2024 Perry County Hazard Mitigation Plan

EMT-2021-BR-133-0030

Awarded September 6, 2022

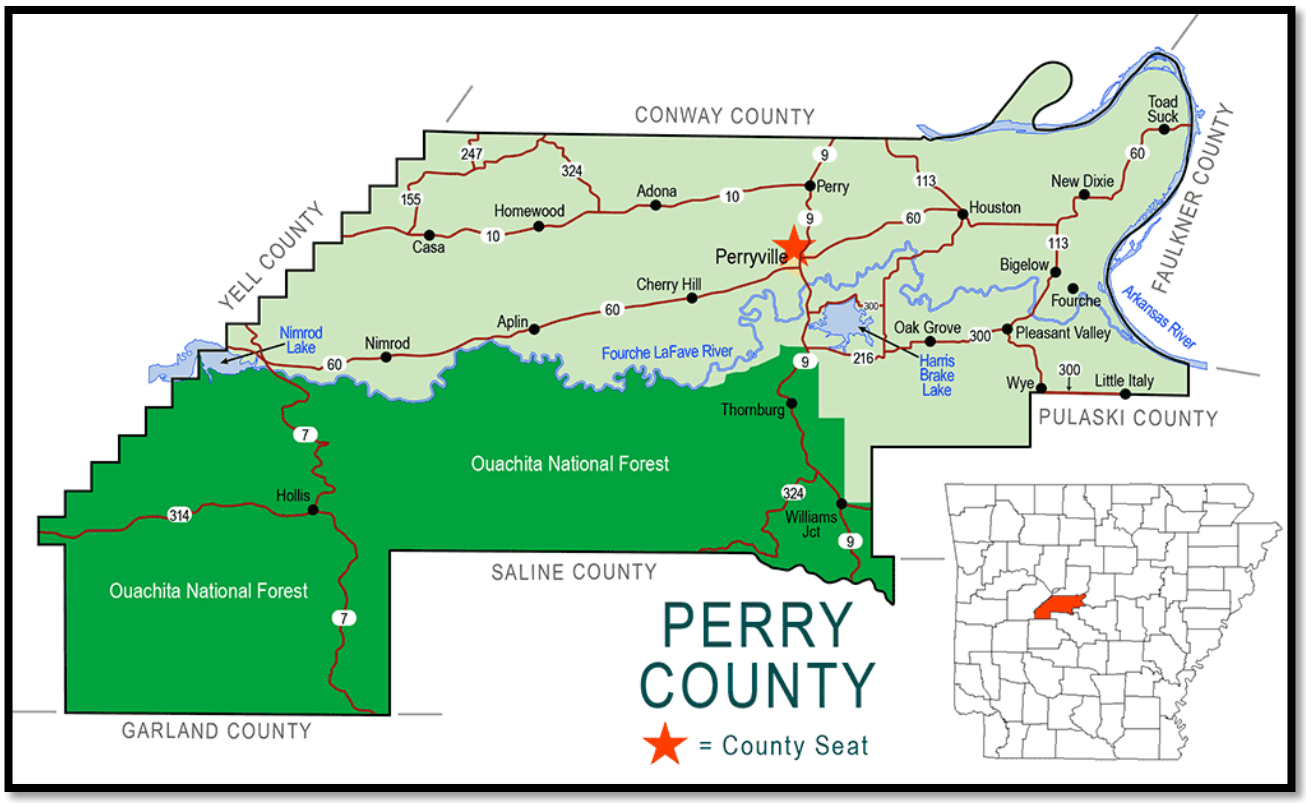

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Table of Contents

SAMPLE ADOPTION RESOLUTION

SAMPLE RESOLUTION

RESOLUTION NO. _____

A RESOLUTION OF (LOCAL GOVERNMENT) ADOPTING THE (TITLE AND DATE OF MITIGATION PLAN)

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within its jurisdiction; and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in its jurisdiction from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT), (STATE), THAT:

In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). While content related to (local government) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (local government) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

ADOPTED by a vote of (local governing body) this _____ day of ___,_____.

Mayor: _____

Clerk: _____

SECTION 1 INTRODUCTION

1.1 General Description

Hazards are part of the world around us. The occurrence of floods, hurricanes, tornadoes, winter storms, earthquakes, wildfires, and other hazardous events are inevitable. These hazards are natural phenomena we cannot control. These events damage the ecological environment. Despite their destructiveness, these occurrences are part of the natural system.

The natural environment is recuperative and can regenerate with resiliency. It is when manmade environments intersect with these natural phenomena that disasters result. Disasters occur when human activity, such as buildings, infrastructure, agriculture, and other land uses take place in the path of the forces of nature. The man-made environment is not as recuperative as the natural one. The consequences could mean damage and hardship for entire communities for years to come.

While we cannot prevent natural hazards, we can take some measures to reduce some of their adverse consequences. We have tools and techniques which, when put into effect in a timely fashion, allow us to avoid the worst-case scenario when a hazard does occur. By managing a community's capabilities and infrastructure before a hazardous event occurs, we can mitigate many of the negative impacts of a disaster. This reduces the magnitude of an event.

Hazard mitigation is the cornerstone of emergency management. It is defined as any sustained action to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation encourages long-term reduction of hazard vulnerability. The goal of mitigation is to save lives and reduce property damage.

In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 (DMA 2000) is the latest legislation to improve this planning process. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). This new section emphasizes the need for State, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts. The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, this Act establishes a pre-disaster hazard mitigation program (PDM) and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). It also requires communities to have an approved hazard mitigation plan to receive Stafford Act assistance, excluding assistance provided pursuant to emergency provisions.

The goals of this Perry County Hazard Mitigation plan are:

1. Reduce the potential for loss of life, injury and economic damage created by exposure to natural hazard for residents of the planning area due to natural disasters.
2. Provide a framework and coordination to encourage all levels of government, public/private organizations, and other participants to undertake mitigation to minimize potential disasters and to employ mitigation in the recovery following disasters.
3. Seek grants for mitigation projects through State and Federal funding.
4. Protect existing properties from natural disasters.

Whole community approach to mitigation has specific planning objectives to minimize damage due to disasters. These five specific objectives are:

1. Identify, describe, and characterize the natural hazards to which Perry County is susceptible,
2. Assess the risk of each hazard including probability and frequency, exposure, and consequences,
3. Examine feasible mitigation opportunities appropriate for the identified hazards and prioritize those opportunities,
4. Implement mitigation actions to reduce loss of lives and property, and
5. Identify mitigation opportunities for long-range planning consideration.

The Perry County Hazard Mitigation Plan has been developed to assess the ongoing natural hazard mitigation activities in Perry County. It evaluates additional mitigation measures that should be undertaken and outlines a strategy for implementation of mitigation projects. This Hazard Mitigation Plan is multi-jurisdictional with a planning area that includes all unincorporated Perry County and municipalities; of unincorporated Perry County and the municipalities within the County including the Cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville.

Formal adoption and implementation of a hazard mitigation plan presents many benefits to Perry County and its residents. By identifying problems and possible solutions in advance of a disaster, the Planning Area will be in a better position to obtain pre- and post-disaster funding. Specifically, the Disaster Mitigation Act of 2000 establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). It requires states and communities to have a FEMA approved hazard mitigation plan in place prior to receiving post-disaster HMGP funds. Adoption of this hazard mitigation strategy will also increase Perry County's eligibility for assistance from FEMA's Flood Mitigation Assistance (FMA) program. The Planning Area will also gain additional credit points under FEMA's Community Rating System (CRS) program. This program provides discounts on National Flood Insurance Program (NFIP) flood insurance premiums for residents of communities who voluntarily

participate in this program. Most importantly, Perry County will be able to recover faster and more wisely from a disaster. Through planning and acting on local mitigation strategies, Perry County communities will reduce vulnerability to disasters and identify opportunities for mitigation. In addition, the communities may meet comprehensive planning requirements and achieve community goals.

This update includes information pertaining to disasters that have impacted the Planning Area since the last revision. This document helps in obtaining information to better mitigate hazards in areas within the county that are prone to certain disasters. This plan is an update of the 2017 FEMA approved Perry County Hazard Mitigation Plan. The priorities of the 2024 Perry County Hazard Mitigation Plan remain consistent with the 2017 FEMA approved Perry County Hazard Mitigation Plan. The priorities of the county have not changed.

1.2 Parts of the Plan

The Perry County Hazard Mitigation Plan is divided into sections. These sections are created to address FEMA requirements that became effective April 19, 2023.

1. Element A: Planning Process
2. Element B: Hazard Identification and Risk Assessment
3. Element C: Mitigation Strategy
4. Element D: Plan Maintenance
5. Element E: Plan Update
6. Element F: Plan Adoption
7. Element G: High Hazard Potential Dams
8. Element H: Additional State Requirements/Supporting Documentation

This Hazard Mitigation Plan is multi-jurisdictional with a planning area that includes all of unincorporated Perry County and municipalities; all unincorporated Perry County and municipalities; of unincorporated Perry County and the municipalities within the County including the Cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville.

All jurisdictions and school districts listed above actively participated in the planning process from its inception. Each jurisdiction provided a representative to participate on the planning team or if a representative was unable to attend, they chose to be represented by the Perry County Office of Emergency Management. Planning team members actively participated in meetings, solicited input from members of their communities, and ensured that all jurisdiction information was reflected in the plan.

1.3 Involvement of Local Governments

Perry County's mitigation planning process was initiated September 6, 2022, when the County, through the efforts of the Perry County Office of Emergency Management (OEM), was awarded a Hazard Mitigation Grant Program (HMGP) grant by FEMA through ADEM, under Perry County Judge Larry Blackmon. Perry County negotiated a subcontract with West Central Arkansas Planning and Development District to facilitate their mitigation planning efforts. West Central Arkansas Planning and Development District served as facilitator. Dennis Ball, Director of the Perry County OEM, led the planning effort.

Once all participants in the Planning Area under the responsibility of the Perry County OEM formally agreed to participate, an initial planning team comprised of representatives from the Planning Area was organized.

This initial team was instructed to solicit interested people from their communities to participate on the planning team. This solicitation led to the addition of several planning team members. The planning team members include representatives from County government, local governments, city governments, public works officials, emergency management officials, fire districts, school districts and nonprofits.

All participating jurisdictions actively participated in the planning process. This participation was performed by soliciting input from communities in the Planning Area and participation in meetings. Due to Covid-19 pandemic some meetings may have been held by Zoom. If a city or school district could not attend a meeting, Perry County OEM Christina Montgomery or Dennis Ball represented them. Also, all minutes and materials were mailed/emailed out to the jurisdiction representatives that could not attend. Communication was followed up by phone and email by Dennis Ball County OEM and Kristen Lancaster or Kristin Cawyer at West Central Arkansas Planning and Development District.

The Planning Teams main discussion topics with WCAPDD were:

- Discussion on what mitigation is and how it benefits the Planning Area
- Risk for the Planning Area
- Past hazard occurrences
- Mitigation actions/plans
- Ongoing/future mitigation projects

Four planning events were scheduled throughout the planning process.

- The original kick off meeting was held on January 5, 2023.

Due to the lapse in time and staff changes three additional meetings were held on:

- March 14, 2024
- April 18, 2024
- April 30, 2024

In April 2023 there was a staff change at WCAPDD. Due to staff changes, the amount of time that passed, and the end of the Covid-19 Pandemic, it was important to conduct a public meeting where the community could attend. Invites were sent out via email and phone calls. The meeting date, time, place, and reason were advertised in the newspaper, social media and on the West Central Arkansas Planning and Development District website.

March 14, 2024, and April 18, 2024, allowed us to:

- Define mitigation and establish its purpose for the Planning Area
- Organize a consistent Planning Team
- Assess capabilities
- Engage the community

April 30,2024, a planning meeting was held. Invites were sent out via email and phone calls. The meeting date, time, place, and reason were advertised in the newspaper, social media and on the West Central Arkansas Planning and Development District website. This meeting was lengthy and allowed the Planning Team to:

- Assess the risks for the Planning Area using the results from the Natural Hazards Questionnaire and the National Risk Index
- Identify specific vulnerable populations
- Discuss mitigation actions from the 2016 Hazard Mitigation Plan and identify what had been completed.
- Develop new mitigation actions
- Develop new mitigation plans/future projects
- Determine how the Planning Team will maintain the Hazard Mitigation Plan once it is adopted.

Technical assistance and training were provided to WCAPDD by the Arkansas Department of Emergency Management and FEMA. Both entities discussed the importance of incorporating whole community into the process. Guidelines for the mitigation plan were outlined in FEMA Local Mitigation Planning Policy Guide FP 206-21-0002.

A whole community approach to mitigation planning was encouraged. According to FEMA a whole community approach is one that attempts to engage the full capacity of residents, emergency

management, government (local, tribal, state, territorial and federal), private and nonprofit sectors. This includes businesses, faith-based organizations, and disability organizations. A whole community approach to mitigation provides people of the planning area a more informed and shared understanding of the community's risk, needs and capabilities. This approach empowers the whole community and allows for resources to be effectively used. Using a whole community approach to mitigation planning paves a path to the planning areas stability and resilience.

For Perry County to achieve a whole community approach, special consideration was taken to enable and target underserved communities by providing the Natural Hazard Risk Questionnaire in an online format for accessibility ease. Other vulnerable populations found the online Questionnaire difficult to navigate, so a paper copy of the Natural Hazard Risk Questionnaire was made available upon request.

1.4 Neighboring Community Involvement

During the Mitigation Planning Process neighboring communities, local, regional and State agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development were informed of planning meetings. They received a personal invite by the Perry County OEM and WCAPDD by phone and email to attend these meetings. Local communities within the Planning Area were invited to attend planning meetings and participate in the planning process. Page 13 has a chart that details the communities that participated and who from each jurisdiction participated.

SECTION 2 PLANNING PROCESS

2.1 Planning Process

The Planning Process consisted of the following items:

- Once the initial planning meeting was held, Planning Committees were formed. These committees were divided by county/city/municipality. Everyone was encouraged to participate in their committee and invite others to join often. Perry County OEM was in charge of organizing and overseeing these committees. Perry County OEM was responsible for collecting data and documentation from committees and sharing them with West Central Arkansas Planning and Development District (WCAPDD).
- Perry County Judge engaged West Central Arkansas Planning and Development District (WCAPDD), the regional planning organization, to provide staff support in conducting the planning process and preparing the plan.
- Meetings were held with committee members to understand and agree on the planning process. The steps required for the planning process include organizing resources, assessing hazards, developing a mitigation plan, implementing the plan, and monitoring progress.
- WCAPDD staff attended workshops presented by FEMA and ADEM on the preparation of the mitigation plan.
- WCAPDD staff had numerous subsequent discussions about the planning process with ADEM staff.
- The WCAPDD staff discussed planning process issues with others in the state that were involved in the preparation of other hazard mitigation plans such as neighboring Counties and other Planning and Development Districts.
- Natural Hazard Mitigation Questionnaires were distributed and a total of 26 were returned. The natural hazards that the public seemed most concerned about were tornadoes and thunderstorms. A copy of the Natural Hazards Questionnaire and the results collected are in the Supporting Documents section of this plan. The Natural Hazards Questionnaire will be available year-round at the public library, County Website, and WCAPDD website. The questionnaire is a google form. The google form provides easy access to anyone with a cellphone or computer. The information will be collected/documented in the next update.
- Mitigation actions were created using the data from the Natural Hazards Questionnaire by the planning team

The Planning Committee utilized these technical documents:

- Arkansas Hazard Mitigation Plan: used as a guidance tool for past occurrences and risk assessments.
- Perry County Land Use Plan: used to prevent land-use conflicts during developing mitigation actions.
- Perry County Emergency Operations Plan: used to better understand how Perry County responds to emergencies and disasters while providing for the safety and welfare of its citizens. Plan provided information about critical facilities in the County.

- WCAPDD Comprehensive Economic Development Strategy: used to review Disaster and Resiliency procedures from natural disasters that helped during the mitigation actions process.
- Perry County Arkansas Continuity of Operations Plan: utilized in the capability assessment to incorporate how the departments and agencies in Perry County continue the operations of their essential functions under a broad range of circumstances including all-hazard emergencies natural, man-made, technological threats and national security emergencies

Timeline Of Events

Date	Meeting Information	Attendees
January 5, 2023	**Kickoff Meeting** Each person who attended received a workbook containing a copy of the Power Point "Overview of the Mitigation Planning Process". The Power Point was presented, and then the floor was opened up for a question-and-answer session. Questionnaire was handed out and everyone was encouraged to share it with the public.	• Russell Weaver Arkansas Forestry • Mark Cosey Mayor of Adona • David Blyth Arkansas Forestry • Harold Hill Perry County Floodplain Manager • David Gaddis Perry Fire Chief • Jose Payne Mayor of Casa • Larry Blackmon Perry County Judge • John Roland Mayor of Perryville • Preston Hurst Perryville Flood Plain Manager • Lee Stewart Perryville Fire Department • David Starky Houston Fire Department • Dennis Ball 911/OEM • Alan Faulkner City of Casa
April 16, 2023	Staff Change Kristen Lancaster was replaced by Kristin Cawyer at WCAPDD	NA
March 14, 2024	Planning meeting Due to staff changes, the amount of time that passed, and the end of the Covid-19 Pandemic, it was important to conduct a public meeting where the community could attend. Invites were sent out via email and phone calls. The meeting date, time, place, and reason were advertised in the newspaper, social media and on the West	• Dennis Ball 911/OEM • Harold Hill Flood Plain Manager • Mike Walker OEM Assistant • Larry Blackmon Perry County Judge

Timeline Of Events

	Central Arkansas Planning and Development District website. This meeting allowed us to: • Define mitigation and establish its purpose for the Planning Area • Discuss the purpose of updating the County Hazard Mitigation Plan • Organize a consistent Planning Team • Define and assess capabilities • Engage the community This meeting was followed up with an email containing a Capabilities Assessment form to be filled out and returned.	• Kristin Cawyer WCAPDD
April 18, 2024	Planning meeting Invites were sent out via email and phone calls. The meeting date, time, place, and reason were advertised in the newspaper, social media and on the West Central Arkansas Planning and Development District website. This meeting allowed us to: • Define mitigation and establish its purpose for the Planning Area • Discuss the purpose of updating the County Hazard Mitigation Plan • Organize a consistent Planning Team • Define and assess capabilities • Engage the community This meeting was followed up with an email containing a Capabilities Assessment form to be filled out and returned.	• Harold Hill Perry County Flood Plain Coordinator • Russell Weaver Arkansas Department of Agriculture • Larry Blackmon Perry County Judge • John Roland Mayor of Perryville • David Gaddis Perry Fire Chief • Micky Hill-citizen • Josie Payne Mayor of Casa • Dale Payne-citizen • Butch Hoyt-citizen • Kay Hoyt-Citizen • Melissa Some BHFC Perryville • Billy Williams WPFD • Heidi Wilson East End School District Superintendent • Courtney Decker WCAPDD • Kristin Cawyer WCAPDD
April 30,2024	• Planning meeting • Mitigation Strategy/Risk Assessment	• Harold Hill Perry County Flood Plain Coordinator • Mark Cossey Mayor of Adona

Timeline Of Events		
	• This meeting was advertised in the newspaper. Emails and phone calls to the entire planning team were made prior to meeting time. • Risk assessment using the Natural Hazard Questionnaire and the National Risk Index were discussed. There were no questions or discussion from attendees. • Mitigation actions in the plan were reviewed to identify if actions were completed, ongoing or no longer applicable. • • Mitigation plans were discussed, and the floor was open to discussion for new mitigation projects. • Items that were discussed consist of: • Acquisition of real property from willing sellers for demolition or relocation of buildings to convert the property to green space. • Retrofitting structure and facilities to minimize damage from high winds, earthquakes, floods, wildfire, or other natural hazards. • Elevation of flood prone structures • Development of initial implementation of vegetative management programs. • Minor flood control projects especially in areas of critical facilities • Construction of safe rooms for public and private structures meeting FEMA construction criteria in FEMA 320 "Taking Shelter from the Storm" and FEMA 361 "Design and Construction Guidance for Community Shelters" • Safe rooms were the largest topic of discussion. Many safe rooms are located in schools. During school hours they are only for the school children while those in nursing homes and day care centers are left vulnerable. • Procedure for keeping the Hazard Mitigation Plan updated was documented.	• Troy Glen • Mike Brown • David Starkey Houston Fire Department • Heidi Wilson East End School District Superintendent • Kay Hoyt • Kristin Cawyer WCAPDD
Those not in attendance for public meetings were represented by the Perry County OEM Steve Beavers. Information from the meeting was followed up by email/phone conversation.		

Follow up meetings were held throughout 2023 and into 2024 with the Planning Team to address questions regarding capabilities assessments, mitigation actions, and future mitigation plans to address concerns in the Planning Area.

Prevention actions were updated:

- Zoning codes limiting development in a floodplain, open space preservation, and development of parks and recreation areas in hazard prone areas.
- Land development regulations such as requiring large lot sizes to ensure a minimum amount of impervious surface area.
- Storm water management regulations requiring retention/detention basins and clearing of ditches.
- Capital improvements planning preventing extension of public infrastructure into hazard areas.
- Building or fire codes requiring certain types of roofing or sprinkler systems

Property Protection actions addressing individual buildings were addressed and updated such as:

- Acquisition
- Relocation
- Retrofitting
- flood proofing
- installing structures such as piles and retaining walls
- grouting rock joints and fissures

Public Education and Awareness actions:

- Provide hazard maps with specific hazard information.
- Develop websites making hazard information publicly available.
- Implement outreach programs providing hazard and mitigation information to the public.
- Asking business owners to provide mitigation information to employees.
- Mailouts about hazards
- Newspaper articles
- Designing education programs for school age children and adults

Natural Resource Protection actions:

- erosion and sediment control programs
- wetland protection programs
- expanding public open space
- environmental restoration, and freshwater/sediment diversion programs)

Emergency Services Protection actions:

- emergency services before, during and immediately after an occurrence such as protection of warning system capability
- protection or hardening of critical facilities (fire stations and hospitals)
- protection of infrastructure (roads needed for emergency response)

Structural Projects actions to control the hazard including:

- reservoirs
- levees
- floodwalls
- other stormwater diversions.

2.2 Public Review

After the completion of planning meetings, the draft plan was provided for the public viewing. Copies of the draft were placed in the Perry County public library and the Perry County Courthouse. The draft can be found online on Perry County social media page, WCAPDD social media page, and on the WCAPDD website. The goal was to reach as many community members as possible for public comment before submission to the Arkansas Department of Emergency Management. The revision process, by which the public could make revision requests, included posting the Plan electronically to the District and County websites, alongside a Google Form link. This method simplified the revision request process. This will be completed after the public review period

2.3 Plan Developers

The following individuals participated in the plan development for their jurisdictions.

Developers and Planning Activities	
Jurisdiction	**Name of Participation/Involvement**
Perry County, unincorporated areas, State Agencies, and neighboring counties	County Larry Blackmon – Represented Perry County. Received hazard mitigation workbook, attended planning meetings, completed questionnaires, and provided information on disasters. Participated in phone calls, emails, and other correspondence. Perry County Office of Emergency Management; Dennis Ball, Director, Harold Hill Perry County Flood Plain Manager All members of CCOEM received hazard mitigation workbooks, attended planning meetings, completed, and distributed hazard questionnaires, participated in collection of historical natural disasters information. Participated in phone calls, emails, and other correspondence with facilitator and school districts, cities, and fire departments. Arkansas Department of Emergency Management; Lacye Blake and Jennifer Oakley; Received hazard mitigation workbook, attended first planning meeting. Addressed questions from planning team about hazard mitigation and assisted in transition between Kristin Lancaster and Kristin Cawyer. Arkansas Forestry Commission; Olivia Standridge assisted with wildfire risk/vulnerability. David Blythe attended planning meetings, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events. Arkansas Department of Agriculture; Russell Weaver attended planning meetings, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.
City Of Adona	Mayor Mark Cossey; Attended planning meetings, completed community capabilities assessment and natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.
City of Bigelow	Mayor Brad Akridge; was represented by OEM Dennis Ball for planning meetings, completed community capabilities assessment and natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.

Developers and Planning Activities	
City of Casa	Mayor Josie Payne Attended planning meetings, completed community capabilities assessment and natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.
City of Houston	Mayor David Starkey Attended planning meetings, completed community capabilities assessment and natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.
City of Perry	Mayor Justin Crain Attended planning meetings, completed community capabilities assessment and natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.
City of Perryville	Mayor John Roland Attended planning meetings, completed community capabilities assessment and natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.
East End School District	Superintendent Heidi Wilson Attended planning meetings, received hazard mitigation workbook, completed inclement weather questionnaire for school district, completed natural hazards questionnaire assisted with Risk Assessment, and participated in open discussion of historical storm events.
Perryville School District	Superintendent Mandi Edwards Attended planning meetings, received hazard mitigation workbook, completed inclement weather questionnaire for school district, completed natural hazards questionnaire assisted with Risk Assessment, and participated in open discussion of historical storm events.
Private Sector	Atlas Smith with TC Works and Mellissa Seme with Practice Plus Attended planning meetings, completed natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion
Non-Profit	Kay Hoyt with the food bank Attended planning meetings, completed natural hazard questionnaires, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion

Developers and Planning Activities	
West Central Arkansas Planning and Development District	Kristen Lancaster, Program Manager with WCAPDD, served as the facilitator in the update of the Perry County Hazard Mitigation Plan. She met and held telephone conferences with school districts, cities, and county members to discuss the mitigation plan process and the HMGP, BRIC, and the FMA grant programs. She contacted local jurisdictions and schools to gather information thru the planning process. April of 2023, these duties were transferred to Kristin Cawyer of WCAPDD who completed the planning process.

Points of Contact		
Perry County Judge Larry Blackmon 310 W. Main St., Perryville, AR 72126 501.889.5128 lblackmon@perrycounty.net	Perry County OEM Director of OEM Dennis Ball 1039 N. Fourche Ave Perryville, AR 72126 501.889.3228 dball@perrycounty.net	Perry County Flood Plain Manager Harold Hill 1039 N. Fourche Ave Perryville, AR 72126 501.889.3228 harold@perrycounty.net
City of Adona Mayor Mark Cossey P.O. Box 103 Adona, AR 72001 501.662.4848 Mcossey306@hotmail.com	City of Bigelow Mayor Bradley Akridge P.O. Box 177 Bigelow, AR 72016 501.759.3080 dana@conwaycorp.net	City of Casa Mayor Josie Payne P.O. Box 6 Casa, AR 72025 501.233.6210 mayor@cityofcasa.org
City of Houston Mayor David Starkey P.O. Box 166 Houston, AR 72070 501.759.2536 Davidstarkey1206@yahoo.com	City of Perry Mayor Justin Crain P.O. Box 36 Perry, AR 72125 501.662.4571 perrycityhall@windstream.net	City of Perryville Mayor John Roland P.O. Box 116 Perryville, AR 72126 501.889.2862 citypv@arbbs.net
East End School District Superintendent Heidi Wilson 114 West Panther Drive Bigelow, AR 72016 501.759.2808 hwilson@bigelow.k12.ar.us	Perryville School District Superintendent Mandi Edwards 614 S. Fourche Ave Perryville, AR 72126 501.889.2327 Mandi.edwards@perryvilleschool.org	City of Fourche Mayor Rick Egger P.O. Box 61 Fourche, AR 72016 501.759.3747 fourchemayor@gmail.com

2.4 Plan Maintenance

This plan is a blueprint for reducing risk and protecting the planning area's investments. Below is the process for maintaining the plan reflecting change. The purpose is threefold:

1. To track progress on implementing the mitigation strategy
2. To update the plan as new information becomes available
3. To record when disasters occur

The plan needs to be revisited at regular intervals to keep it relevant. FEMA regulations require this to be done every five years. It should also be done after major disaster events or if new conditions significantly change risk.

Monitoring, Evaluating and Updating the Perry County Hazard Mitigation Plan is required by FEMA every five years. A review of the Perry County Hazard Mitigation Plan is required yearly. The planning team developed a method to ensure monitoring, evaluation, and updating of the Perry County Hazard Mitigation Plan occurs annually or as needed. The plan will be submitted to FEMA within five years for review. The County will form a Hazard Mitigation Plan Evaluation Sub-Committee of the existing Perry County Local Emergency Planning Committee (LEPC). The LEPC consists of members from fire service, health officials, emergency management, law enforcement, community groups, transportation, hospital personnel, school administration, emergency medical personnel, elected officials, and owners/operators of covered facilities. The Director of the Perry County Office of Emergency Management will be the initial Chair of the sub-committee or Planning Team Leader. The Planning Team Leader will contact the planning team committee, set up meeting dates quarterly, and ensure each community will maintain a representative on the team.

During the update period, representatives of the Planning Team will verify point of contact information is still correct. Also, as events occur within the jurisdictions covered by this plan, they will be recorded in the appropriate sections throughout. If the planning team feels a new hazard is faced by the County and its jurisdictions, then this hazard should be added and addressed in the plan. When Perry County receives a new Presidential Declaration, this will be noted in the appropriate sections of the plan. Mitigation actions are completed, the appropriate section of the plan is updated. The responsible party for overseeing and assuring plan updates is the Perry County Office of Emergency Management. At this time, the maintenance procedures for the Mitigation Plan will be conducted at the quarterly LEPC meeting. Each community's representative will be responsible for monitoring and evaluating the progress of the mitigation strategies in the plan. The team members will monitor the plan by providing a mitigation planning update at each quarterly meeting. During the last LEPC meeting of each year, the sub-committee will meet to review and

evaluate each goal and objective to determine their relevance to changing situations in Perry County. Changes in State or Federal policy will be evaluated. The Sub-committee will also review and evaluate the risk assessment portion of the plan to determine if this information should be updated or modified. The parties or agencies responsible for the various implementation actions will report on the status of their projects and will evaluate which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

The Perry County Office of Emergency Management will revise the plan within three months before submitting it to the Sub-Committee members and the State Hazard Mitigation Officer, undergoing 12 to 18 months of update review. If no changes are necessary, the State Hazard Mitigation Officer will be given justification for this determination. Comments and recommendations offered by Sub-Committee members and the State Hazard Mitigation Officer will be incorporated into the plan update. In addition, the Perry County Hazard Mitigation Plan will be integrated into other plans. Integrating hazard mitigation into the local comprehensive plan establishes resilience as an overarching value of the community and provides opportunity to continuously manage development in a way that does not increase hazard vulnerability.

Land Use and Development Plans will guide future growth and development away from areas with known hazards. Plans will ensure design standards for new or improved construction taking potential hazards into account. Land use policies can build community resilience by taking information on location, frequency, and severity of hazards into consideration and setting forth recommendations that influence development in a way that does not increase risk to life and property.

Transportation Plans can build community resilience by adopting policies directing growth away from known hazard areas. Transportation systems and other critical infrastructure are designed to withstand the effect of known hazards, so they still function in the event of an emergency or disaster.

Housing Plans help strengthen community resilience by ensuring new or improved housing complies with existing building codes. They are a tool for identifying when building code improvements are needed. Opportunities to strengthen or replace structures identified as vulnerable to hazards can be promoted using existing maintenance or rehabilitation programs, or policies regarding non-conforming, substantially damaged, or improved properties.

Economic Development Plans can promote commercial or industrial expansion in areas that are not vulnerable to damage or disruption from hazards. They make community resilience a key

feature in attracting, expanding, and retaining businesses and industry. Public Facilities and Infrastructure Plans can be adopted to ensure critical facilities (police and fire stations) and key infrastructure (water and wastewater treatment plants) are protected from the effects of hazards. They provide establish goals and policies for mitigation projects such as storm water drainage improvements or the public acquisition of hazard areas for open space.

Natural Resource Protection Plans have policies designed to preserve or enhance environmental areas of concern, such as wetlands, riparian corridors, and floodplains. They often include the added benefit of avoiding or minimizing development in hazard areas. These types of policies build community resilience by protecting lives and property and maintaining natural and beneficial functions of system acting as buffers against hazardous events.

Historic Properties and Cultural Resources Plans are designed to protect and preserve historic and cultural sites, buildings, and other resources. They can be linked with mitigation strategies to prevent damage and losses from hazardous events.

The Hazard Mitigation Plan will account for any changes in these plans and incorporate the information accordingly in its next update.

The Planning Committee will make every attempt to ensure the public will be able to directly comment on and provide feedback about the Plan. This will be done by posting the agenda and submitting meeting notice to the local media through newspaper articles, county websites and postings in public locations. This process will inform the citizens of the planning area on any changes or revisions of the Perry County Hazard Mitigation Plan.

Since future plans and government regulations may need to be adopted into the Hazard Mitigation Plan, Perry County Quorum Court will be informed of any necessary changes to the plan by the Team Leader, to be adopted into the Plan by county resolution. The Arkansas Department of Emergency Management will be contacted as necessary for professional and technical advice as needed.

2.5 Continuous Public Involvement

Perry County is dedicated to involving the public directly in the continual reshaping and updating of the Perry County Hazard Mitigation Plan. The Hazard Mitigation Plan Evaluation Sub-Committee members are responsible for the annual monitoring, evaluation, and update of the plan. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan.

Copies of the FEMA approved Perry County Hazard Mitigation Plan will be available at www.wcapdd.org. Contained in the plan are the address, phone number, and e-mail address of the Director of the Perry County Office of Emergency Management, the primary point of contact for the plan.

A public announcement inviting all interested parties will be made prior to each quarterly LEPC meeting, including the December LEPC meeting during which the Hazard Mitigation Planning Sub-Committee reviews and evaluates the plan in its entirety. This meeting will provide the public a forum for which the general public can express concerns, opinions, or ideas about the plan. The Perry County Office of Emergency Management and the Perry County LEPC will publicize and host this meeting. Following the meeting, the evaluation committee will review the comments and make changes to the plan, as appropriate.

2.6 Incorporation into Existing Planning Mechanisms

Perry County and all plan participants currently use state laws pertaining to compliance with the National Flood Insurance Program and state fire codes, to keep compliance with its hazard mitigation programs. These existing mechanisms have hazard mitigation strategies integrated into them. Perry County has a current Emergency Operations Plan. The Hazard Mitigation Plan will become an annex of the EOP for future submissions.

The Perry County Hazard Mitigation Plan will be available for public view on the West Central Arkansas Planning and Development District's website www.wcapdd.org and the Counties website for any entity or citizen who wishes to view or make a copy of it. Copies will also be made available at public libraries, the Perry County Courthouse, municipalities within the County including the Cities Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville.

Any participant without previous plans in place will be encouraged to develop zoning plans and other land ordinances to incorporate mitigation strategies. Participants will incorporate the Perry County Hazard Mitigation Plan as it pertains to them. After these discussions, each incorporating

mechanism will follow their local laws or guidelines necessary for implementation through open forum public meetings. Each incorporating party will monitor the progress of any incorporated mitigation strategy and report the success or failure to the Emergency Operations Council for inclusion in its annual report. After each update of the Perry County Hazard Mitigation Plan, each incorporating participant will be informed of the changes so they can reflect these changes in their plans also.

All participating jurisdictions will use the risk assessment that was conducted in this mitigation plan for creating strategies when dealing with hazards. The data and maps will be used as supporting documentation to encourage participating jurisdictions to address hazards affecting the planning area and organizations. This supporting data may be used in grant applications.

Perry County will incorporate the Perry County Hazard Mitigation Plan into the Perry County Continuity of Operations Plan and in county land use ordinances and/or plans by following the laws set forth by the county government.

Incorporating the plan into other plans will be done by vote at the regular quorum court meetings and passed by resolution.

All participating schools will incorporate the Perry County Hazard Mitigation Plan into their Continuity of Operations Plan by following the rules set forth by each school board. Incorporating the plan into continuity of operation plans will be done at regular school board meetings.

The previous plan was incorporated into the listed planning mechanisms to request grant funding for:

- FMA-PJ-06-AR-2019-007 Perry County FMA Land Acquisition
- HMPG-DR-4441-AR Perry County Acquisition and Demolition Project

SECTION 3 PLANNING AREA AND RESOURCES

3.1 General Geography

34°57′37″N 92°56′07″W

Perry County consists of a total area of 561 square miles. 551 square miles is land. 9.1 square miles is water (Perry County, Arkansas - Wikipedia).

Perry County is a rural area in the Ouachita Mountains. A large portion of the county is located in the Ouachita National Forest. There are multiple points of interest located within Perry County for outdoor recreational use.

- Flatside Wilderness Area
- Ouachita National Recreation Trail
- Flatside Pinnacle Mountain
- Lake Sylvia Recreation Area
- Hollis CCC Camp
- South Fourche Recreation Area
- Nimrod Lake
- Harris Brake
- Toad Suck Park
- The Arkansas River
- Fourche LaFave River
- South Fourche LaFave River

Perry County is surrounded by Conway County to the north, Faulker County to the northeast, Pulaski County to the east, Saline County to the southeast, Garland County to the southwest and Yell County to the west. The city of Perryville is the County seat.

Perry County landscape consists of rolling foothills of the Ouachita Mountains. Almost half of Perry County is National Forest.

The most popular annual event to draw in tourism is the Arkansas Goat Festival. It is held every fall.

Perry County is also home to Heifer Ranch, owned by Heifer International (Heifer USA | Heifer International), a nonprofit organization that provides food and agricultural training for people all across the world.

For the purposes of the Perry County Hazard Mitigation Plan the planning area will consist of unincorporated Perry County and the municipalities within the County including the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville.

General Land Use/Analyzing Development Trends

Perry County, Arkansas - Wikipedia

Historical population data states that in the year 2023 there were 10,184 people living in the Planning Area. This was a 1.6% increase from the historical data for the year 2022. The US Census shows that between the 2010 and 2020 Census the Planning Area had a 4.1% decrease in population. Though this data may look inconsistent, historical data goes all the way back to 1850 and shows the Planning Area to have continued increase in population throughout most years. With this type of consistency, the Planning Area is likely to continue to have an increase in population over the next five years.

The 2020 census documented 4,702 housing units in the Planning Area, with an average density of 8 units per square mile.

The Planning Area has 25.30% population under the age of 18, 14.80% population over the age of 65. This does not take into account other vulnerable populations that are disabled, reliant on medical equipment, economically challenged, or the unhoused.

The statistics show a growing population in the Planning Area where nearly 50% of that population would be considered vulnerable populations.

The county does not require a building permit for new construction; however, the 911 system tracks how many new addresses were requested.

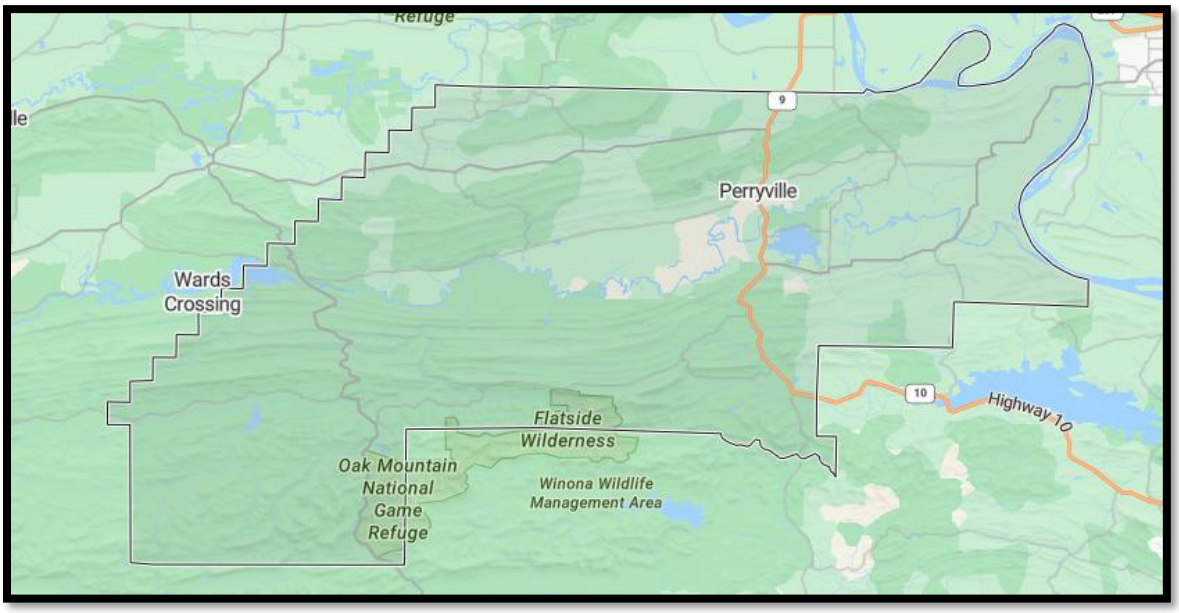
The planning area has not seen a substantial increase or decrease in land use and development that would impact the community's infrastructure, people, and economy. However, this information will continue to be documented by the planning team over the next five years.

There have been positive changes in the area due to the mitigation actions. Perryville school District received funding to complete a safe room in May 2021. This project was completed by February 2024. The project is expected to prevent loss of life. Bigelow School District hopes to receive funding for a safe room project in the future.

3.2 NFIP Participation

The National Flood Insurance Program (NFIP) enables property owners to purchase flood insurance. To qualify, communities must agree to adopt and implement local floodplain management regulations. These regulations are intended to protect lives and reduce the risk of new construction or substantial improvements from flooding.

Perry County ID 050165#



Perry County is a member of the National Flood Insurance Program. Their community Identification number is 050165. Their initial Flood Hazard Boundary Map (FHBM) was identified 07/06/1998, their current effective map date 06/20/2000 and Reg-Emergency Date 11/17/1999.

Perry County participates in the NFIP by assisting residents with filling out documents for the NFIP and educating citizens about the NFIP program. Building permits are not issued by Perry County. In Perry County the city of Perryville is the only city to issue building permits. However, Perry County does have a Certified Floodplain Manager (CFM) who oversees the Counties floodplain management. The CFM monitors land use. This includes new construction, substantial alterations to a structure, and changes in the use of a structure or land. If floodplain resources are needed that the County cannot provide, the Counties CFM requests assistance from Arkansas Natural Resource Conservation Service and FEMA. The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations.

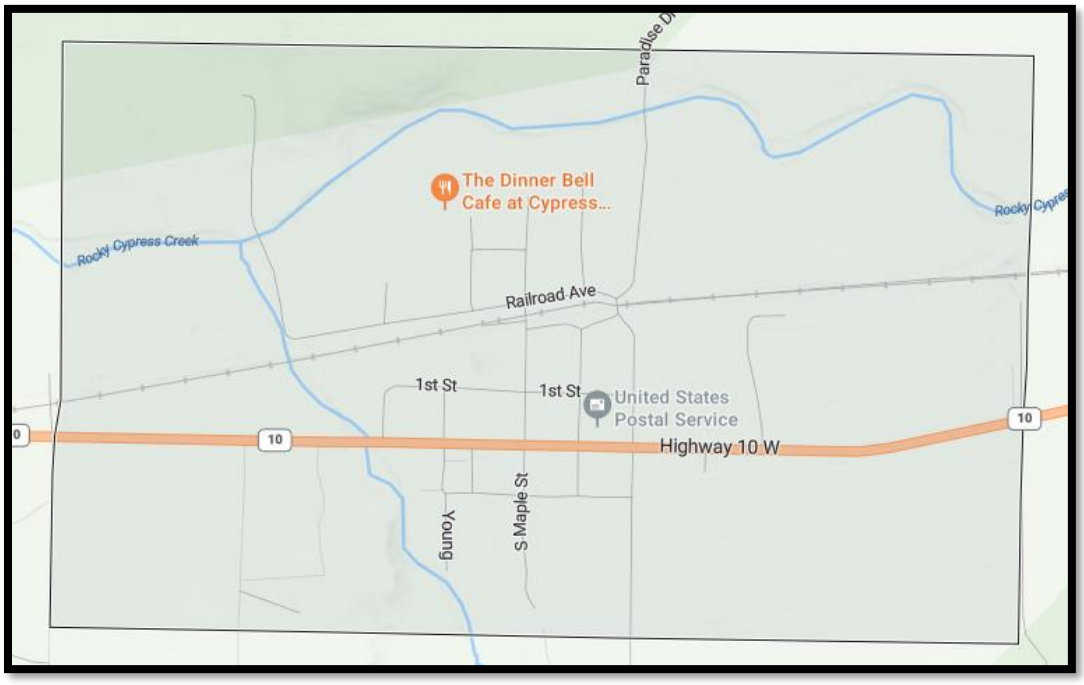
The county plans to continue participating in the NFIP through continuing floodplain education and continually evaluating structures:

- In need of improvements
- Substantially damaged
- Located within the floodplain

The County will work with owners who have structures that are substantially damaged or need improvements/repairs. The County will work with the owner to bring the structure into compliance with State and Federal NFIP compliance codes by providing the owner with the necessary codes and monitoring to ensure compliance

Perry County does not have a Community Rating System (CRS) Classification. Perry County currently lacks the necessary resources to take part in the CRS.

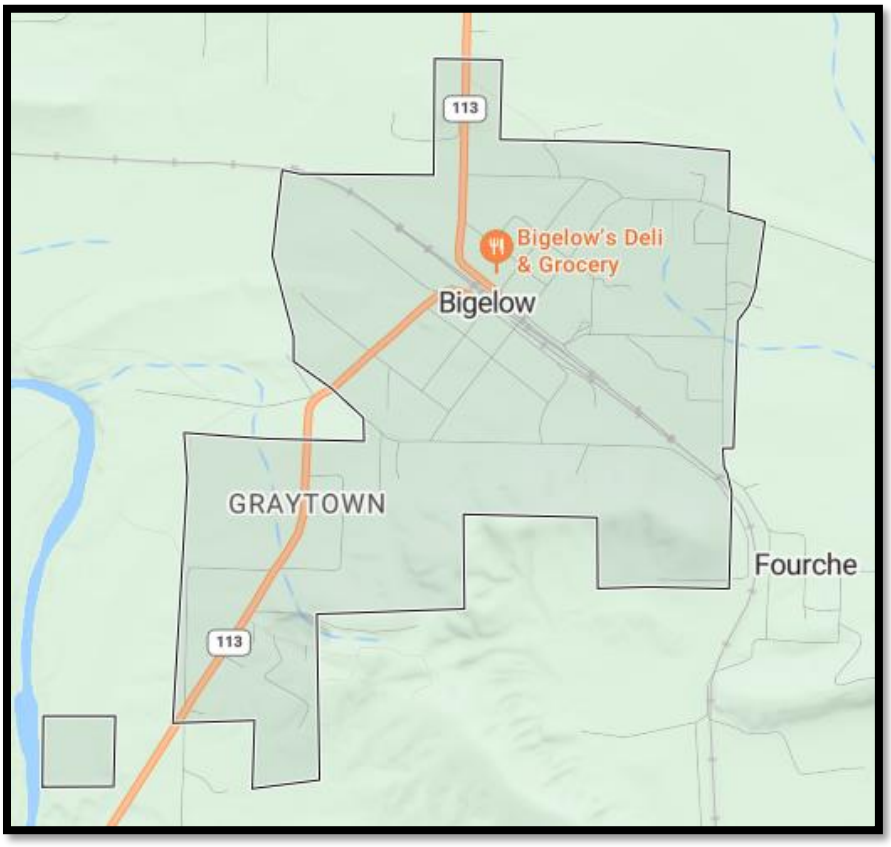
Adona ID 050376#



The City of Adona is not a member of the National Flood Insurance Program, Community Identification Number 050376#. However, their initial Flood Hazard Boundary Map was identified 04/18/1975, the Initial Flood Insurance Rate Map identified 07/06/1998, current effective map date 07/06/1998, and their Sanction Date 09/06/1985.

The City of Adona does not currently participate in the NFIP at this time. The City of Adona is currently researching the benefits they could receive by becoming a member of the NFIP.

Bigelow ID 050387#



The town of Bigelow is a member of the National Flood Insurance Program, Community Identification Number 050387#. Their initial Flood Hazard Boundary Map was identified 06/27/1975, the Initial Flood Insurance Rate Map identified 07/06/1998, current effective map date 07/06/1998, and Reg-Emergency Date 01/26/1983.

The town of Bigelow participates in the NFIP by assisting the residents with filling out documents for the NFIP, issuing permits, and educating citizens about the NFIP program.

The Mayor of Bigelow is the Floodplain Administrator for the town of Bigelow. The Floodplain Manager oversees the town's floodplain management program. The Floodplain Manager monitors land use within the town. This includes new construction, substantial alterations to a structure, and changes in the use of a structure or land. If floodplain resources are needed that the town of Bigelow cannot provide, the Floodplain Manager requests assistance from the County. If the County cannot provide the needed assistance they will rely on State/Federal guidelines and resources such as Arkansas Natural Resource Conservation Service (AMRC) and FEMA. ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations.

The town of Bigelow plans to continue to participate through continuing floodplain education, overseeing, issuing permits, and staying in compliance with NFIP.

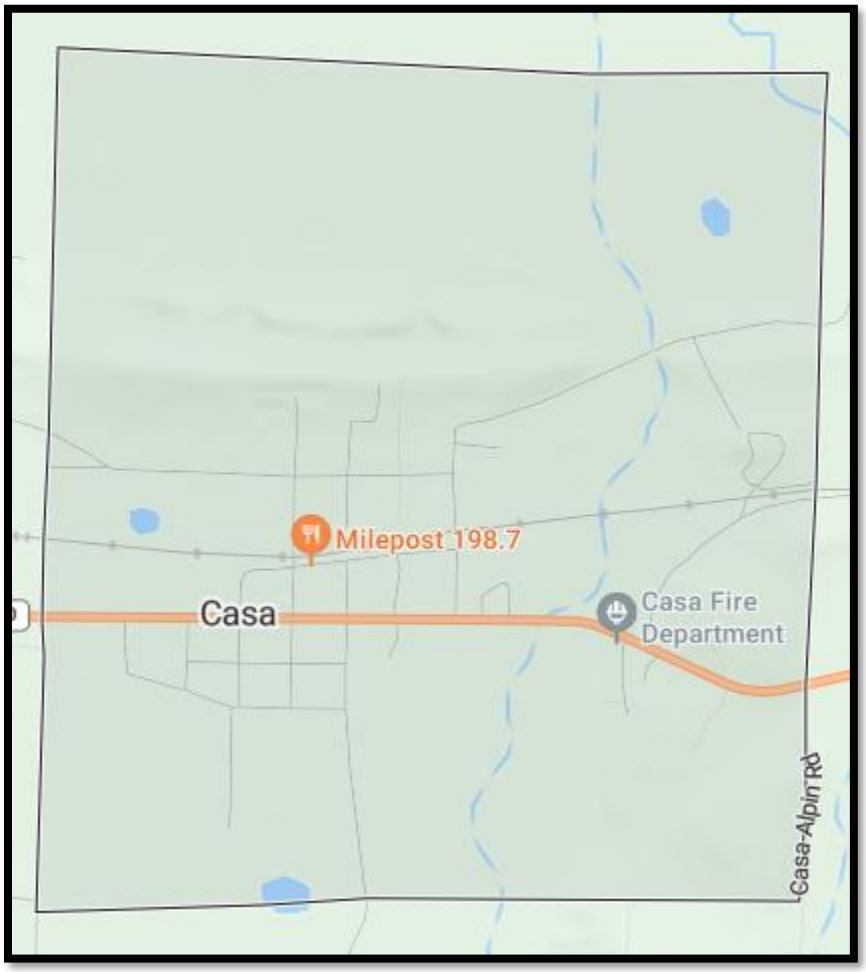
The town of Bigelow and Perry County continues to evaluate structures that are:

- In need of improvements
- Substantially damaged
- Located within the floodplain

The County will work with owners who have structures that are substantially damaged or need improvements/repairs. The County will work with the owner to bring the structure into compliance with State and Federal NFIP compliance codes by providing the owner with the necessary codes, permits and monitoring to ensure compliance.

The town of Bigelow does not have a Community Rating System (CRS) Classification. At this time the town lacks the necessary resources to take part in the CRS.

Casa ID 050395#



The City of Casa is a member of the National Flood Insurance Program, Community Identification Number O50395#. Their initial Flood Hazard Boundary Map was identified 07/11/1975, the Initial Flood Insurance Rate Map identified 03/15/1983, current effective map date 07/06/1998, and Reg-Emergency Date 03/15/1983.

The City of Casa participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program.

The Mayor of Casa is the designated Floodplain Manager. The Floodplain Manager oversees the city's floodplain management program. The Floodplain Manager monitors land use within the city. This includes new construction, substantial alterations to a structure, and changes in the use of a structure or land. If floodplain resources are needed that the city of Casa cannot provide, the Floodplain Manager requests assistance from County. If the County cannot provide the needed assistance they will rely on State/Federal guidelines and resources such as Arkansas Natural Resource Conservation Service (AMRC) and FEMA. ANRC provides technical assistance to the

community assuring that the community is adequately enforcing its floodplain management regulations. The city plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The City of Casa and Perry County continues to evaluate structures that are:

- In need of improvements
- Substantially damaged
- Located within the floodplain

The city will work with owners who have structures that are substantially damaged or need improvements/repairs. The city will work with the owner to bring the structure into compliance with State and Federal NFIP compliance codes by providing the owner with the necessary codes and monitoring to ensure compliance.

The city of Casa does not have a Community Rating System (CRS) Classification. At this time the city lacks the necessary resources to take part in the CRS.

Houston ID 050257#

The town of Houston is a member of the National Flood Insurance Program, Community Identification Number O50257#. Their initial Flood Hazard Boundary Map was identified 09/19/1975, the Initial Flood Insurance Rate Map identified 07/06/1998, current effective map date 07/06/1998, and Reg-Emergency Date 04/15/1982.

The town of Houston participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program.

The Mayor of Houston is the designated Floodplain Manager. The Floodplain Manager oversees the city's floodplain management program. The Floodplain Manager monitors land use within the city. This includes new construction, substantial alterations to a structure, and changes in the use of a structure or land. If floodplain resources are needed that the town of Houston cannot provide, the Floodplain Manager requests assistance from County. If the County cannot provide the needed assistance they will rely on State/Federal guidelines and resources such as Arkansas Natural Resource Conservation Service (AMRC) and FEMA. ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The town plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The town of Houston and Perry County continues to evaluate structures that are:

- In need of improvements
- Substantially damaged
- Located within the floodplain

The town of Houston will work with owners who have structures that are substantially damaged or need improvements/repairs. The town of Houston will work with the owner to bring the structure into compliance with State and Federal NFIP compliance codes by providing the owner with the necessary codes and monitoring to ensure compliance.

The town of Houston does not have a Community Rating System (CRS) Classification. At this time the town lacks the necessary resources to take part in the CRS.

Perry ID 050276#

The town of Perry is a member of the National Flood Insurance Program, Community Identification Number O50276#. Their initial Flood Hazard Boundary Map was identified 06/27/1975, the Initial Flood Insurance Rate Map identified 07/20/1982, current effective map date 06/20/2000, and Reg-Emergency Date 07/20/1982.

The town of Perry participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program.

The Mayor of Perry is the designated Floodplain Manager. The Floodplain Manager oversees the city's floodplain management program. The Floodplain Manager monitors land use within the city. This includes new construction, substantial alterations to a structure, and changes in the use of a structure or land. If floodplain resources are needed that the town of Perry cannot provide, the Floodplain Manager requests assistance from County. If the County cannot provide the needed assistance they will rely on State/Federal guidelines and resources such as Arkansas Natural Resource Conservation Service (AMRC) and FEMA. ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The town of Perry plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

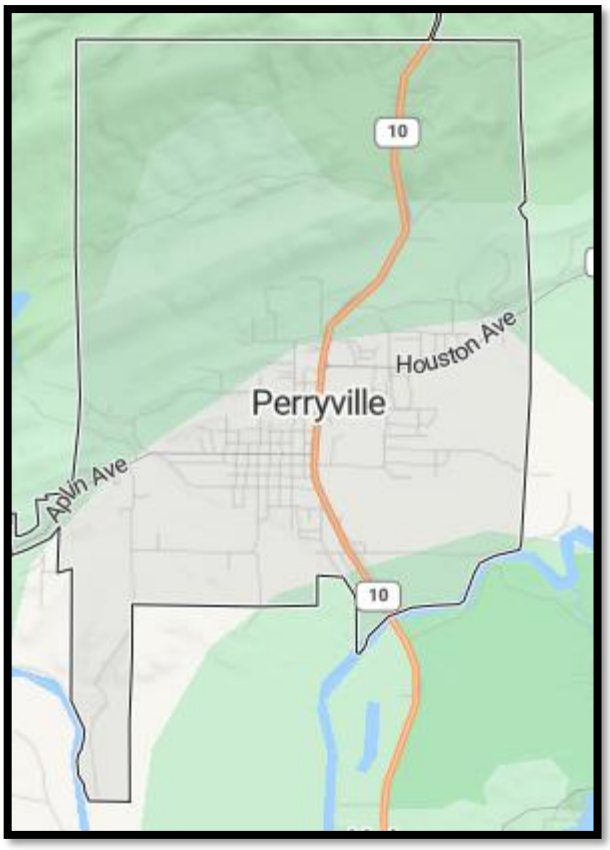
The town of Perry and Perry County continues to evaluate structures that are:

- In need of improvements
- Substantially damaged
- Located within the floodplain

The town of Perry will work with owners who have structures that are substantially damaged or need improvements/repairs. The town of Perry will work with the owner to bring the structure into compliance with State and Federal NFIP compliance codes by providing the owner with the necessary codes and monitoring to ensure compliance.

The town of Perry does not have a Community Rating System (CRS) Classification. At this time the town lacks the necessary resources to take part in the CRS.

Perryville ID 050362#



The City of Perryville is a member of the National Flood Insurance Program, Community Identification Number O50362#. Their initial Flood Hazard Boundary Map was identified 04/18/1975, the Initial Flood Insurance Rate Map identified 04/19/1983, current effective map date 06/20/2000, and Reg-Emergency Date 04/19/1983.

The city of Perryville participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program.

The Mayor of Perryville is the designated Floodplain Manager. The Floodplain Manager oversees the city's floodplain management program. The Floodplain Manager monitors land use within the city. This includes new construction, substantial alterations to a structure, and changes in the use of a structure or land. If floodplain resources are needed that the city of Perryville cannot provide, the Floodplain Manager requests assistance from County. If the County cannot provide the needed assistance they will rely on State/Federal guidelines and resources such as Arkansas Natural Resource Conservation Service (AMRC) and FEMA. ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management

regulations. The city of Perryville plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The city of Perryville and Perry County continues to evaluate structures that are:

- In need of improvements
- Substantially damaged
- Located within the floodplain

The city of Perryville will work with owners who have structures that are substantially damaged or need improvements/repairs. The city of Perryville will work with the owner to bring the structure into compliance with State and Federal NFIP compliance codes by providing the owner with the necessary codes and monitoring to ensure compliance.

The city of Perryville does not have a Community Rating System (CRS) Classification. At this time the city lacks the necessary resources to take part in the CRS.

School Districts: There are two school districts located in the planning area.

East End School district is located at 114 W. Panther Drive in Bigelow. East End School District has both an elementary and high school.

- Anne Watson Elementary School is located at 2768 Highway 60 East in Bigelow.
- Bigelow High School is located at 101 West Panther Drive in Bigelow.

Perryville School District is located at 614 South Fourche Ave in Perryville. Perryville School has both an elementary and a high school.

- Perryville Elementary School is located at 625 North Cedar Street in Perryville
- Perryville High School is located at 325 Houston Avenue in Perryville.

National Flood Insurance Program (NFIP) School Districts are not required to be a member of the NFIP, but they are located in Perry County and the City of members.2.2.2 Fire Districts.

3.3 CAPABILITY ASSESSMENT

Jurisdiction	Planning and Regulatory Capabilities														
	Comprehensive Mater Plan	Capital Improvements	Economic Development Plan	Local Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire	Fire Department ISO Rating	Zoning Ordinance	Subdivision Ordinance	Floodplain Ordinance	Building Codes	Acquisition of land for Open space	BCEGS Score
Perry County				X					X			X			
Adona															
Bigelow		X							X	X					
Casa									X	X					
Houston									X						
Perry									X						
Perryville									X			X			
East End School District	X	X		X	X	X							X		
Perryville School District	X	X		X	X	X							X		

Jurisdiction	Financial Capabilities						
	Fees for water, sewer, gas, or electric services	Capital improvements project funding	Community Development Block Grant	Federal Funding Programs	State Funding Programs	Impact fees for new development	Authority to levy taxes for specific purposes
Perry County	X	X	X	X	X		
Adona							
Bigelow	X		X	X	X		X
Casa							
Houston							
Perry							
Perryville							
East End School District				X	X		
Perryville School District				X	X		

Jurisdiction	Education and Outreach Capabilities					
	n-Profit Organizations for environmental protection, emergency preparedness, or access to assist functional needs populations	Ongoing Public Education Program or information program	Natural Disaster or safety related school programs	Firewise Communities Certification	Public-private partnership initiatives addressing disaster related issues	Storm Ready Certification
Perry County				X		
Adona						
Bigelow						
Casa						
Houston						
Perry						
Perryville						
East End School District		X	X			
Perryville School District		X				

Jurisdiction	Administrative and Technical Capabilities										
	Perry County Local Emergency Planning Committee	Planning Commission	Mutual Aid Agreements	Maintenance Programs to Reduce Risk	Floodplain Administrator	Emergency Manager	Community Planner / Grant Writers	GIS / HAZUS	Warning Systems	Civil Engineer	Hazard Data and Information
Perry County					X	X			X		X
Adona									X		X
Bigelow		X							X		X
Casa									X		X
Houston									X		X
Perry									X		X
Perryville					X				X		X
East End School District		X							X		X
Perryville School District		X							X		X

3.4 Improving Capabilities

Leadership and representatives in all participating jurisdictions are very receptive to mitigation. The Perry County Judge, Perry County OEM, and leadership make mitigation a top priority. Representatives are actively seeking additional funding to improve the readiness and preparedness of their communities. Ways the communities are improving capabilities are:

- Expand upon education and outreach about mitigation activities with an emphasis on underserved populations.
- Work with schools and local jurisdictions to construct saferooms.
- Exploring funding options for flood mitigation.
- Improving roadways and bridges against flooding
- Constructing a County/Community Wildfire Plan

SECTION 4 HAZARD IDENTIFICATION AND RISK ASSESSMENT

4.1 Risk Assessment Overview

This chapter focuses on how the hazards identified in the Planning Area directly and uniquely impact people, the economy, the built environment, and the natural environment.

The risk assessment helps communicate vulnerabilities, develop priorities, and inform decision-making for the hazard mitigation plan and for other emergency management efforts. This plan was completed with hours of input from stakeholders and community members in the Planning Area. The 2023 risk assessment provides the factual basis for developing a mitigation strategy for the Planning Area.

This assessment integrates an assets-based approach with an analysis of individual hazards to provide a deeper understanding of specific hazards and their impact on the Planning Area. An assets-based approach aligns with the most current FEMA guidance, allows communities to identify assets that are critical to their stability and that are most exposed to hazards. For hazard mitigation planning, this approach allows communities to drive mitigation actions more effectively. Beyond the scope of this mitigation plan, results from the risk assessment should be integrated into future emergency management planning, recovery planning, and development efforts.

4.2 Structure of the Risk Assessment

This introductory section includes a brief discussion of previous FEMA disaster declarations, an overview of the hazard assessment process, and a summary risk profile for the Planning Area. The risk profile is driven by an assessment of the hazard's overall significance, combined with a hazard's probability and extent, along with community vulnerabilities to the hazard. The individual risk assessment for each hazard aligns with the same format. They outline a hazard's overall significance from a determination of its specific probabilities, risks, and communities' specific vulnerabilities to them.

4.3 Developing the 2024 Risk Assessment

The 2024 risk assessment updates the risk assessment found in the 2017 Perry County Hazard Mitigation Plan. The update process included reviews of the 2017 Plan, previous events, and the specific vulnerabilities of the planning communities.

Outreach to subject-matter experts, stakeholders, the public and information from the National Risk Index ensured the appropriate elements of each hazard were included and that the best-available data was used for the risk assessment.

4.4 Hazard Risk Profile Overview

The hazard risk profile summarized each hazard's probability, location, extent, vulnerability, and overall significance. FEMA's Local Mitigation Planning Handbook Worksheet 5.1 provided the basis for these classifications, but they were adjusted to better meet the needs of the Planning Area. An overview of these four classifications is provided below.

4.5 Vulnerability and Risk Assessment by Hazard

Vulnerability examines what assets are susceptible to damage from each hazard. Vulnerability is a qualitative estimate based on the Planning Teams desktop research and local expertise from the officials and stakeholders in the Planning Area.

The Planning Team did not use a quantitative metric to describe the vulnerability for each hazard since the vulnerability was not uniform across the Planning Area for all hazards. Instead, the Planning Team used a narrative to describe vulnerability.

The Perry County Hazard Mitigation Plan includes a description or profile, location, and extent of all-natural hazards affecting each jurisdiction. (44 CFR 201.6(c)(2)(i) and 44 CFR 201.6(c)(2)(iii).

Description: the natural hazard affecting the jurisdictions in the planning area.

Location: (Geographic Area Affected) the geographic areas in the planning area affected by the hazard, and when possible, maps to illustrate the location. But for some hazards, such as tornados, the plan states the entire planning area is equally at risk to that hazard.

Extent: (Magnitude/Strength based on historic events or future probability)

Previous Occurrences: hazard events for each jurisdiction (44 CFR 201.6 (c)(2)(i) that have been addressed.

Probability of Future Events: means the likelihood of the hazard occurring in the future and may be defined in terms of general descriptors, historical frequencies, and statistical probabilities. Statistical probabilities often refer to events of a specific size or strength. Hazard likelihood can also be compared using general descriptions or rankings. For the purpose of this plan, we will use the general descriptors to describe the likelihood of hazard events based on historical frequency.

The equation used to estimate probability of future events:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Impact: the consequence or effect of the hazard on the community and its assets. Impacts will be described by referencing historical disaster impacts and/or an estimate of potential future losses, such as percent damage of total exposure.

Vulnerability of Estimating Potential Loss: identifies structures, systems, populations, or other community assets as defined by the community susceptible to damage and loss from hazard events. It is a list of key issues or problem statements that clearly describe the community's greatest vulnerabilities and will be addressed in the mitigation strategy.

Repetitive Loss Properties and Severe Repetitive Loss Properties: addresses NFIP insured structures describing the types (residential, commercial, institutional, etc.) and estimates the number of repetitive loss properties located in the identified flood hazard areas. (44 CFR 201.6(c)(2)(ii)

Methodology used in Estimating Potential Loss

The methodology used in this plan for the potential loss estimate was developed by using past hazard events data from The National Climatic Data Center (NCDC) Storm Events Database.

If we were unable to obtain information of a certain type of past hazard event, we did not estimate a potential loss due to the lack of information.

Natural Hazards Affecting the Planning Area

This mitigation plan addresses the natural hazards affecting the planning area. The hazards of concern are dam failure, drought, earthquake, extreme heat, flooding, landslides, thunderstorms, tornadoes, wildfire, and winter storms. Expansive soils are not addressed in this plan since they are not an issue/threat to the planning area.

4.6 Disaster Declaration History

The Planning Area has been a recipient to 18 disaster declarations from 2000-2023. Since the adoption of the Perry County Hazard Mitigation Plan in 2017, there have been 5 disaster declarations in the Planning Area. The table below is a list of disaster declarations from 2000-2023. For more information on the data in the table below please go to Disaster Declarations for States and Counties | FEMA.gov.

Disaster Declaration	Date	Incident Description
3159	12/28/2000	Severe Ice Storm
1354	12/29/2000	Severe Ice Storm
1472	06/06/2003	Severe Storm
3215	09/02/2005	Hurricane
1751	03/26/2008	Severe Storm
1793	09/18/2008	Hurricane
3301	01/28/2009	Severe Ice Storm
1845	06/16/2009	Severe Storm
1975	05/02/2011	Severe Storm
4100	01/29/2013	Severe Ice Storm
4226	06/26/2015	Severe Storm
4254	02/05/2016	Severe Storm
4318	06/15/2017	Severe Storm
3414	05/30/2019	Flood
4441	06/08/2019	Flood
3461	03/13/2020	Biological
4518	04/03/2020	Biological
3541	08/27/2020	Hurricane

4.7 Hazard Classification and Identification

Classification

The planning team considered a full range of hazards that could affect the area for the 2024 Perry County Hazard Mitigation Plan. FEMA and the Department of Homeland Security generally organize threats and hazards into three categories:

- Natural
- Technological/accidental (dam incident)
- Human-induced/intentional

This plan will address hazards that can be categorized as natural or technological/accidental. Although this plan recognizes the potential threat caused by human-induced/intentional threats, these considerations are outside the scope of this mitigation plan. Natural or technological hazards that have posed a historical threat or a probable future threat were addressed because they FMEA's

hazard mitigation requirements. These assessed hazards were derived from the State Hazard Mitigation Plan and from the 2017 Perry County Hazard Mitigation Plan. The planning team, stakeholders, and the public participated in meetings and hazard questionnaires that were designed to discuss each hazard as it relates to the Planning Area.

Identification

Hazard identification is the process of identifying hazards threatening a given area. It is the first step in the risk assessment process. The planning team identified several natural hazards posing a threat to the Planning Area warranting a complete profile in this hazard mitigation plan.

The following hazards were identified from historical information provided by planning team members, newspapers, review of plans, reports, internet research, the State Mitigation Plan, FEMA publication "Multi-Hazard Identification and Risk Assessment", and information provided by FEMA and ADEM.

Hazards	Hazard Events
Dam/Levee Failure	There have been no dam/levee failures in Perry County
Drought	16 events reported from 2000-2023
Earthquake	7 events reported from 2000-2023
Extreme Heat	2 extreme Heat events and 9 Heat events from 2000-2023
Flood / Flash Floods/Heavy Rain	28 Flood events/ 75 Flash Flood events, 8 Heavy Rain events from 2000-2023
Hailstorm	59 events from 2000-2023
Landslide	1 event (2009) from 2000-2023
Lightning	0 events from 2000-2023
Strong Winds	8 events from 2000-2023
Thunderstorm Wind	97 events reported from 2000-2023
Tornado	11 events from 2000-2023
Wildfire	4 events reported from 2000-2023
Winter Storm / Winter Weather/ Ice Storm/Frost/Freeze/Heavy Snow	17 Winter Storm events, 33 Winter Weather events, 4 Ice storm events, 5 Frost/Freeze events and 4 Heavy Snow events from 2000-2023

https://www.ncdc.noaa.gov/stormevents/

4.8 Natural Hazards Affecting Perry County

This mitigation plan addresses the natural hazards affecting the planning area. The hazards of concern are dam failure, drought, extreme heat, earthquake, flooding, landslides, thunderstorms, tornadoes, wildfire, and winter storms. Expansive soils are not addressed in this plan since they are not an issue/threat to the planning area.

4.8.1 Dam

Dam failure: A dam failure is the collapse, breach or other failure resulting in downstream flooding. A dam impounds water in the upstream area, referred to the reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure:

1. Amount of water impounded
2. Density, type, and value of development and infrastructure located downstream

The Arkansas Natural Resource Commission (ANRC) provides comprehensive regulation and supervision of dams. The link may be used to reference the ANRC Rules Governing Design and Operation of Dams Title 7. TITLE VII (arkansas.gov)

Low Risk Dams that are private, county, or state-owned dams not presenting a danger to individuals, structures, residential housing, county roads or state highways will not be addressed in this plan.

Extent, Magnitude or Severity of Dam Failure: Currently, no studies are available for the dams to determine the extent of dam failure in the Planning Area. The need to conduct flood inundation studies for high and significant risk hazard dams will be addressed in this plan as a mitigation action.

Possible Impact of Climate Change: The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding would have minimal impact on dam failure but will be noted for continued research on nature-based solutions to mitigate all possibilities of potential increased impact.

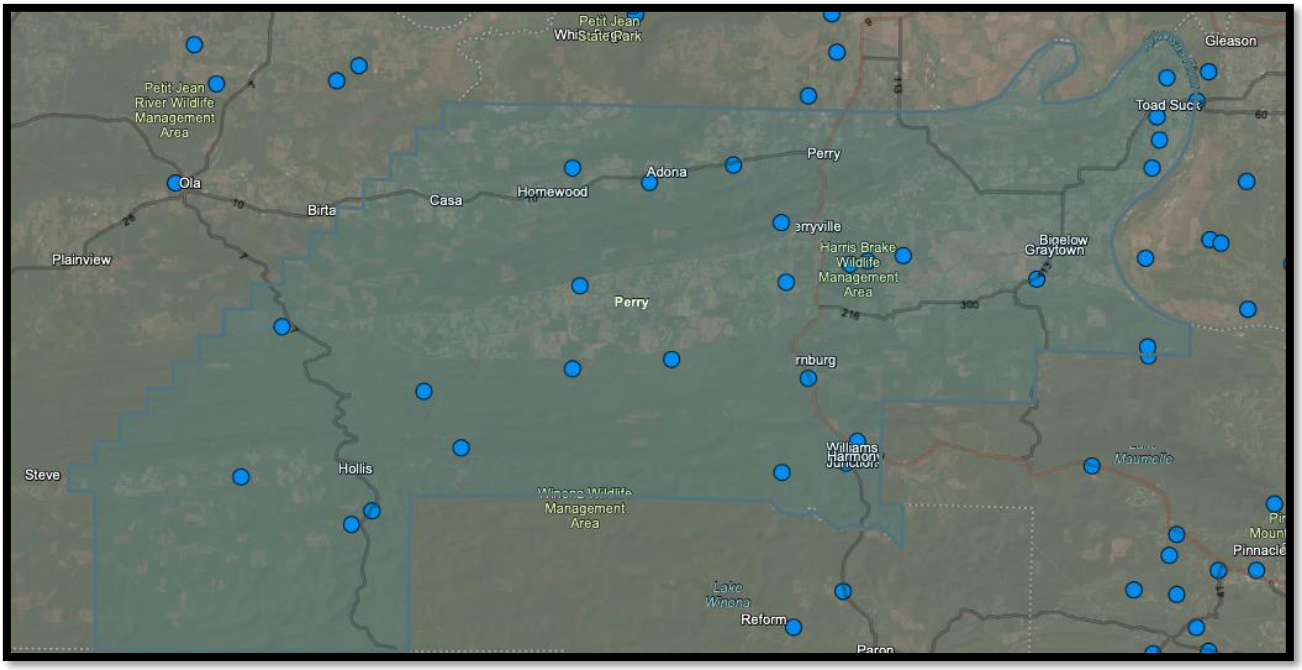
Possible Impact of Population Change: Changes in population pose a threat to dams and dam failure. Population growth and urbanization change the landscape of the area. This results in loss/addition of natural landscaping such as trees, grass, and rock. Building structure influence climate and the natural path of water flow. Population growth will have an impact on the number

of resources used. Adjustments for population growth impacts wildlife. Population growth increases the chances of loss of life if dam failure were to occur.

Previous Occurrences: There have been no previous occurrences of dam failure in the Planning Area. However, there is always a possibility that a dam failure could occur. There is less than 1 percent chance that a dam failure will occur in any given year.

Each dam will be described separately with their corresponding location, impact, and overall summary of vulnerability due to the uniqueness of each dam and location.

Dams located in the Planning Area



National Inventory of Dams (army.mil)

Dam	ANRC Hazard Classification	EAP	Data Deficiency	Probability of Future Events
Nimrod Dam	High	Yes	Yes	Very Low
South Fourche LaFave Wid Site 7	High	Yes	Yes	Unlikely
John Bentley Dam	High	Yes	Yes	Unlikely
Harris Brake Dam	High	Yes	Yes	Unlikely
Deltic Farms Lake Dam	High	No	Yes	Unlikely
Harris Brake Auxiliary Dam	High	No	Yes	Unlikely
South Fourche LaFave Wid Site 3	Significant	No	Yes	Unlikely
Narrow Creek	Significant	No	Yes	Unlikely
Lake Campbell Dam	Significant	No	Yes	Unlikely
Lake Sharon Dam	Significant	No	Yes	Unlikely
Womack Lake Dam	Significant	No	Yes	Unlikely
Ouachita Creek Wid Site 3	Significant	No	Yes	Unlikely
South Fourche LaFave Wid Site 5	Low	No	Yes	Unlikely
South Fourche LaFave Wid Site 4	Low	No	Yes	Unlikely
South Fourche LaFave Wid Site 6	Low	No	Yes	Unlikely
South Fourche LaFave Wid Site 1	Low	No	Yes	Unlikely
South Fourche LaFave Wid Site 8	Low	No	Yes	Unlikely
Darbys Pond Dam	Low	No	Yes	Unlikely
Clear Water Lake Dam	Low	No	Yes	Unlikely
Willenburg Lake Dam	Low	No	Yes	Unlikely
Ouachita Creek Wid Site 1	Low	No	Yes	Unlikely
Ouachita Creek Wid Site 2	Low	No	Yes	Unlikely
Van Dalsen Lake Dam	Low	No	Yes	Unlikely
Francis Lake Dam	Low	No	Yes	Unlikely
Jones Lake Dam No 2	Low	No	Yes	Unlikely
Big Fish Pond Dam	Low	No	Yes	Unlikely
South Fourche LaFave Wid Site 2	Low	No	Yes	Unlikely

Nimrod Dam: Lat: 34.952015353, Long: -93.160435107

NPDP ID : AR00158, High Hazard Dam

Breach Non Breach

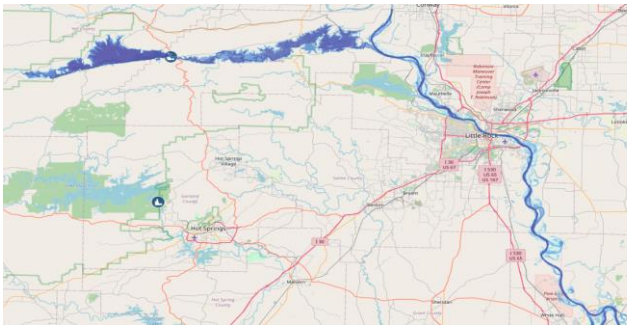
https://nid.sec.usace.army.mil/#/dams/system/AR00158/inspections

Maps below may be viewed at https://nid.sec.usace.army.mil/viewer

HP Breach

HP Non-Breach

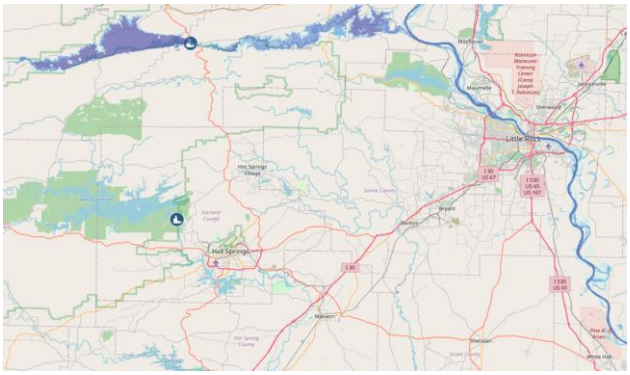
IH Breach



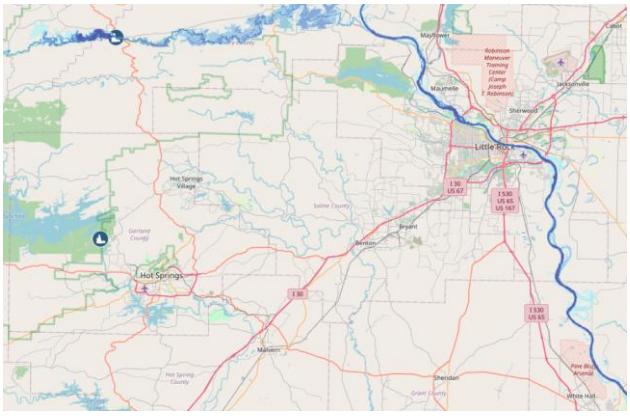
IH Non-Breach

MH Breach

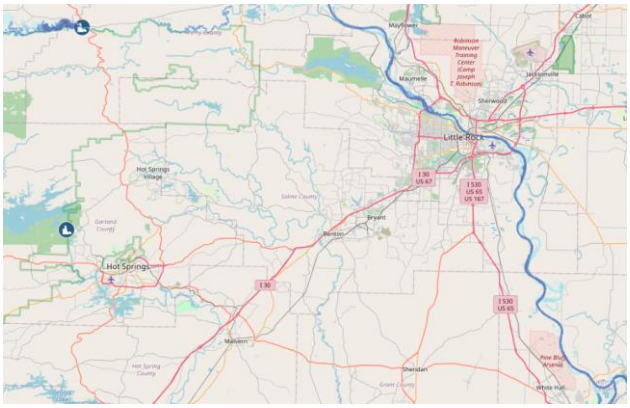
MH Non-Breach



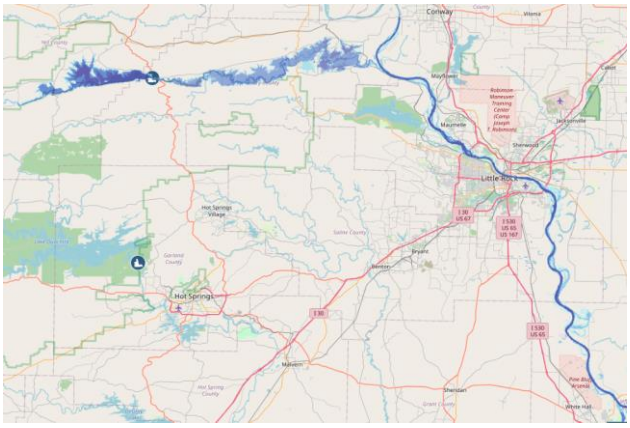
NP Breach

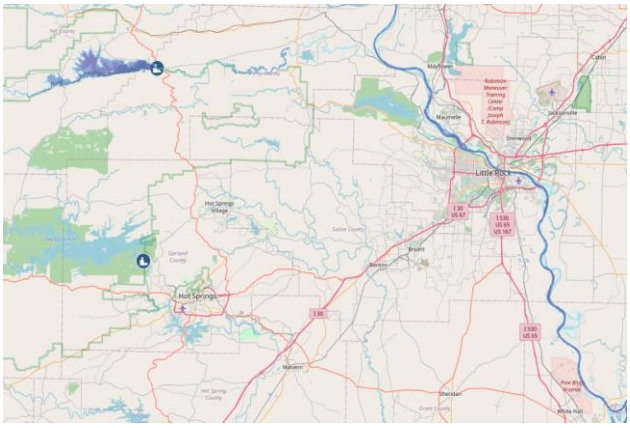


NP Non-Breach

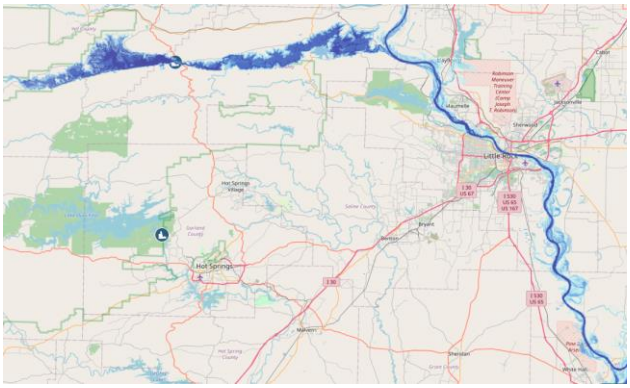


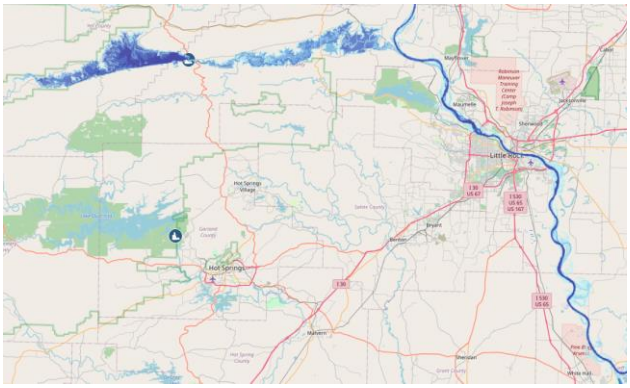
TAS Breach TAS Non-Breach





Total Breach Non-Breach





Nimrod Dam is located on the Fourche LaFave River. Nimrod Dam is a federally owned dam. It is owned by the United States Army Corp of Engineers (USACE). The dam was constructed in 1942 and is used for flood risk reduction, recreation, and water supply. The community of Perryville is the nearest community. It has a dam height of 103 feet and is 1,012 feet long. It is of concrete/gravity construction. It has a normal surface area of 3,550 acres. Maximum discharge is 49,000 cubic feet per second. Its maximum capacity is 336,000-acre feet. Normal storage is 29,000-acre feet. The drain area is 680 square miles.

Nimrod Dam was last inspected on 02/15/2021. It is inspected every 5 years.

The data provided on the National Inventory of Dams for Nimrod Dam was last updated 03/28/2024.

Risk Assessment

The National inventory of Dams has provided a risk assessment for Nimrod Dam. This information is not provided uniformly for all dams listed in the National Inventory of Dams and information is continually updated. You can find the full the risk assessment at https://nid.sec.usace.army.mil/#/dams/system/AR00158/risk.

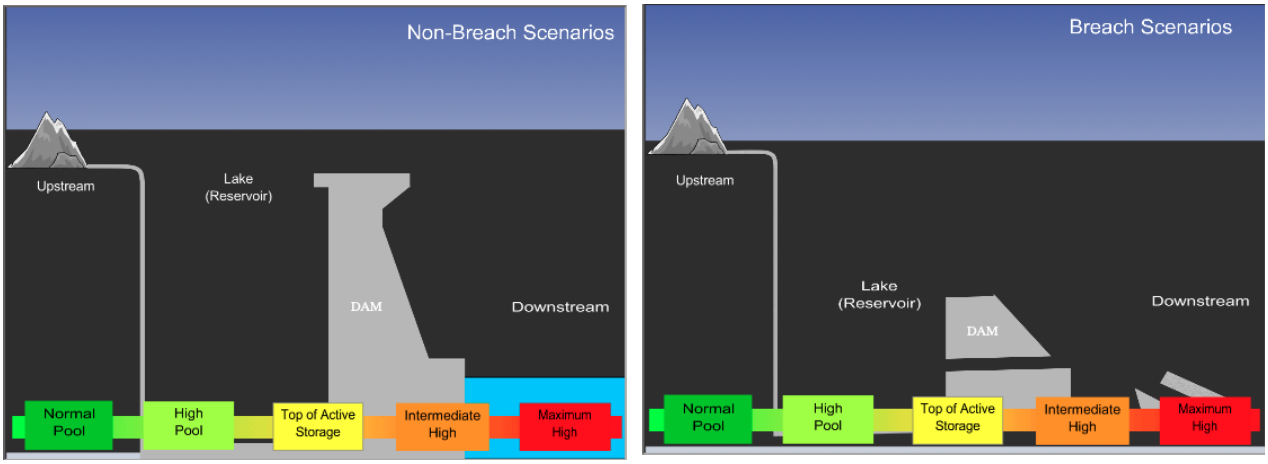
Date: 05/24/2022

Risk Assessment: Very Low (5)

Dams do not eliminate all risk of flooding. Water may be released through the dam to manage water levels up or downstream. Water may also be released to relieve pressure on a dam, so it maintains its structural integrity. Severe weather events that bring in large amounts of water into a system may lead to a dam release or some cases overwhelm the dam.

The USACE manages dam related flood risks by continually monitoring the condition and health of the dam, and working closely with emergency managers to share what is known about the dam to support the development of local emergency and evacuation plans.

Breach versus Non-Breach Scenarios



The image above shows scenarios that are either non-breach or breach. In non-breach scenarios the dam is operating as designed. In the breach scenarios the continuity of the structure has been compromised, resulting in uncontrolled water releases, exceeding the magnitude of release in the equivalent non-breach scenario.

Consequence Estimate

Scenario/ Type	Pool Elevation	Daytime People at Risk	Nighttime People at Risk	Buildings at Risk
Max High Pool-Breach	406.1	1,549	2,343	1,422
Max High Pool- Non-Breach	406.1	629	827	527
Intermediate High Pool-Breach	394.7	860	1,470	892
Intermediate High Pool-Non-Breach	394.7	223	429	276
Top of Active Storage Pool-Breach	373.1	86	177	94
Top of Active Storage Pool-Non-Breach	373.1	0	0	0
Normal High Pool (10% EDP)-Breach	357.4	24	54	26
Normal High Pool (10% EDP)-Non-Breach	357.4	0	0	0
Security Scenario Pool (1% EDP)-Breach	372	75	155	85
Security Scenario Pool (1% EDP)-Non-Breach	372	0	0	0

Impact and Vulnerability

In the event of dam failure, the estimated inundation area is circled in blue or indicated on the designated breach maps above.

Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The Consequence Estimate table above provides statistics for multiple scenarios/ breaches that are possible for Nimrod Dam. A maximum high breach of Nimrod Dam could impact an estimated 2,343 people. Minor to severe damage could occur to people, wildlife, structures and the natural environment. The city of Perryville is about 21 miles downstream from Nimrod Dam. The city of Plainview is about 9 miles southwest of Nimrod Dam. The communities of Cherry Hill, Aplin, Pleasant Grove and Bigelow would also be impacted. Highway 300, Highway 60, Highway 216 and Highway 113 would be impacted. Anyone traveling these highways would be injured or killed. Even though the area is mostly rural a breach of Nimrod Dam would damage or destroy homes, farms, farmland, wildlife, and loss of life is expected. To date there has never been a dam failure for Nimrod Dam.

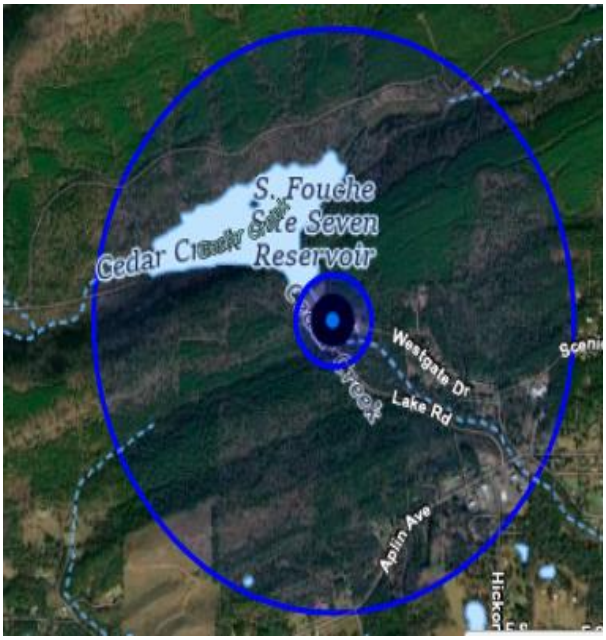
Extent, Magnitude, or Severity of Dam Failure

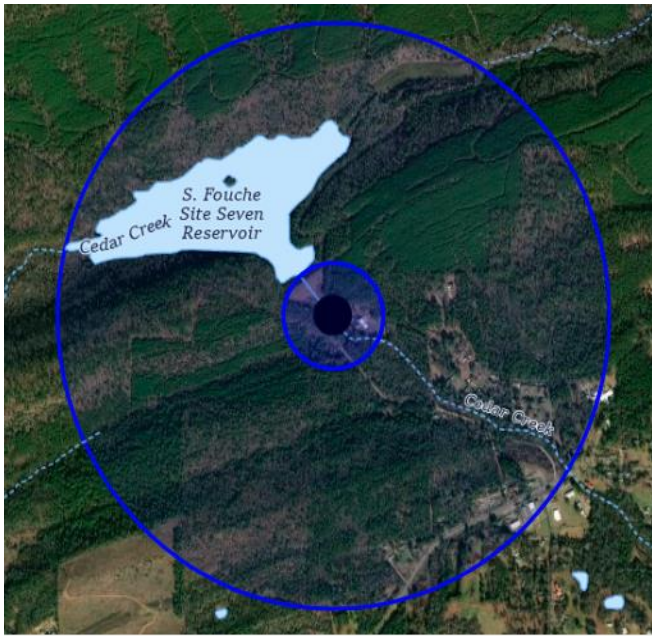
This dam does have an EAP. The EAP was last revised on 06/06/2023. The last EAP exercise date was 07/28/2023. The EAP meets FEMA guidelines, and the emergency contacts were updated on 2/28/2022. Inundation maps have been provided along with links for further study in the above content. There is not an inundation study provided that documents the extent, magnitude or severity to areas that would be inundated due to a failure of Nimrod Dam. However, the Consequence Table Study (https://nid.sec.usace.army.mil/#/dams/system/AR00158/risk) provides partial information for extent. According to Association of Dam Safety, Dams Incident Database (https://damsafety.org/incidents) there have been no breaches for Nimrod Dam.

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

South Fourche LaFave Wid Site 7: Lat: 35.00972222, Long: -92.82166667,

NPDP ID : AR01196, High Risk Hazard.

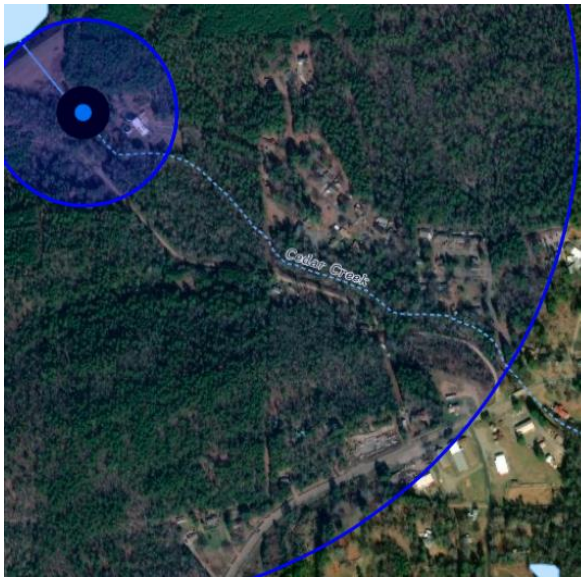




South Fourche Lafave Wid Site 7 is a local government dam owned by the City of Perryville. The dam was constructed in 1978 and is used for flood risk reduction and water supply. It is located in Perryville on Cedar Creek. It has a dam height of 84.6 feet and is 566 feet long. It is of earthen construction. It has a normal surface area of 52 acres. Maximum discharge is 1,170 cubic feet per second. Its maximum capacity is 3,500-acre feet. Normal storage is 750-acre feet. The drain area is 3.4 square miles.

Impact and Vulnerability

Highlight of residential area potentially impacted by dam failure.



https://nid.sec.usace.army.mil/#/dams/system/AR01196/structure

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

Minor to severe damage could occur in the city of Perryville and Hollis. Pedestrians and motorists on Trail 86, Highway 7, and Hwy 324 could be injured or killed. Highway 7 is an extensive and highly used Highway. Even though the area is mostly rural, in the event of a dam failure timberland, agricultural land, farms, homes, automobiles, wildlife, roads, and people may be injured, damaged, or destroyed. There are no critical facilities in the inundation area. Loss of life is possible.

Extent, Magnitude, or Severity of Dam Failure

This dam does have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

John Bentley Dam: Lat: 34.87638889, Long: -92.77777778,

NPDP ID : AR01532, High Risk Hazard.

John Bentley Dam is a privately owned dam. It is owned by John Bentley. The dam was constructed in 1999 and is used for recreational purposes. It is located in Perry County and lies on the Maumelle River Tributary. It has a dam height of 29 feet and is 1,700 feet long. It is of earthen construction. It has a normal surface area of 14 acres. Maximum discharge is 1,825 cubic feet per

second. Its maximum capacity is 75-acre feet. Normal storage is 59-acre feet. The drain area is 0.11 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The inundated area contains a minimal number of residential structures. The area of most impact would be along the road of Shady, Sunny Lane and Williams Junction Community. Pedestrians, people in automobiles driving on some of the rural areas of Highway 9 could be injured or killed. In the event of a dam failure residential structures, privately owned land, roads, timberland, wildlife, and people may be damaged, or destroyed. Loss of life could be expected.

Extent, Magnitude, or Severity of Dam Failure

This dam does have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Harris Brake Dam: Lat: 34.98666667, Long: -92.775,

NPDP ID : AR00833, High Risk Hazard.

Harris Brake Dam is a State-owned dam, It is owned by the Arkansas Game and Fish Commission. The dam was constructed in 1954 and is used for recreational purposes. It has a dam height of 25 feet and is 3,200 feet long. It is of earthen construction. It has a normal surface area of 1,240 acres.

Maximum discharge is 15,400 cubic feet per second. Its maximum capacity is 16,576-acre feet. Normal storage is8,267-acre feet. The drain area is 10.6 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The cities of Perryville, Houston, and Bigelow would be impacted should Harris Brake Dam fail. Pedestrians and motorists on Highway 300, Highway 287, Highway 216, Highway 113, and Highway 60, Snake Hill Road, Levee Road, Strickland Lane, and Holiday Road could be injured or killed. Most of the impacted area is very rural. Timberland, private land, homes, wildlife, and the environment could be damaged or destroyed. Loss of life could be expected.

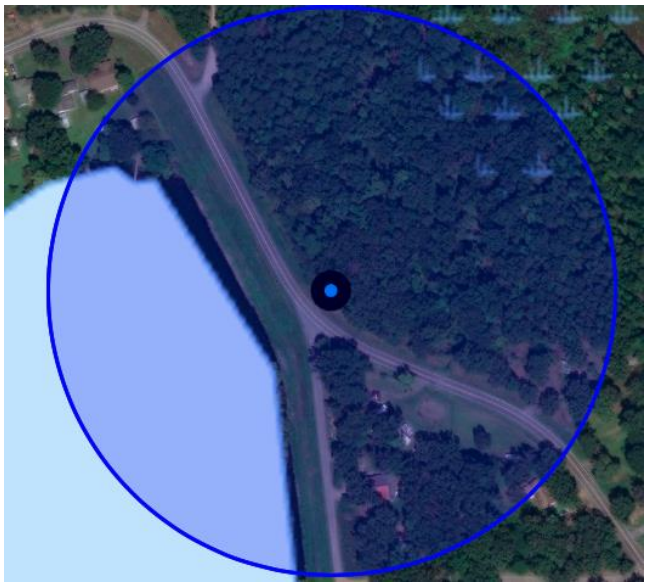
Extent, Magnitude, or Severity of Dam Failure

This dam does have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Harris Brake Auxiliary Dam: Lat: 34.98833333, Long: -92.76305556

NPDP ID : AR01191, High Risk Hazard.



Harris Brake Auxiliary Dam is a State owned dam, owned by the Arkansas Game and Fish Commission. The dam was constructed in 1955 and is used for recreational purposes. Harris Brake Auxiliary Dam lies on Coffee Creek. It has a dam height of 12 feet and is 1,596 feet long. It is of earthen construction. It has a normal surface area of 1,240 acres. Maximum discharge is 15,400 cubic feet per second. Its maximum capacity is 16,576-acre feet. Normal storage is 8,267-acre feet. The drain area is 10.64 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The cities of Perryville, Houston, and Bigelow would be impacted should Harris Brake Auxiliary Dam fail. Pedestrians and motorists on Highway 300, Highway 287, Highway 216, Highway 113, and Highway 60, Snake Hill Road, Levee Road, Strickland Lane, and Holiday Road could be injured or killed. Most of the impacted area is very rural. Timberland, private land, homes, wildlife, and the environment could be damaged or destroyed. Loss of life could be expected.

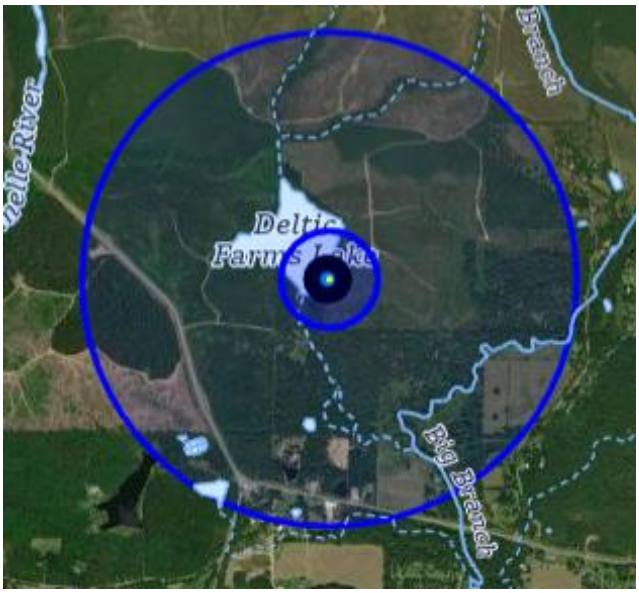
Extent, Magnitude, or Severity of Dam Failure

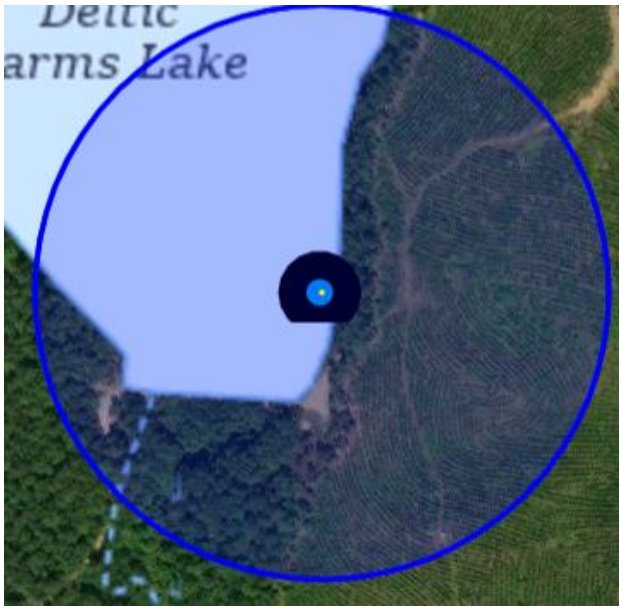
This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Deltic Farms Dam: **Lat: 34.88833333, Long: -92.77**

NPDP ID: AR00834, High Risk Hazard





Deltic Farms Lake Dam is a privately owned dam. It is owned by Deltic Farm Timber Company. The dam was constructed in 1966 and is used for recreational purposes. It is located around Williams Junction. The Dam sits on the Big Branch-TR. It has a dam height of 25 feet and is 440 feet long. It is an earthen type dam. It has a normal surface area of 18 acres. Maximum discharge is

3,243 cubic feet per second. Its maximum capacity is 204-acre feet. Normal storage is 124-acre feet. The drain area is 0.65 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The inundated area contains a minimal number of residential structures. The area of most impact would be along Highway 9 and Highway 10. Travelers on these roads may be injured or killed. The community of Williams Junction would also be impacted. The areas impacted are mostly rural. However, they can expect timberland, private land, residential structures, and roads to be damaged or destroyed. There could be loss of life for both people and wildlife in the area.

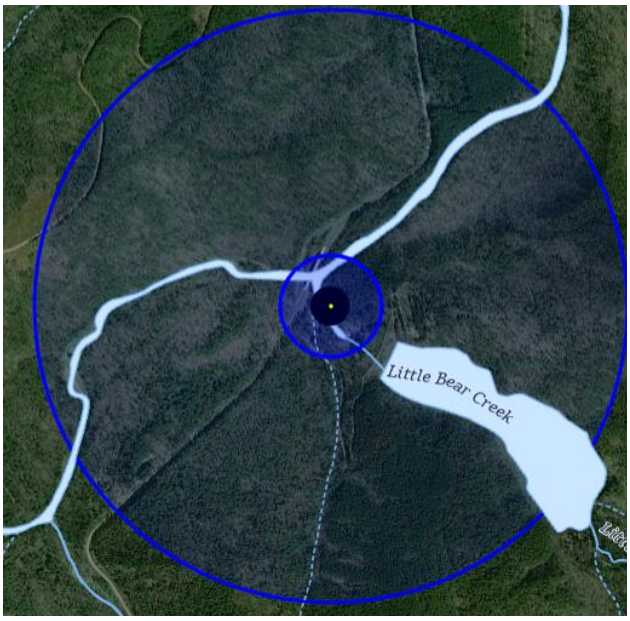
Extent, Magnitude, or Severity of Dam Failure

This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

South Fourche LaFave Wid Site 3: Lat: 34.84972222, Long: -93.09944444

NPDP ID: AR00348, Significant Risk Hazard



South Fourche LaFave Wid Site 3 is a local government owned dam. It is owned by Fourche LaFave Watershed Improvement District. The dam was constructed in 1981 and is used for flood risk reduction. It is located on Little Bear Creek. It has a dam height of 105 feet and is 1,175 feet long. It is an earthen type dam. It has a normal surface area of 36 acres. Maximum discharge is

20,900 cubic feet per second. Its maximum capacity is 6,415-acre feet. Normal storage is 551-acre feet. The drain area is 7.7 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in yellow on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The area of most impact would be the communities of Hollis and Nimrod. Travelers on Highway 324 and Highway 7 could be injured or killed. Though most of the inundated area is rural, a dam failure could result in the damage or destruction of timberland, private land, roads, residential structures, and automobiles. People and wildlife could be injured or killed.

Extent, Magnitude, or Severity of Dam Failure

This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Narrow Creek Dam: Lat: 35.129, Long: -92.92055556,

NPDP ID: AR00840, Significant Risk Hazard

Narrow Creek Dam is a Federally owned dam. It is owned by The United States Department of Agriculture Forestry Services. The dam was constructed in 1938 and is used for recreational purposes, as well as a fish and wildlife pond. It is located 4 miles from the community of Williams Junction. It lies on Narrows Creek. It has a dam height of 37 feet and is 100 feet long. It is a concrete arch dam. It has a normal surface area of 21 acres. Maximum discharge information is not available on the National Inventory of Dams. Its maximum capacity is 261-acre feet. Normal storage is 261-acre feet. Drain area information is not available on the National Inventory of Dams.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The community of Williams Junction and rural areas of Highway 9 are the areas most impacted in the event of a dam failure. Travelers on Highway 9 may be injured or killed. Though most of the area impacted is rural, timberland, private property, residential structures, automobiles, and roads may be damaged or destroyed. Wildlife and people may be injured or killed.

Extent, Magnitude, or Severity of Dam Failure

This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Lake Campbell Dam: Lat: 34.94083333, Long: -92.57305556

NPDP ID: AR00839, Significant Risk Hazard

Lake Campbell Dam is a privately owned dam. It is owned by Falcon Creek Farms Inc. The dam was constructed in 1965 and is used for recreational purposes. Lake Campbell dam lies on the Arkansas River TR. It has a dam height of 31 feet and is 700 feet long. It is an earthen dam. It has a

normal surface area of 10 acres. Maximum discharge is 1,342 cubic feet per second. Its maximum capacity is 182-acre feet. Normal storage is 80-acre feet. The drain area is 0.6 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The community to receive the most impact should Lake Campbell Dam fail is the community of Wye. Travelers on Ross Hollow Road may be injured or killed. Though most of the inundated area is rural, dam failure could result in damage or destruction of timberland, private property, roads, and residential structures. Wildlife and people may be injured or killed.

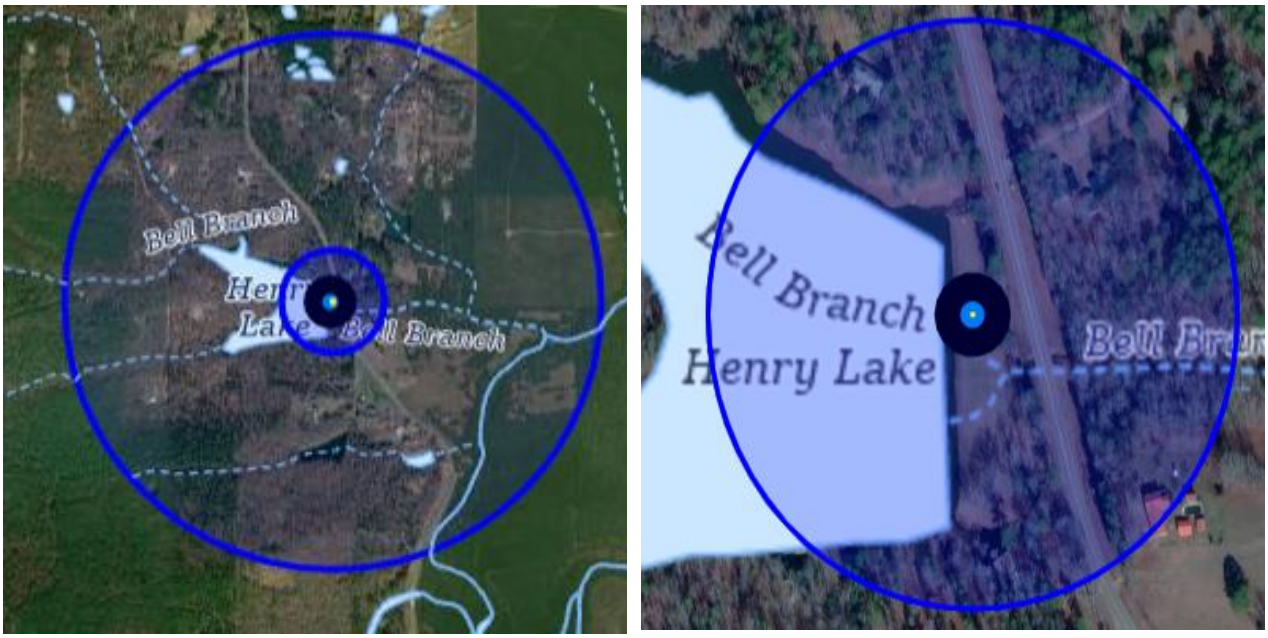
Extent, Magnitude, or Severity of Dam Failure

This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Lake Sharon Dam: Lat: 35.125387049, Long: -92.787426212,

NPDP ID: AR00165, Significant Risk Hazard



Arthur V. Ormond Lock and Dam is federally owned by the United States Army Corps of Engineers. The dam was constructed in 1969 and is used for navigation, hydroelectric and recreational purposes. It is located in the city of Morrilton. It has a dam height of 28 feet and is 1,850 feet long. It is of concrete/gravity construction. It has a normal surface area of 5,660 acres. Maximum discharge is 518,000 cubic feet per second. Its maximum capacity is 70,400-acre feet. Normal storage is 48,800-acre feet. The drain area is 154,949 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

Impact would be most felt by the communities of Thronbury and Williams Junction. Travelers on Highway 10 and Highway 9 may be injured or killed. Though most of the inundated area is rural, a dam failure could damage or destroy timberland, pastureland, farms, residential structures, automobiles, and roads. Wildlife and people may be injured or killed.

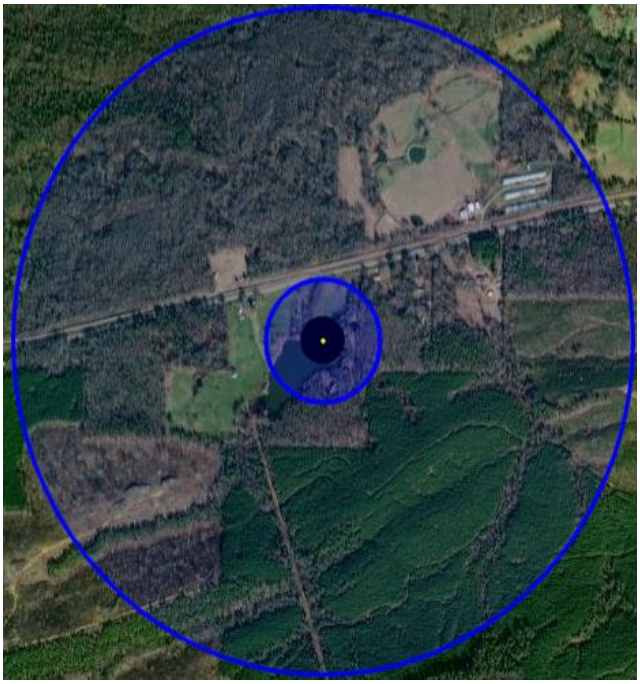
Extent, Magnitude, or Severity of Dam Failure

This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Womack Lake Dam: Lat: 35.04166667, Long: -92.85416667

NPDP ID: AR00823, Significant Risk Hazard



Womack Lake Dam is a private owned dam. It is owned by Linda Thomas. The dam was constructed in 1960 and is used for recreational purposes. It is located near the city of Perry. It has a dam height of 21 feet and is 500 feet long. It is of earthen construction. Normal surface area is not available on the National Inventory of Dams. Maximum discharge is 1,322 cubic ft per second. Its maximum

capacity is 69-acre feet. Normal storage is 30-acre feet. The drain area information is not available on the National Inventory of Dams.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The city of Perry would be impacted in the event of a dam failure. Travelers on Highway 9 and Highway 10 could be injured or killed. Though most of the inundated area is rural, the pictures above show some of the structures that may be damaged or destroyed. Timberland, farmland, private property, farms, chicken houses, residential structures, and roads may be damaged or destroyed. Wildlife and people may be injured or killed.

Extent, Magnitude, or Severity of Dam Failure

This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

Ouachita Creek Dam: Lat: 35.06833333, Long: -92.56666667

NPDP ID: AR00828, Significant Risk Hazard

Ouachita Creek Wid Site 3 Dam is owned by the local government. It is owned by the Ouachita Creek Watershed Improvement District. The dam was constructed in 1966 and is used for flood risk reduction. It is located on the Ouachita Creek TR. It has a dam height of 19 feet and is 1,268 feet long. It is of earthen construction. Normal surface area data is not provided on the National

Inventory of Dams. Its maximum capacity is 400-acre feet. Normal storage data is not available on the National Inventory of Dams. Maximum discharge is 1,200 cubic ft/second. It has a drain area of 7.7 square miles.

Impact and Vulnerability

In the event of dam failure, the inundation area outlined in blue on the map above is an estimate of the area impacted. Dam failure can range from spillover up to a catastrophic breach. Spillover could cause damage or destruction of property. A complete breach would threaten loss of life to people and animals, as well as destruction of property and the environment.

The community of Toad Suck would be the most impacted community. Travelers on Highway 60 could be injured or killed. Though most of the inundated area is rural, the pictures above provide examples of some of the structures that could be damaged or destroyed. Timberland, farms, private property, chicken houses, residential structures, automobiles, and roads may be damaged or destroyed. Wildlife and people may be injured or killed.

Extent, Magnitude, or Severity of Dam Failure

This dam does not have an EAP. There have not been any inundation studies documented to determine the extent of dam failure. According to Association of Dam Safety Dams Incident Database there have been no breaches (https://damsafety.org/incidents).

Over the next five years the Planning Team should research and document natural based mitigation projects for dam failure.

4.8.2 Drought

A drought is a period of unusually dry weather that persists long enough to cause serious deficiencies in water supply (surface or underground). Drought conditions can mean different things in different regions. Normally a drought conditions are defined depending on the average amount of precipitation that an area is accustomed to receiving.

Determining the start of a drought can be tricky as there is no sudden and dramatic onset of this natural hazard unlike tornadoes, earthquakes, and hurricanes. Droughts are more of a slow onset hazard. It can take weeks or years for the full effects of long-term inadequate rainfall to become apparent. However, over time they can severely affect crops, municipal water supplies, recreation resources and wildlife. If drought conditions extend over a number of years, the direct and indirect economic, social, vegetative, wildlife and climate impacts can be significant. In addition, human actions and demands for water resources can accelerate drought-related impacts. There can be a cascading effect as high temperatures, high winds, and low humidity occurring in drought conditions may make areas more susceptible to wildfire.

The end of a drought is also difficult to determine. A single rainstorm will provide short term relief from a drought, but it may take weeks or months before levels of precipitation return to normal.

The United States Droughty Monitor (USDM) differentiates between short-term and long-term drought. Short-term drought can have impacts on agriculture and grasslands, and the drought classification can rapidly change. Long-term drought, in contrast, has deeper impacts on hydrology and ecology and can persist even with short-term gains in precipitation (Drought Classification | U.S. Drought Monitor (unl.edu)).

- S = Short-term, typically less than 6 months (agriculture, grasslands)
- L = Long-term, typically more than 6 months (hydrology, ecology)
- SL = Area contains both short- and long-term impacts

Locations Affected by Drought

The entire Planning Area is equally susceptible to experiencing a drought. There is no defined geographic hazard boundary.

Extent, Magnitude or Severity of Drought

The entire Planning Area could experience a drought that is rated between a D0 and D2 in any given year.

Drought Severity Classification								
RANGES								
Category	Description	Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Percent of Normal Precipitation	Standardized Precipitation Index (SPI)	Satellite Vegetation Health 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	21-30	21-30	<75% for 3 months	-0.5 to -0.7	36-45
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	-2.0 to -2.9	11-20	11-20	<70% for 3 months	-0.8 to -1.2	26-35
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10	6-10	<65% for 6 months	-1.3 to -1.5	16-25
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions	-4.0 to -4.9	3-5	3-5	<60% for 6 months	-1.6 to -1.9	6-15
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	0-2	0-2	<65% for 12 months	-2.0 or less	1-5

Drought Classifications (weather.gov)

Previous Occurrences

There have been 16 past occurrences of drought in the Planning area in the years of 2000-2023.

NOAA Storms Database for Drought

Number of County/Zone areas affected:	1
Number of Days with Event:	16
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	09/08/2000	18:00	CST	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	12/07/2010	06:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	01/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	02/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	03/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	04/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	08/02/2011	06:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	06/19/2012	06:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	07/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	08/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	09/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	10/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	11/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	12/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	01/01/2013	00:00	CST-6	Drought		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	11/07/2017	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

September 8, 2000, the Governor of Arkansas asked that all 75 counties in Arkansas be declared agricultural disasters areas. Dry foliage and dead grass led to numerous grass fires.

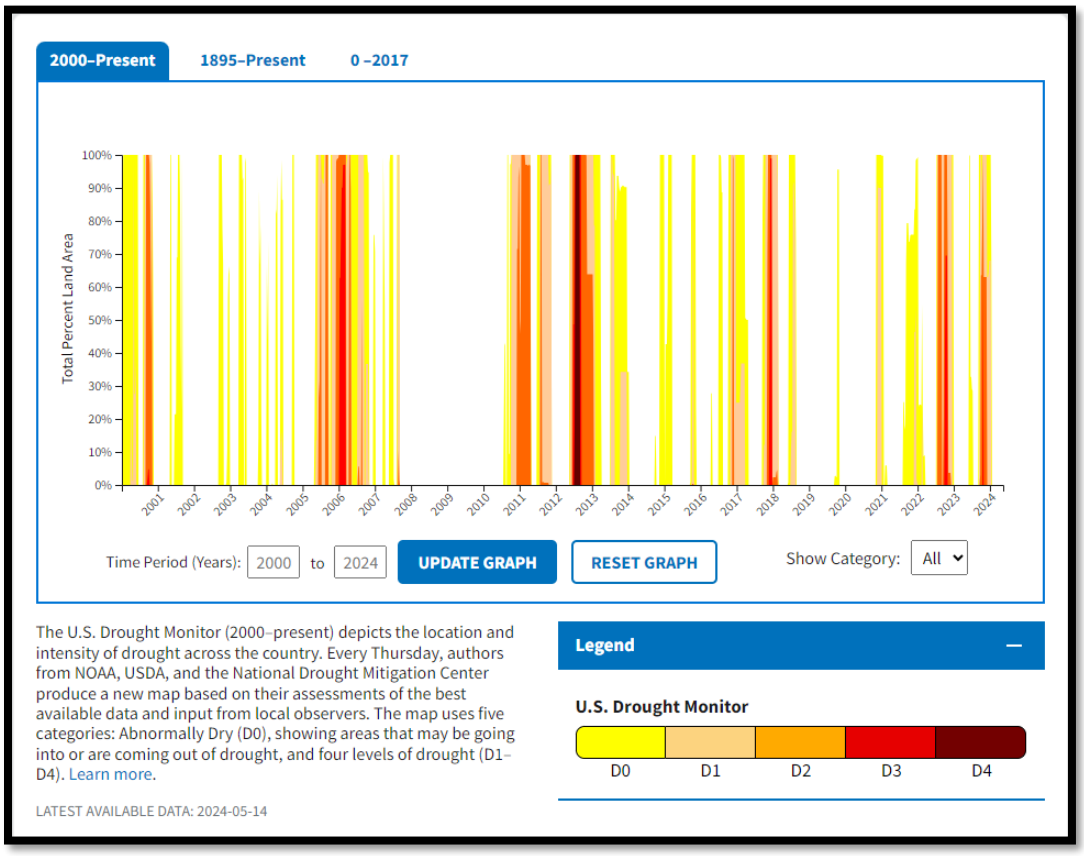
In December of 2010 all but the Northwestern corner of Perry County experienced drought conditions.

The Planning Area was stricken with drought conditions January to April and again in August of 2011. By the end of August drought conditions had improved.

In May of 2012 there was unusually dry weather in Arkansas. It was the driest May on record for the Planning Area and surrounding jurisdictions. As June approached the combination of sparse rainfall and rising temperatures led the drought event to be categorized as extreme. Water companies-initiated water conservation strategies. Pastures and stock ponds dried up forcing cattle grower to send their cattle to market. Crops failed. The entire State of Arkansas was placed under a burn ban. Daily wildfires broke out across the State. Perry County experienced ongoing drought conditions until January of 2013.

In 2017, the months of September thru November were very dry. There had been a 50% decrease in normal rainfall and November 2017 is the driest November on record. Vegetation was dry and tributaries were low. The Planning Area entered D2 drought designation on November 17, 2017 and entered D3 drought designation on November 28,2017.

As of November 30, 2017, there was a high wildfire danger across all of Arkansas due to dry vegetation and soil moisture conditions.



[Perry County Conditions | Drought.gov]

For mapping of past drought conditions, please go to [Perry County Conditions | Drought.gov]. Mapping goes back to 1895 and is updated every five days.

Probability of Future Events

[CMRA - Climate Mapping For Resilience and Adaptation (arcgis.com)]

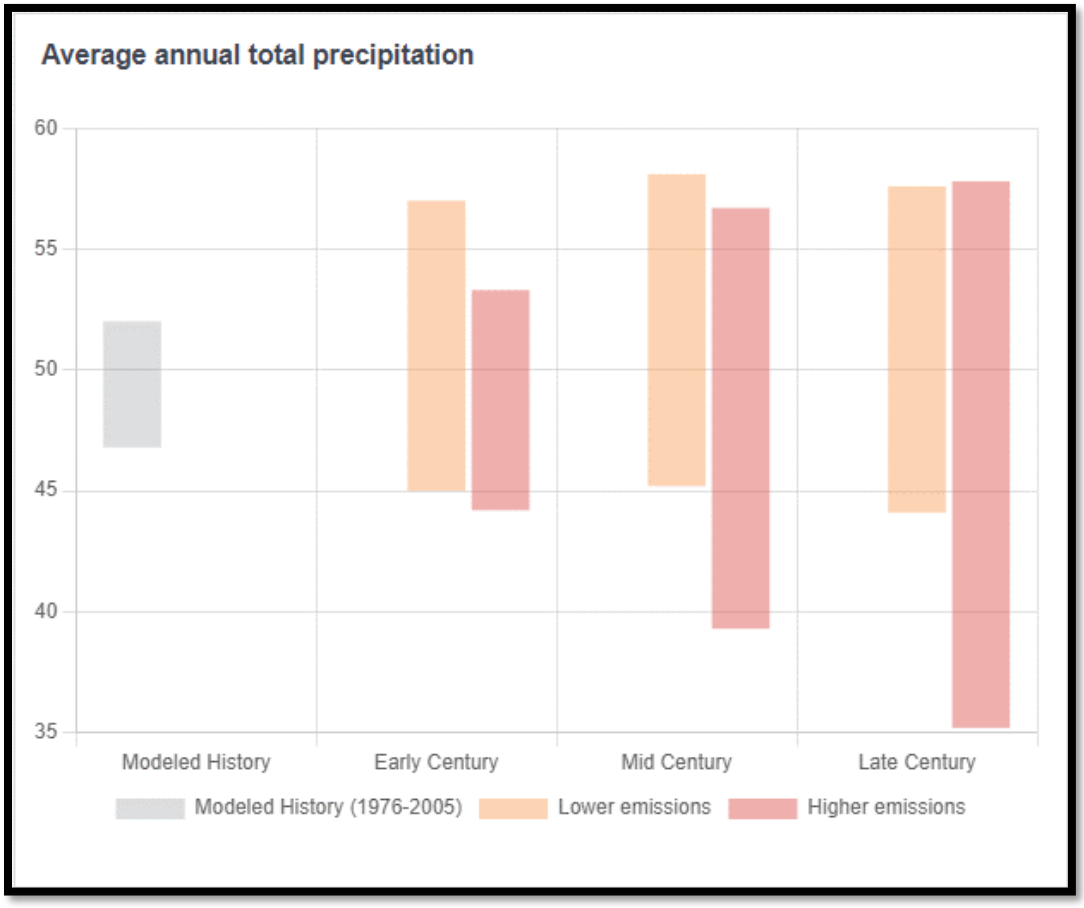
Future Climate Indicators

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Precipitation:							
Average annual total precipitation	49" 47 - 52	50" 45 - 57	50" 44 - 53	50" 45 - 58	50" 39 - 57	50" 44 - 58	50" 35 - 58
Days per year with precipitation (wet days)	168 days 159 - 174	164 days 150 - 175	163 days 137 - 174	163 days 146 - 174	161 days 127 - 177	162 days 143 - 176	157 days 116 - 179
Days per year with no precipitation (dry days)	197 days 191 - 206	201 days 190 - 215	202 days 192 - 229	202 days 191 - 219	204 days 188 - 238	203 days 189 - 222	208 days 186 - 249
Maximum number of consecutive dry days	16 days 13 - 19	16 days 14 - 21	16 days 13 - 20	17 days 14 - 21	17 days 13 - 21	17 days 13 - 24	18 days 14 - 25
Temperature thresholds:							
Annual days with maximum temperature > 90 °F	60 days 60 - 71	89 days 71 - 110	92 days 70 - 115	101 days 72 - 125	108 days 85 - 129	112 days 85 - 142	140 days 108 - 167
Annual days with maximum temperature > 100 °F	6 days 5 - 8	17 days 4 - 35	19 days 6 - 52	25 days 4 - 53	32 days 14 - 82	34 days 11 - 53	66 days 29 - 116

N/A = Data Not Available for the selected area

Climate Projections for Early Century (2015–2044)

	Lower emissions	Higher emissions
Average annual total precipitation	49.9 Inches + 0.4 since 1976-2005	50.0 Inches + 0.5 since 1976-2005
Days per year with precipitation (wet days)	164.3 Days - 3.7 since 1976-2005	163.3 Days - 4.8 since 1976-2005
Days per year with no precipitation (dry days)	200.9 Days + 3.8 since 1976-2005	201.9 Days + 4.8 since 1976-2005
Maximum number of consecutive dry days	16.4 Days + 0.6 since 1976-2005	16.4 Days + 0.6 since 1976-2005
Annual days with maximum temperature > 90°F	89.2 Days + 25.5 since 1976-2005	91.6 Days + 27.9 since 1976-2005
Annual days with maximum temperature > 100°F	17.0 Days + 11.1 since 1976-2005	19.1 Days + 13.2 since 1976-2005



Climate mapping trends indicate a slight increase in annual precipitation with a decrease in the number of wet days. This combined with an increase in the number of dry days, and rising temperature thresholds mean that future drought conditions could exist.

The probability that the Planning Area will experience a drought event every year is less than one percent.

The probability of a drought was estimated using the following formula:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Data collected from 2000-2023 was equal to 8,395 days.

Vulnerability and Impact of Drought

Lack of water could be devastating to the Planning Area. As a dry period progresses and water supplies dwindle, existing water supplies will be overtaxed and dry up. If the drought persists long term the impact of the drought could be permanent. Specific impacts may be:

- Economy: loss of revenue/income, higher rates of unemployment, loss of land value/prices
- Population density: there may be forced migration
- Health: dehydration, poor nutrition, famine
- Natural wildlife: wildlife will be competing for the same resources as people
- Land use: not all plant life will be able to survive in drought conditions changing availability of food for both people and wildlife. Erosion from flash floods, high winds, and possible wildfire from consistent dry conditions may change the landscape and natural habitats permanently.
- Damage or loss of infrastructure
- Social: conflict over resources

While all populations in the Planning Area are vulnerable, children, elderly, and the economically challenged populations are most at risk. The Planning Area currently holds a 32.4% of population in disadvantaged communities (CMRA - Climate Mapping For Resilience and Adaptation (arcgis.com)).

The unincorporated areas of Perry County, and the municipalities within the county including the Cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville, are mostly rural with a large amount of timber plantations, farmland, and pasture for farm animals. Drought can have serious impact on farmland and agriculture. Failed crops, inability to maintain healthy livestock, and decreased land value/prices will cause economic strain. The landscape may be unable to adapt and could be permanently changed. Those who depend on the land for their livelihood may be forced to sell their herds, migrate in search of better grazing lands/fertile fields, or move to urban areas in search of employment. If the dwindling supplies of food are not replaced, famine can occur, further accelerating migration out of these jurisdictions.

The school districts of East End and Perryville will also be greatly affected by the dwindling water supply. School schedules could be delayed or canceled altogether. Drought conditions could create famine worldwide, but locally they could create food insecurity for those students dependent on the school food program.

Severe droughts also elevate the potential for wildfires. Burned areas that were once forested or used as stock ponds may dry up permanently. The increased dry fuel load created by drought could ignite. The wildfire could ravage the Planning Area as well as surrounding Counties. The

dwindling water supply would not be sufficient for firefighting. More importantly, lack of water would be the cause of dehydration for all people and animals in the Planning Area.

Population

Population changes would impact drought. As populations grow there is an increased strain on water supplies. The Planning Area over the years has seen both a decrease and an increase in population. However, the trend seems to support that in future years the Planning Area will see more of an increase than a decrease in population. Increased population would stress the current water supply, with or without a drought. Drought conditions would expedite the impact. Over the next five years the Planning Team will need to research and document changes in population and its effect on the current water supply and drought conditions.

Land Use

Changes in land use could impact the Planning Area. The Planning Area has both agricultural and industrial areas. Both agriculture and industry are dependent on sustainable sources of water. Unsustainable land use by either agriculture or industry can lead to a breakdown of the ecosystem and environmental degradation.

Currently, the Planning Area is mostly rural with more timberland and fewer residential structures. As population increases this trend may change and land use planning will become more essential.

The Planning Area has not conducted a study to determine an increase or decrease in agriculture.

Over the next five years the Planning Team will need to research and document changes in land use and its effects on the Planning Area.

Climate

Climate change is expected to correlate with land use. Lack of green space, increased land use for agriculture, and waste from industry impact climate. The Planning Area contains large amounts of rural agricultural areas and timberland. The Planning Area is expected to see a growth in population. Increased population could lead to a decrease in green space, changing future climate predictions. The Planning Team will need to continue to research over the next five years the impact and possible natural mitigation methods that can be taken to prevent drought.

4.8.3 Earthquake

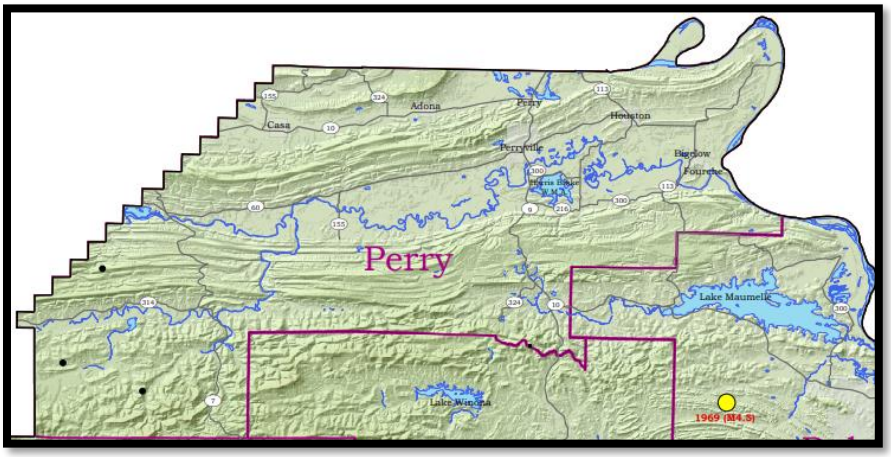
An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates comprising the Earth's crust.

An earthquake is what happens when two blocks of the earth suddenly slip past one another. The surface where they slip is called the fault or fault plane. The location below the earth's surface where the earthquake starts is called the hypocenter, and the location directly above it on the surface of the earth is called the epicenter.

Sometimes an earthquake has foreshocks. These are smaller earthquakes that happen in the same place as the larger earthquake that follows. Scientists can't tell that an earthquake is a foreshock until the larger earthquake happens. The largest, main earthquake is called the mainshock. Mainshocks always have aftershocks that follow. These are smaller earthquakes that occur afterwards in the same place as the mainshock. Depending on the size of the mainshock, aftershocks can continue for weeks, months, and even years after the mainshock.

Locations Affected by Earthquake

The map below shows the location and magnitude of reported earthquakes that have occurred in the Planning Area from 1965-2011. [south-central-arkansas-seismic-zone.pdf]



About the Map

This map illustrates the location and magnitude of reported earthquakes that have occurred in south-central Arkansas from 1930 to 2009. The data source for the earthquakes depicted on this map was derived from the Arkansas Geological Survey (AGS) earthquake catalog. This catalog has been compiled from various sources and publications and includes date, time, latitude, longitude, magnitude or intensity and depth information. Some event records may contain incomplete data due to their date and/or source. The AGS earthquake catalog is dynamic and continually updated as event parameters are modified, new events are added, and occasionally, events are deleted. The seismic areas/zones, illustrated on this map are derived from various geologic sources and publications on file at the AGS. Depicted seismic areas/zones, are for illustration purposes only and may not represent all the seismically active features within a given location or relate to the origin of the earthquakes depicted on this map.

Symbols

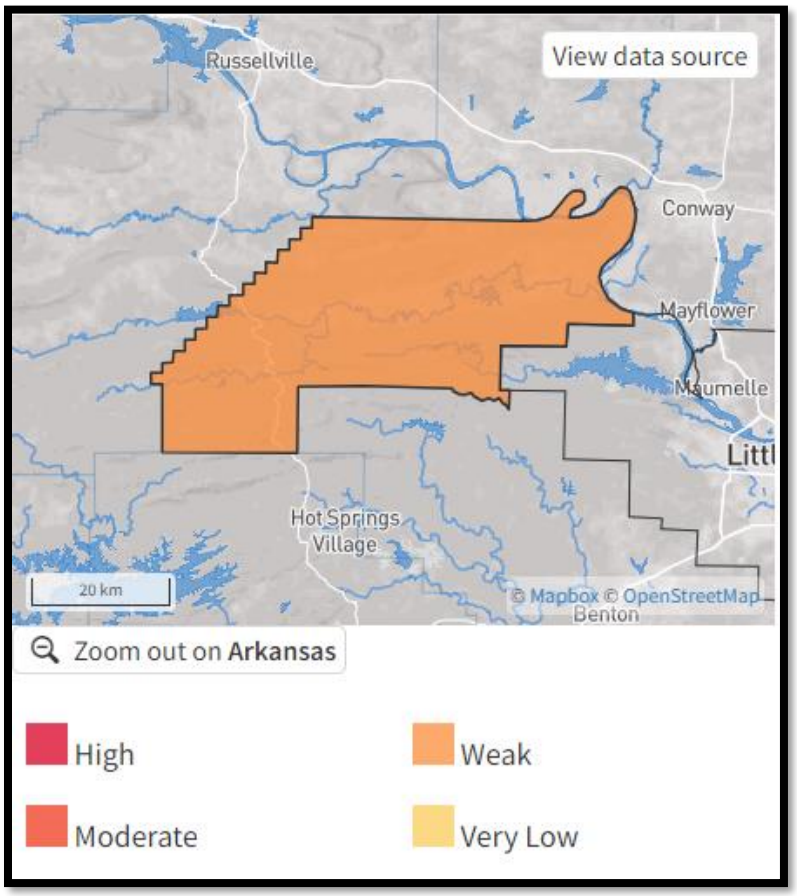
- Interstate Highways
- US Highways
- State Highways
- Water
- Incorporated Areas
- Seismic Areas/Zones

Earthquake Magnitudes

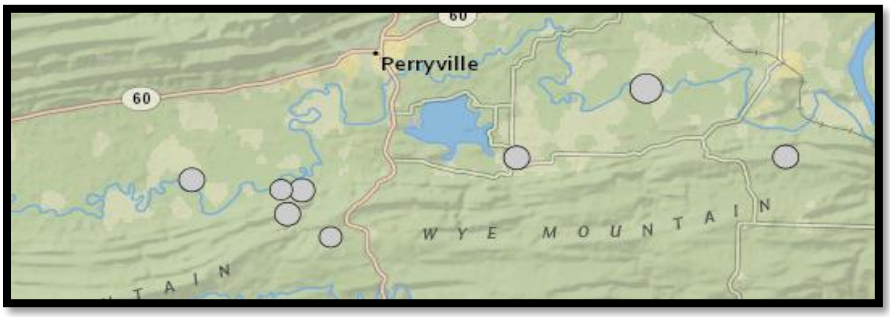
- 0.0 - 1.9
- 2.0 - 2.9
- 3.0 - 3.9
- 4.0 - 4.9

Extent, Magnitude or Severity of Earthquake Events

Think Hazard - Perry -Earthquake



The Planning Area can expect to see earthquakes up to a magnitude of 4.3 on the Richter Scale. The area with the highest probability due to past recorded occurrences would be near the SSW area of Perryville. According to USGS Earthquake data, the most powerful earthquake for the Planning Area occurred in the city of Houston. This earthquakes registered 4.3 on the Richter Scale. No other earthquake activity has been reported for the city of Houston.



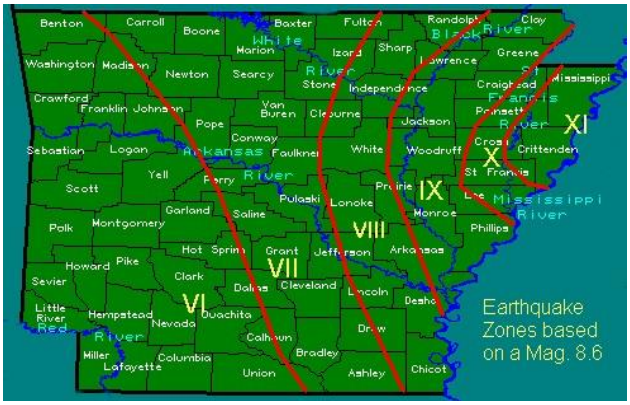
Latest Earthquakes (usgs.gov)

Perry County, AR Earthquake Data & Risk | Homefacts

County	Location	Date	Time	Magnitude	Depth
Perry	Houston AR	01-01-1969	11:35 P.M.	4.3	7 km
Perry	4.13 miles from the Township of Tyler	11-11-1998	5:38 A.M.	2.6	5 km
Perry	SSW of Fourche	08-22-2017	9:42 A.M.	2.1	9.5km
Perry	SE of Perryville	08-30-2017	6:57 A.M	2.4	6 km
Perry	SSW of Perryville	09-04-2023	2:35 A.M	2.0	10.7 km
Perry	SSW of Perryville	09-04-2023	2:37 A.M.	2.1	7 km
Perry	SW of Perryville	10-09-2023	8:17 A.M.	2.3	10 km
Perry	SW of Perryville	11-3-2023	8:05 A.M.	2.0	10.9 km
Perry	SSW of Perryville	11-9-2023	5:07 A.M.	1.8	8 km

Category	Effects	Richter Scale (approximate)
I. Instrumental	Not felt	1-2
II. Just perceptible	Felt by only a few people, especially on upper floors of tall buildings	3
III. Slight	Felt by people lying down, seated on a hard surface, or in the upper stories of tall buildings	3.5
IV. Perceptible	Felt indoors by many, by few outside; dishes and windows rattle	4
V. Rather strong	Generally felt by everyone; sleeping people may be awakened	4.5
VI. Strong	Trees sway, chandeliers swing, bells ring, some damage from falling objects	5
VII. Very strong	General alarm; walls and plaster crack	5.5
VIII. Destructive	Felt in moving vehicles; chimneys collapse; poorly constructed buildings seriously damaged	6
IX. Ruinous	Some houses collapse; pipes break	6.5
X. Disastrous	Obvious ground cracks; railroad tracks bent; some landslides on steep hillsides	7
XI. Very disastrous	Few buildings survive; bridges damaged or destroyed; all services interrupted (electrical, water, sewage, railroad); severe landslides	7.5
XII. Catastrophic	Total destruction; objects thrown into the air; river courses and topography altered	8

The Arkansas Geological Survey confirms that damage is not a concern unless a quake has a magnitude of at least 4.0. Houston is the only jurisdiction that has experienced an earthquake of that magnitude. As shown below, the Planning Area can experience up to a 5.5 magnitude earthquake on the Richter Scale.



Previous Occurrences

There have been nine recorded earthquakes in the Planning Area. There were 7 recorded earthquakes between 2000-2023.

Location	Date	Magnitude
Houston AR	01-01-1969	4.3
4.13 miles from the Township of Tyler	11-11-1998	2.6
SSW of Fourche	08-22-2017	2.1
SE of Perryville	08-30-2017	2.4
SSW of Perryville	09-04-2023	2.0
SSW of Perryville	09-04-2023	2.1
SW of Perryville	10-09-2023	2.3
SW of Perryville	11-3-2023	2.0
SSW of Perryville	11-9-2023	1.8

Probability of Future Events

Between 1811-2013, Arkansas experienced an average of 1-2 earthquakes per year that were a magnitude of 3.0 or greater. Additionally, Arkansas often experiences smaller magnitude earthquakes per year that are never felt. Arkansas lies within the New Madrid seismic zone (NMSZ). This is an active earthquake zone that has produced some of the largest earthquakes within the continental borders. The NMSZ has experienced recent seismic events as late as 2005 and is still considered active and potentially capable of generating powerful earthquakes (SCIPP Simple Planning Tool for Climate Hazards in Arkansas (southernclimate.org)). The Planning Area lies in the South-Central Arkansas Seismic Zone (GH-EQ-ASZM - Regional Seismicity Maps of Arkansas).

The probability of an earthquake taking place in any given year is less than one percent. The probability of an earthquake was estimated using the following formula:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Data collected from 2000-2023 was equal to 8,395 days.

Vulnerability and Impact of Earthquakes

According to the Arkansas State Mitigation Plan the regions with the highest probability of impact and vulnerability are those located along the New Madrid Fault. The portions of Arkansas that are most likely to experience damage are located in the northeast part of the state. This does not include the Planning Area.

The Arkansas Geological Survey confirms that damage is not a concern unless a quake has a magnitude of at least 4.0. The Planning Area is located in Earthquake Zone VI and Zone VII. This means the Planning Area could see an earthquake up to a 5.5 on the Richter Scale. Damage at this magnitude could result in falling household objects and cracked walls.

All buildings and infrastructure in the Planning Area are vulnerable to earthquakes. As businesses and residential areas grow so will the impact and vulnerability of the Planning Area. Growth in the number and size of both businesses and residential areas will require more mitigation efforts to address both new and existing structures.

Damage from an earthquake can be widespread and varied. Buildings can be structurally damaged or collapse depending on the magnitude of the earthquake. Furniture and equipment may be overturned or displaced. Windows could be broken or become unanchored from the structure. Mobile homes could be knocked off their foundations. Infrastructure and lifesaving services could be delayed, damaged, or destroyed by an earthquake. Depending on the magnitude of the earthquake, pipes carrying water and other utilities may become damaged. Hazardous material may be released. Services such as cell service and landlines may become unavailable due to damage or capacity limits.

The planning Area includes populations under the age of 5, over the age of 65, special needs, and those living below the poverty level. These population are at risk of injury, death, or inability to recover from an earthquake.

The area around Perryville would be most affected by an earthquake due to previous occurrences, building density and population density in the urban areas. During a 5.5 magnitude earthquake, the walls of the buildings could crack and collapse. The windows could break. All furniture, equipment, and material inside the buildings could be overturned and broken. The doors could be uneven and disturbed. Cars parked downtown could be rocked and displaced. Sidewalks could be cracked. Pedestrians located in downtown Morrilton would be especially vulnerable. They could be knocked off their feet, and falling debris from buildings could strike a bystander.

Children present at East End School District and Perryville School District would be vulnerable to falling structures and moving furniture/equipment inside the buildings. Due to the ratio of adults to children, there is a high risk of children becoming lost or missing. Fear could be prevalent in children and cause widespread panic.

The unincorporated areas of Perry County, the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville are located in rural areas. Housing in these areas may be constructed with unreinforced masonry. The walls may crack or collapse. The windows may break, and unanchored furniture could be turned over or displaced. Uncontained materials inside homes could be broken and destroyed.

Population

Population increase/decrease will not alter the probability of an earthquake event; however, changes in demographic, socioeconomic characteristics, and distribution of population can affect the vulnerability and impact of earthquakes. Higher population density and lower economic characteristics will result in increased vulnerability and impact. Over the next five years, the planning team should monitor increase/decrease of population and its impact. The mitigation plan should be updated for any significant changes.

Land Use

Sustainable urban resilience to natural disasters is a constant challenge. Lack of green space makes urban areas more vulnerable. Land use planning is an essential tool in promoting earthquake resilience. There have been no land use studies conducted for the Planning Area. Over the next five years the planning team should consider a land use study and update the mitigation plan with any significant changes.

Climate

Climate change does not have a direct impact on earthquake vulnerability, impact, or frequency.

4.8.4 Extreme Heat

There is no strict definition of extreme heat. The term is used to describe a hotter than usual period for the time and place of the extreme heat event.

Extreme heat is a dangerous weather condition. According to MIT it is the leading cause of weather-related deaths in the United States (https://climate.mit.edu/explainers/extreme-heat).

Extreme heat effects:

- Health
- Roads
- Infrastructure
- Crops
- Livestock
- Escalates natural disasters like drought and wildfire

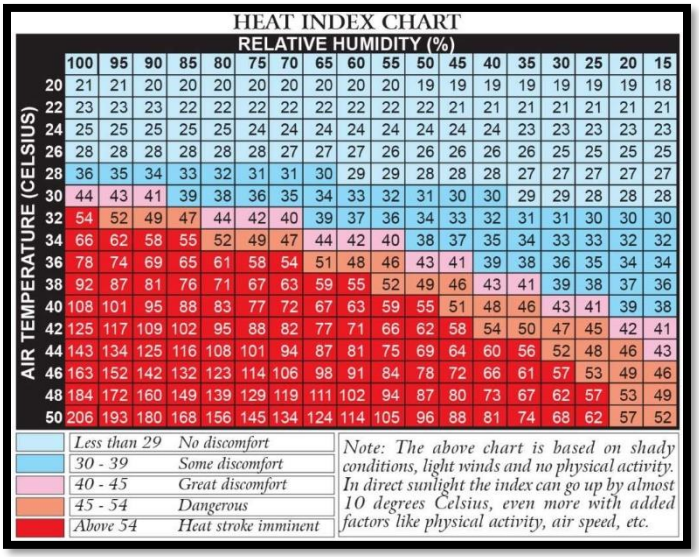
Locations Affected by Extreme Heat

There is no geographic hazard boundary for extreme heat. The entire Planning Area is a risk for extreme heat.

Extent, Magnitude, or Severity of Extreme Heat

The entire Planning Area can experience extreme heat seasonally. Temperatures in the summer months average between 80˚ and 115˚. The extent of extreme heat temperatures in the Planning Area is not expected to exceed 115˚.

The magnitude or intensity of an extreme heat event is measured in relation to the percentage of humidity. According to the National Oceanic Atmosphere Administration (NOAA) this relationship is referred to as the "Heat Index". The Heat Index measures how hot it feels outside when humidity is combined with high temperatures. The Planning Area has seen heat indices near 120˚ (Storm Events Database - Event Details | National Centers for Environmental Information (noaa.gov)).



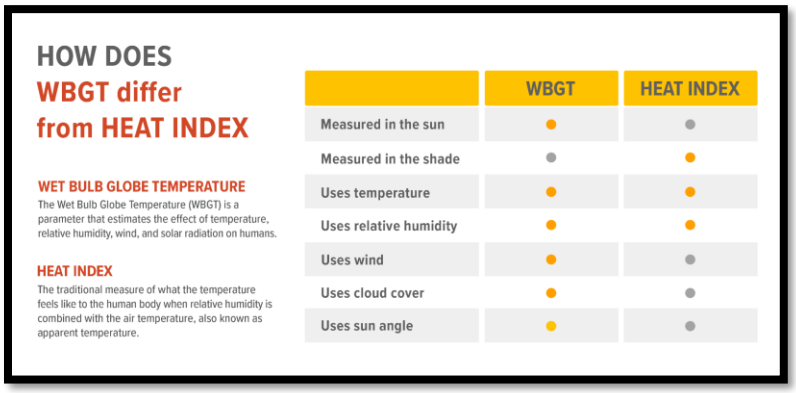
HEAT INDEX CHART

AIR TEMPERATURE (CELSIUS) \ RELATIVE HUMIDITY (%)	100	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15
20	21	21	20	20	20	20	20	20	20	20	19	19	19	19	19	19	19	18
22	23	23	23	22	22	22	22	22	22	22	22	21	21	21	21	21	21	21
24	25	25	25	25	25	24	24	24	24	24	24	24	24	23	23	23	23	23
26	28	28	28	28	28	28	27	27	27	26	26	26	26	26	25	25	25	25
28	36	35	34	33	32	31	31	30	29	29	28	28	28	27	27	27	27	27
30	44	43	41	39	38	36	35	34	33	32	31	30	30	29	29	28	28	28
32	54	52	49	47	44	42	40	39	37	36	34	33	32	31	31	30	30	30
34	66	62	58	55	52	49	47	44	42	40	38	37	35	34	33	33	32	32
36	78	74	69	65	61	58	54	51	48	46	43	41	39	38	36	35	34	34
38	92	87	81	76	71	67	63	59	55	52	49	46	43	41	39	38	37	36
40	108	101	95	88	83	77	72	67	63	59	55	51	48	46	43	41	39	38
42	125	117	109	102	95	88	82	77	71	66	62	58	54	50	47	45	42	41
44	143	134	125	116	108	101	94	87	81	75	69	64	60	56	52	48	46	43
46	163	152	142	132	123	114	106	98	91	84	78	72	66	61	57	53	49	46
48	184	172	160	149	139	129	119	111	102	94	87	80	73	67	62	57	53	49
50	206	193	180	168	156	145	134	124	114	105	96	88	81	74	68	62	57	52

	Less than 29	No discomfort
	30 - 39	Some discomfort
	40 - 45	Great discomfort
	45 - 54	Dangerous
	Above 54	Heat stroke imminent

Note: The above chart is based on shady conditions, light winds and no physical activity. In direct sunlight the index can go up by almost 10 degrees Celsius, even more with added factors like physical activity, air speed, etc.

The heat index does not account for variables such as direct sunlight and wind speed. Many individuals in the Planning Area must perform activities outside, therefore these variables must be considered. A Wet Bulb Globe Temperature (WBGT) would be utilized to identify and notify when protective measures should be taken for outdoor work (Heat Forecast Tools (weather.gov)). The chart below is an example of the differences between heat index and WBGT.



Previous Occurrences

There have been two previous occurrences of extreme heat between January 2000 and December 2023. On August 7, 2011, high temperatures at Nimrod Dam climbed to 112 degrees setting a record for the hottest temperature ever recorded at the reporting station. The previous record was 111 degrees on July 14, 1954.

Storm Events Database Excessive Heat 2000-2023

Number of County/Zone areas affected:	1
Number of Days with Event:	2
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	08/02/2010	03:00	CST-6	Excessive Heat		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	08/02/2011	11:00	CST-6	Excessive Heat		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

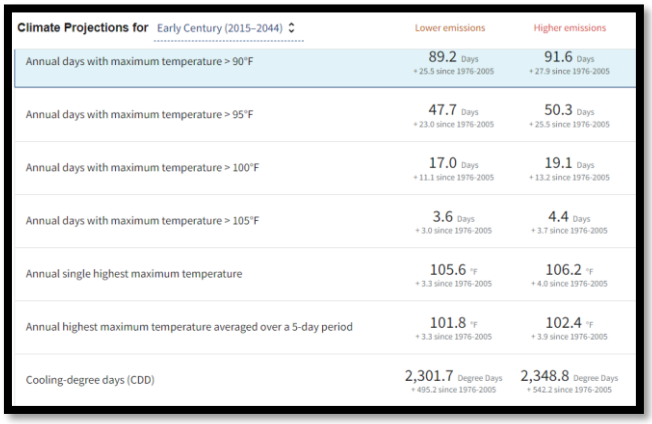
Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

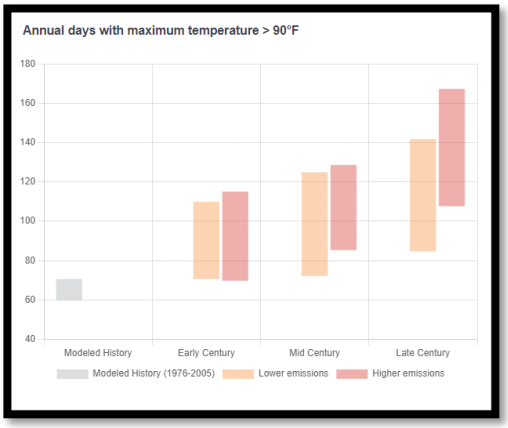
Probability of Future Events

Future Climate Indicators

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Temperature thresholds:							
Annual days with maximum temperature > 90°F	60 days 60 - 71	89 days 71 - 110	92 days 70 - 115	101 days 72 - 125	108 days 85 - 129	112 days 85 - 142	140 days 108 - 167
Annual days with maximum temperature > 95°F	25 days 22 - 29	48 days 24 - 70	50 days 33 - 84	60 days 26 - 89	68 days 43 - 103	71 days 42 - 110	104 days 65 - 142
Annual days with maximum temperature > 100°F	6 days 5 - 8	17 days 4 - 35	19 days 6 - 52	25 days 4 - 53	32 days 14 - 82	34 days 11 - 53	66 days 29 - 116
Annual days with maximum temperature > 105°F	1 days 0 - 1	4 days 0 - 11	4 days 0 - 22	7 days 0 - 14	10 days 2 - 45	11 days 2 - 28	31 days 8 - 86
Annual temperature:							
Annual single highest maximum temperature °F	102 °F 100 - 104	106 °F 102 - 109	106 °F 102 - 111	107 °F 102 - 111	109 °F 104 - 115	109 °F 105 - 113	114 °F 107 - 125
Annual highest maximum temperature averaged over a 5-day period °F	99 °F 97 - 100	102 °F 98 - 105	102 °F 98 - 108	104 °F 98 - 107	105 °F 101 - 111	105 °F 101 - 109	110 °F 104 - 120
Cooling degree days (CDD)	1807 degree-days 1739 - 1894	2,302 degree-days 1,986 - 2,686	2,349 degree-days 2,031 - 2,775	2,544 degree-days 2,113 - 3,055	2,745 degree-days 2,303 - 3,515	2,803 degree-days 2,234 - 3,553	3,645 degree-days 2,807 - 4,636

N/A = Data Not Available for the selected area





Climate mapping trends indicate that the number of annual days at maximum temperatures will continue to grow. Annual single highest maximum temperatures will continue to rise. Annual highest maximum temperatures averaged over a 5 day period will continue to hold at higher temperatures. CMRA - Climate Mapping For Resilience and Adaptation (arcgis.com)

The probability of an extreme heat event occurring in the Planning Area in any given year is less than one percent. The probability of an extreme heat event was estimated using the following formula:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

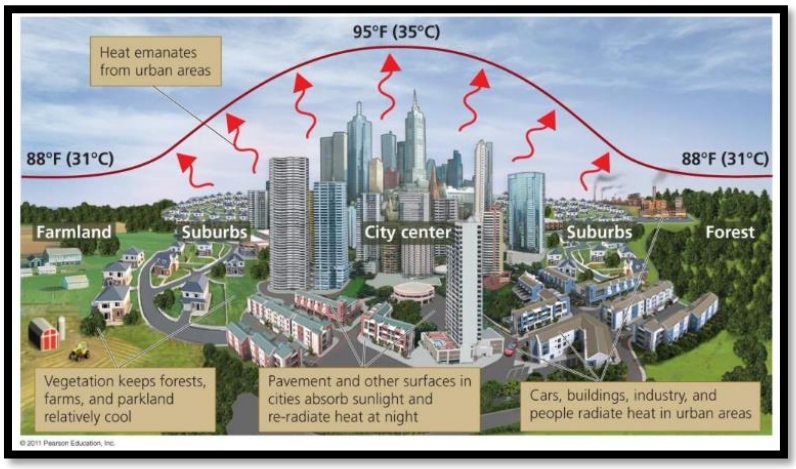
Data collected from 2000-2023 was equal to 8,395 days.

Vulnerability and Impact of Extreme Heat

The entire Planning Area could be impacted by extreme heat.

Urban areas are typically hotter than the surrounding rural areas. Construction materials such as asphalt absorb and re-omit more heat. This creates an urban heat island effect. Changing the natural landscape of an area destroys its ability to moderate air temperatures. Trees, plants, soil, and water can naturally lower air temperatures thru evaporative cooling (Urban Heat Islands | MIT Climate Portal).

Urban Heat Island Effect



urban heat island - Search Images (bing.com)

Tips for preventing heat-related illness can be found at Tips for Preventing Heat-Related Illness | Natural Disasters and Severe Weather | CDC.

The unincorporated areas of Perry County, the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville are mostly located in rural areas. Rural areas have a higher percentage of green space and shade. The natural landscape is less altered than urban areas. However, rural areas may be vulnerable to extreme heat. The rising temperatures may impact people, the natural environment, wildlife, livestock, and farmland. Extreme heat may result in people, the natural environment, wildlife, livestock, and farmland increasing water usage. Extreme heat may cause water sources to run short or dry up.

Those that are under the age of 5, over the age of 65, those with pre-existing medical conditions, those on certain medications, those experiencing homelessness, economically challenged, pregnant women, and those who must work outdoors are most vulnerable to extreme heat. 32.4% of the population in the Planning Area is considered to be vulnerable populations.

The unincorporated areas of Perry County, the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville may be impacted in their agricultural areas during extreme heat. Extreme heat may impact the growth cycle production of many crops. In extreme heat crops may become stressed causing crop production to be altered or fail. The rate of plant growth and development is dependent on the surrounding temperatures. Roots development may be altered depending on the amount of moisture in the soil. Pollinators such as bees may be harmed by extreme heat. Dry soil and crops may become prone to drought and wildfire. The economic loss may be felt by the farmer, community or global economy creating a food shortage.

The unincorporated areas of Perry County, the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville contain livestock. Extreme heat may impact livestock. As temperatures rise livestock will require more water. During extreme heat water sources may become low or dry up. Heat stress can increase vulnerability to disease, reduce fertility, and reduce milk production. Heat stress is one of the major climate change impacts on domesticated livestock.

The unincorporated areas of Perry County, the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville may experience less water/drought during extreme heat. Even without an increase in population water becomes a concern for people, animals, and the natural environment. During extreme heat the natural environment such as trees and wildlife must compete for water resources. Tree growth may be altered due to the availability of water. For timber plantations and forestry, climate will influence the structure and function of forest ecosystems and plays an essential role in forest health. Increased temperature may worsen many of the threats to forests through the increase of pest outbreaks, fires, and drought. Dehydration in wildlife increases risk of disease and impacts reproduction/survival.

The unincorporated areas of Perry County, the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville are at risk of wildfire during extreme heat. Extreme heat may result in drought and an increase in wildfire. The natural environment may be permanently altered or destroyed.

Population

Population changes in size and spatial distribution may have an impact on extreme heat. The Planning Area has seen an increase in population. There have been no specific studies performed in the Planning Area to document the impact and extent of population changes. Over the next five years the Planning Team will need to research how population changes and distribution are affecting the Planning Area.

Land Use

Land cover plays a vital role in controlling the amount of heat absorbed/radiated by the environment. Temperatures rise in urban areas due to the concentration of asphalt and other materials while rural areas with larger portions of green space remain cooler. The Planning Area has been experiencing an increase in population. Land use studies may be necessary to mitigate the impact of a growing population in a predominately rural area. There have been no studies in the Planning Area for land use and its effect on extreme heat. Over the next five years the Planning Team will need to research and document heat mitigation. Heat mitigation involves changing land use to reduce the heat island effect.

Climate

The Planning Area has already experienced rising temperatures and extreme highs. Future climate mapping indicators predict rising temperatures. With the expected growth in population, it will be important for the Planning Team to research, document and mitigate against rising temperatures over the next five years.

4.8.5 Flood

Flood is defined as an overflowing of a large amount of water beyond it normal confines, especially over what is normally dry land. It can be a partial or complete inundation. The various types of flooding in the Planning Area include riverine flooding, urban flooding, shallow flooding and flash flooding.

Riverine flooding occurs from excessive rainfall in upstream areas that gradually cause rivers and streams to overflow their banks inundating the adjacent floodplains. However, it can also be caused by runoff, snowmelt, or dam release. This type of flooding typically lasts longer than flash flooding or shallow flooding. This type of flooding often causes more damage due to the length of tie structures are inundated, the velocity and depth of water and size/force of floating debris.

Urban flooding occurs when heavy rainfall runs off structures, parking lots and streets. It converges in culverts and drainage ways that are often clogged with debris, causing streets to flood and storm sewers to back up.

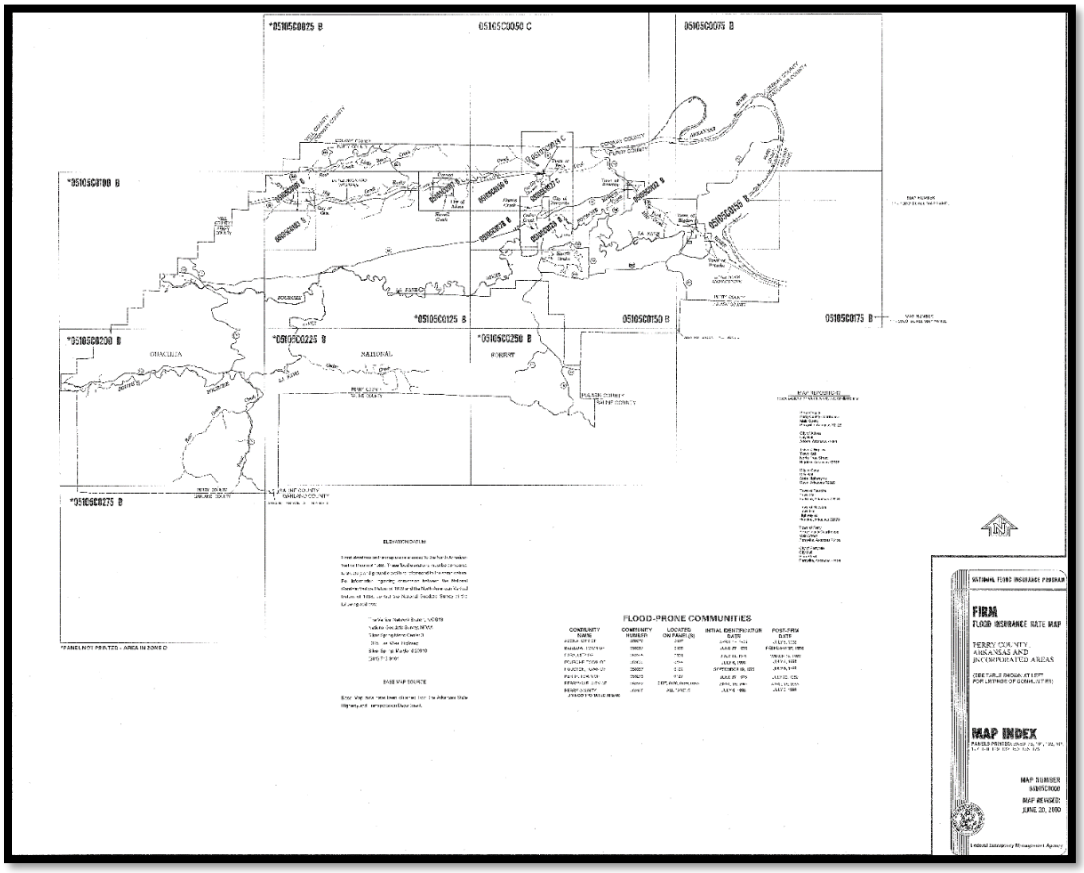
Shallow flooding is defined as flooding with an average depth limited to 3 feet or less where no defined channel exists.

A flash flood is caused by heavy or excessive rainfall in a short period of time, usually less than 6 hours. Flash floods can reach peak flow within a few minutes. They are usually characterized by raging torrents and move with great force and velocity. They can sweep through riverbeds, urban streets, or mountain canyons sweeping everything in their path, rolling boulders, tearing out trees and destroying structures.

Flooding can result in damage to personal property, buildings and infrastructure. In addition to property destruction, flooding can lead to injuries or even fatalities.

Locations Affected by Flooding

FIRM Panel Index

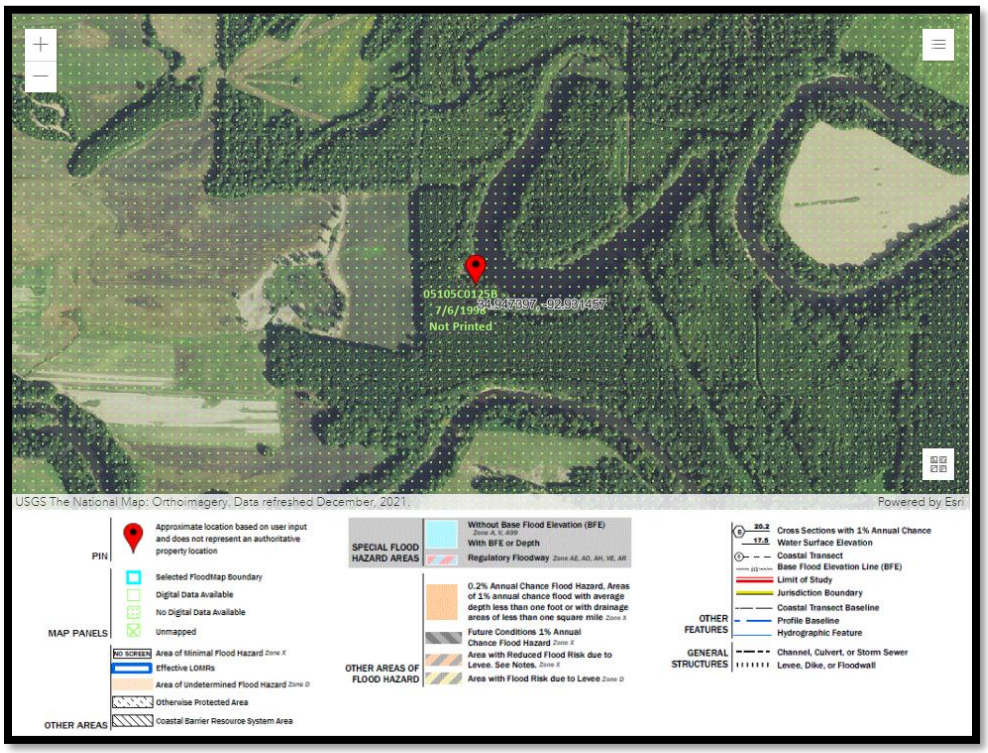


The FIRM Panel index for the planning area and can be found at the following link: [FEMA Flood Map Service Center | Search All Products](#).

There are a total of 14 panels that make up the planning area. Firms can be found in the Supporting Documents section of this plan. Each map contains a quick link below the map.

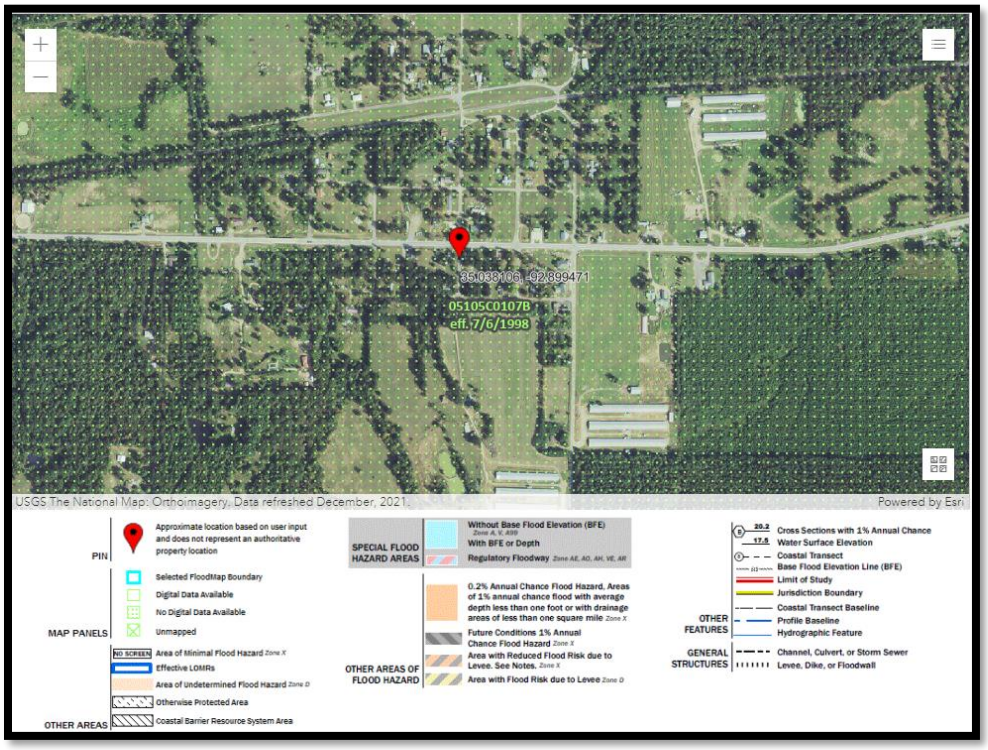
The Flood Insurance Rate Maps (FIRM) inserted below depict the locations of flood zones withing each jurisdiction. The entire Planning Area has potential to be affected by one or more of the flood events described above, even if they are not directly located in a designated flood zone.

Unincorporated Perry County Flood Map 05105C125B Effective 7/6/1998



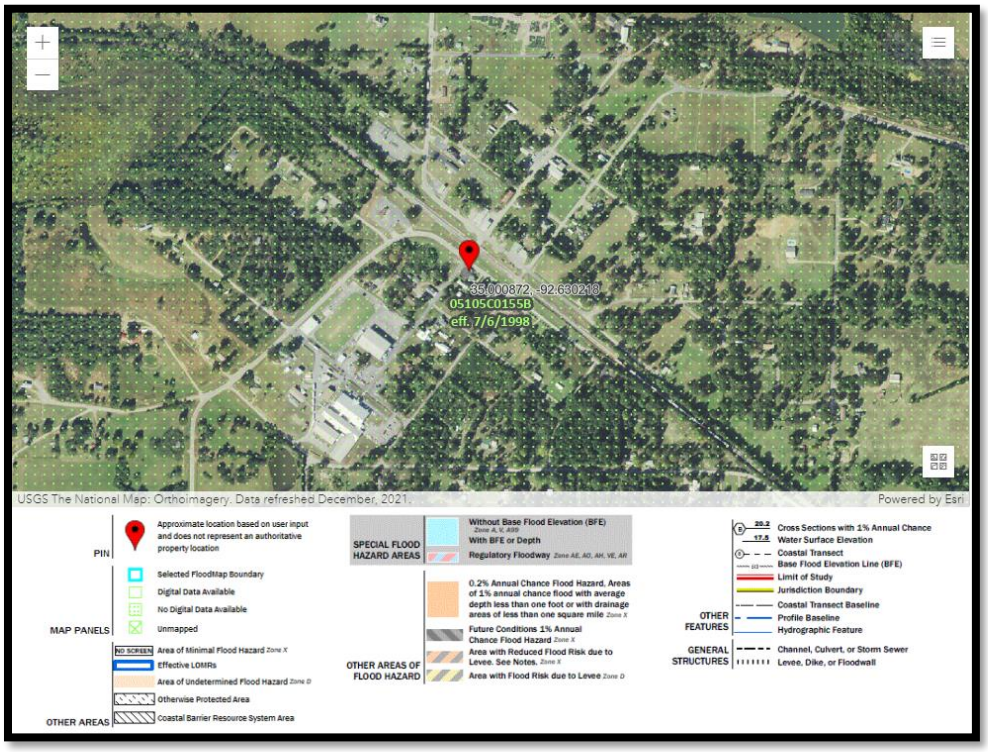
[FEMA Flood Map Service Center | Search By Address]

City of Adona Flood Map 05105C0107B Effective 7/6/1998



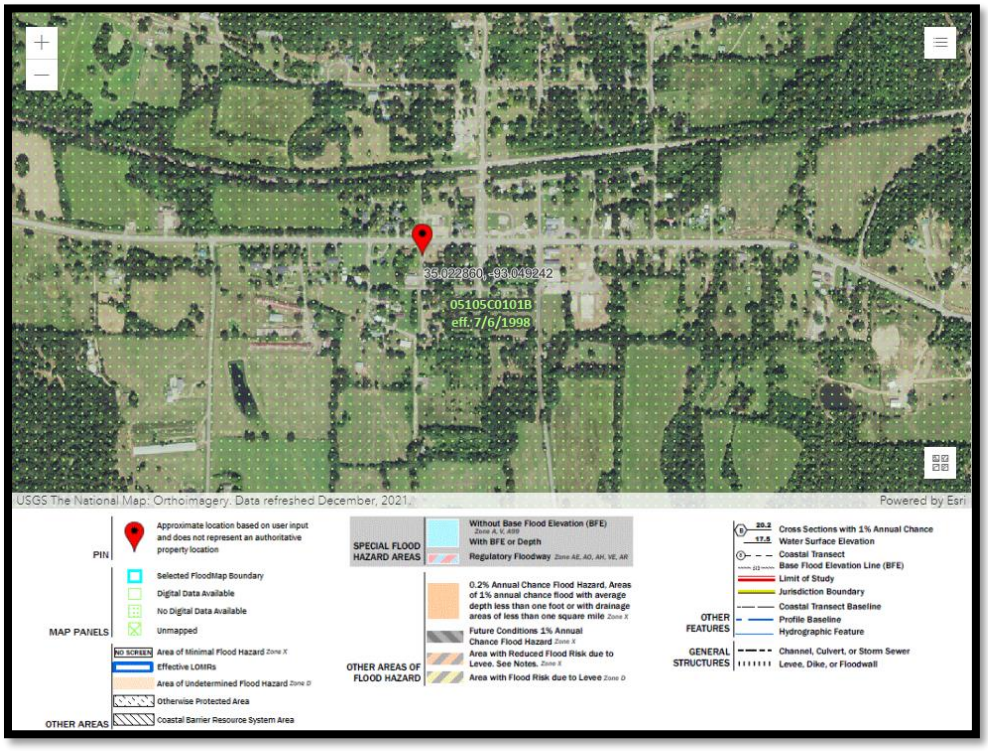
[FEMA Flood Map Service Center | Search By Address]

City of Bigelow Flood Map 05105C0155B Effective 7/6/1998



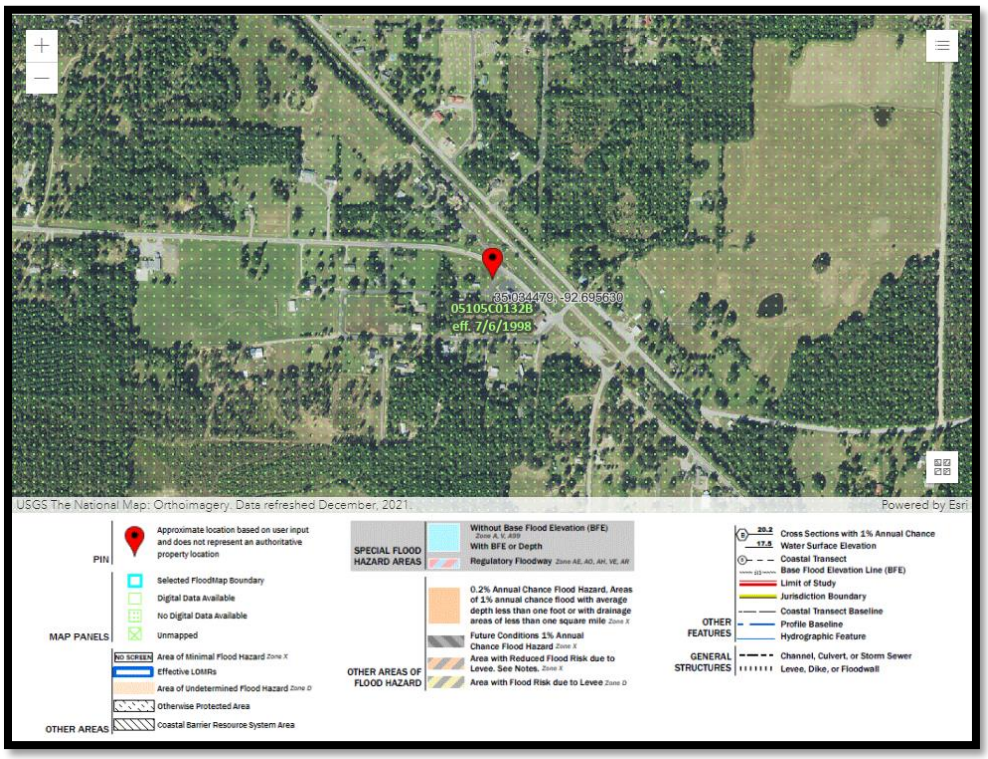
FEMA Flood Map Service Center | Search By Address

City of Casa Flood Map 05105C0101B Effective 7/6/1998



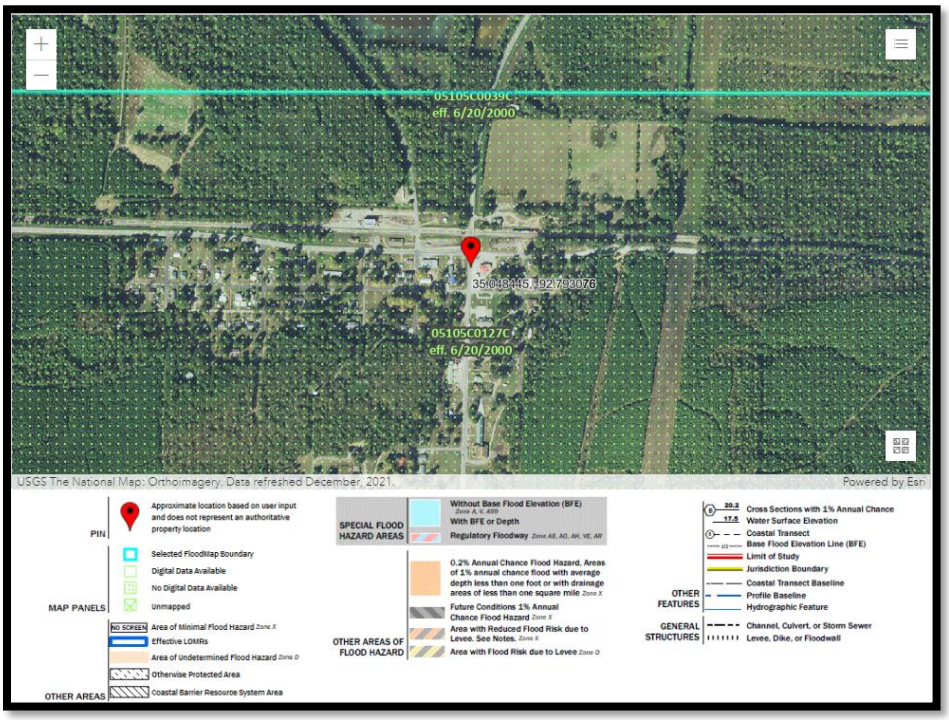
FEMA Flood Map Service Center | Search By Address

City of Houston Flood Map 05105C0132B Effective 7/6/1998



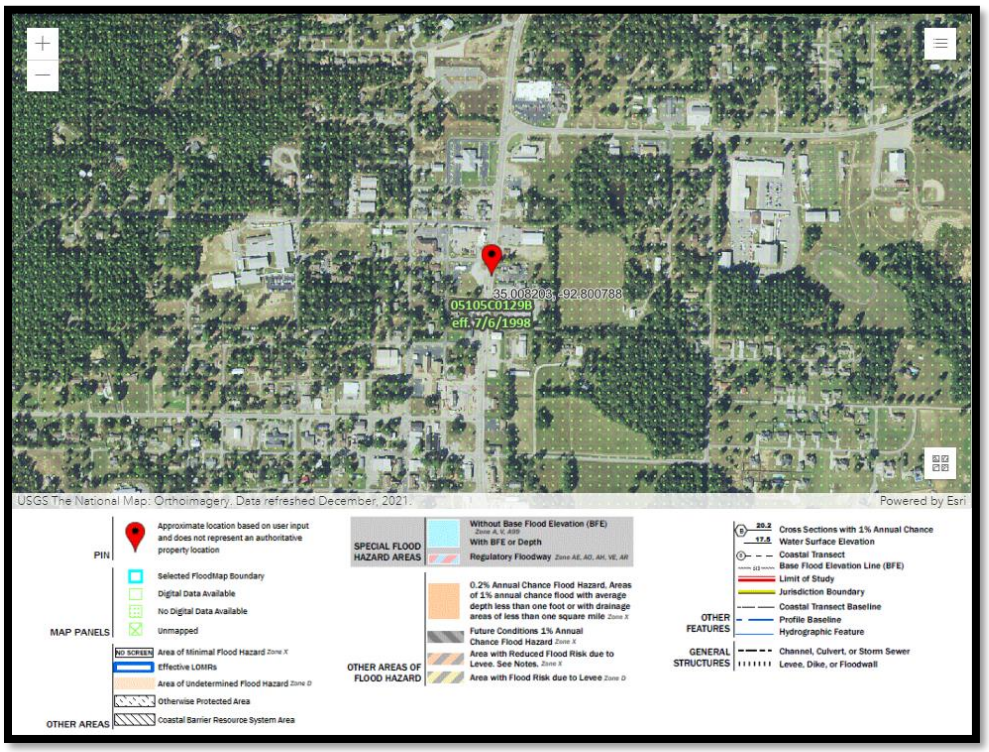
[FEMA Flood Map Service Center | Search By Address]

City of Perry Flood Map 05105C0127C Effective 6/20/2000



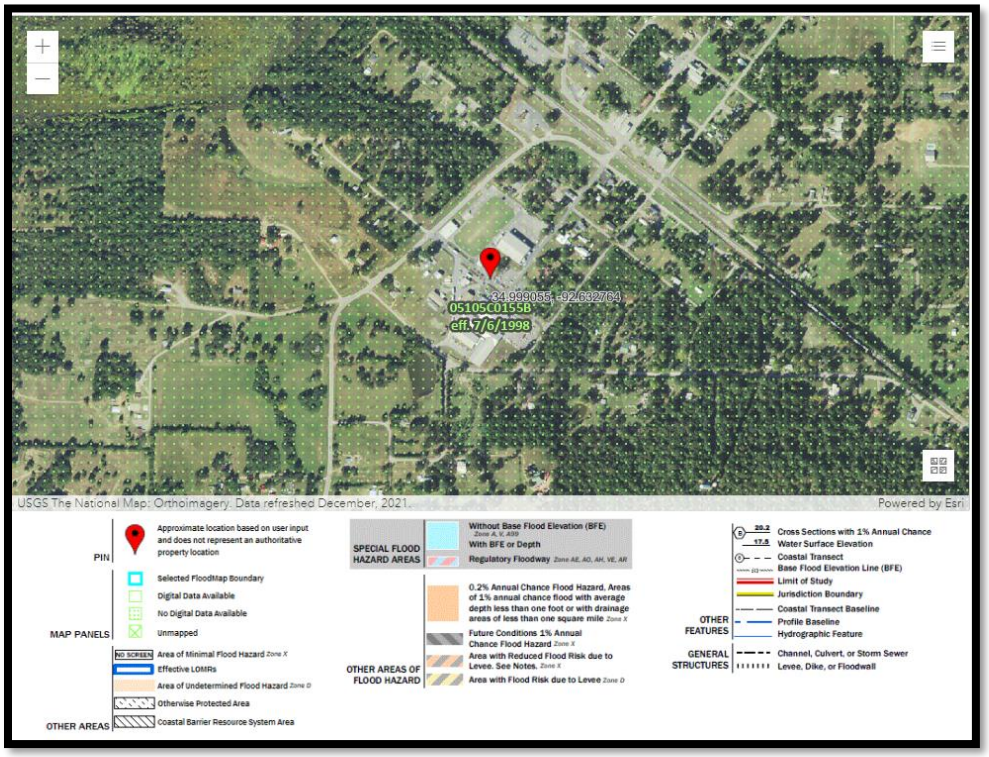
[FEMA Flood Map Service Center | Search By Address]

City of Perryville Flood Map 05105C0129B Effective 7/6/1998



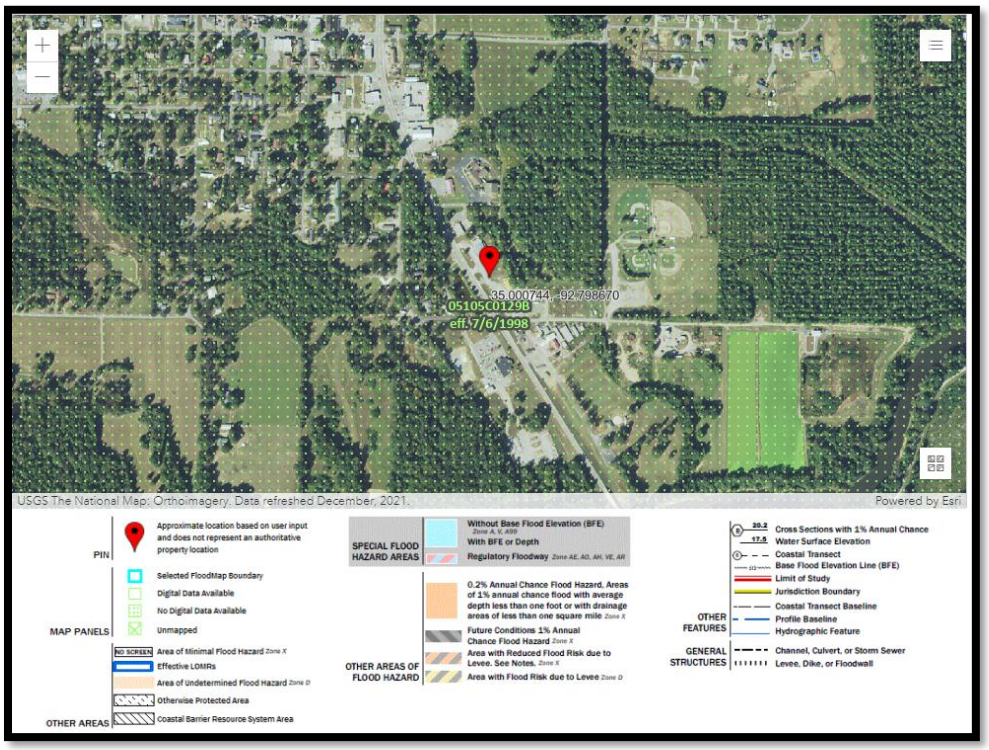
FEMA Flood Map Service Center | Search By Address

East End School District Flood Map 05029C0155B Effective 7/6/1998



FEMA Flood Map Service Center | Search By Address

Perryville School District Flood Map 05029C0129B Effective 7/6/1998



FEMA Flood Map Service Center | Search By Address

Extent, Magnitude, or Severity of Flood

For flooding, location refers to areas of the planning area that are at the highest risk of flooding frequently. Location is based on FIRM mapping and data from communities in the planning area. The Planning Area may experience a flooding/flash flooding when water depth on the roadways reach at least 3" or more.

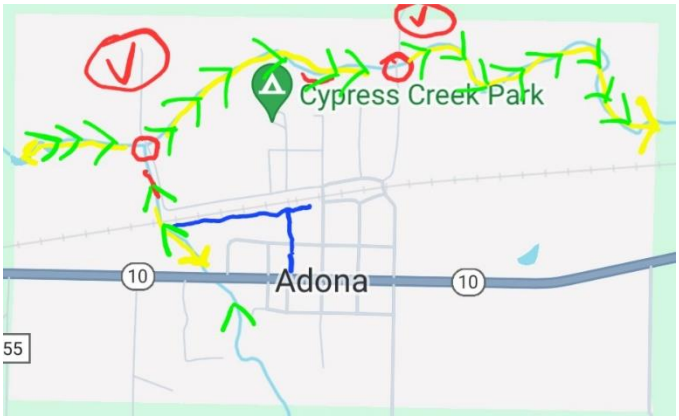
The entire Planning Area can expect flash flooding events when receiving 3" or more rainfall in six hours. In six hours, these jurisdictions can expect to receive 2.6 inches of rainfall. All affected jurisdictions are expected to receive around the same amount of rainfall.

The unincorporated area is mostly rural and may be prone to flooding around Needmore Road and Miller Road. Multiple county roads have historically experienced flooding events.

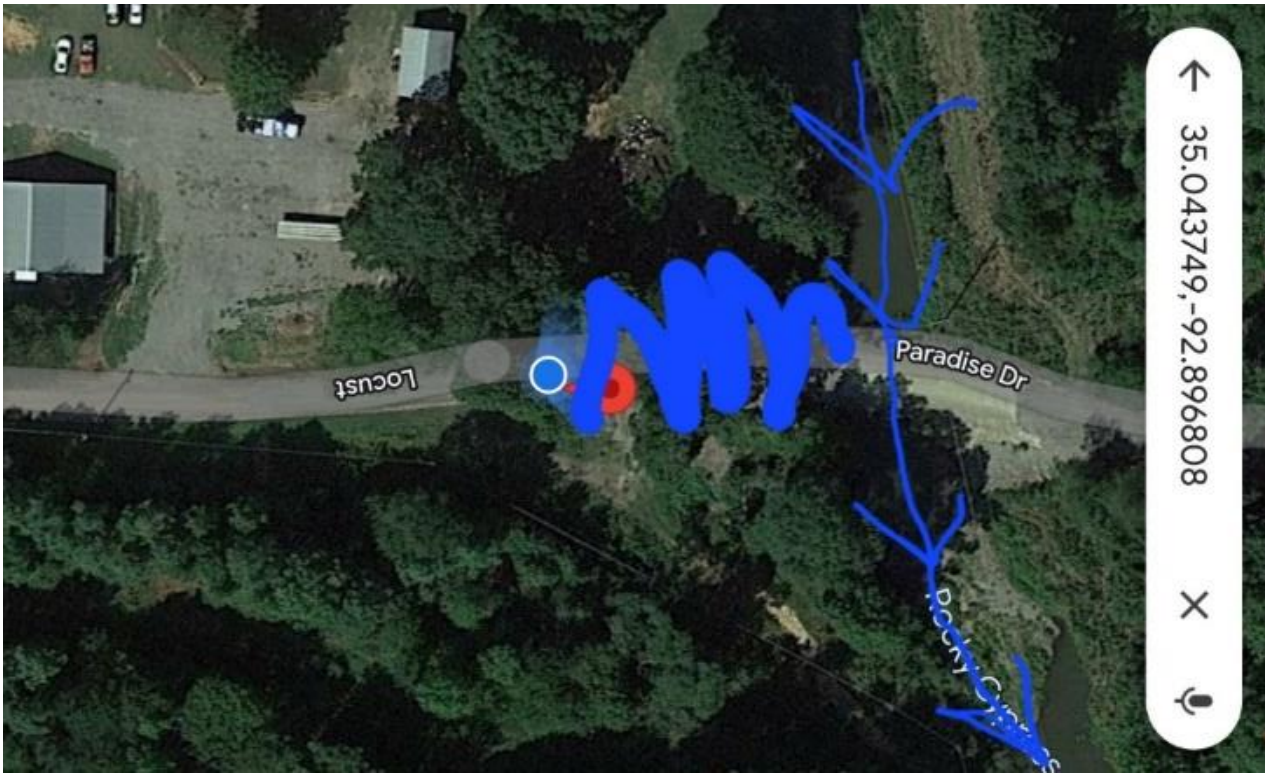
The city of Adona may expect flash flooding events when receiving 3" or more rainfall.
Locations in the city of Adona that may experience minor to moderate flood events:

- Railroad Avenue
- Paradise Drive
- Broadway St

During a flood event these roads have residents that are unable to get out and Emergency services are unable to get to them.



- Green Arrows: Indicate the direction of the flow of the creek
- Yellow: Indicates location of brush and other obstacles that hinder the natural flow of the creek
- Red Circles with a V: location of vulnerable residents who would be directly affected by flood waters.
- Red Circles: Indicate problematic bridges



This depicts an example of the flooding experienced during heavy rainfall on Paradise Drive. The blue arrows shoe the direction of the flow of water while the thick blue line depicts the area of road that will be flooded and unable to be traveled.

The city of Bigelow may expect flash flooding events when receiving 3” or more rainfall. Other locations may experience minor to moderate flood events:

- The area around Toad Suck due to the location of the Arkansas River

The city of Casa can expect flash flooding events when receiving 3” or more rainfall.

- West End of Casa around Grace Creek
- Aplin Road
- Deer Run Lane

The Town of Hollis has historically experienced flooding around Highway 314.

The city of Houston can expect flash flooding events when receiving 3” or more rainfall. Other locations may experience minor to moderate flood events:

- Stony Point Road
- Highway 300
- Pine Street
- Bethel Road

The city of Perry can expect flash flooding events when receiving 3” or more rainfall.

- Hwy 10 (especially the northern area)
- West of Highway 10
- Cypress Creek area

The city of Perryville can expect flash flooding events when receiving 3” or more rainfall.

- Highway 60 East
- Recreation Drive
- Cedar Street
- Reynolds Street

All portions of the Planning Area are expected to receive the same amount of rainfall.

Flood severity categories used by the National Weather Service (NWS) include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat.

Severity	Impact
Minor Flooding	Minimal or no property damage, but possibly some public threat or inconvenience
Moderate Flooding	Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
Major Flooding	Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.

Previous Occurrences

The planning area suffered 103 flooding events between January 1, 2000, and January 31, 2023, resulting in $2,651,000.00 in property losses and $1,450,000.00 in crop losses.

There were 28 flash flood events reported between 01/01/2000 and 12/31/2023.

Number of County/Zone areas affected:	1
Number of Days with Event:	24
Number of Days with Event and Death:	1
Number of Days with Event and Death or Injury:	1
Number of Days with Event and Property Damage:	6
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								1	0	192.00K	0.00K
COUNTYWIDE	PERRY CO.	AR	12/16/2001	20:00	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	PERRY CO.	AR	05/16/2003	21:00	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	PERRY CO.	AR	04/22/2004	03:30	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	PERRY CO.	AR	04/22/2004	05:30	CST	Flash Flood		0	0	0.00K	0.00K
HOLLIS	PERRY CO.	AR	08/14/2005	23:00	CST	Flash Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	01/13/2007	20:00	CST-6	Flash Flood		0	0	0.00K	0.00K
WILLIAMS JUNCTION	PERRY CO.	AR	01/13/2007	20:00	CST-6	Flash Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	01/13/2007	20:00	CST-6	Flash Flood		0	0	0.00K	0.00K
CASA	PERRY CO.	AR	03/03/2008	15:53	CST-6	Flash Flood		0	0	0.00K	0.00K
NEW DIXIE	PERRY CO.	AR	04/03/2008	22:00	CST-6	Flash Flood		0	0	12.00K	0.00K
PERRYVILLE	PERRY CO.	AR	04/10/2008	02:50	CST-6	Flash Flood		0	0	75.00K	0.00K
PERRYVILLE	PERRY CO.	AR	06/13/2008	23:10	CST-6	Flash Flood		0	0	0.00K	0.00K
HOLLIS	PERRY CO.	AR	07/03/2008	15:31	CST-6	Flash Flood		0	0	0.00K	0.00K
WYE	PERRY CO.	AR	05/06/2009	00:15	CST-6	Flash Flood		0	0	20.00K	0.00K
NEW DIXIE	PERRY CO.	AR	09/16/2009	08:00	CST-6	Flash Flood		0	0	50.00K	0.00K
NOGAL	PERRY CO.	AR	10/29/2009	18:15	CST-6	Flash Flood		0	0	25.00K	0.00K
HOUSTON	PERRY CO.	AR	10/29/2009	18:20	CST-6	Flash Flood		0	0	0.00K	0.00K
CASA	PERRY CO.	AR	04/25/2011	16:00	CST-6	Flash Flood		1	0	10.00K	0.00K
PERRY	PERRY CO.	AR	11/28/2015	17:46	CST-6	Flash Flood		0	0	0.00K	0.00K
PERRY	PERRY CO.	AR	06/03/2016	19:53	CST-6	Flash Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	04/26/2017	15:55	CST-6	Flash Flood		0	0	0.00K	0.00K
PERRY	PERRY CO.	AR	04/29/2017	23:14	CST-6	Flash Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	02/24/2018	15:15	CST-6	Flash Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	09/21/2018	17:26	CST-6	Flash Flood		0	0	0.00K	0.00K
ANTIOCH	PERRY CO.	AR	02/11/2019	12:12	CST-6	Flash Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	02/19/2019	23:02	CST-6	Flash Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	08/10/2019	06:29	CST-6	Flash Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/17/2021	06:30	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								1	0	192.00K	0.00K

Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

On April 25, 2011, in the city of Casa, the arrival of a slow-moving cold front and several low pressure areas aloft triggered several rounds of thunderstorms resulting in tornadoes and flash flooding. As a result of these heavy rains and flash floods, rivers, creeks, and bayous backed up onto land creating mass flooding. The driver of a feed truck exited his vehicle at a low water crossing to remove a large log that was in the road at Casa (Aplin Road and Deer Run Lane). While he was outside his truck, he was swept away by high water and killed.

There were 75 flood events reported between 01/01/2000 and 12/31/2023.

Number of County/Zone areas affected:	1
Number of Days with Event:	73
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	20
Number of Days with Event and Crop Damage:	10
Number of Event Types reported:	1

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	2.459M	1.450M
PERRYVILLE	PERRY CO.	AR	03/19/2008	14:00	CST-6	Flood		0	0	600.00K	100.00K
FOURCHE	PERRY CO.	AR	04/01/2008	00:00	CST-6	Flood		0	0	50.00K	0.00K
NOGAL	PERRY CO.	AR	04/11/2008	12:00	CST-6	Flood		0	0	250.00K	50.00K
COPPERAS GAP	PERRY CO.	AR	09/03/2008	07:00	CST-6	Flood		0	0	110.00K	0.00K
PERRYVILLE	PERRY CO.	AR	09/17/2009	01:26	CST-6	Flood		0	0	0.00K	25.00K
PERRYVILLE	PERRY CO.	AR	10/30/2009	09:00	CST-6	Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	11/01/2009	00:00	CST-6	Flood		0	0	0.00K	5.00K
NEW DIXIE	PERRY CO.	AR	12/24/2009	15:00	CST-6	Flood		0	0	25.00K	0.00K
HOUSTON	PERRY CO.	AR	05/20/2010	20:00	CST-6	Flood		0	0	1.00K	5.00K
HOUSTON	PERRY CO.	AR	04/25/2011	20:45	CST-6	Flood		0	0	20.00K	100.00K
HOUSTON	PERRY CO.	AR	04/26/2011	02:00	CST-6	Flood		0	0	300.00K	0.00K
NOGAL	PERRY CO.	AR	04/26/2011	18:30	CST-6	Flood		0	0	25.00K	100.00K
HOUSTON	PERRY CO.	AR	05/01/2011	00:00	CST-6	Flood		0	0	10.00K	50.00K
HOUSTON	PERRY CO.	AR	05/01/2011	00:00	CST-6	Flood		0	0	1.000M	1.000M
HOUSTON	PERRY CO.	AR	05/21/2011	21:00	CST-6	Flood		0	0	5.00K	10.00K
HOUSTON	PERRY CO.	AR	11/22/2011	11:25	CST-6	Flood		0	0	10.00K	0.00K
HOUSTON	PERRY CO.	AR	12/05/2011	13:30	CST-6	Flood		0	0	5.00K	0.00K
HOUSTON	PERRY CO.	AR	12/16/2011	08:00	CST-6	Flood		0	0	5.00K	0.00K
HOUSTON	PERRY CO.	AR	12/26/2011	13:00	CST-6	Flood		0	0	1.00K	0.00K
HOUSTON	PERRY CO.	AR	03/21/2012	06:30	CST-6	Flood		0	0	15.00K	0.00K
HOUSTON	PERRY CO.	AR	01/13/2013	12:30	CST-6	Flood		0	0	2.00K	0.00K
HOUSTON	PERRY CO.	AR	04/11/2013	12:40	CST-6	Flood		0	0	5.00K	0.00K
FOURCHE JCT	PERRY CO.	AR	05/31/2013	06:00	CST-6	Flood		0	0	0.00K	0.00K
FOURCHE JCT	PERRY CO.	AR	06/01/2013	00:00	CST-6	Flood		0	0	5.00K	0.00K
HOUSTON	PERRY CO.	AR	06/02/2013	09:45	CST-6	Flood		0	0	10.00K	0.00K
HOUSTON	PERRY CO.	AR	06/10/2014	03:45	CST-6	Flood		0	0	5.00K	5.00K
OAK GROVE	PERRY CO.	AR	03/13/2015	22:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/11/2015	05:30	CST-6	Flood		0	0	0.00K	0.00K

NOGAL	PERRY CO.	AR	05/26/2015	21:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	06/01/2015	00:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	06/21/2015	01:45	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	11/29/2015	18:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	12/01/2015	00:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	12/26/2015	10:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	01/01/2016	00:00	CST-6	Flood		0	0	0.00K	0.00K
OAK GROVE	PERRY CO.	AR	03/10/2016	12:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	04/30/2017	00:57	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/01/2017	00:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/12/2017	20:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/21/2017	13:52	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	02/21/2018	17:00	CST-6	Flood		0	0	0.00K	0.00K
ANTIOCH	PERRY CO.	AR	02/23/2018	09:20	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	03/01/2018	00:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	04/14/2018	20:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	11/01/2018	13:22	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	12/15/2018	18:25	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	01/05/2019	00:20	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	02/11/2019	17:07	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	02/20/2019	04:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	04/18/2019	14:33	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/02/2019	01:10	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/09/2019	03:05	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/24/2019	10:52	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	06/01/2019	00:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	06/24/2019	14:30	CST-6	Flood		0	0	0.00K	0.00K
RAVENDEN SPGS	PERRY CO.	AR	01/12/2020	07:35	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	02/13/2020	08:48	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	03/19/2020	00:00	CST-6	Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	04/01/2020	00:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/17/2020	05:41	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/23/2020	09:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/27/2020	16:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	09/02/2020	12:45	CST-6	Flood		0	0	0.00K	0.00K
PERRYVILLE	PERRY CO.	AR	03/26/2021	02:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	04/30/2021	05:55	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/01/2021	00:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/18/2021	12:22	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	06/02/2021	18:45	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	03/23/2022	15:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	04/26/2022	10:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	05/06/2022	18:30	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	06/08/2022	20:51	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	02/08/2023	20:00	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	03/03/2023	04:49	CST-6	Flood		0	0	0.00K	0.00K
HOUSTON	PERRY CO.	AR	03/24/2023	22:21	CST-6	Flood		0	0	0.00K	0.00K
Totals:								0	0	2.459M	1.450M

Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

On May 1, 2011, in the city of Casa, large amounts of rain from the day before created high waters to flow down from Missouri creating backwater flooding in the rivers, large creeks, and bayous. The Mississippi River was also experiencing unusually high stages, causing the White River and Arkansas River to back up near the river's confluence. Arkansas Farm Bureau estimated that more than 1 million acres of farmland was underwater for the State of Arkansas. This flooding closed parts of Highway 216. There was a reported one million dollars in property damage and one million dollars in crop damage.

In the months of January thru June of 2019, the city of Houston experienced multiple flood events. Heavy rainfall resulted in record river stages at 4 of the gauge sites in the area. The heavy rains overfilled upstream reservoirs. The release of water in addition to heavy rainfall flooded the Fourche LaFave River.

The Storm Events Database does not show loss of life, property, or crops due to flooding in 2019. However, the year 2019 reported historical rainfall leading to widespread flooding in the State of Arkansas. Perry County received 2 Disaster Declarations for flooding. Disaster Declaration 3414 on May 30, 2019, and Disaster Declaration 4441 on June 8, 2019. Perry County was awarded a Perry County FY 19 Flood Mitigation Assistance Grant on April 5, 2021. One residence on Toad Suck Road was acquired and is now committed to green space.

On February 14, 2020, in the city of Perryville, heavy rain brough flooding to several rivers including the Fourche LaFave River. This flood event along with continued raid affected the city of Houston from February to May of 2020.

On March 27, 2021, in the city of Perryville, heavy rains brought river flooding to the Ouachita, Fourche LaFave, and White Rivers. The heavy rains also brought river flooding to the city of Houston where the Fourche LaFave River and the Black River overflowed. The flooding in the city of Houston occurred from April to June 2021.

In the months of March to June 2022 heavy rains caused flooding in the city of Houston by overflowing the Fourche LaFave River.

The city of Houston once again experienced flood events from February to March 2023 when heavy rains overflowed the Fourche LaFave River.

Probability of Future Flood Events

Future Climate Indicators

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Temperature thresholds:							
Annual days with maximum temperature > 90°F	**60 days** 60 - 71	**89 days** 71 - 110	**92 days** 70 - 115	**101 days** 72 - 125	**108 days** 85 - 129	**112 days** 85 - 142	**140 days** 108 - 167
Annual days with maximum temperature > 95°F	**25 days** 22 - 29	**48 days** 24 - 70	**50 days** 33 - 84	**60 days** 26 - 89	**68 days** 43 - 103	**71 days** 42 - 110	**104 days** 65 - 142
Annual days with maximum temperature > 100°F	**6 days** 5 - 8	**17 days** 4 - 35	**19 days** 6 - 52	**25 days** 4 - 53	**32 days** 14 - 82	**34 days** 11 - 53	**66 days** 29 - 116
Annual days with maximum temperature > 105°F	**1 days** 0 - 1	**4 days** 0 - 11	**4 days** 0 - 22	**7 days** 0 - 14	**10 days** 2 - 45	**11 days** 2 - 28	**31 days** 8 - 86
Annual temperature:							
Annual single highest maximum temperature °F	**102 °F** 100 - 104	**106 °F** 102 - 109	**106 °F** 102 - 111	**107 °F** 102 - 111	**109 °F** 104 - 115	**109 °F** 105 - 113	**114 °F** 107 - 125
Annual highest maximum temperature averaged over a 5-day period °F	**99 °F** 97 - 100	**102 °F** 98 - 105	**102 °F** 98 - 108	**104 °F** 98 - 107	**105 °F** 101 - 111	**105 °F** 101 - 109	**110 °F** 104 - 120
Cooling degree days (CDD)	**1807 degree-days** 1739 - 1894	**2,302 degree-days** 1,986 - 2,686	**2,349 degree-days** 2,031 - 2,775	**2,544 degree-days** 2,113 - 3,055	**2,745 degree-days** 2,303 - 3,515	**2,803 degree-days** 2,234 - 3,553	**3,645 degree-days** 2,807 - 4,636

N/A = Data Not Available for the selected area

Climate Projections for Early Century (2015–2044)	Lower emissions	Higher emissions
Average annual total precipitation	49.9 Inches + 0.4 since 1976-2005	50.0 Inches + 0.5 since 1976-2005
Days per year with precipitation (wet days)	164.3 Days - 3.7 since 1976-2005	163.3 Days - 4.8 since 1976-2005
Maximum number of consecutive wet days	12.7 Days + 0.4 since 1976-2005	12.3 Days No change since 1976-2005
Annual days with total precipitation > 1 inch	9.7 Days + 0.5 since 1976-2005	10.0 Days + 0.7 since 1976-2005
Annual days with total precipitation > 2 inches	1.2 Days + 0.1 since 1976-2005	1.2 Days + 0.2 since 1976-2005
Annual days with total precipitation > 3 inches	0.2 Days No change since 1976-2005	0.2 Days No change since 1976-2005
Annual days that exceed 99th percentile precipitation	7.5 Days + 0.5 since 1976-2005	8.0 Days + 1.0 since 1976-2005

CMRA - Climate Mapping For Resilience and Adaptation (arcgis.com)

Climate mapping trends do not show a significant change in precipitation and how it relates to flooding. There is a slight increase in annual average total precipitation with a slight decrease in wet days per year. Data for the annual days with total precipitation for less than 1 inch, less than 2 inches, and less than 3 inches document very little increase or no change at all.

The probability for a flood event occurring in the Planning Area in any given year is less than one percent. The probability for a flood event was estimated using the following formula:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Data collected from 2000-2023 was equal to 8,395 days.

Vulnerability and Impact of Flood

The primary concerns for the Unincorporated areas of Perry County and the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville include the impact of flooding on crops, livestock, and timber plantations.

Flood events may wash out farm fields, resulting in lost crops and significant economic hardship for farmers.

Timber plantations may suffer from stress, root rot, and damage to seedlings due to the submersion and silt deposition.

Livestock are at risk of drowning in floodwaters, especially the young. This further exacerbates the economic strain on farmers and plantation owners.

In the entire Planning Area, floods can disrupt gas, electricity, and water services, contaminating the water supply and making it unsafe to drink. Homes, personal belongings, and businesses are at risk of significant damage or total loss. Particularly for those without flood insurance, leading to severe financial hardship from cleanup and rebuilding cost.

While the School Districts may not be directly impacted by flood waters due to their construction and location, flood events may still cause significant disruptions. Damaged or inundated roadways can impede the ability of students and staff to attend school. Additionally, contaminated groundwater can affect food preparation and drinking water at schools, leading to further complications.

Economic

Residential loss or damage. Businesses also suffer, not only from the loss of property, but the lack of customers during the flood and recovery. Farmers suffer from the loss of their crops/livestock.

Financial

Residents who do not carry flood insurance suffer a great financial hardship. Those who do have insurance get help with the clean-up, but some costs may still come out of pocket. Towns and cities impacted by a flood carry the financial burden of fixing the public buildings, roads and other structures damaged by the flood waters. People who are impacted by the flood may also lose wages because the business they work for suffered damages or they are unable to get to work.

Health

Flood water can also damage the health of those living and working in the area. Because flood waters can wash dangerous waste into water supplies, tap water may become unsafe to use if the local authorities do not issue a boil advisory warning everyone to boil water before ingesting it. Mold is also likely to grow in homes and other buildings engulfed by the flood waters. It is important to search all homes for mold and remove it completely before moving back in. Breathing the mold spores is dangerous for your health. A flood can also contribute to other health problems from human waste contaminating the ground.

Safety

Once flooding begins, strong currents can pull a grown man beneath the water to drown. Once the flood waters have settled, it is still unsafe to wander through the water by car or on foot. Deep spots may be undetectable and there may be electric currents running through the water.

Rural Impact

Floods damage farmland by burying crops in silt, uprooting crops by the force of the water or drowning crops. Flood waters can drown livestock as well. Flooding devastates wetlands and other wildlife habitats by depositing massive amounts of silt or leaving behind toxic substances such as petroleum products, fertilizers and pesticides and other man-made chemicals. This can kill animals and lead to water and land pollution.

Disease

Flooding increases human exposure to dysentery and other diseases. Flooded sewage treatment plants contaminate drinking water supply.

Population

Population may have an impact on flood events when there is a shift in population size and composition. Population growth and urbanization alter the natural landscape. This results in loss/addition of natural landscaping such as trees, grass, and rock. Building structures to accommodate growth influences climate and the natural path of water flow. Population growth/density will place a larger number of people at risk for injury or death. The shift could create limited escape routes. Rising populations could mean that more people are vulnerable to a flood event. Population growth will increase the need for mitigation measures to protect people, property, resources, and the natural environment.

There have been no research studies on population and flood risk for the Planning Area. Over the next five years the Planning Team will need to research and document the shift in population and its effect if any on flood events.

Land Use

Changes in land cover such as urbanization, deforestation and cultivation may result in increased flood frequency and severity. Urbanization may result in a lack of the natural environment's capacity to absorb water. Loss of vegetation and forest clearing disrupts the natural environment's process of evaporating water from both the soil and leaves of plants.

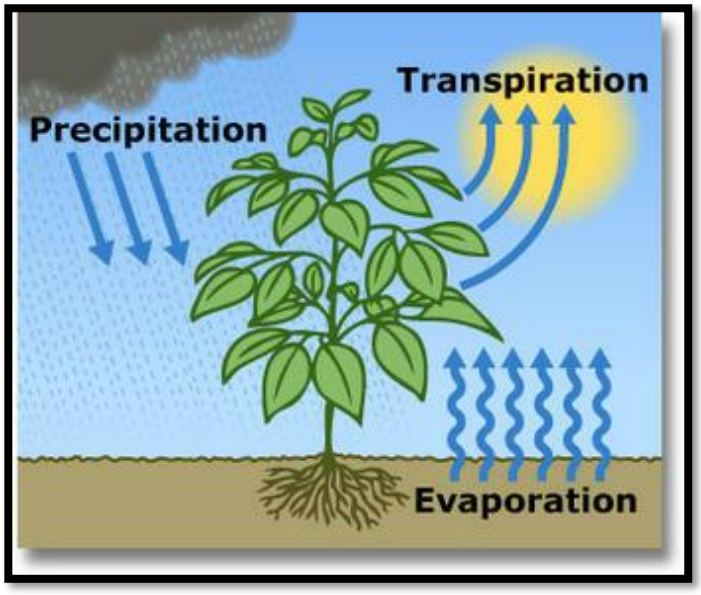
Flooding results in poor soil aeration, leading to poor plant growth. Soil becomes more acidic following a flood. In addition, flooding can lead to soil erosion or soil contamination from such man-made pollutants as oils (on roadways), fertilizers (in yards and farms) and paints.

Flooding can severely stress or even kill trees, depending on how deeply or how long they remain submerged. Floods kill trees that are completely covered by water and seedlings pushed over by the force of the water or buried under silt. Prolonged flooding can cause root rot, leading to tree death. Prior tree health plays a role in whether the trees survive after flooding.

Currently there is no documented research for the Planning Area on land use and its effect on flood events. Over the next five years the Planning Team will need to conduct and document research on the effects of land use and flood events in the Planning Area.

Climate

Climate change may have an impact on flooding. Changes in temperatures impact the frequency and severity of flood events. Warmer temperatures could cause increased amounts of precipitation. The Planning Area is currently trending both higher temperatures and more days each year of extreme heat. These warmer temperatures, in addition to population distribution and land use, affect the amounts of water evaporating from the land. This process called evapotranspiration, impacts atmospheric temperature changes. Higher rates of evapotranspiration can have a cooling effect on the land's surface and aid the natural environment's ability to filter water.



https://www.usgs.gov/special-topics/water-science-school/science/evapotranspiration-and-water-cycle

The Planning Area does not have any documented research on climate change and its effects on flooding. Over the next five years the Planning Team will need to research and document climate changes and their effect on frequency and size of flood events.

Repetitive Loss

Repetitive loss information was provided by Whit Montague, Arkansas Natural Resources. No personal identifiable information will be presented. Information is as of 3/5/2024.

Repetitive Loss/ Sever Repetitive Loss	Number of Loss Properties	Total Losses	Total Building Payments	Total Contents Payments
Repetitive Loss	4	10	$249,092.26	$0.00
Severe Repetitive Loss	2	6	$199,911.82	$0.00

There were 4 repetitive loss properties in the Planning Area totaling $249,092.26 and 2 severe repetitive loss properties totaling $199,911.82.

Vulnerability of Estimating Potential Loss

The entire Planning Area is vulnerable to one or more types of flood events. Loss of life and injuries are possible. Expect damage to residential and business structures, transportation systems, disruption of utility services, and major environmental damage.

4.8.6 Landslide

"Landslide" is used to describe the downward and outward movement of slope-forming materials reacting under the force of gravity. Landslides are classified by type of movement and type of materials. The types of movement are:

- Slides of soil or rock involve downward displacement along one or more failure surfaces. The material from the slide may be broken into several pieces or remain a single, intact mass.
- Flows are characterized by shear distributed throughout the mass of material.
- Lateral Spreads are large elements of distributed, lateral displacement of materials characterize lateral spreads.
- Falls and topples occur when masses of rock or other material detach from a steep slope or cliff, and descend by free fall, rolling, or bouncing.

Extent, Magnitude or Severity of Landslide:

Landslide movement is measuring using an extensometer. This is an instrument that can detect movement of the ground surface between stable ground and sliding ground. Mapping and observations are other ways of detecting landslide activity.

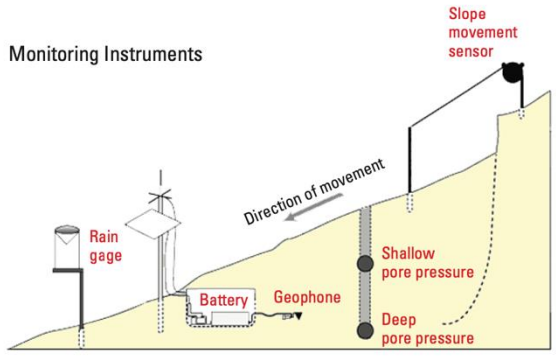
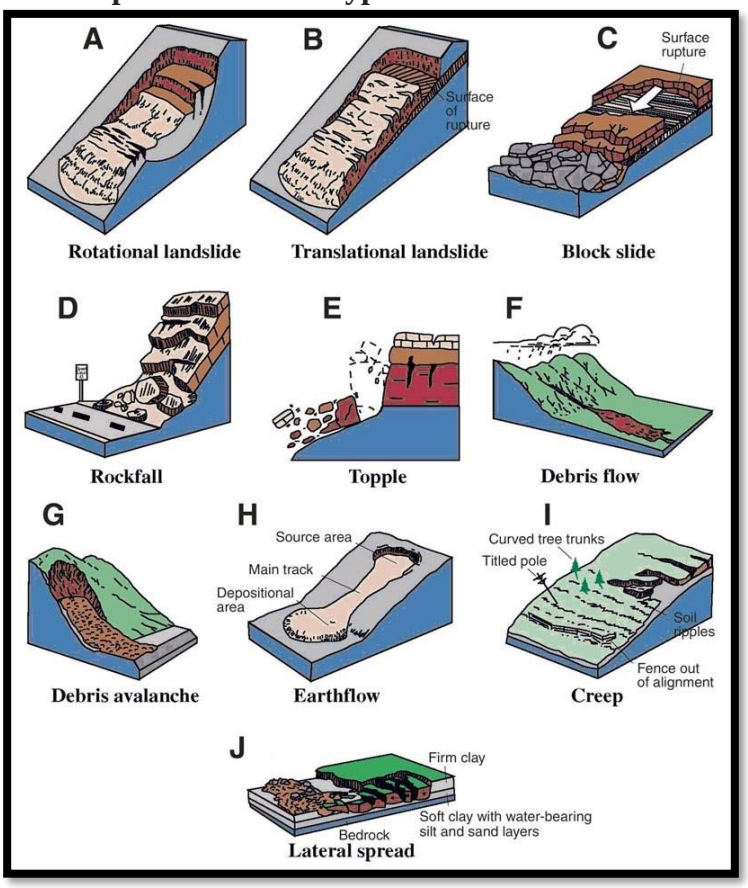


Figure B10. Example of a network for measurement and transmission of real-time landslide data. (Schematic from U.S. Geological Survey.)

As can be seen in the figure below, slope movement can occur in multiple ways. They typically start on steep hillsides such as the ones surrounding Petit Jean Mountain. Landslides may occur with or without warning and travel up to 35 mph. Historically, landslides have been responsible for moving up to 1,000 tons of rock, dirt, and debris. If a landslide were to occur, it is expected that the extent would be classified as a rock fall, topple, or slide.

Examples of different types of landslide movement



(modified from Cruden and Varnes, 1996)

Location of Landslide Events

There are no recorded landslide events in the Storm Events Database between the dates of 01/01/2000 and 12/31/2023. Landslides were not addressed in the 2017 Hazard Mitigation Plan.

Previous Occurrences

There are no recorded landslide events in the Storm Events Database between the dates of 01/01/2000 and 12/31/2023. Landslides were not addressed in the 2017 Hazard Mitigation Plan.

Probability of Future Landslides

The probability for a landslide event occurring in the Planning Area in any given year is less than one percent. The probability for a landslide event was estimated using the following formula:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Data collected from 2000-2023 was equal to 8,395 days.

Vulnerability and Impact of Landslides

Landslides have the capability of burying people, animals, and homes. Landslides may damage or destroy critical infrastructure. Landslides have been known to damage and destroy roads, bridges, and rail lines. Landslides may cause a disruption in utility services and communication lines.

Landslides can be unpredictable and may move fast or slow. There may be little to no warning before a landslide event.

A large portion of the Planning Area is rural. Those most vulnerable to a landslide event would be children under the age of 5, adults over the age of 65, those that are disabled or dependent on medical equipment, and those suffering from homelessness.

Population, Land Use, and Climate

Population density influences both the natural landscape and climate.

As people build, they remove rock, dirt, trees, and grass. They build structures for homes, businesses, and infrastructure. Areas that were once full of trees become prime real estate or farmland to meet increased food demands. These changes in structure, weight and landscape alter the vulnerability and impact of a landslide. The human-made changes in topography and vegetation impact the earth's natural balance. Cutting roads, building retaining walls, adding concrete, or clearing vegetation for farmland may weaken slopes. According to research by the American Geophysical Union in 2021, urban areas are at a greater risk for precipitation-triggered landslides than rural areas.

As population dynamics and climate patterns undergo transformation, their combined impact and associated vulnerabilities also evolve. A growing population necessitates the construction of additional infrastructure, thereby heightening the likelihood of resource depletion, property damage, and loss of life in the face of adverse events. The shifting demographic and climatic landscape highlight the need for comprehensive analysis by the planning team.

According to *thinkhazard.org* climate change is likely to alter the slope and bedrock stability due to changes in precipitation and temperature. However, it is difficult to determine the time and location of landslides due to other factors that do not include climate.

Currently, the Planning Area lacks documented research concerning the effects of population, land use, and climate change on landslide events. These impacts will be monitored by the planning team over the next 5 years to continue research for nature-based solutions to mitigate all possibilities of potential increased impact.

4.8.7 Thunderstorm

Thunderstorms are formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as warm or cold fronts.

Thunderstorms can bring heavy rains, strong winds, hail, lightning, and tornadoes.

Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm.

Hail - Hail is a form of precipitation occurring when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice. Hail can damage aircraft, homes, and cars, and can be deadly to livestock and people.

Strong Winds - also referred to as straight-line wind, is any wind that is not associated with rotation. This term is used mainly to differentiate thunderstorm winds from tornado winds. High winds originate as a downdraft of rain-cooled air, which reaches the ground and spreads out rapidly. This can produce a potentially damaging gust of wind up to and sometimes over 100 mph. In recent years, there have been several occasions in Arkansas where winds greater than 100 mph have been measured. Winds of 58 mph (50 knots) or more are considered severe. The horizontal component of near-surface wind phenomena is the most significant aspect of the hazard.

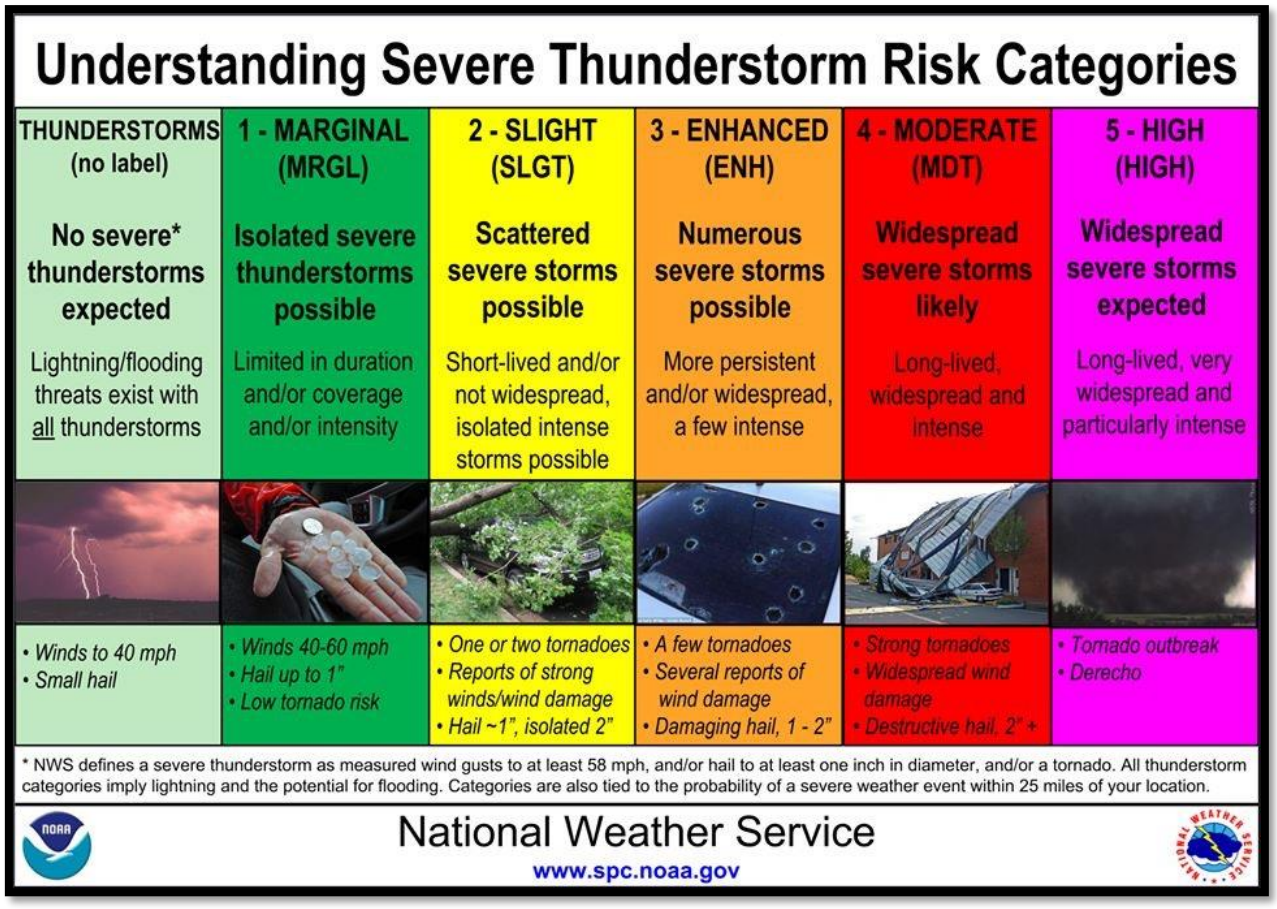
Extent, Magnitude, or Severity

All plan participants experience thunderstorms, lightning, strong winds and hail events. All parts of the planning area are equally subject to thunderstorms ranging from marginal (TS1) to high risk (TS5).

Location of Thunderstorm, Lightning, Strong Winds, and Hail Events

Thunderstorm, lightning, strong winds and hail events do not have any geographical boundaries in the Planning Area. The entire planning area is capable of experiencing thunderstorm, lightning, strong winds and hail events.

TS Scale



Damage from severe thunderstorm winds account for half of all severe reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damaged path extending for hundreds of miles.

Previous Occurrences

Event	Events	Fatalities	Injuries	Property Damage/Crop Damage	Total Loss
Thunderstorm winds	97	0	0	25	$989,000.00
Strong Winds	8	0	0	8	$362,000.00
Lightning	0	0	0	0	$0.0
Hail Events	59	0	0	1	$252,000.00

Storm Events Database - Search Page | National Centers for Environmental Information (noaa.gov)

There has been a total of 156 events over the last 23 years. There have been no reported injuries for thunderstorm, strong winds, and hail events. There have been 34 events with property or crop damage totaling $1,603,000.00.

There have not been any reports of lightning events in the Planning Area from the year 2000 to the year 2023. Although, July 21, 2018, the death of a horse by lightning strike is reported for the city of Houston.

July 21, 2018, in the city of Houston, trees and power lines were blown down during a thunderstorm wind event with winds of 60-70 mph. A well-built tractor shed was destroyed, and a garage had it top blown off by thunderstorm winds of 80-90 mph. $100,000.00 in damages were reported.

January 29, 2008, a strong cold front arrived in the early afternoon hours. Wind speeds of 30-40 mph were reported with gusts over 50 mph. Approximately 80,000 power outages occurred and multiple power lines across the Planning Area were reported down. Numerous trees were reported down across the Planning Area. Six houses reported roof or structural damage. Bigelow High School sustained substantial damage to the roofs of the administration building and the agricultural building. Reported property damage totaled $250,000.00.

May 16, 2010, in the town of Thornburg, a stalled front in Arkansas became active as low pressure moved in. The result was the development of severe storms resulting in hail up to 2 inches in diameter. Broken windows dented and torn house siding, damaged roofs, broken windshields, and ruined gardens were reported in the Union Valley Community. Damages totaled $250,000.00.

Probability of Future Occurrences

The probability for a thunderstorm, strong wind, lightning, or hail event occurring in the Planning Area in any given year is 1.86 percent. Probability was estimated using the following formula:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Data collected from 2000-2023 was equal to 8,395 days.

Climate change may increase the probability and strength of thunderstorms and associated hazards. These impacts will be monitored by the planning team over the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact.

Vulnerability and Impact for Thunderstorm Events

The threat of thunderstorms, strong winds, lightning, and hailstorms affect the entire Planning Area.

People, wildlife, livestock, timberland, farmland, and crops in the Planning Area are vulnerable to damage by thunderstorms winds, strong winds, lightning strikes, and hailstorms.

Strong winds can down trees and power lines. Strong winds may damage mobile homes that are not anchored and rip off roofing. Strong winds may cause death and injuries by lifting unanchored objects and turning them into flying missiles.

Lightning strikes can cause structural, timberland, and grass fires. Lightning may cause damage to the communication towers throughout the Planning Area and disrupt service. Lighting strikes may cause injury or death to people and animals if they are struck.

Hailstorms could cause damage to all structures, mainly roof shingles which can lead to roof leaks and further damage to the structure interiors. All types of real estate and personal property are vulnerable to hail, such as cars, trailers, boats, and crops. Hailstorms can cause bodily injury to people and animals if caught outside without protection.

Population changes in the Planning Area and its effect on thunderstorm events are unknown. Historically there have not been any injuries or deaths due to thunderstorm events. However, changes in population demographics could potentially increase the need for mitigation in the Planning Area due to thunderstorm events. Over the next five years the Planning Team will need to monitor and document an increase/decrease in population as well as track demographics to see if there is a rise or decline in vulnerable populations.

Land use changes can have an impact on atmospheric temperatures. Urbanization creates higher air temperatures compared to the surrounding rural areas. The Planning Team will need to monitor and document land use changes to see if they correlate with an increase/decrease in thunderstorm events over the next five years.

Climate change may increase the probability and strength of thunderstorms and associated hazards. These impacts will be monitored by the planning team over the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact.

4.8.8 Tornado

A tornado is a rapidly rotating vortex or funnel of air extending groundward from a cumulonimbus cloud.

Tornado damage severity is measured by the Enhanced Fujita Scale. The Enhanced Fujita Scale assigns numerical values based on wind speeds and categorizes tornadoes from EF-0 to EF-5. Scale values above EF-5 are not used because wind speeds above 318 mph (513km/h) are unlikely.

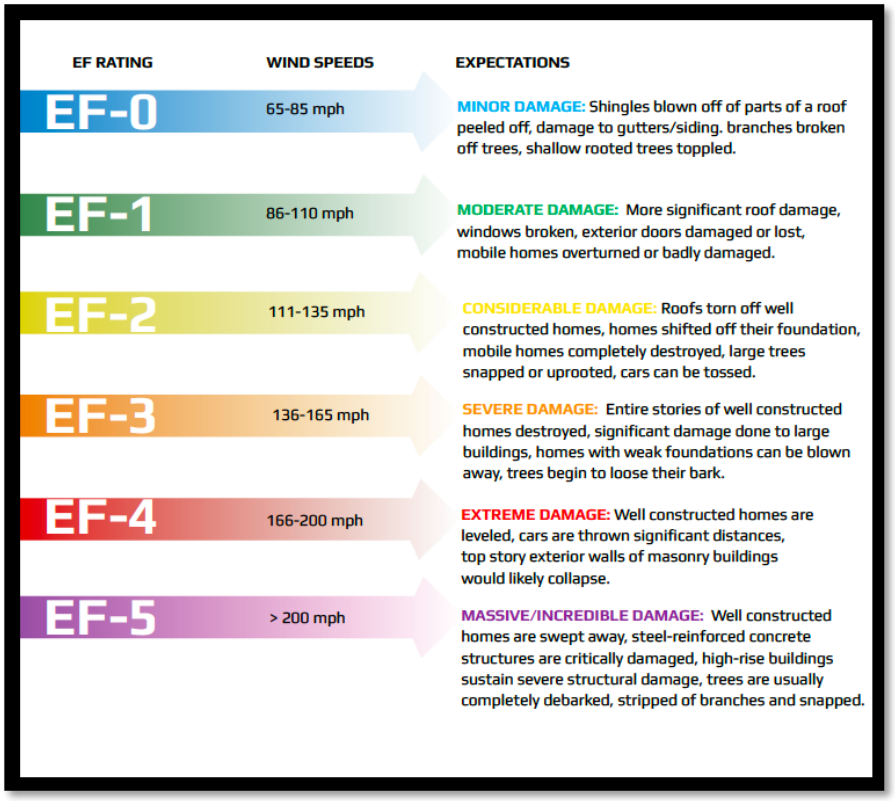
Locations of Tornado Events

There are no defined geographic hazard boundaries. All people and property in the Planning Area are exposed to the risk of a tornado event.

Extent, Magnitude, or Severity of Tornado

The entire Planning Area is exposed to the risk of a tornado event any time of the year. The Planning Area could have a tornado ranging from EF-0 to EF-3 causing minor to severe damage.

Enhanced Fujita Scale



https://www.weather.gov/oun/efscale

Previous Occurrences

There have been 11 tornado events reported between 01/01/2000 and 12/31/2023. There are no recorded injuries or deaths, $4,745,000.00 in property damage and $0.00 in lost crops.

Number of County/Zone areas affected:	1
Number of Days with Event:	7
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	5
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	4.745M	0.00K
CASA	PERRY CO.	AR	05/16/2003	15:20	CST	Tornado	F1	0	0	0.00K	0.00K
WILLIAMS JUNCTION	PERRY CO.	AR	05/16/2003	15:27	CST	Tornado	F0	0	0	0.00K	0.00K
WILLIAMS JUNCTION	PERRY CO.	AR	05/16/2003	15:37	CST	Tornado	F0	0	0	0.00K	0.00K
THORNBURG	PERRY CO.	AR	11/27/2005	17:41	CST	Tornado	F3	0	0	4.000M	0.00K
WILLIAMS JUNCTION	PERRY CO.	AR	11/27/2005	18:25	CST	Tornado	F1	0	0	0.00K	0.00K
APLIN	PERRY CO.	AR	09/13/2008	15:03	CST-6	Tornado	EF1	0	0	20.00K	0.00K
HOUSTON	PERRY CO.	AR	09/13/2008	15:20	CST-6	Tornado	EF1	0	0	5.00K	0.00K
WILLIAMS JUNCTION	PERRY CO.	AR	02/24/2011	16:00	CST-6	Tornado	EF1	0	0	15.00K	0.00K
THORNBURG	PERRY CO.	AR	04/25/2011	17:21	CST-6	Tornado	EF1	0	0	700.00K	0.00K
WYE	PERRY CO.	AR	03/13/2016	17:16	CST-6	Tornado	EF0	0	0	5.00K	0.00K
NOGAL	PERRY CO.	AR	06/18/2023	01:12	CST-6	Tornado	EF0	0	0	0.00K	0.00K
Totals:								0	0	4.745M	0.00K

Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

On November 11, 2005, a strong EF3 tornado touched down over southern Perry County. This tornado produced around $4,000,000.00 in property damage. This tornado had a length of 19 miles, width of 800 yards, and produced winds around 160 mph. The tornado snapped trees down in the Ouachita National Forest. As it emerged out of the National Forest it knocked down eleven large steel towers on a 500-kilovolt power line. It continued to track northeast destroying a sawmill along with several houses. Numerous vehicles were damaged or destroyed along with numerous barns and outbuildings. Several chicken houses sustained damage as the tornado moved into Conway County.

On September 9, 2008, an EF-1 tornado began in the town of Aplin. This tornado had a length of 1.3 miles and a width of 75 yards. This tornado was spawned by Tropical Storm Ike. There were trees blown down and one large tree fell on a mobile home resulting in $20,000.00 in damage.

On April 25, 2011, an EF1 tornado began in the town of Thornburg. This tornado had a length of 5.95 miles, a width of 300 yards, and produced $700,000.00 in property damage. This tornado was the result of a slow-moving front from the 24th-25th resulting in several rounds of thunderstorms and flash flooding. The worst damage occurred at Heifer International ranch. Heifer International had several roofs torn off and thrown into adjacent fields. Even though they had several hay barns destroyed, no animals on the ranch were harmed.

Other damage that occurred in the area included damaged roofs, destroyed vehicles, damaged barns and outbuildings, downed trees and powerlines. There are no reports of injuries or deaths.

Probability of Future Occurrences

There is less than one percent chance of a tornado occurring in any given year. Probability is estimated using the following equation:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Data collected from 2000-2023 was equal to 8,395 days.

Vulnerability and Impact of Tornado

The Planning Area is located in “Tornado Alley”, the most tornado prone area of the nation.

Because there is no defined geographic hazard boundary, all areas, residents, structures, and critical facilities in Planning Area are at high risk from tornado events.

People, wildlife, and livestock in the Planning Area, are all vulnerable to tornados and airborne objects. Fatalities can occur with a tornado event. Those that are most vulnerable are children under the age of 5, older adults over the age of 65, those with disabilities, those suffering from economic hardship and the unhoused. Even with advances in meteorology, tornado warning times may be issued in a short period of time.

All infrastructure in the Planning Area is vulnerable to a tornado event. This includes energy, gas, communication, and transportation. Electrical wires and communication towers are the most vulnerable to tornados. Downed power lines combined with other debris from the tornado can cause delay in travel, injury or death. Power and water outages would cause food spoilage and sanitation problems for communities, increasing the chance of disease. Power outages and water outages during seasonal heat or cold could contribute to fatalities.

All critical facilities in the Planning Area are vulnerable to a tornado event. This includes nursing homes, clinics, hospitals, day care centers, and schools. At least one of these facilities is located in every part of the Planning Area. These facilities house a large portion of the Planning Areas most vulnerable populations. Infrastructure and utility outages caused by a tornado event could prevent staff and emergency workers from working. Supply shipments may be interrupted leaving people without basic necessities and medications. Schools may be forced to close for a short term or longer.

All businesses in the Planning Area are vulnerable to a tornado event. Businesses could receive minor to major damage or be completely destroyed. Damage or destruction of a business could lead to economic hardship for individual business owners, economic damage to the Planning Area, or hazardous waste/contamination.

All residences in the Planning area are vulnerable to a tornado event. Residential structures may receive mild damage or be completely destroyed. Damage to residential structures could cause a significant number of people to be without shelter or live in unsafe conditions.

The natural environment is vulnerable to a tornado event. Trees may be ripped out of the ground clearing large areas of forest. Change to the natural landscape could have a cascading effect on the Planning Area.

The structures most vulnerable to tornadoes are wood frame structures and manufactured homes. Damage to residential structures could cause hundreds to be without shelter leaving them with no place to live.

Population

As population rises and cities become denser the impact of tornados changes. It is not the frequency of tornadoes that changes due to population changes. It is the level of damage that can result due to higher populations, structures, automobiles, and other objects that can be thrown around damaging property and injuring/killing people. The most vulnerable population in the planning area will be those who are unable to take adequate shelter due to disability, age, or poverty levels. These impacts will be monitored by the planning team over the next 5 years to continue research for nature-based solutions to mitigate all possibilities of potential increased impact.

Land Use

The Planning Area does not currently have any documented research on how land use in the Planning Area would affect tornado events. The Planning Area is currently experiencing a slight increase of population. This may create a change in land use patterns and the natural environment. Land use changes can have an impact on atmospheric temperatures. Urbanization creates higher air temperatures compared to the surrounding rural areas. The Planning Team will need to monitor and document land use changes to see if they correlate with an increase/decrease in tornado events over the next five years. The Planning Team will need to research nature-based solutions to mitigate all possibilities of potential increased impact.

Climate

Climate change caused by population growth, burning of fossil fuels, release of carbon dioxide in larger amounts has an impact on global warming. Global warming is attributed to drought in some places and higher levels of rainfall in others. However, nationalgeographic.org states that weather events such as tornadoes are much harder for climatologists to attribute to climate change. As of right now the data does not support any long-term increase in tornado frequency.

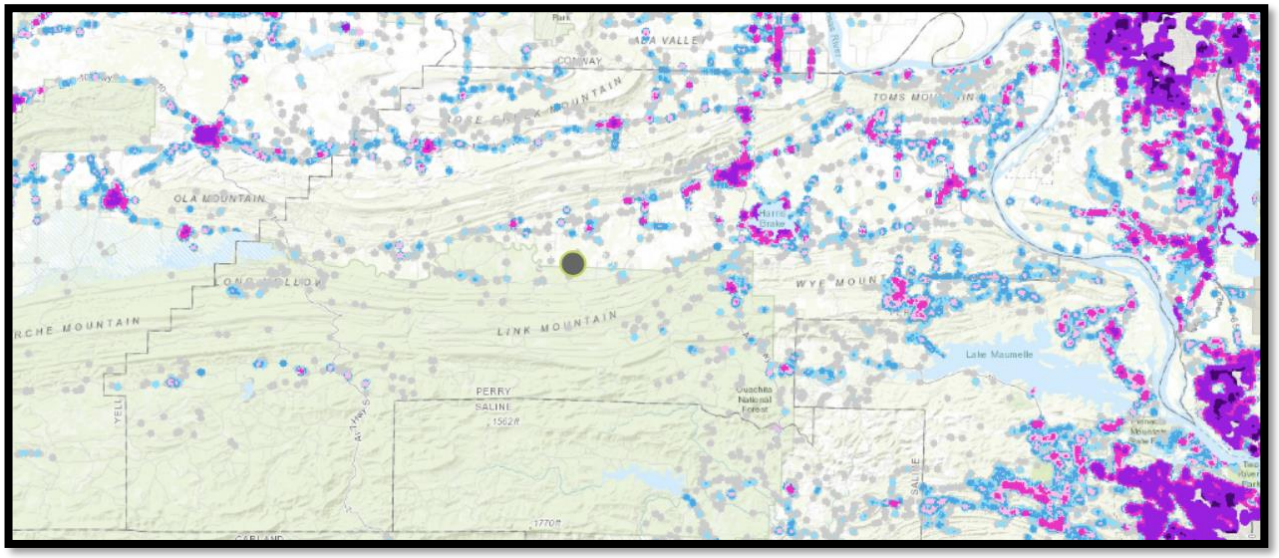
4.8.9 Wildfire

A wildfire is an unplanned, unwanted fire burning in a natural area, such as a forest, grassland, or prairie. Wildfires can start from natural causes, such as lightning, but most are caused by humans, either accidentally or intentionally. Wildfires can damage natural resources, destroy homes, and threaten human lives and safety. (FEMA)

Locations Affected by Wildfires

According to the Southern Group of State Foresters, the Wildland Urban Interface (WUI) provides the best assessment of wildfire risk to humans. WUI reflects housing density depicting where humans and their structures meet or intermix with wildland fuels. The darker purple indicates a higher population in proximity to burnable areas.

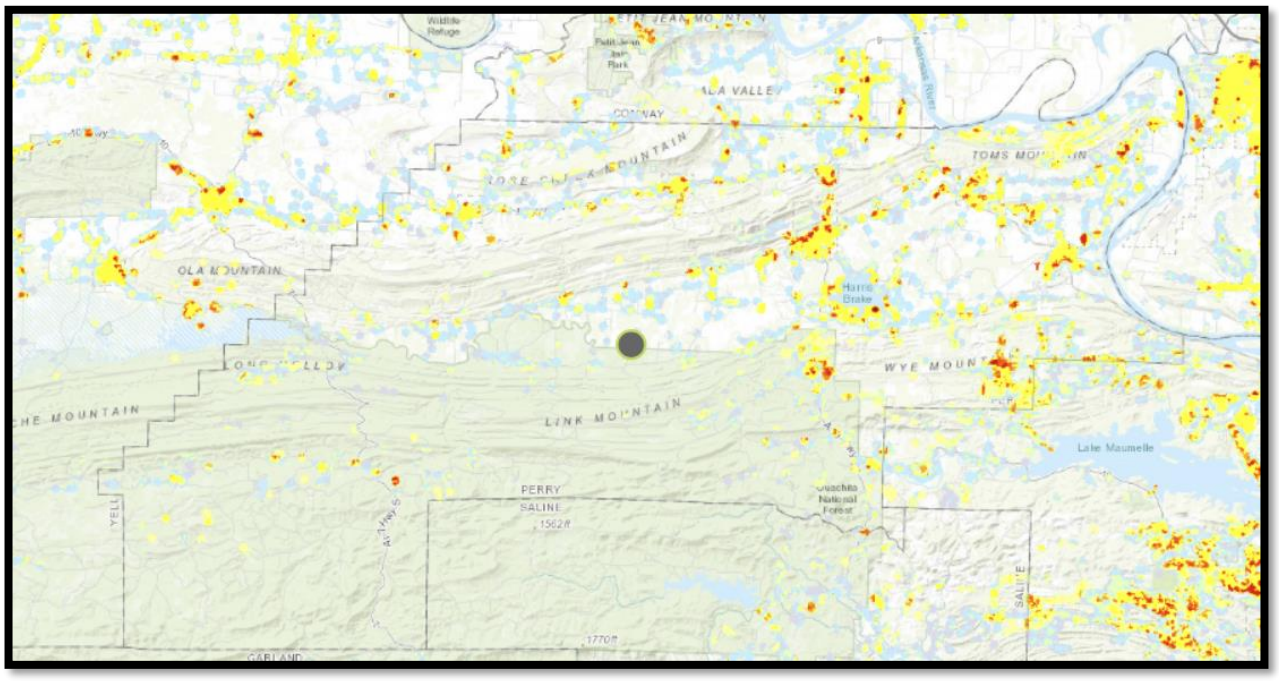
Wildland Urban Interface (WUI)



SGSF WRAP - Basic Viewer (southernwildfirerisk.com)

The WUI Risk Index visualizes the potential impact of a wildfire on people and their homes. The Risk Index is based on WUI (housing density) and the susceptibility to fire at different intensity levels, such as flame length. Areas with a high housing density and high flame length have a higher risk than areas with low housing density and low flame lengths. Locations in red determine where the greatest potential impact to homes and people is likely to occur.

WUI Risk Index



SGSF WRAP - Basic Viewer (southernwildfirerisk.com)

Extent, Magnitude and Severity of Wildfires

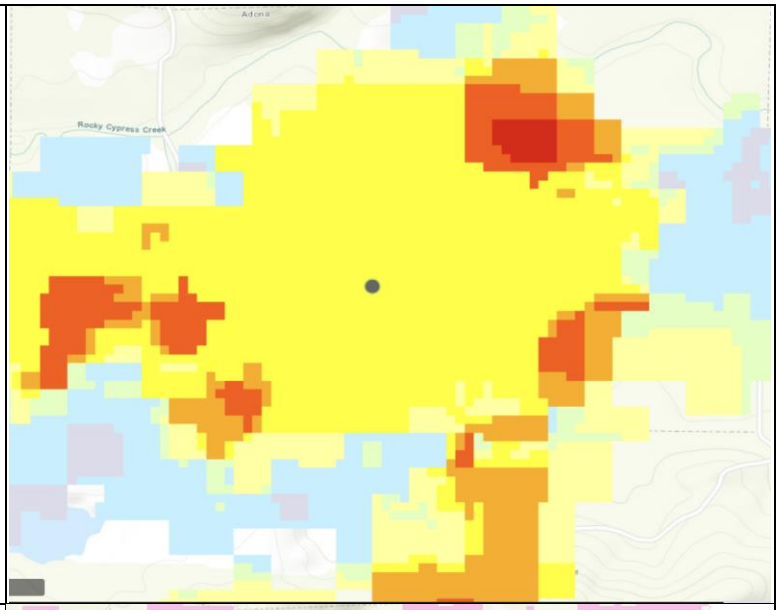
Two methods were used to analyze wildfires risk and mitigation for each plan participant. First, the WUI Risk Index was reviewed to determine the areas with the highest potential impact of wildfire on people and their homes.

Second, Community Protection Zones (CPZs) were evaluated. CPZs are based on an analysis of the housing density data and surrounding fire behavior potential. Primary CPZs represent those areas considered the highest priority for mitigation planning activities. Secondary CPZs are determined using the rate of spread data to determine buffer areas around populated areas within a 2-hour fire spread distance.

City of Adona

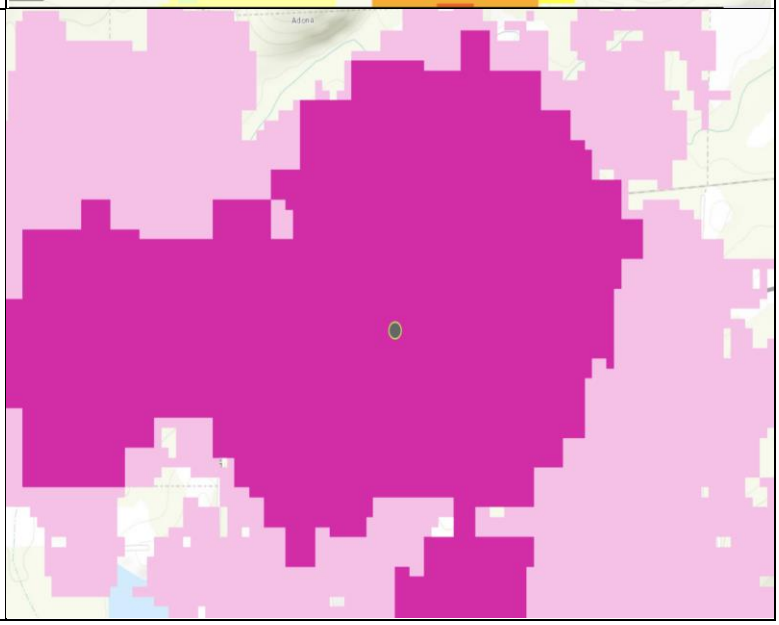
WUI Risk Index

-9	Major Impacts
-8	
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts



Community Protection Zones (CPZs)

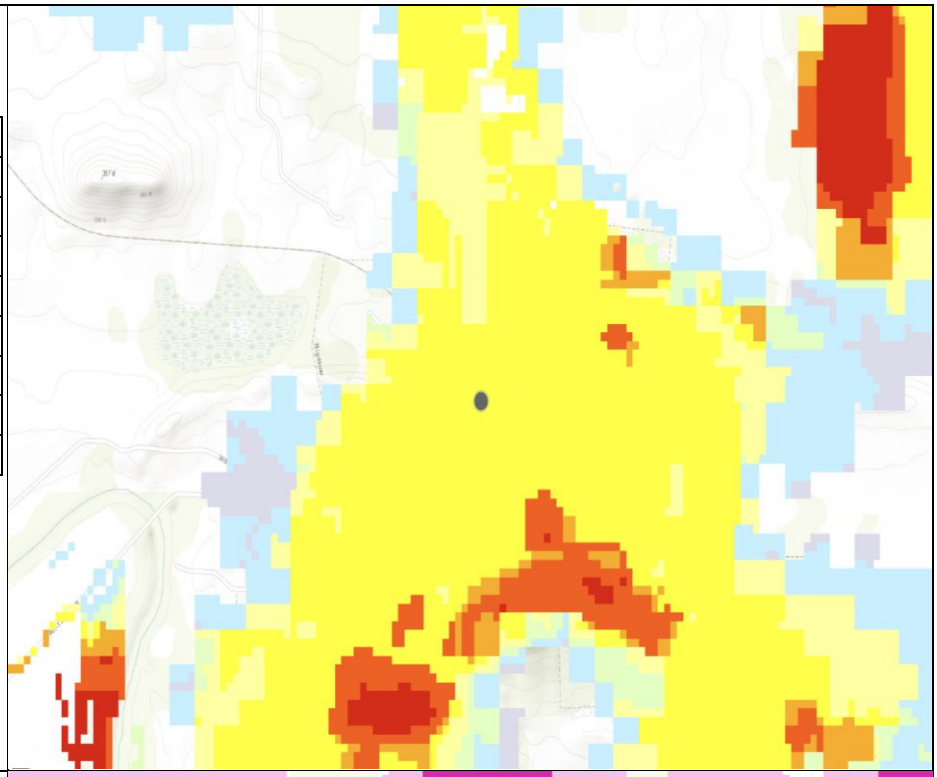
	Primary CPZs
	Secondary CPZs



City of Bigelow

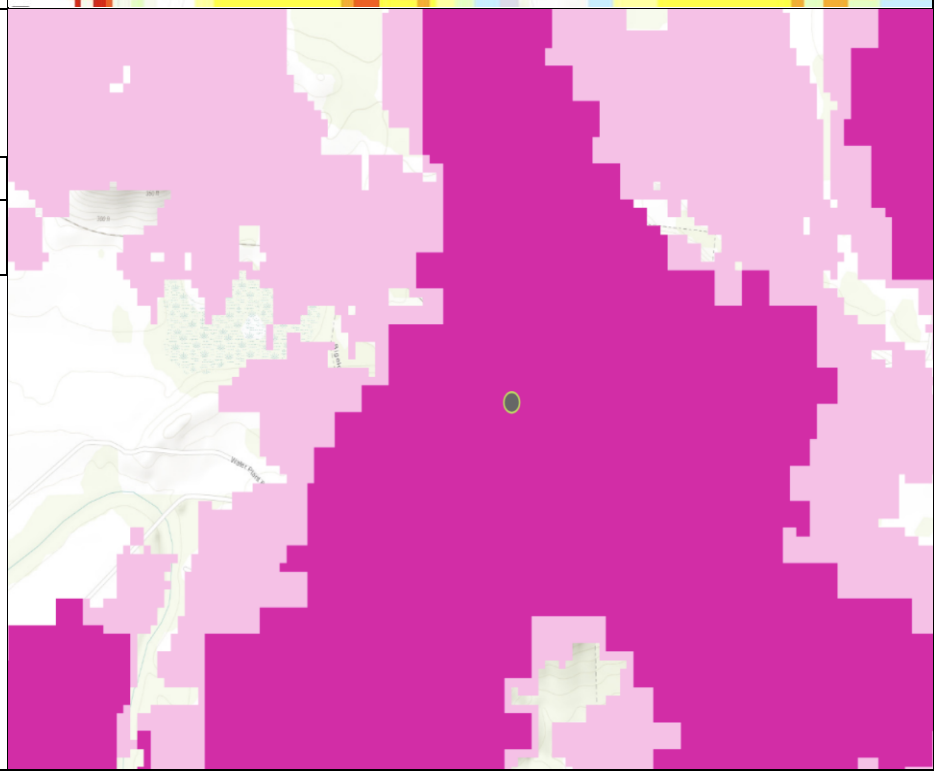
WUI Risk Index

-9	Major Impacts
-8	
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts



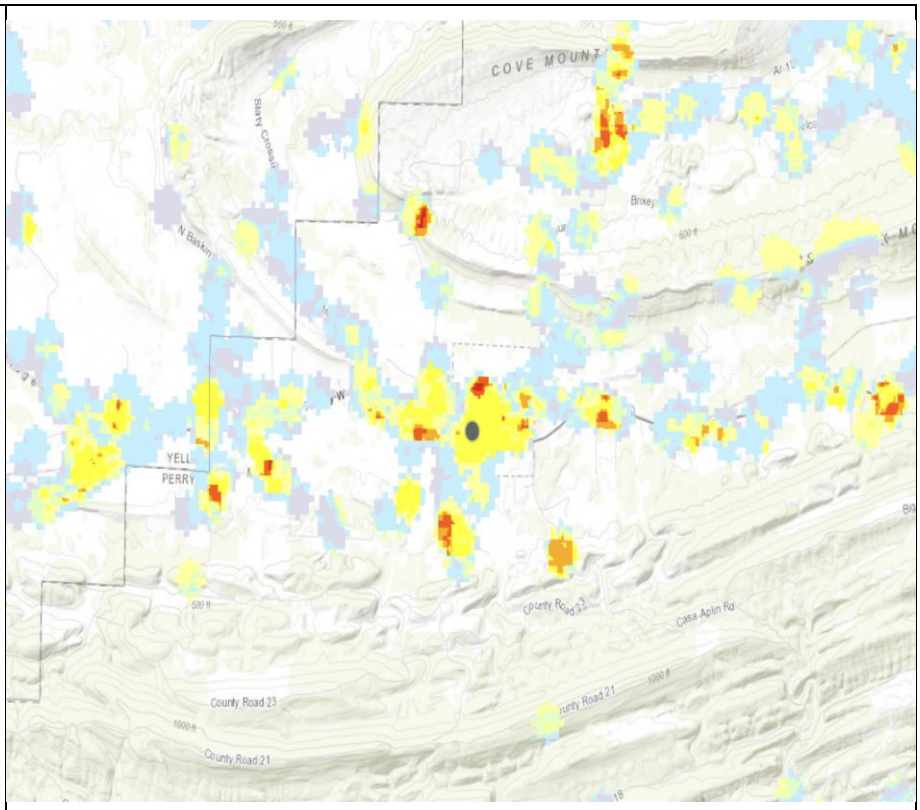
Community Protection Zones (CPZs)

	Primary CPZs
	Secondary CPZs



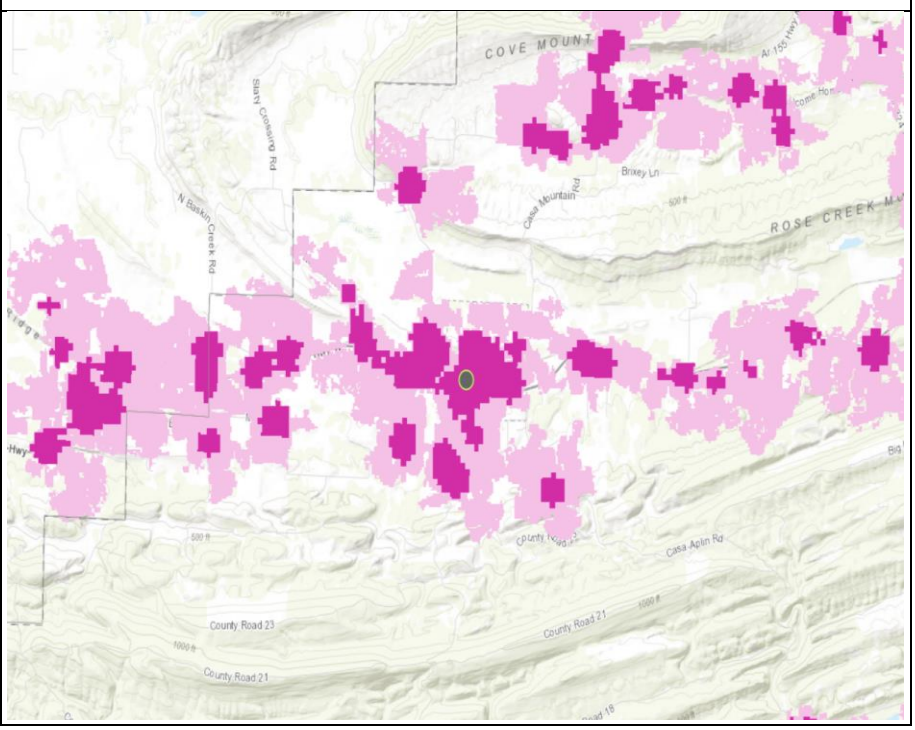
WUI Risk Index

-9	Major Impacts
-8	
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts



Community Protection Zones (CPZs)

	Primary CPZs
	Secondary CPZs



WUI Risk Index

-9	Major Impacts
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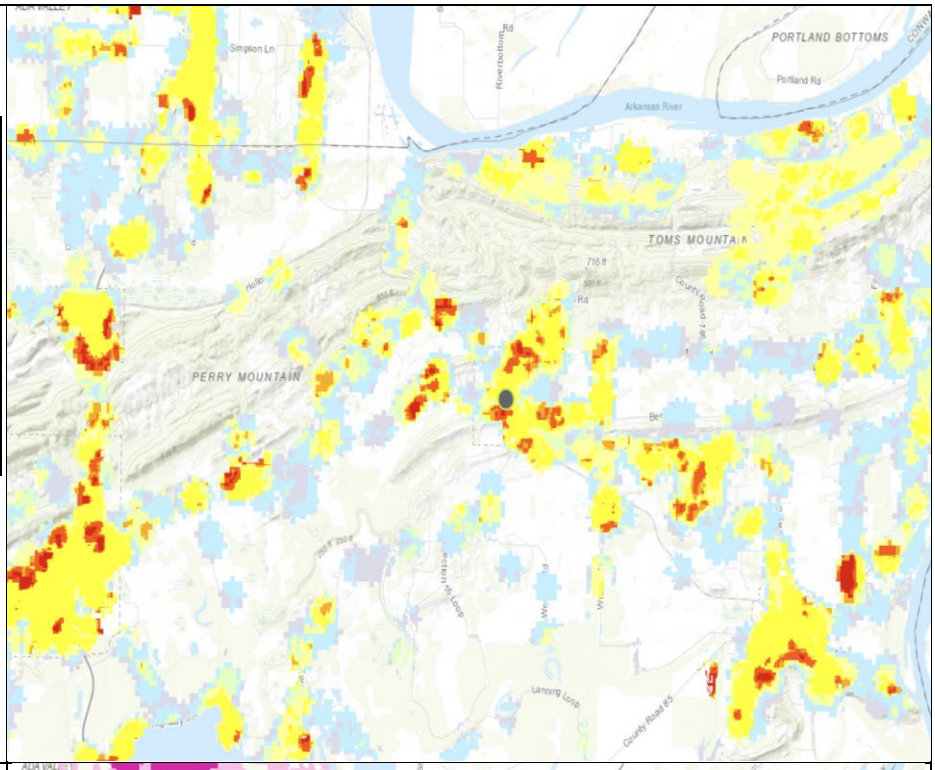
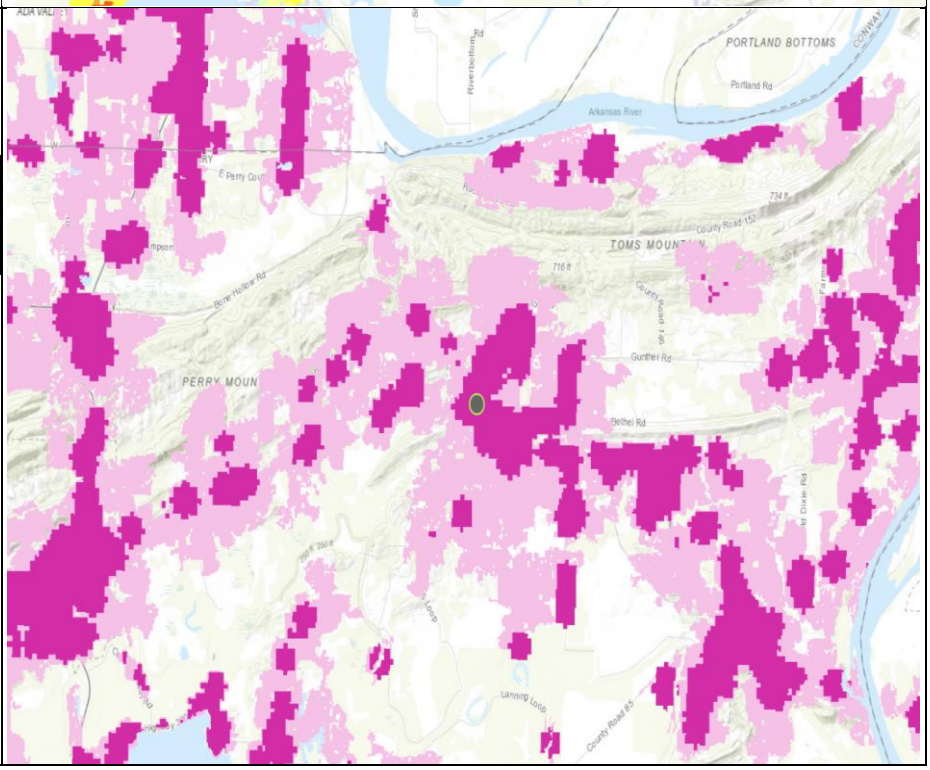
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts



Community Protection Zones (CPZs)

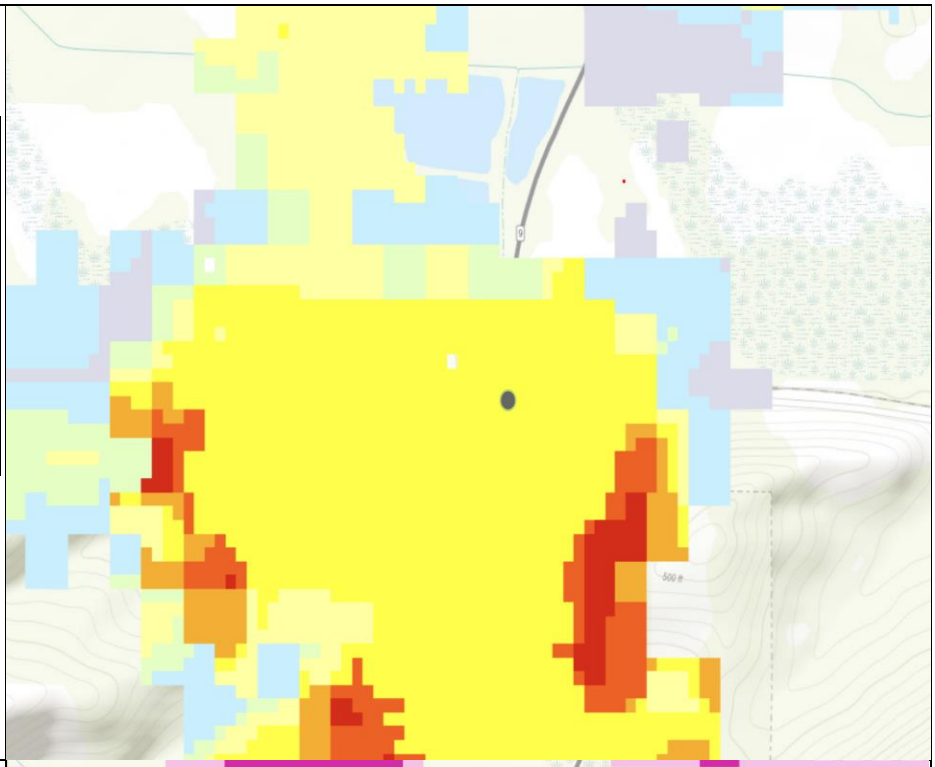
	Primary CPZs
	Secondary CPZs



City of Perry

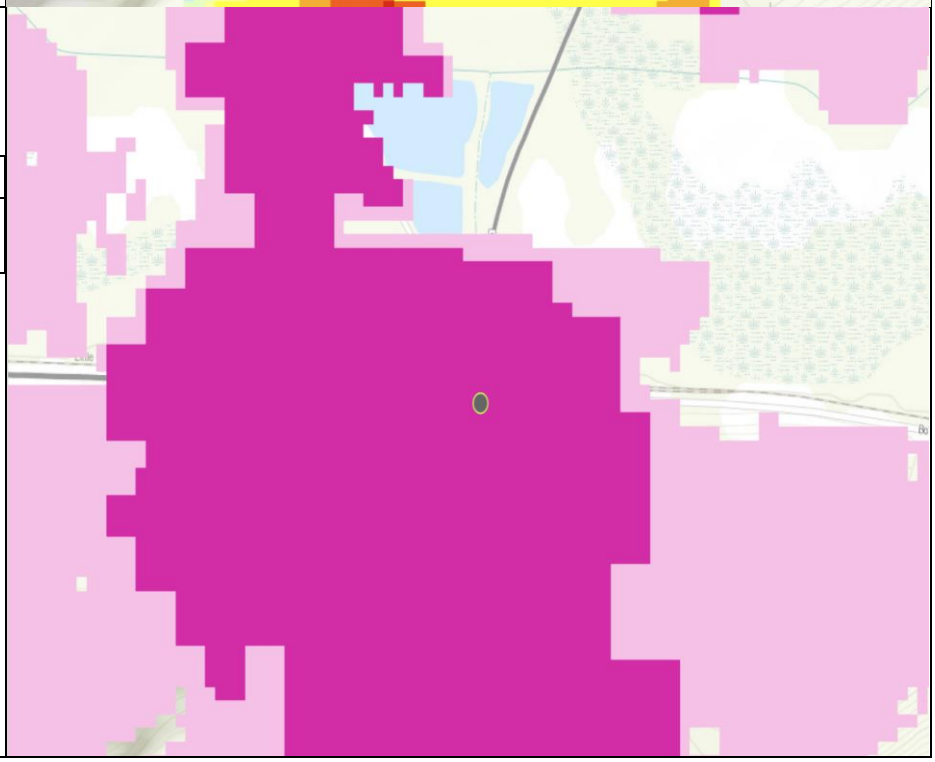
WUI Risk Index

-9	Major Impacts
-8	
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts



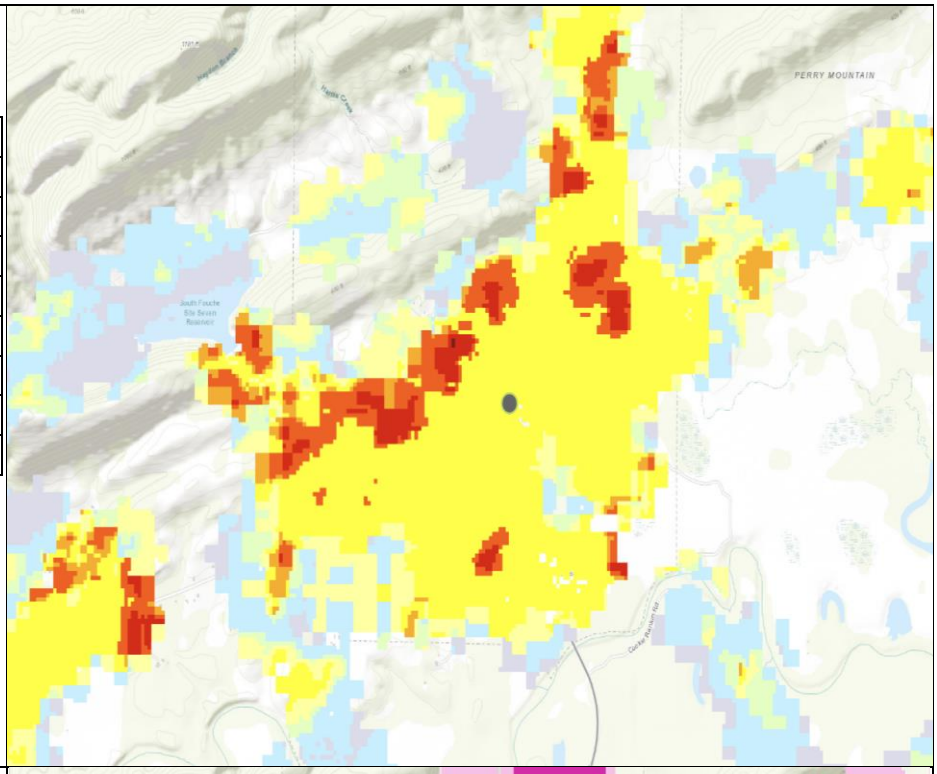
Community Protection Zones (CPZs)

	Primary CPZs
	Secondary CPZs



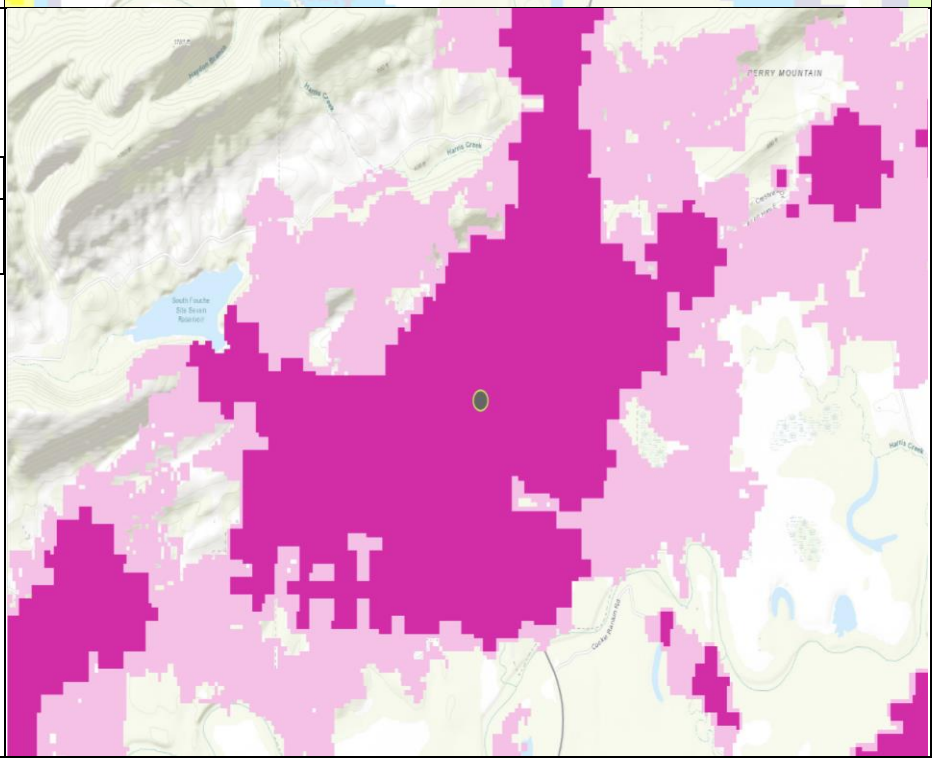
WUI Risk Index

-9	Major Impacts
-8	
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts



Community Protection Zones (CPZs)

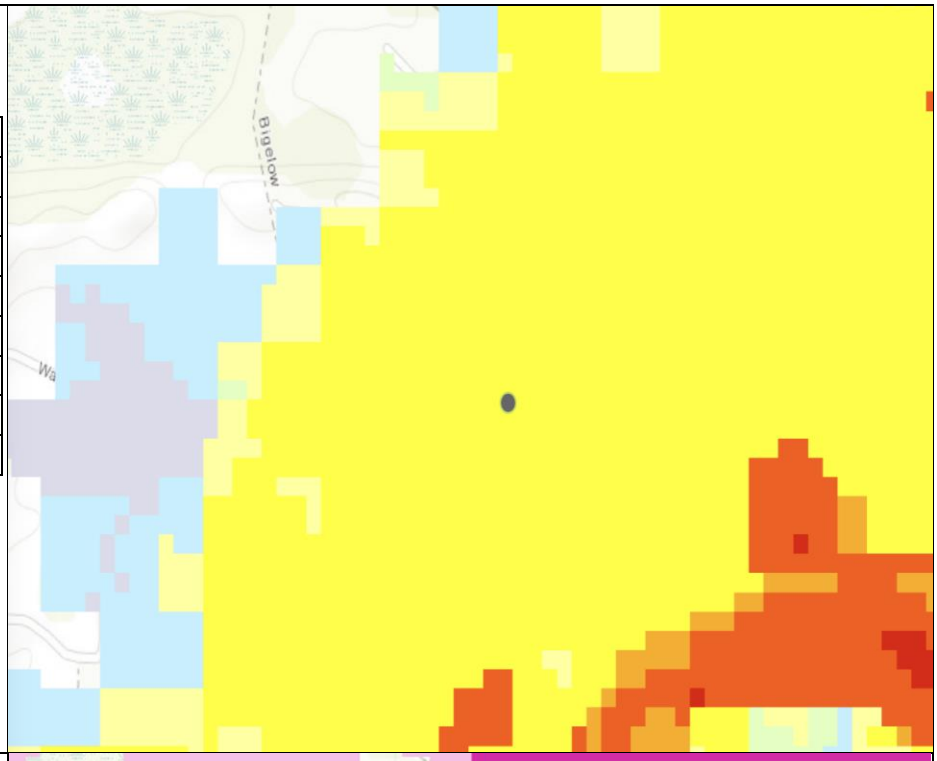
	Primary CPZs
	Secondary CPZs



East End School District

WUI Risk Index

-9	Major Impacts
-8	
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts



Community Protection Zones (CPZs)

	Primary CPZs
	Secondary CPZs

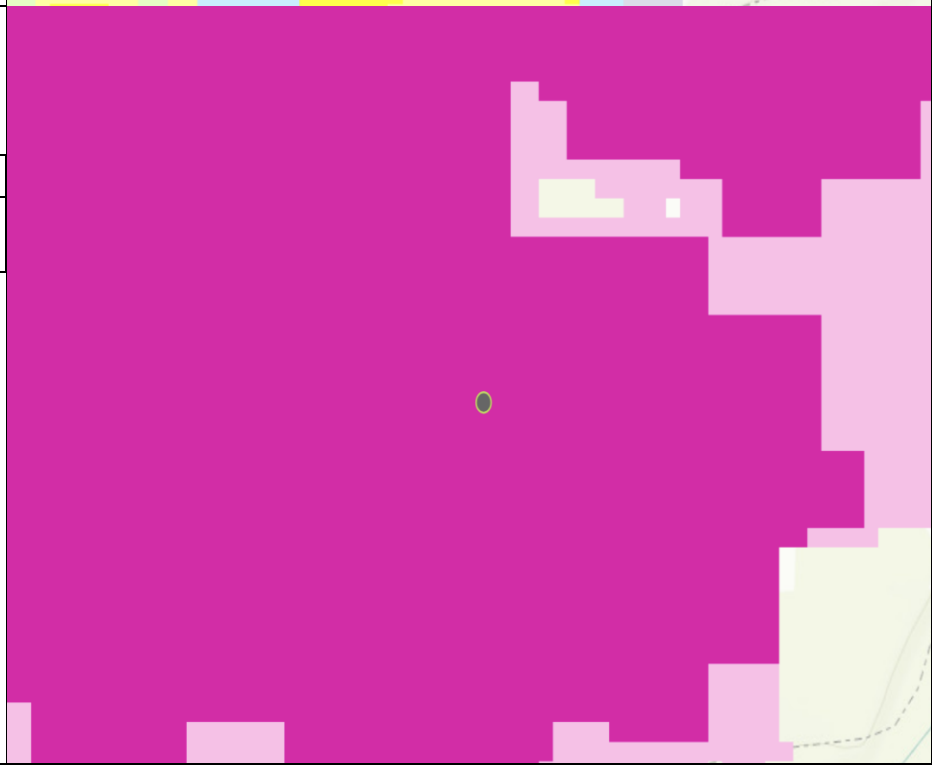
Perryville School District

WUI Risk Index

-9	Major Impacts
-8	
-7	
-6	
-5	Moderate
-4	
-3	
-2	
-1	Minor Impacts

Community Protection Zones (CPZs)

	Primary CPZs
	Secondary CPZs



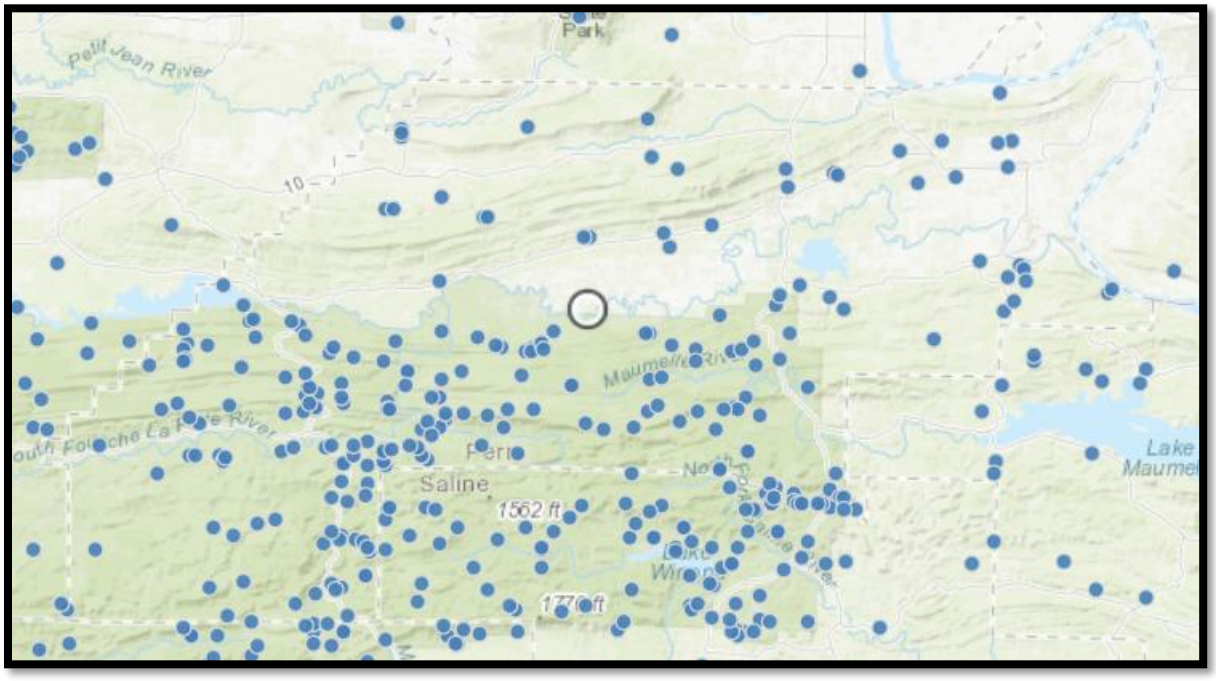
Previous Occurrences

According to the National Interagency Fire Center (NFIC), there were 117 wildfires from 2017-2023 with a total of 2,148 acres burned.

Years	Fires	Acres
2017	**23**	**202**
2018	**14**	**131**
2019	**12**	**189**
2020	**11**	**157**
2021	**20**	**345**
2022	**19**	**107**
2023	**18**	**1,017**
Total	**117**	**2,148**

Copy of FiresByCounty, 2017.xlsx (arkansas.gov)

NIFC Wildland Fire Data



InFORM Fire Occurrence Data Records | InFORM Fire Occurrence Data Records | National Interagency Fire Center (arcgis.com)

The NOAA Storms Events Database only reports four wildfires from 2000-2023. There are no reports of injuries or deaths. There are no reports of property or crop damage.

Number of County/Zone areas affected:	1
Number of Days with Event:	3
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	1
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	07/30/2011	11:30	CST-6	Wildfire		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	08/07/2011	00:30	CST-6	Wildfire		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	08/13/2012	12:00	CST-6	Wildfire		0	0	0.00K	0.00K
PERRY (ZONE)	PERRY (ZONE)	AR	11/24/2012	18:00	CST-6	Wildfire		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

On July 20,2011, very dry weather and a heat wave made conditions very favorable for wildfires. A wildfire 8 miles southwest of Hollis in Perry County burned 215 acres.

On August 7, 2011m a continued heat wave/drought made conditions favorable for wildfires. The Forked Mountain Fire began on the 7th in the Ouachita National Forest and burned 180 acres.

On August 13, 2012, a fire burned down a house, some outbuildings, a boat, several vehicles, and a total of 820 acres in the town of Casa. The fire was started by a lightning strike 2 miles northwest of Casa. The towns of Casa, Homewood, and Rose Creek had to be evacuated. There are no reported injuries or deaths.

On November 24, 2012, the Round Mountain Fire began about 3 miles southeast of Williams Junction burning a total of 330 acres in both Perry and Saline County before it was extinguished on November 25, 2012.

Probability of Future Events

There are potentially many more wildfires in the Planning Area than documented. However, due to the multiple ways of documenting or classifying fires at the time of reporting those numbers may not be captured in this document. The Planning Area has experienced an average of 17 wildfires per year. The probability of the Planning Area experiencing a wildland fire is approximately 4.6% per year. Based upon previous occurrences (117 events over a 7-year period with the number of days totaling 2,555).

Probability is estimated using the following formula:

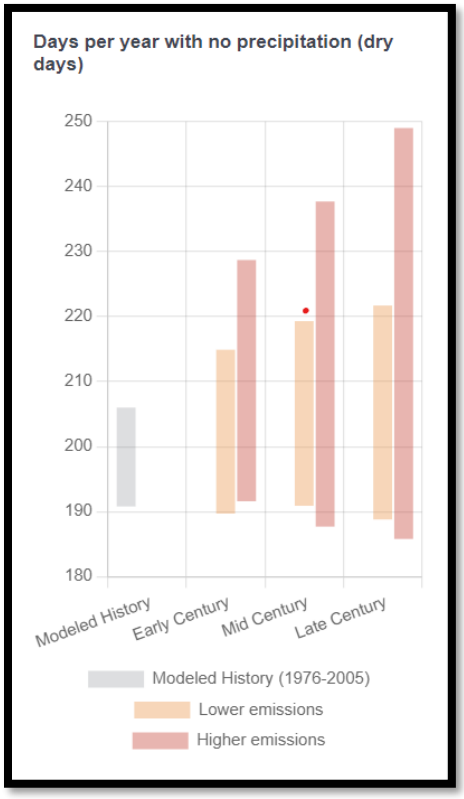
$$\frac{\text{\# of events}}{\text{\# of days}} \text{ x100} = \_\_\_\_\_$$

Future Climate Indicators

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Precipitation:							
Days per year with no precipitation (dry days)	197 days 191 - 206	201 days 190 - 215	202 days 192 - 229	202 days 191 - 219	204 days 188 - 238	203 days 189 - 222	208 days 186 - 249
Maximum number of consecutive dry days	16 days 13 - 19	16 days 14 - 21	16 days 13 - 20	17 days 14 - 21	17 days 13 - 21	17 days 13 - 24	18 days 14 - 25
Days per year with precipitation (wet days)	168 days 159 - 174	164 days 150 - 175	163 days 137 - 174	163 days 146 - 174	161 days 127 - 177	162 days 143 - 176	157 days 116 - 179
Temperature thresholds:							
Annual days with maximum temperature > 90°F	60 days 60 - 71	89 days 71 - 110	92 days 70 - 115	101 days 72 - 125	108 days 85 - 129	112 days 85 - 142	140 days 108 - 167
Annual days with maximum temperature > 100°F	6 days 5 - 8	17 days 4 - 35	19 days 6 - 52	25 days 4 - 53	32 days 14 - 82	34 days 11 - 53	66 days 29 - 116

N/A = Data Not Available for the selected area

Climate Projections for Early Century (2015–2044)	Lower emissions	Higher emissions
Days per year with no precipitation (dry days)	200.9 Days + 3.8 since 1976-2005	201.9 Days + 4.8 since 1976-2005
Maximum number of consecutive dry days	16.4 Days + 0.6 since 1976-2005	16.4 Days + 0.6 since 1976-2005
Days per year with precipitation (wet days)	164.3 Days - 3.7 since 1976-2005	163.3 Days - 4.8 since 1976-2005
Annual days with maximum temperature > 90°F	89.2 Days + 25.5 since 1976-2005	91.6 Days + 27.9 since 1976-2005
Annual days with maximum temperature > 100°F	17.0 Days + 11.1 since 1976-2005	19.1 Days + 13.2 since 1976-2005



CMRA - Climate Mapping For Resilience and Adaptation (arcgis.com)

Climate mapping trends indicate a rise in the number of dry days, maximum number of consecutive dry days, and a decrease in the number of wet days. This combined with rising temperatures, and an increase in annual days with maximum temperatures greater than 100˚F could lead to an increase in wildfire for the Planning Area.

According to FEMA's National Risk Index, the Planning Area's risk index is relatively low (53.5) compared to the rest of the U.S.:

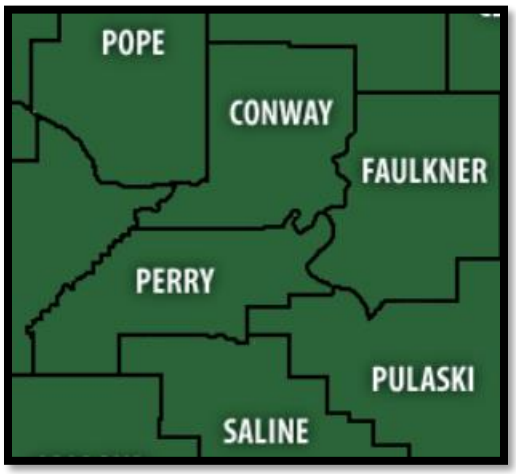
Hazard Type	Expected Annual Loss Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
Wildfire	$40,959.00	Relatively Low	Very Low	1.27	$50,690.00	53.5

FEMA's Expected Annual Loss Values:

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Wildfire	$120,806	$27,781.00	$13,132.00	0.00	$46.00

See supporting documents section for full FEMA National Risk Index report.

Wildfire Danger



To find out the most recent wildfire danger and current burn bans please click the link:

Wildfire Map : Arkansas Forestry Division

The Forestry Division is asking you to report fires by calling 1-800-468-8834

Vulnerability and Impact of Wildfires

Wildfires can result in significant damage to the Planning Area including risk to human life, property damage, agricultural impacts, as well as cutting off access to utilities, emergency services, and evacuation routes.

Wildfires moving into residential areas and along roadways place the population at risk due to smoke inhalation and burn wounds. Firefighters responding to wildfires may be at an increased risk of injury or death. Area evacuations due to fires could put individuals at additional risk.

Wildfires may impact the economy by destroying crops and farm animals. Business may be damaged or destroyed, forcing them too permanently close. Much of the Planning Area is rural containing large amounts of timberland, farmland and pastures for animals. Livestock and product sales continue to be a major source of income for farmers.

Wildfire may cause utility outages placing those even out of the path of the wildfire at risk.

The school districts located in the Planning Area are vulnerable to damage or destruction from a wildfire event. Students located on campus are considered vulnerable populations and will have limited capabilities due to age. Students and staff could experience injury or death.

Given the rural landscape the entire Planning Area faces susceptibility to wildfires, presenting potential risks to its inhabitants. Particularly vulnerable demographics such as children under the age of 55, adults over the age of 65, individuals with disabilities or reliant on medical equipment and those experiencing homelessness. Additionally, residents dwelling in wooden structures or manufactured homes may encounter heightened vulnerability. The anticipated rise in population and construction activity further compounds these risks, potentially exacerbating the impact of wildfires, especially in the Urban Interface zone of the Planning Area.

Climate

Changes in climate are anticipated to increase leading to warmer temperatures and the likelihood of drought. Both of these changes may heighten the frequency and severity of wildfires across the Planning Area. These impacts will be monitored by the planning team over the next 5 years. Research will be documented for nature-based solutions to mitigate potential increased impact.

Population

Changes in population will affect the impact of wildfires. As populations grow, more individuals and infrastructure will be impacted by wildfires. These impacts will be monitored by the planning team over the next 5 years. Research will be documented for nature-based solutions to mitigate potential increased impact.

Land Use

As land is developed, the risk of wildfires can become greater if precautions are not taken. Constructing residential buildings in close proximity to flammable vegetation or other materials can degrade the Wildland Urban Interface Risk. However, ensuring defense zones are included during new construction can minimize the risk of fire damage. Land use impacts will be monitored by the planning team over the next 5 years. Research will be documented for nature-based solutions to mitigate potential increased impact.

4.8.10 Winter Weather

Description

A winter storm is a combination of severe winter weather types occurring over a wide area. Winter storm formation requires below freezing temperatures, moisture, and precipitation. Severe winter storms include heavy snowfall, ice storms, strong winds, extreme cold, and/or freezing fog.

The National Weather Service defines a winter weather event as a winter weather phenomenon (such as snow, sleet, ice, wind chill) that impacts public safety, transportation, and/or commerce. It typically occurs during the climatological winter season between October 15 and April 15.

Types of winter warnings

Warning Type	Description
Blizzard Warning	A blizzard event is imminent or expected in the next 12 to 36 hours. Sustained wind or frequent gusts greater than or equal to 35 mph will accompany falling and/or blowing snow to frequently reduce visibility to less than 1/4 mile for three or more hours.
Ice Storm Warning	An ice storm event is expected to meet or exceed local ice storm warning criteria in the next 12 to 36 hours. Criteria for ice is 1/2 inch or more over at least 50 percent of the zone or encompassing most of the population.
Winter Storm Warning	A winter storm event (heavy sleet, heavy snow, ice storm, heavy snow and blowing snow or a combination of events) is expected to meet or exceed local winter storm warning criteria in the next 12 to 36 hours. Criteria for snow is 7 inches or more in 12 hours or less; or 9 inches or more in 24 hours covering at least 50 percent of the zone or encompassing most of the population. Use "mid-point" of snowfall range to trigger warning (i.e 5 to 8 inches of snow = warning). Criteria for ice is 1/2 inch or more over at least 50 percent of the zone or encompassing most of the population.
Wind Chill Warning	Wind chill temperatures are expected to meet or exceed local wind chill warning criteria in the next 12 to 36 hours. Wind chill temperatures may reach or exceed -25°F.

National Weather Service (weather.gov)

Severe winter storms produce heavy snowfall, sleet, ice, and/or freezing rain. They can also include extreme cold temperatures and high winds, intensifying the impact of the storm. Severe winter weather impacts travel causes widespread power outages, damages property, and can result in fatalities and injuries.

Locations Affected by Winter Storms

There is no defined geographical hazard boundary. Winter storms are typically widespread. The entire Planning Area is susceptible to severe winter storm events. Higher elevations typically

experience lower temperatures and higher probability of frozen precipitation. Geographical features influence wind chill.

Extent, Magnitude and Severity of Winter Storms

The magnitude and severity of winter storms are affected by the duration of the storm. Factors such as the precipitation type (snow compared to ice), rate, and amount affect the storm's impact.

According to National Climatic Data Center (NCDC) and National Weather Service Data, typical snow accumulations in the Planning Area during heavy snow and winter storm events range from 1 inch to 8 inches of snow. Typical ice storm accumulations range from 1/10 of one inch to 1/2 of an inch of ice. However, the Planning Area had a record snowfall of 12.5 inches on December 26, 2012. Therefore, historically the Planning Area can expect 1-12.5 inches of snow/ice.

When severe winter storm events do occur (the worst typically associated with ice), they are usually widespread over the area and impede the movement of vehicles. They limit regular movement of traffic, cause accidents, and limit responsiveness of emergency services. Power lines and communication networks can also be downed. Structures may sustain serious damage creating potentially critical conditions for the entire area.

School Districts located in the Planning Area monitor weather updates via television, radio and internet. If weather becomes hazardous as determined by the Superintendent, then appropriate actions are taken. There is not an actual policy on inclement weather response. Instead, the school administrators use their judgement based on weather forecast, time of day, and location of students to implement actions.

Extreme low temperatures and wind chill can also significantly affect the impact of winter storms. The lowest temperature ever recorded in Perryville was -15 °F, which occurred on February 2, 1951. The average low temperature for the winter months is approximately 30 °F. The Planning Area can expect temperatures to extend down to -15 °F.

When temperatures are below 32-40 degrees, students may be kept inside by the determination of school principals to protect against extreme cold temperatures. Wind chill would be the determining factor in keeping students inside.

Previous Occurrences

Type	Number of Events	Death	Injury	Property Damage	Crop Damage
Winter Weather	**33**	**0**	**0**	**$35,000.00**	**$0.00**
Winter Storm	**17**	**0**	**0**	**$2,145,000.00**	**$0.00**
Ice Storm	**4**	**0**	**0**	**$10,200,000.00**	**$0.00**
Total	**54**	**0**	**0**	**$12,380,000.00**	**$0.00**

Storm Events Database - Search Page | National Centers for Environmental Information (noaa.gov)

On February 20, 2013, a low-pressure system passing thru brought two rounds of winter weather from the 20th to the 21st. During the morning of the 20th light snow mixed with sleet. As evening came precipitation became heavier, progressing into a mixture of freezing rain, sleet and snow. Most snowfall accumulation was in the 1-to-2-inch range with some areas reaching 3 inches. Ice accruals measured from ¼ inch to ½ inch. There were power outages and a total of $15,000.00 in property damage.

On February 20, 2015, an arctic high pressure brought a mass of cold air into Arkansas. At the same time, a storm system approached from the southwest. Moisture ahead of the system flowed into subfreezing air, resulting in patchy light wintry precipitation during the morning hours on the 20th. While ice accumulations were minor, it was enough to create travel issues and many accidents. There was $20,000.00 in property damage but no deaths or injuries reported.

On Christmas Day, 2012, a stationary front caused a cold rain to fall over most of Arkansas. As the day progressed this turned into snow. By midday of the 26th most of the snow had stopped falling across the State. The Planning Area reported the second highest recorded snowfall in the State at 17.5 inches. This broke the Planning Areas all-time Calander day snowfall and monthly snowfall records. Thunderstorms and strong winds accompanied the snowfall with sustained winds of 20-30 mph and gusts of 35-45 mph. This combination of ice, snow, and wind caused blizzard conditions and massive power outages. Branches, limbs and entire trees fell over onto powerlines, houses, and vehicles. There was $2,000,000.00 in property damage and no reported deaths or injuries.

On March 11, 2022, a strong cold front moved thru in the morning hours. This very cold air surged in just ahead of incoming precipitation causing it to snow. The previous temperatures were warm enough that accumulation on snow only occurred on elevated surfaces and travel impacts were limited to bridges and overpasses. The city of Perryville reported receiving 5.5 inches of snow.

On January 26, 2009, freezing rain and sleet fell rapidly and began to accumulate ice. The end result was a devastating, historic ice storm. The Planning Area reported that ¼ inch of ice had accumulated by 6 am. Total ice accumulations ranged between 1 and 2 inches. The ice storm

knocked out electricity as the weight of the ice toppled and broke power lines and poles. Telephone service was also knocked out and some places suffered with a lack of water and sewer service. There was $10,000,000.00 in property damage with no reported deaths or injuries.

On February 4, 2014, widespread precipitation developed out of a low pressure, artic air aloft. Freezing rain and sleet created an accrual of ice that measured ¼ to ½ inch. Trees, power lines, and power poles were taken down by the ice accumulation. There was $200,000.00 in property damage with no reported injuries or deaths for the Planning Area.

Probability of Future Events

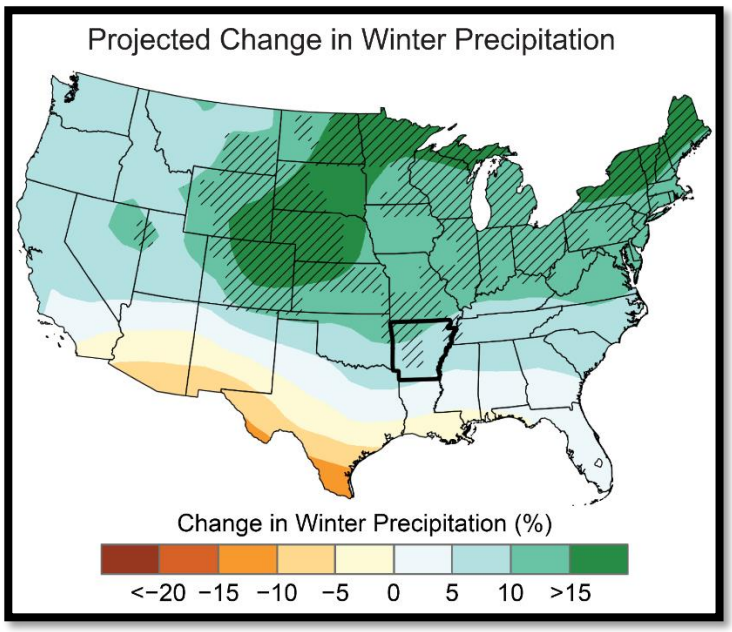
The probability the Planning Area will experience a severe winter storm event is less than 1% per year. Based upon previous occurrences (53 events between 2000 and 2023), the probability is estimated using the following formula:

$$\frac{\text{\# of events}}{\text{\# of days}} \times 100 = \_\_\_\_\_$$

Data collected from 2000-2023 was equal to 8,395 days.

The Planning Area has experienced approximately 2.21 events per year since 2000. Based on climate research, Arkansas' wintertime precipitation is expected to increase. NOAA National Centers for Environmental Information performed a State Climate Summary in 2022. According to their research,

> Wintertime precipitation is projected to increase in Arkansas by midcentury (see figure below), with the increase being in the form of rain rather than snow. In the other seasons, precipitation changes are uncertain. Increases in evaporation rates due to rising temperatures may increase the rate of soil moisture loss during dry spells. As a result, naturally occurring droughts are projected to be more intense.



Projected changes in total winter (December–February) precipitation (%) for the middle of the 21st century compared to the late 20th century under a higher emissions pathway. Hatching represents areas where the majority of climate models indicate a statistically significant change. Arkansas is part of a large area of projected increases in winter precipitation across the United States. Sources: CISESS and NEMAC. Data: CMIP5.

Based on historical evidence, the planning team determined the likelihood of future winter storms is HIGH.

Vulnerability and Impact of Winter Storms

Historical data reports that the Planning Area has had 53 winter weather events in the last 24 years. This means theoretically the Planning Area can expect at least two winter weather events per year. Damage from winter storms is often not reported to public agencies for recording in databases such as SHELDUS.

The overall impact of a severe winter storm is high for the Planning Area. Winter storms can cause dangerous travel conditions and possible structural damage, placing communities and individuals at risk. Utilities including electricity, water, and communications can be lost.

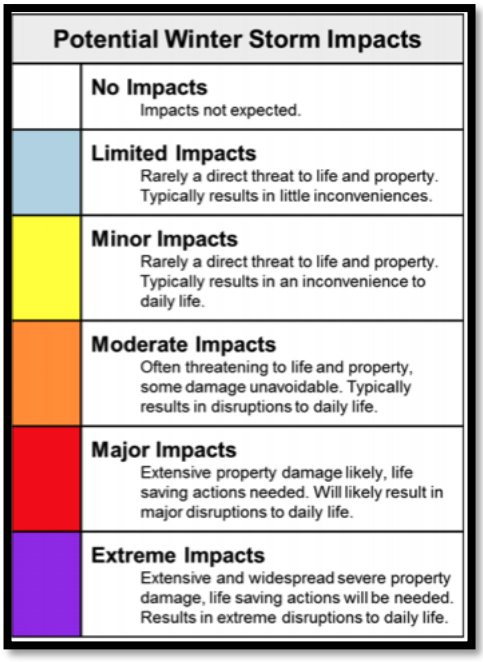
Winter storms can immobilize an entire county. Wet snow quickly turns into ice rendering roads impassable, damaging trees, power lines, cutting off power/communications, and causing death.

Winter storms may bring strong winds, freezing rain, snow, ice, and blizzard like conditions that limit visibility. During a winter weather event, roads will likely be impassable. The availability of emergency and essential services will be restricted throughout all participating jurisdictions. Ice accumulation may leave roads, bridges and culverts damaged. The County Road Department has access to equipment for clearing roads and has mutual aid agreements with private services and other counties for support. However, due to the extent of winter weather, there will be limited manpower for clearing roads in the Planning Area. Roads will be cleared on a priority bases. The Planning Area may not have the capabilities to clear rural and unpaved roads. Road conditions as described may leave motorists stranded, interrupt supply chains, and disrupt lifesaving services.

All people and structures in the Planning Area are vulnerable to downed limbs and trees. Ice accumulation on tree branches may cause limbs to fall on people or structures causing minor to extreme impacts.

The entire Planning Area is at risk of extended power outages resulting in exposure to freezing temperatures. Rural areas of the Planning Area are most at risk of losing power and becoming isolated during a winter storm. Children under the age of 5, adults over the age of 65, those with disabilities, economically challenged, and the unhoused are at the greatest risk of hypothermia and other life-threatening health problems.

In addition to hypothermia risks, there is a greater risk of fire, carbon monoxide (CO) poisoning, electrical shock or electrocution during winter weather due to increased use of portable heaters and generators. According to a 2013 Consumer Product Safety Commission report, half of the generator-related deaths happened in the four coldest months of the year, November through February, and portable generators were involved in the majority of carbon monoxide deaths involving engine-driven tools. According to the National Fire Protection Association (NFPA), home fires occur more in the winter than in any other season, and heating equipment is involved in one of every six reported home fires, and one in every five home fire deaths ("Put a Freeze on Winter Fires", NFPA) ("Extreme Cold Guide", CDC). In addition, frozen pipes and impassable roads may impede firefighting efforts.



Severe winter weather also negatively impacts the Planning Area's economy. Businesses are closed due

to snow and ice as well as power outages. Infrastructure can be damaged by a buildup of ice and snow. Extreme cold can rupture pipes. The agricultural sector can be impacted by damaged crops and lost farm animals from winter weather events.

Estimating Potential Loss

Expected annual loss was calculated for the Planning Area at https://hazards.fema.gov/nri/map.

Expected annual loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss rations for the hazard type.

According to FEMA's National Risk Index, the Planning Area's risk index is relatively low (40.76) compared to the rest of the U.S.:

Hazard Type	Expected Annual Loss Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
Ice Storm	$860,530.00	Relatively Low	Very Low	1.27	$1,082,167.00	93.9
Winter Weather	$92,520.00	Relatively Low	Very Low	1.27	$116,372.00	67.5

FEMA's Expected Annual Loss Values:

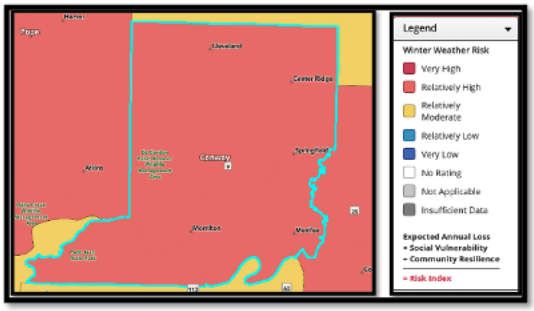
Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Ice Storm	$860,530.00	$854,432.00	$6,098.00	$0.00	NA
Winter Weather	$92,520.00	$81,428.00	$8,510.00	0.00	$2,583.00

Community Report - Perry County, Arkansas | National Risk Index (fema.gov)

See supporting documents section for full FEMA National Risk Index report.

The entire Planning Area is affected by winter storms. Winter storms are not unique to any portion of the Planning Area. The occurrence of severe winter storms can have a substantial impact on the Planning Area's buildings, utility systems, transportation systems, and agriculture. Heavy accumulations of ice or snow commonly result in damage to buildings. Damage may be caused directly by the excessive weight of the ice/snow or by ice-laden trees or branches falling on structures. Homes, businesses, as well as weaker nonresidential structures are most vulnerable to this type of structural damage. The abundant wood structures and manufactured houses in the planning area are much more vulnerable than steel, concrete, or masonry structures. Past storms indicate poultry houses are particularly vulnerable. Heavy accumulations of ice or snow as well as high winds can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communication and power can be disrupted for days or weeks while utility companies repair the damage. Power and communication disruptions are common consequences of ice storms and heavy snow. Transportation systems are vulnerable to severe winter storms. Accumulations of ice and snow can be extremely hazardous to motorists. The planning area lacks the necessary snow removal equipment due to the infrequent occurrence of severe winter storms. Motorists in the planning area are not accustomed to driving on icy roads. These factors result in an increase in traffic accidents. When major roads are blocked, travel flow and the availability of essential services throughout the area is affected.

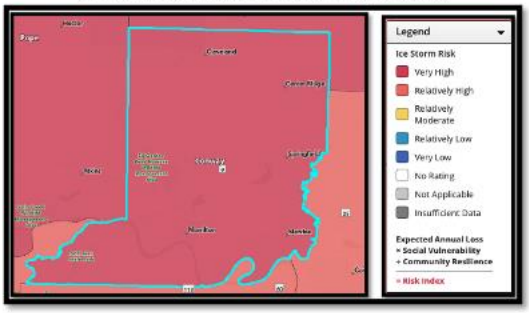
National Risk Index Winter Weather



https://hazards.fema.gov/nri/map

National Risk Index Ice Storm

National Risk Index Ice Storm



https://hazards.fema.gov/nri/map

The majority of the Planning Area is very rural and somewhat isolated from more developed areas. When utilities and communications are disrupted due to a winter storm event, the more rural areas are the last to receive support and service reconnection. The populations in the more rural areas may go a week without access to heat, fresh food, and other resources. During very icy conditions residents in the more rural areas may be trapped at home, making them extremely vulnerable. Children under the age of 5 and disabled or elderly residents are the most vulnerable and account for the largest percentage of hypothermia victims. House fires are common during winter storm

events due to the use of alternate heat sources such as stoves. Rural are a common location for many large farms with both vegetation and livestock. The cold will damage/destroy vegetation and may kill livestock. Poultry houses without a heat source may lose their entire population of birds. Homes in these areas may be damaged by fallen branches or destroyed by toppled trees. Roads may become impassable. The fire districts in these areas are not equipped with plows or other winter storm equipment and may be unable to respond when needed.

A winter storm event may make many roads temporarily impassible as the State and County Transportation Department prioritizes the clearing of roads using their limited resources. Road closures will prevent residents from accessing some essential services. Trees that are weighed down by ice and snow may damage or destroy structures such as businesses and homes. All utilities could be affected. Water pipes may freeze, and power lines could be taken down by ice. Frozen water pipes could prevent fire fighters from being able to adequately respond to a fire. The most vulnerable populations are children under the age of 5, adults over the age of 65, disabled residents, those dependent on medical equipment and the unhoused.

All school districts in the Planning Area are vulnerable to winter storm events. Many of the school buildings may not be insulated well enough to withstand the freezing temperatures if they exist for multiple days. The school buildings may have frozen pipes or damage from surrounding trees. Students would be considered vulnerable populations. It is likely classes will be canceled due to a winter storm event.

Population

Changes in population will affect the impact of winter storms. As populations grow, more individuals and infrastructure will be impacted by winter storms. Currently the Planning Area is trending a decrease in population. However, the Planning Area is expecting growth in industry. Over the next five years the Planning Team will need to research and document the effects of population on winter weather.

Land Use

Changes in land use could impact the effects of a winter storm. The Planning Area has both agricultural and industrial areas, which are affected by winter storms. Over the next five years the Planning Team will need to research and document changes in land use and its effects on the Planning Area.

Climate

According to NOAA National Centers for Environmental Information wintertime precipitation is projected to increase. The increase will consist of more rain than snow. The challenges posed by climate change can increase the probability of extreme weather events including winter storms and ice storms. These impacts will be monitored by the planning team over the next 5 years to continue research for nature-based solutions to mitigate all possibilities of potential increased impacts.

SECTION 5 MITIGATION STRATEGIES

The Perry County Hazard Mitigation plan includes a mitigation strategy that provides the Planning Area's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

The County, Cities, and School District have varying capabilities for implementing and maintaining mitigation efforts. These capabilities depend on existing authorities, policies, programs, and resources.

The cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville are each different in terms of staffing, funding, policies, and programs capabilities providing the ability to carry out their local hazard mitigation goals. However, each city has the capability to:

- be an active member in the NFIP,
- to pass mitigation ordinances for their local government,
- regulate and limit the development in wildfire hazard areas and flood prone areas through land use planning implement retrofit construction plans,
- brace equipment
- provide emergency preparedness information to area residents through FEMA brochures.

The entire Planning Area is dependent upon grant funding to assist with larger mitigation projects. Examples of projects that may be requested:

- Safe Rooms
- Heavy Duty Generators (back up and maintain electrical power for critical facilities)
- Communication and early warning systems
- Heating/Cooling Centers
- Flood Inundation Study for the Planning Area
- Flash Flood Inundation Studies
- Inspection, Maintenance, and Enforcement Programs for High-Risk Dams

5.1 Mitigation Goals and Objectives for Each Hazard

Based upon the results of the local and State risk assessments, the Perry County Hazard Mitigation Planning Team, with input from local jurisdictions and officials, developed hazard mitigation goals and objectives and selected those that were determined to be of greatest benefit. These goals and objectives represent what Perry County believes is a long-term vision for reduction and enhancement of mitigation capabilities.

Goal 1: Reduce the potential for loss of life, injury and economic damage created by exposure to natural hazard for residents of Perry County due to natural disasters.

- Identify, describe, and characterize the natural hazards to which Perry County is susceptible Objective
- Assess the risk of each hazard including probability and frequency, exposure, and consequences Objective
- Examine feasible mitigation opportunities appropriate for the identified hazards and prioritize those opportunities.
- Implement mitigation actions to reduce loss of lives and property Objective
- Identify mitigation opportunities for long-range planning consideration.
- Encourage members of the Perry County Local Emergency Planning Committee (LEPC) and other stakeholders to include mitigation measures in emergency planning efforts.
- Promote NFIP compliance throughout the County.

Goal 2: Provide a framework and coordination to encourage all levels of government and public and private organizations to undertake mitigation to minimize potential disasters and to employ mitigation in the recovery following disasters.

- Hold regular LEPC meetings to discuss mitigation actions with city officials, County emergency office, and private sectors.
- Keep records of all natural hazards and analyze areas that are at risk to prevent future losses.

Goal 3: Seek grants for mitigation projects through the State and Federal funding.

- Update Hazard Mitigation plan every 5 years.
- Inquire grant information from Arkansas Department of Emergency Management, and Planning and Development District.

Goal 4- Protect existing properties from natural disasters.

- Protect existing structures from natural hazards using cost-effective approaches.

5.2 Implementation of Mitigation Actions

The mitigation actions are prioritized based upon their effect on the overall:

- Risk to life
- Risk to property
- Ease of implementation
- Community
- Agency support
- Ability to obtain funding

The County and participating jurisdictions have used the STAPLEE method to prioritize mitigation actions. This method has the benefit that the Mitigation actions are considered in discrete categories of:

- Social
- Technical
- Administrative
- Political
- Economic
- Environmental

Prioritization can be effectively conducted by meticulously considering each of these categories. By comprehensively analyzing each aspect, potential oversights can be minimized, enabling a thorough evaluation of the most appropriate actions for each jurisdiction to contemplate.

Criteria used for prioritization and review of mitigation actions based on STAPLEE

Evaluation Category	Sources of Information
Social	Members of Local governments and the County Government were members of the Hazard Mitigation Planning Team and had input throughout the planning process. It must be noted that many small-town political leaders are also business or professional people. They are also members of the LEPC. Existing community plans were and will be relied on wherever possible. Members of the media were contacted and invited to all attend all HMPT meetings.
Technical	The following persons/agencies were consulted as to the technical feasibility of the various projects: Arkansas Geological Commission, University of Arkansas Extension Service, Arkansas Soil and Water Conservation Commission, Arkansas Health Department, Arkansas Highway and Transportation Department, Arkansas Department of Environmental Quality, Arkansas

	Governor's Pre-Disaster Advisory Council, Arkansas Governor's Earthquake Advisory Council, and Arkansas Forestry Service. Arkansas Department of Emergency Management. All of these had their comments and suggestions incorporated.
Administrative	Staffing for proper implementation of the plan currently will rely largely on existing members of the various agencies involved. Technical assistance is available from various local and state agencies. Some local jurisdictions have incorporated Hazard Mitigation efforts into their Capital Improvement Plans. Operations costs are under discussion by the appropriate agency or department heads.
Political	The County Quorum Court has passed resolutions in support of mitigation activities involving floodplain ordinances, mitigation planning, and fire districts, among others. The Governor of Arkansas issued an Executive Order in August of 2004 (EO 04-02) instructing all state agencies to assist ADEM in mitigation planning and implementation of mitigation goals.
Legal	Members of the HMPT discussed legal issues, and it was their opinion that no significant legal issues were involved in the projects that were selected by the HMPT. However, where legalities may be an issue, this is noted.
Economic	Economic and benefit cost issues were the predominant topics discussed by all concerned. Each entity felt that the projects selected would have positive effects, but yet realized that actions often have costs, sometimes hidden, imposed on the community, residents and businesses. Funding for the various activities was a major concern as local budgets are always under pressure with existing and competing projects and activities. Where necessary, particularly for costly capital projects, outside grants would be relied on heavily.
Environmental	The Arkansas Geological Survey, Arkansas Department of Environmental Quality, Arkansas Forestry Commission, and Arkansas Soil and Water Conservation Commission were all consulted as to the environmental impact of the various projects and it was felt that there would be no negative impact. Local environmental issues and concerns were also taken into consideration.

The Perry County Office of Emergency Management (CCOEM) will be responsible for evaluating actions among competing actions. The Planning Team prioritized the list of mitigation actions by conducting a cost-benefit review. This review was conducted by:

1. Considering the number of people who would be affected by a chosen project.
2. Determining the area the project would cover.
3. Considering how critical the structures were within the project area.
4. Which structures were most critical?
5. How would it benefit the entire community?

The CCOEM shall evaluate actions based on funding availability, comparative value to mitigation objectives, and consideration of economic benefits and environmental concerns of the communities. Actions are prioritized in three different categories:

- **High** need for immediate action
- **Medium** need for action
- **Low** lacking in urgency

All Perry County actions are the responsibility of the Perry County Office of Emergency Management Director. Actions for the cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville are the responsibility of their respective Mayors. The School Districts of East End and Perryville will be the responsibility of their School Board Administration.

The Responsible Agency for each mitigation action will identify resources. Their responsibility will be to examine resources from all levels of government. The responsible parties will integrate the requirements of the mitigation plan into other plans when appropriate. This will also include funding and support for enacting and enforcing:

- Building codes
- Zoning ordinances
- Developing public education programs
- Alert residents to risks
- Alert residents how they can reduce hazard losses.

Plans will be made to earmark resources for implementing these actions.

Each jurisdiction and school district within the Planning Area that participated in the planning process has at least two actions that will benefit the jurisdiction.

For the purpose of developing the Garland County Hazard Mitigation Plan, mitigation actions are categorized into six groups:

- Prevention: Actions that will keep problems from getting worse.
- Property Protection: Actions that address individual buildings
- Public Education and Awareness: Actions that will inform the public.
- Natural Resource Protection: Actions that will protect natural resources.
- Emergency Service Protection: Actions that will protect emergency services before, during, and immediately after an occurrence.
- Structural Projects: Actions that will control the hazard.

Previous Mitigation Actions

Previous Mitigation Action/Project list below have been:

- Updated to reflect changes over the past 5 years.
- Updated to reflect changes in economic growth.
- Updated to reflect changes in population growth.
- Updated to reflect changes in FEMA Plan requirements.

Certain initiatives, such as safe room construction, may have been pursued, albeit not achieving the desired level of coverage as envisioned by the Planning Area.

Completed Mitigation Actions/Projects	
Jurisdiction	**Action/Project**
Perry County	Backup generators have been placed at: • County Courthouse • County Health Unit • County Detention Center
Perry County	Adopted County Ordinance 11-99 to limit development in areas that could be affected by flooding caused by dam failure.
Perry County	Acquired 80 Toad Suck Lane in land acquisition due to repetitive loss in floodplain.
Perry County	911 system was upgraded in 2023 to NG911
Perry County	Fire Chief Association upgraded antenna, repeater towers, handheld/mobile radios for the fire trucks throughout the County.
School Districts	Safe Rooms have been installed at the following School Districts: • Perryville School System While the schools have been able to find funding for safe room projects the Planning Area will continue to seek funding to protect other vulnerable populations in the Planning Area such as nursing homes and Day Care Centers. During school hours current safe rooms are available for school students and staff only.
School Districts	Backup generators have been placed at existing safe rooms for the following School Districts: Perryville School System

Mitigation Actions/Projects in Progress	
Jurisdiction	**Action/Project**
Perry County Office of Emergency Management	Provide mitigation information and resources for extreme weather conditions through an active education outreach program with specific plans and procedures for at-risk populations.
Perry County Office of Emergency Management	Use GIS to map hazard areas, at-risk structures and associated hazards in order to assess high risk-areas using Genasys and DataScout One Map.
Perry County Quorum Court	Pass an ordinance (County) to prioritize or control water use, particularly for emergency situations in order make more water available for firefighting. Previously a temporary ordinance was passed for the city of Perryville.
Arkansas Forestry Commission (through the Stafford Act with the assistance of the Perry County Fire Department)	Implements fuel management team using prescribed burning techniques to reduce the hazardous vegetative fuels that threaten public safety and property on public lands and working with landowner on private land, and near essential infrastructure.

Mitigation Actions/Projects

Purchase heavy duty generators to back up and maintain electrical power for critical facilities and shelter to maintain power and water supply during disasters.

Associated Hazard: Dam Failure, Extreme Heat, Flood, Lightning, Thunderstorm Winds, Tornado, Wildfire, Winter storms
Type of Action: Emergency Services Protection
Contribution to Mitigation Objective: Continuation of water service, and temperature control
Priority: High
Rationale of Priority: Past disasters
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial, cost varies on size and type of generator.
TimeLine: two years
Projected Resources: Existing County, Local and School Resources and possible grant funds
Responsible Party: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Construct safe rooms within new and existing public buildings, such as schools, libraries, and community centers.

Associated Hazard: Thunderstorms, tornado
Type of Action: Structural Project
Contribution to Mitigation Objective: Prevent the loss of life by providing shelter during pre/post disasters.
Priority: High
Rationale of Priority: Prevents the loss of life during storms and also minimizes the effects post hazard events. Ranked high due to past storm events
Addresses New or Existing buildings: New and Existing
Cost Benefit: Benefits outweigh cost. Possible grants for construction.
TimeLine: five years
Projected Resources: HMGP funding, PDM
Responsible Party Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Install hail resistant roofing and window coverings, shutters laminated glass in windowpanes with a focus on critical infrastructure.

Associated Hazard: Hail
Type of Action: Property Protection
Contribution to Mitigation Objective: Seeks to protect critical facilities from hail damages
Priority: Medium
Rationale for Priority: Past hail events
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial, minimum cost to owner
Timeline: three years
Projected Resources: Existing County and Local Resources
Responsible Party: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Protect exceptionally vulnerable populations from the impacts of severe weather events through identifying specific at-risk populations in the event of long-term power outages by establishing accessible heating and cooling centers.

Associated Hazard: Winter storms, Thunderstorm Winds and Tornado
Type of Action: Structural Project
Contribution to Mitigation Objective: Prevent the loss of life by providing shelter during pre/post disasters.
Priority: High
Rationale of Priority: Prevents the loss of life during storms and also minimizes the effects post hazard events. Ranked high due to past storm events
Addresses New or Existing buildings: Existing
Cost Benefit: Benefits outweigh cost. Possible grants for refurbishment
TimeLine: One year
Projected Resources: HMGP funding
Responsible Party: Emergency Management, County and City Governments Offices
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville
STAPLEE: Meets all Criteria

Use designed failure mode for power line design to allow line to fall or fail in small sections rather than as a complete system to enable faster repairs.

Associated Hazard: Winter Storms, Tornado, Thunderstorm Winds
Type of Action: Prevention Action
Contribution to Mitigation Objective: Prevents strong winds and ice causing trees from falling on power lines creating power outages to homes, critical facilities and communication systems.
Priority: High
Rationale of Priority: Past disasters
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial, cost to the owner of rights-of-way either County or City
TimeLine: In progress at Utility Companies ability to replace/repair.
Projected Resources: Existing County and Local Resources
Responsible Party: Local Utility Companies
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville
STAPLEE: Meets all Criteria

Purchase of all-hazard NOAA weather radios in all schools, city halls, churches, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries where large numbers of people congregate; provide information to public on importance of having and how to acquire.

Associated Hazard: Dam Failure, Drought, Flooding, Thunderstorm Winds, Lightning, Hail, Tornado, Extreme Heat, Wildland Fire, Winter storm**s**
Type of Action: Prevention
Contribution to Mitigation Objective: Protect lives by alerting congregations of people of impending disasters
Priority: High
Rationale of Priority: Past Disasters
Addresses New or Existing buildings: New and Existing
Cost Benefit: If action proves effective in influencing other**s** to obtain radios, benefits will greatly outweigh cost. (NFIP consideration: CRS 610 Flood Warning Program)
TimeLine: One year
Projected Resources: Existing County, Local and School District Resources
Responsible Party: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Implement Weather Warning early telephone warning system designed to automatically deliver targeted weather notifications for the immediate threats of severe thunderstorm warnings, flash flood warnings and tornado warnings within moments of being issued by the National Weather Service (NWS) throughout the County.

Associated Hazard: Flood, Thunderstorm Wind/Strong Wind, Lightning, Hail, Tornado, winter storm**s**
Type of Action: Prevention
Contribution to Mitigation Objective: Prevents the loss of lives by alerting citizens by landline or cell phone of approaching storms by physical address
Priority: High
Rationale of Priority: Past Storm events
Addresses New or Existing Buildings: N/A
Cost Benefit: Highly beneficial
Timeline: One year
Projected Resources: Existing County and Possible Outside Resources
Responsible Party: Perry County Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Brace equipment (such as mechanical equipment, chillers, and emergency generators) whose failure may disrupt the operation of a critical facility, such as hospitals and schools.

Associated Hazard: Tornado, Thunderstorm Winds and Earthquakes
Type of Action: Non-Structural
Contribution to Mitigation Objective: Prevents damage to necessary operating equipment and injury to citizens
Priority: High
Rationale for Priority: Protection of critical operations equipment
Addresses New or Existing Buildings: New and Existing
Cost Benefit: Highly Beneficial, minimum cost
Timeline: 3 years
Projected Resources: Existing County, State and Local Resources
Responsible Party: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Apply window film to windows in public schools and public buildings as able to prevent shattering.

Hazard Associated: Earthquake, Thunderstorm winds, Tornados
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to injuries due to broken glass
Priority: Medium
Rationale for Priority: Thunderstorm winds and Tornados have been an issue several times in the past. There are possibilities for future Earthquake events.
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
TimeLine: 1 year
Projected Resources: County funds to develop plan. Possible grant funding.
Responsible Party: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Create a data base within each fire district to track those individuals at high risk of death, such as the small children, elderly, shut-ins, homeless, and those requiring medical attention or medical equipment that require transportation to heating or cooling centers.

Hazard Associated: Extreme Heat, Drought, Winter/Ice Storms
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to lives due extreme heat or winter/ice storms
Priority: High
Rationale for Priority: Extreme Heat and Winter/Ice Storms have created problems in the past with the lack of cooling equipment or lack of electricity during winter/ice storms.
Addresses New or Existing Buildings: NA
Cost Benefit: Highly beneficial with little cost
TimeLine: 1 year
Projected Resources: Little or no funding required
Responsible Party: Perry County and County Fire Departments
Action adopted by: Perry County, cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Provide emergency preparedness information and resource for extreme weather conditions through an active education outreach program with specific plans and procedures for at risk populations

Hazard Associated: Dam Failure, Drought, Earthquake, Extreme Heat, Flash Flood/Flooding, Thunderstorms (winds, lightning, hail) Tornado, Wildfire, and Winter/Ice Storms
Type of Action: Public Education and Awareness
Contribution to Mitigation Objective: Prevent loss of life and property by preparing at risk population for possible future hazards.
Priority: Medium
Rationale for Priority: Action to inform the public prior to hazard events Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
TimeLine: 1 year
Projected Resources: FEMA brochures and time
Responsible Party: Perry County Office of Emergency Services
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Use GIS to map hazard areas, at-risk structures and associated hazards to assess high risk areas.

Hazard Associated: Earthquake, Flood Flash/Flood and Wildland Fires
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to lives due to hazard events
Priority: High
Rationale for Priority: Pin pointing areas that are high risk to earthquake, flood flash/flood
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
TimeLine: 1 year
Projected Resources: County funds
Responsible Party: Perry County Office of Emergency Services
Action adopted by: Perry County
STAPLEE: Meets all Criteria

Conduct inspections, maintenance and enforcement programs on dams to ensure structural integrity. (NFIP consideration; CRS 330 Outreach, CRS 350 Flood Protection Information).

Associated Hazard: Dam Failure
Type of Action: Prevention
Contribution to Mitigation Objective: Prevent loss of life or property due to future dam and levee failure by correcting structural weakness
Priority: High
Rationale for Priority: Since there have been problems with dams and levees in the past, priority is high and failure a possibility.
Addresses new or existing buildings: New and existing
Cost Benefit: Highly beneficial, low cost
TimeLine: 5 years
Projected Resources: Existing County and Local Resources Responsible Party: Perry County Soil and Water Conservation Mitigation Action adopted by: Perry County
STAPLEE: Meets all Criteria

Adopting Ordinances that limit development in areas that could be affected by flooding caused by a dam failure.

Associated Hazard: Dam Failure
Type of Action: Prevention
Contribution to Mitigation Objective: Prevent the loss of lives and property by limiting the development in areas that could be destroyed or flooded during a dam failure.
Priority: High
Rationale for Priority: There have been no dam and levee failures, but the possibility is high, and failure is a possibility.
Addresses New or Existing Buildings: New
Cost Benefit: Highly Beneficial, no cost
TimeLine: 2 years
Projected Resources: FEMA, and NFIP Resources
Responsible Party: Perry County
Mitigation Action adopted by: Perry County
STAPLEE: Meets all Criteria

Conduct flood inundation study for high and significant hazard dams; study will be used to develop mitigation measures such as facilitate acquisition projects, new zoning requirements, or elevation projects. Acquire reliable and current information relating to existing and new buildings and infrastructure, especially critical facilities located in or developed in the path of flooding from dam failure.

Associated Hazard: Dam Failure
Type of Action: Prevention
Contribution to Mitigation Objective: Seeks to protect citizens and property in path of dam failure by diverting flow from flood waters as a result of dam failure.
Priority: High
Rationale for Priority: No past dam failures, but possible making high priority
Address New or Existing Buildings: New and Existing
Cost Benefit: Highly Beneficial, low or minimal cost
Timeline: 5 years
Projected Resources: County, local resources and unidentified outside resources
Responsible Party: Perry County Action adopted by: Perry County
STAPLEE: Meets all Criteria

Develop a Countywide drought communication plan and early warning system to facilitate timely communication of relevant information to officials, decision makers, school administration, emergency managers **and the general public.**

Hazard Associated: Drought
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to lives due to water shortages
Priority: High
Rationale for Priority: Drought has been an issue several times in the past.
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
TimeLine: 1 year
Projected Resources: County funds to develop plan. Possible grant funding.
Responsible Party: Perry County
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Pass a County ordinance to prioritize or control water use, particularly for emergency situations in order to make more water available for firefighting. County, Cities, and school would uphold ordinance until drought ordinance is canceled.

Hazard Associated: Drought
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk due to water shortages
Priority: Medium
Rationale for Priority: Drought has been an issue several times in the past.
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at no cost.
TimeLine: 1 year
Projected Resources: County funds to publish Ordinance
Responsible Party: Perry County Quorum Court
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Establish Memorandums of Understanding with adjacent communities designed to provide additional sources of water.

Hazard Associated: Drought
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to lives due to water shortages
Priority: Medium
Rationale for Priority: Drought has been an issue several times in the past.
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
TimeLine: 1 year
Projected Resources: County funds to develop plan. Possible grant funding.
Responsible Party: Perry County Quorum Court
Action adopted by: Perry County
STAPLEE: Meets all Criteria

Create a seismic safety committee to provide policy recommendations evaluate and recommend changes in seismic safety standards and give an annual assessment of local and statewide implementation of seismic safety improvements

Hazard Associated: Earthquake
Type of Action: Prevention
Contribution to Mitigation Objective: Assist the risk of the hazard
Priority: High
Rationale for Priority: Recent minor earthquake activity
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
TimeLine: 1 year
Projected Resources: County funds to develop plan.
Responsible Party: Perry County Quorum Court
Action Adopted By: Perry County
STAPLEE: Meets all Criteria

Establish school survey procedures and guidance documents to inventory structural and non-structural hazards in and around school buildings.

Hazard Associated: Earthquake
Type of Action: Prevention
Contribution to Mitigation Objective: Actions that will keep problems from getting worse.
Priority: High
Rationale for Priority: Earthquake damage is possible
Addresses New or Existing Buildings: New and Existing
Cost Benefit: Highly beneficial with little cost
TimeLine: 1 year
Projected Resources: Little or no additional funding required
Responsible Party: School Districts
Action adopted : school districts of East End and Perryville
STAPLEE: Meets all Criteria

Pass Ordinance requiring all critical facilities to meet requirements of Executive Order 11988 and be built 1 foot above the 500-year flood elevation.

Associated Hazard: Flood Flash/Flood
Type of Action: Prevention
Contribution to Mitigation Objective: Protect Critical Facilities
Priority: High
Rationale for Priority: Past flooding events and prevent loss of life and property.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial at no cost
TimeLine :1 Year
Projected Resources: Guidance from FEMA Resources/Publications FEMA p-259,345, B-797 Responsible Party: Perry County cities of Bigelow, Casa, Houston, Perry, and Perryville
Action adopted by: Perry County cities of Bigelow, Casa, Houston, Perry, and Perryville
STAPLEE: Meets all Criteria

County and Local Road Departments implement retrofit construction plans to increase drainage or absorption capacities with detention and relief drains, extra culverts, and bridge modification where susceptible to flooding.

Associated Hazard: Flood Flash/Flooding
Type of Action: Prevention and Structural
Contribution to Mitigation Objective: Corrects current weaknesses and prevents any future structural damage.
Priority: High
Rationale for Priority: Protection of life
Addresses New or Existing buildings: N/A
Cost Benefit: Highly Beneficial. Benefit will outweigh any cost.
TimeLine: 3 Years
Projected Resources: Existing State, County and Local Resources
Responsible Party: State Highway Department, County and City Road Departments.
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville
STAPLEE: Meets all Criteria

Conduct countywide community NFIP workshops and for newly elected officials and public the National Flood Insurance Program Summary of Coverage FEMA F-679/November 2012.

Associated Hazard: Flood
Type of Action: Public Education and Awareness
Contribution to Mitigation Objective: Education residents on the need of flood insurance
Priority: High
Rationale to Priority: Perry County is prone to flooding.
Addresses New or Existing Buildings: New and Existing
Cost Benefit: Highly Beneficial with no cost
TimeLine: 1 year
Projected Resources: FEMA F-679 online free brochures
Responsible Party: Perry County Floodplain Management
Action adopted by: Perry County cities of Bigelow, Casa, Houston, Perry, and Perryville
STAPLEE: Meets all Criteria

Acquire properties that are located in the floodplain that flood on a repetitive basis.

Associated Hazard: Flood
Type of Action: Prevention and structural
Contribution to Mitigation Objective: Education residents on the need of flood insurance minimize the number of homes located in the flood area
Priority: High
Rationale to Priority: Perry County is prone to flooding.
Addresses New or Existing Buildings: New and Existing
Cost Benefit: Highly Beneficial
TimeLine: 2 years
Projected Resources: Federal, State, and local grants
Responsible Party: Perry County
Action adopted by: Perry County cities of Bigelow, Casa, Houston, Perry, and Perryville
STAPLEE: Meets all Criteria

Install surge protection, lightning protection devices on all communications infrastructure and critical facilities.

Associated Hazard: Lightning
Type of Action: Property Protection
Contribution to Mitigation Objective: Will guard critical communication equipment from lightning strikes.
Priority: High
Rationale of Priority: Past lightning events, and the need for operable communication equipment before, during and after disasters.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial, cost to owners of communications infrastructure and critical facilities.
TimeLine: 2 years
Projected Resources: Existing County, Local and School District Resources
Responsible Party: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
Action adopted by: Perry County cities of Adona, Bigelow, Casa, Houston, Perry, and Perryville and school districts of East End and Perryville
STAPLEE: Meets all Criteria

Mitigate future losses by regulating development in wildfire hazard areas through land use planning and address density and quantity of development, as well as emergency access, landscaping and water supply.

Hazard Associated: Wildfire
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk of wildfire due to land use
Priority: High
Rationale for Priority: Prior Wildfire events
Addresses New or Existing Buildings: Existing
Cost Benefit: Highly Beneficial at no cost
TimeLine: 2 Years
Projected Resources: Publish notice in paper at minimum expense
Responsible Party: Perry County Quorum Court
Action adopted by: Perry County
STAPLEE: Meets all Criteria

Implement a fuels management team using prescribed burning techniques to reduce hazardous vegetative fuels that threaten public safety and property on public lands and working with landowners on private land, and near essential infrastructure.

Hazard Associated: Wildland Fire
Type of Action: Prevention
Contribution to Mitigation Objective: Eliminates the fuel for wildland fires
Priority: Medium
Rationale for Priority: Proven to save lives and lessen property damage. Has experienced past wildfire events.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly beneficial, controlled burn would be under the direction of United States Forest Service and Arkansas Forest Service.
TimeLine: 5 years in coordination with Arkansas Forestry
Projected Resources: Perry County Fire Departments
Responsible Party: USFS or State Forestry to oversee, Fire Departments; Perry County Fire Departments assisting.
Action adopted by: Perry County
STAPLEE: Meets all Criteria

Find alternate means to assign probability when no events have occurred.

Hazard Associated: Dam Failure
Type of Action: Prevention
Contribution to Mitigation Objective: Help planning team and community to understand risk.
Priority: Low
Rationale for Priority: Dam Failure
Addresses New or Existing buildings: New and existing
Cost Benefit: NA
TimeLine: 5 year**s**
Projected Resources: no additional funding required
Responsible Party: Planning Team Action adopted by: Perry County
STAPLEE: Meets all Criteria

Conduct Dam failure inundation studies with the creation of EAP or obtain EAP's that have already completed for existing dams in Perry Co. Will provide information for extent and impact it may have on county, cities, and schools.

Hazard Associated: Dam Failure
Type of Action: Prevention
Contribution to Mitigation Objective: Help planning team and community to understand risk.
Priority: Low
Rationale for Priority: Dam failure
Addresses New or Existing Buildings: New and Existing
Cost Benefit: NA
TimeLine: 5 years
Projected Resources: Grants
Responsible Party: Planning Team
Action Adopted By: Perry County
STAPLEE: Meets all Criteria

SECTION 6 ACRONYMS

ADA	Average Daily Attendance
ADEM	Arkansas Department of Emergency Management
BCA	Benefit-Cost Analysis
BMPs	Best Management Practices
CFR	Code of Regulations
CRS	Community Rating System
DMA 2000	Disaster Mitigation Act of 2000
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographic Information System
HMC	Hazard Mitigation Committee
HMGP	Hazard Mitigation Grant Program
IBC	Internal Building Code
FR	Final Rule
LEPC	Local Emergency Planning Committee
MOU	Memorandum of Understanding
NFIP	National Flood Insurance Program
PDM	Pre-Disaster Mitigation Program
PGA	Peak Ground Acceleration
SHMO	State Hazard Mitigation Officer
STAPLEE	Social, Technical, Administrative, Political, Legal,
UCC	Uniform Construction Code
WUI	Wildland Urban Interface
CCOEM	County Office of Emergency Management

SECTION 7 RESOLUTIONS/ADOPTION

The following county, cities and school districts will submit and adopted resolutions after FEMA has approved the 2023 Perry County Hazard Mitigation Plan.

SECTION 8 SUPPORTING DOCUMENTS

8.1 Sample Questionnaire

Name: _____

Email: _____

Please indicate the municipality you reside in: _____

Campuses you visit (select all that apply):

- East End School District ☐
- Perryville School District ☐

Are you responding as:

- Citizen ☐
- Community Organization ☐
- Company ☐
- Local Jurisdiction ☐
- School Administrator ☐

Have you ever experienced or been impacted by a disaster? (select all that apply)

- Dam Failure ☐
- Drought ☐
- Earthquake ☐
- Extreme Heat ☐
- Flood ☐
- Mud/Landslide ☐
- Thunderstorm (Including High Winds/Lightning/Hail) ☐
- Tornado ☐
- Wildfire ☐
- Wind ☐
- Winter storm ☐
- None ☐

How concerned are you about the possibility of your neighborhood being impacted by a disaster?

- Very concerned ☐
- Somewhat concerned ☐
- Not concerned ☐

Please explain your answer:

_____

_____

_____

Is your home located in a FEMA designated floodplain?

Yes ☐

No ☐

Unknown ☐

Do you have flood insurance on your home?

Yes ☐

No ☐

Unknown ☐

If you do not have flood insurance, why not?

_____

_____

What is the <u>most</u> effective way for you to receive information about protecting your family and preparing your home from hazard events?

Email ☐

Mail ☐

Public or School Meetings/Workshops ☐

Radio ☐

Social Media ☐

Television ☐

Other (explain): _____

Please rank the following hazards according to the degree of threat faced by your community. One (1) represents the highest/greatest threat and ten (10) represents the lowest/least threat.

Hazards	List Hazards from highest threat to lowest
Tornado	1. _____
Winter Storm	2. _____
Thunderstorm (Including High Winds/Lightning/Hail)	3. _____
Extreme Heat	4. _____
Wildfire	5. _____
Flood	6. _____
Drought	7. _____
Dam Failure	8. _____
Earthquake	9. _____
Mud/Landslide	10. _____

Is there another natural hazard that is a threat that was not listed in the previous question?

_____

_____

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

_____

_____

If you answered yes to the previous question regarding actions to make your home or neighborhood more resistant to hazards, please explain.

Are there specific actions you have taken for the following hazards?

Flood:

Wildfire:

Drought:

Earthquake:

Severe Winter Storm:

Thunderstorm (including high winds/lightning/hail):

Tornado:

Dam Failure:

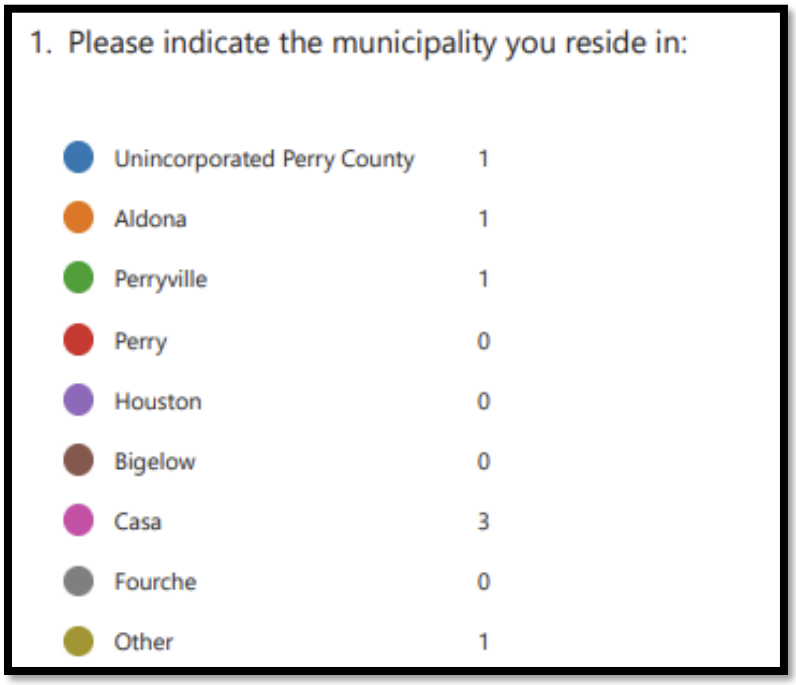
Extreme Heat: _____

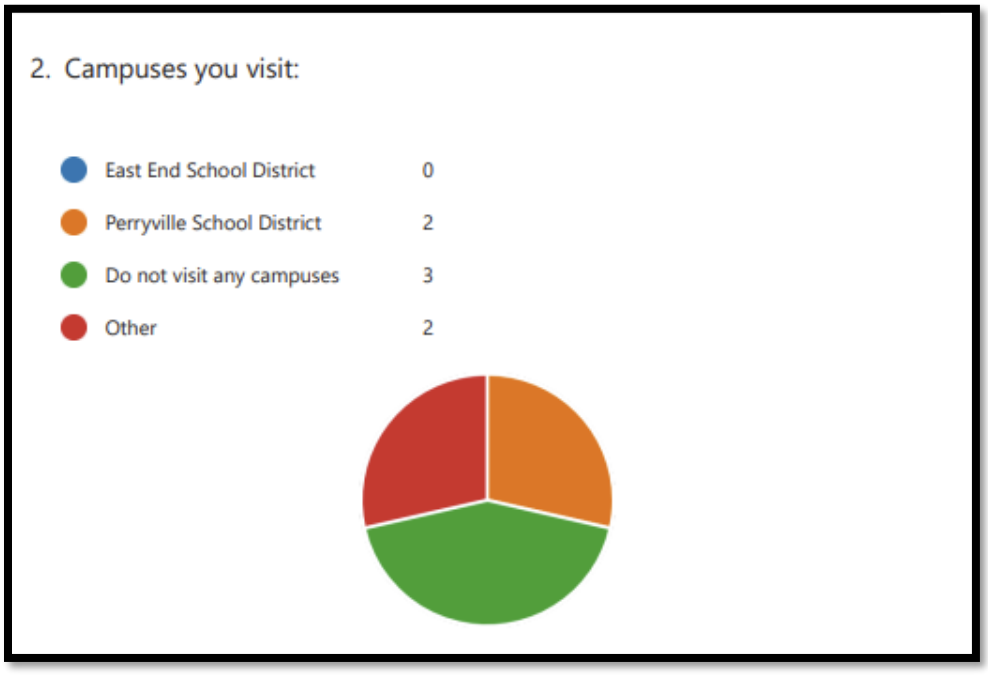
_____

Mud/Landslide: _____

_____

8.2 Questionnaire Reponses





3. Are you responding as:

Citizen	4
Local Jurisdiction	1
Community Organization	1
Company	0
Non-Profit	0
Other	1

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

Yes	4
No	3

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

Very concerned	3
Neither concerned nor unconce...	1
Somewhat concerned	3

6. Please explain if you answered, "Somewhat Concerned" or "Very Concerned" on the last question.

6
Responses

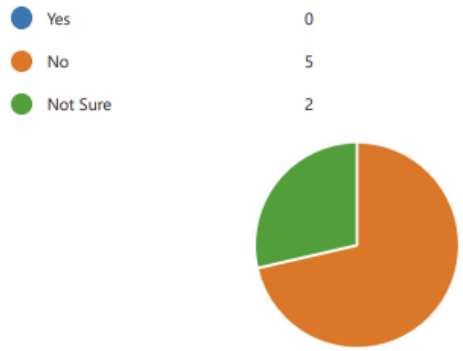
Latest Responses

"Very concerned "

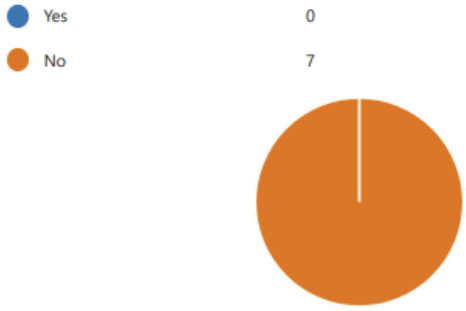
"I live in a mobile home with my family...if there is ...

"You never know I'd you are going to get hit or no...

7. Is your home located in a FEMA designated floodplain?



8. Do you have flood insurance on your home?



9. If you do not have flood insurance, why not?

Not located in a floodplain	5
Located in a floodplain but insur...	0
Not necessary because it never f...	0
Not necessary because my hous...	1
Too expensive	0
Other	1

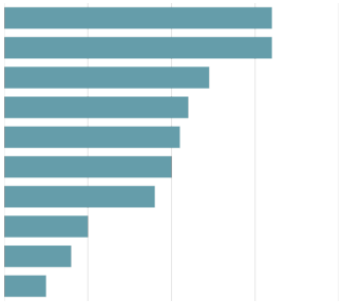
4

10. What is the most effective way for you to receive information about protecting your family and prepare your home from hazard events?

Email	4
Phone	3
Television	0
Mail	0
Radio	0
Public School Meeting/Workplace	0
Social media	0

11. Please rank the following hazards according to the degree of threat faced by your community.
One (1) represents the highest/greatest threat and ten (10) represents the lowest/least threat.

1 Thunderstorm (Including High ...
2 Tornado
3 Wildfire
4 Extreme Heat
5 Winter Storms
6 Drought
7 Flood
8 Earthquake
9 Dam Failure
10 Mud/Landslides

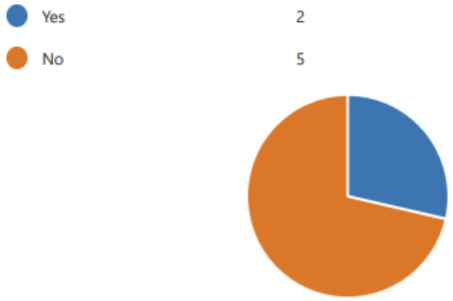


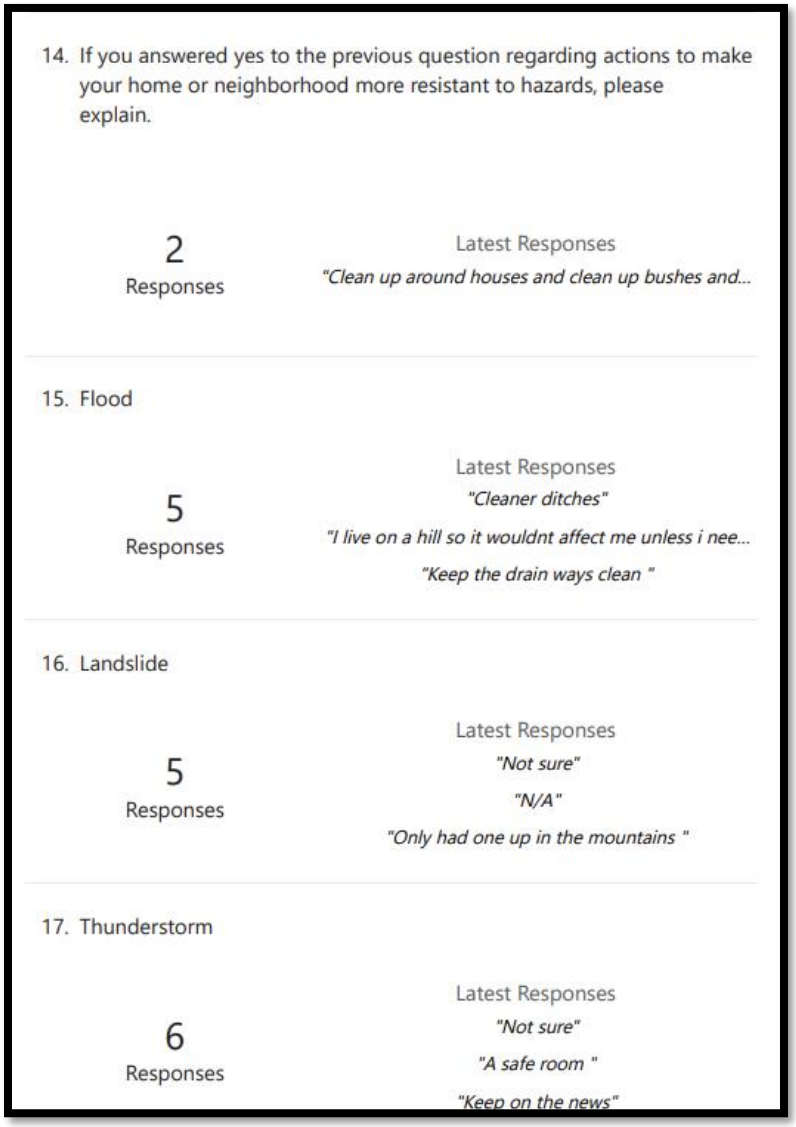
12. Is there another natural hazard that is a threat that was not listed in the previous question?
(pandemic is not considered a natural hazard in this survey).

5
Responses

Latest Responses
"No storm shelters"
"No"
"No"

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





14. If you answered yes to the previous question regarding actions to make your home or neighborhood more resistant to hazards, please explain.

2
Responses

Latest Responses
"Clean up around houses and clean up bushes and...

15. Flood

5
Responses

Latest Responses
"Cleaner ditches"
"I live on a hill so it wouldnt affect me unless i nee...
"Keep the drain ways clean "

16. Landslide

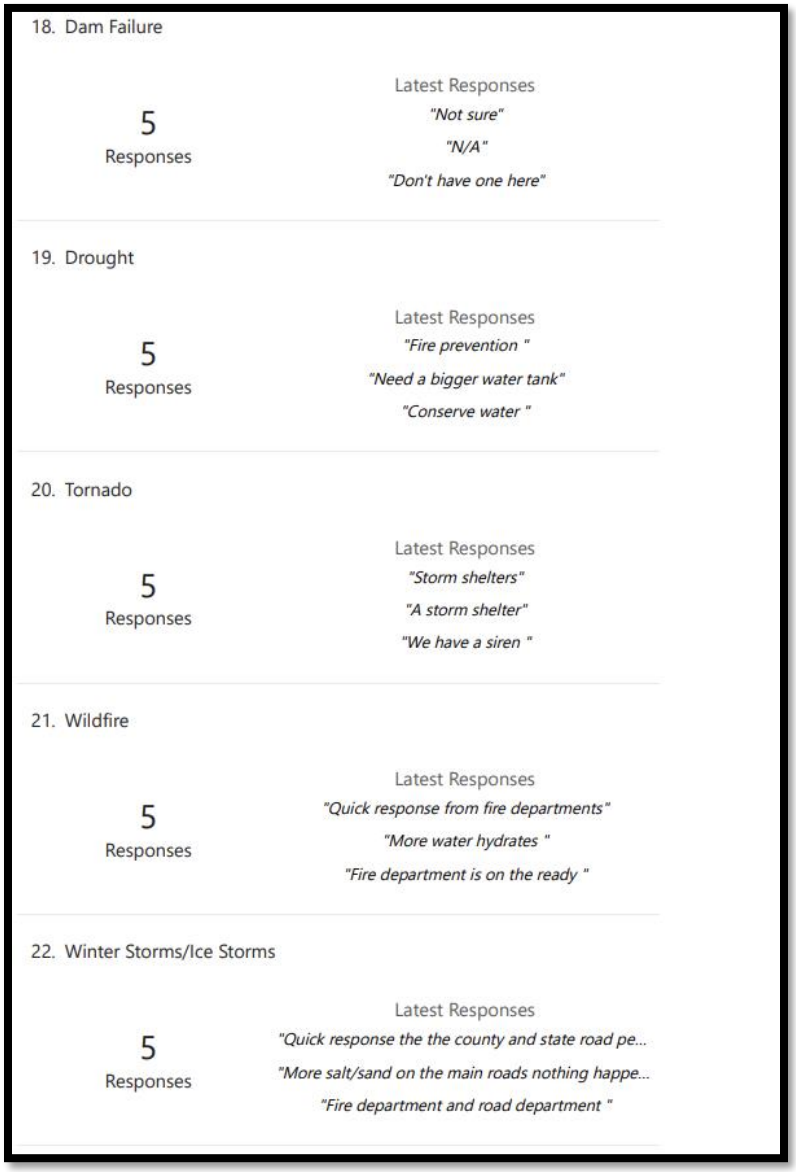
5
Responses

Latest Responses
"Not sure"
"N/A"
"Only had one up in the mountains "

17. Thunderstorm

6
Responses

Latest Responses
"Not sure"
"A safe room "
"Keep on the news"



18. Dam Failure

5
Responses

Latest Responses
"Not sure"
"N/A"
"Don't have one here"

19. Drought

5
Responses

Latest Responses
"Fire prevention "
"Need a bigger water tank"
"Conserve water "

20. Tornado

5
Responses

Latest Responses
"Storm shelters"
"A storm shelter"
"We have a siren "

21. Wildfire

5
Responses

Latest Responses
"Quick response from fire departments"
"More water hydrates "
"Fire department is on the ready "

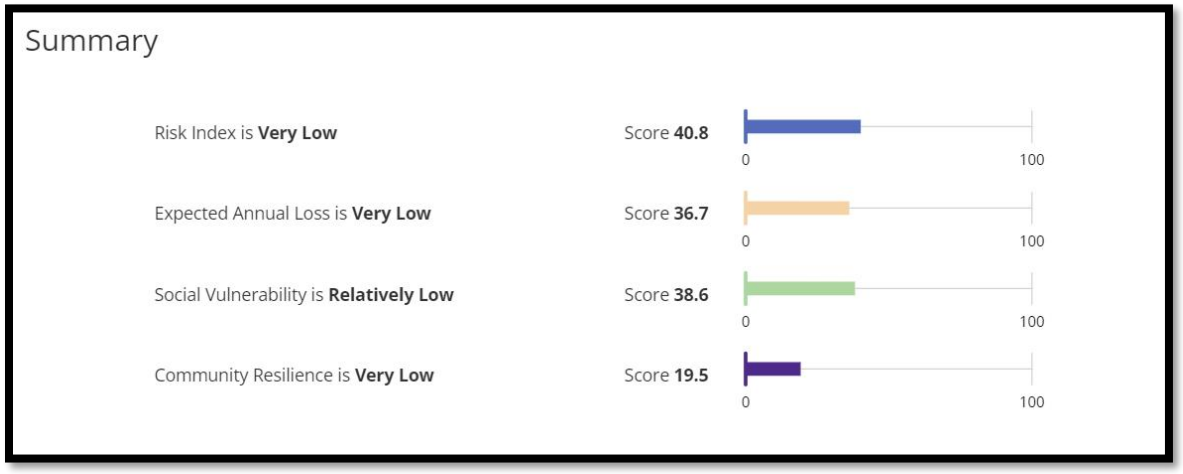
22. Winter Storms/Ice Storms

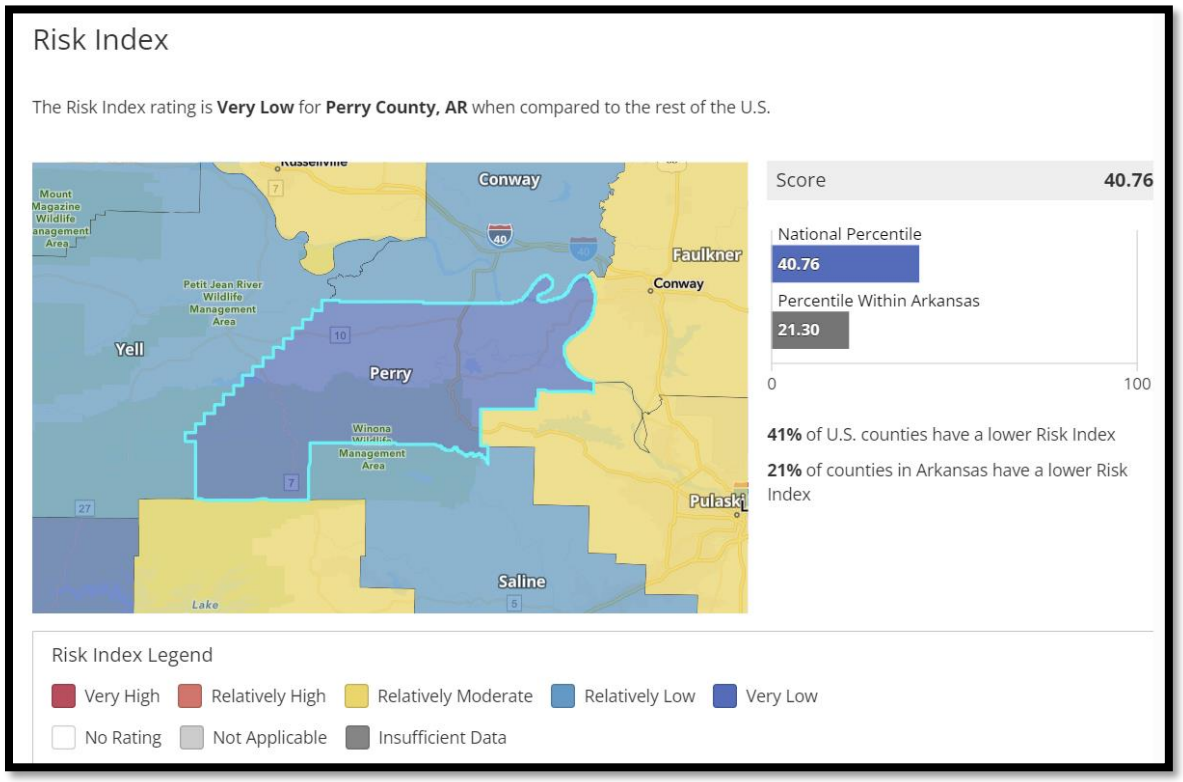
5
Responses

Latest Responses
"Quick response the the county and state road pe...
"More salt/sand on the main roads nothing happe...
"Fire department and road department "

8.3 National Risk Assessment Report

For full report: [Community Report - Perry County, Arkansas | National Risk Index (fema.gov)]





Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's Expected Annual Loss value, community risk factors, and the adjustment factor used to calculate the risk value.

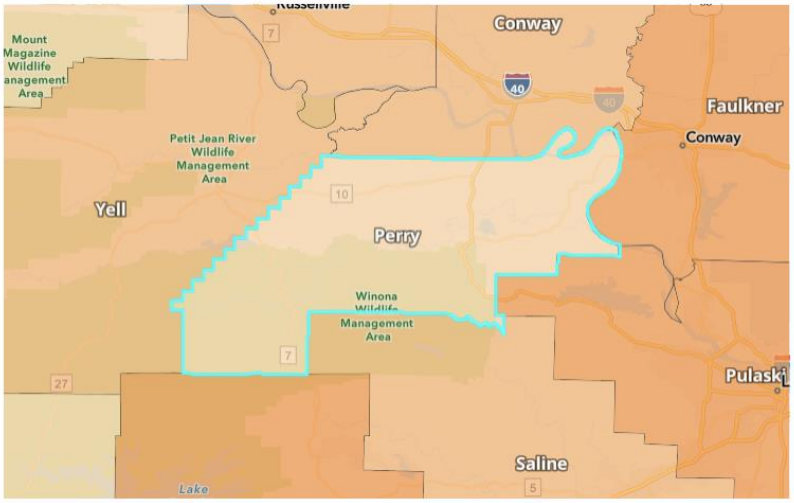
Hazard Type	Risk Index Rating	Risk Index Score	National Percentile
Avalanche	Not Applicable	--	
Coastal Flooding	Not Applicable	--	
Cold Wave	Relatively Moderate	58.3	0 100
Drought	Relatively Low	66	0 100
Earthquake	Very Low	59.9	0 100
Hail	Relatively Low	56.4	0 100
Heat Wave	Relatively Low	57.7	0 100
Hurricane	Very Low	20.4	0 100
Ice Storm	Relatively High	93.9	0 100
Landslide	Relatively Low	56.7	0 100
Lightning	Relatively Low	47.5	0 100
Riverine Flooding	Relatively Low	47.9	0 100
Strong Wind	Relatively Low	55.3	0 100
Tornado	Relatively Low	62.5	0 100
Tsunami	Not Applicable	--	
Volcanic Activity	Not Applicable	--	
Wildfire	Very Low	53.5	0 100
Winter Weather	Relatively Moderate	67.5	0 100

Risk Factor Breakdown

Hazard Type	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
Tornado	$1,421,198	Relatively Low	Very Low	1.27	$1,798,950	62.5
Ice Storm	$860,530	Relatively Low	Very Low	1.27	$1,082,167	93.9
Strong Wind	$356,683	Relatively Low	Very Low	1.27	$449,763	55.3
Riverine Flooding	$321,828	Relatively Low	Very Low	1.27	$421,971	47.9
Earthquake	$207,787	Relatively Low	Very Low	1.27	$263,217	59.9
Hail	$116,469	Relatively Low	Very Low	1.27	$144,980	56.4
Heat Wave	$103,898	Relatively Low	Very Low	1.27	$131,796	57.7
Winter Weather	$92,520	Relatively Low	Very Low	1.27	$116,372	67.5
Cold Wave	$90,996	Relatively Low	Very Low	1.27	$114,832	58.3
Drought	$80,296	Relatively Low	Very Low	1.27	$100,563	66
Lightning	$76,574	Relatively Low	Very Low	1.27	$97,222	47.5
Wildfire	$40,958	Relatively Low	Very Low	1.27	$50,690	53.5
Landslide	$21,900	Relatively Low	Very Low	1.27	$28,061	56.7
Hurricane	$18,786	Relatively Low	Very Low	1.27	$23,476	20.4
Avalanche	--	Relatively Low	Very Low	1.27	--	--
Coastal Flooding	--	Relatively Low	Very Low	1.27	--	--
Tsunami	--	Relatively Low	Very Low	1.27	--	--
Volcanic Activity	--	Relatively Low	Very Low	1.27	--	--

Expected Annual Loss

In **Perry County, AR**, expected loss each year due to natural hazards is **Very Low** when compared to the rest of the U.S.



Score	36.74

National Percentile: 36.74

Percentile Within Arkansas: 22.70

0 — 100

37% of U.S. counties have a lower Expected Annual Loss

23% of counties in Arkansas have a lower Expected Annual Loss

Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

No Expected Annual Losses | Not Applicable | Insufficient Data

Composite Expected Annual Loss	**$3,810,423.57**		
Composite Expected Annual Loss Rate National Percentile	**86.5**		
Building EAL	**$1,895,070.95**	Population EAL	**0.15** fatalities
Building EAL Rate	**$1 per $779.33 of building value**	Population EAL Rate	**1 per 67.66K people**
Agriculture EAL	**$197,662.77**	Population Equivalence EAL	**$1,717,689.84**
Agriculture EAL Rate	**$1 per $325.56 of agriculture value**		

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type.

14 of 18 hazard types contribute to the expected annual loss for **Perry County, AR**.

Hazard Type	Expected Annual Loss Rating	EAL Value	Score
Tornado	Relatively Low	$1,421,198	61.9
Ice Storm	Relatively High	$860,530	93.6
Strong Wind	Relatively Low	$356,683	54.5
Riverine Flooding	Relatively Low	$321,828	45.9
Earthquake	Very Low	$207,787	57.6
Hail	Relatively Low	$116,469	56.4
Heat Wave	Relatively Low	$103,898	57.8
Winter Weather	Relatively Moderate	$92,521	66.6
Cold Wave	Relatively Low	$90,996	58.3
Drought	Relatively Low	$80,296	65.4
Lightning	Relatively Low	$76,574	45.6
Wildfire	Very Low	$40,959	51.4
Landslide	Relatively Low	$21,900	65.1
Hurricane	Very Low	$18,786	18.9
Avalanche	Not Applicable	--	--
Coastal Flooding	Not Applicable	--	--
Tsunami	Not Applicable	--	--

Expected Annual Loss Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$90,996	$128	$77,380	0.01	$13,488
Drought	$80,296	n/a	n/a	n/a	$80,296
Earthquake	$207,787	$134,790	$72,997	0.01	n/a
Hail	$116,469	$72,190	$940	0.00	$43,339
Heat Wave	$103,898	$44	$103,796	0.01	$58
Hurricane	$18,786	$9,843	$175	0.00	$8,769
Ice Storm	$860,530	$854,432	$6,098	0.00	n/a
Landslide	$21,900	$4,500	$17,400	0.00	n/a
Lightning	$76,574	$6,346	$70,228	0.01	n/a
Riverine Flooding	$321,828	$89,145	$184,927	0.02	$47,756
Strong Wind	$356,683	$235,805	$120,832	0.01	$46
Tornado	$1,421,198	$378,641	$1,041,273	0.09	$1,284
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$40,958	$27,781	$13,132	0.00	$46
Winter Weather	$92,520	$81,428	$8,510	0.00	$2,583

Exposure Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$117,761,627,865	$1,476,876,656	$116,220,400,000	10,019.00	$64,351,209
Drought	$10,057,483	n/a	n/a	n/a	$10,057,483
Earthquake	$117,697,248,000	$1,476,848,000	$116,220,400,000	10,019.00	n/a
Hail	$117,761,627,865	$1,476,876,656	$116,220,400,000	10,019.00	$64,351,209
Heat Wave	$117,761,627,865	$1,476,876,656	$116,220,400,000	10,019.00	$64,351,209
Hurricane	$117,707,351,219	$1,475,553,193	$116,167,737,847	10,014.46	$64,060,179
Ice Storm	$117,697,276,656	$1,476,876,656	$116,220,400,000	10,019.00	n/a
Landslide	$44,173,016,809	$601,788,632	$43,571,228,178	3,756.14	n/a
Lightning	$117,697,276,656	$1,476,876,656	$116,220,400,000	10,019.00	n/a
Riverine Flooding	$7,376,004,568	$94,968,395	$7,260,500,221	625.91	$20,535,952
Strong Wind	$117,761,627,865	$1,476,876,656	$116,220,400,000	10,019.00	$64,351,209
Tornado	$117,761,627,865	$1,476,876,656	$116,220,400,000	10,019.00	$64,351,209
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$7,789,872,715	$84,513,083	$7,701,839,682	663.95	$3,519,949
Winter Weather	$117,761,627,865	$1,476,876,656	$116,220,400,000	10,019.00	$64,351,209

Annualized Frequency Values

Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	0.1 events per year	1	2005-2021 (16 years)
Drought	8.4 events per year	210	2000-2021 (22 years)
Earthquake	0.114% chance per year	n/a	2021 dataset
Hail	5.9 events per year	201	1986-2021 (34 years)
Heat Wave	1 event per year	16	2005-2021 (16 years)
Hurricane	0 events per year	2	East 1851-2021 (171 years) / West 1949-2021 (73 years)
Ice Storm	1.3 events per year	85	1946-2014 (67 years)
Landslide	0 events per year	0	2010-2021 (12 years)
Lightning	80.9 events per year	1,780	1991-2012 (22 years)
Riverine Flooding	3.2 events per year	77	1996-2019 (24 years)
Strong Wind	3.8 events per year	128	1986-2021 (34 years)
Tornado	0.4 events per year	19	1950-2021 (72 years)
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	0.096% chance per year	n/a	2021 dataset
Winter Weather	1.4 events per year	22	2005-2021 (16 years)

Historic Loss Ratios

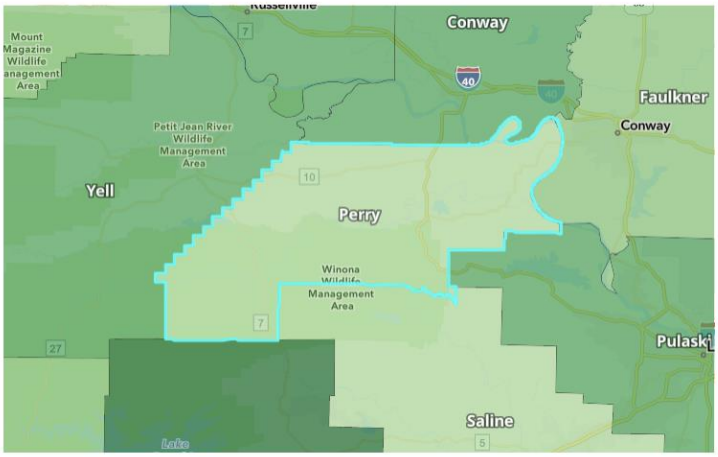
Hazard Type	Overall Rating
Avalanche	--
Coastal Flooding	--
Cold Wave	Relatively Low
Drought	Relatively Moderate
Earthquake	Relatively Moderate
Hail	Relatively Low
Heat Wave	Relatively Low
Hurricane	Relatively Low
Ice Storm	Relatively High
Landslide	Relatively Low
Lightning	Relatively Moderate
Riverine Flooding	Very Low
Strong Wind	Relatively Moderate
Tornado	Relatively High
Tsunami	--
Volcanic Activity	--
Wildfire	Relatively Low
Winter Weather	Relatively High

Expected Annual Loss Rate

Hazard Type	Building EAL Rate (per building value)	Population EAL Rate (per population)	Agriculture EAL Rate (per agriculture value)
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	$1 per $11.52M	1 per 1.50M	$1 per $4.77K
Drought	--	--	$1 per $801.43
Earthquake	$1 per $10.96K	1 per 1.59M	--
Hail	$1 per $20.46K	1 per 123.58M	$1 per $1.48K
Heat Wave	$1 per $33.84M	1 per 1.12M	$1 per $1.11M
Hurricane	$1 per $150.05K	1 per 664.51M	$1 per $7.34K
Ice Storm	$1 per $1.73K	1 per 19.06M	--
Landslide	$1 per $328.19K	1 per 6.68M	--
Lightning	$1 per $232.73K	1 per 1.65M	--
Riverine Flooding	$1 per $16.57K	1 per 628.47K	$1 per $1.35K
Strong Wind	$1 per $6.26K	1 per 961.84K	$1 per $1.41M
Tornado	$1 per $3.90K	1 per 111.61K	$1 per $50.13K
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	$1 per $53.16K	1 per 8.85M	$1 per $1.41M
Winter Weather	$1 per $18.14K	1 per 13.66M	$1 per $24.92K

Social Vulnerability

Social groups in **Perry County, AR** have a **Relatively Low** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.



Score **38.57**

National Percentile
38.57
Percentile Within Arkansas
14.70
0 100

39% of U.S. counties have a lower Social Vulnerability

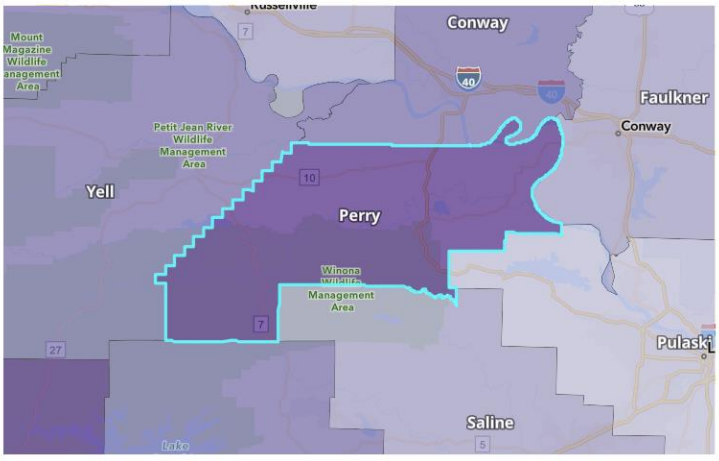
15% of counties in Arkansas have a lower Social Vulnerability

Social Vulnerability Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

Community Resilience

Communities in **Perry County, AR** have a **Very Low** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.



Score **19.45**

National Percentile
19.45
Percentile Within Arkansas
44.00
0 100

81% of U.S. counties have a higher Community Resilience

56% of counties in Arkansas have a higher Community Resilience

Community Resilience Legend

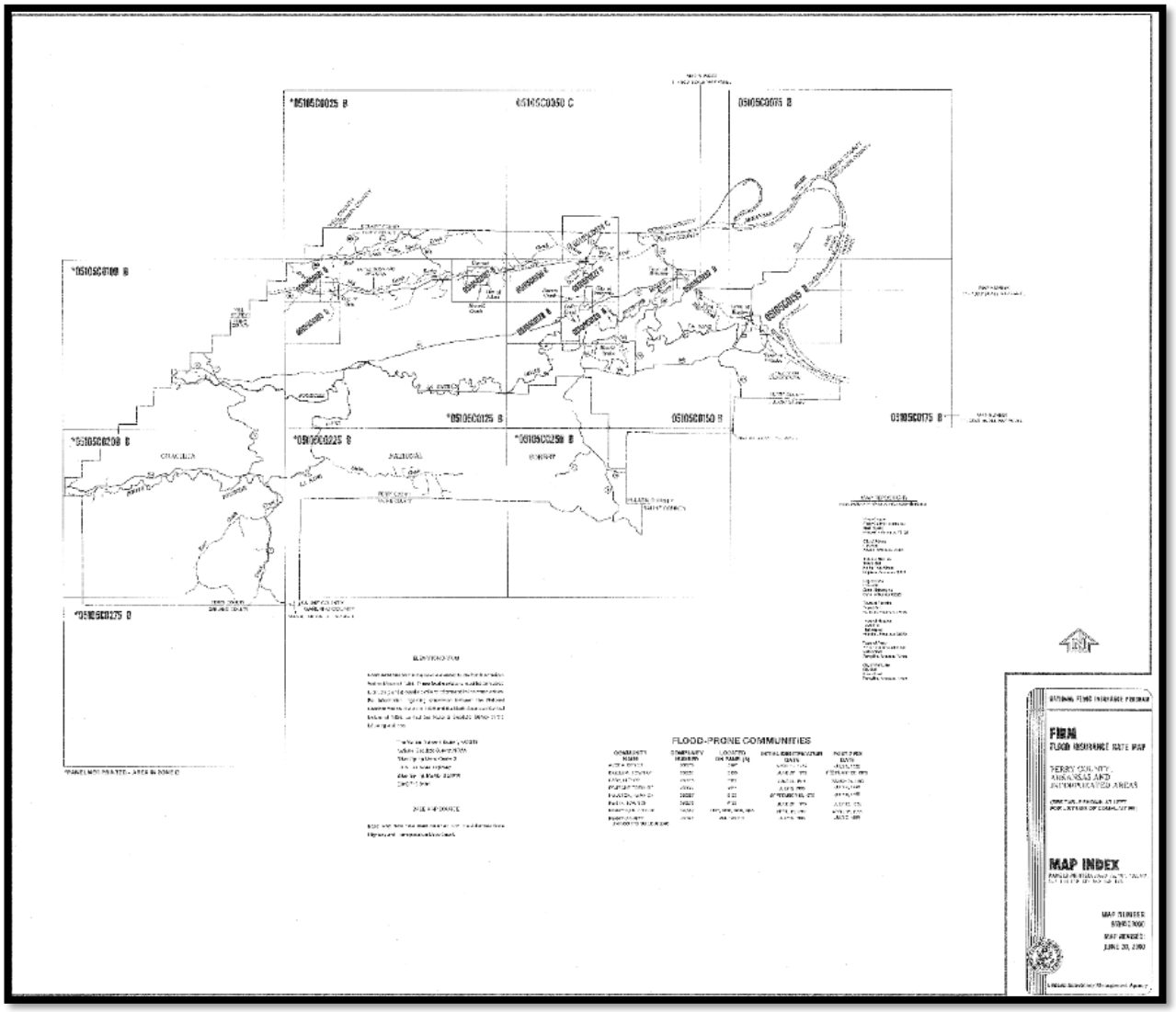
Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

8.4 Firms

Panels can be found at the links provided or at [FEMA Flood Map Service Center | Search All Products](). There are 14 panels that make up Perry County.

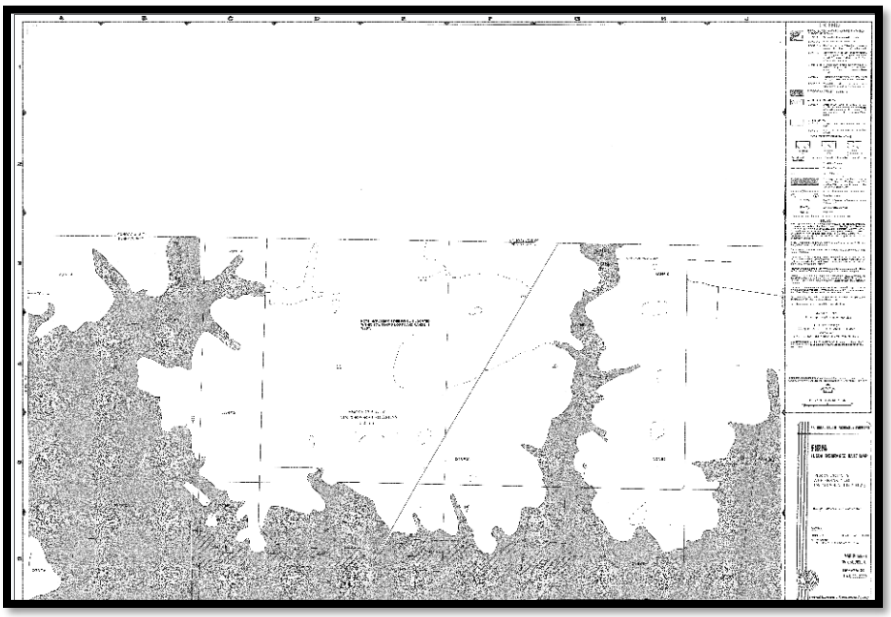
Panel Index

05105C1ND0 Effective 6/20/2000



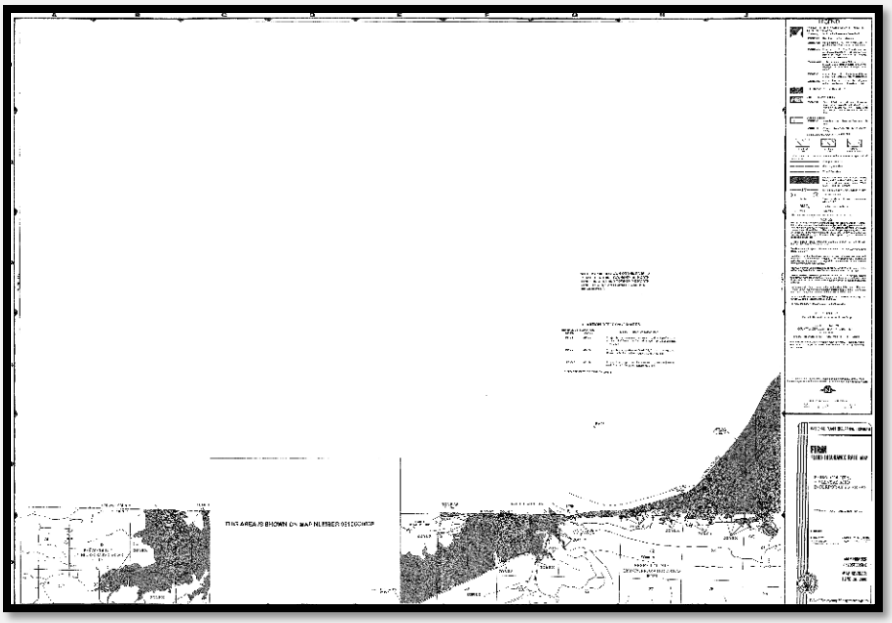
[FIRMette Web [05105CIND0] (fema.gov)]()

05105C0039C Effective 6/20/2000



FEMA Flood Map Service Center | Search All Products

05105C0050C Effective 6/20/2000



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05105C0075B Effective 7/6/1998

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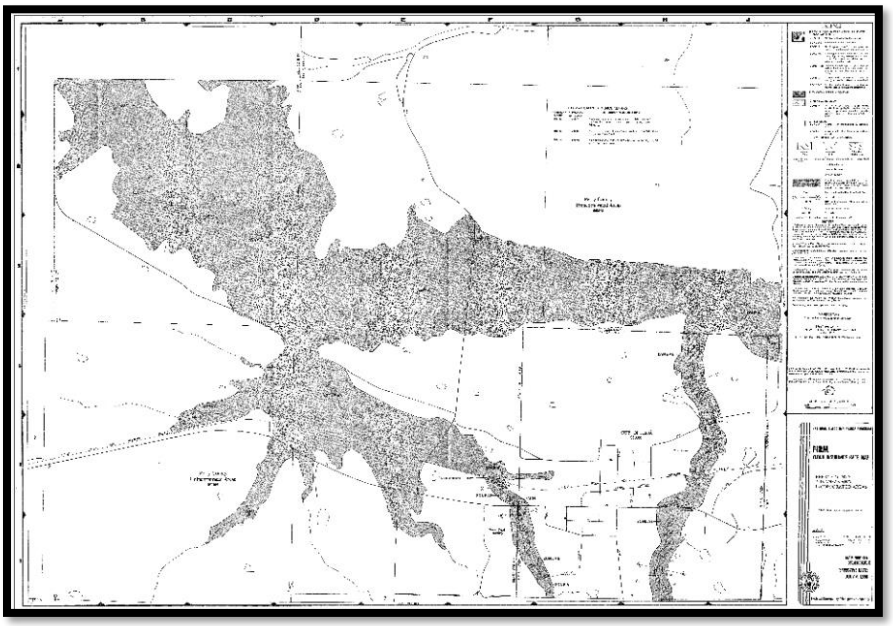

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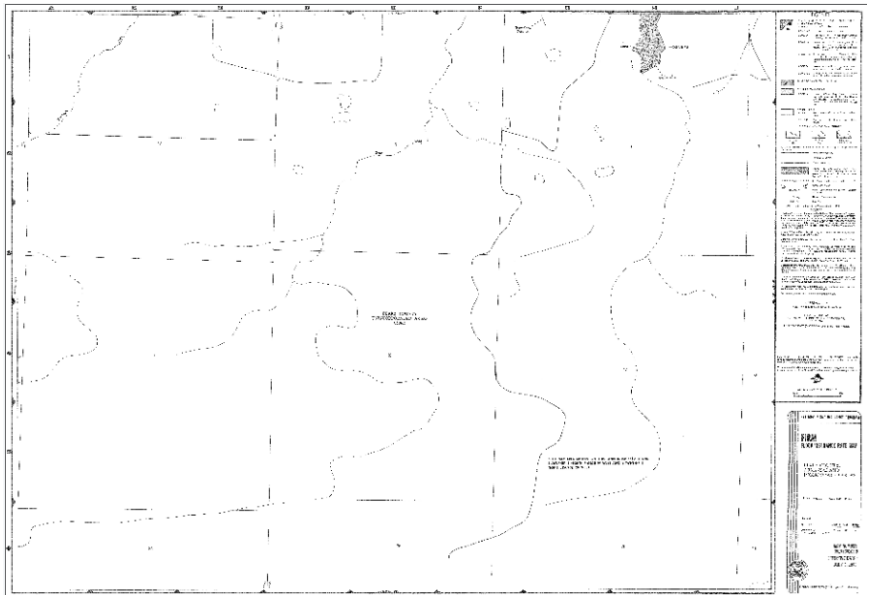

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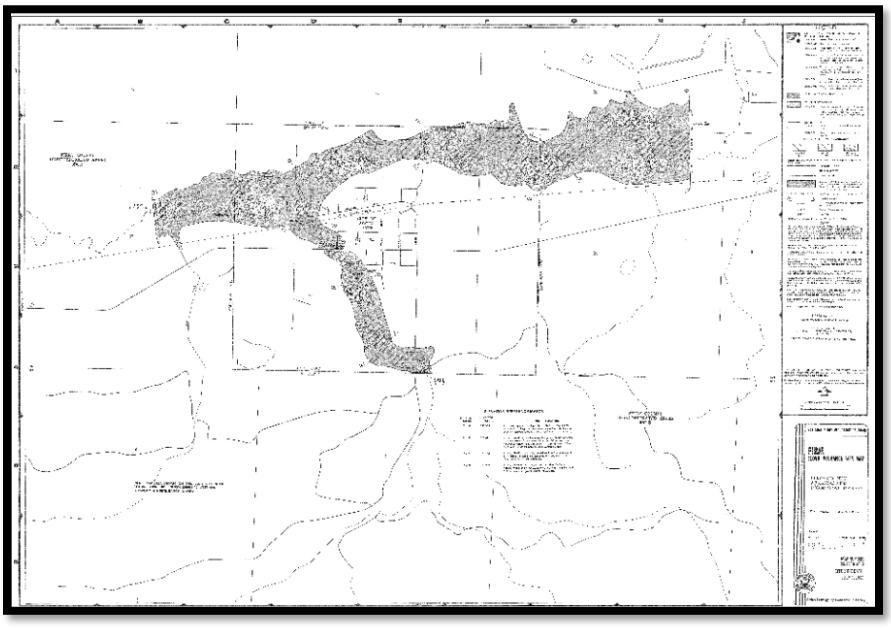

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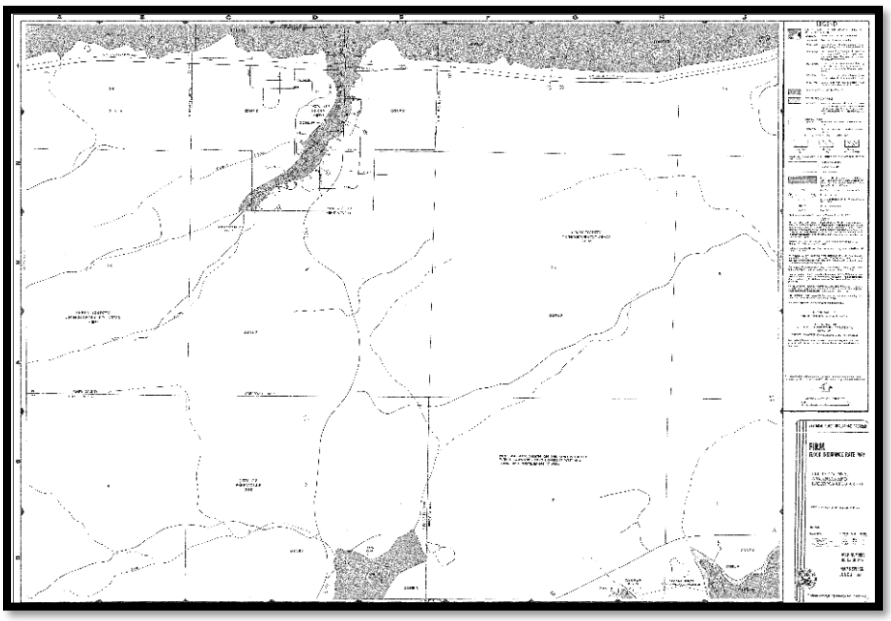

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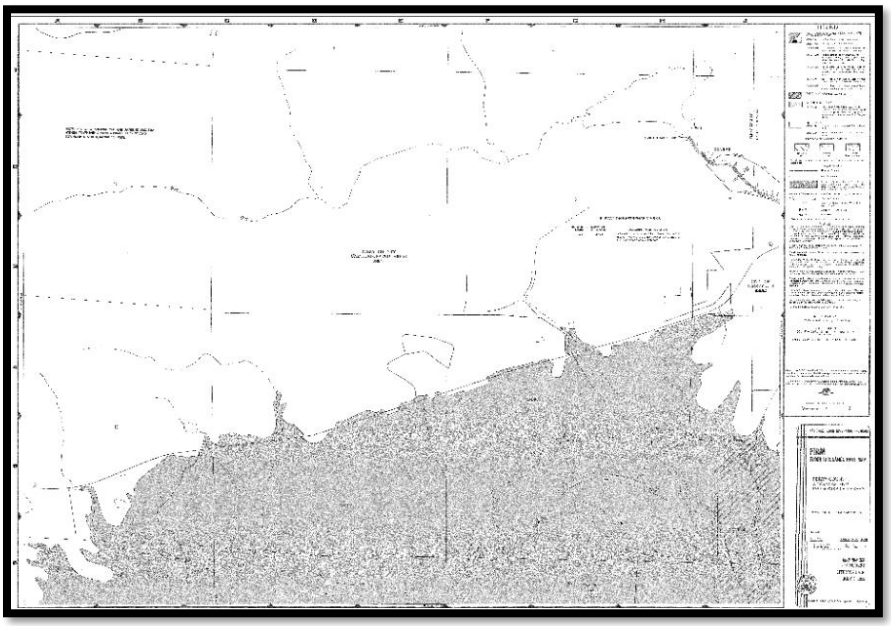

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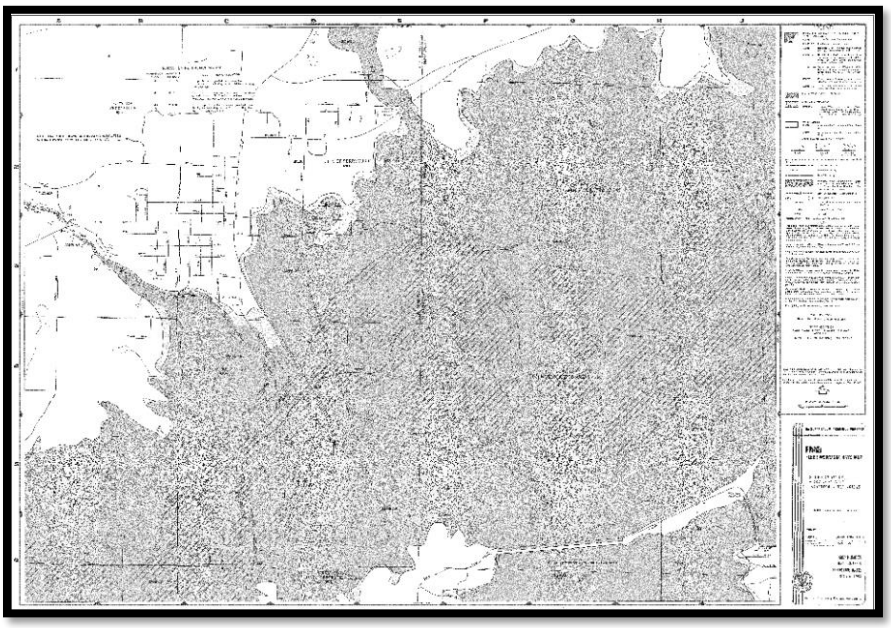

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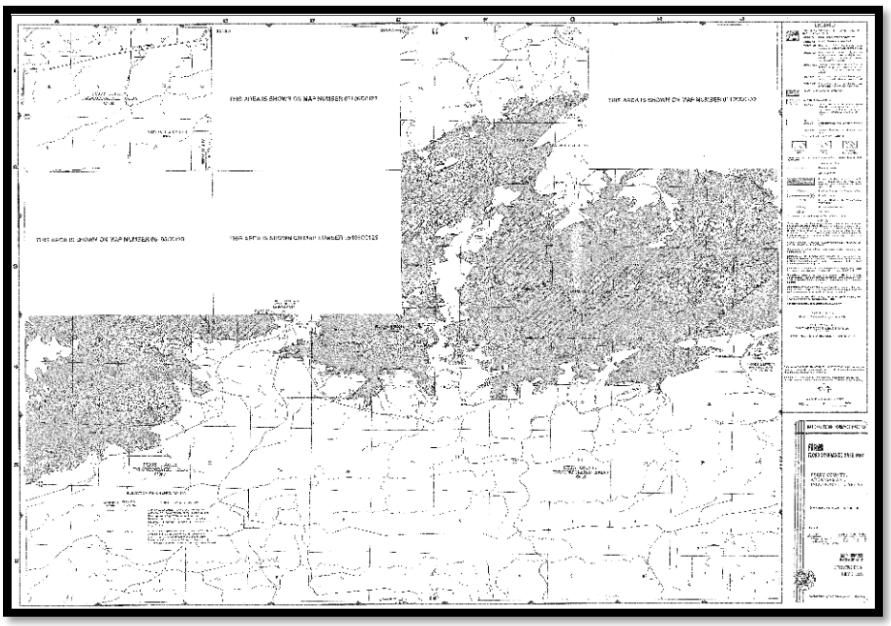

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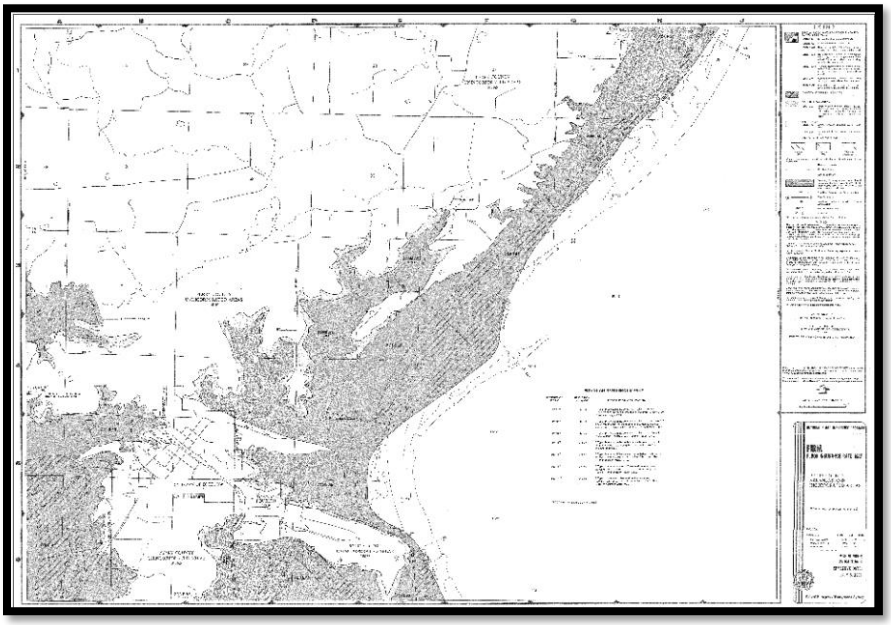

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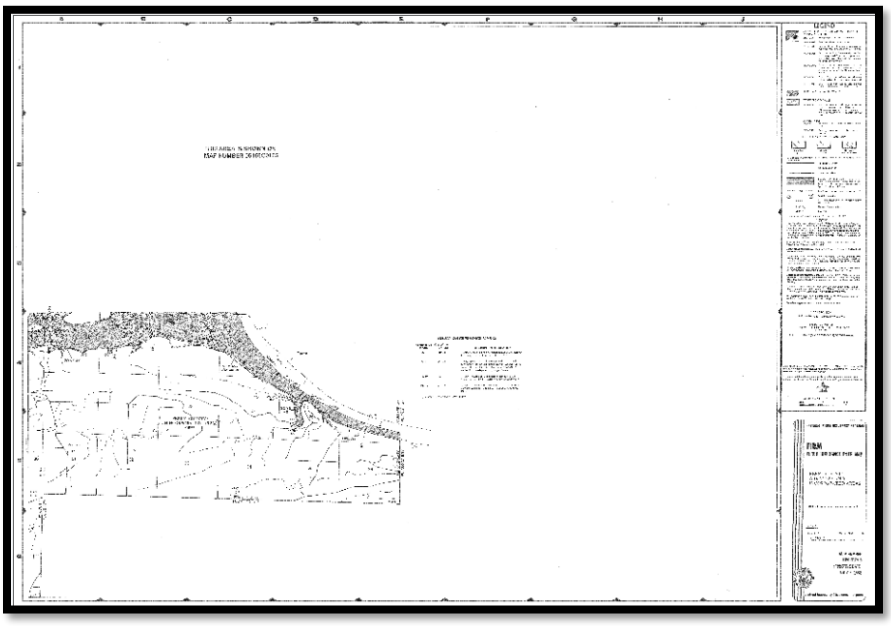

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