can be found in Section 8.

An inclusive and structured process was used to develop and prioritize new mitigation actions for this plan update. It included the following steps:

- Review of the mitigation goals and objectives from the 2004 Plan.
- A "menu" of optional mitigation actions was developed based on plan reviews, studies, and interviews with Federal, state and local officials. The participants reviewed the optional mitigation actions and narrowed the list down to those that were most applicable to their area of responsibility, most cost-effective in reducing risk, could be implemented easily, and would be likely to receive institutional and community support.
- Potential Federal and State funding sources to assist implementing proposed actions were inventoried. Information was collected including the program name authority, purpose of the program, types of assistance and eligible projects, conditions on funding, types of hazards covered, matching requirements, application deadlines, and a point of contact.
- Mitigation Planning Team members considered benefits that would result from the mitigation actions versus the cost of those projects. Detailed cost-benefit analyses were beyond the scope of this plan. However, economic evaluation was one factor that helped Team members select one mitigation action from competing actions.
- Team members then selected and prioritized mitigation actions.

Each Team member evaluated the mitigation action of their own jurisdiction as well as the county's actions found in Section 8. The prioritization method was based on FEMA's STAPLE+E criteria and included social, technical, administrative, political, legal, economic and environmental considerations. As a result of this exercise, an overall priority was assigned to each mitigation action by each Team member. The overall priority of each action as well as the STAPLE+E prioritization is found in the mitigation actions located in Section 8.

Team members developed action plans identifying proposed actions, costs and benefits, the responsible organization(s), effects on new and existing buildings, implementation schedule, priority, and potential funding sources.

A copy of the Plan will be made available to the planning team and the general public for inspection, review and comment.

Review and Incorporation of Existing Plans

Review

A variety of existing studies, plans, reports, and technical information were reviewed as part of the planning process. Sources of the information included FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, National Oceanic and Atmospheric Administration (NOAA), the Texas Water Development Board (TWDB), the Texas Commission on Environmental Quality (TCEQ), the State Comptroller, the Texas State Data Center, Texas Forest Service, the Texas Division of Emergency Management (TDEM), and local hazard assessments and plans.

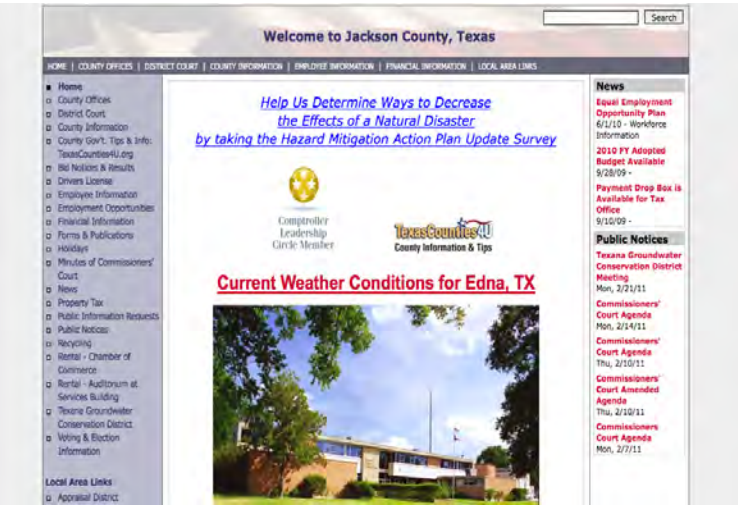
Some of these documents, including those from FEMA, provided information on risk, existing mitigation actions currently underway, and ideas for possible future mitigation actions. Other documents, including those from NOAA, provided histories of disasters in the area. The USACE studies were compiled by participating entities and included in capability surveys. Materials from FEMA and TDEM were reviewed for guidance on plan development requirements. Communities included actions from other plans, such as Floodplain Management Plans and developed actions to implement and incorporate other plans such as Capital Improvement Plans.

Incorporation of Existing Plans

Current projects and studies from the USACE were utilized as a starting point for discussing mitigation actions among the jurisdictions. Previous hazard events, occurrences and descriptions were identified through NOAA's National Climatic Data Center (NCDC). Results of past hazard events were found through searching the NCDC and included in hazard sections (4-6) of this Plan Update. The preliminary results were also presented at the Risk Assessment Workshop held in February of 2011 in order to facilitate a discussion on risk to help participants appropriately rank hazards for their jurisdiction. The Water Development Board studies were reviewed for population and other projections and included. Further, these studies were used as a starting point for suggesting grant and mitigation activities based on flood-related funding availability. Information from the Texas Forest Service was used to appropriately rank the wildfire hazard and to help identify potential grant opportunities. The State of Texas Mitigation Plan, developed by TDEM, was reviewed in initial planning meetings in order to develop a specific group of hazards to address in the planning effort. The State Plan was also used as guidance document, along with FEMA materials, in the development of the Plan Update.

Public and Stakeholder Involvement

An important component of mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the planning team with a greater understanding of local concerns and increases the likelihood of successfully implemented mitigation actions. If citizens and stakeholders, such as local businesses, non-profits, hospitals and schools, are involved, they are more likely to gain a greater appreciation of the hazards present in their community and take steps to reduce their impact.



Screenshot advertising the Hazard Mitigation Action Plan Update Survey on the Jackson County Web site: www.co.jackson.tx.us

Public Participation

Public involvement in the development of the Jackson County Hazard Mitigation Plan Update was sought at separate periods of the planning process: (1) during the beginning of the planning process; and (2) during the drafting stage of the Plan. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making copies of draft Plan deliverables available for public review on the county's website as well as government offices and public libraries.

Community members were informed about public meetings and surveys through: the Jackson County Website; the Jackson County Hazard Mitigation Plan Update Facebook page; ads in the local newspaper for the City of Edna, as it is the county seat; and bulletins placed in public buildings, such as the County Courthouse bulletin board.

Three series of open public meetings were held during the development of this Plan, as described below.

First Public Meeting

The first public meeting was held on January 27, 2011. This meeting was scheduled on the same day as the Kickoff Workshop to solicit public and stakeholder input. Topics of discussion for this first meeting included the purpose of hazard mitigation, the reason for the update and options for hazards.

Community members and stakeholders attend a public meeting.

Second Public Meeting

The second public meeting was held on February 24, 2011. At this meeting, preliminary hazard results were discussed in addition to preliminary results from the public surveys that were distributed online.

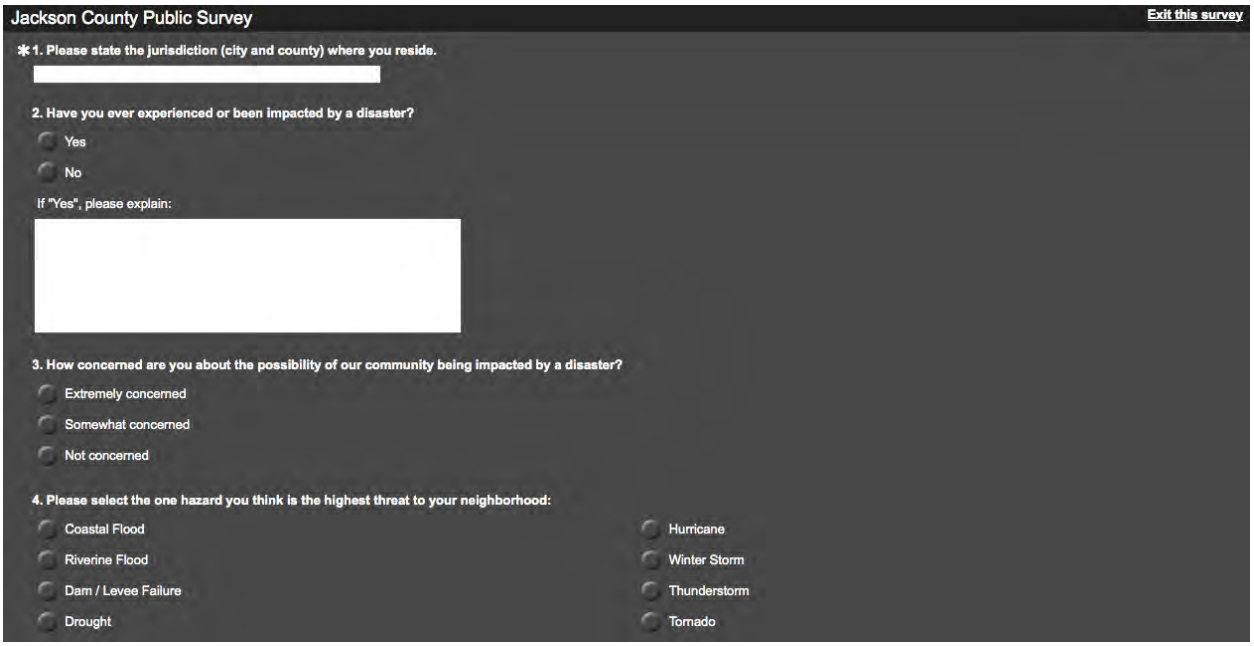
The meetings were advertised through a variety of means including newspaper ads, flyers at meeting locations, notices on the county website, and invitations sent via e-mail to community members.

Public Participation Survey

In addition to the open public meetings, the county was able to solicit input from citizens and stakeholders through the use of a public participation survey. This survey was designed to obtain data and information from residents in Jackson County

Copies of the Public Participation Survey were distributed by local officials and made available for citizens to download from the county website. In addition, the survey was made available online. A total of 124 responses to the survey were submitted, which provided valuable input in the development of the Plan Update. A summary of the survey findings is provided in Appendix A.

Figure 2-1. Screenshot of the Public Survey



Stakeholder Involvement

Stakeholders provide an essential service in hazard mitigation planning; therefore, throughout the planning process, members of state and federal agencies, community

groups, local businesses, schools, and hospitals were invited to workshops held throughout the planning process. Table 2-2 provides a list of groups invited to the meetings, and details whether each stakeholder attended the meeting or became a planning member.

Table 2-2. Stakeholder Groups

Stakeholder Group	Attended Meeting (Y/N)	Became Planning Team Member/Participant (Y/N)
Edna Independent School District	Yes	Yes
Industrial Independent School District	Yes	Yes
Ganado Independent School District	No	No
Jackson County Hospital District	Yes	Yes

County Profile

Overview

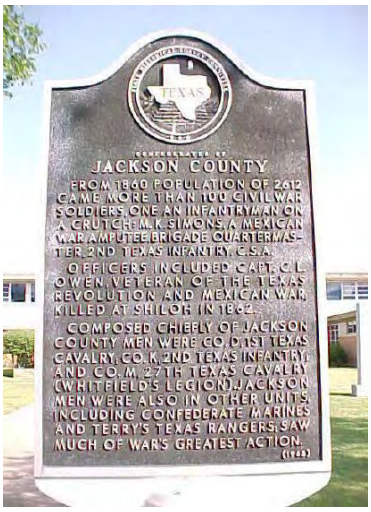
Jackson County is located in the coastal region of Texas. It is 103 miles southwest of Houston and 34 miles northeast of Victoria. The county is an 829 square mile area[1] having 17 persons per square mile. A total of 28 square miles is water. Jackson County is bounded by Calhoun, Victoria, Lavaca, Colorado, Wharton, and Matagorda counties. The Lavaca and Navidad Rivers run through Jackson County. The waters of Brushy and Sandy Creek lead into Mustang Creek, which widens at the center of the County and flows southerly to eventually meet the Lavaca Bay.

Jackson County is one of the original counties of Texas and was named after President Andrew Jackson in 1836. The City of Edna is the county seat with a population 5,899 (Census 2000). The City of La Ward is far smaller having only a population of 196. Along with the cities of Edna and La Ward, the City of Ganado,

[1] United States Census Bureau

Industrial Independent School District (ISD), Edna ISD, the Lavaca-Navidad River Authority, and the Jackson County Hospital District are participating in this Plan.

The participating jurisdictions range from larger urbanized areas to small rural communities. In an 829 square mile area, the hazards each community faces will be similar thereby allowing for an in depth look at community resources, mitigation needs, and mitigation projects to reduce the threat of the natural and man-caused hazards discussed in Sections 4-6 of this Plan Update. This section looks at a general profile of the county as a whole, providing data, where available, for each jurisdiction, including:



- City Government;
- Population and Demographics; and
- Economy and Industry

Government

Jackson County is governed by an elected Commissioners Court made up of a county judge and one commissioner for each of the four county precincts. Jackson County is protected by a Sheriff's Department that employs an elected sheriff, a staff of deputies, reserve members, and two elected constables.

Jackson County Courthouse, Edna, TX

The City of Edna, the county seat, has a council-manager form of government with a mayor and five council members who are elected for two-year terms. These officials set policies and hire the city manager, who serves as chief administrative officer. In addition, the City of Ganado is governed by general law, with a mayor, and five council members, whom are elected for two-year terms.

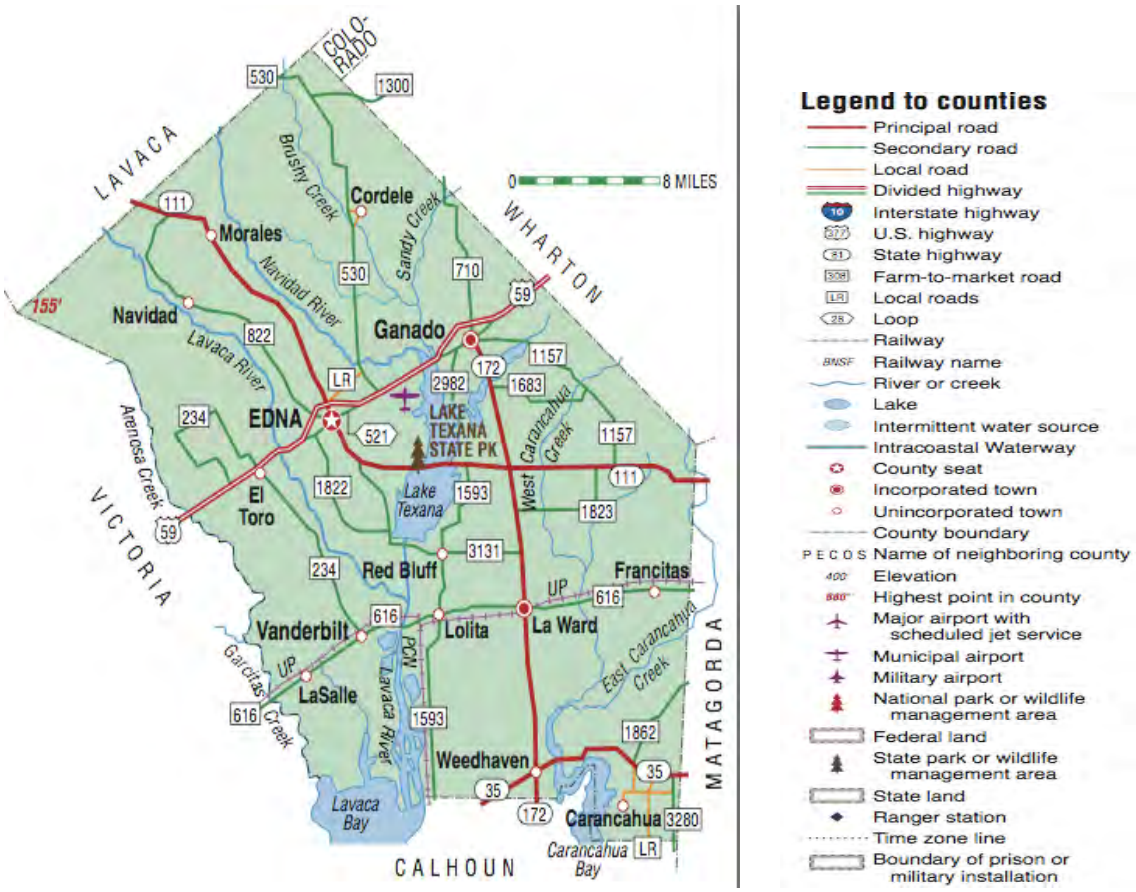
Population and Demographics

Figure 3-1 shows Jackson County and all unincorporated areas in the County. Table 3-1 below provides a numeric breakdown of the population by jurisdiction, including a breakdown of the special needs population (elderly and low income).

Table 3-1. Population Distribution and Special Needs by Jurisdiction

JURISDICTION	TOTAL POPULATION (CENSUS 2000)	ESTIMATES OF SPECIAL NEEDS POPULATIONS	
		Elderly (Over 65)	Low Income (< $20,000)
City of Edna	5,899	910	941
City of Ganado	1,915	295	221
City of La Ward	200	26	35
Unincorporated Jackson County	6,377	1,064	704
TOTALS	**14,391**	**2,295**	**1,901**

Figure 3-1. Map for Jackson County



Ethnicity

The ethnic makeup of Jackson County according to estimates for 2000 by the United States Census Bureau is shown in Table 3-4 below.

Table 3-4. Ethnicity - Jackson County

Description	Percentage
Hispanic Alone	24.7
White Alone	76.5
African American Alone	7.6
American Indian and Alaska Native Alone	0.4
Asian Alone	0.4
Native Hawaiian/Pacific Islander Alone	0.1
Multi-Racial	2.4

Lavaca-Navidad River Authority

The Lavaca-Navidad River Authority (LNRA) was established to develop, conserve, and protect the water resources of the Lavaca River Basin. The Palmetto Bend Project was authorized to provide a reliable water supply for municipal, industrial, and environmental interests through operational and management decisions designed to protect the integrity of the Basin and Lake Texana. The Authority's mission is to manage, conserve, and protect the natural resources of the Lavaca Basin, in partnership with our customers, to enhance the growth and development of the Basin's communities and the well-being of its citizens.

The Authority cooperates with several State and Federal agencies by collecting water samples for water quality studies, providing weather and rainfall data, maintaining and monitoring rain and stream gages across the Navidad River Basin, monitoring and reporting water pollution, and providing man power, materials, and equipment to control and remove noxious aquatic vegetation from the Lake. Furthermore, the Authority also works with other entities such as cities and counties to coordinate the maintenance and construction of drainage structures, disposal of wastewater, flood and emergency planning, public events, and law enforcement.

Jackson County Hospital District

The Jackson County Hospital District owns and operates the Jackson County Hospital, Jackson County Medical Clinic, Hospital District Pharmacy and Jackson County Home Care. Their mission is to identify, provide and improve quality healthcare services in a cost effective manner consistent with the needs of our community.

The Jackson County Hospital District is in the process of developing an 18,921 square foot Hospital Expansion, which will encompass a new Emergency Suite, Imaging Suite, Laboratory Suite, Respiratory Therapy Suite, Medical Records Suite, Helipad, Administration/ Public Suite and Physical Plant to the Jackson County General Hospital in Edna.

Edna ISD and Industrial ISD

Edna ISD is composed of one elementary, junior high, and high school. Currently, the state accountability rating is Academically Acceptable. In addition, Industrial ISD is also composed of one elementary, junior high, and high school campus. It was rated Exemplary for the 2010 school year. Both school districts total enrollment is approximately 1,348 for Edna ISD, and 1,039 for Industrial ISD.

Hazard Identification

This is the first section of the risk assessment, which also includes hazard profiles found in Section 5 and the vulnerability assessment found in Section 6. The purpose of this section is to provide background information for the hazard identification process as well as descriptions for the natural hazards identified.

Hazards Considered

At the initial Kickoff workshop, planning team members identified seven natural hazards to be addressed in the Plan Update based on a review of the 2004 Plan, past disaster declarations and the State of Texas Hazard Mitigation Plan ("State Plan").

Table 4-1 lists the full range of natural hazards initially identified for consideration. The table documents the evaluation process used for determining the significance of each hazard. Only hazards identified as significant were included in the Plan Update. Hazards not identified for inclusion at this time may be addressed during future evaluations and updates.

Table 4-1. Hazard Identification Process

Hazard Considered	Identified as Significant	Reason for Determination
Coastal Erosion/Subsidence	NO	Jackson County is a coastal county and therefore exposed to coastal erosion and subsidence. However according to the State Plan, Jackson County's coastline is not subject to critical erosion, but is in a low risk zone due to the small amount of coastline

Hazard Considered	Identified as Significant	Reason for Determination
		touching the Gulf. In addition, actions developed to mitigate hurricane, profiled in this assessment, will also mitigate the risk of coastal erosion and subsidence.
Dam Failure	YES	Although there are no jurisdictions at risk for inundation, several homes in the county are exposed to one significant risk dam.
Drought	YES	Drought is included as a threat in the State Plan and can occur throughout the state.
Earthquake	NO	According to the National Geophysical Data Center (NGDC), earthquake is a very low risk for Jackson County. This hazard was profiled in the 2004 Plan, but no mitigation actions were developed due to the low risk.
Expansive Soils	NO	Although expansive soils are a potential risk for the area according to the State Plan, it is difficult to develop actions to mitigate this risk. Also data for previous occurrences, vulnerability and impact is not available.
Flood	YES	Jackson County and participating entities are at a high risk for coastal and inland flooding.
Hail	YES (sub hazard)	The County is exposed to a hail event during a severe thunderstorm. Therefore hail is profiled as a sub-hazard to thunderstorm.
Hurricane	YES	Participating jurisdictions and entities are at a high risk for hurricanes as Jackson County is a coastal county.
Lightning	YES (sub hazard)	The County is exposed to lightning during a severe thunderstorm.
Thunderstorm	YES	Thunderstorms have a high frequency of occurrence for the County.
Tornado	YES (sub hazard)	Federal and state sources indicate tornadoes are a threat to the area. Because tornados often occur during a severe thunderstorm and the mitigation actions that can be developed for a tornado will also mitigate severe thunderstorms, tornado is considered a sub-hazard for this Plan Update.
Winter Storm	YES	Although the State Plan and the NOAA National

Hazard Considered	Identified as Significant	Reason for Determination
		Climatic Data Center (NCDC) indicate that winter storms are a low threat, the County experienced freezing temperatures throughout the winter of 2010.
Wildfire	YES	Wildfire is a high risk for the area based on planning participant responses from workshops and state and national data sources.

Hazard Descriptions

The seven hazards identified as significant according to Table 4-1 are divided into three main categories: atmospheric; hydrologic; and other. Although dam failure is considered a quasi-natural hazard it is categorized as technological.

Atmospheric hazards are events or incidents associated with weather generated phenomenon. Atmospheric hazards identified as significant include severe thunderstorms and winter storms. Hydrologic hazards are events or incidents associated with water related damage and account for over 75 percent of Federal disaster declarations in the United States. Hydrologic hazards identified as significant include drought and inland flooding. For the purposes of the risk assessment, "other" natural hazards consist of wildfire.

Table 4-2 provides descriptions for each of the natural and technological hazards included in the Plan.

Table 4-2. Hazard Descriptions

Hazard	Description
ATMOSPHERIC	
Hailstorm (sub hazard of thunderstorm)	Any thunderstorm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant.
Hurricane	Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) with a

Hazard	Description
	diameter averaging 10 to 30 miles across. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves and tidal flooding which can be more destructive than cyclone wind.
Lightning (sub hazard of thunderstorm)	An abrupt, discontinuous natural electric discharge in the environment.
Thunderstorm	A thunderstorm occurs when an observer hears thunder. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms. Lightning detection networks routinely track cloud-to-ground flashes, and therefore thunderstorms.
Tornado (sub hazard of thunderstorm)	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph.
Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces.
HYDROLOGIC	
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality.
Flood	The accumulation of water within a water body, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land

Hazard	Description
	adjoining the channel of a river, stream, ocean, lake or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, or shallow flooding.
OTHER	
Wildfire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface.
TECHNOLOGICAL	
Dam Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam.

Hazard Profile

Overview

This section contains profiles for the natural hazards identified in Section 4. Each hazard is discussed in terms of location, extent, historical occurrences and probability of future events, including any specific or detailed items noted by the planning team as it relates to historical hazard information. A full vulnerability assessment for each is included in Section 6.

The detailed profiles in this section are discussed according to category, and included in the following order:

- Atmospheric
  - Hurricane
  - Thunderstorm
    - Hail
    - Lightning
    - Tornado
  - Winter Storm
- Hydrologic
  - Flood
  - Drought
- Other Natural Hazards
  - Wildfire
- Technological
  - Dam Failure

Hurricane

Hurricanes often began as tropical depressions that intensify into tropical storms when maximum sustained winds increase to between 35-64 knots (39 – 73 mph). At these wind speeds the storm becomes more organized and circular in shape and it begins to resemble a hurricane. Tropical storms can be equally problematic without ever becoming a hurricane, resulting in heavy rainfall, high winds and tidal surge in coastal communities. When maximum sustained winds reach or exceed 39 mph, the system becomes a tropical storm. Once sustained winds reach or exceed 74 mph, the storm becomes a hurricane. The intensity of a land falling hurricane is expressed in categories relating wind speeds and potential damage. Tropical storm-force winds are strong enough to be dangerous to those caught in them. For this reason, emergency managers plan to have evacuations complete and personnel

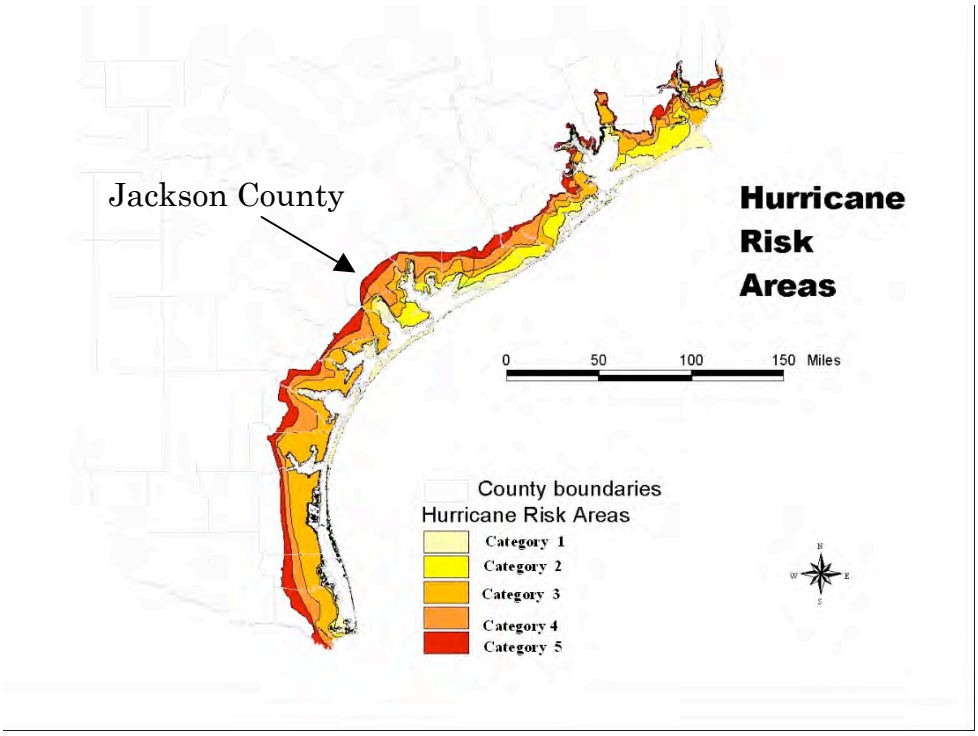
sheltered before winds of tropical storm-force arrive which precedes the arrival of hurricane-force winds.

According to the National Hurricane Center, the greatest potential for loss of life related to a hurricane is from storm surge. Low pressure and high circular winds "pile" the water into a dome shape that can be 50-100 miles wide. The surge travels with the storm and is most severe on the right side of the storm; relative to the direction the storm travels. Surge can be 15 feet deep, topped by waves, and make landfall ahead of the center or "eye" of the hurricane. Wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with normal high tides.

Location

As a coastal community, Jackson County is vulnerable to threats directly and indirectly related to a hurricane event, such as high-force winds, storm surge and flooding. Figure 5-1 displays the location of hurricane risk by storm category along the Gulf Coast.

Figure 5-1. Location of Hurricane Risk



Extent

Hurricanes are categorized according to the strength and intensity of their winds using the Saffir-Simpson Hurricane Scale (See Table 5-1). A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. This scale only ranks wind speed, but lower category storms can inflict greater damage than higher category storms depending on where they strike, other weather they interact with and how slow they move.

Table 5-1. Extent Scale for Hurricanes

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (MPH)	MINIMUM SURFACE PRESSURE (MILLIBARS)	STORM SURGE (FEET)
1	74–95	Greater than 980	3–5
2	96–110	979–965	6–8
3	111–130	964–945	9–12
4	131–155	944–920	13–18
5	155 +	Less than 920	19+

Source: National Hurricane Center

Figure 5-2. Extent – Average Wind Speeds to Mitigate (HAZUS-MH)

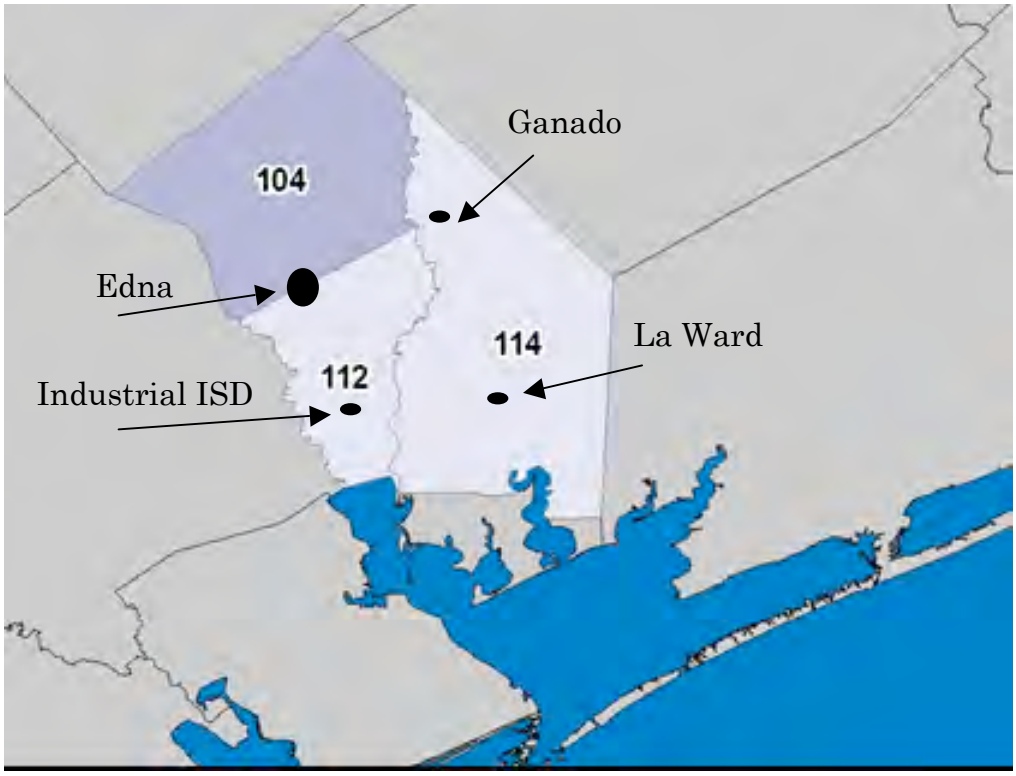


Figure 5-2 provides extent per participating entity in terms of average wind speeds that should be mitigated in the event of a hurricane. This data was provided through HAZUS-MH and is based on the design wind speeds for a 100-year event.

Due to its location closer to the coast, the City of La Ward can expect to mitigate wind speeds of 114 miles per hour. Interestingly, the extent for the City of Ganado is the same as La Ward despite the distance from the Gulf Coast. Industrial ISD in the Census Designate Place, Vanderbilt, is in a zone of slightly less risk with the average expected wind speed of 112 miles per hour to be mitigated. The City of Edna, the Lavaca-Navidad River Authority (LNRA), Edna ISD and the Jackson County Hospital District have a wider range of intensity to mitigate as the area is between two wind zones. For these entities, the average wind speed to mitigate ranges from 104 to 112 miles per hour.

Figure 5-3. Average Extent to Mitigate – Hurricane Category

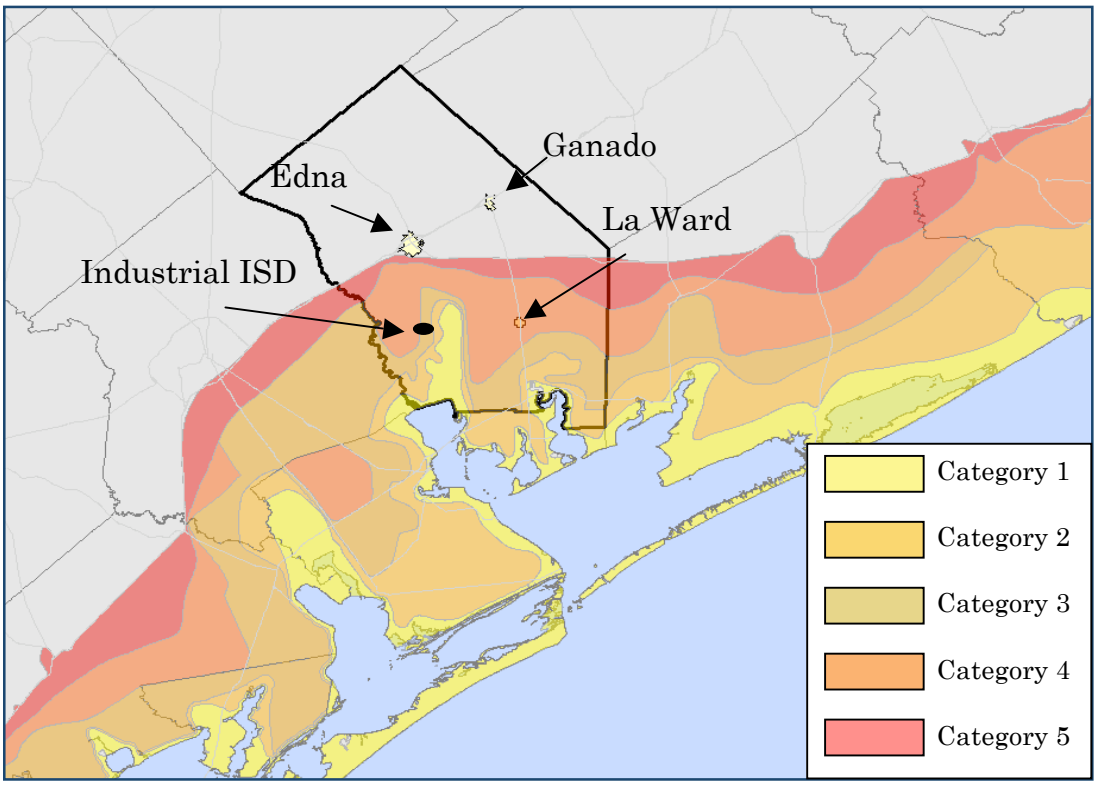


Figure 5-3 displays the potential extent to be mitigated for each area of Jackson County by providing a detailed map of the hurricane categories that could potentially threaten the area. Although the County may be affected by a Category 1 to a Category 5 hurricane, the average extent to be mitigated for each participating

entity varies depending on location. The City of La Ward and Industrial ISD are located closest to the coast and therefore have a slightly greater risk, with the average intensity of a storm event to be expected at a Category 3. This is consistent with the average wind zones to be mitigated for both areas, 112-114 miles per hour, which are within the maximum wind speeds for a Category 3 storm.

Edna ISD, the Jackson County Hospital District, and the LNRA are located within the boundaries for the City of Edna and therefore have the same average extent to be mitigated as the City of Edna, which is that of a Category 2 storm. Although wind speeds vary to be mitigated for the City of Ganado, the City is outside the area of extreme risk for surge and therefore could be expected to mitigate on average a Category 2 storm event.

Previous Occurrences

Previous occurrences include storms that had a direct path through Jackson County and those that, although still causing an impact, did not follow a direct, but a track that was near the county. Figure 5-4 displays the tracks for direct and near hits. Although tracks are shown as lines on the map it is important to note that hurricanes and tropical storms will have a cone or sphere of impact, covering an entire area.

Table 5-2. Historic Events, Direct[1]

Season	Storm Name	Category
1875	Not Named	Tropical Depression (TD)
1901	Not Named	Tropical Storm (TS)
1938	Not Named	Tropical Storm (TS)
1942	Not Named	Hurricane: Category 3 (H3)
1963	Cindy	Hurricane: Category 1 (H1)
1964	Abby	Tropical Storm (TS)

[1] Source: Hazard and Vulnerability Research Institute (HVRI, University of South Carolina), SHELDUS Database

Season	Storm Name	Category
1980	Danielle	Tropical Storm (TS)
1998	Frances	Tropical Storm (TS)
2002	Fay	Tropical Storm (TS)

Table 5-3. Historic Events, Near Hits[2]

Season	Storm Name	Category
1851	Not Named	Tropical Storm (TS)
1869	Not Named	Hurricane: Category 2 (H2)
1872	Not Named	Tropical Depression (TD)
1875	Not Named	Tropical Depression (TD)
1875	Not Named	Hurricane: Category 3 (H3)
1880	Not Named	Tropical Storm (TS)
1882	Not Named	Tropical Depression (TD)
1888	Not Named	Hurricane: Category 1 (H1)
1888	Not Named	Tropical Storm (TS)
1893	Not Named	Hurricane: Category 2 (H2)
1893	Not Named	Tropical Depression (TD)
1902	Not Named	Hurricane: Category 1 (H1)
1909	Not Named	Hurricane: Category 3 (H3)
1912	Not Named	Hurricane: Category 2 (H2)
1921	Not Named	Hurricane: Category 1 (H1)
1929	Not Named	Hurricane: Category 1 (H1)
1933	Not Named	Tropical Storm (TS)

[2] Source: SHELDUS Database

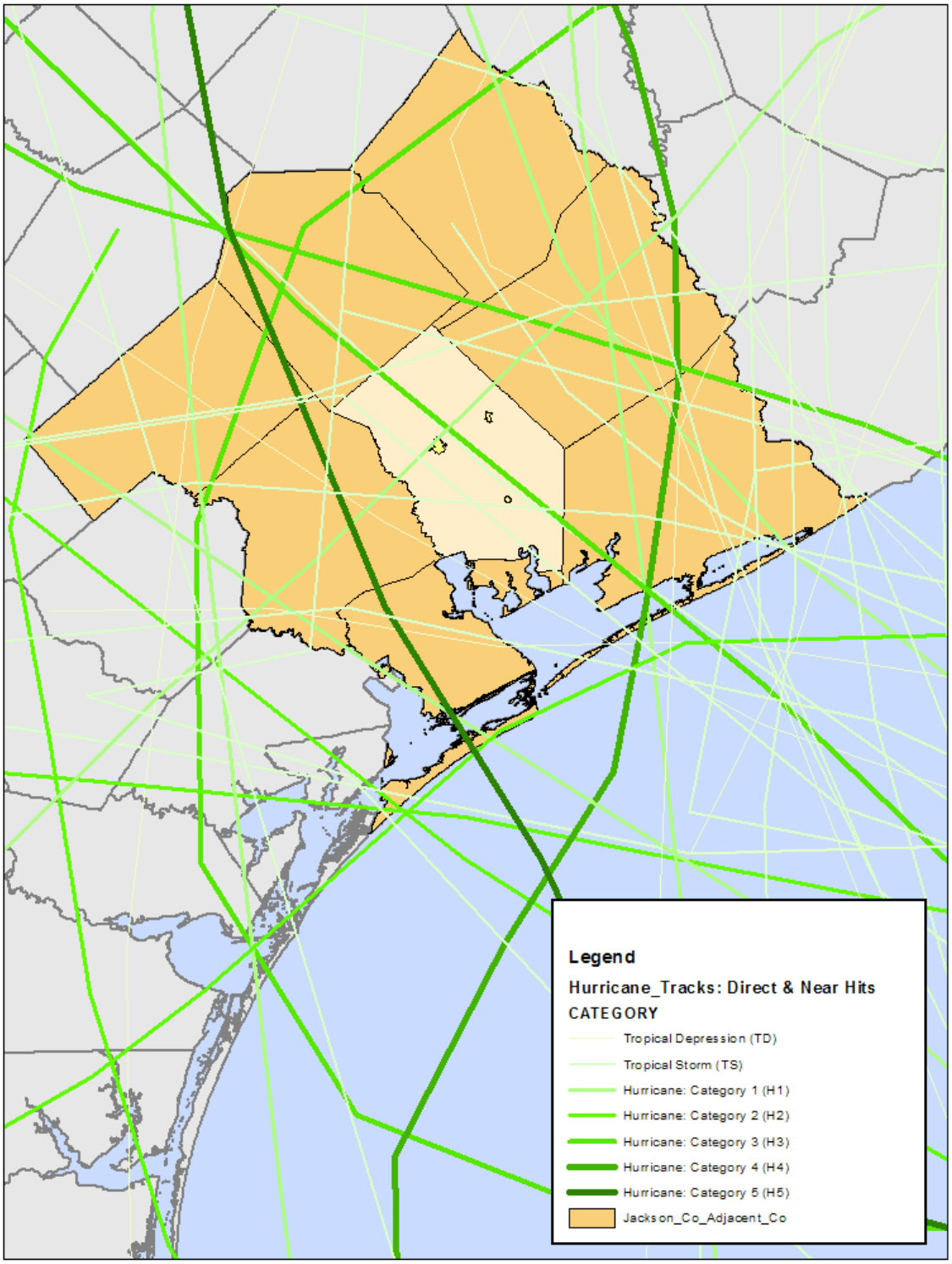
Season	Storm Name	Category
1945	Not Named	Hurricane: Category 4 (H4)
1961	Carla	Hurricane: Category 5 (H5)
1970	Ione 1	Tropical Storm (TS)
1971	Ginger	Hurricane: Category 2 (H2)
1973	Delia	Tropical Storm (TS)
1973	Unnamed	Tropical Depression (TD)
1977	Unnamed	Tropical Depression (TD)
1979	Elena	Tropical Storm (TS)
1980	Unnamed	Tropical Depression (TD)
1981	Unnamed	Tropical Depression (TD)
1989	Allison	Tropical Storm (TS)
1995	Dean	Tropical Storm (TS)
1998	Charley	Tropical Storm (TS)
2001	Allison	Tropical Storm (TS)
2003	Enrique	Tropical Storm (TS)
2003	Claudette	Hurricane: Category 2 (H2)

Table 5-4. Historical Losses (2009 Dollars)

Number of Events[3]	Property Damage	Crop Damage
20	$120,502,289	$61,205,316

[3] The number of event represents near and direct storms that have affected the county.

Figure 5-4. Hurricane Tracks – Direct and Near Hits



Probability of Future Events

Due to the location on the Gulf Coast, and the previous history of hurricanes for the area, the likelihood or future probability of a tropical storm event or hurricane in Jackson County is likely, meaning an event is probable in the next three years.

Thunderstorm

Thunderstorms are created when heat and moisture near the Earth's surface is transported to the upper levels of the atmosphere. By-products of this process are the clouds, precipitation, and wind that become the thunderstorm and sub hazards of thunderstorm (profiled herein) are hail, lightning and tornados.

According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Radar observers use the intensity of radar echoes to distinguish between rain showers and thunderstorms. Along with rolling thunder, lightning detection networks routinely track cloud-to-ground flashes to help track thunderstorms.

Location

Thunderstorms can develop in any geographic location, but more frequently develop in mid-latitudes where warm air collides with cooler area. Within the Jackson County planning area, a thunderstorm could occur at any location as these storms develop randomly and are not confined to any geographic area within the county.

Extent

When not measuring a sub hazard of thunderstorm (hail, lightning or tornadoes), the extent or magnitude of a thunderstorm event is measured by the Beaufort Wind Scale. Table 5-6 describes the intensity of a wind in terms of speed and effects, from calm to violent and destructive.

Table 5-5. Beaufort Wind Scale[4]

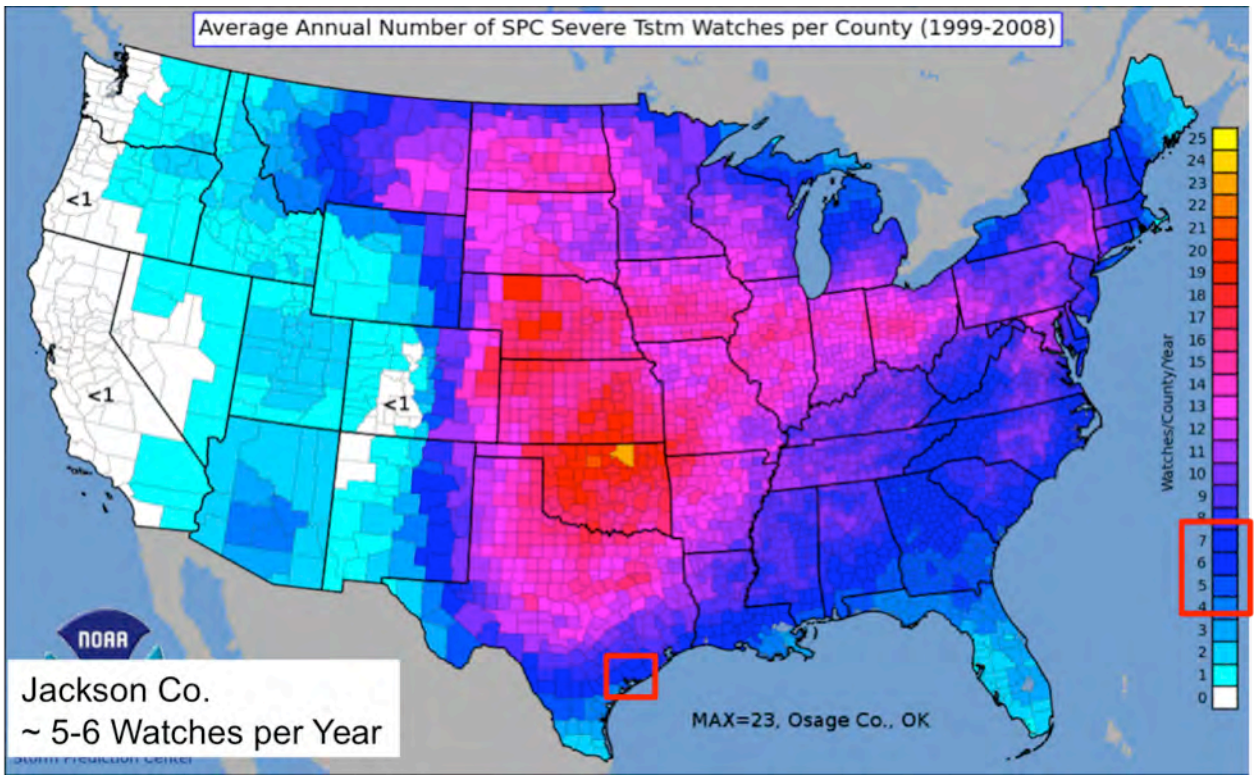
Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	19-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	Strong Breeze	Larger tree branches moving, whistling in wires
7	32-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Whole trees in motion, resistance felt walking against wind
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	64-72	Violent Storm	If experienced on land, widespread damage
12	73+	Hurricane	Violence and destruction

On average, the planning area experiences less than seven thunderstorms per year (See Figure 5-5), which are not usually accompanied by maximum wind speeds. Jackson County has not expereienced a significant wind event or an extent greater than "Force 10" on the Beaufort Wind Scale[5]. The average extent for severe winds with a thunderstorm is a "Force 8", which includes winds at 39-46 knots. Therefore, planning participants on average could experience a range of wind speeds from 39-45 knots, where trees are in motion and resistance is felt walking and driving against the wind.

[4] Source: World Meteorological Organization (WMO)

[5] Although county has experienced extreme wind greater than 73 knots, these events were associated with a hurricane or tornado and not a single thunderstorm/significant wind event.

Figure 5-5. Average Number of Thunderstorm Watches (NOAA)



Previous Occurrences

Table 5-6 depicts historical occurrences of thunderstorm events for the county according to NCDC data.

Table 5-6. Historical Severe Thunderstorm Events (NCDC 1950–2010)

LOCATION	DATE	MAGNI-TUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Jackson County	5/28/1965	N/A	0	0	$0	$0
Jackson County	2/9/1965	N/A	0	0	$0	$0
Jackson County	5/20/1967	N/A	0	0	$0	$0
Jackson County	5/11/1968	N/A	0	0	$0	$0
Jackson County	5/11/1968	N/A	0	0	$0	$0
Jackson County	10/11/1970	N/A	0	0	$0	$0
Jackson County	4/30/1975	N/A	0	0	$0	$0
Jackson County	4/30/1975	N/A	0	0	$0	$0
Jackson County	5/8/1975	61 kts.	0	0	$0	$0
Jackson County	4/22/1978	52 kts.	0	0	$0	$0

LOCATION	DATE	MAGNI-TUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Jackson County	11/16/1987	N/A	0	0	$0	$0
Jackson County	8/27/1990	N/A	0	0	$0	$0
Jackson County	3/16/1991	N/A	0	0	$0	$0
Jackson County	4/5/1991	52 kts.	0	0	$0	$0
Jackson County	9/16/1992	N/A	0	0	$0	$0
Jackson County	5/10/1993	N/A	0	0	$5,000	$0
La Ward	5/10/1993	N/A	0	0	$5,000	$0
Edna	10/12/1993	N/A	0	0	$50,000	$0
Jackson County	3/13/1995	N/A	0	0	$2,000	$0
Jackson County	6/11/1995	69 kts.	0	0	$20,000	$0
Jackson County	9/5/1995	N/A	0	0	$10,000	$0
Edna	9/5/1995	N/A	0	0	$0	$0
Ganado	5/31/1997	60 kts.	0	0	$10,000	$0
Jackson County	5/28/1999	52 kts.	0	0	$25,000	$0
Jackson County	8/3/2002	N/A	0	0	$20,000	$0
Edna	8/3/2002	15 kts.	0	0	$15,000	$0
Jackson County	9/7/2002	N/A	0	0	$50,000	$0
Jackson County	5/11/2004	55 kts.	0	0	$9,000	$0
Edna	5/11/2004	60kts.	0	0	$30,000	$0
Jackson County	11/23/2004	55 kts.	0	0	$5,000	$0
Edna	5/10/2007	63 kts.	0	0	$45,000	$0
Jackson County	5/10/2007	60 kts.	0	0	$0	$0
Ganado	8/4/2008	52 kts.	0	0	$1,000	$0
TOTALS	-	-	**0**	**0**	**$302,000.00**	**$0.00**

Probability of Future Events

Most thunderstorms occur during the spring (March, April and May) and fall, during the month of September. Even though the intensity of thunderstorms is relatively low for the county, the frequency of occurrence for a thunderstorm event is highly likely, meaning that an event is probable within the next year.

Sub Hazard - Hail

Hailstorms are a potential damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the

subsequent cooling of the air mass. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size.

Location

Hailstorms can vary greatly in terms of size, location, intensity and duration and like thunderstorms, are not confined to any specific geographic location. Just as thunderstorms can form in any location, hailstorms are not limited by any specific boundaries as they are developed from severe thunderstorms.

Extent

The National Weather Service classifies a storm as severe if hail of ¾ of an inch in diameter (approximately the size of a penny) or greater is imminent based on radar intensity or seen by observers. The intensity of a hailstorm depends on the damage potential related to size as depicted in the NCDC Intensity Scale in Table 5-7, based on the TORRO Hailstorm Intensity Scale.

Table 5-7. Hailstorm Intensity Scale (H0 to H10)

	Intensity Category	Typical Hail Diameter (in)[6]	Description	Probable Kinetic Energy, J-m^2	Typical Damage Impacts
H0	Hard Hail	Up to 0.33	Pea	0-20	No damage
H1	Potentially Damaging	0.33 – 0.60	Marble	>20	Slight general damage to plants, crops
H2	Significant	0.60-0.80	Dime	>100	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.2	Nickel	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Ping	>800	Widespread destruction of glass, damage to tiled roofs, significant risk of injuries

[6] Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed and surface wind speeds) affect severity.

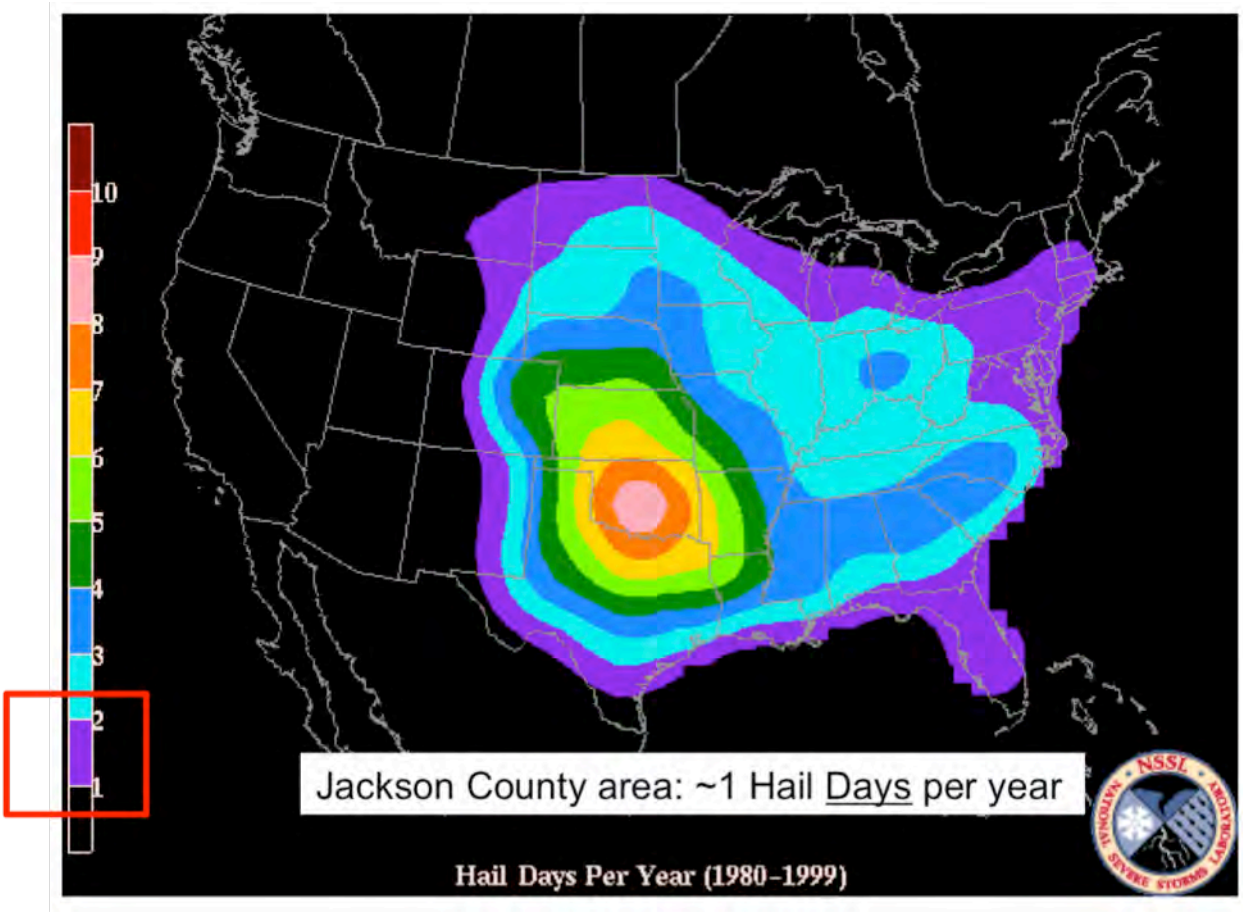
	Intensity Category	Typical Hail Diameter (in)[6]	Description	Probable Kinetic Energy, J-m^2	Typical Damage Impacts
H6	Destructive	2.0-2.4	Hen's Egg		Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	2.4-3.0	Golf Ball		Severe roof damage, risk of serious injuries
H8	Destructive	3.0-3.5	Hen's Egg		Severe damage to all structures
H9	Super Hailstorms	3.5-4.0	Tennis Ball		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>4.0	Baseball		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

The scale in Table 5-7 extends from H0 to H10 with its increments of intensity or damage potential related to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind.

Hailstorms do not occur often for the county, and when there is a hail event, the magnitude of the event is at or below an intensity category of an H2 (See Figure 5-6 and Table 5-8, respectively). The average storm to mitigate for the county is a hailstorm with nickel-sized hail that would significantly damage crops, fruit and other vegetation. Although a more severe hail event is possible for Jackson County and participating planning partners, on average hailstorms are infrequent and of a low to moderate intensity, of H0 to H2 on the Hailstorm Intensity Scale.

Figure 5-6 shows average number of days for damaging hail over a 19-year period, as compiled from hail reports from the 1980's to 1990s by the National Severe Storms Library (NSSL).

Figure 5-6. Average Number of Hail Days (Damaging Hail)



Previous Occurrences

Table 5-8 provides a detailed, historical account of hail events reported to the National Climatic Data Center (NCDC) that are known to have impacted the City of Edna (LNRA, EISD and the Jackson County Hospital District), the City of Ganado, the City of La Ward, and unincorporated areas of Jackson County, including Vanderbilt (Industrial ISD) between 1950 and 2010[7].

[7] In some instances, historical occurrence data may appear to contain duplicate entries. However, when all fields of the NCDC records are compared, there are differences (such as unique spatial coordinates or hand-written accounts) that establish these as individual events. Similarities in dollar losses and magnitudes can likely be attributed to estimations made at the time the event was reported.

Table 5-8. Historical Hail Occurrences (NCDC 1950-2010)

LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Jackson County	03/31/1955	2300	2.00 in.	0	0	$0	$0
Jackson County	05/11/1968	0030	1.00 in.	0	0	$0	$0
Jackson County	05/11/1968	0100	1.75 in.	0	0	$0	$0
Jackson County	05/11/1968	0100	1.75 in.	0	0	$0	$0
Jackson County	05/08/1969	1300	1.50 in.	0	0	$0	$0
Jackson County	07/31/1972	1615	1.00 in.	0	0	$0	$0
Jackson County	04/26/1973	0055	2.00 in.	0	0	$0	$0
Jackson County	04/26/1973	0055	2.00 in.	0	0	$0	$0
Jackson County	05/08/1975	2000	0.75 in.	0	0	$0	$0
Jackson County	04/22/1978	1655	1.75 in.	0	0	$0	$0
Jackson County	04/22/1978	1715	1.75 in.	0	0	$0	$0
Jackson County	05/09/1981	1730	1.75 in.	0	0	$0	$0
Jackson County	05/09/1981	1810	1.75 in.	0	0	$0	$0
Jackson County	04/19/1992	1940	1.75 in.	0	0	$0	$0
Jackson County	05/28/1992	1630	0.88 in.	0	0	$0	$0
La Ward	04/30/1993	1610	0.88 in.	0	0	$0	$0
Jackson County	05/05/1993	0645	0.88 in.	0	0	$0	$0
Jackson County	05/05/1993	0650	0.88 in.	0	0	$0	$0
La Ward	05/10/1993	0000	1.00 in.	0	0	$0	$0
La Ward	05/10/1993	0000	1.00 in.	0	0	$0	$0
Edna	10/12/1993	1358	0.88 in.	0	0	$0	$0
Jackson County	04/05/1996	01:31 PM	1.75 in.	0	0	$5,000	$0
Jackson County	06/20/1996	07:06 PM	1.75 in.	0	0	$5,000	$0
La Ward	05/28/1997	05:04 PM	1.00 in.	0	0	$5,000	$0
Jackson County	05/28/1997	05:04 PM	1.75 in.	0	0	$10,000	$0
Jackson County	05/28/1997	05:04 PM	1.75 in.	0	0	$10,000	$0
Jackson County	03/07/1998	11:35 PM	0.75 in.	0	0	$2,000	$0
Ganado	02/27/1999	07:08 PM	0.75 in.	0	0	$3,000	$0
Jackson County	05/02/1999	04:55 PM	1.25 in.	0	0	$25,000	$0
Edna	04/02/2000	01:40 AM	1.75 in.	0	0	$25,000	$0
Ganado	07/23/2000	05:55 PM	1.75 in.	0	0	$50,000	$0
Edna	03/30/2002	05:45 PM	1.00 in.	0	0	$10,000	$0
Ganado	03/30/2002	05:54 PM	1.75 in.	0	0	$20,000	$0
La Ward	12/12/2002	07:00 AM	1.75 in.	0	0	$5,000	$0
Jackson County	12/12/2002	07:00 AM	1.75 in.	0	0	$5,000	$0
Ganado	12/12/2002	07:15 AM	2.75 in.	0	0	$15,000	$0
Jackson County	02/21/2003	05:25 AM	0.75 in.	0	0	$5,000	$0

LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
La Ward	03/13/2003	09:54 PM	1.75 in.	0	0	$5,000	$0
Edna	03/25/2003	11:30 PM	0.75 in.	0	0	$4,000	$0
Edna	04/11/2004	09:50 AM	0.75 in.	0	0	$10,000	$0
Jackson County	04/11/2004	12:50 AM	1.00 in.	0	0	$10,000	$0
La Ward	06/14/2004	04:25 PM	0.75 in.	0	0	$8,000	$0
Ganado	06/14/2004	05:34 PM	0.75 in.	0	0	$3,000	$0
Ganado	06/14/2004	05:39 PM	0.88 in.	0	0	$5,000	$0
Edna	03/27/2005	01:25 AM	0.75 in.	0	0	$4,000	$0
Edna	05/10/2006	03:46 PM	0.75 in.	0	0	$2,000	$0
Edna	05/10/2006	04:05 PM	1.00 in.	0	0	$15,000	$0
Jackson County	07/19/2009	17:05 PM	1.00 in.	0	0	$1,000	$1,000
TOTALS	-	-	-	**0**	**0**	**$267,000.00**	**$1,000.00**

Probability of Future Events

Because severe thunderstorm events will remain a very frequent occurrence in Jackson County, the probability of future occurrences of hail is highly likely, meaning that an event is probable in the next year. It can be expected that future hail events will occur during the spring (March, April and May) and in the fall during the month of September.

Sub Hazard – Lightning

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground and occurs during severe thunderstorms.

Location

Lightning occurs randomly with thunderstorms, therefore it is impossible to predict where it will strike. It is assumed that all of Jackson County is uniformly exposed to lightning, as it occurs during thunderstorms which have no specific geographic boundaries.

Extent

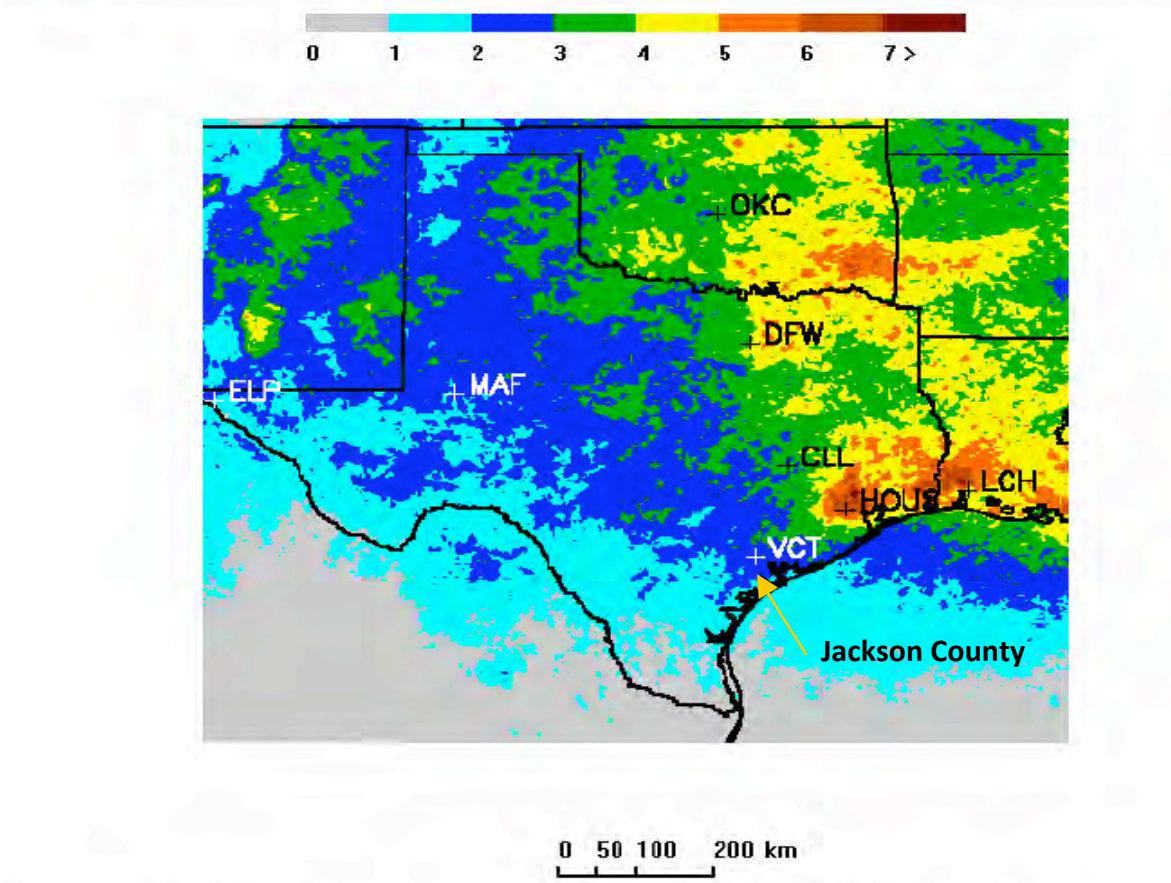
The intensity for lightning is measured by the Lightning Activity Level (LAL) from the National Weather Service. Table 5-9 depicts the magnitude for an event by measuring the most common lightning occurrences, cloud-to-ground (CG) lightning discharges, from a severity of one to six, with a level six being the most intense.

Table 5-9. Lightning Activity Level

SCALE	DESCRIPTION	AREAL COVERAGE	COUNTS (CG/5 MIN)	COUNTS (CG/15 MIN)	AVERAGE CG/MIN
1	No lightning or thunderstorms	None	0	0	0
2	Cumulus clouds are common but only a few reach the towering stage. A single thunderstorm must be confirmed in the rating area. Lightning is very infrequent	<15%	1-5	1-8	<1
3	Cumulus clouds are common. Thunderstorms are few, but 2 to 3 occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	15% to 24%	6-10	9-15	1-2
4	Swelling cumulus and towering cumulus cover 2-3/10 of the sky. Thunderstorms are scattered but more than three must occur within the observation area. Moderate rain is commonly produced, and lightning is frequent.	25% to 50%	11-15	16-25	2-3
5	Towering cumulus and thunderstorms are numerous. They cover more than 3/10 and occasionally obscure the sky. Rain is moderate to heavy, and lightning is frequent and intense.	>50%	>15	>25	>3
6	Dry lightning outbreak.	>15%	-	-	-

In addition to the LAL Table, Figure 5-7, below, displays average lightning flash density for the county. The density for the county ranges from a density of one to two, with areas closer to the coast (La Ward and Industrial ISD) experiencing less lightning flash density than the cities of Ganado and Edna to the North.

Figure 5-7. Lightning Flash Density Level



There is a lack of historical data to accurately state the average extent, but based on the Lightning Flash Density level for the county, the average intensity to mitigate for the county would range from a low activity level, LAL of 1, to a moderate level of intensity, LAL of 4.

Previous Occurrences

There are no reported lightning events outside of general thunderstorm events that are detailed in Table 5-6.

Probability of Future Events

Although lightning events in Jackson County occur slightly less than that of thunderstorms, as a thunderstorm event is not always accompanied by lightning, the county is located in an area that experiences two or less lightning flashes per square kilometer per year. Future lightning events are therefore highly likely to occur, meaning an event is probable within the next year.

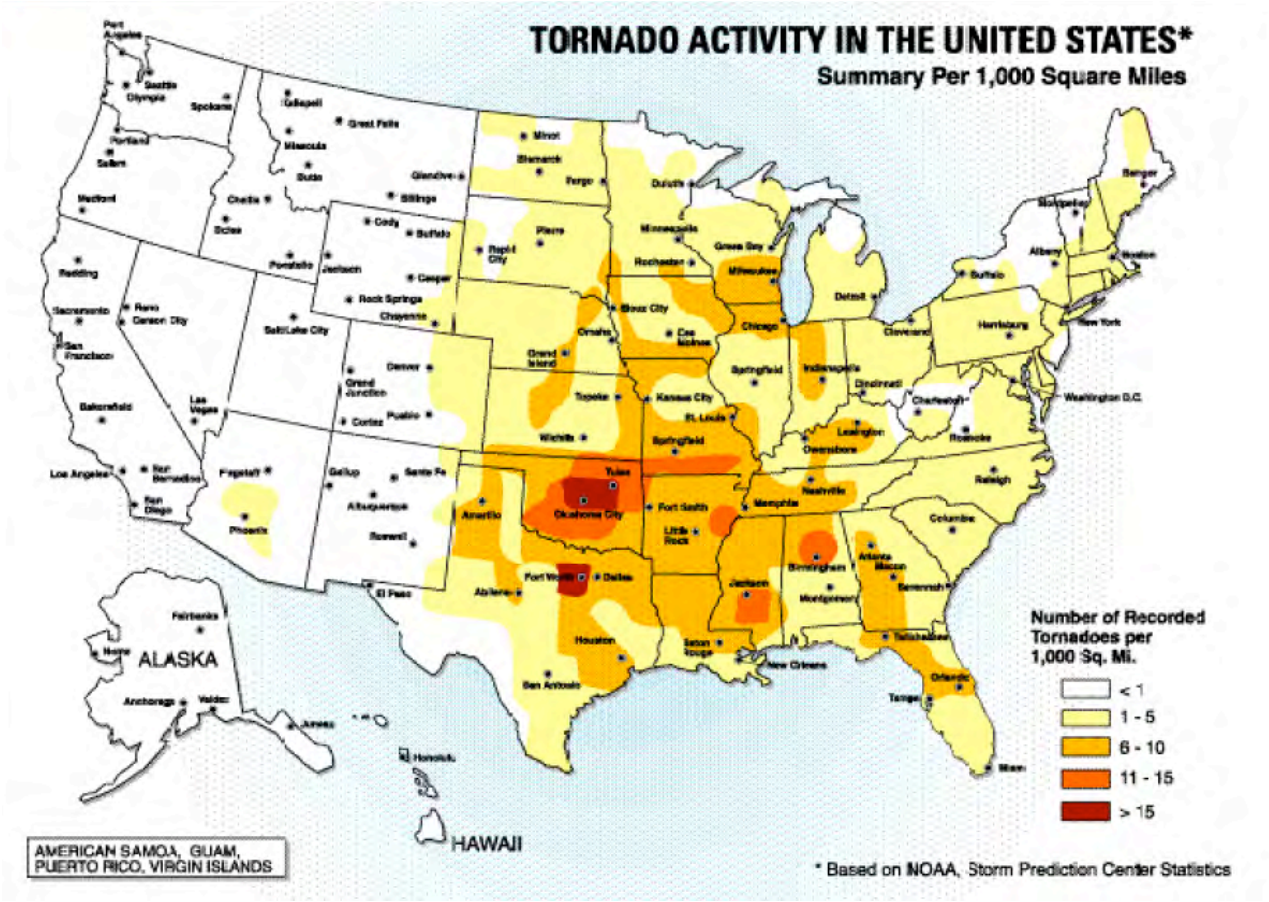
Sub Hazard - Tornado

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. Although tornadoes can sometimes result from hurricanes and other tropical storms, there has not been a historical occurrence of a tornado developing from a hurricane or tropical storm in Jackson County..

Location

As with thunderstorms, tornadoes do not have any specific geographic boundary and can occur throughout the county uniformly. Although it is assumed that the area is uniformly exposed to tornado activity, Figure 5-8 depicts the location and frequency of tornadoes throughout the United States per 1,000 square miles according to FEMA. Jackson County is located in an area that experiences one to five tornadoes per square mile.

Figure 5-8. Tornado Activity in the United States (NOAA)



Extent

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction such as residential homes (particularly mobile homes. Additionally, it should be noted that tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (Table 5-10). Tornado magnitudes that were determined in 2005 and later were determined using the Enhanced Fujita Scale[8] (Table 5-11). The largest magnitude reported within the study area is F2 on the Fujita Scale. Based on this data, the area could experience anywhere from an EF0 to an EF3 depending on the wind speed.

Table 5-10. The Fujita Scale (Effective Prior to 2005)

F-SCALE NUMBER	INTENSITY	WIND SPEED	TYPE OF DAMAGE DONE
F0	GALE TORNADO	40–72 MPH	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE TORNADO	73–112 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT TORNADO	113–157 MPH	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE TORNADO	158–206 MPH	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING TORNADO	207–260 MPH	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE TORNADO	261–318 MPH	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
F6	INCONCEIVABLE	319–379 MPH	These winds are very unlikely. The small area of damage they

[8] Source: National Weather Service

	TORNADO		might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Table 5-11. The Enhanced Fujita Scale (Effective 2005 and Later)

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Although the county has experienced tornadoes as devastating as an EF3 or severe tornado, the typical range of intensity that communities within Jackson County would be expected to mitigate would be a low to moderate risk or an EF0 to an EF1.

Previous Occurrences

It is important to note that only tornadoes that have been reported have been factored into this risk assessment. Table 5-12 shows details for 42 tornado events specifically associated with the study area. Property damage is shown in adjusted dollars.

Table 5-12. Historical Tornado Occurrences (NCDC 1950–2007)

LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Jackson County	05/23/1959	0338	F0	0	0	$0	$0
Jackson County	05/23/1961	1715	F1	0	0	$3,000	$0
Jackson County	09/11/1961	1320	F3	0	3	$25,000	$0
Jackson County	02/09/1966	2255	F3	0	0	$25,000	$0
Jackson County	09/20/1967	0530	F	0	0	$25,000	$0
Jackson County	09/20/1967	0530	F	0	0	$25,000	$0
Jackson County	09/20/1967	0800	F	0	0	$0	$0
Jackson County	09/20/1967	0800	F	0	0	$3,000	$0
Jackson County	09/20/1967	0800	F3	0	3	$0	$0
Jackson County	09/20/1967	0900	F	0	1	$25,000	$0
Jackson County	09/20/1967	0930	F	0	0	$0	$0
Jackson County	09/20/1967	0930	F	0	0	$0	$0
Jackson County	09/20/1967	0930	F	0	0	$0	$0
Jackson County	09/20/1967	1020	F	0	1	$25,000	$0
Jackson County	09/21/1967	0200	F1	0	0	$3,000	$0
Jackson County	05/07/1972	0727	F1	0	0	$25,000	$0
Jackson County	04/30/1974	0530	F0	0	0	$0	$0
Jackson County	04/30/1974	0530	F1	0	0	$0	$0
Jackson County	12/24/1975	1600	F3	0	0	$0	$0
Jackson County	05/07/1976	1110	F1	0	0	$25,000	$0
Jackson County	04/22/1978	1750	F1	0	0	$25,000	$0
Jackson County	06/21/1980	1610	F1	0	0	$25,000	$0
Jackson County	06/21/1980	1615	F1	0	0	$25,000	$0
Jackson County	05/19/1984	1240	F0	0	1	$250,000	$0
Jackson County	06/16/1991	1940	F0	0	0	$0	$0
Jackson County	06/16/1991	2123	F0	0	0	$3,000	$0
Jackson County	06/16/1991	2215	F0	0	2	$25,000	$0
Jackson County	10/01/1991	1635	F1	0	0	$250,000	$0
Jackson County	06/06/1992	1320	F1	0	0	$25,000	$0
Edna	10/08/1994	0033	F0	0	0	$50,000	$0
La Ward	10/18/1994	0842	F0	0	0	$0	$0

LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Jackson County	03/13/1995	0435	F0	0	0	$70,000	$0
Jackson County	04/04/1995	1011	F0	0	0	$2,000	$0
Edna	06/20/1996	06:54 PM	F0	0	0	$5,000	$0
Jackson County	08/12/1996	06:20 PM	F0	0	0	$0	$0
Edna	06/21/1997	04:06 PM	F0	0	0	$20,000	$0
Jackson County	01/21/1998	03:40 PM	F0	0	0	$0	$0
Jackson County	07/28/2003	12:15 PM	F0	0	0	$1,000	$0
Jackson County	04/06/2004	10:01 AM	F0	0	0	$0	$0
Jackson County	05/11/2004	12:45 PM	F0	0	0	$8,000	$0
Jackson County	06/21/2008	20:15 PM	F0	0	0	$20,000	$0
Edna	10/03/2009	14:12 PM	F0	0	0	$3,000	$0
TOTALS	-	-	-	0	11	$1,016,000.00	$0.00

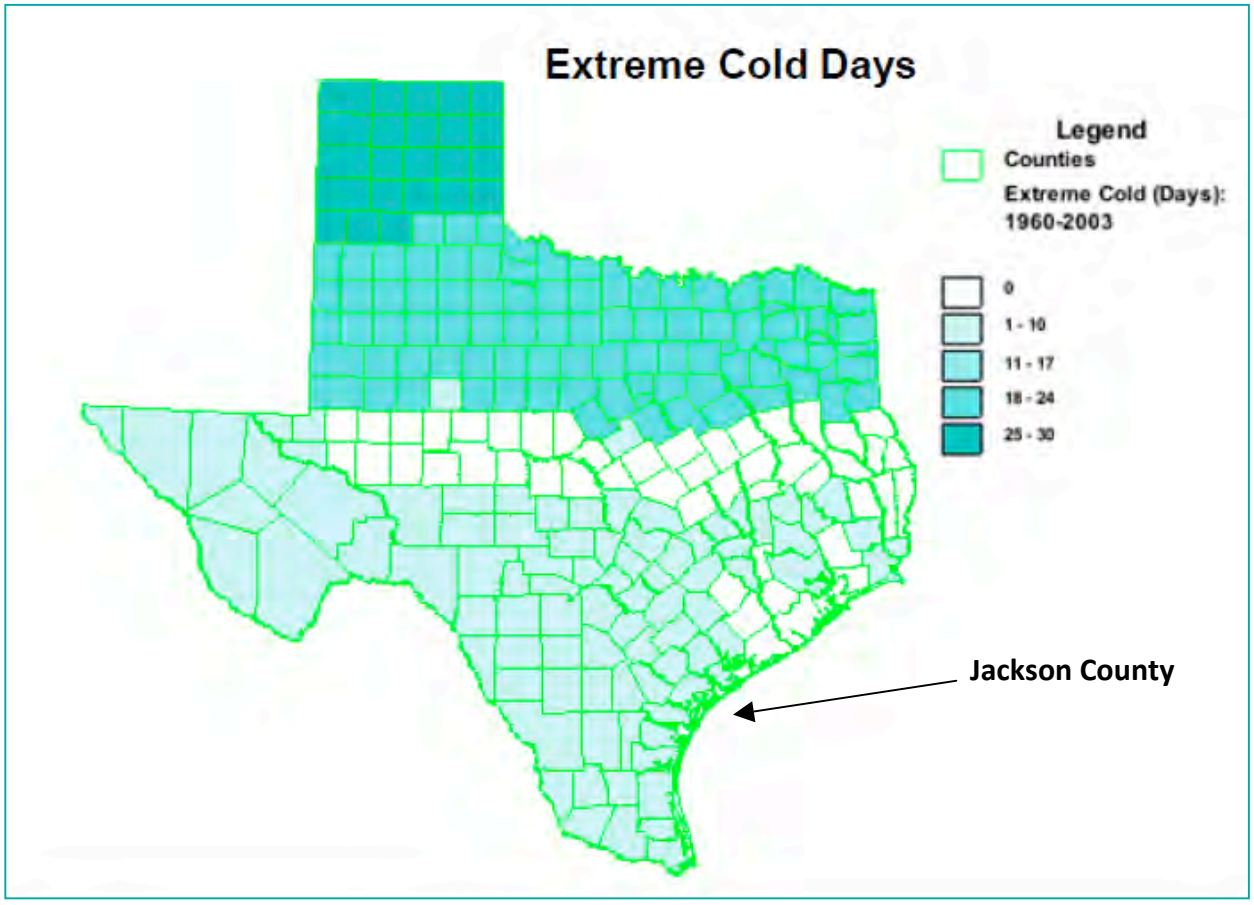
Probability of Future Events

According to historical records, the county experiences a confirmed tornado touchdown every three to four years. Hence, the probability of future tornado occurrences affecting Jackson County is likely, meaning an event is probable within the next three years.

Severe Winter Storm

Winter storms that threaten Jackson County usually begin as powerful cold fronts that push south. As indicated in Figure 5-9 on the following page, the county experiences a limited amount of extreme cold days a year, meaning that participating jurisdictions and unincorporated areas typically receive less than ten days at or around freezing temperatures. However there is the potential for ice and snow accumulation, meaning response times will increase until public works road crews are able to assist in making the major roads passable.

Figure 5-9. Extreme Cold Days 1960-2003 (NWS)



Location

Because winter storm events are not confined to specific geographic boundaries, all existing and future buildings, facilities and populations are considered to be exposed to this hazard uniformly.

Extent

Table 5-13 displays the magnitude of severe winter storms. The wind-chill factor is further described in Figure 5-10. This is an index developed by the National Weather Service, although the chart is not applicable when temperatures are over 50° or winds are calm.

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures.

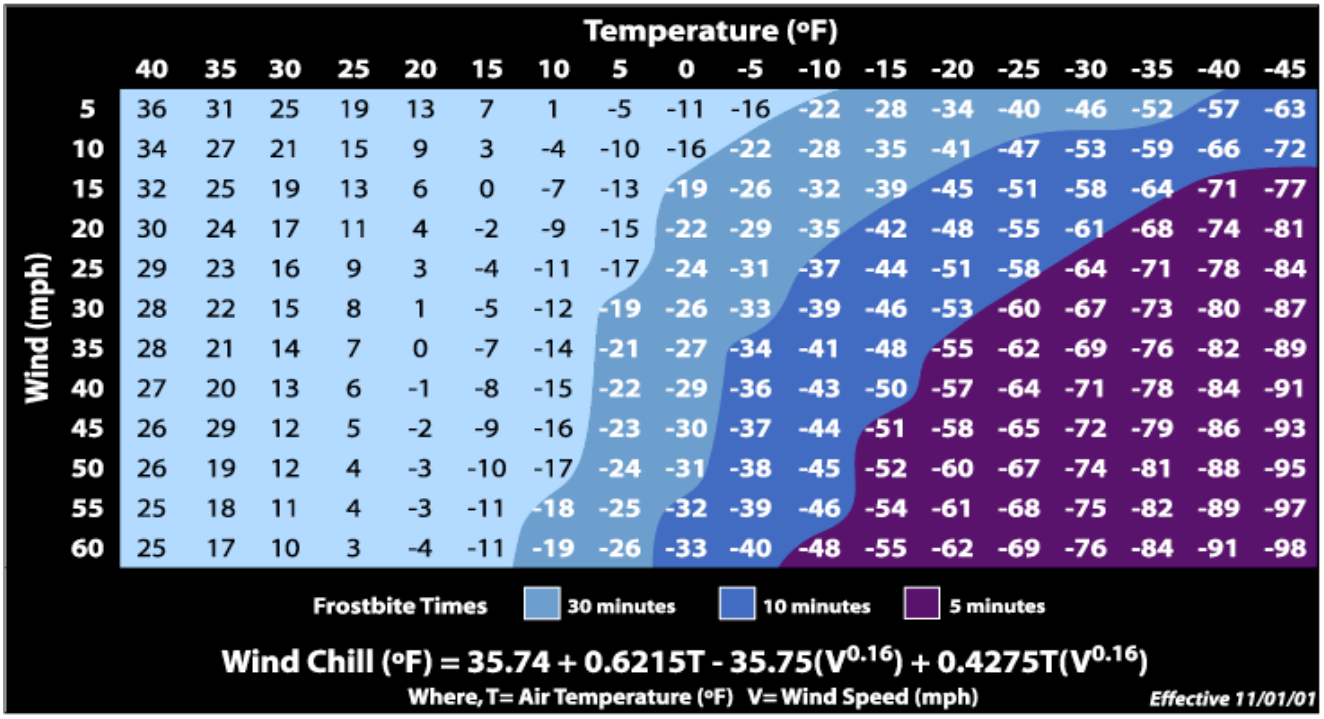
Table 5-13. Extent Scale for Severe Winter Storm

Winter weather advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter storm watch	Severe winter weather conditions may affect your area (freezing rain, sleet or heavy snow may occur separately or in combination).
Winter storm warning	Severe winter weather conditions are imminent.
Freezing rain or freezing drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice, usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/freeze warning	Below freezing temperatures are expected and may cause significant damage to plants, crops and fruit trees.
Wind chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

Based on previous occurrences, participating communities in Jackson County on average can expect to mitigate winter storm watches. Although this is the average intensity for the area to mitigate, the county is still susceptible to freezing rain and

snow as the county experienced record days for below-freezing temperature during the winter of 2010-2011.

Figure 5-10. Wind Chill Chart



Previous Occurrences

Table 5-14 presents information on historical winter storms reported to NCDC during a period of time ranging from January 1950 to November 2010. These events were recorded at the county level, as severe winter weather typically impacts a geographic area greater than a city or town's incorporated limits.

Table 5-14. Historical Severe Winter Storms (NCDC 1950-2010)

DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
01/12/1997	6:00 AM	3	0	$800,000	None Reported
12/24/2004	9:00 PM	0	0	None Reported	None Reported
12/04/2009	11:00 AM	0	0	None Reported	None Reported
TOTALS	-	**3**	**0**	$800,000	-

January 12, 1997 Event

Freezing rain and sleet occurred January 12-13 in 1997. Trees, power lines and roadways were affected, with ice causing trees and power lines to snap and fall. Glazed roadways posed hazardous driving conditions and over 1,100 traffic accidents were reported in Southeast Texas, which accounted for 3 deaths. Estimated damage was set at $800,000, which includes damages for the 23-county Southeast Texas region.

December 24, 2004 Event

A rare and record breaking snowfall occurred Christmas Eve into early Christmas morning across Southeast Texas. For the first time in recorded history, some areas experienced their first white Christmas. Snowfall totals ranged from about an inch (in Pasadena) to around 12 inches (in Brazoria) across the region. An arctic cold front had pushed across Southeast Texas on December 22, 2004, dropping temperatures below freezing leaving plenty of cold air in place Christmas Eve when the snow began. What made this event unusual was not just the cold air, but the depth of the cold air that was in place over the area. Before the heavy snow began on the night of Christmas Eve, the entire depth of the atmosphere over Southeast Texas was below freezing. Normally when winter weather events occur in Southeast Texas, the depth of the cold air is much shallower, resulting in ice, freezing rain or sleet, rather than snow. The morning of Christmas Eve, a strong upper level low was evident on satellite across northern Mexico. Ahead of this system, some snow began across Southeast Texas, but the dry atmosphere kept the snowfall light during the day, resulting in only trace amounts or a light dusting through late afternoon. Eventually, the atmosphere moistened up by late in the day as the upper level low approached from the west. The upper low moved across South Texas during the nighttime hours Christmas Eve, resulting in a band of heavy snowfall just north of the track of the system. The band of heaviest snowfall, about 20 miles

wide, was centered from Victoria to Edna to Bay City to Lake Jackson. In this area, approximately 9 to 12 inches of snow fell. The heavier snowfall occurred over the coastal counties south of Houston, including Jackson County, because this area had more moisture in the atmosphere (being closer to the Gulf), and was also closer to the track of the upper level low. No damages were reported.

December 4, 2009 Event

Snow accumulations of between one to two inches occurred across the interior portions of Jackson County. The City of Edna reported the highest snow accumulation of two inches. Moderate, to locally heavy, snow fell across portions of Southeast Texas. This resulted in the region's earliest recorded snow fall. Light rain developed over Jackson County, which turned to snow and sleet. No damages were reported.

February 4, 2011 Event

Although not reported to the NCDC at the time of drafting, Jackson County experienced record cold weather days at the end of January and beginning of February 2011. On February 4, 2011, the area received a mix of sleet and ice that blanketed Southeast Texas. No injuries have been reported.

Probability of Future Events

Based on the available data for previous occurrences of winter storms, the probability of a future event is ocassional, with a winter storm possible every five years or less.

Flood

Inland or riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. It is natural and inevitable as it is the overbank flooding of rivers and streams, typically resulting from large-scale weather systems that generate prolonged rainfall over a wide geographic area. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

Coastal flooding is typically a result of storm surge, wind-driven waves and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Flooding in the coastal environment can be further exacerbated by tidal influence in the low lying coastal areas. Higher tides will increase stream and river stage heights from the mouth while floodwaters rush in from upland areas. Flooding in coastal areas is defined by recurrence intervals and flood zones are determined. Coastal flood zones consider velocity of wave action.

Location

Figure 5-11 shows the flood zones for Jackson County based on FEMA Q-3 data as a digital Flood Insurance Rate Map (FIRM) is not available. Figure 5-12 presents a more detailed view that displays jurisdictional boundaries. Figures 5-13 and 5-14 show coastal flood zones in the county based on storm surge inundation levels.

Figure 5-11. Flood Zones in Jackson County

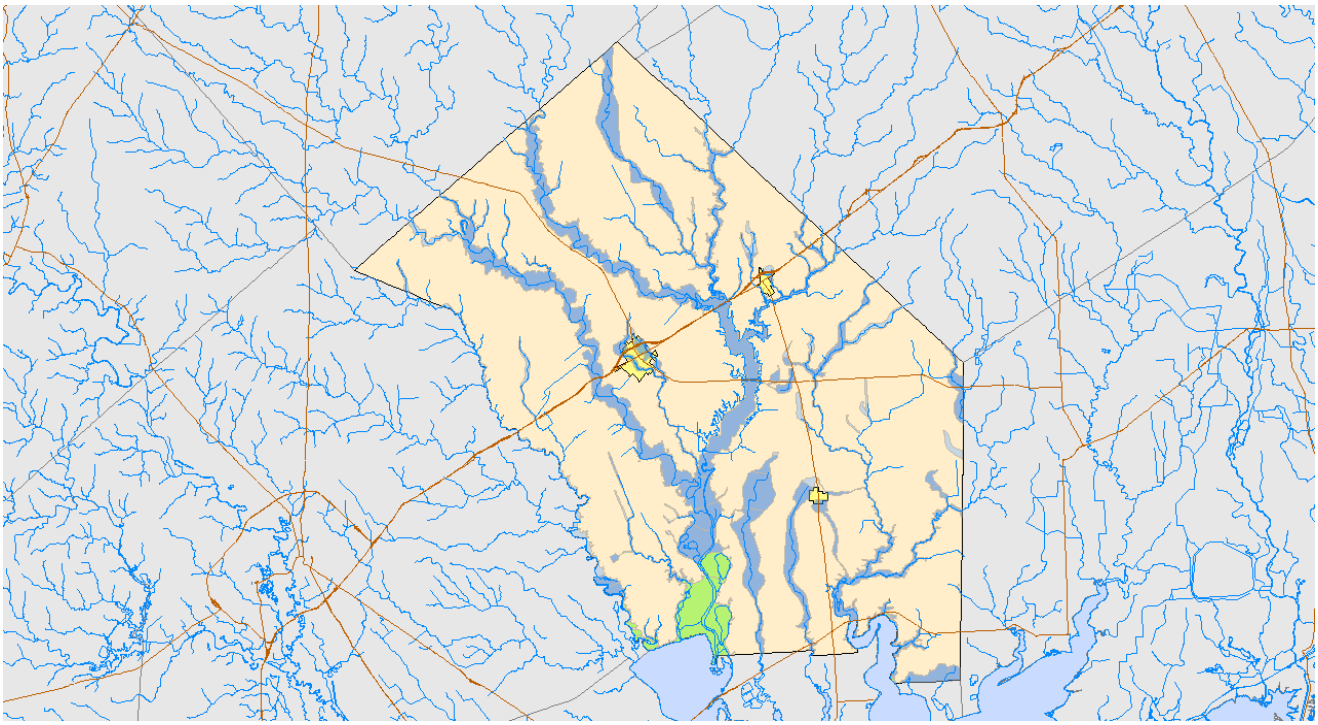


Figure 5-12. Flood Zones – Jurisdictional View

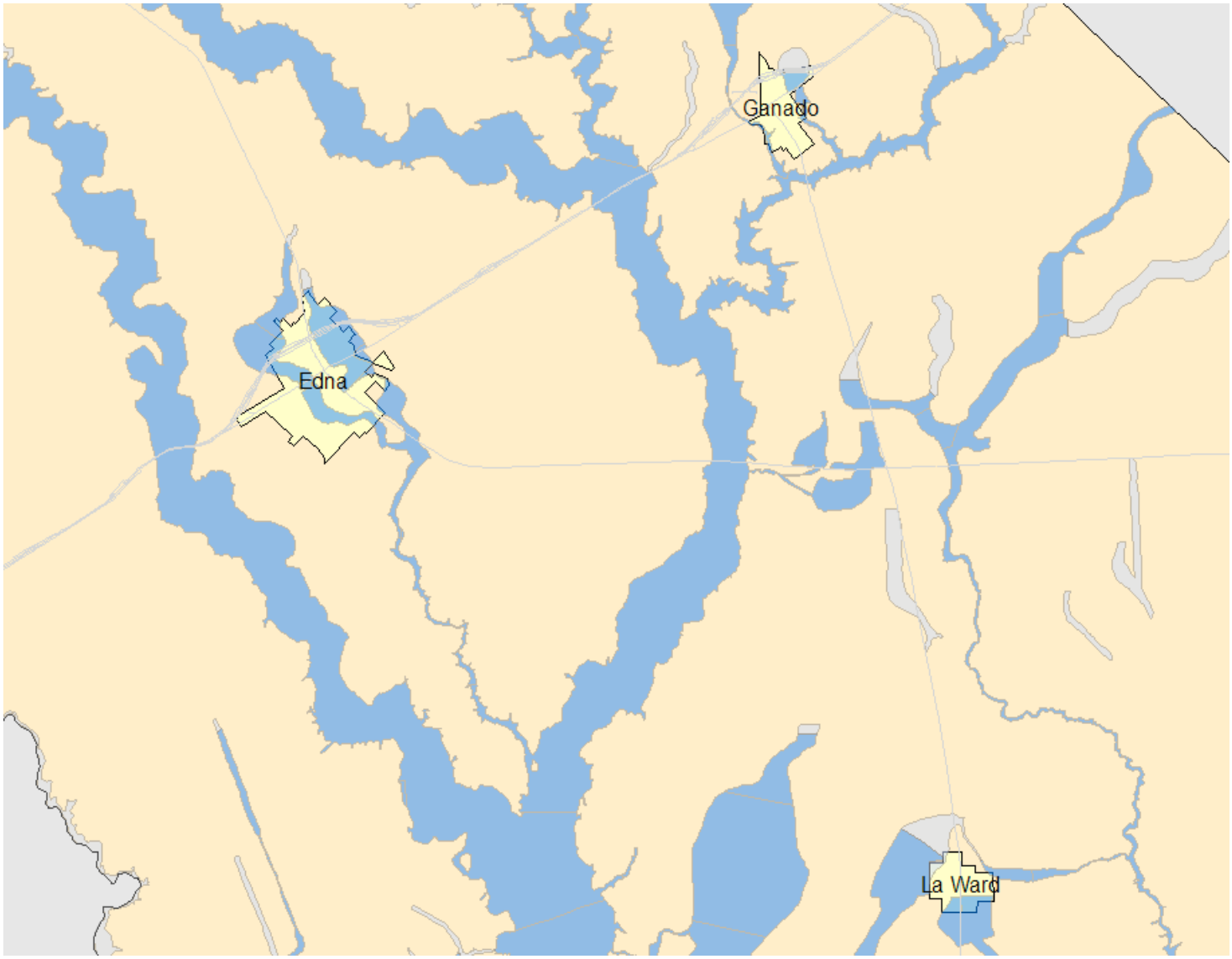


Figure 5-13. Coastal Flood Zones – Storm Surge Elevations (Cat 5)
HAZUS-MH

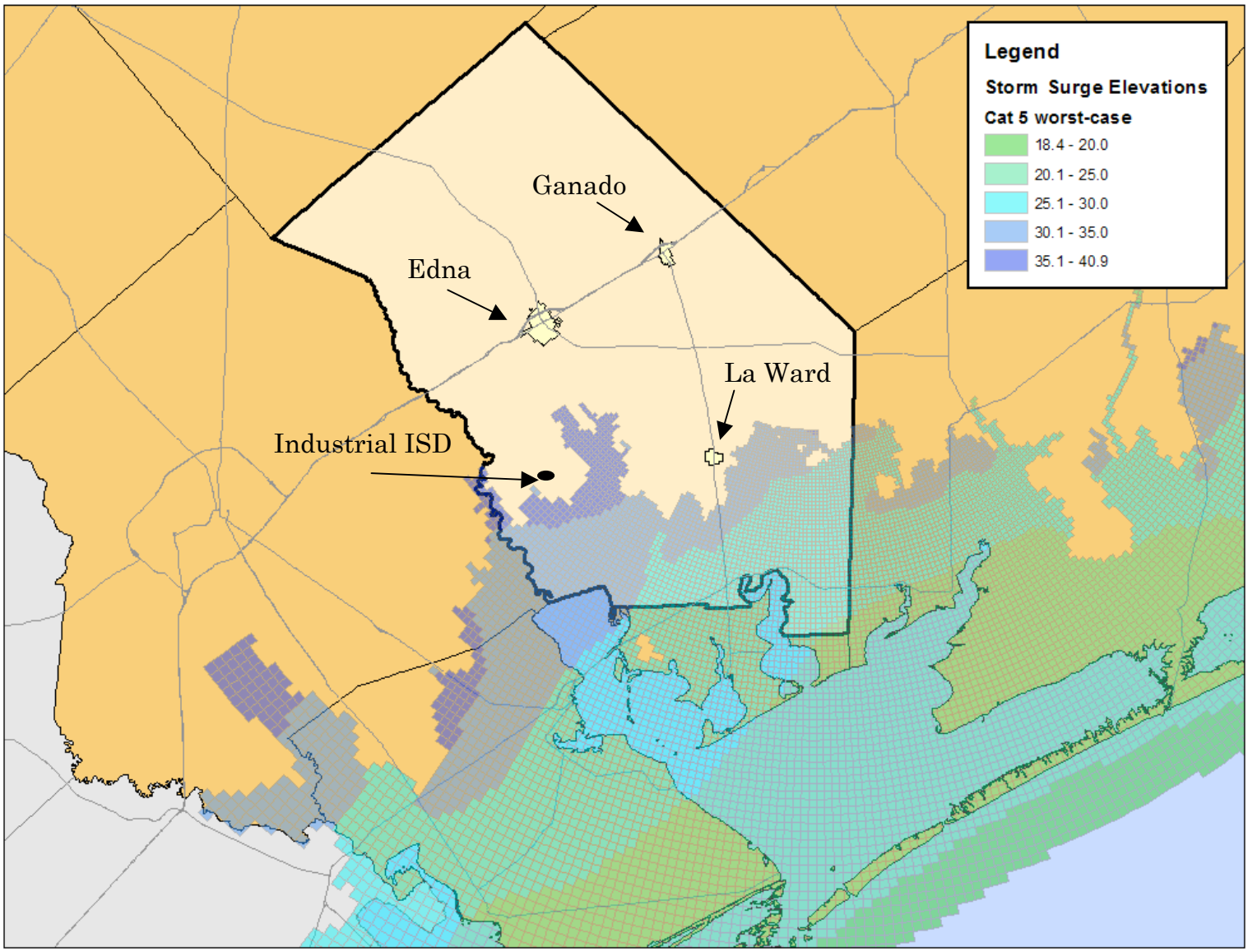
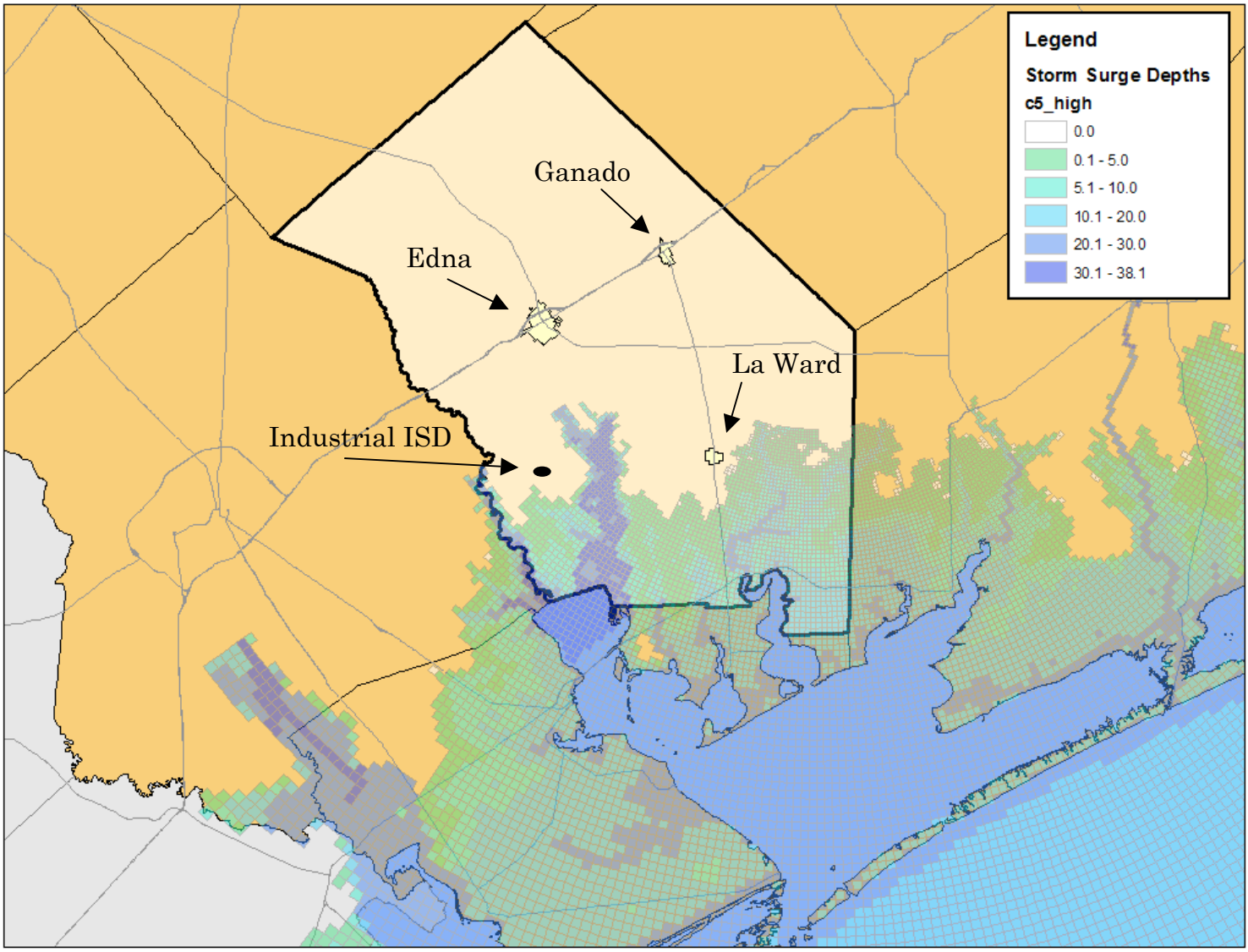


Figure 5-14. Coastal Flood Zones – Storm Surge Depths (Cat 5)
HAZUS-MH



Extent

The severity of a flooding event is typically determined by a combination of several factors including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface. Floods resulting from excessive precipitation can be classified under two categories: general floods, precipitation

over a given river basin for an extended period of time combined with storm-induced wave or tidal action; or flash floods, the product of heavy localized precipitation in a short time period.

Table 5-15. Extent Scale – Water Depth (Mean Sea Level, MSL)

LEVEL OF RISK	JACKSON COUNTY	EDNA (LNRA, EDNA ISD, JACKSON COUNTY HOSPITAL)	LA WARD AND INDUSTRIAL ISD[9]	GANADO
LOW	0 - 20 feet*	0 - 20 feet*	0 - 12 feet	0 - 20 feet*
MODERATE	21 - 25 feet	21 - 25 feet	13 - 16 feet*	21 - 25 feet
HIGH	26 - 29 feet	26 - 29 feet	17 - 27 feet	26 - 29 feet

* Expected extent to mitigate

The water depths depicted in Table 5-15 are an approximation based on elevation data (above sea level rather than above ground) and stream gauge data provided by the National Weather Service. This level of risk is determined by the levels of area streams and rivers. According to Table 5-15, the expected extent to mitigate for Jackson County, Edna and Ganado is from zero to 20 feet and between 13 and 16 feet for La Ward and Industrial ISD. This is due to the relative location of La Ward and Industrial ISD as both are closer to the coastline than Edna and Ganado.

Reading the maps at Figures 5-11 through 5-14 in conjunction with Table 5-15 indicates that the intensity of a flood event for the county ranges from low to high risk depending on the location of the particular jurisdiction, whether closer inland or along the coast.

Previous Occurrences

Table 5-16 lists historical flood occurrences for the county and participating jurisdictions.

[9] Industrial ISD is located in Vanderbilt, a CDP within unincorporated Jackson County

Table 5-16. Historical Flood Occurrences (NCDC 1993–2010)

LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Jackson County	05/05/1993	2010	Flash Flood	0	0	$5,000	$0
Jackson County	10/18/1994	0400	Flash Flood	0	0	$5,000,000	$50,000
Jackson County	06/11/1995	0514	Flash Flood	0	0	$5,000	$0
Ganado	12/31/1996	03:30 AM	Flash Flood	0	0	$5,000	$0
Jackson County	04/04/1997	03:30 AM	Flash Flood	0	0	$5,000	$0
Jackson County	05/09/1997	03:00 PM	Flash Flood	0	0	$5,000	$0
Jackson County	06/21/1997	03:45 PM	Flash Flood	0	0	$5,000	$0
Jackson County	09/11/1998	03:45 AM	Flash Flood	0	0	$0	$0
Jackson County	09/16/1998	02:30 PM	Flash Flood	0	0	$15,000	$0
Jackson County	09/16/1998	08:30 AM	Flash Flood	1	0	$30,000	$0
Jackson County	10/17/1998	12:00 PM	River Flooding	0	0	$0	$0
Jackson County	10/18/1998	01:19 PM	Flash Flood	0	0	$0	$0
Jackson County	10/18/1998	05:07 PM	Flash Flood	0	0	$0	$0
Edna	10/18/1998	06:29 AM	Flash Flood	0	0	$15,000	$0
Jackson County	10/18/1998	08:12 PM	Flash Flood	0	0	$0	$0
Jackson County	11/12/1998	09:47 PM	Flash Flood	0	0	$20,000	$0
Jackson County	11/12/1998	12:00 PM	Flash Flood	0	0	$0	$0
Jackson County	11/13/1998	01:00 AM	Flash Flood	0	0	$10,000	$0
Jackson County	11/14/1998	05:30 AM	Flash Flood	0	0	$5,000	$0
Jackson County	08/30/2001	10:15 PM	Flash Flood	0	0	$80,000	$0
Jackson County	09/01/2001	06:30 AM	Flash Flood	0	0	$45,000	$0
Jackson County	07/16/2002	08:42 AM	Flash Flood	0	0	$3,000	$0
La Ward	06/23/2004	12:15 AM	Flash Flood	0	0	$0	$0
Edna	06/30/2004	04:10	Flash Flood	0	0	$20,000	$0

LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
		PM					
Jackson County	11/21/2004	02:16 AM	Flash Flood	0	0	$500,000	$0
Ganado	05/28/2006	09:00 AM	Flash Flood	0	0	$20,000	$0
Jackson County	07/02/2007	04:00 AM	Flash Flood	0	0	$0	$0
TOTALS	-	-	-	**1**	**0**	**$5,793,000**	**$50,000**

Probability of Future Events

The probability of future occurrences of flood events is highly probable, with more than a 75 percent chance of a flood event occurring in any given year.

Drought

Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological, hydrologic, agricultural and socioeconomic. Table 5-17 presents definitions for these different types of drought.

Table 5-17. Drought Classification Definitions[10]

METEOROLOGICAL DROUGHT	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
HYDROLOGIC DROUGHT	The effects of precipitation shortfalls on stream flows and reservoir, lake and groundwater levels.
AGRICULTURAL DROUGHT	Soil moisture deficiencies relative to water demands of plant life, usually crops.
SOCIOECONOMIC DROUGHT	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Location

Drought can occur throughout the area and is not confined to any specific location.

[10] Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Extent

Table 5-18 displays the Palmer Drought Index and Table 5-19 depicts the extent or magnitude of drought that can be experienced in the county.

Table 5-18. Palmer Drought Index[11]

Drought Index	Drought Condition Classifications						
	Extreme	Severe	Moderate	Normal	Moderately Moist	Very Moist	Extremely Moist
Z index	-2.75 and below	-2.00 to -2.74	-1.25 to -1.99	-1.24 to +.99	+1.00 to +2.49	+2.50 to +3.49	n/a
Meteorological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.00	+3.00 to +3.00	+4.00 and above
Hydrological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.00	+3.00 to +3.00	+4.00 and above

Table 5-19. Palmer Drought Category Descriptions[12]

Category	Description	Possible Impacts	Palmer Drought Index
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested	-2.0 to -2.9
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed	-3.0 to -3.9
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions	-4.0 to -4.9
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies	-5.0 or less

[11] Source: U.S. Drought Monitor

[12] Source: National Drought Mitigation Center

Although Jackson County has experienced periods of moderate, severe and extreme drought, both agricultural and hydrological, based on historical occurrences and the climate for the area, the county on average experiences a range of intensity from D0 to a D1.

Previous Occurrences

Figure 5-15 below provides an overview of severe drought in the Texas Gulf Region from 1895 to 1995. NCDC results provide drought history from 1996 to 2000 in Table 5-20. Because this information is based on a 23-county region, property and crop losses reported for these events are for the region as a whole and not Jackson County alone. An averaged allocation was produced for estimation purposes by dividing the total amount of damages by the number of counties in the affected region. All dollar amounts are shown in adjusted values. Drought losses by type of crop for Jackson County from 2008 to 2010 are provided at Table 5-21 as reported to the Texas Agri-Life Extension Office for Jackson County.

Figure 5-15. Drought in the Texas Gulf Basin

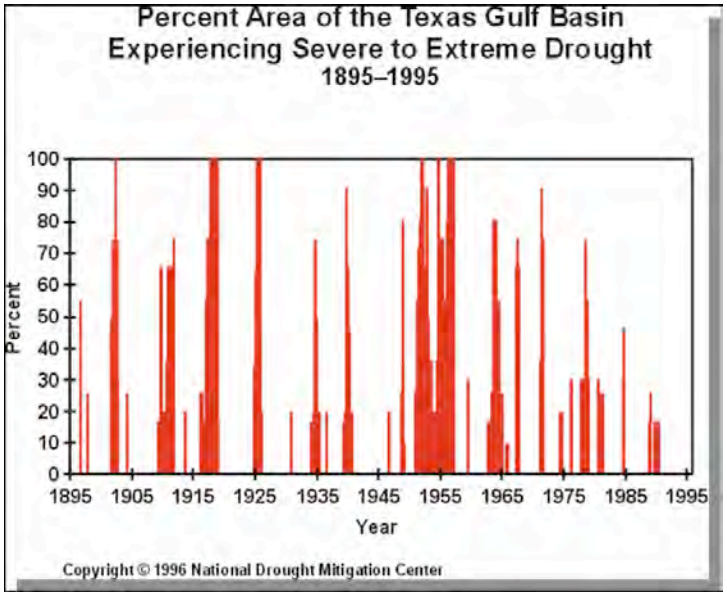


Table 5-20. Drought Events (NCDC 1996–2006)

DATE	NUMBER OF COUNTIES IMPACTED	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)	ALLOCATED AVERAGE (PROPERTY DAMAGE) FOR JACKSON COUNTY	ALLOCATED AVERAGE (CROP DAMAGE) FOR JACKSON COUNTY
1996	23	-	-	$10,000,000	$100,000,000	$434,783	$4,347,826
1998	23	-	-	$23,000,000	$167,900,000	$1,000,000	$7,300,000
2000	23	-	-	$0	$102,300,000	$0	$4,447,826
TOTAL	**23**	**-**	**-**	**$33,000,000**	**$370,200,000**	**$1,434,783**	**$16,095,652**

1996 Event

During this period of drought, extreme failures of crops and pastureland were reported across the impacted area. Due to the lack of grasses for cattle, approximately half the cattle in the region had to be sold early. This flooding of the cattle market sent cattle prices plummeting. The commodity losses for the impacted area included losses to grain, sorghum, hay, cotton, and rice.

The winter of 1995-1996 had below normal precipitation over all of Southeast Texas. By April, what was a dry spell became known as the drought of 1996. Rainfall was 50% below normal and drought conditions continued into May. Normally one of the wettest months, less than 0.10 of an inch of rain fell during the month of May. The effects of agricultural products continued to worsen with many spring crops being lost due to lack of rainfall.

Despite June rain, the annual amounts remained far below normal. Damage from the extended drought reached record proportions as many crops were completely lost and large portion of animals were sold because lack of grass in pasture land.

1998 Event

By the end of May 1998, rainfall fell nine inches below normal, which had adverse effects on agriculture. With no relief in sight, drought-like conditions continued into June, where rainfall was 8-12 inches below normal. Agriculture losses continued to escalate, and conditions worsened in July. Drought relief came late in August with welcomed rainfall and slightly cooler temperatures. Property damage totaled $23 million and crop damage totaled $167.9 million from May to August.

2000 Event

Rainfall for the month of August averaged only 30 to 50 percent at best of the normal amount of precipitation across southeast Texas. Several cities were placed under water rationing and large crop losses were noted across the area. Wildfires became increasingly common, especially toward the end of the month. Severe drought continued across southeast Texas through September 2000, and by the end of the month, damage estimates for the season to cotton, wheat, and forage crops and increased irrigation reached $102.3 million for southeast Texas.

Table 5-21. Drought Losses by Crop Type, Jackson County[13]

DATE	TYPE OF CROP	DAMAGE TOTALS[14]
2008	CORN	$3,870,331
2008	COTTON	$138,987
2008	GRAIN SORGHUM	$336,986
2008	PAST./RANGE	$337,014
2008	RICE	$9,161
2008	SOYBEANS	$160,672
2008	WHEAT	$44,360
TOTAL 2008	-	**$4,897,511**
2009	CORN	$8,405,194
2009	COTTON	$6,408,359
2009	GRAIN SORGHUM	$522,269
2009	PAST./RANGE	$327,747
2009	RICE	$19,441
2009	SOYBEANS	$82,662
TOTAL 2009	-	**$15,765,672**
2010	CORN	$549,499
2010	COTTON	$185,293
2010	GRAIN SORGHUM	$684,437
2010	PAST./RANGE	$72,531
2010	RICE	$59,854
2010	SOYBEANS	$236,359
2010	WHEAT	$148,910
TOTAL 2010	-	**$1,936,883**
TOTAL 2008-2010	-	**$22,600,066**

[13] Source: Texas Agri-Life Extension Service, Edna, Texas

[14] Damage totals are based on insurance indemnity amounts paid by crop for reported losses.

Probability of Future Events

Although instances of extreme drought are less frequent, due to crop losses and previous occurrences, the probability of a future drought event for Jackson County is likely, with an event probable in the next three years.

Wildfire

A wildfire can rapidly spread out of control and occurs most often in the summer, when the brush is dry and flames can move unchecked through a highly vegetative area. The fire often begins unnoticed and spreads quickly, lighting brush, trees and homes. It may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, lightning or arson.

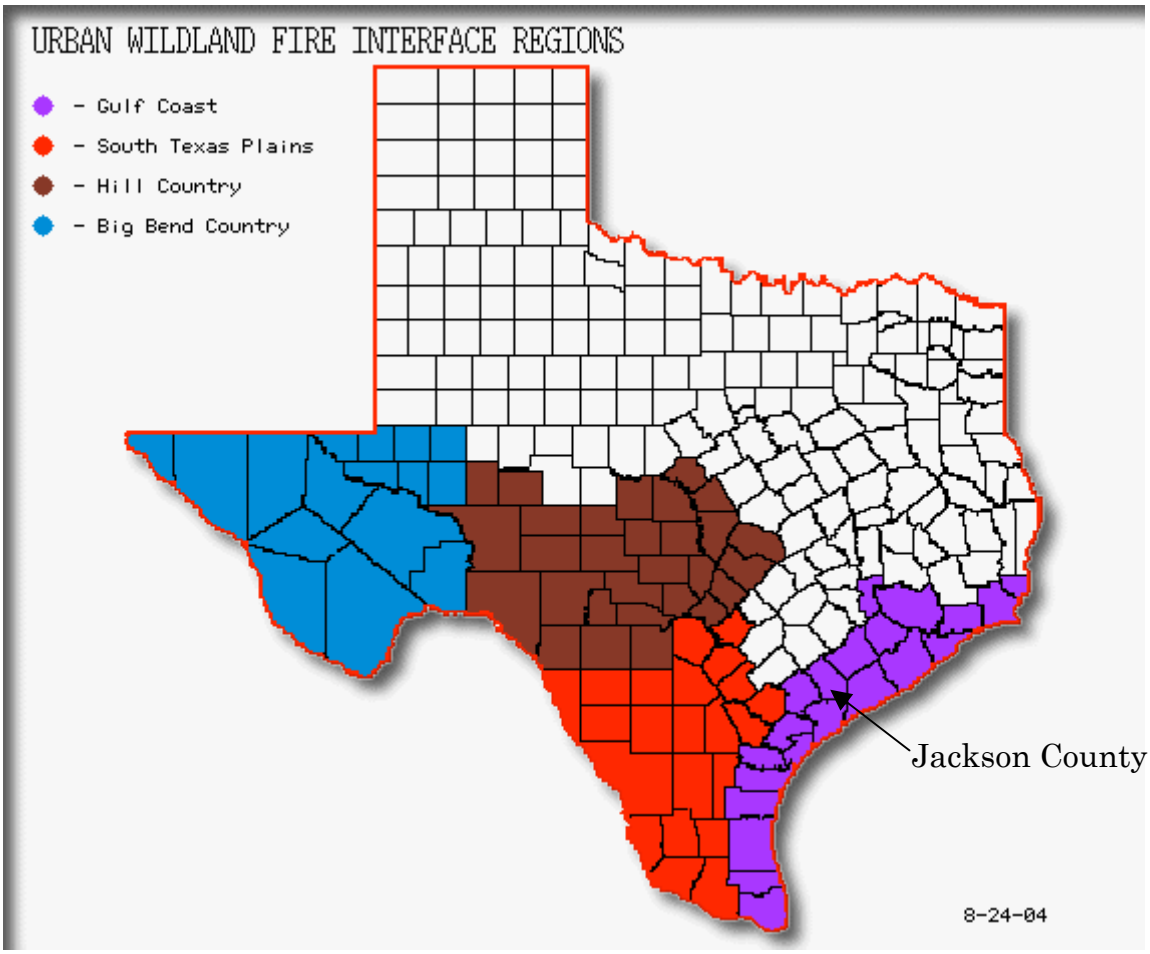
Wildfires can start as a slow burning along the forest floor, killing and damaging trees. They often spread more rapidly as they reach the tops of trees, with wind carrying the flames from tree to tree. Usually, dense smoke is the first indication of a fire.

Texas has seen a huge increase in the number of wildfires in the past 30 years, which include wildland, interface, or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation while interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide the fuel.

Location

Figure 5-21 illustrates the location of Jackson County and the level of risk in terms of urban wildfire interface.

Figure 5-21. Wildland Urban Interface (WUI) Areas

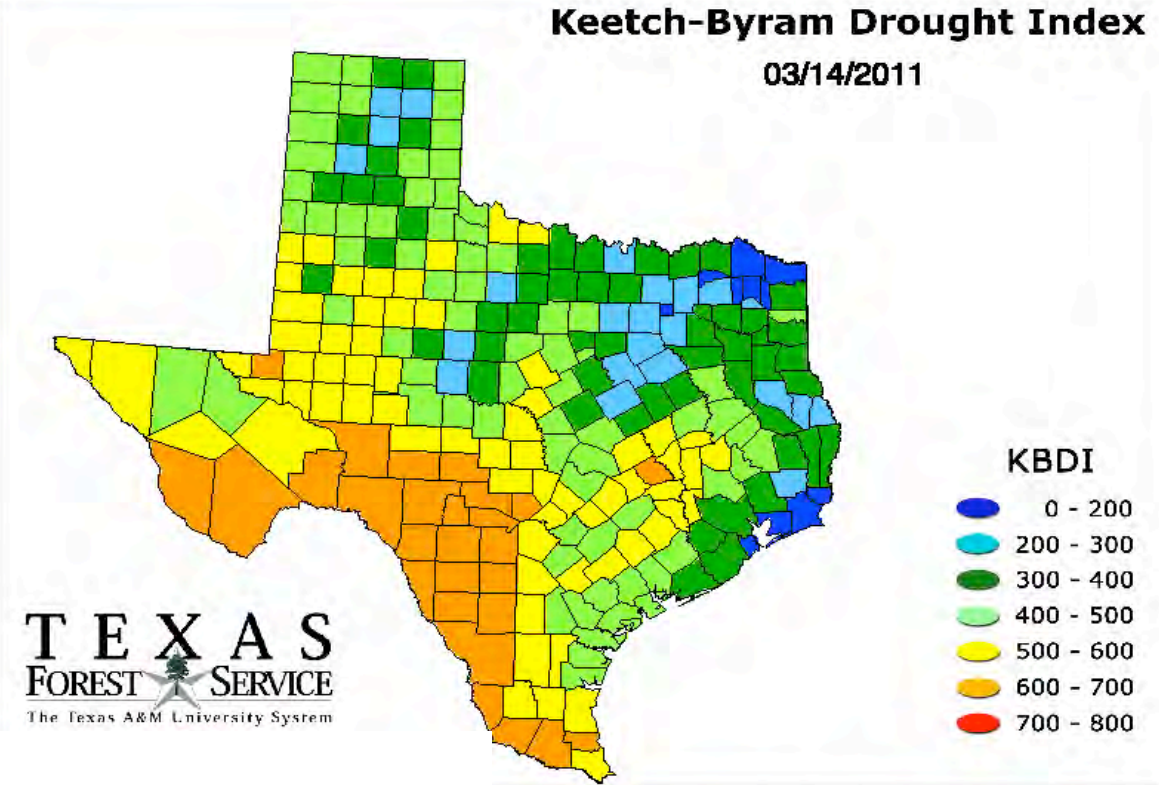


Extent

Fire risk is measured in terms of magnitude and intensity using the Keetch-Byram Drought Index (KBDI), a mathematical system for relating current and recent weather conditions to potential or expected fire behavior.

The KBDI determines forest fire potential and is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inchs) and is expressed in hundredths of an inch of soil moisture depletion.

Figure 5-22. KBDI County Averages – November 2009



Each color on the map represents the drought index at that location. The drought index ranges from 0 to 800, where a drought index of 0 represents no moisture depletion, and an index of 800 represents absolutely dry conditions.

These numbers correlate with potential fire behavior as follows:

- **0 - 200** Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
- **200 - 400** Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
- **400 - 600** Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
- **600 - 800** Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn thorough the night and heavier fuels will actively burn and contribute to fire intensity.

Using the KBDI index is a good measure of the readiness of fuels for wildland fire. Caution should be exercised in dryer, hotter conditions, and the KBDI should be referenced as the area experiences changes in precipitation and soil moisture.

The range for intensity for Jackson County begins from a KBDI of 288 at a minimum to a KBDI of 607 at a maximum. The average extent to be mitigated for Jackson County is a KBDI index of 496. At this level fires readily burn, exposing mineral soils. Larger fuels burn or smolder for several days create smoke and control problems.

Previous Occurrences

According to reports from Volunteer Fire Departments in Jackson County, a total of $6,000.00 in damage has occurred from 2005 to 2009 as indicated in Table 5-22.

Table 5-22. Historical Wildfire Events, Jackson County (2005–2009)[15]

LOCATION	NUMBER OF EVENTS	DOLLAR LOSSES
Jackson County	16	$6,000
TOTAL	**16**	**$6,000**

Probability of Future Events

Wildfires can occur at any time of the year, but due to the low to moderate risk for the area and limited amount of previous occurrence an event for Jackson County is likely, with an event probable in the next three years.

Dam Failure

Dams are water storage, control, or diversion barriers that impound water upstream in reservoirs. Dam failure is a collapse or breach in the structure. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage amounts can cause significant flooding downstream.

[15] Source: Texas Forest Service and Volunteer Fire Stations

Dam failures can result from any one 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, or maintain gates, valves, and other operational components;
- Improper design, such as use of improper construction materials;
- Failure of upstream dams in the same drainage basin;
- Landslides into reservoirs, which cause surges that result in overtopping;
- High winds, which can cause significant wave action and result in substantial erosion;
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments, leading to structural failure.

Location

Jackson County has one major dam, the Palmetto Dam, which is addressed in this risk assessment. The general location is shown in Figure 5-23.

Figure 5-23. General Location of the Major Dam in Jackson County

Distances of 0.25, 0.5, and 1 mile are shown.

Table 5-23 contains general hazard-related information about the dam based on information available from the U.S. Army Corps of Engineers (USACE) National Inventory of Dams and Lavaca-Navidad River Authority (LNRA) personnel.

Table 5-23. General Hazard-Related Information

DAM NAME	IMPOUNDING WATER SOURCE	LENGTH (Ft)	HEIGHT (Ft)	MAXIMUM STORAGE CAPACITY	OWNER
Palmetto Bend Dam	Navidad River (Lake Texana)	42,867	60	204,300	Lavaca-Navidad River Authority

Source: National Inventory of Dams and LNRA personnel

Extent

Dam failure is at times difficult to mitigate due to the fact that any initial steps require determination of ownership. In Texas, there are a total of 7,590 dams. Of these 890 are high hazard dams, with another 802 as significant hazard dams. Almost 90% are over 25 years old. Responsibility for dams lies with the owners and managers of each dam.

Prior to 2009, *High-hazard-potential* dams were defined as those at which failure or mis-operation would probably cause loss of human life. *Significant-hazard-potential* dams are those at which failure or mis-operation probably would not result in loss of human life but could cause economic loss, environmental damage, disruption of lifeline facilities, or other significant damage. *Low-hazard-potential* dams are those at which failure or mis-operation probably would not result in loss of human life but would cause limited economic and/or environmental losses. Losses would be limited mainly to the owner's property.

Table 5-24. Previous Dam Classifications, National Inventory of Dams

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, and Lifeline Losses
Low	None expected	Low and generally limited to owner
Significant	None expected	Yes
High	Probable. One or more expected	Yes (but not necessary for this classification)

In 2008, the TCEQ proposed new rule changes including changing dam classification definitions. Effective January 1, 2009, dam classifications are labeled as shown in Table 5-25.

Table 5-25. Dam Classifications Effective January 1, 2009

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, and Lifeline Losses
Low	None expected	Minimal economic loss
Significant	Probable (1 to 6)	Economic loss appreciable
High	Loss of life expected (7 or more).	Economic loss excessive

Source: Texas Commission on Environmental Quality

The new classifications place a greater impact on high and significant hazard dams. Now a significant classification indicates a probable loss of life, whereas before no

loss of life was expected in the event of dam failure. A High Hazard dam breach is now indicative of an expected loss of life of seven or more persons versus a probable chance in pre-2008 classifications.

Palmetto Dam, located in Jackson County, is classified as "Significant" meaning that the average extent to be mitigated in the event of a dam failure is appreciable economic loss. There is no city or community directly in the inundation area. However, there are 31 homes that are on the east side. No loss of life is expected though damages would occur; a breach would result in two feet of flooding in the 31 homes.

Previous Occurrence

There are about 80,000 dams in the United States today. Catastrophic dam failures have occurred frequently throughout the past century. Between 1918 and 1958, 33 major dam failures in the United States caused 1,680 deaths—an average of 42 deaths a year. From 1959 to 1965, nine major dams failed worldwide.

According to the TCEQ, there have been a total of 98 dam failures from 1970 to 2008 in the State of Texas. Of these 13 were high hazard dams, 28 were significant, and 55 were low[16]. One of the dams that failed is no longer classified and another has been removed from inventory.

There have been no previous occurrences of dam failure in Jackson County.

Probability of Future Events

No major dam failure has affected Jackson County. Therefore failure of a major dam for the county is an unlikely event, meaning that an occurrence is a possibility over the next ten years.

[16] These dams total 96 as one of the dams that failed is no longer classified, while the other has been removed from inventory.

HAZARD VULNERABILITY

Overview

This section builds upon the information provided in Section 5 by providing a statement of vulnerability and assessing the potential impact and where available, losses, that can be expected to be caused by each identified hazard event.

This section focuses on the results of the vulnerability assessment, and is organized by hazard as listed below:

- Atmospheric
  - Hurricane
  - Thunderstorm
    - Hail
    - Lightning
    - Tornado
  - Winter Storm
- Hydrologic
  - Flood

    - Drought
- Other Natural Hazards
    - Wildfire
- Technological
    - Dam Failure

This risk assessment was conducted using two distinct methodologies: utilizing GIS-based analysis and statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information.

A GIS-based analysis was conducted for five hazards:

- Hurricane
- Flood
- Wildfire

A statistical risk assessment approach was used to analyze four hazards:

- Thunderstorm
    - Hail
    - Lightning
    - Tornado
- Drought

An analysis of historical data was used to analyze five hazards:

- Dam Failure
- Winter Storm

For each of the hazards profiled, a description of general vulnerability and impact statement are included. Impact statements are defined in the Table 6-1.

Table 6-1. Impact Statements

Potential Severity	Description
Substantial	Multiple deaths Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.

Potential Severity	Description
Major	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Hurricane

Due to Jackson County's mid-coastal geographic location, this area of the State is vulnerable to damage from hurricane winds and inland impact of coastal storms. Jackson County is vulnerable to threats directly and indirectly related to a hurricane or tropical storm event, including high-force winds, storm surge and flooding. Structures along the beachfront or in coastal areas face the primary impact of hurricane winds; however, hurricanes and their secondary hazards can affect the entire county. The effects of a hurricane or tropical storm begin to diminish as it moves inland, although effects may be far-reaching. For example, winds alone from Hurricane Ike covered 120 miles, stretching well beyond the coastal area.

Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. Debris such as signs, roofing materials, and small items left outside become extremely hazardous in hurricanes and tropical storms. Extensive damage to trees, towers, and underground utility lines (from uprooted trees) and fallen poles cause considerable civic disruption.

The impact from a hurricane for the county is "Major," as storms can shutdown critical facilities for weeks.

Thunderstorm

Vulnerability is difficult to evaluate since thunderstorms can occur at different strength levels, in random locations, and can create relatively narrow paths of destruction. Due to the randomness of this event, all existing and future structures, and facilities in Jackson County could potentially be impacted and remain vulnerable to possible injury and/or property loss from lightning, hail and strong winds associated with tornadoes and severe thunderstorm.

Trees, power lines and poles, signage, manufactured housing, radio towers, lighting, concrete block walls, storage barns, windows, garbage recepticles, brick facades, and vehicles, unless reinforced, are vulnerable to severe winds associated with thunderstorm events. More severe damage involves windborne debris—in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In numerous instances roofs have been reported as having been torn off of buildings.

A severe event can result in heavy rains and extensive damage to personal property and critical facilities as accompanying winds can down trees and powerlines.Traffic discruptions, injuries and in rare cases, fatalities, can occur. Therefore the impact of a thunderstorm event is "Minor".

Sub Hazard - Hail

Damage from hail approaches $1billion in the US each year. Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles,

roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail.

Hail has been known to cause injury to humans, and occasionally has been fatal. Due to the lower level of risk for hail for Jackson County and previous damages, impact for hail is "Limited".

Sub Hazard - Lightning

Depending on the intensity of a lightning event, damage can result in electrocution of humans and animals; vaporization of materials along the path of the strike; fire caused by the high temperature produced by the strike; and a sudden power surge that can damage electrical and electronic equipment. Millions of dollars of direct and indirect damages result from lightning strikes on electric utility substations and distribution lines. While property damage is the major hazard associated with lightning, it should be noted that lightning strikes kill nearly 100 people each year in the United States[1]. Though manufactured homes are most vulnerable to strong wind associated with thunderstorms, all structures are vulnerable to lightning. Lightning can strike ten miles out from the rain column, enabling injurious lightning strikes to people to occur under a clear sky ahead of the storm.

A worst case scenario involving lightning strikes is a solid or redeveloping line of severe thunderstorms moving through the entire county. Large economic loss to agriculture and/or major damage to buildings and other property can result if such storms are accompanied by high winds. High winds and lightning associated with such storms can also down trees and highline poles and result in power outages capable of affecting large areas of a county.

Due the level of lightning activity for the county and previous occurrences, impact for lightning is "Limited".

Sub Hazard - Tornado

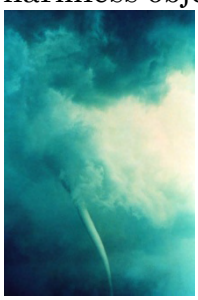
Because tornadoes often cross jurisdictional boundaries, all existing and future buildings, facilities and populations in Jackson County are considered to be exposed to this hazard and could potentially be impacted.

[1] National Weather Service

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Consequently, vulnerability of humans and property is difficult to evaluate since tornadoes form at different strengths, in random locations, and create relatively narrow paths of destruction. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Manufactured Homes
- Homes on crawlspaces (more susceptible to lift)
- Buildings with large spans, such as shopping malls, gymnasiums, and factories

The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.



Most tornadoes are a few dozen yards wide and touchdown briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long. However, impact for tornado is "Minor" based on previous losses and potential risk.

Winter Storm

During periods of extreme cold and freezing temperatures, water pipes can freeze and crack, and ice can build up on power lines, causing them to break under the weight or causing tree limbs to fall on the lines. These events can disrupt electric service for long periods.

Economic impact may be felt by increased consumption of heating fuel which can lead to energy shortages and higher prices. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

All populations, buildings, critical facilities, and infrastructure in Jackson County are vulnerable to severe winter events. People and animals are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in the rural areas of the county where populations are sparse, icy roads may impede travel, and there are fewer neighbors to check in on the elderly. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Despite the potential harm from a winter storm event, based on the level of risk and previous occurrences for winter storms in Jackson County, the impact for winter storm is "Minor".

Flood

A property's vulnerability to a flood depends on its location in, or in proximity, to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures.

Jackson County has experienced minimum growth (US Census 2000), resulting in lesser flood losses due to limited development in this area. However, due to the generally flat terrain of this mid-coastal county, homes and businesses in the floodplain remain at risk of flooding. During periods of heavy rainfall, homes and businesses located in the downtown area of the City of Edna experience severe runoff and are vulnerable to flooding from the Lavaca River, located approximately two miles west of the city.

Although the county has experienced minimum growth and has encouraged development outside of the floodplain, impact for flood is "Major" as it could result in the shutdown of facilities for multiple weeks, depending on the scale of the storm.

NFIP Participation

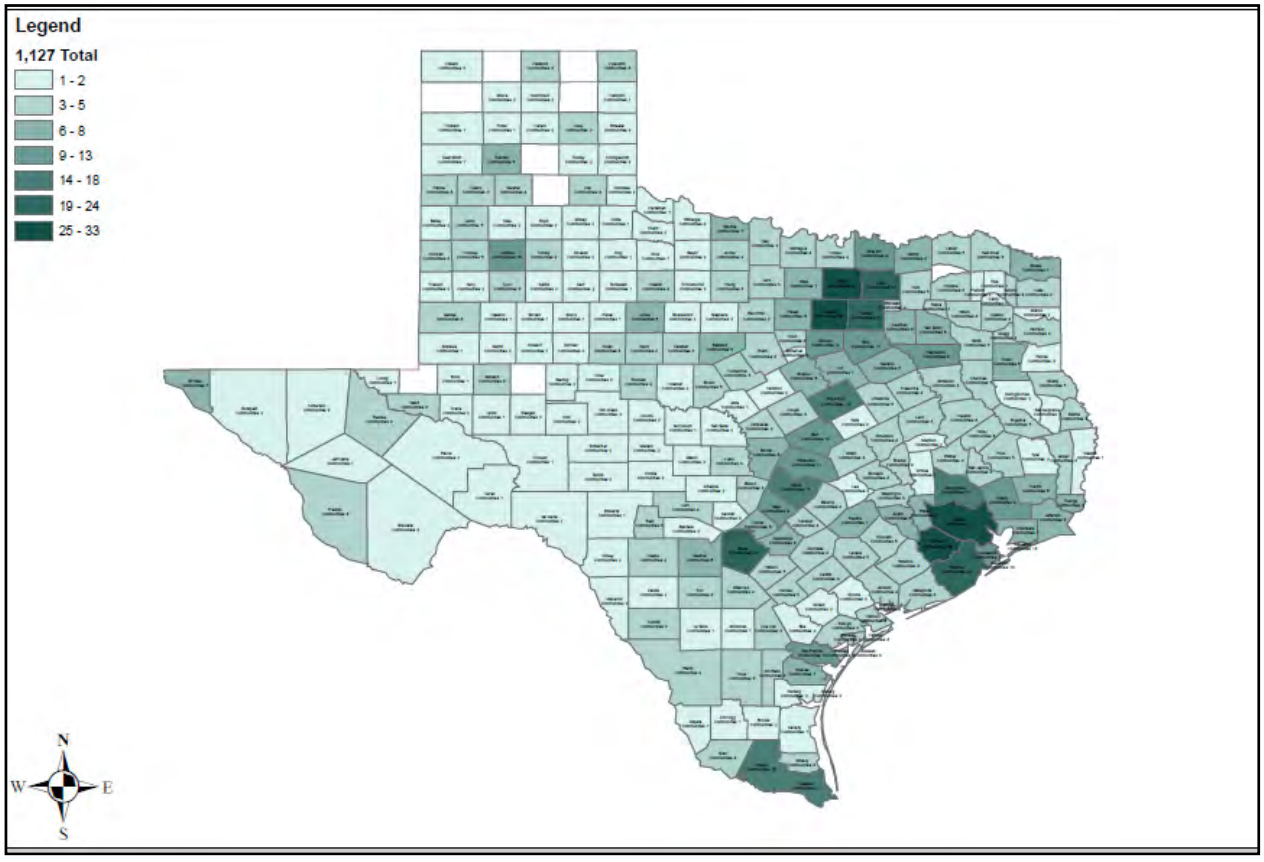
Jackson County and the Cities of Edna, Ganado and La Ward are all participating in the National Flood Insurance Program (NFIP).

As part of continual compliance with the NFIP, both the City of Ganado and the City of La Ward have developed floodplain management plans. In addition all

participating jurisdictions have taken part in the Community Assistance Program (CAP), which ensures that communities are taking flood loss reduction steps.

The Cities of Edna and La Ward received a Community Assistance Contact (CAC) in 1994, and Ganado received a CAC in 1996. All three cities, and Jackson County, received a Community Assistance Visit (CAV) from 2000 to 2001. Figure 6-1, which is provided by the Texas Water Development Board (TWDB), shows overall participation in the NFIP.

Figure 6-1. NFIP Participation by County



Identification and Analysis of NFIP Mitigation Strategy

In reviewing mitigation actions and the mitigation goals included in the 2004 Plan, planning participants analyzed actions in terms of the availability of funding for NFIP strategies.

As discussed in Sections 2 and 8, mitigation strategies were prioritized using the STAPLE+E method of evaluation. At the mitigation workshop, planning participants separated into groups to facilitate discussion and prioritized actions for the NFIP taking into account grant funding opportunities available through the Flood Mitigation Assistance Program and other flood reduction programs administered by the TWDB. Actions were then prioritized based on the likelihood of funding for the type of actions. For example, eligible activities, such as dry flood proofing or elevating structures, were given a higher priority based on the availability of funding for these actions.

NFIP actions can be found in Section 8 with all of the mitigation actions for participating entities in this Plan Update. NFIP actions are denoted as "NFIP" in the top row of the action item.

Repetitive Losses

The Severe Repetitive Loss (SRL) Grant Program under FEMA, provides federal funding to assist states and communities in implementing mitigation measures to reduce or eliminate the long-term risk of flood damage to severe repetitive loss residential structures insured under the National Flood Insurance Program (NFIP). The Texas Water Development Board administers the SRL grant program for the State of Texas.

Severe Repetitive Loss properties are defined as residential properties that are:

- covered under the NFIP and have at least four (4) flood related damage claim payments (building and contents) over $5,000.00 each, and the cumulative amount of such claims payments exceed $20,000; or
- for which at least two (2) separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

In either instance, at least two of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart[2]. Table 6-2 below shows repetitive loss properties for Jackson County and the participating jurisdictions in the Plan Update.

Table 6-2. Repetitive Loss Properties, Jackson County[3]

Community Name	Community Number	Property Locater	Mitigated?	Insured?	Property Type?
JACKSON COUNTY	480379	0097308	NO	NO	RESIDENTIAL
JACKSON COUNTY	480379	0069789	NO	NO	RESIDENTIAL
EDNA, CITY OF	485465	0071493	NO	YES	RESIDENTIAL
EDNA, CITY OF	485465	0069787	NO	NO	RESIDENTIAL
EDNA, CITY OF	485465	0128790	NO	YES	RESIDENTIAL
EDNA, CITY OF	485465	0073556	NO	YES	RESIDENTIAL
EDNA, CITY OF	485465	0073555	NO	YES	RESIDENTIAL
EDNA, CITY OF	485465	0098422	NO	NO	RESIDENTIAL
EDNA, CITY OF	485465	0025850	NO	SDF	RESIDENTIAL
EDNA, CITY OF	485465	0099140	NO	YES	RESIDENTIAL
EDNA, CITY OF	485465	0026643	YES	NO	RESIDENTIAL
EDNA, CITY OF	485465	0026190	YES	NO	RESIDENTIAL
EDNA, CITY OF	485465	0068797	YES	NO	RESIDENTIAL

Drought

Droughts are slow-onset hazards, but over time can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant.

Drought warnings are issued by the State Drought Preparedness Council, as directed by H.B. 2660, based upon input from NOAA, the Office of the State Climatologist, the U.S. Geological Service, the Texas Water Development Board, Texas Commission on Environmental Quality, and the Texas Agricultural Statistics Service. Warnings utilize five "levels of concern" and take into account assessments of climatology, agriculture and water availability for each of 10 climatic regions of the state.

[2] Source: Texas Water Development Board (TWDB)

[3] Source: TWDB

Mitigation Strategy

Mitigation Goals

Based on the results of the risk and capability assessments, the planning team was able to develop and prioritize the mitigation strategy. At the Risk Assessment and Mitigation Workshop held in February, 2011, planning team members refined the mitigation strategy for the Plan, revising the order of the mitigation goals. However, team members selected to maintain the overall goal of reducing and eliminating the long-term risk of loss of life and property damage from the full range of disasters.

Goal 1

Protect public health and safety.

Objective 1.1

Maintain critical facilities.

Objective 1.2

Maximize the utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

Objective 1.3

Reduce the danger to, and enhance protection of, high risk areas during hazard events

Objective 1.4

Protect critical facilities and services.

Goal 2

Protect new and existing properties.

Objective 2.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

Objective 2.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

Historic Movie Theater, Edna, TX

Objective 2.3

Enact and enforce regulatory measures to ensure that development will not put people in harm's way or increase threats to existing properties.

Goal 3

Build and support partnerships to enhance mitigation to continuously become less vulnerable to hazards.

Objective 3.1

Build and support local partnerships to continuously become less vulnerable to hazards.

Objective 3.2

Build a cadre of committed volunteers to safeguard the community before, during and after a disaster.

Objective 3.3

Build hazard mitigation concerns into City and County planning and budgeting processes.

Goal 4

Leverage outside funds for investment in hazard mitigation.

Objective 4.1

Maximize the use of outside sources of funding.

Objective 4.2

Maximize participation of property owners in protecting their properties.

Objective 4.3

Maximize insurance coverage to provide financial protection against hazard event.

Objective 4.4

Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.

Goal 5

Increase understanding of residents of the need for mitigation and steps they can take to protect people and properties.

Old Jackson County Courthouse, Edna, TX

Objective 5.1

Heighten public awareness of the full range of natural and man-made hazards they face.

Objective 5.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards.

Objective 5.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

Mitigation Actions

As discussed in Section 2, at the mitigation workshop held for the County, the planning team and stakeholders reviewed actions included in the 2004 Plan and provided a review for these actions, stating whether the action was completed, should be deleted or deferred for the Update. In addition, the planning team identified and prioritized new mitigation actions, including at least two different types of mitigation actions for every hazard. Mitigation actions were prioritized in terms of cost, benefit, implementation and feasibility. A STAPLE+E analysis is included after each action.

Jackson County

Previous Actions and Review

		Jackson County (Past Action)-1
	Proposed Action:	Place NOAA weather radios in every principal's office in all schools, 3 city halls and public library. Increase public education about severe weather threats and appropriate responses. Enhance the ability to inform communities and special authorities about weather warnings.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	There are currently no early warning systems in place in Jackson County that can severely limit the ability to provide notification to the public regarding potentially dangerous weather events and safety precautions.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1500-2000
Potential Funding Sources:	Grants and bonds
Lead Agency/Department Responsible:	Jackson County Emergency Management
Implementation Schedule:	ASAP

Review:
Completed—NOAA provided radios in 2009.

		Jackson County (Past Action)-2
	Proposed Action:	Establish a washing facility for hazard contamination spills or radiation accidents.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	This County has no provisions for any type of washing facility for hazard contamination spills or radiation accidents.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Hazardous Material Incidents
Priority (High, Moderate, Low):	High
Estimated Cost:	$15,000-20.000
Potential Funding Sources:	Grants or bonds
Lead Agency/Department Responsible:	County, City, EMS, Fire Department, DPS, Police/Sheriff, and hospitals
Implementation Schedule:	ASAP

Review:
This action should be deleted because it is not a natural disaster and does not address one of the mitigation hazards.

		Jackson County (Past Action)-3
	Proposed Action:	Arrange a pre-incident contract with environmental spill cleanup contractor.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	This County has no contracts with an established environmental cleanup crew in the event of a manmade hazard accident such as hazard contamination spills or radiation accidents.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Hazard Material Incidents
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants or bonds
Lead Agency/ Department Responsible:	County
Implementation Schedule:	ASAP

Review:
Completed a pre-incident contract with an environmental spill cleanup contractor.

		Jackson County (Past Action)-4
	Proposed Action:	Provide portable decontamination/washdown facilities for carrying on fire trucks/ambulances.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	There are no decontamination facilities for over 30 miles in the area; yet there are two intersections that are notorious for truck roll-overs.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Hazardous material spills
Priority (High, Moderate, Low):	High
Estimated Cost:	$5000
Potential Funding Sources:	General revenues or grants
Lead Agency/Department Responsible:	Carancahua Community VFD
Implementation Schedule:	2005

Review:
Completed—portable decontamination/washdown facilities were provided for hazmat trailer and the hospital facility.

		Jackson County (Past Action)-5
	Proposed Action:	Provide training for elected officials and professional technical staff (including emergency management coordinators) on emergency management issues.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	Many elected officials and city and county staff that must deal with emergency management issues do not receive adequate training or have access to comprehensive technical resources.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Dam Failure, Flood, Severe Thunderstorm, Winter Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants or bonds
Lead Agency/Department Responsible:	County, City, EMS, Fire Department, DPS, Police/Sheriff, and hospitals
Implementation Schedule:	Ongoing

Review:
The development of a new narrower action will be drafted. Therefore this action is partially deferred.

	Jackson County (Past Action)-6
Proposed Action:	Implement major clearing of trees and brush from all main creeks and ditches. Increase dimensions of drainage culverts in troublesome areas. Get easements to private property.
BACKGROUND INFORMATION	
Site and Location:	Jackson County
History of Damages:	Areas of concern had flooding problems during the flooding events of 1994 and 1997.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Jackson County Drainage District
Implementation Schedule:	January 1, 2007

Review:
Tree and brush clearing from all creeks/ditches and getting easements for private property are ongoing operations. However, increasing dimensions of drainage culverts hasn't been completed due to funding issues.

		Jackson County (Past Action)-7
	Proposed Action:	Obtain an elevated, high volume (at least 6000 gal)/high flow water tanks (at least 3, preferably 8) spaced throughout the area, which is 114 square miles.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	No fire mains or hydrants exist in this area and fire fighting in limited to the amount of water carried on the fire trucks.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Fire
Priority (High, Moderate, Low):	High
Estimated Cost:	Less than $10,000 per tank
Potential Funding Sources:	Grants and bonds
Lead Agency/Department Responsible:	Carancahua Community VFD
Implementation Schedule:	ASAP

Review:
This action has been partially completed. The county has sub-storage tanks but they are not elevated at this time.

		Jackson County (Past Action)-8
	Proposed Action:	Provide for traffic control on non-regulated intersections (signs, traffic officer, one way routes).
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	There are currently no highway markings as designated evacuation routes. Traffic flow is currently not regulated to one-way during an evacuation to increase the available volume on the route. There are some evacuating signs. However, evacuation routes need to be reconsidered and remarked. This is a regional plan, not just for Jackson County.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Hurricane
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000-15,000
Potential Funding Sources:	General revenues or grants
Lead Agency/Department Responsible:	Jackson County, State Highway Department
Implementation Schedule:	ASAP

Review:
This action needs to be deleted due to the scope of the mitigation action.

		Jackson County (Past Action)-9
	Proposed Action:	Install a network of dry hydrants in stack ponds, creeks, small lakes, and Lake Texana to increase the supply of water for fire protection.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	There is a need for a quicker water supply to fight rural fires.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Fire
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$1200 per connection for materials More need for gravel for all weather sites.
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	2005

Review:
Partially complete—Some hydrants are currently in place. County has decided to defer this action and will continue installing dry hydrants when funding becomes available.

		Jackson County (Past Action)-10
	Proposed Action:	Provide warning sirens or other communications system for communities on the coast.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	At least five communities have many retired people and no public warning of any kind - not even police cars with public address systems. In the past, tropical storms have developed and come ashore in less than one day making television weather is an insufficient warning device.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Hurricane
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Could potentially cost up to $20,000 per community
Potential Funding Sources:	Funding sources are currently being explored
Lead Agency/Department Responsible:	Local fire department
Implementation Schedule:	To be determined

Review:
Completed—The county uses the R-911 system as the communications system for the community.

New Actions

		Jackson County – 1
	Proposed Action	**Develop a water supply plan in advance of drought**
	BACKGROUND INFORMATION	
	Site and Location	Countywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Drought
Effect on new/existing buildings	This action will ensure that an adequate water supply is provided for structures countywide during times of drought to prevent from damage.
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$5,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Emergency Management Office
Implementation Schedule	Upon receipt of funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 2
	Proposed Action	**Implement a program to remove downed trees to reduce fire fuel and potential fire risk**
	BACKGROUND INFORMATION	
	Site and Location	Countywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Wildfire
Effect on new/existing buildings	Reduce fire risk to all structures in unincorporated areas of county
Priority (High, Moderate, Low)	High
Estimated Cost	$30,000
Potential Funding Sources	Grants, county funds
Lead Agency/Department Responsible	Precinct offices
Implementation Schedule	As funding becomes available

COMMENTS
This would be an ongoing project

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 3
	Proposed Action	**Obtain funding to purchase and increase burn ban signage**
	BACKGROUND INFORMATION	
	Site and Location	Unincorporated areas of county
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Wildfire
Effect on new/existing buildings	Increased awareness and notification serves to educate citizens on reducing fire fuel around structures thus reducing wildfire threat
Priority (High, Moderate, Low)	High
Estimated Cost	$1,000
Potential Funding Sources	Grants and local funding
Lead Agency/Department Responsible	County
Implementation Schedule	Upon receipt of funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 4
	Proposed Action	**Implement a program to trim trees hanging in right of way of streets that when downed during severe winter storm, pose a threat to structures, cars and citizens**
	BACKGROUND INFORMATION	
	Site and Location	Incorporated areas of county
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Winter Storm
Effect on new/existing buildings	Reduce possible damage to buildings from fallen limbs/branches
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$20,000
Potential Funding Sources	County funds/grants
Lead Agency/Department Responsible	Commissioner's court
Implementation Schedule	Upon funding

COMMENTS
This would be an ongoing project/action

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 5
	Proposed Action	**Develop a dual-purpose community safe room/shelter at Edna ISD.**
	BACKGROUND INFORMATION	
	Site and Location	EISD
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Increased protection to structures and students during a hurricane event
Priority (High, Moderate, Low)	High
Estimated Cost	$5 Million
Potential Funding Sources	FEMA/ Grants shared with EISD
Lead Agency/Department Responsible	EISD
Implementation Schedule	2011-2012

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 6
	Proposed Action	**Obtain funding to add window glazing to county courthouse**
	BACKGROUND INFORMATION	
	Site and Location	Count courthouse, Edna, TX
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Severe Thunderstorm
Effect on new/existing buildings	Protect existing structure's windows from increased damage during storms
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$15,000-$20,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Emergency Management office
Implementation Schedule	2012 or as funding becomes available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 7
	Proposed Action	**Purchase cots and supplies for safe room initiative project**
	BACKGROUND INFORMATION	
	Site and Location	Emergency Management Office
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$10,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Emergency Management Office
Implementation Schedule	Within one year of funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 8
	Proposed Action	**Obtain funding to retrofit county courthouse for a hurricane shelter**
	BACKGROUND INFORMATION	
	Site and Location	County courthouse
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Further protect existing structure from damage
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$20,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Emergency Management office
Implementation Schedule	Upon funding

COMMENTS
This includes adding rollup shutters to second floor windows

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County –9 (NFIP)
	Proposed Action	**Review and revise current National Flood Insurance Program floodplain management regulations/ordinance based on new digital flood maps developed under Risk MAP program**
	BACKGROUND INFORMATION	
	Site and Location	Unincorporated areas of the county
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Increase protection from flooding for new construction and substantially improved or modified existing structures
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$20,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Emergency Management Office
Implementation Schedule	Upon receipt of grant funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 10
	Proposed Action	**Develop water conservation program to educate and provide incentives to residents for installing low-flow plumbing for toilets, energy efficient W/D, and rain harvesting devices on homes**
	BACKGROUND INFORMATION	
	Site and Location	Unincorporated Jackson Co.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Drought
Effect on new/existing buildings	More efficient new construction and older structures that may be retrofitted for conservation
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$500
Potential Funding Sources	County funds
Lead Agency/Department Responsible	Extension office
Implementation Schedule	2011-2012 and ongoing

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 11 (NFIP)
	Proposed Action	**Develop procedures and plan for obtaining Community Rating System (CRS) status through the NFIP**
	BACKGROUND INFORMATION	
	Site and Location	Unincorporated Jackson Co.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Would promote purchase of flood insurance to residents in floodplain areas and protect structures elevated above BFE
Priority (High, Moderate, Low)	Moderate
Estimated Cost	Unknown
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Emergency Management office
Implementation Schedule	Upon receipt of funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County – 12
	Proposed Action	**To switch from a manual generator switch to an auto generator switch**
	BACKGROUND INFORMATION	
	Site and Location	Precinct 2 Barn
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Winter Storm
Effect on new/existing buildings	This action would protect existing buildings by ensuring power supply and preventing damage in the event of a storm.
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$7,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Precinct 2
Implementation Schedule	ASAP

COMMENTS
Jackson County currently has a manual switch and is looking to switch to an auto switch. In the event of a storm, the switch has to be manually operated which potentially endangers emergency personnel. Investing in an auto switch would protect more lives and prevent injury.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County- 13
	Proposed Action	**Purchase generator for the County Courthouse for protection of EOC Staff and records**
	BACKGROUND INFORMATION	
	Site and Location	County Courthouse- EOC
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	This action would protect existing buildings by ensuring power supply and preventing damage in the event of a storm.
Priority (High, Moderate, Low)	High
Estimated Cost	$150,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Commissioner's Court
Implementation Schedule	2012

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County- 14
	Proposed Action	**Transfer from manual to automatic switch for the County Services Building**
	BACKGROUND INFORMATION	
	Site and Location	County Courthouse- EOC
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	This action would protect existing buildings by ensuring power supply and preventing damage in the event of a storm.
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$20,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Commissioner's Court
Implementation Schedule	2013

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County- 15
	Proposed Action	**Retrofit building for emergency generator to storm-proof it in the event of a thunderstorm or other hazard event.**
	BACKGROUND INFORMATION	
	Site and Location	County Services Building
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Severe Thunderstorm
Effect on new/existing buildings	This would protect the existing building which will house the generator.
Priority (High, Moderate, Low)	High
Estimated Cost	$10,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Commissioner's Court
Implementation Schedule	2013

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County-16
	Proposed Action	**Harden critical facilities by installing hurricane shutters.**
	BACKGROUND INFORMATION	
	Site and Location	County Services Building
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Shutters will provide protection to existing buildings in the event of a hurricane by protecting windows and other vulnerable areas of the county services building.
Priority (High, Moderate, Low)	High
Estimated Cost	$20,000
Potential Funding Sources	Grant
Lead Agency/Department Responsible	EOC
Implementation Schedule	ASAP

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County- 17
	Proposed Action	**Purchase amateur radio set**
	BACKGROUND INFORMATION	
	Site and Location	EOC
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$2,500
Potential Funding Sources	Grant
Lead Agency/Department Responsible	EOC
Implementation Schedule	ASAP

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County- 18
	Proposed Action	**Strengthen County Road 480 with the development of a headwall.**
	BACKGROUND INFORMATION	
	Site and Location	County Road 480
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$1 Million
Potential Funding Sources	Grant
Lead Agency/Department Responsible	Precinct 4
Implementation Schedule	ASAP

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County- 19
	Proposed Action	**Purchase message board trailers (solar boards) in event of emergency**
	BACKGROUND INFORMATION	
	Site and Location	Jackson County, county-wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$30,000/per unit
Potential Funding Sources	Local Funding/ Grants
Lead Agency/Department Responsible	EOC
Implementation Schedule	Upon receipt of funding

COMMENTS
The multi-purpose mobile message board could be used in the event of a disaster.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

Lavaca-Navidad River Authority (LNRA)

Previous Actions and Review

		LNRA (Past Action)-1
	Proposed Action:	Increase security around Palmetto Bend Dam, Lake Texana spillway, FM 3131 crossing at Palmetto Dam, Lavaca-Navidad headquarter complex and public access points (parks and boat ramps). Place security cameras and alarm systems around Lake Texana spillway, as well as around pumping plants at dam site to protect the dam from terrorist attacks.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	After the "9-11" attacks, it has become apparent that dam structures are vulnerable to attacks that could create mass destruction.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Dam Failures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Lavaca-Navidad River Authority
Implementation Schedule:	ASAP

Review:
Partially complete—a few cameras and a security lock were added to each facility in 2008, as well as area lighting and fencing.

		LNRA (Past Action)- 2
	Proposed Action:	Install an auto dialer on the Downstream Landowner List to call during flood releases.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	LNRA now manually calls the downstream landowners. Automating this process will save time and get the information to the proper landowner as soon as possible.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$4,500.00, additional $1,000 per year
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	LNRA – I&E Department – Reservoir Department
Implementation Schedule:	2005

Review:
Partially complete—The computer and software needs to be updated.

		LNRA (Past Action)-3
	Proposed Action:	Identify sites where stream, rain, complete weather station need to be added or upgraded. Coordinate with the National Weather Service and the U.S.G.S.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	LNRA has 26 sites in the basin and plans are to add several in the area where needed.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1200
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	LNRA – I&E Department
Implementation Schedule:	2006

Review:
Partially completed in 2009. Added twelve sites, however, we need more sites to cover the complete area.

		LNRA (Past Action)-4
	Proposed Action:	Conduct an annual review of the Hurricane Preparedness Plans for LNRA basin operations.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	During a hurricane event, keeping water and wastewater facilities in operation is critical. Developing a hurricane preparedness plan and maintaining the plan is an important part of the process. LNRA has developed plans for its basin operation.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$2000 per year
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	LNRA Operations Division
Implementation Schedule:	This is an on-going activity to be conducted annually.

Review:
Conducting an annual review of the Hurricane Preparedness Plans is an ongoing operation, therefore this action is deferred.

		LNRA (Past Action)-5
	Proposed Action:	Work with the Texas Department of Transportation to stabilize erosion on Highway 111 Bridge over Lake Texana.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	The Navidad River at Highway 111 bridge southeast of Edna has experienced severe erosion on the south bank. Continued erosion may jeopardize the bridge in the next 5 – 10 years. If the erosion is not checked in the next 3 – 4 years, Texas Department of Transportation may also experience problems since the road is a major evacuation route.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$250,000
Potential Funding Sources:	TXDOT Grant
Lead Agency/Department Responsible:	LNRA/TXDOT Operations Division
Implementation Schedule:	2004/05

Review:
This action was completed in 2009/2010.

		LNRA (Past Action)-6
	Proposed Action:	Conduct an annual workshop with the National Weather Service for Jackson County and the Lavaca-Navidad River Authority Administrators within the LNRA area.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	The Lavaca River basin has experienced numerous flooding since the 1930's. On an average, the Lavaca and Navidad Rivers record a flood event every 3 – 5 years.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood, Dam Failure
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$1000 per year
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	LNRA and NWS
Implementation Schedule:	This is an on-going action to occur annually.

Review:
Ongoing—The workshop with the National Weather Service for Jackson County and the LNRA Administrators occurs annually.

		LNRA (Past Action)-7
	Proposed Action:	Continue Early Warning System Data Reports to the National Weather Service.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	Communications problems are common during major flood events. In the last few years, LNRA has worked with the NWS to develop alternate methods of sending out river forecasts. Today, LNRA gathers flood stage forecasts for the NWS and provides a river summary to the Emergency Management Coordinators and other emergency management personnel in the basin. The program is called the LNRA Early Warning System. It collects data and it is sent to the NWS in Dickinson, Texas. The NWS then sends out a river forecast.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$16,000 per year
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	LNRA – I&E Department
Implementation Schedule:	This is an ongoing activity

Review:
Completed in 2010

		LNRA (Past Action)-8
	Proposed Action:	Outfit a portable emergency electric generator to provide temporary electric power at water and wastewater treatment plants and operation area.
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	LNRA has purchased a 4500 KVA generator. The unit is mounted on a trailer.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Dam Failure, Winter Storm, Severe Thunderstorm, Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1500 per year
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	LNRA Operations Division
Implementation Schedule:	2004

Review:
This action should be deleted as the generator was out of service in 2009.

		LNRA (Past Action)-9
	Proposed Action:	Conduct a dye flow measurement review of the LNRA "Heavy Rainfall and Flood Runoff for the Navidad River".
	BACKGROUND INFORMATION	
	Site and Location:	Jackson County
	History of Damages:	During flooding events and low flow on the Navidad River area, LNRA completed a study to get an accurate flow time from the most upper part of the Navidad River to Lake Texana.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	Low
Estimated Cost:	$20,000 every 5 years
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	LNRA
Implementation Schedule:	2004/05- First text completed 2000

Review:
The dye flow measurement review of the LNRA was completed in 2008.

New Actions

		LNRA –1
	Proposed Action	**Strengthen communication system by installing an auto dialer on the downstream landowner list of the Palmetto Dam to call during flood releases.**
	BACKGROUND INFORMATION	
	Site and Location	LNRA facilities
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education & Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Dam Failure, Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$6,500,000 additional, $2,000 annually
Potential Funding Sources	Budgets/Grants
Lead Agency/Department Responsible	Lavaca-Navidad River Authority-I&E /Reservoir Depts.
Implementation Schedule	2012

COMMENTS
LNRA now manually calls the downstream landowners. Automating this process will save time and get the information to the proper landowner as soon as possible. This project would be in conjunction with support from NWS and Jackson County broadcast information to alert citizens.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA –2
	Proposed Action	**Conduct Early Warning System Data Reports to communicate to the National Weather Service**
	BACKGROUND INFORMATION	
	Site and Location	LNRA facilities
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention, Property protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Prevention and notification further protects/mitigates potential flooding and saves lives
Priority (High, Moderate, Low)	High
Estimated Cost	$18,000 annually
Potential Funding Sources	LNRA budget
Lead Agency/Department Responsible	LNRA I&E Dept.
Implementation Schedule	2012 and annually

COMMENTS
Communication problems are common during major flood events. In the last few years, LNRA has worked with the NWS to develop alternate methods of sending out river forecasts. Today, LNRA gathers flood stage forecasts for the NWS and provides a river summary to the Emergency Management Coordinators and other emergency management personnel in the basin. The program is called the LNRA Early Warning System. It collects data and it is sent to the NWS in Dickinson, Texas. The NWS then sends out a river forecast. This information is now reported via the internet and from there it is also reported to pagers and phones.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA –3
	Proposed Action	**Conduct an annual review of the Hurricane Preparedness Plan for LNRA operations in conjunction with NWS annual updates regarding current or updated regulations and expectations**
	BACKGROUND INFORMATION	
	Site and Location	LNRA facilities
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Mitigate against wastewater outages for affected basin structures
Priority (High, Moderate, Low)	High
Estimated Cost	$3,000
Potential Funding Sources	Budget
Lead Agency/Department Responsible	LNRA O&M
Implementation Schedule	2012 and ongoing

COMMENTS
During a hurricane event, keeping water and wastewater facilities in operation is critical. Developing a hurricane preparedness plan and maintaining a plan is an important part of the process. LNRA has developed plans for its basin operation.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA – 4 (NFIP)
	Proposed Action	**Conduct an annual workshop with the National Weather Service for Jackson Co. and the LNRA Administrators within the LNRA area.**
	BACKGROUND INFORMATION	
	Site and Location	LNRA area wide basin
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood, Dam Failure
Effect on new/existing buildings	Increased awareness may reduce flooding and property damage with more residents purchasing flood insurance
Priority (High, Moderate, Low)	Medium
Estimated Cost	$2,000
Potential Funding Sources	LNRA budget
Lead Agency/Department Responsible	LNRA/NWS
Implementation Schedule	2012 and ongoing

COMMENTS
The Lavaca River Basin has experienced numerous flooding since the 1930's. On an average, the Lavaca and Navidad Rivers record a flood event every 3-5 years.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA – 5
	Proposed Action	**Acquire portable emergency electric generator to provide temporary electric power for water and wastewater utilities in the area**
	BACKGROUND INFORMATION	
	Site and Location	During an extended power outage, the generator could be delivered to the targeted LNRA site and temporarily tied into the site's electric service until normal power is restored.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Severe Thunderstorm, Winter Storm, Dam Failure
Effect on new/existing buildings	Reduce sanitary risk posed to all structures to keep them operational during severe weather events
Priority (High, Moderate, Low)	High
Estimated Cost	$30,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	LNRA O&M
Implementation Schedule	2015

COMMENTS
The State of Texas has urged all water and wastewater utilities to install or arrange for auxiliary generation. Small communities cannot fund such a mandate. Extended power outages, places the public at risk due to adequate sanitation.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA – 6
	Proposed Action	**Upgrade radio system to narrow band frequency for more effective communication to local governments during disaster events such as flooding and dam failure**
	BACKGROUND INFORMATION	
	Site and Location	Jackson County 4631 FM 3131 Edna, Texas 77957
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Dam Failure
Effect on new/existing buildings	Increase communication serves to increase notification of impending disaster and protect lives and property
Priority (High, Moderate, Low)	High
Estimated Cost	$50,000
Potential Funding Sources	Budget/Grants
Lead Agency/Department Responsible	LNRA
Implementation Schedule	2013 or prior if funded

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA – 7
	Proposed Action	**Increase security including installing a network camera system around Palmetto Bend Dam, Lake Texana Spillway, FM 3131 crossing Palmetto Dam, Lavaca-Navidad river Authority headquarters complex and public access points (parks and boat ramps). Update security cameras and alarm systems around Lake Texana spillway, as well as around pumping plants at dam site to protect the dam from terrorist attacks.**
	BACKGROUND INFORMATION	
	Site and Location	Palmetto Bend Dam, Lake Texana Spillway, FM 3131 crossing Palmetto Dam, LNRA headquarters complex, public access points.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Dam Failure
Effect on new/existing buildings	Reduce potential for damage during dam failure to all structures with more warning time due to increased security
Priority (High, Moderate, Low)	High
Estimated Cost	$100,000
Potential Funding Sources	Budgets/Grants
Lead Agency/Department Responsible	LNRA
Implementation Schedule	2013

COMMENTS
After the "9-11" attacks, it has become apparent that dam structures are vulnerable to attacks that could create mass destruction leading to dam failure.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA – 8
	Proposed Action	**Install barriers and automatic warning system road closure of FM 3131 across the dam and spillway in the event of dam failure or severe flooding.**
	BACKGROUND INFORMATION	
	Site and Location	FM 3131
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Dam failure
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$15,000
Potential Funding Sources	LNRA Budget/Grants
Lead Agency/Department Responsible	LNRA
Implementation Schedule	2012-2013

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA – 9
	Proposed Action	**Identify sites where stream, rain, complete weather station need to be added or upgraded. Coordinate with the National Weather Service and the U.S.G.S.**
	BACKGROUND INFORMATION	
	Site and Location	36 LNRA existing sites and future sites to be identified
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Better forecasting reduces potential damage to lives and property
Priority (High, Moderate, Low)	High
Estimated Cost	$12,000
Potential Funding Sources	LNRA Budget/Grants
Lead Agency/Department Responsible	LNRA I&E
Implementation Schedule	2012-2016

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		LNRA – 10
	Proposed Action	**Install new box culverts and corrugated pipe at Hay Meadow (dam inundation area) at public road in order to allow access to public road during severe weather events and high water**
	BACKGROUND INFORMATION	
	Site and Location	East side of lake
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood, Dam Failure
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Low
Estimated Cost	$15,000
Potential Funding Sources	LNRA Budget/Grants
Lead Agency/Department Responsible	LNRA I&E
Implementation Schedule	2012-2013

COMMENTS
Area at public road has been patched numerous times; upgrade at this site would prevent future washing out of road completely during flood and severe weather events

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

City of Edna

Previous Actions and Review

		City of Edna (Past Action)-1
	Proposed Action:	Create Reverse 911 technology adaptable to Jackson County 911 system.
	BACKGROUND INFORMATION	
	Site and Location:	City of Edna
	History of Damages:	Jackson County is in need of a system to communicate to all homes.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Dam Failure, Winter Storm, Flood, Severe Thunderstorm
Priority (High, Moderate, Low):	High
Estimated Cost:	$12,000 to implement $5,000 annually to operate
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Jackson County Sheriff's Office
Implementation Schedule:	2005

Review:
This action was completed in 2006. Continued funding is supported by budgets of Jackson County, City of Edna, and the City of Ganado. Additional funding would be beneficial in supporting staff and for yearly fees.

		City of Edna (Past Action)-2
	Proposed Action:	Construct diversion drainage structures.
	BACKGROUND INFORMATION	
	Site and Location:	City of Edna
	History of Damages:	Past flooding experiences have determined the need for diversion drainage ditches in certain areas.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Federal and state
Lead Agency/Department Responsible:	Federal and state
Implementation Schedule:	2009

Review:
This action was not implemented due to lack of funding. It should be continued in the 2011 plan and is therefore deferred.

		City of Edna (Past Action)-3
	Proposed Action:	Flow meter for creeks in town.
	BACKGROUND INFORMATION	
	Site and Location:	City of Edna
	History of Damages:	The City of Edna has no warning in case of flooding.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grant revenues
Lead Agency/Department Responsible:	City of Edna
Implementation Schedule:	2005

Review:
This action was completed in 2008 with assistance of the LNRA.

New Actions

		Edna –1
	Proposed Action	**Purchase mobile traffic control devices for evacuation routes**
	BACKGROUND INFORMATION	
	Site and Location	U.S. Bus. Hwy 59@ Tx. Hwy. 111; U.S. Hwy. 59@Tx. Hwy. 111; U.S. Bus. 59@Allen, Edna, TX
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Severe Thunderstorm
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grants/Budget
Lead Agency/Department Responsible	City of Edna
Implementation Schedule	2012 or as funds become available

COMMENTS
During electric outages police officers must man controlled intersections along evacuation routes

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2	3	4	5 ☑
Technically Feasible:				
1	2	3 ☑	4	5
Administratively Possible:				
1	2	3	4 ☑	5
Politically Acceptable:				
1	2	3	4	5 ☑
Legal:				
1	2	3	4	5 ☑
Economically Sound:				
1	2	3	4 ☑	5
Environmentally Sound:				
1	2	3	4 ☑	5

		Edna –2
	Proposed Action	**Develop program to standardize burial of electrical, telephone, cable lines and other utilities.**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention/Property protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Winter Storm, Severe Thunderstorm
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grants/Budget/Bonds
Lead Agency/Department Responsible	Public Works
Implementation Schedule	2012 or upon Funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2	3 ☑	4	5
Technically Feasible:				
1	2	3	4	5 ☑
Administratively Possible:				
1	2	3 ☑	4	5
Politically Acceptable:				
1	2	3	4	5 ☑
Legal:				
1	2	3	4	5 ☑
Economically Sound:				
1	2	3	4 ☑	5
Environmentally Sound:				
1	2	3	4	5 ☑

		Edna –3
	Proposed Action	**Develop and implement tree trimming program to clear trees from limbs hanging in right of way and in drainage systems that when downed, pose threat to structures, cars, citizens during severe weather events**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Severe Thunderstorm, Winter Storm
Effect on new/existing buildings	Reduce damage to all structures by falling limbs and trees
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grants/bonds
Lead Agency/Department Responsible	Public Works
Implementation Schedule	2012 or upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2	3 ☑	4	5
Technically Feasible:				
1	2	3	4	5 ☑
Administratively Possible:				
1	2	3	4	5 ☑
Politically Acceptable:				
1	2	3 ☑	4	5
Legal:				
1	2	3	4	5 ☑
Economically Sound:				
1	2	3	4	5 ☑
Environmentally Sound:				
1	2	3	4	5 ☑

		Edna –4
	Proposed Action	**Retrofit existing public facilities such as police station, fire station, EMS, and city hall as safe sites for severe weather events**
	BACKGROUND INFORMATION	
	Site and Location	City facilities
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention/ Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Enhance and protect existing structures from damage during severe weather events
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grants/Bonds
Lead Agency/Department Responsible	City
Implementation Schedule	2012 or as funding is available

COMMENTS
The City of Edna owns a number of public buildings such as those listed above; none were designed to withstand extreme weather events

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2	3	4	5 ☑
Technically Feasible:				
1	2	3	4	5 ☑
Administratively Possible:				
1	2	3	4	5 ☑
Politically Acceptable:				
1	2	3	4	5 ☑
Legal:				
1	2	3	4	5 ☑
Economically Sound:				
1	2	3	4 ☑	5
Environmentally Sound:				
1	2	3	4	5 ☑

		Edna –5 (NFIP)
	Proposed Action	**Floodproof sewage treatment plant located in flood hazard and low lying area by installing dykes and pumping system**
	BACKGROUND INFORMATION	
	Site and Location	City of Edna Waster Water treatment facility Coordinates: 28 degrees 58' N x 96 degrees 37'W
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention/Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grants/Bonds
Lead Agency/Department Responsible	City
Implementation Schedule	2012 or as funding is available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2	3	4	5 ☑
Technically Feasible:				
1	2	3 ☑	4	5
Administratively Possible:				
1	2	3	4 ☑	5
Politically Acceptable:				
1	2	3	4 ☑	5
Legal:				
1	2	3	4	5 ☑
Economically Sound:				
1	2	3 ☑	4	5
Environmentally Sound:				
1	2	3	4	5 ☑

		Edna –6
	Proposed Action	**Develop project to divert rainwater and runoff that flows through town by installing a system of dykes and drainage ditches to Lavaca River**
	BACKGROUND INFORMATION	
	Site and Location	City wide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention/Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Managing storm water and runoff potentially reduces threat of flooding to existing and new structures
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grants/Bonds
Lead Agency/Department Responsible	City
Implementation Schedule	2012 or as funding becomes available

COMMENTS
City is located approx. 2 miles east of the Lavaca River but rainwater drains from agricultural land north of city through the center of town causing flooding and exacerbating drainage problems

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2	3	4	5 ☑
Technically Feasible:				
1	2	3 ☑	4	5
Administratively Possible:				
1	2	3 ☑	4	5
Politically Acceptable:				
1	2	3	4 ☑	5
Legal:				
1	2	3	4	5 ☑
Economically Sound:				
1	2	3	4 ☑	5
Environmentally Sound:				
1	2	3	4	5 ☑

		Edna – 7
	Proposed Action	**Drill additional water wells to increase water supply during times of drought**
	BACKGROUND INFORMATION	
	Site and Location	City
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection/Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Drought
Effect on new/existing buildings	Ensure adequate supply of water to all structures during drought
Priority (High, Moderate, Low)	Moderate
Estimated Cost	To be determined
Potential Funding Sources	Grants/bonds
Lead Agency/Department Responsible	City of Edna
Implementation Schedule	2012 or as funds become available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2	3	4 ☑	5
Technically Feasible:				
1	2	3	4	5 ☑
Administratively Possible:				
1	2	3	4 ☑	5
Politically Acceptable:				
1	2	3	4 ☑	5
Legal:				
1	2	3	4 ☑	5
Economically Sound:				
1	2	3	4 ☑	5
Environmentally Sound:				
1	2	3	4 ☑	5

		Edna –8
	Proposed Action	**Adopt ordinance to add a surcharge or fine for excess water usage**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Drought
Effect on new/existing buildings	Ensure all structures have adequate water supplies during drought or extreme heat
Priority (High, Moderate, Low)	Low
Estimated Cost	To be determined
Potential Funding Sources	Grants/Bonds
Lead Agency/Department Responsible	City
Implementation Schedule	2012 or as funding is available

COMMENTS
The City has a drought contingency plan to ration water during drought

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1	2 ☑	3	4	5
Technically Feasible:				
1	2	3	4	5 ☑
Administratively Possible:				
1	2	3	4	5 ☑
Politically Acceptable:				
1	2 ☑	3	4	5
Legal:				
1	2	3	4	5 ☑
Economically Sound:				
1	2	3	4	5 ☑
Environmentally Sound:				
1	2	3	4	5 ☑

		Edna –9
	Proposed Action	**Increase public awareness of drought and extreme heat risk by promoting xeriscaping through flyers and inserts in utility water bills**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Drought
Effect on new/existing buildings	Xeriscaping reduces water consumption ensuring adequate water supplies are maintained for all structures
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$5,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Water Dept.
Implementation Schedule	Upon funding availability

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

Edna Independent School District

New Actions

	Edna ISD – 1
Proposed Action	**Construct a multi-purpose safe room shelter.**
BACKGROUND INFORMATION	
Site and Location	Edna ISD
Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$5 Million
Potential Funding Sources	FEMA/ EISD
Lead Agency/Department Responsible	Edna ISD in association with Jackson County
Implementation Schedule	July 2011 to August 2012

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Edna ISD – 2 (NFIP)
	Proposed Action	**Conduct a public awareness campaign by distributing info about the National Flood Insurance Program (NFIP) at schools**
	BACKGROUND INFORMATION	
	Site and Location	Edna ISD
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$5,000
Potential Funding Sources	HMGP Grants
Lead Agency/Department Responsible	Edna/ Jackson County
Implementation Schedule	Upon funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

Industrial Independent School District

New Actions

		Industrial ISD –1
	Proposed Action	**Purchase two new 72-passenger school buses which may be used to transport/evacuate residents in Jackson County to Comal County**
	BACKGROUND INFORMATION	
	Site and Location	IISD School district
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Evacuating residents/students out of harm's way
Priority (High, Moderate, Low)	High
Estimated Cost	$200,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	IISD Transportation Supervisor
Implementation Schedule	2012-2014 or as funds available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Industrial ISD –2
	Proposed Action	**Purchase and install electric roll down shutters on doors/windows of ISD buildings to protect schools from flying debris during severe weather**
	BACKGROUND INFORMATION	
	Site and Location	ISD High School, 187 Fifth, Vanderbilt, TX; Junior High, 3 Fifth St., Vanderbilt, TX; Elementary East, 390 Main St., Vanderbilt, TX; Elementary West, 599 FM 444 S., Inez, TX
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Protect schools and facilities during severe weather
Priority (High, Moderate, Low)	High
Estimated Cost	$659,212
Potential Funding Sources	Grants
Lead Agency/Department Responsible	IISD Maintenance Supervisor
Implementation Schedule	2012-2014 or as funds are available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Industrial ISD –3
	Proposed Action	**Demolish abandoned or unoccupied school buildings to safeguard against unsafe structures with weak materials to loosen and become flying debris during severe weather**
	BACKGROUND INFORMATION	
	Site and Location	La Ward Elementary, Industrial Ave. La Ward, TX
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention and Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Protect surrounding properties from flying debris
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$96,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	IISD Maintenance Supervisor
Implementation Schedule	2012-2014 as funds become available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Industrial ISD –4
	Proposed Action	**Demolish abandoned or unoccupied school buildings to safeguard against unsafe structures with weak materials to loosen and become flying debris during severe weather**
	BACKGROUND INFORMATION	
	Site and Location	Lolita Jr. High, Walnut St., Lolita, TX
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention/Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Protect surrounding buildings from flying debris during severe weather
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$215,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	IISD Maintenance Supervisor
Implementation Schedule	2012-2014 or as funds become available

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

Jackson County Hospital District

New Actions

		Jackson County Hospital –1
	Proposed Action	**Purchase and install electric roll down shutters on doors/windows of hospital facilities to protect hospital from flying debris during severe weather**
	BACKGROUND INFORMATION	
	Site and Location	Emergency Room and Clinic in Edna
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Protect existing Emergency Room and clinic facilities during severe weather
Priority (High, Moderate, Low)	High
Estimated Cost	$175,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Jackson County Hospital
Implementation Schedule	2012

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Jackson County Hospital –2
	Proposed Action	**Retrofit existing building for storage of EMS ambulances and equipment and seek grant funds for EMS personnel**
	BACKGROUND INFORMATION	
	Site and Location	Jackson Co Hospital District
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Severe Thunderstorm
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$1.5 M – 2 M
Potential Funding Sources	Grants
Lead Agency/Department Responsible	Jackson Co. Hospital District
Implementation Schedule	Upon grant funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

City of Ganado

Previous Actions and Review

		City of Ganado (Past Action)-1
	Proposed Action:	Clean and remove debris from ditches and creeks in community.
	BACKGROUND INFORMATION	
	Site and Location:	City of Ganado
	History of Damages:	During rains of 1994 and 1998, areas of the city were flooded in part due to debris in ditches and creeks preventing proper flood of run off water.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants and bonds
Lead Agency/Department Responsible:	City of Ganado
Implementation Schedule:	ASAP

Review:
Cleaning and removing debris from ditches/creeks is an ongoing operation.

		City of Ganado (Past Action)-2
	Proposed Action:	Replace old sewer lines.
	BACKGROUND INFORMATION	
	Site and Location:	City of Ganado
	History of Damages:	We have some old sewer lines, which have infiltration and need to be replaced.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Health hazard
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Ganado
Implementation Schedule:	ASAP

Review:
This action was partially completed. Will continue to pursue grant funding.

New Actions

		Ganado –1
	Proposed Action	**Create a public educational campaign for schools on preparedness and mitigation**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Public Education & Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane, Flood, Winter Storm, Dam Failure
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$500 annually
Potential Funding Sources	General Revenue/grants
Lead Agency/Department Responsible	City
Implementation Schedule	Annually

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Ganado –2
	Proposed Action	**Purchase message board trailers (solar boards) in the event of emergency**
	BACKGROUND INFORMATION	
	Site and Location	Citywide
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	N/A
Priority (High, Moderate, Low)	High
Estimated Cost	$30,000 /per unit
Potential Funding Sources	Local funding/ Grants
Lead Agency/Department Responsible	City of Ganado - Police
Implementation Schedule	Upon receipt of funding

COMMENTS
Multi-purpose mobile message board for use during an emergency or disaster.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Ganado – 3 (NFIP)
	Proposed Action	**Place culvert in railroads bed on the north side of town to divert floodwater.**
	BACKGROUND INFORMATION	
	Site and Location	Northeast section; before major flood on Bus 59 because railroad tracks act as dam.
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Protection for subdivisions in low areas
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$500,000
Potential Funding Sources	FEMA funding or CDBG
Lead Agency/Department Responsible	Ganado Public Works
Implementation Schedule	1 year from receipt of funds

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		Ganado -4
	Proposed Action	**Develop a safe room in city hall**
	BACKGROUND INFORMATION	
	Site and Location	City Hall Building
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane, Severe Thunderstorm
Effect on new/existing buildings	New
Priority (High, Moderate, Low)	Moderate
Estimated Cost	$500,000 -1 Million
Potential Funding Sources	Federal Grants
Lead Agency/Department Responsible	Police
Implementation Schedule	2 years after receipt of funding

COMMENTS

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

City of La Ward

Previous Actions and Review

		City of La Ward (Past Action)-1
	Proposed Action:	Clean up the City's property on the east side of town.
	BACKGROUND INFORMATION	
	Site and Location:	City of La Ward
	History of Damages:	The City of La Ward owns approximately 80 acres on the east side of town. At the present time, the property is overgrown with brush. This presents a fire hazard to all citizens on the east side of town.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of La Ward
Implementation Schedule:	ASAP

Review:
This action was deferred due to lack of funding.

		City of La Ward (Past Action)-2
	Proposed Action:	Clean out some of the city's existing ditches as well as making of ditches on the property that the city owns on the east side of town. Also, replace damaged culverts and install new ones.
	BACKGROUND INFORMATION	
	Site and Location:	City of La Ward
	History of Damages:	At this time the City of La Ward does have a few minor drainage problems that could be fixed.

MITIGATION ACTION DETAILS	
Primary Hazard Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of La Ward
Implementation Schedule:	2006

Review:
This action was partially completed.

New Actions

		La Ward –1
	Proposed Action	**Update existing lunch room for hurricanes or thunderstorms for Hurricane disaster**
	BACKGROUND INFORMATION	
	Site and Location	Industrial Elementary School
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Structural Projects

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Hurricane
Effect on new/existing buildings	Strengthens existing Building
Priority (High, Moderate, Low)	High
Estimated Cost	$300,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	City and ISD
Implementation Schedule	ASAP

COMMENTS
The current building has a strong solid structure but needs updating. In the event of a hurricane, the nearest shelter is 150 miles away. With a high population of special needs and elderly residents, the citizens could benefit from a shelter closer to home. When the building is not in use, it could be used as a food bank.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		La Ward –2
	Proposed Action	**Reduce vegetation to prevent wildfires**
	BACKGROUND INFORMATION	
	Site and Location	Inside city limits
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Property Protection and Natural Resource Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Wildfire
Effect on new/existing buildings	Prevent damage from wildfire
Priority (High, Moderate, Low)	High
Estimated Cost	$30,000
Potential Funding Sources	Grants
Lead Agency/Department Responsible	LaWard in conjunction with county
Implementation Schedule	After funding

COMMENTS
No city employees to reduce weeds/vegetation with county on boundary of town.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

		La Ward –3 (NFIP)
	Proposed Action	**Develop drainage study to address flooding on south side of town.**
	BACKGROUND INFORMATION	
	Site and Location	South side of La Ward- Hwy 172
	Type of Action (*Prevention, Property Protection, Public Education & Awareness, Natural Resource Protection, or Structural Projects)*	Prevention

MITIGATION ACTION DETAILS	
Hazard(s) Addressed	Flood
Effect on new/existing buildings	Baptist Church and 3 Houses suffer from flooding
Priority (High, Moderate, Low)	High
Estimated Cost	$20,000-30,000
Potential Funding Sources	FEMA
Lead Agency/Department Responsible	La Ward
Implementation Schedule	6 months after receipt of funding

COMMENTS
When it rains even as little as two inches, there is no drainage system on roads.

ADDITIONAL CONSIDERATIONS The following STAPLEE criteria were evaluated on a scale of 1 to 5 indicating the extent to which this action satisfies each consideration. (1= Does Not Satisfy 3 = Moderately Satisfies 5 = Strongly Satisfies)				
Socially Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Technically Feasible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Administratively Possible:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Politically Acceptable:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Legal:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Economically Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑
Environmentally Sound:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☑

Plan Maintenance

Plan Maintenance Procedures

The following is an explanation of how the participating jurisdictions in Jackson County will implement the updated plan, and continue to evaluate and enhance it over time. Continual public involvement is also addressed. The sustained hazard mitigation planning process consists of three main parts:

- Incorporation
- Monitoring and Evaluation
- Continued Public Involvement

Incorporation

Each participating jurisdiction will be responsible for further development and/or implementation of mitigation action plans. Each action has been assigned to a specific organization within the jurisdiction. The following describes the process by which the participating jurisdictions will incorporate elements of the mitigation plan into other planning mechanisms as well as how information was incorporated where appropriate over the past five years.

Process of Incorporation

Once the Plan Update is adopted, each jurisdiction will implement actions based on priority and the availability of funding. The County and participating jurisdictions

already implement policies and programs to reduce losses to life and property from hazards. The mitigation actions developed for this Plan Update build upon that effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the jurisdiction begins to seek funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

Participating jurisdictions will integrate implementation of their mitigation actions with other existing jurisdiction plans such as construction standards and emergency management plans.

Each participating jurisdiction will review their existing plans in light of the Hazard Mitigation Action Plan Update and incorporate any mitigation policies and actions into these plans, as appropriate. The jurisdictions will ensure that the actions in the mitigation plans are reflected in other planning efforts.

Upon formal adoption of the Plan Update, team members will work to integrate the updated hazard mitigation strategies into existing plans as indicated in Table 9-1 below.

Table 9.1 - Process of Incorporation by Planning Mechanism

Planning Mechanism	Incorporation of Plan Update
Grant Applications	The Plan Update will be consulted by planning team members for each jurisdiction whenever grant funding is sought for mitigation projects. If a project is not in the Plan Update, an amendment may be necessary to include the action in the Plan.
Annual Budget Review	Each participating jurisdiction representative that participated in the planning process will review the Update and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant

Planning Mechanism	Incorporation of Plan Update
	applications sought or mitigation actions that will be undertaken according to the implementation schedule of the specific action
Regulatory Plans	All of the participating jurisdictions currently have regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Disaster Recovery Plans, Economic Development or Evacuation Plans. The Plan Update will be consulted when participating cities and the county review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.
Capital Improvement Plans	Two of the jurisdictions have a Capital Improvement Plan (CIP) in place. These include Edna ISD and the Lavaca-Navidad River Authority. The county is currently developing a CIP. Before any updates to the CIP are conducted, jurisdictions with CIPs will review the risk assessment and mitigation strategy sections of the HMAP Update, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments. In addition, the Plan Update will be consulted if a CIP is developed for Edna, Ganado, or La Ward.
Comprehensive Plans	Two of the jurisdictions, the City of Edna and the Lavaca-Navidad River Authority, have comprehensive Plans in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan Update will be reviewed in the development

Planning Mechanism	Incorporation of Plan Update
	or revision of a Comprehensive Plan.
Floodplain Management Plans	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore the actions for flooding, and information found in Section 5 of this plan discussing the people and property at risk to flood, will be reviewed and revised when jurisdictions update their management plans or develop new plans. All of the jurisdictions currently have a plan in place except Jackson County and Edna ISD.

Incorporation of the 2004 Mitigation Plan

As part of their periodic review process, the county and participating jurisdictions have incorporated provisions of the 2004 Plan into other planning mechanisms as availability and funding allowed.

On an annual basis, planning team members reviewed mitigation strategies when grant funds from the Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Program (HMGP) were available to determine whether grant funding should be sought. This review led to the development of the Plan Update for Jackson County as HMGP funding was available to update the plan.

In addition to consistency among goals, specific mitigation actions called for the development of planning mechanisms. For example, the City of Edna included an action in the 2004 Plan to develop Reverse 911 technology adaptable to Jackson County's 911 System. Edna entered into a partnership with Jackson County and the City of Ganado to appropriate and maintain a public notification system. The City of Edna maintains that system, which is housed within the County Courthouse. In addition, the City of Edna entered into a partnership with the Lavaca-Navidad River Authority to install and maintain water levels and temperatures along the primary drainage canal. These actions have since been completed and were created utilizing the goals, implementation schedule and funding sources as listed in the mitigation action included in the 2004 Plan.

By reviewing mitigation actions included in the 2004 Plan, the City of Ganado applied for and was awarded a Community Development Block Grant (CDBG) for funding for an improved drainage and sewer system to mitigate flooding. The City of La Ward proposed to pass an ad valorem tax in the city to help meet mitigation actions from the 2004 Plan.

Other plans and program mechanisms have been implemented based on strategies included in the 2004 plan, such as: conducting annual reviews of the Hurricane Preparedness Plans for the LNRA basin operations; cleaning and clearing debris from ditches and creeks in the city of Ganado; and, continuing early warning system data reports to the National Weather Service.

The risk assessment sections from the 2004 mitigation plan were also reviewed for consistency and accuracy in data in developing emergency and regulatory plans. Although the majority of regulatory plans are for response activities, the information developed in the 2004 plan regarding risk for natural and man-caused hazards was utilized in describing current threats in emergency planning.

Incorporating the Adopted Resolution by Quasi-Jurisdictional Team Members

Edna ISD: Upon FEMA approval, the ISD will post the item on the agenda for a regular board meeting, at least 72 hours in advance. A presentation and discussion regarding ISD's participation in the Plan will take place. Following discussion a board member would move to approve or adopt, there would be a second, and the recommendation to adopt the plan would be approved by majority vote, and reflected in the minutes. The approved plan will then be posted on the ISD's website.

Industrial ISD: The Industrial ISD Board of Trustees consists of 7 members, elected by the community. They meet once a month for a regularly scheduled meeting. The resolution would be presented to the Board at a regularly scheduled meeting for discussion and approval.

Jackson County Hospital District: The Jackson County Hospital District consists of a Board of Directors comprised of all precincts in the County. The Board of Directors is voted in by registered voters of Jackson County. The Jackson County

Hospital District CEO shall recommend adoption of the plan to the JCHD Board of Directors. Discussion will ensue and the Resolution voted in by the Board.

Lavaca-Navidad River Authority (LNRA): The Lavaca-Navidad River Authority Board of Directors consists of nine members that meet on a monthly basis. Upon FEMA approval, the LNRA will present the resolution and seek approval of the Plan by the Board of Directors.

Monitoring and Evaluation

Periodic revisions of the updated plan are required to ensure that the goals, objectives, and mitigation action plans are kept current. More important, revisions may be necessary to ensure that the updated plan is in full compliance with federal regulations and state statutes. This portion outlines the procedures for completing such revisions and updates.

Monitoring

Designated Hazard Mitigation Planning Team Members are responsible for yearly monitoring of components of the hazard mitigation plan that pertain to their jurisdiction. Jackson County will oversee the monitoring and evaluation process. The County will organize two meetings a year by conference call or by having a presentation to discuss the implementation of the mitigation actions and to provide feedback on the progress of the Plan. The office responsible for each jurisdiction is included in Table 9-2.

Evaluation

At the beginning of each fiscal year, Team Members will meet once to evaluate the hazard mitigation plan. As part of the evaluation process, Jackson County will assess any changes in risk, determine whether implementation of mitigation actions is on schedule or if there are any implementation problems (such as technical, political, legal or coordination issues), and reflect changes in land development or programs that affect mitigation priorities in their respective jurisdictions. On an annual basis, Team Members will identify any needed changes in the updated plan based upon their evaluation activities. This yearly evaluation process will help determine if any further updates are necessary.

Table 9.2 – Chair Person/Office Responsible for Evaluation and Monitoring of the Plan

Jurisdiction	Office Responsible
Jackson County	Emergency Management Coordinator
City of Edna	Chief of Police
City of Ganado	City Administrator
City of La Ward	Mayor
Lavaca-Navidad River Authority	Emergency Manager
Edna Independent School District	Superintendent
Industrial Independent School District	Chief Administrator
Jackson County Hospital District	Director

Plan Amendments

At any time, minor technical changes may be made to the plan to keep it updated. However, any material changes to the mitigation actions or major changes in the overall direction of the plan or the policies contained within it must be subject to formal adoption by the governing bodies of participating jurisdictions. Any amendment to the plan must undergo an open public process. Participating jurisdictions will seek public input on any material change to the plan during a formal review and comment period of not less than 30 days.

At the end of the comment period, the proposed amendment and all comments will be forwarded to the governing bodies of each participating jurisdiction. If no comments are received from the reviewing parties within the specified review period, this will also be noted. Planning team members will then review the proposed amendment and comments received and vote to accept, reject, or amend the proposed change. Upon ratification, the amendment will be transmitted to TDEM.

In determining whether to recommend approval or denial of a plan amendment request, the following factors will be considered:

- Errors or omissions made in the identification of issues or needs during the preparation of the plan;
- New issues or needs that were not adequately addressed in the plan; and

- Changes in information, data, or assumptions from those on which the plan was based.

Five (5) Year Review

The Plan will be thoroughly reviewed by the Planning Team every five years to determine whether there have been any significant changes in the area that may necessitate changes in the types of mitigation actions proposed.

As with the development of this Plan Update, the Office of Emergency Management for Jackson County will oversee the review process. At the beginning of each fiscal year, planning team members will meet once by conference call to evaluate the current mitigation plan. In addition, participants will also meet twice a year, by conference call or presentation, to discuss the implementation of the mitigation actions.

New developments in identified hazard areas, an increased exposure to hazards, disaster declarations, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the content of the updated plan.

The plan review provides Jackson County with an opportunity to evaluate those actions that have been successful and to explore documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned.

Following the five-year review, any revisions deemed necessary will be summarized and utilized according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the revised plan will be submitted to TDEM for final review and approval in coordination with FEMA.

Continued Public Involvement

Input from the public was an integral part of the preparation of this updated plan and will continue to be essential as the plan grows and changes. Changes or suggestions to this plan will require opportunities for the public to make its views known.

This plan will be available on the Jackson County Web Site (http://www.co.jackson.tx.us/ips/cms) where officials and the public are invited to provide ongoing feedback. Copies of the updated plan also will be kept for public review in the offices of each participating jurisdiction.

Further, if necessary, the county can designate voluntary citizens or willing members of the private sectors as members of the Planning Team as well as utilize local media to notify the public of any maintenance or periodic review activities taking place.

APPENDIX A

Overview

Jackson County prepared a public survey that asked a wide range of questions concerning the opinions of the public regarding natural hazards. This fifteen-question survey was made available on the County website, (www.co.jackson.tx.us/ips/cms). This survey was also distributed in hard copy format at public meetings and stakeholder events throughout the planning process.

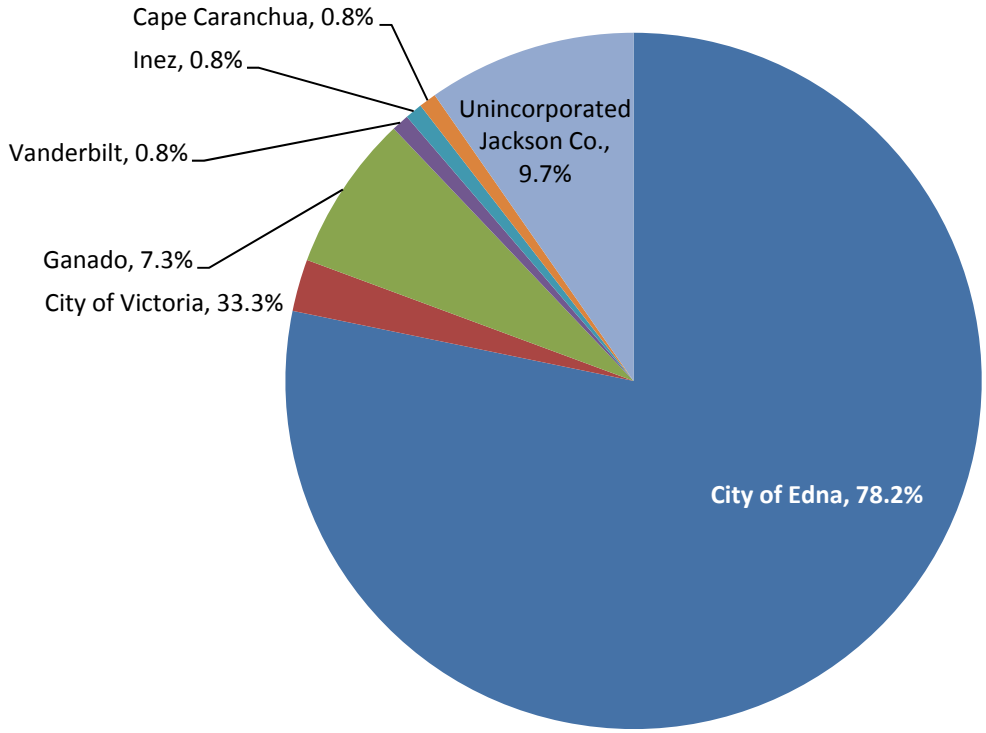
A total of 124 surveys were collected, the results of which are analyzed in this Appendix. The purpose of the surveys was twofold: 1) to solicit public input during the planning process and 2) to help the city to identify any potential actions or problem areas.

Survey results are depicted on the following pages showing the percentage of responses for each answer.

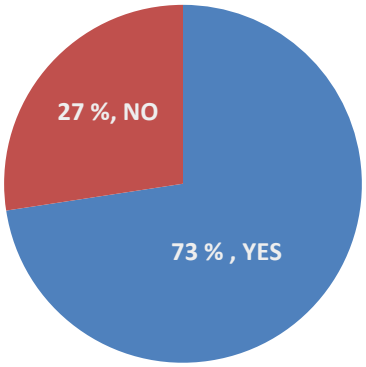
For questions that were not multiple choice, such as questions 13, 14 and 15, or that required an explanation, such as question 10, comments are included as they were entered on the survey itself.

Survey Results

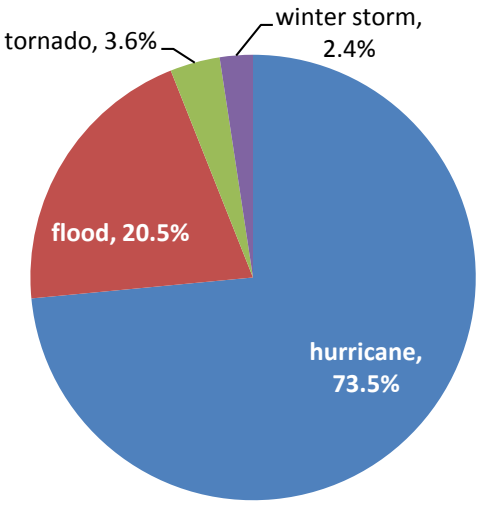
1. Which jurisdiction do you live in?



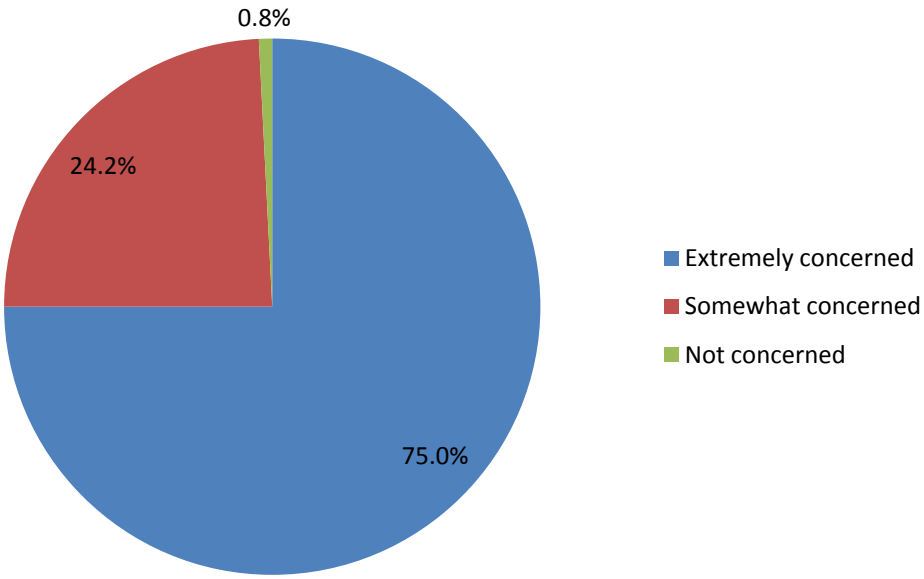
2. Have you ever experienced or been impacted by a disaster?



If "yes", what hazard have you endured[1]?

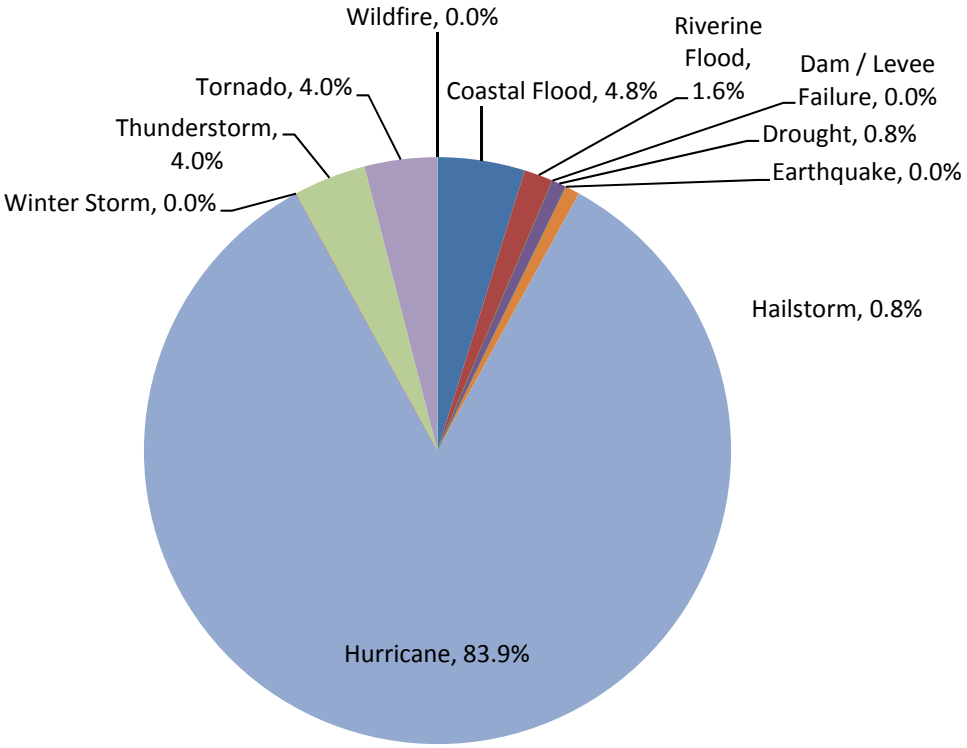


3. How concerned are you about the possibility of your community being impacted by a disaster?

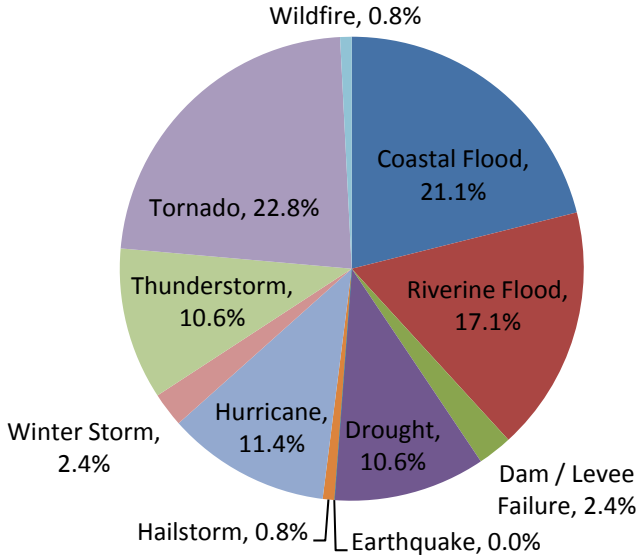


[1] Responses entered may not be specific to Jackson County as some survey participants could have endured a hazard in another location.

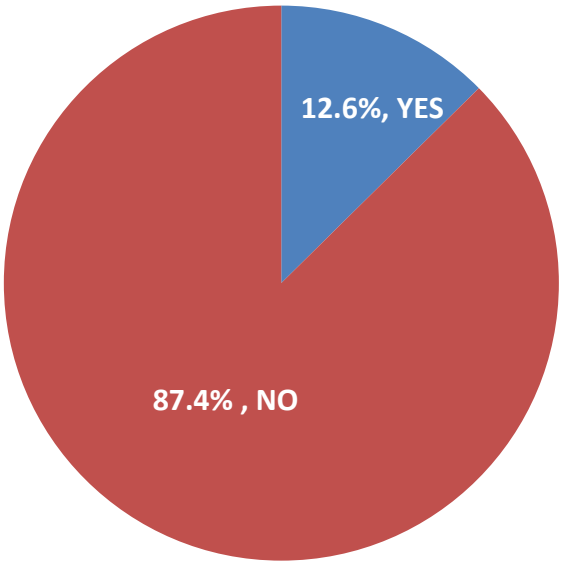
4. Please select the one hazard you think is the highest threat to your neighborhood:



5. Please select the one hazard you think is the second highest threat to your neighborhood:



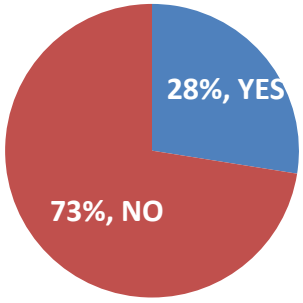
6. Is there another hazard not listed above that you think is a wide-scale threat to your neighborhood?



If "yes", please explain what hazards you think are a wide-scale threat that are not listed[2]?

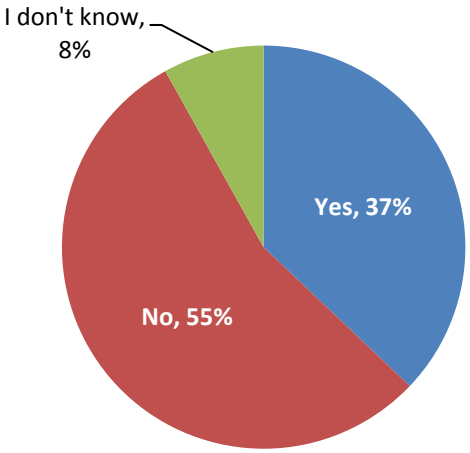
- Terrorism
- Power plants

7. Is your home located in a floodplain?

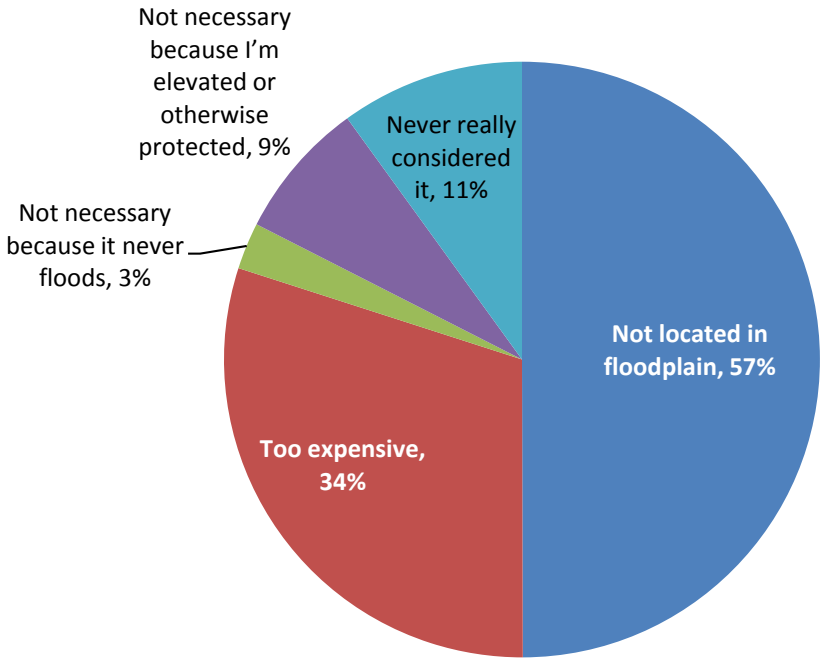


[2] Unless specified otherwise, open ended responses are not listed in any particular ranking order.

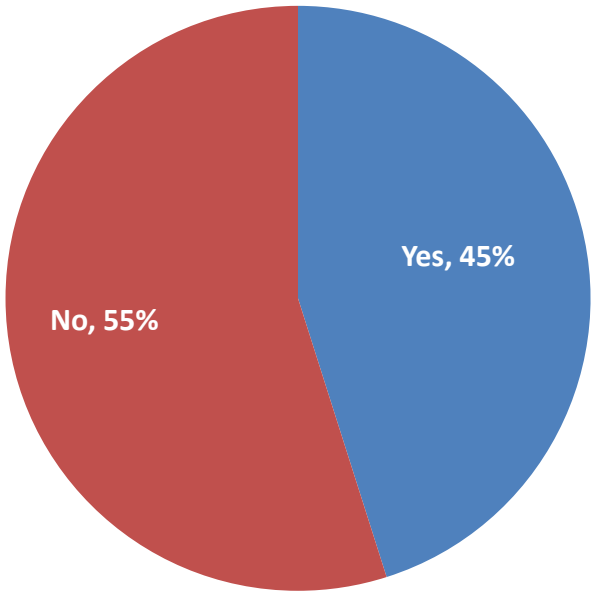
8. Do you have flood insurance?



9. If you don't have flood insurance, why not?



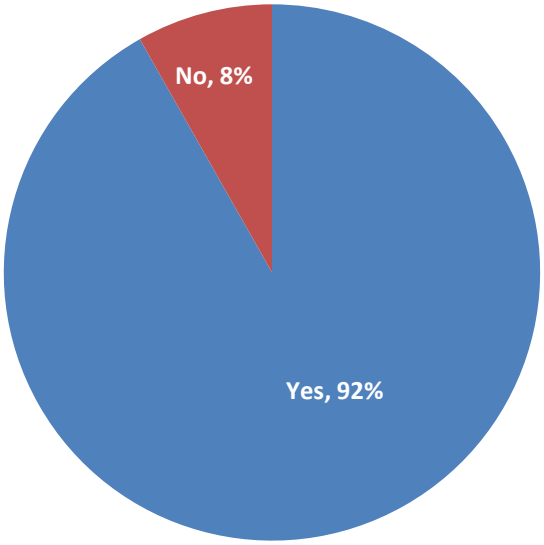
10. Have you taken any actions to make your home or neighborhood more resistant to hazards?



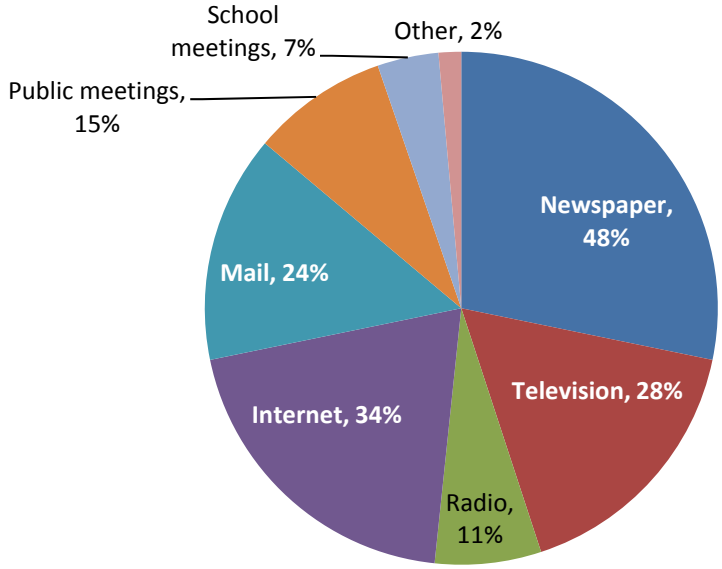
If "yes", please explain:

- Flood insurance, hurricane preparedness kit, fire extinguishers, new roof
- Built a steel framed home.
- Boarded windows and moved everything indoors
- Removing useless TV antennas.
- Have hurricane shutters for home.
- Enclosed ditches.
- Roof replaced with a metal roof to withstand hail/ hi winds.

11. Are you interested in making your home or neighborhood more resistant to hazards?



12. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards[3]?



[3] Results total more than 100 percent as participants selected more than one type of communication.

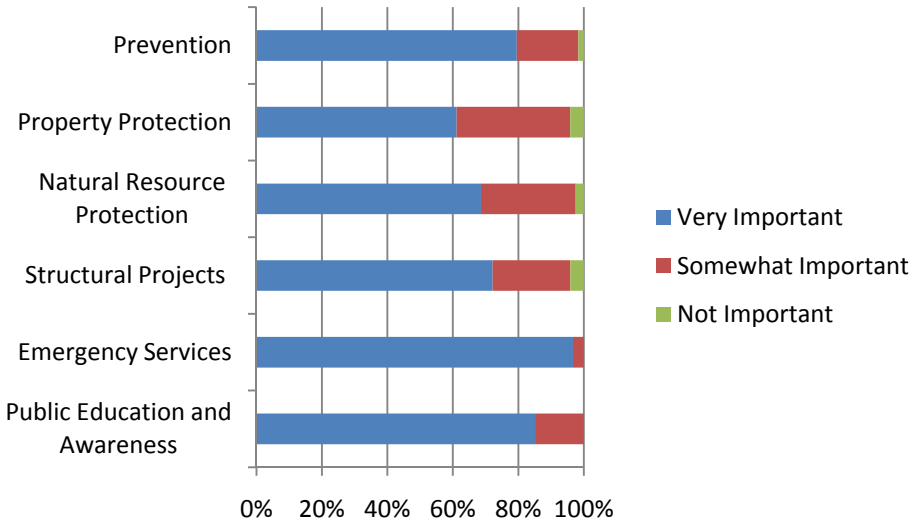
13. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

- Have more interaction between the "politicians" and the average working person
- Build a shelter
- mandatory clean up of potential debris left in neighboring yards and lots
- shelters; coordinated evacuation plans; centralized location for services in emergencies
- We need a storm shelter. We do not have any place for people to go in case of a hurricane that is in good condition in Jackson County.
- Keep drainage areas clear for runoff.
- Have a safe place to go to. Plus having three nursing homes and hospital.
- Stop encouraging people to build in coastal areas. High population density makes in impossible to evacuate if needed.

14. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

- We need in Jackson County a full time, fully staffed Emergency Operations Manager. We don't have one.
- We have no safe shelter here.
- I live in Victoria, but I work 5 days a week in Jackson County. I stand more of a chance needing shelter in Jackson County than I do in Victoria
- The local government in conjunction with state and federal governments can build a structure that house the community during a natural disaster.
- Farmers and ranchers need to be able to access their property to move livestock and expensive equipment during hurricanes. This some times takes many trips to complete. Police should not set up road blocks and deny farmers and rancher access to their property. No forced evacuations.

15. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



PUBLIC EDUCATION AND AWARENESS

Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include: outreach projects, school education programs, library materials and demonstration events.

EMERGENCY SERVICES

Actions that protect people and property during and immediately after a hazard event. Examples include: warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.

STRUCTURAL PROJECTS

Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include: dams, levees, seawalls, detention/retention basins, channel modifications, retaining walls and storm sewers.

NATURAL RESOURCE PROTECTION

Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

PROPERTY PROTECTION

Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include: acquisition, relocation, evaluation, structural retrofits, and storm shutters.

PREVENTION

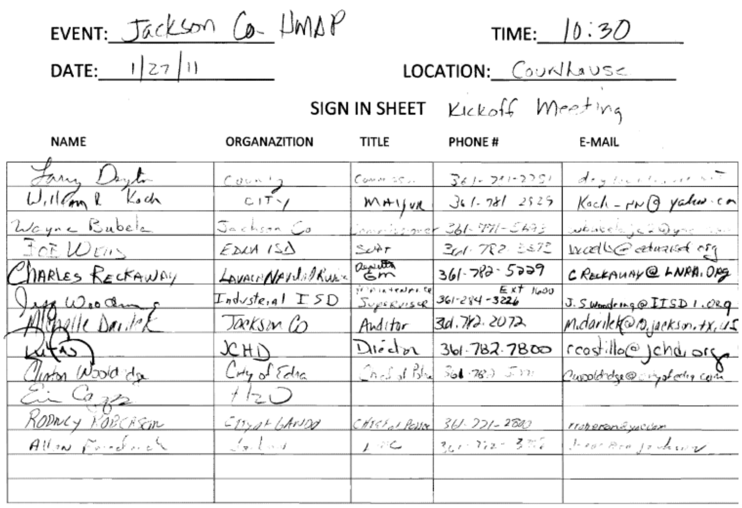
Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include: planning and zoning, building codes, open space, preservation, and floodplain regulations.

APPENDIX B

The following are sign-in sheets and notices for workshops and meetings conducted in the development of the Plan Update.

Workshops

Figure B-1. Kickoff Workshop: Jan. 27, 2011


EVENT: Jackson Co HMAP TIME: 10:30

DATE: 1/27/11 LOCATION: Courthouse

SIGN IN SHEET Kickoff Meeting

NAME	ORGANAZITION	TITLE	PHONE #	E-MAIL
Larry Deyton	County	[illegible]	361-771-2251	[illegible]
William R Koch	CITY	MAYOR	361-781 2525	Koch-rn@yahoo.com
Wayne Bubela	Jackson Co	Commissioner	361-771-5493	[illegible]
Joe Wells	EDNA ISD	SUPT	361-782-3573	[illegible]
Charles Reckaway	Lavaca Navidad River	Deputy GM	361-782-5229	CReckaway@LNRA.org
[illegible]	Industrial ISD	Maintenance Supervisor	361-284-3226 Ext 1600	[illegible]@IISD1.org
Michelle Darilek	Jackson Co	Auditor	361.782.2072	m.darilek@co.jackson.tx.us
[illegible]	JCHD	Director	361.782.7800	rcostillo@jchd.org
Clinton Wooldridge	City of Edna	Chief of Police	361-782-[illegible]	cwooldridge@cityofedna.com
[illegible]	H2O			
Rodney Robertson	City of Ganado	Chief of Police	361-771-2800	[illegible]
Allen [illegible]	[illegible]	[illegible]	361-782-3[illegible]	[illegible]

Figure B-2. Risk & Mitigation Workshop: Feb. 24, 2011

EVENT: Risk /Mitigation Workshop TIME: 10:30 am

DATE: 2/24/11 LOCATION: Edna EOC

SIGN IN SHEET

NAME	ORGANAZITION	TITLE	PHONE #	E-MAIL
William R Koch	City of LAMAR	Mayor	361-781-2575	Koch-rn yahoo.com
Larry Deyton	Jackson County	Commissioner	361-781-2751	[illegible]
[illegible]	Jackson County Hospital	Director	361-781-2694	rcastillo@jchd.org
[illegible]	City of Edna	[illegible]	[illegible]	[illegible]
[illegible]	Edna ISD	Supt	361-782-3575	Dwells@[illegible].org
Michelle Darilek	Jackson Co	Auditor	361 782-2072	M.darilek@co.jackson.tx.us
Charles A. Reckaway	Lavaca-Navidad River	Deputy GM	361 782 5229	CReckaway@LNRA.Org
Rodney Roberson	City of Ganado	Chief of Police	361-771-2800	[illegible]
Allen [illegible]	Jackson Co	EMC	361-782-3356	

Public Meetings

Figure B-3. Public / Stakeholder Meeting: Jan. 27, 2011

COUNTY OF JACKSON · STATE OF TEXAS

H_2O PARTNERS

Jackson County Hazard Mitigation Plan Update
Public Meeting
January 27, 2011

SIGN-IN SHEET

Name	Department & Title	Phone/Fax	Email
Larry Deyton	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
Kendrick Callis	Jackson County Herald-Tribune	361-782-3547	news@jacksoncountynews.[illegible]
Charles Reckaway	Lavaca Navidad River Auth.	361-782-5229	CReckaway@LNRA.org
[illegible]	Ganado Council	361-771-2339 / 6119	[illegible]@[illegible]

Figure B-4. Public / Stakeholder Meeting: Feb. 24, 2011

H_2O PARTNERS

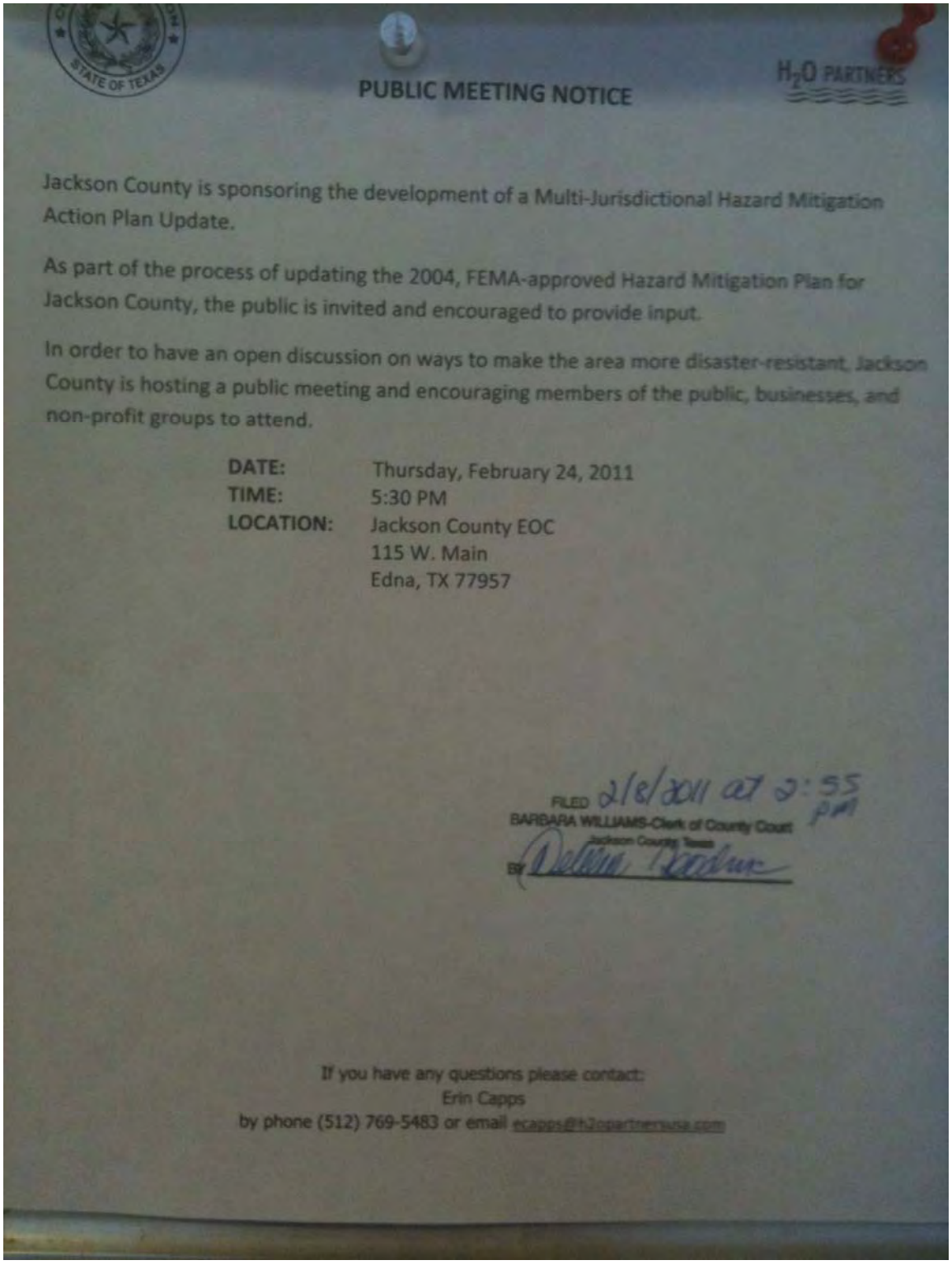
Jackson County Hazard Mitigation Plan Update
Public Meeting
February 24, 2011

SIGN-IN SHEET

Name	Department & Title	Phone/Fax	Email
Allen Friedrich	Jackson County EOC	361-782-3318	JCEOC@co.Jackson.tx.us
LARRY DEYTON	JACKSON COUNTY Commissioner	361-781-2751	deyton0laward.NET
Ken Collins	Jackson - Herald Tribune	361-782-3547	News@JacksonCounty.com
CHARLES A RECKAWAY	LNRA	361-782-5229	CRECKAWAY@LNRA.ORG

Notices

Figure B-5. Public Meeting Notice displayed in County Courthouse



PUBLIC MEETING NOTICE

H_2O PARTNERS

Jackson County is sponsoring the development of a Multi-Jurisdictional Hazard Mitigation Action Plan Update.

As part of the process of updating the 2004, FEMA-approved Hazard Mitigation Plan for Jackson County, the public is invited and encouraged to provide input.

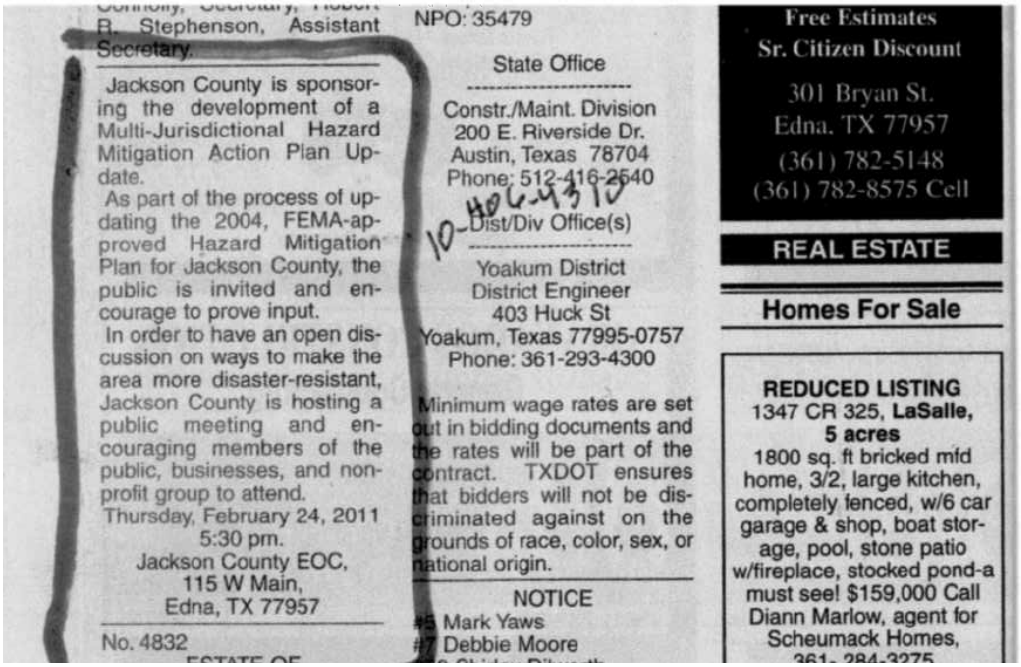
In order to have an open discussion on ways to make the area more disaster-resistant, Jackson County is hosting a public meeting and encouraging members of the public, businesses, and non-profit groups to attend.

DATE: Thursday, February 24, 2011
TIME: 5:30 PM
LOCATION: Jackson County EOC
115 W. Main
Edna, TX 77957

FILED 2/8/2011 at 2:55 PM
BARBARA WILLIAMS-Clerk of County Court
Jackson County Texas
BY Debbie Bodine

If you have any questions please contact:
Erin Capps
by phone (512) 769-5483 or email ecapps@h2opartnerswa.com

Figure B-6. Publisher's Affidavits and Ads for Public Meetings



R. Stephenson, Assistant Secretary.

Jackson County is sponsoring the development of a Multi-Jurisdictional Hazard Mitigation Action Plan Update.

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Thursday, February 24, 2011
5:30 pm.
Jackson County EOC,
115 W Main,
Edna, TX 77957

No. 4832

NPO: 35479

State Office

Constr./Maint. Division
200 E. Riverside Dr.
Austin, Texas 78704
Phone: 512-416-2540

10-406-4310

Dist/Div Office(s)

Yoakum District
District Engineer
403 Huck St
Yoakum, Texas 77995-0757
Phone: 361-293-4300

Minimum wage rates are set out in bidding documents and the rates will be part of the contract. TXDOT ensures that bidders will not be discriminated against on the grounds of race, color, sex, or national origin.

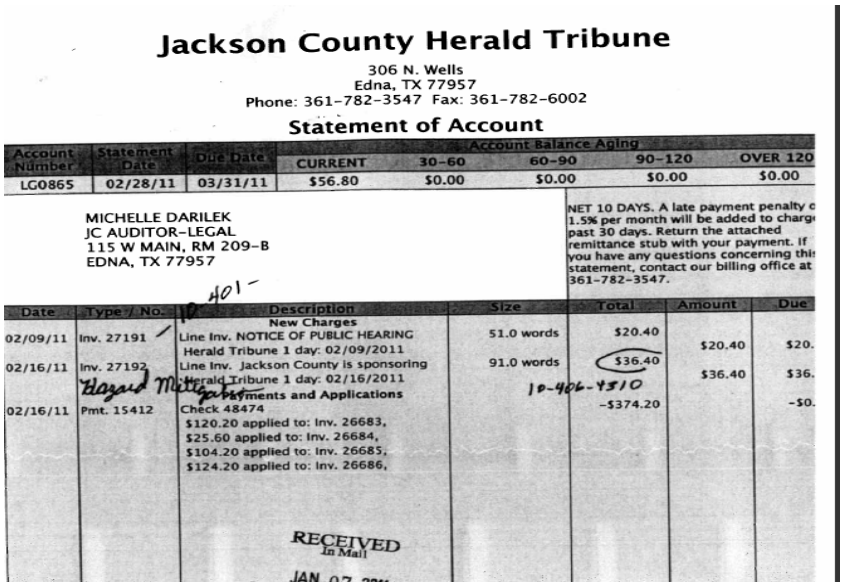
NOTICE
#5 Mark Yaws
#7 Debbie Moore

Free Estimates
Sr. Citizen Discount
301 Bryan St.
Edna, TX 77957
(361) 782-5148
(361) 782-8575 Cell

REAL ESTATE

Homes For Sale

REDUCED LISTING
1347 CR 325, **LaSalle, 5 acres**
1800 sq. ft bricked mfd home, 3/2, large kitchen, completely fenced, w/6 car garage & shop, boat storage, pool, stone patio w/fireplace, stocked pond-a must see! $159,000 Call Diann Marlow, agent for Scheumack Homes,



Jackson County Herald Tribune

306 N. Wells
Edna, TX 77957
Phone: 361-782-3547 Fax: 361-782-6002

Statement of Account

Account Number	Statement Date	Due Date	Account Balance Aging				
			CURRENT	30-60	60-90	90-120	OVER 120
LG0865	02/28/11	03/31/11	$56.80	$0.00	$0.00	$0.00	$0.00

MICHELLE DARILEK
JC AUDITOR-LEGAL
115 W MAIN, RM 209-B
EDNA, TX 77957

NET 10 DAYS. A late payment penalty c
1.5% per month will be added to charg
past 30 days. Return the attached
remittance stub with your payment. If
you have any questions concerning thi
statement, contact our billing office at
361-782-3547.

401

Date	Type / No.	Description	Size	Total	Amount	Due
		New Charges				
02/09/11	Inv. 27191	Line Inv. NOTICE OF PUBLIC HEARING Herald Tribune 1 day: 02/09/2011	51.0 words	$20.40	$20.40	$20.
02/16/11	Inv. 27192	Line Inv. Jackson County is sponsoring Herald Tribune 1 day: 02/16/2011	91.0 words	$36.40	$36.40	$36.
		Hazard Mitig Update		10-406-4310		
		Payments and Applications				
02/16/11	Pmt. 15412	Check 48474 $120.20 applied to: Inv. 26683, $25.60 applied to: Inv. 26684, $104.20 applied to: Inv. 26685, $124.20 applied to: Inv. 26686,		-$374.20		-$0.

RECEIVED
In Mail
JAN

Screenshots

Figure B-7. Screenshot of Facebook Page

Figure B-8. Screenshot of County Website with Survey Announcement