Hazard Mitigation Plan
Drew County, Arkansas

FEMA Approved, Pending Adoption
February 15, 2017
May 10, 2017 With Adoptions

Developed by:
Central Arkansas Planning and Development District

Drew County Unincorporated * Jerome * Monticello * Tillar * Wilmar * Winchester * Drew Central School District * Monticello School District * University of Arkansas at Monticello

Contents

Sample Adoption Resolution

County, Participating Jurisdictions and School Districts

Sample Resolution

RESOLUTION #

A RESOLUTION ADOPTING THE DREW COUNTY HAZARD MITIGATION PLAN FOR THE CITY/COUNTY/SCHOOL DISTRICT DREW COUNTY ARKANSAS.

WHEREAS, certain areas of Drew County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the City/County/School District desires to prepare and mitigate for such circumstances; and
WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED BY THE City/Quorum/Board of City/County/School District.

That the City/County/School District, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards (date) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this _____ day of _____, 2014

APPROVED:

_____
Mayor/Judge/Superintendent

ATTEST:

_____
Secretary

SECTION 1: Planning Process

1.1 Plan Introduction

1.1.1 Disaster Mitigation Act of 2000

The purpose of the Drew County Hazard Mitigation Plan is to provide guidance for hazard mitigation activities in Drew County. The Drew County Office of Emergency Management has the responsibility to coordinate all local activities relating to hazard evaluation and mitigation, and to prepare and submit to FEMA a Local Mitigation Plan following the criteria established in 44 CFR 201.4 and Section 322 of the Disaster Mitigation Act of 2000 (Public Law 106-390). The Disaster Mitigation Act of 2000 became law on October 30, 2000, and amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act ("Stafford Act") (Public Law 93-288, as amended). Regulations for this activity can be found in Title 44 of the Code of Federal Regulations Part 206, Subpart M.

This plan meets requirements for a local mitigation plan under Final Rule 44 CFR 201.4, published in the Federal Register by the Federal Emergency Management Agency (FEMA) on February 28, 2002. Meeting the requirements of the regulations cited above keeps Drew County qualified to obtain all disaster assistance including hazard mitigation grants available through the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended.

Drew County initiated the Hazard Mitigation planning process by securing a FEMA Flood Mitigation Assistance (FMA) grant to complete the Flood Section of the Plan. Drew County hired Central Arkansas Planning and Development District, Inc. (CAPDD) to author the plan. Drew County Office of Emergency Management and CAPDD worked together to engage the county, cities, communities and school districts in the planning process.

The Drew County Hazard Mitigation Plan is being developed to assess the ongoing natural hazard mitigation activities in Drew County, to evaluate additional mitigation measures that should be undertaken, and to outline a strategy for implementation of mitigation projects. This plan is multi-jurisdictional with a planning area that includes all of unincorporated Drew County and the municipalities within the County including the Cities of Jerome, Monticello, Tillar, Wilmar and Winchester. This plan also includes the School Districts of Drew Central and Monticello and the University of Arkansas at Monticello.
Formal adoption and implementation of a hazard mitigation plan presents many benefits to Drew County and its residents. By identifying problems and possible solutions in advance of a disaster, Drew County, participating communities and school districts will be in a better position to obtain pre- and post-disaster funding. Specifically, the Disaster Mitigation Act of 2000 establishes a non-disaster hazard mitigation grant programs like the Pre-Disaster Mitigation (PDM) grant program and the Flood Mitigation Assistance (FMA) grant program, and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). It requires that states and communities have a FEMA approved hazard mitigation plan in place prior to receiving post-disaster HMGP funds. Drew County and participating communities will also gain additional credit points under FEMA's Community Rating System (CRS) program, which provides discounts on National Flood Insurance Program (NFIP) flood insurance premiums for residents of communities that voluntarily participate in this program. Most importantly, Drew County will be able to recover faster and more wisely from a disaster. Through planning and acting on local mitigation strategies, the communities will reduce vulnerability to disasters and identify opportunities for mitigation. In addition, the communities may meet comprehensive planning and other planning requirements and achieve community goals. The priorities of the 2016 Drew County Hazard Mitigation Plan remain consistent with the 2008 FEMA approved Drew County Hazard Mitigation Plan. The priorities of the county and participating jurisdictions have not changed, including those related to financial, legal and political conditions.

1.1.2 Parts of the Plan

The Drew County Hazard Mitigation Plan is divided into sections to address FEMA requirements for a local multi-jurisdictional plan. These sections are;

1. Planning Process
2. Planning Area and Resources
3. Hazard Identification and Risk Assessment
4. Mitigation Strategy
5. Acronyms
6. Plan Adoption
7. Appendix

This plan is multi-jurisdictional with a planning area that includes all of unincorporated Drew County and the municipalities within the County including the Cities of Jerome, Monticello, Tillar, Wilmar and Winchester. This plan also includes the School Districts of Drew Central and Monticello and the University of Arkansas at Monticello.

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 "Hazard Mitigation Planning Team" (HMPT) or if a representative was unable to attend, they chose to be represented by the Drew County Office of Emergency Management. HMPT members actively participated in meetings, provided data, solicited input from members of their communities, and ensured that all jurisdiction information was reflected in the plan.

1.1.3 Involvement of Local Governments

Drew County's mitigation planning process was initiated on March 30, 2015, when the County was awarded a Flood Mitigation Assistance (FMA) grant by FEMA through Arkansas Natural Resources Commission, under Drew County Judge Robert Akin. Drew County negotiated a contract with Central Arkansas Planning and Development District to facilitate their mitigation planning efforts. Central Arkansas Planning and Development District served as facilitator and Judge Akin led the planning effort.

Once all participating cities and school districts for which the Drew County OEM is responsible formally agreed to participate, an initial HMPT comprised of representatives from Drew County and participating jurisdiction was organized. This initial team was instructed to solicit interested persons from their community to participate on the HMPT. This solicitation led to the addition of several HMPT members. The HMPT members include representatives from County government, local city governments, public works officials, emergency management officials, local floodplain managers, fire districts, school districts and the University of Arkansas at Monticello. All participating jurisdictions actively participated in the planning process through soliciting input from their communities and participation in meetings. If a participant could not attend a meeting, all minutes and materials were mailed out to the jurisdiction. The Drew County Mitigation Hazard Mitigation Planning Team also discussed mitigation actions, projects, and past hazard occurrences with CAPDD during conference calls and one-on-one calls and meetings.

Three planning events were scheduled throughout the planning process. Training events began the planning process. The Central Arkansas Planning and Development District also utilized technical assistance provided by the Arkansas Department of Emergency Management by receiving training at workshops provided by ADEM and FEMA. Technical assistance regarding NFIP was provided by Arkansas Natural Resources Commission. Technical Assistance regarding the Firewise Program was provided by the Arkansas Forestry Commission. Guidelines for the mitigation plan were discussed as well as training for entering data and how to locate and research the data needed for the mitigation plan. It was stressed to have public involvement and to work together with cities, schools, and County.

Natural Hazard Mitigation Questionnaires were distributed in hard copy by the HMPT members, posted on various websites and available for online completion.
In summary, the planning process consisted of the following items:

- County appointed a Hazard Mitigation Planning Team (HMPT) consisting of mayors and city personnel, school personnel, local floodplain managers, fire department members, emergency workers, planning and development district employees, and LEPC/Citizens Corp Members.
- County engaged Central Arkansas Planning and Development District (CAPDD), the regional planning organization, to provide staff support in conducting the planning process and preparing the plan.
- Meetings were held with HMPT to understand and agree on planning processes and steps required, including organizing resources, assessing hazards, developing a mitigation plan, and implementing the plan and mentoring progress.
- Central Arkansas Planning and Development District staff attended workshops presented by FEMA and ADEM on the preparation of the mitigation plan.
- Central Arkansas Planning and Development District staff also had numerous subsequent discussions about the planning process with ADEM staff. The CAPDD staff also discussed planning process issues with others in the state that were involved in the preparation of other hazard mitigation plans such as other Planning and Development Districts.
- CAPDD staff also has personal experience in reviewing Local Mitigation Plans as former employees of ADEM in the Mitigation Branch.
- The Drew County OEM reached out directly via email to the OEMs of the surrounding Counties of Cleveland, Lincoln, Desha, Chicot, Ashley and Bradley County inviting their participation and providing a draft of the plan for review.
- Public Notices including an invitation to the next HMPT Meeting and a link to an online survey for public, business, academia and other private and non-profit interests was published in the Advance-Monticellonian Newspaper, Monticello Live Online Newspaper and distributed by the Monticello-Drew County Chamber of Commerce to chamber members. The notice was also published on websites for some of the participating jurisdictions.

The Planning Committee utilized these technical documents:

- Arkansas Hazard Mitigation Plan was used as a guidance tool for past occurrences and risk assessments.
- Local Floodplain Ordinances for each NFIP Participating jurisdiction to maintain compliance, especially for mitigation actions.
- Drew County Emergency Operations Plan was used to better understand how Drew 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.
- 2008 Drew County Hazard Mitigation Plan- information that was still relevant was incorporated into the plan
- Lake Monticello Dam Emergency Action Plan- provided information for the risk assessment
- FEMA Local Mitigation Planning Handbook (March 2013)- guidance for the plan requirements
- FEMA G318 Local Mitigation Planning Workshop Student Manual (May 2013) - guidance for the plan requirements
- FEMA Local Mitigation Plan Review Guide (October 1, 2011) - guidance for the plan requirements

Timeline:

1. Planning Grant Awarded March 30, 2015
2. ANRC Administrative Briefing Meeting with Drew County Officials, CAPDD and ANRC Staff held on April 28, 2015
3. Contract between Drew County and CAPDD executed on May 5, 2015.
4. Memorandum of Understanding was signed between Drew County and the Arkansas Natural Resources Commission on May 19, 2015

5. First organized planning meeting was held February 29, 2016 at the Monticello Branch Library. Each person in attendance received a workbook containing a copy of the PowerPoint, a HMPT Survey and Community Surveys to distribute to the community. The PowerPoint including an overview of the planning process was presented, and then the floor was opened for discussion and a questions and answer session.
   Drew County Hazard Mitigation Questionnaires were handed out and participants were asked to forward this information to co-workers and public.
6. Second Meeting was held May 18, 2016 - A PowerPoint addressed Task 5- Risk Assessment and Critical Facilities. Jurisdictions were given critical facility map from previous plan along with materials to make and changes/updates. Information on risk assessment development, risks and impacts, the location areas, extent of the magnitude and discussion of probably of future events and identifying the community assets.
7. Third Meeting was held June 28, 2016 - A PowerPoint addressed Task 6 and 7, Develop a Mitigation Strategy and Procedures to Keep Plan Updated and 7 were covered. Mitigation Goals, Mitigation Action, and Action Plan were the main topic of planning meeting. Each jurisdiction was given a copy of the previous version of the mitigation action table.
8. A final draft of the Plan was provided to the HMPT for review before official FEMA approval or adoption as an opportunity to provide even more input to affect the plan's content.

Meeting Materials are available upon request from Central Arkansas Planning and Development District.

1.1.4 Neighboring Community Involvement

During the Mitigation Planning Process for Drew County, neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development were informed of the meetings and invited personally by Drew County OEM to attend planning meetings. Lacye Blake from the Arkansas Dept. of Emergency Management was involved as the State's point of contact. The Drew County Coordinator, Michael Frisby, was brought into the discussion of prioritizing hazards and mitigation projects for Drew County. Several other first responders were involved during the planning process. The DCOEM contacted surrounding counties to invite them to participate in the planning process by attending meetings and to fill out the Questionnaire.

1.1.5 Public Involvement

During the development of the plan update, the HMPT was provided a three page survey titled "Drew County Natural Hazards Questionnaire" to distribute to the community, businesses, non-profits and neighboring communities for input. The City of Monticello included the survey on its website. In addition, a Public Notice was posted on Monticello Live (a completely online newspaper serving Drew County), in the Advance-Monticellonian (a weekly County-wide newspaper), the Monticello-Drew County Chamber of Commerce website, the Drew County Facebook page and the Central Arkansas Planning and Development District website. Notices were also distributed to the email list serv of the Monticello-Drew County Chamber of Commerce to local businesses. The notice provided a link for people to complete the survey on the web, a link to the original Drew County Hazard Mitigation Plan, and invited citizens to attend the May 18, 2016 HMPT meeting. The notice also gave contact information for questions or more information.

A total of 43 responses were returned. The natural hazards that concerned the general public were drought, floods, tornadoes, thunderstorm winds, lightning and hail, and winter storms. The information from these questionnaires was given to the HMPT and was discussed by the HMPT, and any relevant input was incorporated into the plan.

After the completion of the planning meetings, the draft plan was provided on the Central Arkansas Planning and Development District (CAPDD) website http://www.capdd.org/index.php/fema-hazard-mitigation-plans.html for any additional input from surrounding communities, the public, businesses, state

and local agencies, and anyone else wishing to review. A notice to all Drew County residents regarding the availability of the draft plan and an invitation for their comment was published on the Monticello Live webpage. The notice also stated that hard copies of the draft were also available for review at the Drew County Judge's Office and each City Hall in the County.

Planning members were made aware of the requirement that the Drew County Hazard Mitigation Plan must be submitted to the Arkansas Department of Emergency Management for review prior to the State submitting plans to FEMA.

1.1.6 Plan Developers

Drew County Hazard Mitigation Planning Team-

Jurisdiction	Participation/Involvement
Drew County, unincorporated areas and state agencies	County Judge Robert Akin *County Judge received hazard mitigation workbook, attended planning meetings, completed questionnaires, participated in collection of historical natural disaster information and provided input for the Risk Assessment.* Drew County Office of Emergency Management (DCOEM); Michael Frisby, Director *Personnel of DCOEM received hazard mitigation workbook, 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. DCOEM also handles floodplain management for all of unincorporated Drew County and provides technical assistance regarding floodplain issues to all other areas of the County.* Arkansas Department of Emergency Management; Lacye Blake *Addressed questions from HMPT about hazard mitigation. Provided Technical Assistance to CAPDD and Drew County as needed.* Arkansas Natural Resources Commission; Veronica Villalobos-Pogue *Managed the FMA grant and provided Technical Assistance to CAPDD and Drew County as needed.*
City of Jerome	Mayor Glen Reynolds *Mayor completed questionnaires and communicated with CAPDD regarding natural hazards events and mitigation strategies.*
City of Monticello	Mayor Zackery Tucker *Mayor attended planning meetings, received hazard mitigation workbooks, completed questionnaires assisted with Risk Assessment, and participated in open discussion of historical storm events.* Kelly Reid, Fire Chief *Attended planning meetings, completed questionnaires, distributed Firewise information to County Volunteer Fire Departments and participated in Risk Assessment discussions.* Eddy Deaton, Police Chief *Attended planning meetings, completed questionnaires, provided information about historical events, and participated in discussions.* Andrea Chambers, Flood Manager *Attended planning meetings, completed questionnaires, provided historical flood information and participated in discussions.*
City of Tillar	Mayor Lemuel Overton *Attended planning meetings, completed community capabilities assessment and natural hazard questionnaire, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.*
City of Wilmar	Mayor Curley Jackson City Clerk Amanda Orr *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 Winchester	Mayor General Alexander *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.*
Drew Central School District	Supt. Billy Williams *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.*
Monticello School District	Supt. Sandra Lanehart Jerry Martens, Assistant Superintendent *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.*
University of Arkansas at Monticello	Chancellor Karla Hughes Chester Ashcraft- Director of Physical Plant Officer Adam Barnes- UAM Police Department Christine Bryant- Safety Coordinator Jay Jones- Vice Chancellor for Finance & Admin Christy Pace, Assistant to the Chancellor Lisa Shemwell, Executive Assistant to the Chancellor and Chief of Staff *Attended planning meetings, received hazard mitigation workbook assisted with Risk Assessment, and participated in open discussion of historical storm events.*
Central Arkansas Planning and Development District	Amanda Adaire, CFM, PCED *Program Manager and facilitator for the Drew County Hazard Mitigation Planning process.*

Point of Contacts

County Judge Robert Akin Drew County 210 South Main Street Monticello, AR 71655 870-460-6200 drewcojudge@sbcglobal.net	Mayor Glenn Reynolds City of Jerome 160 North Louisiana Blvd Dermott, AR 71638 870-538-5659 870-417-4370 WORK, 870-538-8831 CELL	Mayor Zackery Tucker City of Monticello PO Box 505 Monticello, AR 71657 870-367-4400 zack.tucker@monticelloar.org
Mayor Lemuel Overton Town of Tilar PO Box 86 Tillar, AR 71670 870-392-2584	Mayor Curley Jackson City of Wilmar PO Box 397 Wilmar, AR 71675 870-469-5609	Mayor General Alexander City of Winchester PO Box 52 Winchester, AR 71677 870-377-7029 CELL, 870-392-7911 WORK
Superintendent Billy Williams Drew Central School District 250 University Drive Monticello, AR 71655 870-367-5369 Billy.Williams@drewcentral.org	Superintendent Sandra Lanehart Monticello School District 935 Scogin Drive Monticello, AR 71655 870-367-4000 sandra.lanehart@billies.org	Chancellor Karla Hughes University of Arkansas at Monticello UAM Box 3596 Monticello, AR 71656 870-460-1020 jonesj@uamont.edu
Director of Emergency Management Michael Frisby Drew County Office of Emergency Management 210 S Main Street Monticello, AR 71655 870-460-6203 drewoem911@gmail.com		

1.2 Plan Maintenance Process

1.2.1 Monitoring, Evaluation and Updating the Plan

Although FEMA regulations require a plan update within five years, Drew County has developed a method to ensure that monitoring, evaluation, and updating of the Drew 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 Drew 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 and emergency medical personnel, elected officials, and owners and operators of covered facilities. The Director of the Drew County Office of Emergency Management will be the initial Chair of the sub-committee or HMPT Leader. The HMPT Leader will contact the HMPT committee, set up meeting dates, and ensure that each community will maintain a representative on the team.

The responsible party for overseeing and assuring plan updates is the Drew County Office of Emergency Management. At this time, the maintenance procedures for the Mitigation Plan will be conducted at the LEPC meeting, which are held quarterly. 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 Drew County, as well as changes in State or Federal policy, and to ensure that they are addressing current and expected conditions. 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 (identified in Section 4) will report on the status of their projects and will evaluate which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

The Drew County Office of Emergency Management will then have three months to update and make changes to the plan before submitting it to the Sub-Committee members and the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a 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.

The HMPT will take into account any changes in the plan and incorporate the information accordingly in its next update. One such anticipated change is information pending from a Risk MAP study of Bayou Bartholomew currently being under-taken by FEMA. The HMPT will incorporate any relevant information into the next plan 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 by posting the agenda and submitting meeting notice to the local media through newspaper articles, County website and postings in public locations. This process will inform the County citizens on any changes or revisions of the Drew County Hazard Mitigation Plan.

Since future plans and government regulations might need to be adopted into the Hazard Mitigation Plan, Drew 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.

Additionally, if any of the participating jurisdictions plan to apply for future FEMA Hazard Mitigation Grants, the public will be invited to comment before the application is submitted, per the HMA grant application guidelines.

1.2.2 Incorporation into Existing Planning Mechanisms

The Drew County Hazard Mitigation Plan will be integrated into other plans. Integrating hazard mitigation into local comprehensive plans thereby establishes resilience as an overarching value of a community and provides the opportunity to continuously manage development in a way that does not lead to increased hazard vulnerability.

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

The Drew County Hazard Mitigation Plan will be available for public view on the Central Arkansas Planning and Development District's website http://www.capdd.org/index.php/fema-hazard-mitigation-plans.html 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 Drew County Courthouse in Monticello, the city halls of Jerome, Monticello, Tillar, Wilmar and Winchester, and the offices of Drew Central School District, Monticello School District and the University of Arkansas at Monticello.

Drew County Quorum Court, City Councils of Jerome, Monticello, Tillar, Wilmar and Winchester will adopt the approved mitigation plan through resolution. The Board of Directors of the school districts of Drew Central and Monticello and the Board of Visitors of the University of Arkansas at Monticello will be adopting the approved Hazard Mitigation Plan by formal adoption or resolution in their existing plans that are relevant to Hazard Mitigation. The same process will also be followed when parts of the Drew County Hazard Mitigation Plan are incorporated into community planning mechanisms.

Any participant without previous plans in place will be encouraged to develop zoning plans and other land ordinance plans to incorporate mitigation strategies. Participants incorporating the Drew County Hazard Mitigation Plan pertain 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 strategies and report the success or failure to the Local Emergency Planning Committee for inclusion in its annual report. After each update of the Drew County Hazard Mitigation Plan, each incorporating participant will be informed of the changes so they can reflect these changes in their plans also. Incorporating the plan or parts of the plan into other plans will be done by vote at the regular quorum court meetings and passed by resolution.

All participating jurisdictions will use the risk assessment that was conducted for the mitigation plan for creating strategies when dealing with hazards as well as the budget. The data and maps will be used as supporting documentation to encourage participating jurisdictions to address the hazards that affect their areas and organizations and can be used in grant applications.

Drew County will be incorporating the Drew County Hazard Mitigation Plan into the Drew County Continuity of Operations Plan, and any future county land use ordinances and/or plans by following the laws set forth by the county government. Incorporating the plan (and any plan) into other county plans will be done by vote at the regular quorum court meetings and passed by resolution.

Both participating school districts will consider incorporating the Drew County Hazard Mitigation Plan into their existing emergency preparedness, response and recovery plans, such as a Continuity of Operations Plan, where applicable by following the rules set forth by each school board. Incorporating the plan into any existing or future plans will be done at regular school board meetings by resolution of the School Board.

UAM will consider incorporating the Drew County Hazard Mitigation Plan into their existing emergency preparedness, response and recovery plans, such as a Continuity of Operations Plan, where applicable by following the rules set forth by the Board of Visitors. Incorporating the plan into any existing or future plans will be done at board meetings by resolution of the Board of Visitors.

The previous plan was not incorporated into any planning mechanisms due to a change in administration as well as the goals and priority of the county.

1.2.3 Continuous Public Involvement

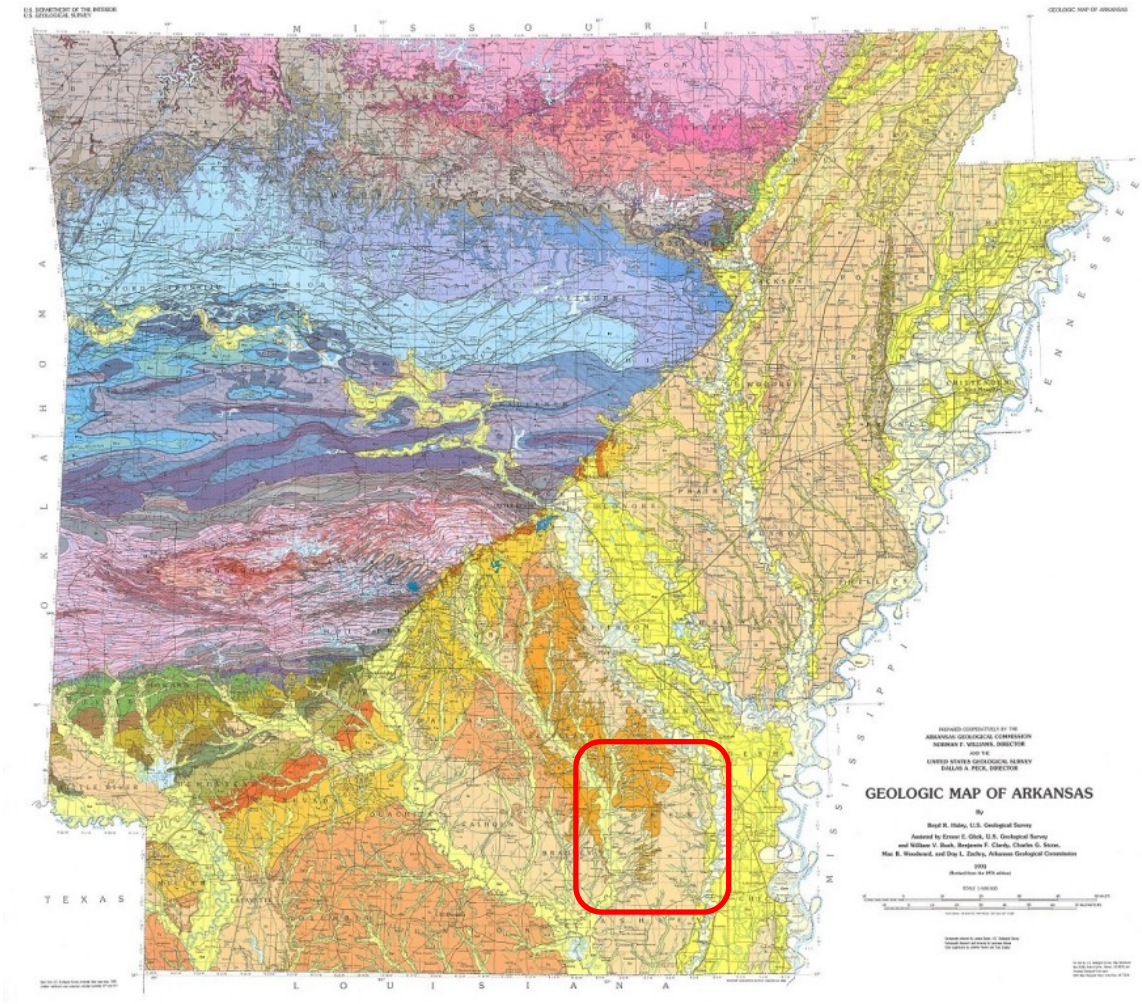
Drew County is dedicated to involving the public directly in the continual reshaping and updating of the Drew County Hazard Mitigation Plan. The Hazard Mitigation HMPT members are responsible for the annual monitoring, evaluation, and update of the plan. Although they represent the public to some extent,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

Copies of the FEMA approved Drew County Hazard Mitigation Plan will be available at http://www.capdd.org/index.php/fema-hazard-mitigation-plans.html. The plan will also be available at the County Courthouse, City Halls of each participating city, public libraries, UAM's, Drew Central School District's and Monticello School District's administration offices for public review. Contained in the plan are the address, phone number, and e-mail of the Director of the Drew 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 Team 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 Drew County Office of Emergency Management and the Drew 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.

SECTION 2: Planning Area and Resources

2.1 General Geography



2.1.1 Topography

Drew County comprises 835 square miles (828 square miles of land and 7 square miles of water) in the southeast section of Arkansas. The western third of this almost square county lies in the coastal plain natural division while the eastern two thirds lies in the alluvial plain or delta natural division. The topography consists of gently rolling, sandy hills.

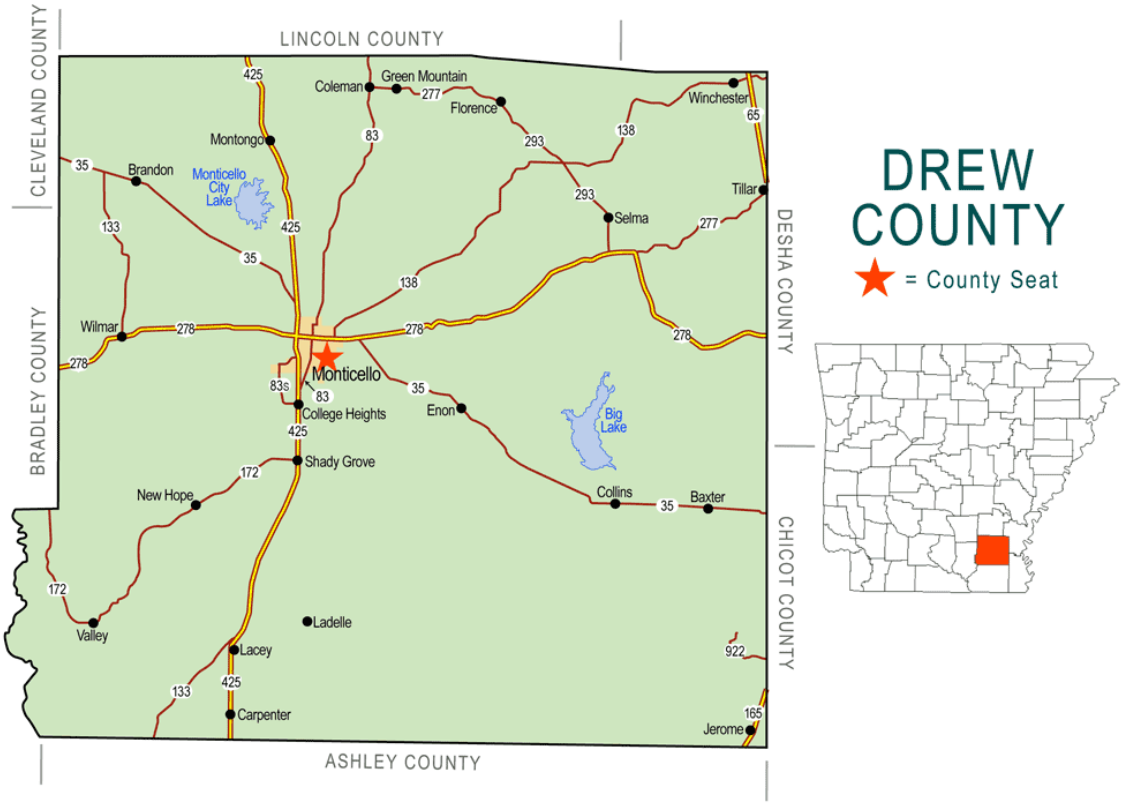
2.1.2 Rivers and Watersheds

Bayou Bartholomew, the longest bayou in the world, runs the length of the eastern side of the county. Drew County is also drained by Cut Off Creek which originates in the north central part of the county runs through Seven Devil's Swamp, in east central Drew County, and empties into Bayou Bartholomew in northern Ashley County. (Cut Off Creek Wildlife Management Area is in the Southeast corner of the County.) Saline River forms part of the Southwest boundary between Drew and Bradley Counties. Lake Monticello is in the northwest part of the county.

The following watersheds drain Drew County: Bayou Bartholomew, Boeuf and Lower Saline.

2.2 General Land Use/Analyzing Development Trends

Drew County was formed November 26, 1846 and was named after Thomas Stevenson Drew, the 3rd governor of Arkansas, who served from November 1844 to 1849. Spanish, French, U.S., and Confederate flags have flown over Drew County. There are 60 Drew County buildings on the National Historic Register. The Historical Museum, a fourteen room mansion is maintained by the historical society.



There has been no significant growth in population or development that has increased the impact of natural disasters to the community's infrastructure, people, and economy. There have been changes in the area due to the mitigation actions in the previous mitigation plan. Where it is applicable, the changes in land use and development will be addressed in the hazard profile. If there is not a summary identifying the changes in land use and development trends, then there is no applicable change that affects the impact to the community's infrastructure, people, and economy in respect to that hazard.

U.S. Census Bureau

AMERICAN FactFinder

GCT-PH1 | Population, Housing Units, Area, and Density: 2010 - County – County Subdivision and Place

2010 Census Summary File 1

NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://www.census.gov/prod/cen2010/doc/sf1.pdf.

Geography: Drew County, Arkansas

Geographic area	Population	Housing units	Area in square miles		
			Total area	Water area	Land area
Drew County	18,509	8,408	835.66	7.31	828.36
COUNTY SUBDIVISION AND PLACE					
Bartholomew township	168	93	75.13	0.66	74.47
Jerome town	39	19	0.17	0.00	0.17
Remainder of Bartholomew township	129	74	74.96	0.66	74.30
Bearhouse township	38	18	59.16	0.00	59.16
Bearhouse township	38	18	59.16	0.00	59.16
Clear Creek township	551	286	58.78	0.04	58.75
Clear Creek township	551	286	58.78	0.04	58.75
Collins township	235	118	59.27	1.51	57.76
Collins township	235	118	59.27	1.51	57.76
Cominto township	422	174	50.78	1.66	49.12
Cominto township	422	174	50.78	1.66	49.12
Crook township	305	140	64.55	0.32	64.23
Crook township	305	140	64.55	0.32	64.23
Franklin township	617	317	81.06	1.79	79.27
Tillar city (part)	204	93	0.42	0.00	0.42
Remainder of Franklin township	413	224	80.64	1.79	78.85
Live Oak township	498	241	63.11	0.58	62.53
Winchester town	167	82	0.50	0.00	0.50
Remainder of Live Oak township	331	159	62.61	0.58	62.03
Marion township	12,673	5,555	115.76	0.46	115.30
Monticello city	9,467	4,093	11.04	0.01	11.02
Remainder of Marion township	3,206	1,462	104.72	0.44	104.28
Saline township	1,281	616	62.65	0.02	62.63
Wilmar city	511	272	1.57	0.00	1.57
Remainder of Saline township	770	344	61.08	0.02	61.06
Spring Hill township	850	428	64.21	0.26	63.95
Spring Hill township	850	428	64.21	0.26	63.95
Veasey township	871	422	81.21	0.00	81.20
Veasey township	871	422	81.21	0.00	81.20
PLACE					
Jerome town	39	19	0.17	0.00	0.17
Monticello city	9,467	4,093	11.04	0.01	11.02
Tillar city (part)	204	93	0.42	0.00	0.42
Wilmar city	511	272	1.57	0.00	1.57
Winchester town	167	82	0.50	0.00	0.50

Geographic area	Density per square mile of land area	
	Population	Housing units
Drew County	22.3	10.2
COUNTY SUBDIVISION AND PLACE		
Bartholomew township	2.3	1.2
Jerome town	232.8	113.4
Remainder of Bartholomew township	1.7	1.0
Bearhouse township	0.6	0.3
Bearhouse township	0.6	0.3
Clear Creek township	9.4	4.9
Clear Creek township	9.4	4.9
Collins township	4.1	2.0
Collins township	4.1	2.0
Cominto township	8.6	3.5
Cominto township	8.6	3.5
Crook township	4.7	2.2
Crook township	4.7	2.2
Franklin township	7.8	4.0
Tillar city (part)	485.1	221.1
Remainder of Franklin township	5.2	2.8
Live Oak township	8.0	3.9
Winchester town	335.1	164.5
Remainder of Live Oak township	5.3	2.6
Marion township	109.9	48.2
Monticello city	859.0	371.4
Remainder of Marion township	30.7	14.0
Saline township	20.5	9.8
Wilmar city	325.7	173.4
Remainder of Saline township	12.6	5.6
Spring Hill township	13.3	6.7
Spring Hill township	13.3	6.7
Veasey township	10.7	5.2
Veasey township	10.7	5.2
PLACE		
Jerome town	232.8	113.4
Monticello city	859.0	371.4
Tillar city (part)	485.1	221.1
Wilmar city	325.7	173.4
Winchester town	335.1	164.5

X Not applicable.
Source: U.S. Census Bureau, 2010 Census.
Census 2010 Summary File 1, Geographic Header Record G001.

2.2.1 Capability Assessment

Jurisdiction	Planning and Regulatory Capabilities														
	Comprehensive / Master Plans	Local Emergency Operations Plan	Land Use Plan	Continuity of Operations Plan	County Foreman	Stormwater Management Plan	Adopted Stream Management Ordinance	Adopted Zoning Ordinance	Adopted Subdivision Management Ordinance	Community Wildfire Protection Plan	Building Codes	Fire Department ISO Rating	Development Ordinance	Site Plan Review Requirements	Economic Development Plan
Drew County		X			X							*			X
Jerome															X
Monticello	X		X			X			X		X	4/9	X		X
Tillar												9/10			X
Wilmar												9/10			X
Winchester												9/10			X
Drew Central S.D.															
Monticello S.D.		X													
UofA at Monticello															

*Other Fire Departments in the unincorporated Drew County:

Department Name	ISO Rating
Clear Creek Volunteer Fire Department	9/10
Collins-Cominto Volunteer Fire Department	9/10
Lacey-Ladelle Volunteer Fire Department	9/10
Selma Volunteer Fire Department	9/10

Jurisdiction	Administrative and Technical Capabilities										
	Planning Commission	Maintenance Programs to Reduce Risk	Mutual Aid Agreements	GIS Analysts or HAZUS	Warning Systems/Services	Hazard Data and Information	Grant Writers	Emergency Manager	Floodplain Administrator	Building and Grounds Maintenance Staff	General Staff for a Variety of Duties/ Responsibilities
Drew County			X	X	X	X	X	X	X	X	X
Jerome			X	X	X	X	X				X
Monticello	X		X	X	X	X	X	X	X	X	X
Tillar			X	X	X	X	X		X		X
Wilmar			X	X	X	X	X		X	X	X
Winchester			X	X	X	X	X		X		X
Drew Central S.D.				X	X	X	X			X	X
Monticello S.D.				X	X	X	X			X	X
UofA at Monticello				X	X	X	X			X	X

All participating jurisdictions receive revenue from taxes, millage and/or other revenue. In the case of the University, tuition fees are received. Each jurisdiction could qualify for a variety of grants to improve financial capabilities. The Southeast Arkansas Economic Development District out of Pine Bluff assists all of the jurisdictions with community and economic development activities including grant assistance.

	Education and Outreach Capabilities								
	Drew County	Jerome	Monticello	Tillar	Wilmar	Winchester	Drew Central SD	Monticello SD	UAM
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations	X		X						
Ongoing public education or information program	X		X						
Natural disaster or safety related school programs							X	X	X
StormReady certification									X
Firewise Communities certification									
Public-private partnership initiatives addressing disaster-related issues	X		X						
Website	X		X						X
Social Media (Facebook, Twitter, etc.)	X		X						X
Newspaper	X	X	X	X	X	X	X	X	X
Mobile Alert System (such as Code RED)		X	X						X
Radio	X								
Phone		X							
Community Mail-Outs		X							

Drew County

Electric Utilities- Entergy, C&L Electric
Telephone Utilities- AT&T
Gas Utilities-Southern L/P Gas, Enable
Water Systems Utilities- Monticello Water
Wastewater Treatment- Monticello Sewer, Individual Septic Systems

City of Jerome

Electric Utilities- Entergy
Telephone Utilities- AT&T
Gas Utilities- Butane Tanks- no natural gas
Water Systems Utilities- Montrose Water
Wastewater Treatment- Individual Septic Systems

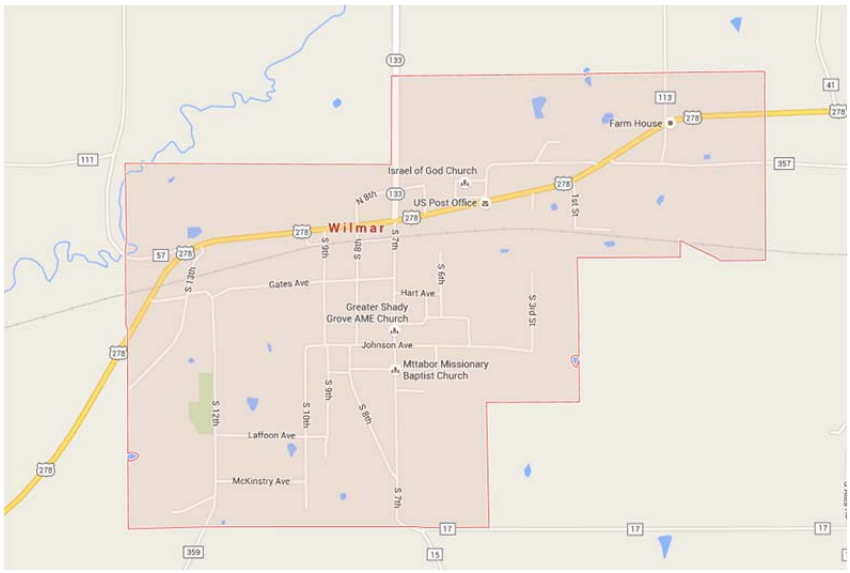
City of Monticello

Electric Utilities- Entergy
Telephone Utilities- AT&T
Gas Utilities- Centerpoint Energy
Water Systems Utilities- Monticello Water
Wastewater Treatment- Monticello Sewer Department

City of Tillar

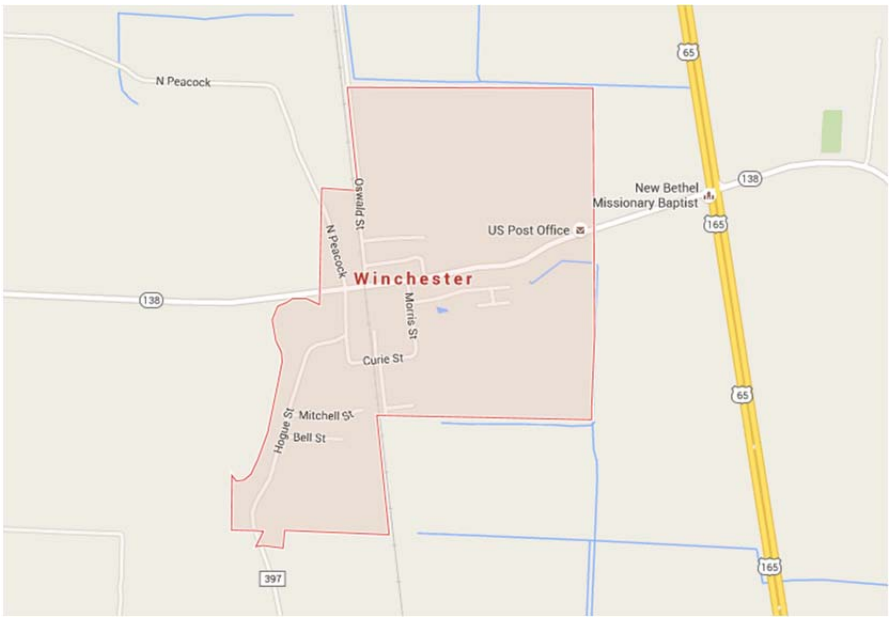
Electric Utilities- Entergy
Telephone Utilities- AT&T
Gas Utilities- None
Water Systems Utilities- Murray
Wastewater Treatment- Murray

City of Wilmar



Electric Utilities- Entergy
Telephone Utilities- AT&T
Gas Utilities- Centerpoint Energy
Water Systems Utilities- Wilmar Waterworks
Wastewater Treatment- Wilmar Waterworks

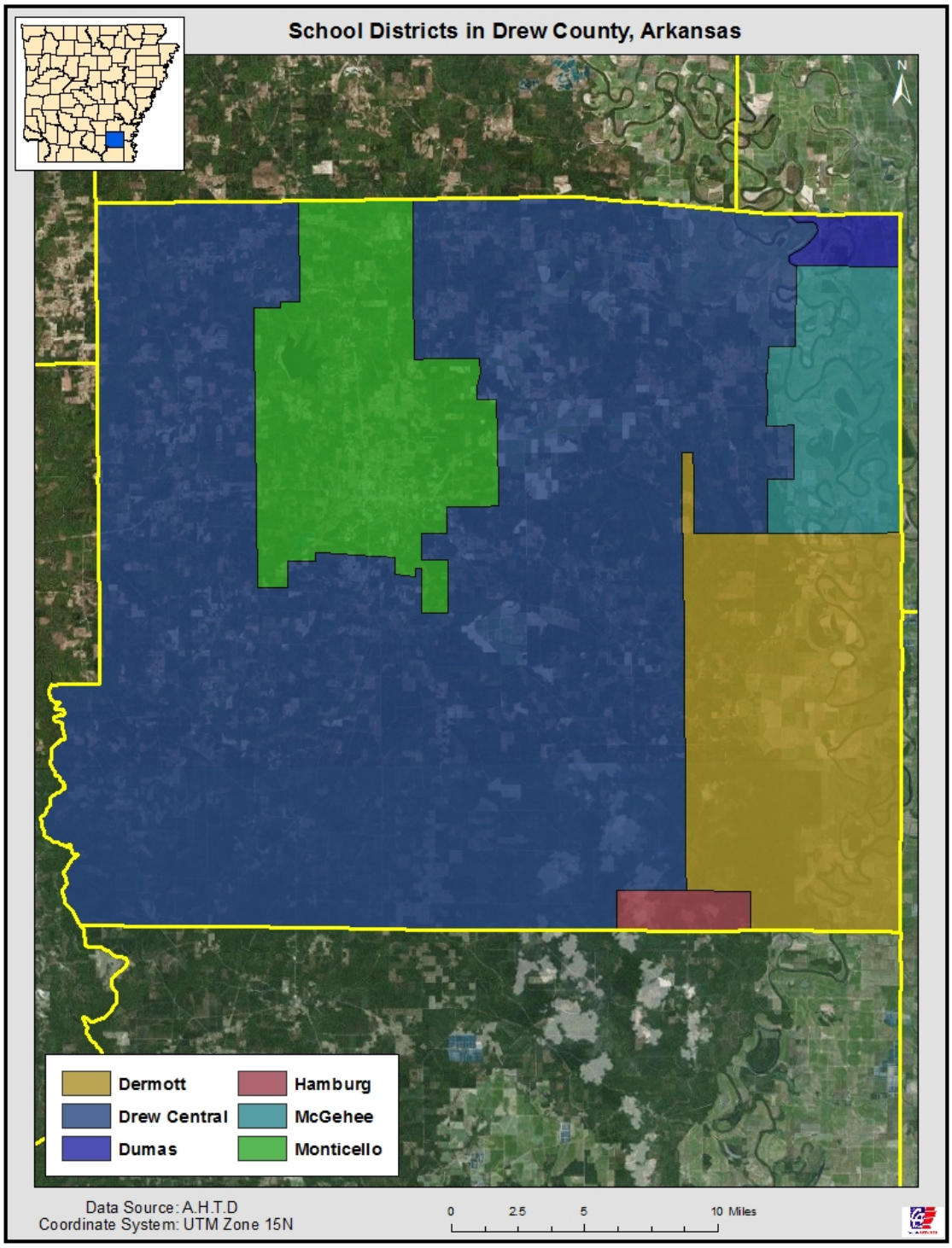
City of Winchester



Electric Utilities- Entergy
Telephone Utilities- CenturyTel
Gas Utilities-
Water Systems Utilities- Winchester Water
Wastewater Treatment- None (Septic)

School Districts:

There are six school districts that serve Drew County: Dermott, Drew Central, Dumas, Hamburg, McGehee and Monticello. However, only Monticello and Drew Central School Districts are headquartered within Drew County, therefore the other schools are not plan participants.



The Dermott, Dumas, Hamburg and McGehee School Districts do not have any physical locations within Drew County.

Drew Central School Facilities:

Administration:

250 University Drive
Monticello, AR 71655

Elementary:

250 University Drive
Monticello, AR 71655

Middle School:

250 University Drive
Monticello, AR 71655

High School:

250 University Drive
Monticello, AR 71655

Monticello School Facilities:

Administration:

935 Scogin Drive
Monticello, AR 71655

Elementary:

1037 Scogin Drive
Monticello, AR 71655

Middle School:

180 Clyde Ross Drive
Monticello, AR 71655

High School:

390 Clyde Ross Drive
Monticello, AR 71655

Intermediate School:

280 Clyde Ross Drive
Monticello, AR 71655

Occupational Education Center:

741 Scogin Drive
Monticello, AR 71655

Pre-K School:

175 Henley Drive
Monticello, AR 71655

2.2.1.1 Improving Capabilities

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

- Becoming StormReady Certified and organizing a Community Emergency Response Team (CERT).
- Becoming Firewise Communities
- Regularly attend state-wide full-scale drills for evacuation.
- Participate in the Great Arkansas Shake-Out.
- Expand upon education and outreach by establishing and promoting cooling centers and shelters.
- Expand the Road Department Budget to improve culverts, box tiles, and water crossings.

- Representatives to attend training through ADEM and FEMA to include ICS and NIMS.
- Create a Transportation Plan to include in the Master Plan.

2.2.2 NFIP Participation

Jurisdiction	NFIP Member	Community Identification Number	Init FHBM	Init FIRM	Current Effective Map Date	Reg-Emergency Date	CRS
Drew County	Yes	050430	10/25/1977	7/1/2009	1/6/2011	10/14/1998	NO
Jerome	No	050073	N/A	1/6/2011	1/6/2011	N/A	NO
Monticello	Yes	050074	11/30/1973	4/1/1982	1/6/2011	4/3/1975	NO
Tillar	Yes	050075	11/1/1974	2/1/1988	6/19/2012	4/3/1975	NO
Wilmar	Yes	050076	6/4/1976	10/12/1982	1/6/2011	7/17/1975	NO
Winchester	Yes	050077	8/30/1974	8/1/2009	1/6/2011	4/15/2004	NO

NFIP Members	
Drew County	**Participation:** Drew County participates in the NFIP by assisting the residences by assisting with the filling out documents for the NFIP and educating citizens about the NFIP program. The county plans to continue to participating through continuing floodplain education, and staying in compliance with NFIP. Drew County adopted a local floodplain ordinance on 7/27/1998. The County requires a 2' Freeboard. The County maintains elevation certificates. **Insurance Summary:** There are 31 policies in force, $2,931,300 insurance in force, 20 paid losses with a total loss paid of $223,420.11. There has also been 1 Substantial Damage Claim since 1978. **Staff Resources:** Drew County has a Certified Floodplain Manager who oversees the floodplain management, along with his other responsibilities as County Emergency Management Coordinator. The NFIP administrative services include floodplain maps, permit reviews and inspections. If floodplain resources are needed that the county cannot provide, the County's CFM request assistance from the Arkansas Natural Resource Conservation Service and FEMA. **Compliance History:** Drew County is in good standing with the NFIP, and there are no outstanding compliance issues. The last Community Assistance Visit (CAV) or Community Assistance was on 6/27/2007. Drew County intends to maintain compliance with the NFIP by continuing ensure all constructing, locating, substantially altering or changing the use of any structure or land after the effective date of the county's floodplain ordinance.
Monticello	**Participation: A**ssisting the residences by assisting with the filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain, and then the floodplain manager monitors the construction process to ensure compliance. The city plans to continue to participating through continuing floodplain education, and staying in

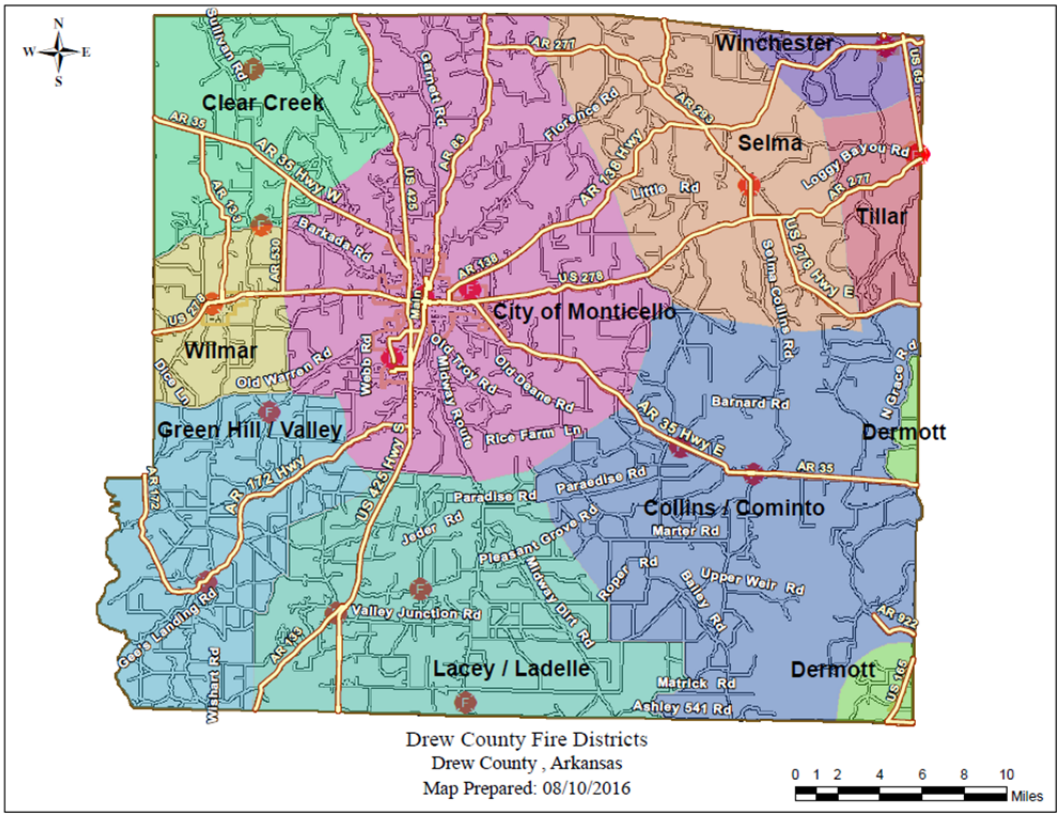
NFIP Members	
	compliance with NFIP. The city maintains elevation certificates. **Insurance Summary:** There are 24 policies in force, $2,922,500 insurance in force, 4 paid losses with a total loss paid of $17,375.58. **Staff Resources:** The City of Monticello has a Certified Floodplain Manager who oversees the floodplain management, along with his other responsibilities as County Emergency Management Coordinator. The NFIP administrative services include floodplain maps, permit reviews and inspections. If floodplain resources are needed that the city cannot provide, the City's CFM request assistance from the Drew County Floodplain Manager or the Arkansas Natural Resource Conservation Service and FEMA. **Compliance History:** The City of Monticello is in good standing with the NFIP, and there are no outstanding compliance issues. The last Community Assistance Visit (CAV) or Community Assistance was on 6/27/2007. The City of Monticello intends to maintain compliance with the NFIP by continuing ensure all constructing, locating, substantially altering or changing the use of any structure or land after the effective date of the county's floodplain ordinance.
Tillar	**Participation:** The city plans to continue to participating through continuing floodplain education, and staying in compliance with NFIP. **Insurance Summary:** There are 6 policies in force, $416,600 insurance in force and 0 paid losses. **Staff Resources:** The City of Tillar relies on the DCOEM to provide technical assistance for floodplain management. None of the City resides in a floodplain, and no flooding has occurred since 1927. If floodplain resources are needed that the city cannot provide, the City's will request assistance from the Drew County Floodplain Manager or the Arkansas Natural Resource Conservation Service and FEMA. **Compliance History:** The City of Tillar is in good standing with the NFIP, and there are no outstanding compliance issues. The last Community Assistance Visit (CAV) or Community Assistance was on 9/4/2008. The City of Tillar intends to maintain compliance with the NFIP by continuing ensure all constructing, locating, substantially altering or changing the use of any structure or land after the effective date of the county's floodplain ordinance.
Wilmar	**Participation: A**ssisting the residences by assisting with the filling

NFIP Members	
	out documents for the NFIP and educating citizens about the NFIP program. The city plans to continue to participating through continuing floodplain education, and staying in compliance with NFIP. **Insurance Summary:** There are 3 policies in force, $128,000 insurance in force and 0 paid losses. **Staff Resources:** The City of Wilmar has a Certified Floodplain Manager who oversees the floodplain management, along with his other responsibilities as County Emergency Management Coordinator. The NFIP administrative services include floodplain maps, permit reviews and inspections. If floodplain resources are needed that the city cannot provide, the City's CFM request assistance from the Drew County Floodplain Manager or the Arkansas Natural Resource Conservation Service and FEMA. **Compliance History:** The City of Wilmar is in good standing with the NFIP, and there are no outstanding compliance issues. The last Community Assistance Visit (CAV) or Community Assistance was on 7/3/2007. The City of Wilmar intends to maintain compliance with the NFIP by continuing ensure all constructing, locating, substantially altering or changing the use of any structure or land after the effective date of the county's floodplain ordinance.
City of Winchester	**Participation: A**ssisting the residences by assisting with the filling out documents for the NFIP and educating citizens about the NFIP program. The city plans to continue to participating through continuing floodplain education, and staying in compliance with NFIP. **Insurance Summary:** There is 1 policy in force, $15,000 insurance in force and 0 paid losses. **Staff Resources:** The City of Winchester relies on the DCOEM to provide technical assistance for floodplain issues and NFIP compliance. The NFIP administrative services include floodplain maps, permit reviews and inspections. **Compliance History:** The City of Winchester is in good standing with the NFIP, and there are no outstanding compliance issues. The last Community Assistance Visit (CAV) or Community Assistance was on 7/31/2007. The City of Winchester intends to maintain compliance with the NFIP by continuing ensure all constructing, locating, substantially altering or changing the use of any structure or land after the effective date of the county's floodplain ordinance.

The Town of Jerome (although incorporated) is currently not an NFIP Participant because with a population size of 39, resources are not available to participate. The Town of Jerome relies on Drew County to assist with floodplain issues. Discussion with the Mayor of Jerome indicates that there are no known flood-prone structures in the city, and no input from the citizens requesting the ability to purchase flood insurance. None the less, information on how to join and the benefits of doing so were provided to the City's Mayor for consideration and encouragement.

2.2.3 Fire Districts

None of the fire districts in Drew County belong to the Community Firewise at this time, but plans are being made to become Firewise Communities in the future.



Please note that the Dermott Fire District is a part of Chicot County and is profiled in the Chicot County Hazard Mitigation Plan, and will therefore not be included further in this plan.

2.2.4 Transportation

The major highways in Drew County are Arkansas Highway 425 running North-South passing through Monticello in the Central part of the County and connecting Hamburg with Star City. Arkansas Highway 83 runs North-South ending in Monticello, and connecting to Dumas to the Northwest.

Arkansas Highway 278 is the only major West-East running route through Drew County. It intersects Monticello as well and connects Warren and McGehee.

The only major State Highway going through Drew County is Arkansas Highway 35. It connects to Highway 278 from the East just before Monticello.


Herbine
Relfs Bluff
Winchester
New Edinburg
Rye
Rohwer
Tillar
Eutaw
Wilmar
Tennessee
Monticello
McGehee
Warren
Arkansas City
Banks
Cominto
Collins
Baxter
Dermott
Halley
Farmville
Hermitage
Lacey
Ladelle
Macon Lake
Yellow Bayou
Jerome
Johnsville
Boydell

SECTION 3: Hazard Identification and Risk Assessment

3.1 Hazard Identification and Prioritization

Hazard identification, the process of identifying hazard that threatens a given area, is the first step in the risk assessment process. Drew County has identified several natural hazards that, because they pose a threat to the County and its residents, have warranted a complete profile in this hazard mitigation plan.

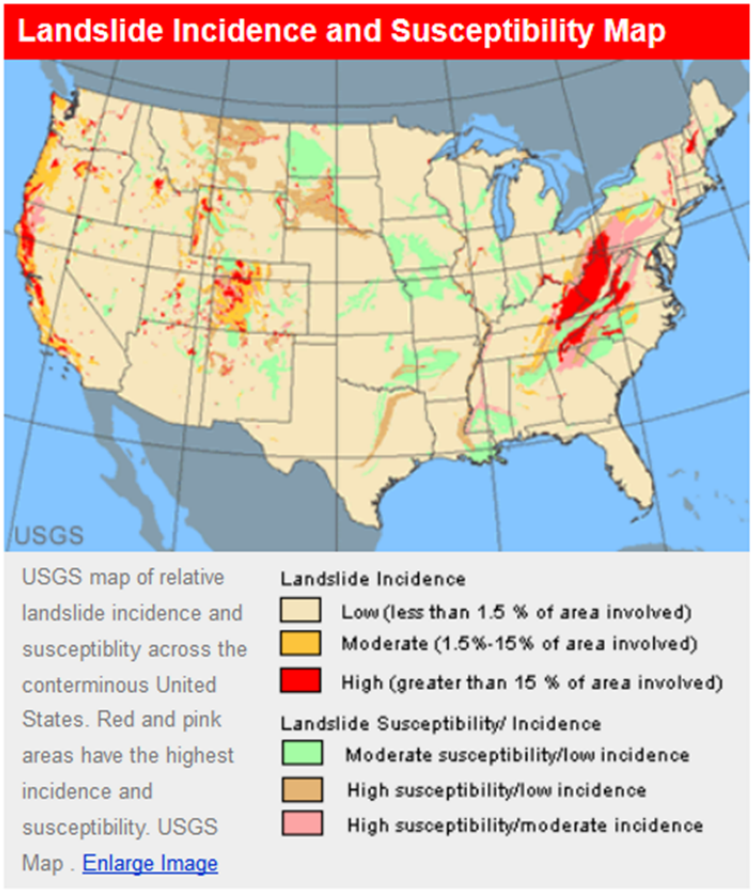
Please note that the update period of this plan is September 2008 through July 2016.

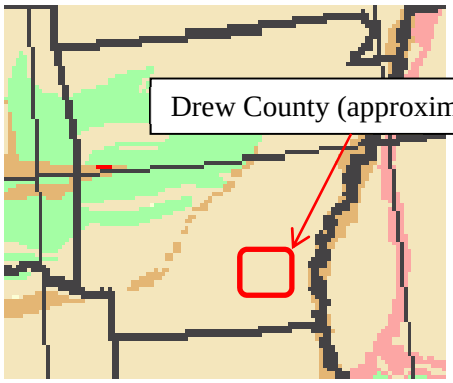
The following hazards were identified from historical information provided by HMPT members, newspapers, review of plans and reports, internet research, the State Mitigation Plan, and FEMA publication "Multi-Hazard-Identification and Risk Assessment", and information provided by FEMA and ADEM.

Hazards	Hazard Events during the update period
Dam Failure	No dam/levee failures for Drew County.
Drought	164 events reported between 2000 and 2013
Earthquake	2 events in 1978 and 2003
Extreme Heat	1 event reported in 2010
Flood	36 flood or flash flood events between 2000 and 2016
Thunderstorm	153 events between 2000 and 2016
Tornado	11 events between 2000 and 2016
Wildfire	5 events between 2000 and 2016
Winter Storm	36 winter storm events between 2000 and 2016

Although the "Landslide" and "Expansive Soils" hazards were profiled in the original Drew County Hazard Mitigation Plan, they are being removed from the plan update for the following reasons: 1) lack of previous occurrences (none documented), 2) they are not profiled in the Arkansas All-Hazard Mitigation Plan (version 2013) because "they occur infrequently and their impacts are minimal", and 3) the Hazard Mitigation Planning Team did agreed that these hazards do not affect any areas of Drew County based on history, lack of previous occurrences and lack of public concern about it.

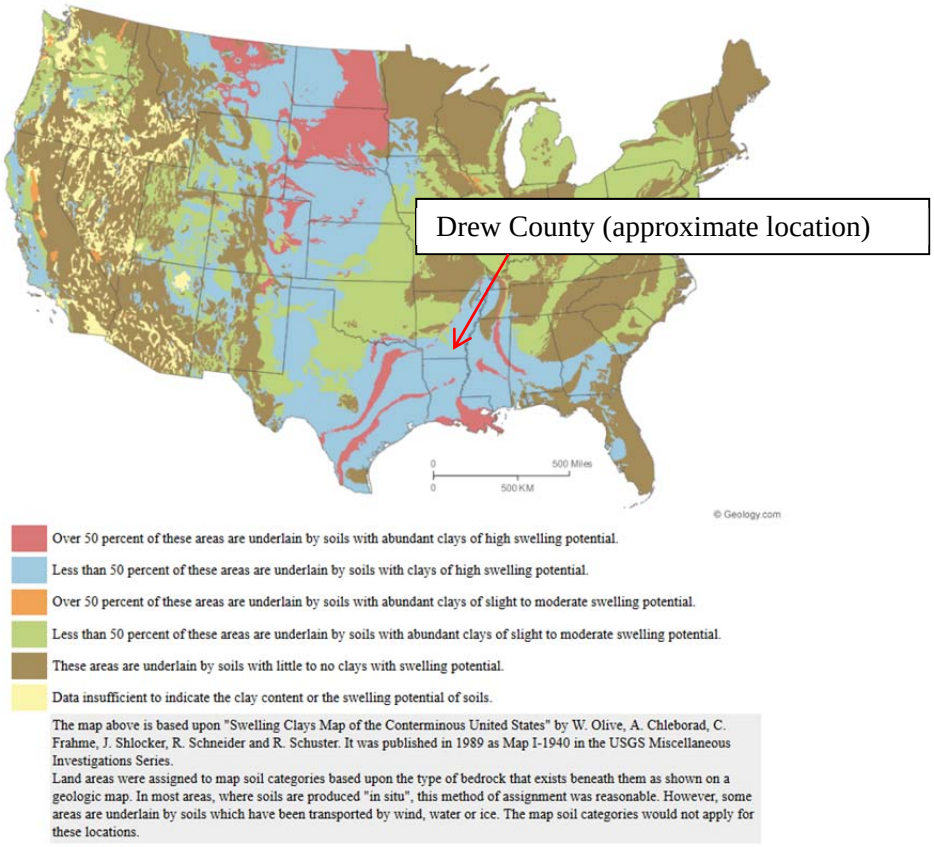
Landslide – There is information from the USGS on Landslides in Arkansas. Consultation with Ms. Martha T. Kopper, Geology Supervisor, at the Arkansas Geological Survey indicates there may have been one recorded landslide event, but data was not recorded regarding when this occurred, or its impacts. This was addressed in the planning meeting and Drew County is not a high risk area for landslides. Additionally, according to a USGS map obtained from geology.com, Drew County has a "Low (less than 1.5% of area involved) Incidence" for Landslide Incidence and Susceptibility.





Expansive Soils- Ms. Kopper also provided information regarding the rock/soil deposits of the area having expansive qualities, and expressed concern for potential impacts on the Lake Monticello Dam (a high hazard dam). This will be addressed under the Dam Failure Hazard Profile.

According to the below map from geology.com (and also used in the 2013 Arkansas All-Hazard Mitigation Plan), Drew County has is of the category: “less than 50 percent of these areas are underlain by soils with clays of slight to moderate swelling potential.”



High Winds- While profiled separately in the 2008 Drew County Hazard Mitigation Plan, "high winds" will be included as a component of Thunderstorm for this plan update, as is commonly accepted by FEMA.

Presidential Disaster Declarations in Drew County from 2008 to current date

Declaration #	Date	Purpose	Amnt. Obligated for Public Assistance (PA)
DR-1793	9/18/08	Severe Storms and Flooding (Hurricane Gustav)	$4,010,939.33
DR-1845	6/16/09	Severe Storms, Tornadoes and Flooding	$9,609,964.67
DR-1861	12/3/09	Severe Storms, Tornadoes, and Flooding	$15,536,008.76
DR-1872	2/4/10	Severe Storm and Flooding	$9,792,672.66
			$32,129,585.42

3.2 Vulnerability and Risk Assessment by Hazard

The Drew County Hazard Mitigation Plan includes a description or profile, location, and extent of all natural hazards that can affect each jurisdiction.

Description describes the natural hazard that can affect the jurisdictions in the planning area.

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

Extent describes the strength or magnitude of the hazard. This will usually be demonstrated with a scientific chart or scale.

Previous Occurrences lists past hazard events for each jurisdiction.

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.

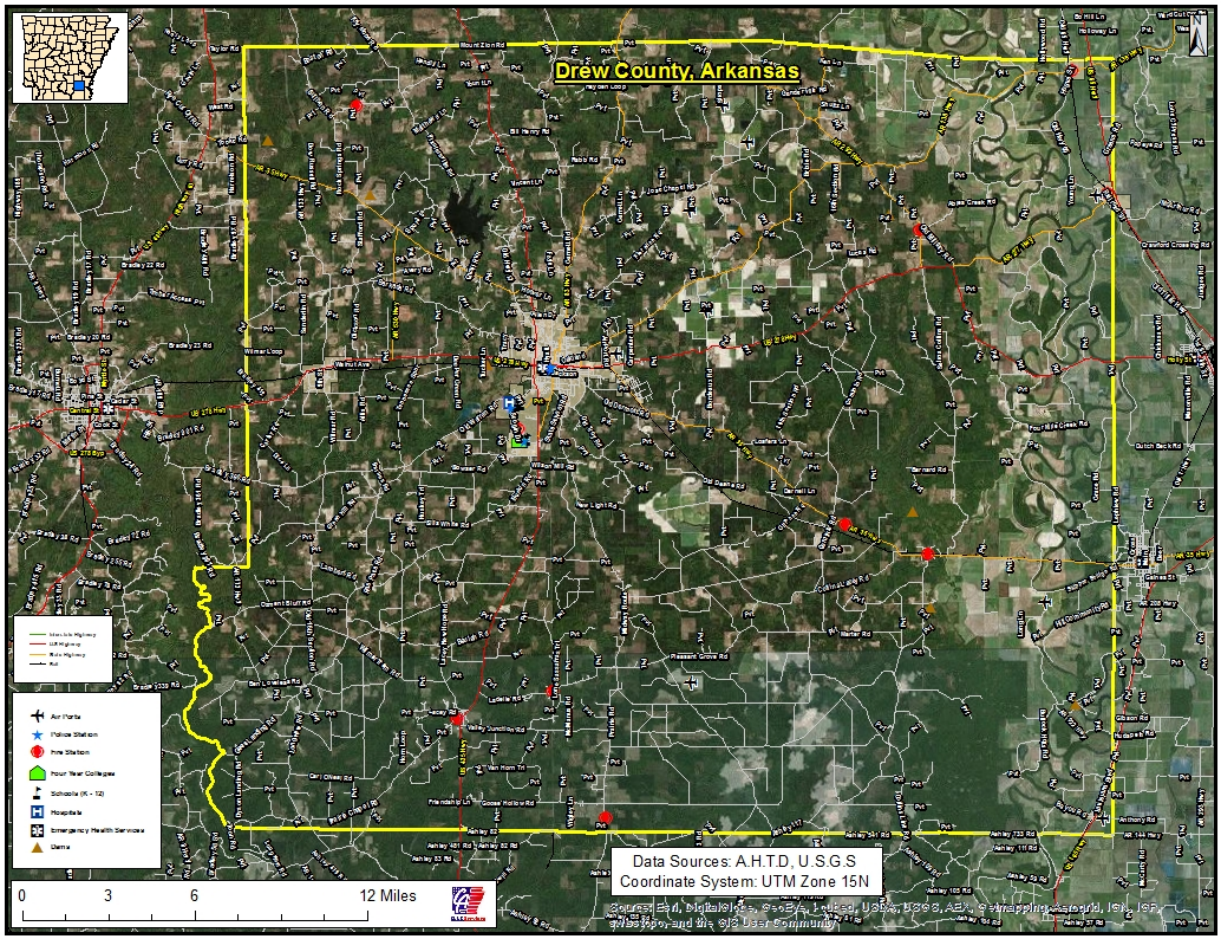
The percent probability was determined using the Poisson distribution, an equation that expresses the probability of a given number of events occurring in a fixed interval of time if these events occur with a known average rate and independently of the time since the last event. A description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction is included.

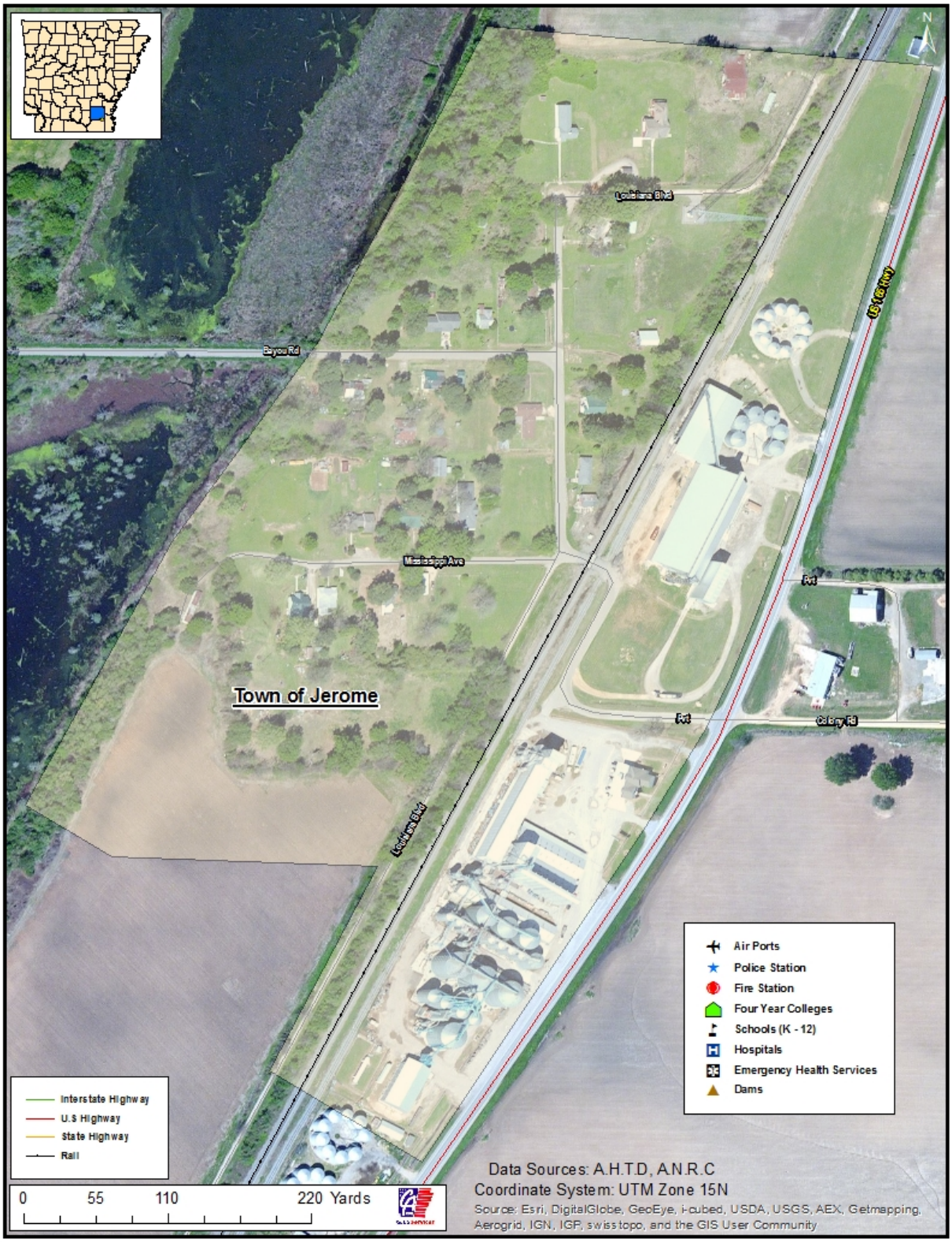
Impact and Overall Jurisdictional Vulnerability– is the consequence or effect of the hazard on the community and its assets. Impacts will be described by referencing historical disaster impacts and/or an estimate of potential future losses, such as percent damage of total exposure. It will identify structures, systems, populations or other community assets as defined by the community that are susceptible to damage and loss from hazard events. It is a list of key issues or problem statements that clearly describes the community's greatest vulnerabilities and that will be address in the mitigation strategy.

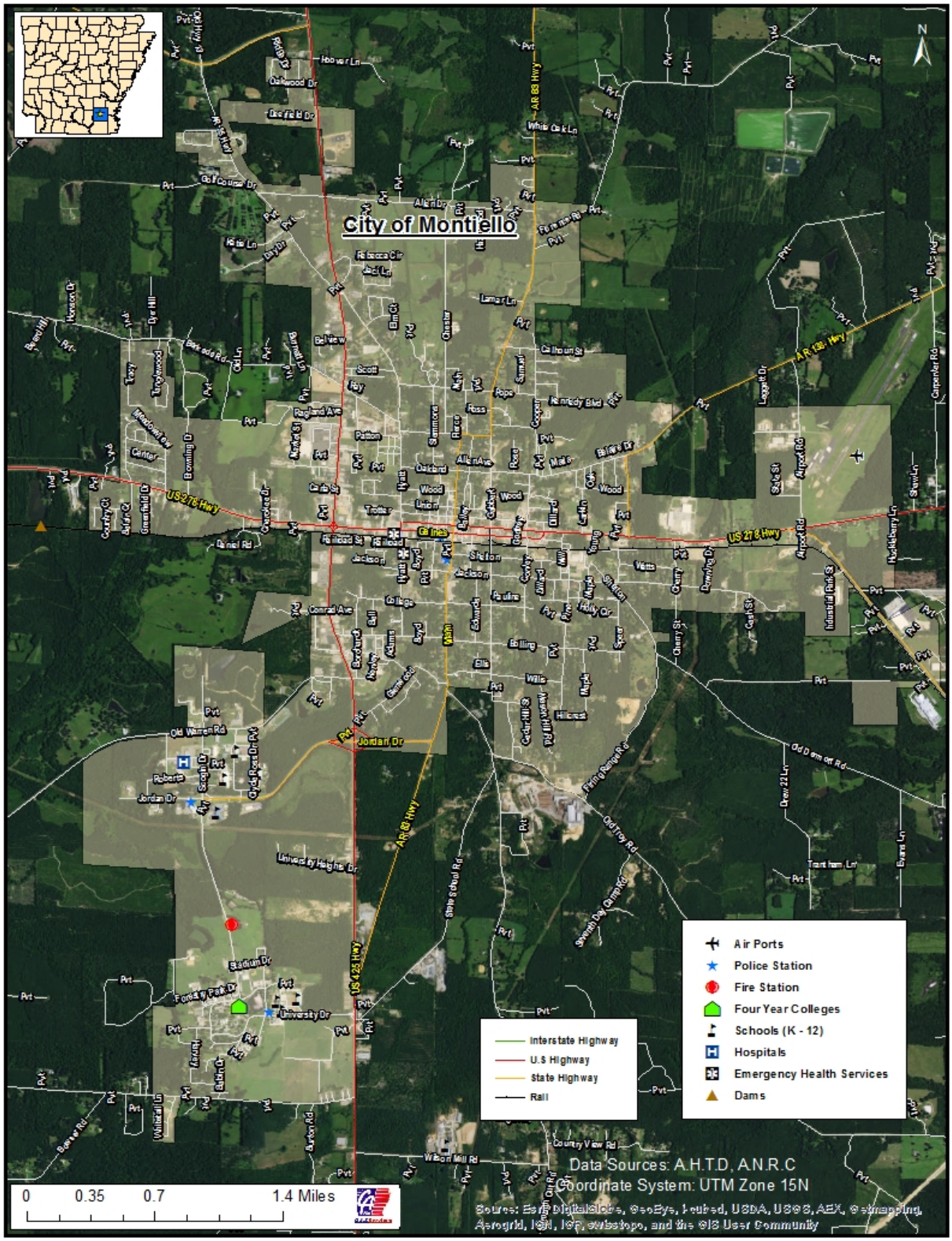
Repetitive Loss Properties and Severe Repetitive Loss Properties- addresses NFIP insured structures describing the types (residential, commercial, institutional, etc.) and estimates the number of repetitive loss properties located in the identified flood hazard areas.

3.2.1 Critical Facilities

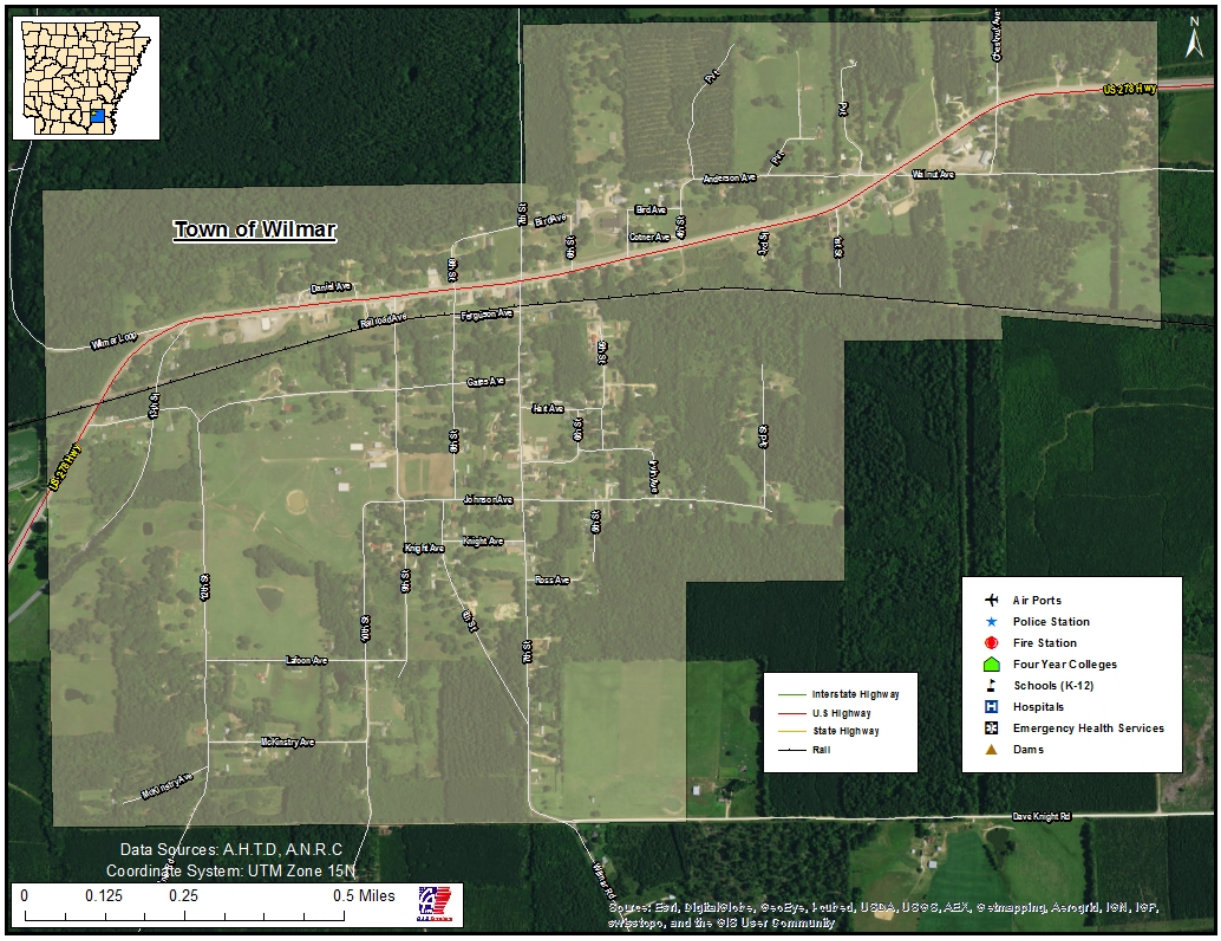
Critical facilities for each jurisdiction are provided below. If a hazard affects the entire planning area's structures and infrastructure, these critical facilities area included, unless otherwise stated in each hazard profile.


Drew County, Arkansas
Air Ports
Police Station
Fire Station
Four Year Colleges
Schools (K - 12)
Hospitals
Emergency Health Services
Dams
0
3
6
12 Miles
Data Sources: A.H.T.D, U.S.G.S
Coordinate System: UTM Zone 15N


Louisiana Blvd
Bayou Rd
Mississippi Ave
Town of Jerome
Louisiana Blvd
Pvt
Pvt
Colony Rd
US 165 Hwy
Air Ports
Police Station
Fire Station
Four Year Colleges
Schools (K - 12)
Hospitals
Emergency Health Services
Dams
Interstate Highway
U.S Highway
State Highway
Rail
0
55
110
220 Yards
Data Sources: A.H.T.D, A.N.R.C
Coordinate System: UTM Zone 15N
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


City of Montiello
N
Air Ports
Police Station
Fire Station
Four Year Colleges
Schools (K - 12)
Hospitals
Emergency Health Services
Dams
Interstate Highway
U.S Highway
State Highway
Rail
Data Sources: A.H.T.D, A.N.R.C
Coordinate System: UTM Zone 15N
0
0.35
0.7
1.4 Miles


Town of Tillar
Interstate Highway
U.S Highway
State Highway
Rail
Air Ports
Town Hall
Police Station
Fire Station
Four Year Colleges
Schools (K-12)
Hospitals
Emergency Health Services
Water Wells
Dams
Data Sources: A.H.T.D, A.N.R.C
Coordinate System: UTM Zone 15N
0 0.1 0.2 0.4 Miles
N


Town of Wilmar
Air Ports
Police Station
Fire Station
Four Year Colleges
Schools (K-12)
Hospitals
Emergency Health Services
Dams
Interstate Highway
U.S Highway
State Highway
Rail
Data Sources: A.H.T.D, A.N.R.C
Coordinate System: UTM Zone 15N
0 0.125 0.25 0.5 Miles
N

The Central Office located at 935 Scogin Drive, Monticello, and the Technology Building located at 927 Scogin Drive, Monticello are critical facilities for the Monticello School District.

3.2.2 Structure Data

HAZUS Data from the 2013 Arkansas State All-Hazard Mitigation Plan estimates the following for Drew County as a whole:

Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Total
Building Count							
8,543	374	123	54	59	15	16	**9,184**
Building and Content Values for the Key Occupancies (Uses) ***All dollar values are in thousands***							
$1,350,576	$314,681	$233,364	$15,742	$66,572	$16,108	$46,366	**$2,043,409**

When structures are noted as vulnerable for the entire planning area, above is the count and dollar value at risk (unless otherwise noted). Structure count and values are given by two different sources within the plan: County Assessment Data and HAZUS Data obtained from the 2013 Arkansas All-Hazard Mitigation Plan. Please note some discrepancies may appear as both sources provided data usable to the plan; the Assessor's data is more up to date, but the 2013 Arkansas All-Hazard Mitigation Plan HAZUS data provides greater insight than what's currently available from the Assessor.

3.3 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 and the NOAA National Centers for Environmental Information. If information was not able to be obtained of a certain type past hazard event, an estimate of potential loss was not completed due to the lack of information.

3.4 Natural Hazards Affecting Drew County

This mitigation plan addresses the natural hazards that can affect Drew County, cities of Jerome, Monticello, Tillar, Wilmar and Winchester and the School Districts of Drew Central, Monticello and the University of Arkansas at Monticello. The hazards which have affected Drew County in the past or could possibly affect in the near future are dam failure, drought, extreme heat, earthquake, flooding, thunderstorms, tornadoes, wildfire, and winter storms.

3.4.1. Dam Failure

According to the Association of State Dam Safety Officials, the term dam is defined in the rules as "any barrier, including one for flood detention, designed to impound liquid volumes." A dam failure is the collapse, breach, or other failure resulting in downstream flooding. A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-ft. 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-ft. of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

Note that the inundation area depicted in the following map has been estimated by following natural floodways using information of maximum discharge release, maximum capacity, and the drainage area acreage retrieved from the National Inventory of Dams.

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.

According to the Arkansas Natural Resource Commission (ANRC) Title 7, Sections 705.3 – 705.4, the criteria for size classifications are based on height of dam and impoundment capacity, and hazard classifications, which are used in this plan to describe the level of risk and severity associated with dam failure.

Section 705.5 provides detail on the hydrologic criteria for dams based on hazard classification. The classifications are shown in the table below:

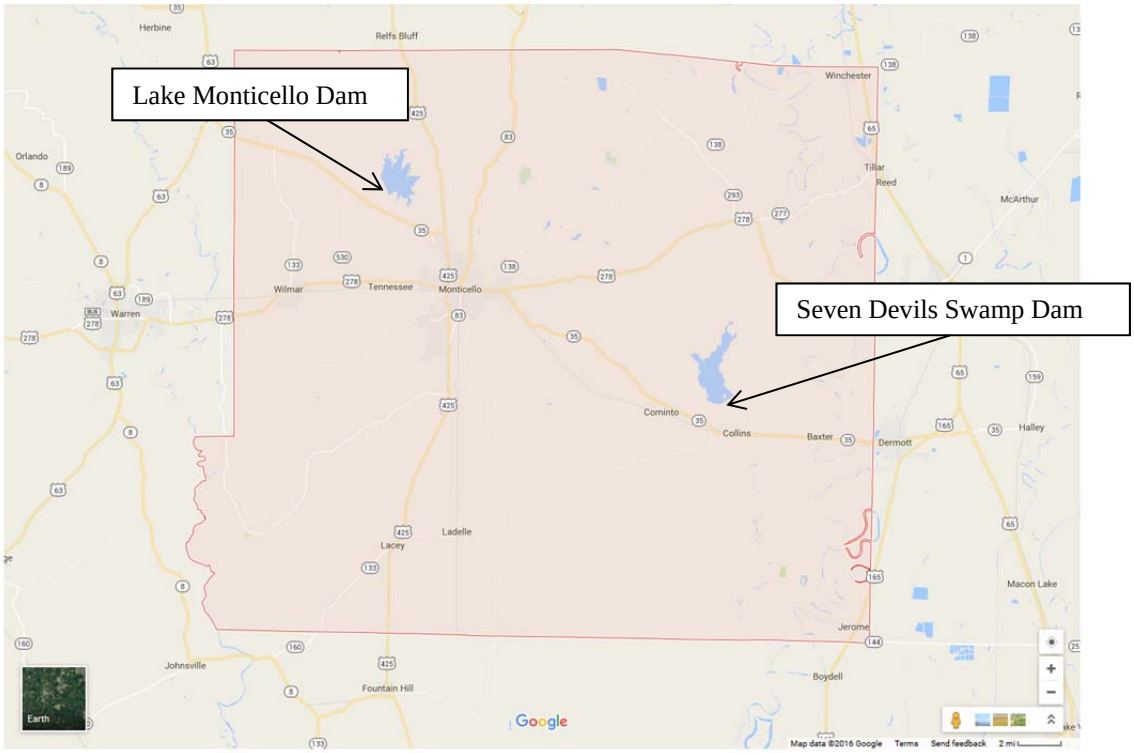
Category	Maximum Storage (ac-ft)	Height (Feet)
Small	50 to 1000	25-40
Intermediate	1000 and <50,000	40 and <100
Large	50,000	100

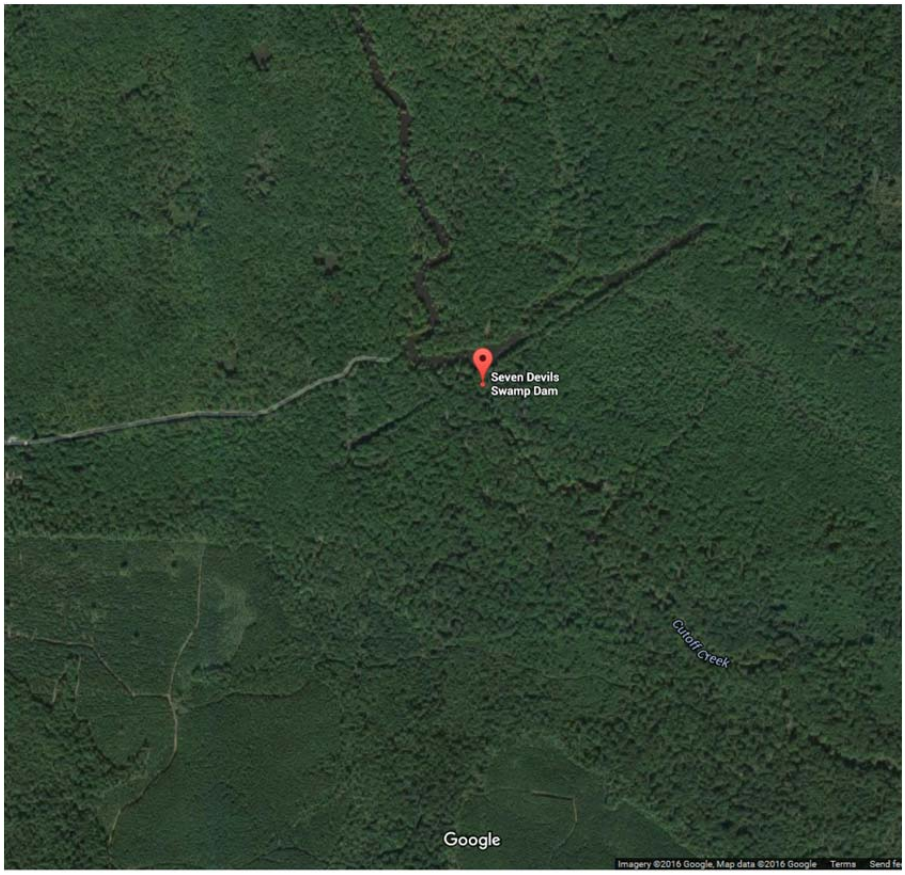
Location

According to the Arkansas State Hazard Mitigation Plan, there are a total of 9 dams throughout the entire Drew County. There are 7 dams rated as a low hazard in the State plan, therefore they will not be profiled in the Drew County Hazard Mitigation Plan update. There is one that is ranked significant and one ranked high in the State plan, and those will be profiled. If a dam is rated as a high risk, it is required to have an Emergency Action Plan (EAP) completed. This EAP will also require inundation studies that will detail the extent of a dam failure for a particular dam. The following table outlines the 2 dams in the county that are High and Significant risk or failure would impact roads, structures, and/or human lives. The table illustrates whether there is an EAP for a specified dam.

Dam	Height in Feet	Volume in Acre-Foot	Size	ANRC Hazard Classification	EAP	Owner	Probability of Future Events
Seven Devils Swamp Dam	12	560.00	Small	Significant	No	Arkansas Game and Fish Commission	Unlikely
Lake Monticello Dam	88.50	25,000.00	Intermediate	High	Yes	City of Monticello	Unlikely

Only areas in the unincorporated Drew County are vulnerable to this hazard. Although one of the dams is owned and operated by the City of Monticello, the dam and the inundation area are outside the City limits. No UAM or Public School locations are vulnerable to dam failure.





The Seven Devils Swamp Dam was constructed primarily for fish and wildlife and for recreation. The dam is located in the unincorporated County.

Additional location information for the Lake Monticello Dam can be found below in ***Impact and Vulnerability*****.**

Extent

The following calculations do not reflect the physical conditions of the dams, but rather describe areas downstream of the dams that could be impacted in the event of failure. According to ANRC Title 7, the rate of risk for dam failure is calculated as follows:

Low Hazard Dams	No loss of life and minimal economic loss are expected. (No significant structures, pastures, woodland, or largely undeveloped land); less than $ 100,000.
Significant Hazard Dams	Loss of life is possible, but not expected. Economic loss would be appreciable. (Significant structures, industrial, or commercial development, or cropland); $100,000 to $500,000.
High Hazard Dams	Loss of life is expected, and economic damage would be excessive. (Extensive public, industrial, commercial, or agricultural development); over $500,000.

Previous Occurrences

There are no documented previous occurrences of dam failure in Drew County.

Probability of Future Events

Because there are no known dam failures to have occurred in Drew County, it is not possible to predict a future event using the Poisson probability equation. The Seven Devils Swamp Dam was constructed in 1955, and the Lake Monticello Dam was constructed in 1993. Regular inspection and maintenance will circumvent future events.

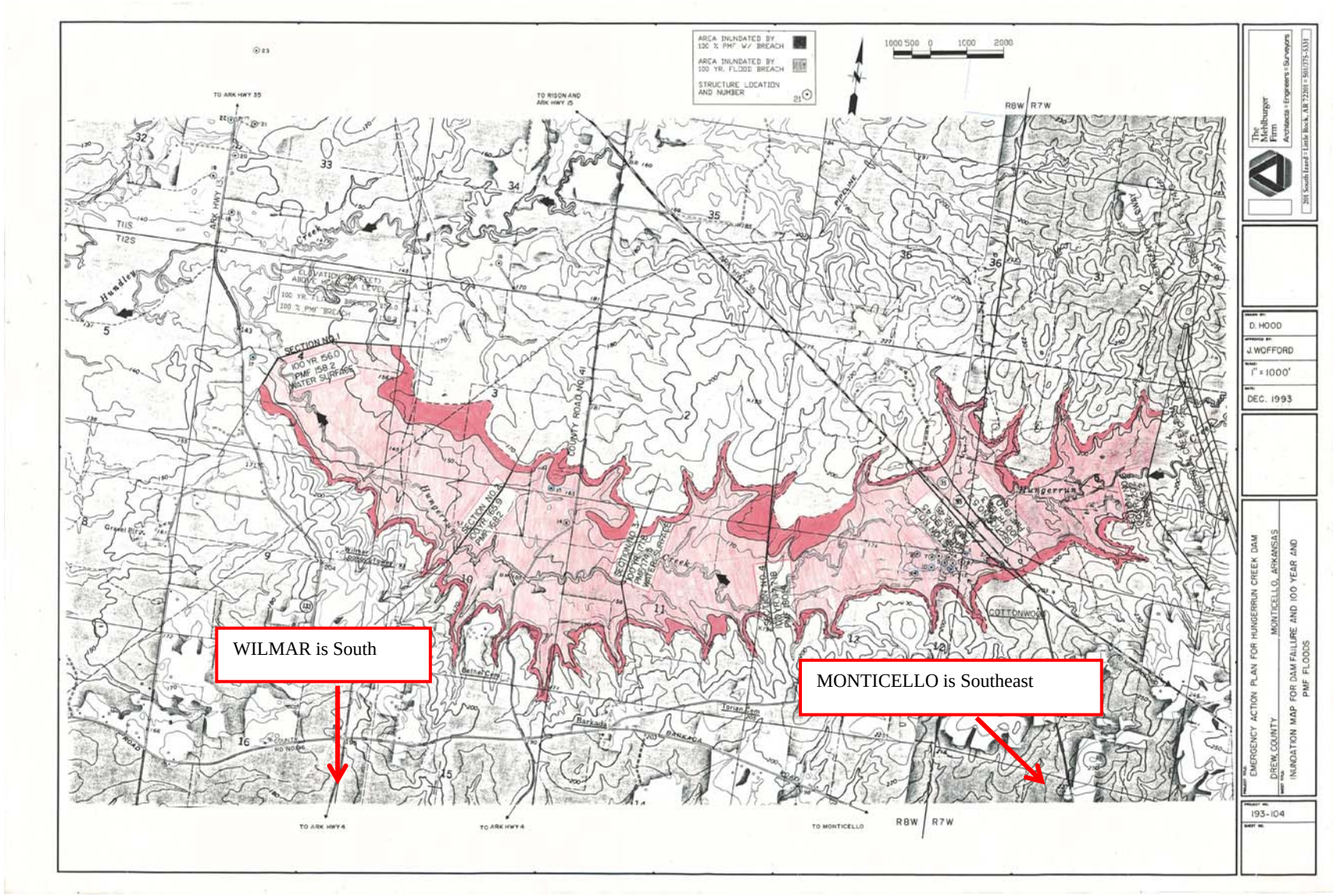
Impact and Vulnerability

The flood inundation map for the Lake Monticello Dam is below. According to the Lake Monticello Dam Emergency Action Plan, 22 residential structures would be affected by a total failure. Depth of water in each structure ranges from 1.95 to 8.90 Feet. Other vulnerable populations include those traveling on Highways 35 and 530 along Hungerrun Creek. According to the Emergency Action Plan, the estimated drainage area is 4,900 acres. Potential impacts include loss of life and economic damage. According to the Arkansas All-Hazards Mitigation Plan (2013), there is $1,100,000 in potential losses should the dam fail.

Since there is no Emergency Action Plan for the Seven Devils Swamp Dam, information related to potential inundation and drainage area does not exist. The HMPT will seek to remedy this data deficiency before the next plan update.

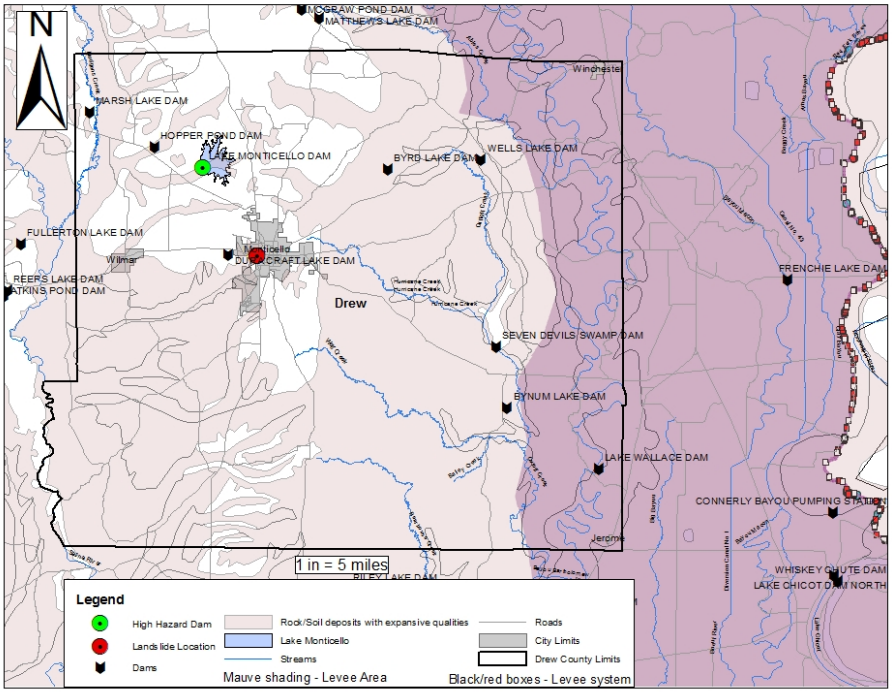
There are no structures near the Seven Devils Swamp Dam and none downstream that could be damaged as a result of failure. The vulnerable population would be those utilizing the Seven Devils Lake or Cutoff Creek for recreational purposes. The dam is owned and operated by the Arkansas Game and Fish Commission, which performs regular maintenance and inspections to ensure the dam's integrity. Evacuations would occur during the first sign of a potential breach/failure.

Although not located in the planning area, data provided by the Arkansas Geological Survey indicates that a levee failure on the Mississippi River would affect approximately 125 sq. miles of Drew County (indicated by the Mauve shading below).


WILMAR is South
MONTICELLO is Southeast
EMERGENCY ACTION PLAN FOR HUNGERRUN CREEK DAM
DREW COUNTY MONTICELLO, ARKANSAS
INUNDATION MAP FOR DAM FAILURE AND 100 YEAR AND PMF FLOODS
193-104

Should a dam failure occur, expansive soils could cause a greater problem in the inundation areas. These soils could seep up the discharged water and create problems with erosion. However, the HMPT does not consider Expansive Soils as a cause for concern as a stand-alone hazard.

Drew County, Arkansas Geohazards - Dams, Levees, Flooding Landslides, Expansive Rock/Soil



3.4.2 Drought

A drought is a period of unusually persistent dry weather that persists long enough to cause serious deficiencies in water supply (surface or underground). Droughts are slow onset hazard, but 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 impacts can be significant. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. In addition, human actions and demands for water resources can accelerate drought-related impacts.

Location

All areas of Drew County and plan participants are equally likely to experience severe drought. There is no defined geographic hazard boundary, and the entire planning area is equally susceptible to this hazard.

Changes in Land Use

Agriculture, forestry, fishing and hunting, and mining continue to make up 6.6% of Drew County's industry. A drought places risk on the livelihood of these industries.

Extent

Drought Severity Classification	
	RANGES

Category	Description	Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Percent of Normal Precip	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 requested	-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 Severity Classification
Source: U.S. National Drought Mitigation Center.

Previous Occurrences

According to the U.S. Drought Monitor, there are:

- 0 D4 incidents reported
- 15 D3 incidents reported
- 35 D2 incidents reported
- 29 D1 incidents reported
- 85 D0 incidents reported

Since 2000.

Probability of Future Events

Based on previous occurrences, the planning area is likely to see 10.25 drought events per year, so the probability of a drought event is 64.06% in any given year. The entire planning area is expected to experience a drought that is rated between a D0 and D3 in any given year.

Impact and Vulnerability

The primary and most devastating impact for planning area is the lack of water. As a dry period progresses and water supplies dwindle, existing water supplies are overtaxed and dry up. If the drought is long term, it may result in permanent changes in settlement, social, and living patterns in these jurisdictions. During a past drought event, the water utility companies serving these jurisdictions instituted mandatory water restrictions. Cascading effects also include major ecological changes such as increased flash flooding and desertification. All populations in these

jurisdictions are vulnerable during a drought event; however, children and elderly are the biggest concerns for the communities as they may suffer from dehydration before other populations.

The planning area, with the exception of the City of Monticello, is mostly rural with a large amount of timber plantations, farmland, and pasture for farm animals. According to 2014 Business Pattern Data from American Fact Finder, Agriculture, forestry, fishing and hunting makes up $8,747,000,000 (6.7%) of Drew County's total payroll of $130,843,000, Forestry and Logging provided payroll of $4,060,000 (3.10%). These industries make up almost 15% of Drew County's labor force. According to the Arkansas State All-Hazards Mitigation Plan (2013), there has been $394,125 in drought-related crop insurance paid, and an estimated $498,892 total estimated crop damages due to drought; $49,889 annually.

As water supplies dwindle in these jurisdictions, the crops and fodder will deplete. Farmers/ranchers and private individuals own a large share (about 90%) of the timberland in Drew County. Farming families will begin to migrate in search of better grazing lands for their herds or move to the cities to seek jobs and alternative sources of income. If the dwindling supplies of food are not replaced, famine can occur, further accelerating the migration out of these jurisdictions. The migration may contribute to spreading the scope of the disaster, especially if grazing animals are moved with the people. Severe droughts will cause crop damage and elevate the potential to wildfires. While all populations are considered vulnerable during a drought event, the communities are more concerned about the farmers, their crops and animals.

The school districts of Drew Central and Monticello, and the campus of the University of Arkansas at Monticello will also be greatly affected by the dwindling water supply. School schedules could be hindered, or canceled altogether.

3.4.3 Earthquake

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.

Location

Data is not available to predict the location of future earthquakes for areas of Drew County; therefore it is assumed that all areas of the planning area are equally susceptible to earthquakes. The Arkansas State Mitigation Plan describes the regions with high probability of future earthquakes in the State of Arkansas are along the New Madrid Fault. The portion of Arkansas that is likely to experience damage is located in the northeast portion of the state. Drew County is not located in this area.

Extent

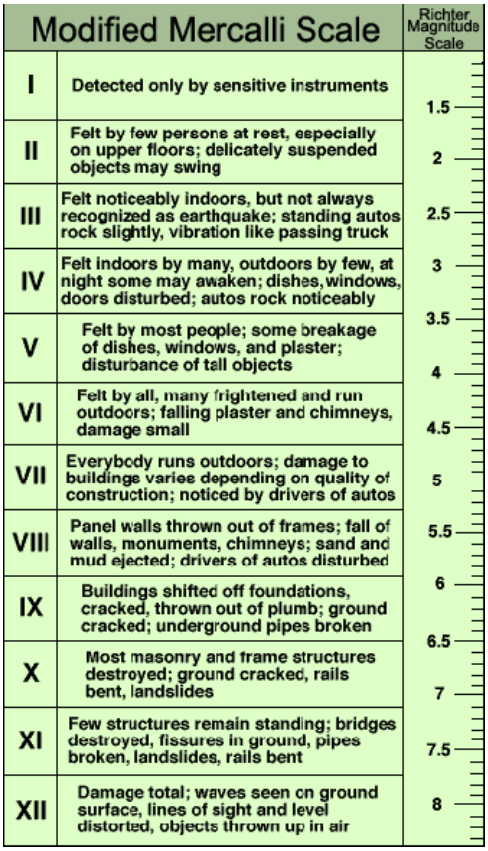
The extent, magnitude and severity of an earthquake are measured using the Modified Mercalli Intensity Scale and the Richter Scale. While the Mercalli scale describes the intensity of an earthquake based on its observed effects, the Richter scale describes the earthquake's magnitude by measuring the seismic waves that cause the earthquake. The two scales have different applications and measurement techniques. The Mercalli scale is linear and the Richter scale is logarithmic, i.e. a magnitude 5 earthquake is ten times as intense as a magnitude 4 earthquake. The Mercalli Intensity Scale measures the intensity of an earthquake by observing its effect on people, the environment and the earth's surface.

The Richter Scale measures the energy released by an earthquake using a seismograph. A base-10 logarithmic scale is obtained by calculating the logarithm of the amplitude of waves recorded by the seismograph.[1] Earthquakes that occurred Northwest of Wilmar and Northwest of Monticello, respectively were 3s on the Richter Scale which are described as "Minor". They would be the equivalent of a IV on the Modified Mercalli Scale. No other earthquake activity has been reported for Drew County.

[2]

Richter Scale

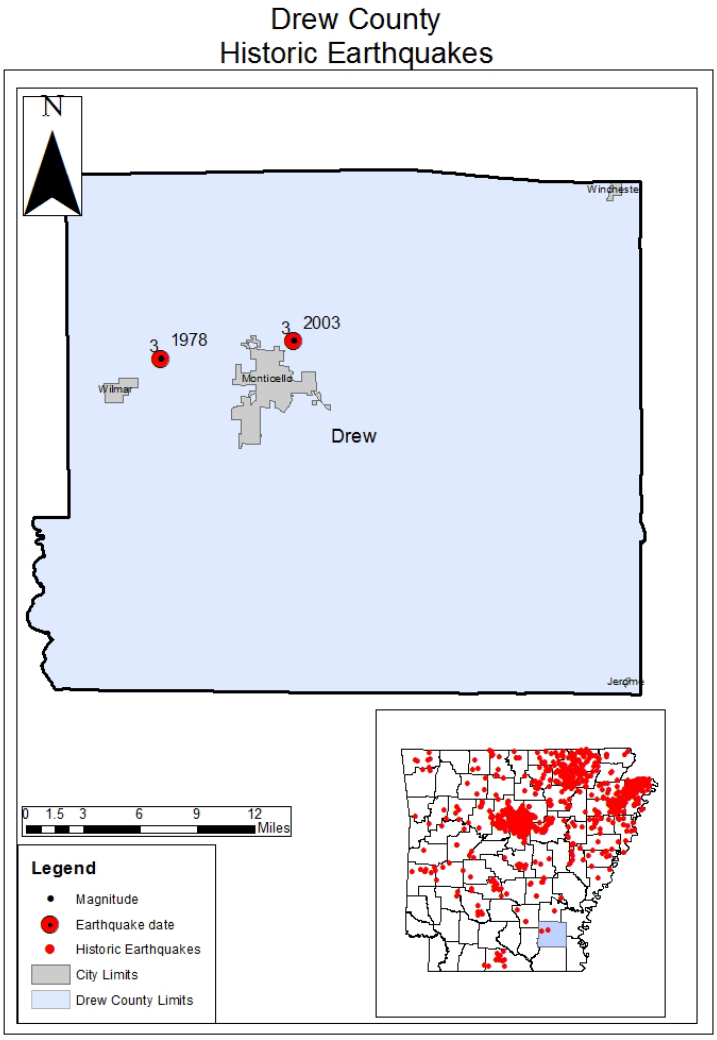
Magnitude	Description	Earthquake effects	Frequency of occurrence
Less than 2.0	Micro	Micro earthquakes, not felt.[13]	Continual
2.0–2.9	Minor	Generally not felt, but recorded.	1,300,000 per year (est.)
3.0–3.9		Often felt, but rarely causes damage.	130,000 per year (est.)
4.0–4.9	Light	Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.	13,000 per year (est.)
5.0–5.9	Moderate	Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings.	1,319 per year
6.0–6.9	Strong	Can be destructive in areas up to about 160 kilometres (99 mi) across in populated areas.	134 per year
7.0–7.9	Major	Can cause serious damage over larger areas.	15 per year
8.0–8.9	Great	Can cause serious damage in areas several hundred kilometres across.	1 per year
9.0–9.9		Devastating in areas several thousand kilometres across.	1 per 10 years (est.)
10.0+	Massive	Never recorded, widespread devastation across very large areas; see below for equivalent seismic energy yield.	Extremely rare (Unknown/May not be possible)



Previous Occurrences

There have been 2 recorded earthquakes in Drew County according to the Arkansas Geological Survey. There were both rated at 3 on the Richter Scale (below), and occurred in 1978 and 2003 as depicted on the map below. According to a "Final Technical Report" conducted by the University of Memphis in 2010 as an "Investigation of the Magnitude and Timing of Paleo-Earthquakes in Southeast Arkansas," there is evidence of prehistoric earthquakes occurring in Drew County as well.

[1] Retrieved July 14, 2016 from http://www.diffen.com/difference/Mercalli_Scale_vs_Richter_Scale
[2] Retrieved July 14, 2016 Missouri Department of Natural Resources; https://dnr.mo.gov/geology/geosrv/geores/richt_mercali_relation.htm



Probability of Future Events

Based on previous occurrences, an earthquake has occurred 0.052 times per year since 1978, so the probability of an earthquake event in any given year is 0.138%. Based on this, a future event is unlikely. However, it is possible that all plan participants in Drew County could experience up to a 4.0-4.5 magnitude earthquake (on the Richter Scale).

Impact and Vulnerability

Most earthquake-related property damage and deaths are caused by the failure and collapse of structures due to ground shaking. Impacts to the Drew County planning area during a New Madrid event would lend more toward recovery, i.e. acceptance of displaced residents from other counties and the providing of resources to the overall state recovery effort.

Two areas in Drew County have experienced a 3.0 magnitude earthquake on the Richter Scale. The Arkansas Geological Survey confirms that damage is not a concern unless a quake has a magnitude of at least a 4.0.

The magnitude of a future probable event for the planning area would not impact any areas differently, i.e. urban vs. rural so building density would not be a factor. There are vulnerable commercial structures located in the planning

area that are constructed with unreinforced masonry. During a Magnitude 4.5 on the Richter Scale, the planning area could experience noticeable shaking of indoor items and rattling noises. According to the Modified Mercalli Scale, an event of this magnitude (VI equivalent) would be felt by all and many would be frightened and run outdoors. Falling plaster and chimneys, but overall the damage would be small. Falling objects could cause injury to people.

All areas of the planning area contain housing that is constructed with unreinforced masonry. The walls could be cracked or collapsed. The windows could be broken and unanchored furniture could be displaced. There are also areas with mobile homes that are mounted on piers. The homes could be knocked off their foundation and drop 24 to 36 inches before striking the ground. Any residents in mobile homes are vulnerable and would be knocked from their current position to the floor and injured or killed. The contents of the home would be scattered and damaged, and structures connected to the home can be torn away from the main structure.

Elderly and small children (including students at the Drew Central and Monticello Schools) are most vulnerable to this hazard as they may be unable to reach safety (outdoors) as quickly as others. Additionally, an earthquake could create stress or take an emotional toll on this population for fear of future events.

Infrastructure such as roads, bridges, power lines, etc. are not expected to be vulnerable to a future earthquake event.

3.4.4 Extreme Heat

Extreme heat is characterized by a combination of very high temperatures and exceptionally humid conditions. Temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. When persisting over a period of time, it is called a heat wave. Many areas of the United States are susceptible to heat waves and Arkansas is certainly one of these.

An estimation of the heat index is a relationship between dry bulb temperatures at different humidity's and the skin's resistance to heat and moisture transfer. Because skin resistance is directly related to skin temperature, a relation between ambient temperature and relative humidity versus skin or apparent temperature can be determined. If the relative humidity is higher or lower than the base value, then the apparent temperature is higher or lower than the ambient temperature.

Approximately 200 deaths a year are attributable to extreme heat in the U.S. There were no records available to the HMPT documenting any deaths in the county which was attributable to extreme heat, although it is doubtful there have not been some over the years, though perhaps not recorded as such or attributed directly to the weather.

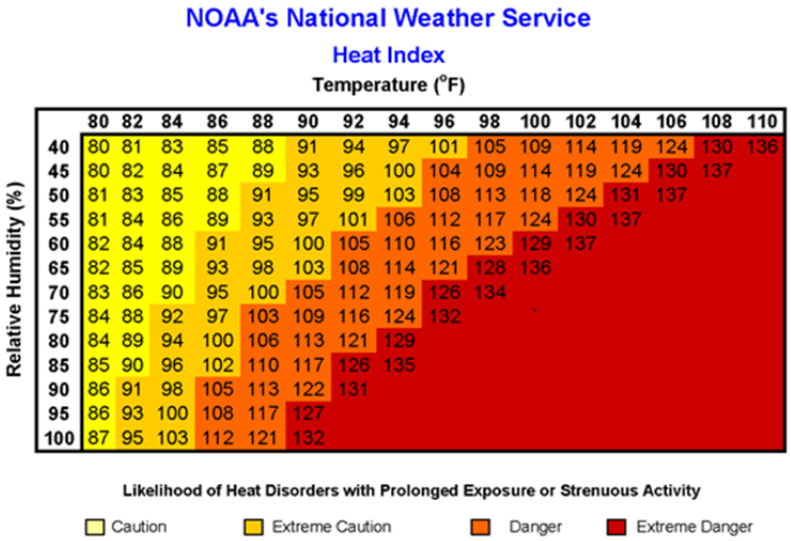
Location

There is no defined geographic hazard boundary for extreme heat. Extreme heat generally affects people rather than property. All plan participants are equally likely to experience an extreme heat event.

Extent

All plan participants are affected seasonally by summer heat, with summer temperatures averaging 80 degrees and maximum around 92 degrees (all temperatures given in Fahrenheit). Between 2000 and 2015, areas in Drew County have recorded high temperatures between 100 and 109 degrees. The highest recorded temperature of 109 occurred on July 19, 2006. Temperature readings of 108 were recorded on September 1, 2000 and September 3, 2000. The past occurrences help predict that the participating jurisdictions can expect extreme heat up to 109 degrees Fahrenheit.

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmosphere Administration (NOAA) this relationship is referred to as the "Heat Index" which is shown below. The Heat Index measures how hot it feels outside when humidity is combined with high temperatures.



Heat Index/Heat Disorders

Heat Index	Possible heat disorders for people in higher risk groups
130° OR HIGHER	HEATSTROKE/SUNSTROKE HIGHLY LIKELY WITH CONTINUED EXPOSURE.
105°- 130°	SUNSTROKE, HEAT CRAMPS OR HEAT EXHAUSTION LIKELY, AND HEATSTROKE POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY.
90° – 105°	SUNSTROKE, HEAT CRAMPS AND HEAT EXHAUSTION POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY.
80° - 90°	FATIGUE POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY

IMPORTANT: Since heat index values were devised for shady, light wind conditions, **exposure to full sunshine can increase heat index values by up to 15°F.** Also, **strong winds**, particularly with very hot, dry air, can be extremely hazardous.

Condition	Symptoms
Sunburn	Skin redness and pain, possible swelling, blisters, fever, headaches
Heat Cramps	Painful spasms, usually in leg and abdominal muscles; heavy sweating
Heat Exhaustion	Heavy sweating but skin may be cool, pale, or flushed. Weak pulse. Normal body temperature is possible, but temperature will likely rise. Fainting or dizziness, nausea, vomiting, exhaustion, and headaches are possible.
Heat Stroke (a severe medical emergency)	High body temperature (105+); hot, red, dry skin; rapid, weak pulse; and rapid shallow breathing. Victim will probably not sweat unless victim was sweating from recent strenuous activity. Possible unconsciousness.

Previous Occurrences

There has been one instance of "excessive heat" recorded by the NCDC on August 2, 2010. No injuries, damages or deaths were reported. However, areas of the County have recorded temperatures 100°F and above 147 days since the year 2000.

Probability of Future Events

Based on previous occurrences, the planning area is likely to see 9.1875 extreme heat events per year, so the probability of a future event is 57.42 % in any given year. The entire planning area is expected to experience temperatures between 100°F and 110°F and a heat index up to 137 any given year.

Impact and Vulnerability

All participating jurisdictions have total vulnerable populations of children under 5 years and elderly over 62 years. Prolonged exposure to temperatures above 100 degrees Fahrenheit can cause significant health-related ailments that include heat stroke and even death. Infrastructure is not affected by extreme heat events.

For the Drew Central and Monticello School Districts, the students, faculty, and staff are at risk to heat injuries during recess, and transition from building to building.

The major threat of extreme heat or heat waves is heatstroke, a medical emergency that can be fatal. Most at risk are outdoor laborers, the elderly, children, and people in poor physical health. The combined effects of high temperature and high humidity are more intense in urban centers than in rural areas.

The unincorporated areas of Drew County and rural communities are concerned about the agriculture crops, livestock, water supply, and timber populations during extreme heat events. As temperatures rise, people and animals need more water to maintain their health. Many important economic activities like raising livestock and growing food crops require plenty of water. Agriculture, forestry, fishing and hunting, and mining continue to make up 6.6% of Drew County's industry. This trend remains a vulnerability of the farmers and the economy that relies on the product sales during extreme heat events.

During extreme heat, warmer temperatures make crops grow more quickly, also while warmer temperatures can reduce yields. For some crops, such as grains, faster growth reduces the amount of time that seeds have to grow and mature. Also, more extreme temperatures prevent crops from growing.

Heat waves directly threaten livestock. Heat stress can increase vulnerability to disease, reduce fertility, and reduce milk production. Pasture and feed supplies will deplete. Extreme heat will reduce the amount of quality forage available to grazing livestock. Animals that rely on grain will have a lack of feed. All the while, the prevalence of parasites and diseases will rise.

For timber plantations and forestry, the 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.

Structures and infrastructure are not vulnerable to this hazard.

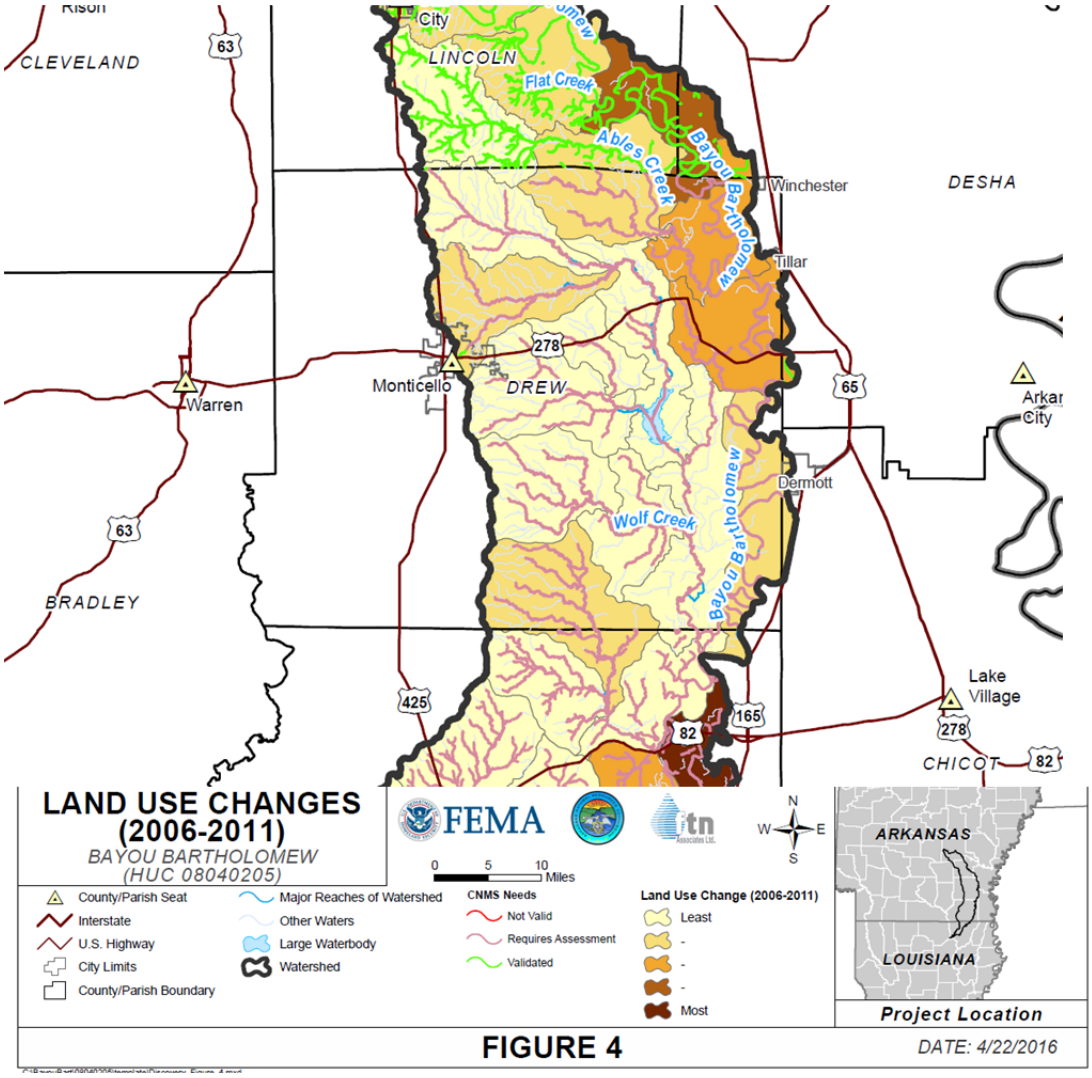
3.4.5 Flood

A flood is the partial or complete inundation of normally dry land. The various types of flooding include riverine flooding, and shallow flooding in Drew County. Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries or even fatalities.

Land Use and Development Trends

According to the FEMA Bayou Bartholomew Pre-Discovery Report dated 4/22/16, land use for most areas of Drew County within this watershed remains unchanged since the 2008 plan, while smaller portions have seen some change including pasture to forest, from forest to pasture, or from pasture to residential, etc. The below map provided from

that report demonstrates where the watershed hydrology can be seen, either in increased or decreased run-off potential, based on the changes in land use reflected over the past 5 years. Other areas of the county remain unchanged since the previous plan.

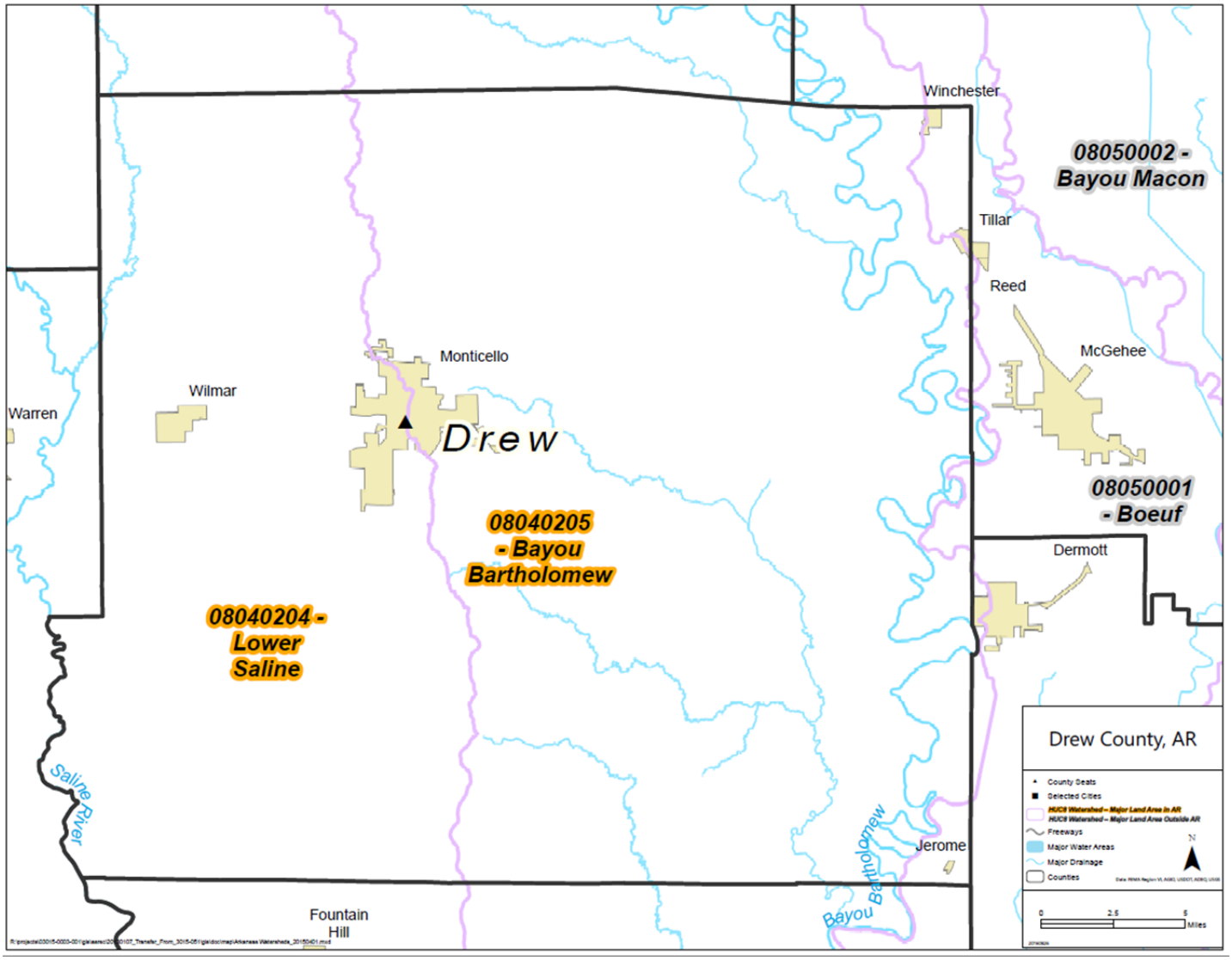


Between 2008 and 2016, the City of Monticello has constructed a canal that has relieved flooding on Market Street. Since construction, this area (including the County's only SRL property) has not experienced further flooding.

Location

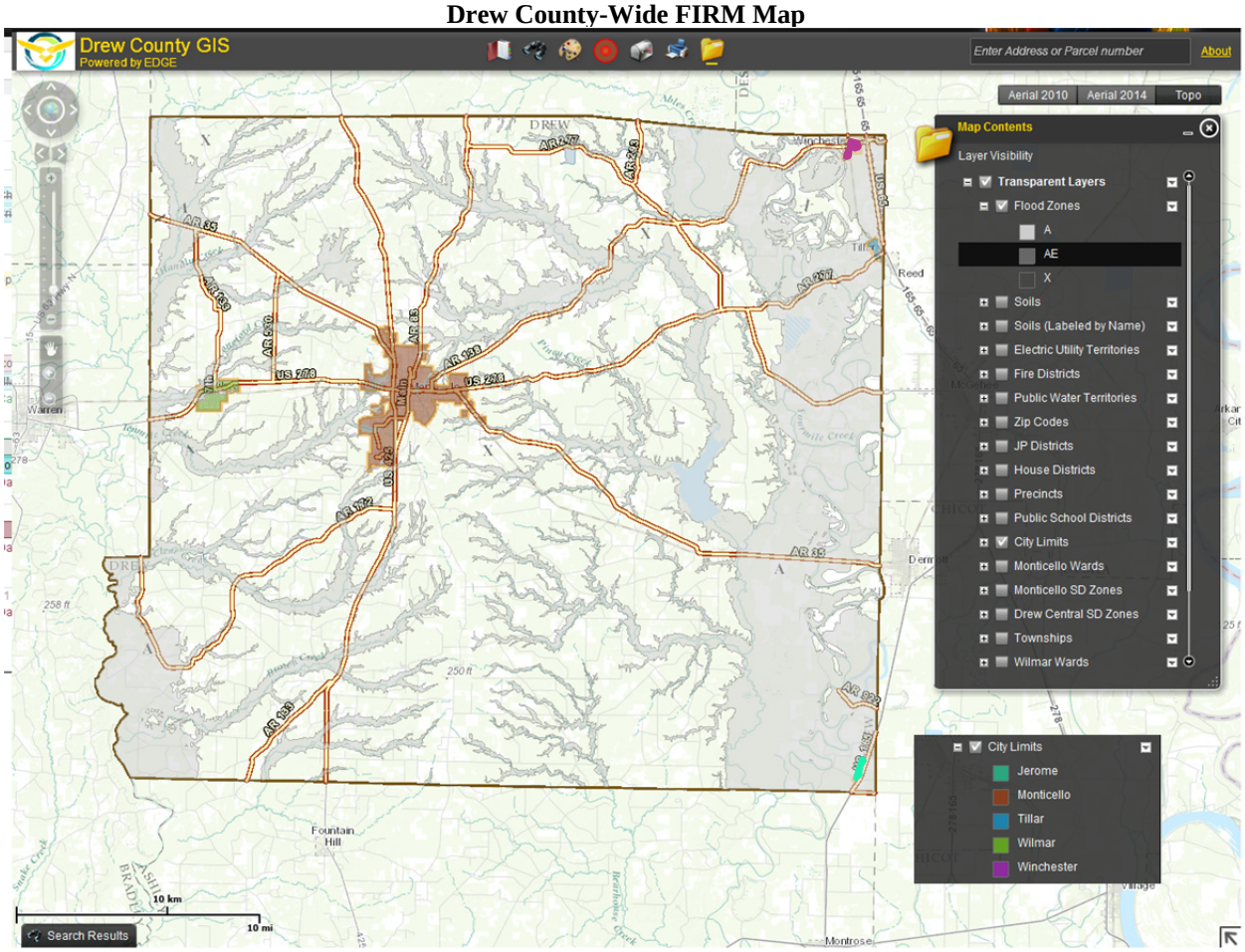
The *Bayou Bartholomew Watershed* is attributed to over two-thirds of Drew County and includes parts of the Cities of Monticello, Tillar, and Winchester and the City of Jerome. The *Boeuf Watershed* is in a small portion of Drew County and includes parts of the Cities of Tillar and Winchester. The remaining almost one-third of the county is in the *Lower Saline Watershed*, which includes parts of the City of Monticello and the City of Wilmar. All of the Drew Central School District, Monticello School District and University of Arkansas at Monticello's buildings are within the city limits of Monticello. Therefore, a portion of them are in the *Bayou Bartholomew Watershed* and the other portion is in the *Lower Saline Watershed.*

Drew County Watersheds



Flood Insurance Rate Maps (FIRM) included in Section 7, Appendix A depict the locations of flood zones within each jurisdiction. These demonstrate the likely locations of flooding during a 100-year event. The locations that are affected by flooding are the jurisdictions of the unincorporated areas of Drew County, the cities of Jerome, Monticello, Wilmar and Winchester. A portion of the Monticello School District's Monticello Elementary School is in a floodplain; none of the other buildings owned by the school district are in a floodplain. Portions of four of the Parcels the University of Arkansas at Monticello own are in a floodplain, however there are no structures in any of these areas. The city of Tillar and the Drew Central School District are not in floodplains.

Drew County-Wide FIRM Map



The entire town of Jerome is in a FEMA-delineated floodplain.
Approximately 15% of the City of Monticello is in a FEMA-delineated floodplain.
None of the City of Tillar is in a FEMA-delineated floodplain.
Approximately 10 % of the City of Wilmar is in a FEMA-delineated floodplain.
Approximately 50% of Winchesters is in a FEMA-delineated floodplain.
Approximately 40% of Drew County overall is in a FEMA-delineated floodplain.

Extent

NOAA data from 2005-2015 indicates Drew County as a whole experienced 794 rain events with rainfall 0.01 inches or greater, the average rainfall for those events being 0.437 inches. The maximum rainfall recorded is 4.65 inches on 10/30/09. Oftentimes flooding can be a result of the condition of the land's ability to absorb precipitation, which can be affected by how much and in what time period previous rains have occurred. For example, although for the month of September 2008 Drew County rainfall of 3.67" and 3.38" for two days from Hurricane Gustav, there were several days before (and after) those heavy events when small rainfall amounts occurred. This left the condition of the land less able to absorb more precipitation which contributes to runoff. Runoff is also increased by the land use and development changes causing an increase in non-permeable surfaces such as asphalt and concrete. The City of Jerome can expect flash flood events when receiving 3" or more of rainfall in a short amount of time. The remaining planning area in Drew County can expect flash flooding events when receiving 5" or more of rainfall in a short amount of time. At the beginning of the year 2016, Drew County experienced 20" of rain in a four-day window causing 35 County roads to be submerged.

Flood elevation data is not available for any of the planning area to determine how high the water can get.

The City of Jerome can experience flooding in the following areas but are not limited to just these areas:

- One house on Bayou Road has experienced flooding

The City of Monticello can experience flooding in the following areas but are not limited to just these areas:

- Godfrey Ditch and Hwy 278 East can experience flooding up to half a foot in some areas
- Market Street (apartments) close to Ragland Avenue up to half a foot
- Main Street at the Intersection of College Street
- McCloy and Gaines Streets near the intersection with Gabbert Street
- North Conley near Merrydale and Davis Street

The City of Tillar has not experienced any flooding since 1927. Since that time, the Dollar Hill Dam Levee has been constructed higher and the City has not experienced any further flooding issues.

The City of Wilmar can experience flooding in the following areas but are not limited to just these areas:

- Gates Avenue
- McKinstry Ave
- Several other areas during heavy rain events

The City of Winchester can experience flooding in the following areas but are not limited to just these areas:

- Hwy 138
- Oswald Street

Flood severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat. Any of the planning area could see any of the below categories of flooding.

- **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 high 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

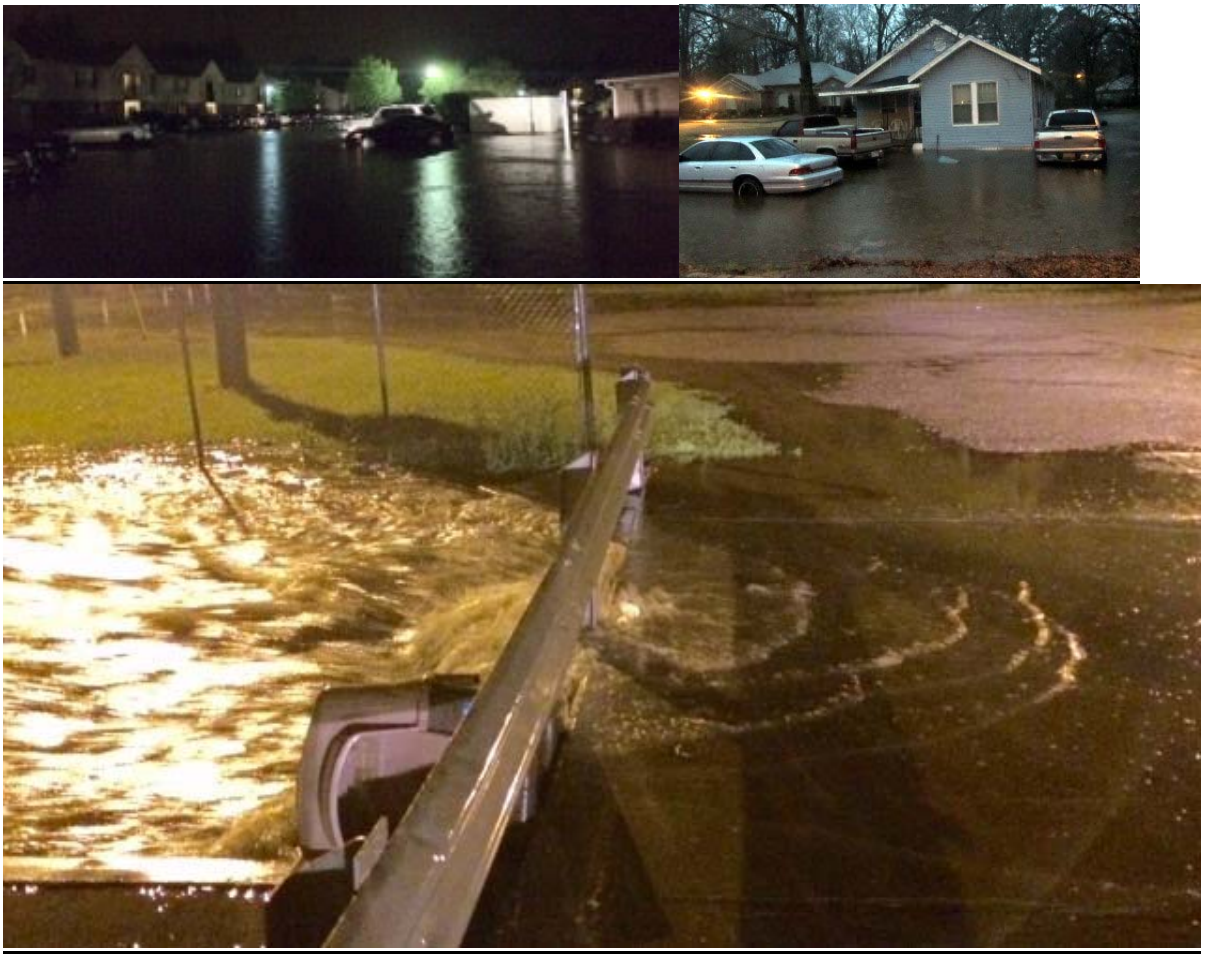
Location	Date	Type	Property Damage	Crop Damage	Narrative
COLLINS	4/3/2000	Flash Flood	$ -	0	Excessive rain covered several roads with water in eastern Drew County. Highway 35 near Collins was closed due to high water.
SELMA	4/3/2000	Flash Flood	$ -	0	Excessive rain covered Arkansas Highway 278 with water in eastern Drew County. The road was closed as a result.
SELMA	4/3/2000	Flash Flood	$ -	0	Due to excessive rain, Highway 278 in eastern Drew County remained closed due to high water.
COUNTY WIDE	2/16/2001	Flash Flood	$ -	0	Five to seven inches of rain was common over much of central and southern Arkansas from 02/13/2001 to 02/17/01. During the afternoon hours of 02/16/2001, excessive rain caused flooding of some roadways in Drew County. In some cases, roads had to be barricaded to prevent traffic from driving through high water.
COUNTY WIDE	11/28/2001	Flash Flood	$ -	0	Heavy rains fell across much of southeast Arkansas on the evening of the 28th and continued into the early morning hours on the 29th. The rains occurred over the same areas, resulting in flash flooding. There were scattered reports of roads

Location	Date	Type	Property Damage	Crop Damage	Narrative
					covered by water, with several roads closed until the water receded.
COUNTY WIDE	11/29/2001	Flash Flood	$ -	0	Prolonged heavy rains occurred over much of southeast Arkansas on the 28th and the morning of the 29th. Between 4 and 6 inches of rainfall was common across the area which resulted in widespread flash flooding. A number of houses were flooded and numerous roads were covered by high water for a period of time.
COUNTY WIDE	12/13/2001	Flash Flood	$ -	0	Additional heavy rains fell over saturated ground across Southeast Arkansas. This resulted in more flash flooding over the region. A number of roads were covered by high water for several hours until the rainfall diminished.
COUNTY WIDE	12/17/2001	Flash Flood	$ -	0	Heavy rains fell over much of southeast Arkansas from the evening hours on the 16th through early on the 17th. Between 2 and 4 inches of rain fell which resulted in flash flooding. Numerous county roads were covered by high water. A number of homes and businesses also sustained damage from the flood waters.
MONTICELLO	12/22/2001	Flash Flood	$ -	0	Heavy rains resulted in flash flooding over parts of Drew County. Highway 35 between Monticello and Dermott was covered by high water for several hours.
COUNTY WIDE	12/19/2002	Flash Flood	$ -	0	Heavy rains fell across a large portion of southeast Arkansas starting on the evening of the 18th and continuing through the morning hours of the 19th. Rainfall amounts between 2 and 5 inches were common across the area, with some locations seeing totals of 5 to 7 inches. The rainfall resulted in widespread flash flooding over the region with numerous county roads covered by high water. There were also a number of reports of homes and businesses sustaining flood damage as well.
COUNTY WIDE	5/17/2003	Flash Flood	$ -	0	Excessive rainfall flooded a number of roads across Drew County.
MONTICELLO	5/30/2004	Flash Flood	$ -	0	Several streets were under water at Monticello.
MONTONGO	7/1/2004	Flash Flood	$ -	0	Heavy rains caused flash flooding to occur at Montongo. Numerous streets were flooded for a short period of time.
COLLEGE STATION	6/25/2008	Flash Flood	$ -	0	The air mass in Arkansas became somewhat tropical on the 25th, with dew points in the lower 70s in some areas. With a lot of moisture in place, all it took was some heating to get isolated thunderstorms to bubble up during the afternoon and evening hours. This mainly occurred in southern sections of the state. Streets were flooded including U.S. Highway 425.
MONTICELLO MUNI ARPT	6/25/2008	Flash Flood	$ -	0	Flooding was reported around town, including U.S. Highway 278.
BETHEL	9/2/2008	Flash Flood	$ 340,000.00	0	Sanderlin Road, Panther Creek Road, 4 Mile Creek Road, 16th Section Road, Old Warren Road, Old Dermott Road and Arkansas Highway 172 west of U.S. Highway 425 were closed due to flooding.
MONTICELLO MUNI ARPT	4/2/2009	Flash Flood	$ -	0	A forest road was barricaded due to high water.
WILMAR	5/3/2009	Flash Flood	$ 10,000.00	0	Several county roads outside of Monticello were closed due to high water.
CARPENTER	5/6/2009	Flood	$ 100,000.00	0	Within Drew County, flooding of the Saline River damaged roads and impacted cabins along the river. A few structures were impacted north of the Longview community at the Arkansas Highway 8 bridge, near Gee's Landing, and Ozment Bluff. About 3 to 5 structures were impacted by the high river

Location	Date	Type	Property Damage	Crop Damage	Narrative
					stages. County roads in the flood plain of southwest Drew county were also impacted.
BETHEL	10/13/2009	Flash Flood	$ 75,000.00	0	Countywide flooding occurred and several county roads had to be closed due to high water.
ROSE HILL	10/22/2009	Flash Flood	$ 15,000.00	0	Arkansas Highway 138 and U.S. Highway 278 had water over them, and several county roads were closed due to flooding.
ROCK SPGS	10/30/2009	Flash Flood	$ 50,000.00	0	Flash flooding which developed early on the 30th became widespread areal flooding later in the morning.
ROCK SPGS	10/30/2009	Flood	$ -	0	Roads were impassable in Monticello due to high water. Several feet of water was in area yards with the ditches overflowing. Arkansas Highway 138 was closed. A number of county roads were damaged.
ROCK SPGS	12/24/2009	Flash Flood	$ 250,000.00	0	A strong but slow-moving low pressure system began its approach to Arkansas on the 23rd. Ahead of this low, unseasonably large amounts of moisture were drawn northward from the Gulf of Mexico. The approach of the low set off heavy rain and thunderstorms on the 23rd and 24th. Rainfall amounts of 3 to 6 inches were common for the two-day period. In a broad swath from southwest Arkansas through the central part of the state into northeast Arkansas, many places picked up 7 to 10 inches of rain. Flash flooding resulted initially, followed by areal flooding and river flooding. After the low passed by, colder air spilled into Arkansas. Light snow fell across parts of northern and western Arkansas from late on the 24th into the early morning hours of Christmas Day. Most snowfall amounts were in the 1/2 to 1 inch range, with spotty totals up to 2 inches. Though the amounts were rather small, hazardous driving conditions resulted. Widespread heavy rain resulted in the development of flash flooding on the 24th.
ROCK SPGS	12/24/2009	Flood	$ 250,000.00	0	A strong but slow-moving low pressure system began its approach to Arkansas on the 23rd. Ahead of this low, unseasonably large amounts of moisture were drawn northward from the Gulf of Mexico. The approach of the low set off heavy rain and thunderstorms on the 23rd and 24th. Rainfall amounts of 3 to 6 inches were common for the two-day period. In a broad swath from southwest Arkansas through the central part of the state into northeast Arkansas, many places picked up 7 to 10 inches of rain. Flash flooding resulted initially, followed by areal flooding and river flooding. After the low passed by, colder air spilled into Arkansas. Light snow fell across parts of northern and western Arkansas from late on the 24th into the early morning hours of Christmas Day. Most snowfall amounts were in the 1/2 to 1 inch range, with spotty totals up to 2 inches. Though the amounts were rather small, hazardous driving conditions resulted. Flash flooding, which developed on the morning of the 24th, became widespread areal flooding later on the 24th and continued into Christmas morning. Numerous county roads were flooded.
MONTICELLO	7/27/2010	Flash Flood	$ 1,000.00	0	Several streets were flooded in Monticello.
MONTICELLO	7/27/2010	Flash Flood	$ 1,000.00	0	Several streets were flooded in Monticello.
ROCK SPGS	4/26/2011	Flood	$ 100,000.00	0	Widespread areal flooding occurred.
ROCK SPGS	5/1/2011	Flood	$ 250,000.00	500000	Areal flooding was widespread in Arkansas, beginning early in May. The flooding was caused by large amounts of rain on April 30th, and May 1st and 2nd; high water flowing down from Missouri; and backwater flooding from rivers and large creeks and bayous. The Mississippi River was also

Location	Date	Type	Property Damage	Crop Damage	Narrative
					experiencing unusually high stages, causing the White and Arkansas Rivers to back up near the rivers' confluence. Arkansas Farm Bureau estimated that more than 1 million acres of farmland were under water in the state. The flooding lasted well into May in many counties, and even into June in some of the counties in eastern Arkansas
MONTICELLO	7/13/2011	Flash Flood	$ 50,000.00	0	Street flooding occurred in Monticello, and water entered some businesses. The Arkansas Forestry Commission station at Monticello measured 2.50 inches of rain in a short amount of time.
ROCK SPGS	1/13/2013	Flash Flood	$ 75,000.00	0	Arkansas 35, 138, and 83 were flooded. Numerous county roads were inundated, as were some streets in Monticello. Garnett Rd. collapsed just north of Arkansas 83. Cut-Off Creek flooded.
ROSE HILL	7/18/2013	Flash Flood	$ 1,000.00	0	Streets flooded in several parts of Monticello.
ROCK SPGS	12/21/2013	Flash Flood	$ 10,000.00	0	Water covered several roads and entered an office in downtown Monticello.
MONTICELLO MUNI ARPT	4/9/2015	Flash Flood	$ -	0	Numerous low water crossings were flooded.
STATE SCHOOL	4/24/2015	Flash Flood	$ -	0	Flooding was reported throughout the county.
REED	12/25/2015	Flash Flood	$ -	0	There were many roads flooded across the area.
			$1,578,000	**$500,000**	

Photos from April 2015 flooding in the City of Monticello are below.



During periods of heavy rainfall, the City of Monticello has experienced flash flooding up to half a foot in the areas surrounding Godfrey Ditch, including the City warehouse and Highway 278 East.

Probability of Future Events

Based on previous occurrences, the planning area is likely to see 2.067 flash flood events per year, so the probability of a flash flood event is 13.78% in any given year of varying severities. The planning area located in a floodplain is likely to see 0.333 Flood events per year, or a 2.22% chance of flooding in any given year of varying severities. The planning area not located in a floodplain is least likely to experience flood events in the future, especially the City of Tillar. Based on the amount of floodplain in the County as a whole, 40% of the planning areas is likely to flood during a 100-year flood event.

Impact and Vulnerability

The Arkansas Natural Resources Commission under Cooperating Technical Partner (CTP) with FEMA has recently completed the Discovery meeting for the *Bayou Bartholomew Watershed*. It is not known what final products will be produced from the Risk MAP project, but the future plan update will incorporate any additional information gathered, especially pertaining to vulnerable structures and infrastructure, hazard mitigation activities and flood depth grids.

The potential flood depth for areas of Drew County in the *Bayou Bartholomew Watershed* is not currently available. The HMPT Utilized FEMA FIRM Maps to determine flood hazard areas for a 100-year event, historical data and NFIP insurance and claims data to determine risk.

A small portion of Drew County, including portions of the Towns of Jerome and Tillar, and the City of Winchester are attributed to the *Boeuf Watershed* to the extreme east of the county. Arkansas Natural Resources Commission under Cooperating Technical Partner (CTP) with FEMA completed the full Risk MAP process for the *Boeuf Watershed* and the following non-regulatory risk assessment products of "Flood Risk Map", "Flood Risk Report," and "Flood Risk Database" were made available. This information was in the plan.

According to the Arkansas State All-Hazards Mitigation Plan (2013)[3], should a 1% annual (100-year) flood event occur in Drew County, the following losses would occur:

Residential Building Losses	$4,089,000
Residential Contents Losses	$2,814,000
Commercial Building Losses	$147,000
Commercial Content Losses	$778,000
Other Building Losses	$301,000
Other Contents Losses	$4,377,000
Total Contents Losses	$7,969,000
Total Building Losses	$4,537,000
Business Disruption Losses	$1,388,000
Total Losses	$49,437,000

This same source also estimates crop exposure value at $35,925,000, and an annual estimated crop damages at $238,283.

Jurisdiction	**Approximate Number of Structures in Floodplain**
Jerome	32 (all)
Monticello	95
Tillar	0
Wilmar	10-20
Winchester	36

There are numerous ways that flooding could impact Drew County. Flooding causes problems by blocking passage on streets, collapsing overpasses and bridges and causing traffic-light failures. Cars may stall and can even be carried off by flood waters. Flood waters interrupt gas, electricity and water services and contaminate the water supply, making drinkable water unavailable.

People can die in floods when their autos and homes are overtaken quickly by fast-rising flood waters. Homes, personal belongings and businesses can be damaged or lost entirely as a result of ravages of flooding. People may be unable to get to work, creating a loss of income and a lack of services they would provide. Listed below are other means in which flooding can affect Drew County:

Environmental- Flat areas that do not have trees or rocks to prevent erosion are often swept away. Farm fields, which typically are located in flat areas, become washed out and crops are lost. Contaminants from sewer back-ups and other waste may be washed into the water supply, resulting in water that is unsafe for residents to use. The shelters of animals in the area are also washed out, resulting in many homeless animals that can cause problems for their owners.

[3] HAZUS Estimated Losses

Economic- Residential loss or repair could have an impact. Businesses also suffer, not only from the loss of property, but the lack of customers during the flood and for a while during recovery. Farmers also suffer from the loss of their crops.

Financial- Some residents who do not carry flood insurance suffer a great financial hardship. Those who do not have insurance get help with the clean-up, but some costs may still come out of pocket. Towns and cities that are impacted by 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 waters 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 that were 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 that contaminates 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 as well. Low spots on County roads, city roads and state highways are vulnerable to flooding in Drew County.

Timber Plantations 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.

Soil Flooding results in poor soil aeration, leading to poor plant growth. Soil becomes more acidic following flooding. 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.

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 supplies. Contaminated drinking water is a greater problem in developing countries.

Data is available from a HAZUS run for those parts of the planning area that are in the *Boeuf Watershed* in FEMA's Flood Risk Report for the *Boeuf Watershed* Report Number 2 Published 10/6/14. The watershed includes unincorporated areas of Drew County, Jerome, Tillar and Winchester. The remaining plan participants do not have this type of data available, but could be acquired through a flood study, a HAZUS run or future RiskMAP data. The HMPT will seek to gather this information for the next plan update.

	Town of Jerome Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$2,700,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$2,700,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$5,500,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents + Business Disruption

	City of Tillar Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$7,800,000	44%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$400,000	2%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$700,000	4%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$8,900,000	50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$17,800,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents + Business Disruption

	City of Winchester Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$10,600,000	49%	$50,000	<1%	$30,000	<1%	$70,000	1%	$70,000	1%	N/A	N/A
Commercial Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$100,000	<1%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$10,700,000	50%	$50,000	<1%	$30,000	<1%	$70,000	1%	$70,000	1%	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$21,500,000	100%	$50,000	N/A	$30,000	N/A	$70,000	1%	$70,000	1%	N/A	N/A

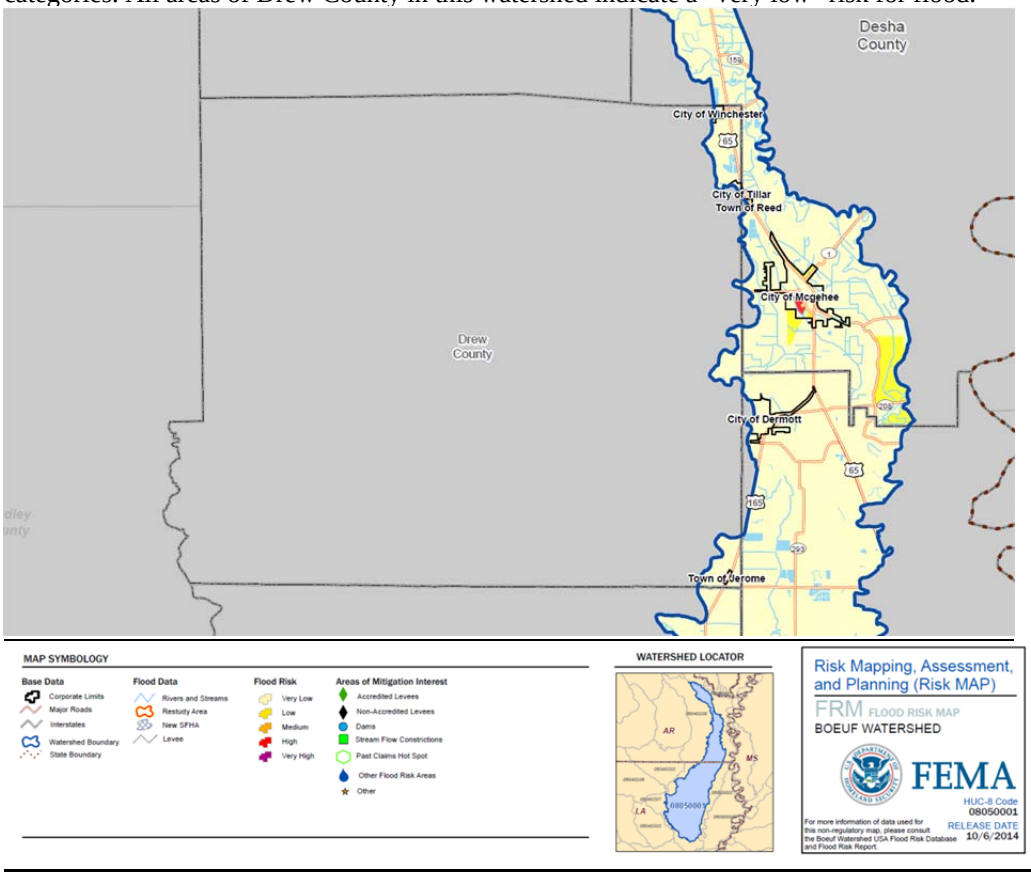
Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents + Business Disruption

Areas of Drew County (unincorporated) within the *Boeuf Watershed*:

	Drew County Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$6,100,000	35%	$30,000	<1%	$50,000	1%	$50,000	1%	$60,000	1%	N/A	N/A
Commercial Building and Contents Losses	$2,200,000	13%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$500,000	3%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$8,800,000	50%	$30,000	<1%	$50,000	1%	$50,000	1%	$60,000	1%	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$17,500,000	100%	$30,000	N/A	$50,000	N/A	$50,000	N/A	$60,000	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents + Business Disruption

The below map from that report indicates areas of “very low”, “low”, “medium”, “high” and “very high” flood risk within the watershed and planning area, but does not give an indication of what the impacts are for each of those categories. All areas of Drew County in this watershed indicate a “very low” risk for flood.



3.4.6 Addressing Repetitive Loss Properties

Please see Section 2.2.2 for greater detail of each jurisdiction’s participation in the NFIP.

Per 2015 HMA Guidance, a **severe repetitive loss property** is a structure that:

(a) Is covered under a contract for flood insurance made available under the NFIP
(b) Has incurred flood related damage-
    i. For which 4 or more separate claims payments (includes building and contents) have been made under flood insurance coverage with the amount of each such claim exceeding $5,000, and which the cumulative amount of such claims payments exceeding $20,000

    OR

    ii. For which at least 2 separate claims payments (includes only building) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

A **repetitive loss property** is a structure covered by a contract for flood insurance made available under the NFIP that:

(a) Has incurred flood-related damage on 2 occasions, in which the cost of the repair, on the average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event
AND
(b) At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage

According to data that was available as of March 2016, Drew County had 7 loses on one property with building payments of $195,420.11. The City of Monticello had 3 loses on one property with total building payments of $14,982.27. Although these claims are listed in both Drew County and the City of Monticello, the address is the same, so although not listed as such, the entire planning area has one property that is Severe Repetitive Loss in the City of Monticello with no other Severe Repetitive or Repetitive Loss properties. The property type is listed as 2-4 family housing- residential, and has actually received a LOMR to be removed from the floodplain due to the construction of a drainage canal.

There are no severe repetitive or repetitive loss properties in Jerome, Tillar, Wilmar or Winchester.

3.4.7 Thunderstorms

A **thunderstorm**, also known as an **electrical storm**, a **lightning storm**, **thundershower** or simply a **storm**, is a form of turbulent weather characterized by the presence of lightning and its acoustic effect on the Earth's atmosphere known as thunder. The meteorologically assigned cloud type associated with the thunderstorm is the cumulonimbus. Thunderstorms are usually accompanied by **strong winds**, heavy rain and sometimes snow, sleet, hail, or no precipitation at all. Those that cause hail to fall are called **hailstorms**. Thunderstorms may line up in a series or rain bands, known as a squall line. Strong or severe thunderstorms may rotate, known as supercells. While most thunderstorms move with the mean wind flow through the layer of the troposphere that they occupy, vertical wind shear causes a deviation in their course at a right angle to the wind shear direction.

Lightning- Lightning is a channel of electrical charge called a stepped leader that zigzags downward in roughly 50-yard segments in a forked pattern. This step leader is invisible to the human eye, and shoots to the ground in less time than it takes to blink. As it nears the ground, the charged step leader is attracted to a channel of opposite charge reaching up, a streamer, normally through something tall, such as a tree, house, or telephone pole. When the oppositely-charged leader and streamer connect, a powerful electrical current begins flowing. A bright return stroke travels about 60,000 miles per second back towards the cloud. A flash consists of one or perhaps as many as 20 return strokes. We see lightning flicker when the process rapidly repeats itself several times along the same path. The actual diameter of a lightning channel is one-to-two inches.

Hail- Hail is a form of precipitation that occurs 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.

According to data from the FEMA 1997 publication “Multi-Hazard - Identification and Risk Assessment,” Arkansas is within a part of the country that averages two to three hailstorms annually.

Strong Winds- Damaging winds are often called “straight-line” winds to differentiate the damage they cause from tornado damage. Strong thunderstorm winds can come from a number of different processes. Most thunderstorm winds that cause damage at the ground are a result of outflow generated by a thunderstorm downdraft. Damaging winds are classified as those exceeding 50-60 mph.

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 damage path extending for hundreds of miles.

Location

All areas of the planning area will experience thunderstorm events and are equally at risk.

Extent

The entire planning area is subject to thunderstorms ranging from weak to extreme that includes up to a T-5 on the chart below.

Modified Extreme Weather Madness Thunderstorm Criteria published by AccuWeather:

THUNDERSTORM CRITERIA							
THUNDERSTORM TYPES	RAINFALL RATE/HR	MAX WIND GUST	HAIL SIZE	PEAK TORNADO	LIGHTNING FREQUENCY	DARKNESS FACTOR	STORM IMPACT
T-1 Weak Thunderstorms or Thundershowers	.03" .10"	25 MPH	None	None	Only a few strikes during the storm	Slightly Dark. Sunlight may be seen under the storm.	1. No Damage 2. Gusty Winds at times
T-2 Moderate Thunderstorms	.10" .25"	25-40 MPH	None	None	Occasional 1 -10	Moderately Dark. Heavy downpours may cause the need for car lights.	1. Heavy Downpours. 2. Occasional lightning. 3. Gusty winds. 4.Very little damage. 5. Small tree branches may break. 6. Lawn furniture moved around
T-3 Heavy Thunderstorms 1. Singular or lines of storms	.25" .55"	40-57 MPH	1/4"-3/4"	EF 0	Occasional to Frequent 10-20	Dark. Car lights used. Visibility low in heavy rains.	1. Minor Damage 2. Downpours that produce some flooding. 3. Frequent lightning 4. Hail occurs with the downpours 5. Small branches are broken. 6. Shingles are blown off roofs.
T-4 Intense Thunderstorms 1. Weaker Supercells 2. Bow echos or lines of storms	.55" 1.25"	57-70 MPH	1" - 1.5"	EF 0 to EF 2	Frequent 20-30	Very Dark. Car lights are used and street lights come on.	1. Moderate Damage 2. Heavy rains can cause flooding to streams, creeks, and roadways. 3. Wind damage to trees and buildings 4. Tornado damage 5. Power outages
T-5 Extreme Thunderstorms 1. Supercells with famility of tornadoes 2. Derecho Windstorms	1.25" 4"	Over 70 MPH	Over 1.5" to 4"	EF 3 to EF5	Frequent to Continuous < 30	Pitch Black with the need for street lights and housing lights.	1. Severe damage to trees and property. Damage is widespread. 2. Flooding rains. 3. Damaging hail. 4. Damaging wind gusts to trees and buildings. 5.Tornados F3-F5 or family of tornados can occur and cause total devastation. 6. Widespread power outage

Previous Occurrences

There have been 153 events reported from January 2000 to January 2016.

On January 30, 2013, strong storms moved through the state and blew a horse barn off its foundation and across a parking lot at UAM, damaging three livestock trailers. The barn housed 11 horses owned by students who were members of the UAM rodeo team. No injuries were reported and none of the horses were injured during the storm. The storm also snapped power lines and damaged UAM's indoor practice facility at the north end of Convoy Leslies-cotton Boll Stadium.

Probability of Future Events

Based on previous occurrences, the planning area is likely to see 9.5625 Thunderstorm events per year, so the probability of an event is 59.76% in any given year. The entire planning area is expected to experience a T-1 to a T-5 event any given year.

Impact and Vulnerability

All parts of the planning area are equally likely to experience severe thunderstorm, lighting, strong winds and hail storm events.

In all participating jurisdictions, structures and their contents are vulnerable to damage by thunderstorms winds. Strong winds can down trees onto power lines, damage mobile homes (and other light construction) that are not

anchored, and rip off roofing. Winds can cause death and injuries by lifting unanchored objects. On average, 55 people are killed and hundreds are injured each year in the United States by Lighting. Lightning can strike communications equipment (e.g. radio or cell towers, antennae, satellite dishes, etc.) and hamper communication and emergency response. Lightning strikes can cause significant damage to buildings, critical facilities, and infrastructure, largely by igniting a fire (and even wildfires). Hailstorms will 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 if caught outside without protection.

In the planning areas as a whole, there are a total of 10,202 structures valued at $632,820,066 that are all vulnerable to this hazard. According to the 2013 Arkansas All-Hazards Mitigation Plan, HAZUS Data for Drew County indicates $137,184,000 in crop exposure, and a total of $278,534 in annualized property loss and crop claims. Those structures not properly constructed or anchored could be damaged.

3.4.8 Tornado

A tornado is a rapidly rotating vortex or funnel of air extending ground ward from a cumulonimbus cloud. Most of the time, vortices remain suspended in the atmosphere (Golden and Snow, 1991). When the lower tip of the vortex touches earth, the tornado becomes a force of destruction. Approximately 1,000 tornadoes are spawned by severe thunderstorms each year.

Tornadoes are related to larger vortex formations and therefore often form in convective cells such as thunderstorms or in the right forward quadrant of a hurricane, far from the hurricane eye. The strength and number of tornadoes are not related to the strength of the hurricane that generates them. Often, the weakest of hurricanes produce the most tornadoes (Bryant, 1991). In addition to hurricanes, events such as earthquake induced fire and fires from atomic bombs or wildfires may produce tornadoes.
The path of a single tornado generally is less than 0.6 mi (1km). The path length of a single tornado can range from a few hundred meters to dozens of kilometers. A tornado typically moves at speeds between 30 and 125 mph (50 and 200 km/h) and can generate internal winds exceeding 300 mph (500km/h). However, the lifespan of a tornado rarely is longer than 30 minutes.

Location

Because there is no defined geographic hazard boundary, all people and property in Drew County and the entire planning area are exposed to the risk of damage from Tornadoes. Based on the short 50-year dataset, no clear areas of high tornado occurrence occur at any particular county scale. Thus, although tornado risk appears to vary at a statewide scale, variable tornado risk at the county scale cannot be demonstrated. Thus, mapping variations in tornado risk at a local or county scale is not currently possible. For the purpose of this plan, all parts of this plan are considered equally likely to experience a tornado event. This is proven to be the case in tornadoes that have occurred in a wide variety of areas.

Extent

The Enhanced Fujita (EF) Scale was devised by a panel of meteorologists and engineers convened by the Wind Science and Engineering Research Center at Texas Tech University. The Weather Channel's severe weather expert Dr. Greg Forbes was on the team of experts who determined the revised wind speed ranges. Since 2007, the EF Scale has been used to rate tornadoes.

Enhanced Fujita Scale		
Category	**Wind Speed**	**Potential Damage**
EF0	105–137 km/h 65–85 mph	Light damage. Peels surface off roofs; some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; mobile homes pushed off foundations or overturned; sign boards damaged.
EF1	138–179 km/h 86–110 mph	Moderate damage. Roofs torn off frame houses; windows and glass doors broken; moving autos blown off roads; mobile homes demolished; boxcars overturned.
EF2	180–217 km/h 111–135 mph	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	218–266 km/h 136–165 mph	Severe damage. Some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	267–324 km/h 166–200 mph	Devastating damage. Well-constructed houses and whole frame houses completely leveled; structures with weak foundations blown away some distance; trees debarked; cars thrown and small missiles generated.
EF5	>324 km/h >200 mph	Incredible damage. Strong frame houses leveled off foundations and swept away; with strongest winds, brick houses completely wiped off foundations; automobile-sized missiles fly through the air in excess of 100 m (109 yd); cars thrown and large missiles generated; incredible phenomena will occur.

Associated hazards include:

- Wind- Tornadoes consist of strong, often destructive winds that can uproot trees and damage buildings and cars
- Rain/Hail-Tornadoes are associated with thunderstorms and may be preceded or followed by heavy rainfall or hail. Depending on the hydrological conditions, flash flooding may occur.
- Obstacles to Response- Damage or destruction of public facilities, including hospitals, can complicate emergency response efforts. Additionally, debris may block roadways, there may be extensive damage to electric and telephone lines, utility lines may be broken, and communication may be cut off because of damaged or destroyed cell, radio and television towers.

All participating jurisdictions could experience a tornado on the Enhanced Fujita Scale from an EF0 to EF5.

The entire planning area could experience any of the below damages corresponding to the wind speed on the Enhanced Fujita Scale.

RESIDENTAL HOME DAMAGE CLASSES		
Degree of Damage (DOD)		**Expected Wind Speed Value (mph)**
1	Threshold of visible damage	65
2	Loss of roof covering material (<20%), gutters, and/or Awning; loss of vinyl or metal siding	79
3	Broken glass in doors and windows	90
4	Uplift of roof deck and loss of significant roof covering material (>20%); collapse of chimney, garage doors; collapse inward, failure of porch or carport.	97
5	Entire house shifts off foundation	121
6	Large sections of roof structure removed; most walls remain standing	122
7	Exterior walls collapsed	132
8	Most walls collapsed, except small interior rooms	152
9	All walls collapsed	170
10	Destruction of engineered and/or well-constructed residence; slab swept clean.	200

Source: FEMA

Previous occurrences

In Drew County there have been 11 reported tornadoes between 2000 and 2016.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	1	220.00K	10.00K
SELMA	DREW CO.	AR	02/24/2001	17:43	CST	Tornado	F1	0	1	0.00K	0.00K
COLLINS	DREW CO.	AR	12/18/2002	17:23	CST	Tornado	F0	0	0	0.00K	0.00K
LACEY	DREW CO.	AR	09/24/2005	11:54	CST	Tornado	F1	0	0	0.00K	0.00K
MONTICELLO	DREW CO.	AR	12/03/2005	23:03	CST	Tornado	F0	0	0	0.00K	0.00K
LACEY	DREW CO.	AR	02/24/2007	14:18	CST-6	Tornado	EF1	0	0	0.00K	0.00K
MONTICELLO	DREW CO.	AR	02/24/2007	14:36	CST-6	Tornado	EF2	0	0	0.00K	0.00K
MONTICELLO	DREW CO.	AR	02/24/2007	16:01	CST-6	Tornado	EF2	0	0	100.00K	0.00K
SELMA	DREW CO.	AR	02/24/2007	16:33	CST-6	Tornado	EF1	0	0	0.00K	0.00K
ROSE HILL	DREW CO.	AR	05/06/2009	03:52	CST-6	Tornado	EF1	0	0	50.00K	0.00K
MONTICELLO MUNI ARPT	DREW CO.	AR	01/29/2013	20:51	CST-6	Tornado	EF0	0	0	20.00K	0.00K
GREEN HILL	DREW CO.	AR	12/27/2015	18:06	CST-6	Tornado	EF1	0	0	50.00K	10.00K
Totals:								0	1	220.00K	10.00K

On February 24, 2007, a tornado touched down in Drew County, about 4.5 miles north of Monticello. Damage along the track of the tornado consisted of downed trees onto a vehicle and mobile home, windows blown out of a house, a large metal building was destroyed, and a metal barn sustained major damage.

Probability of Future Events

Based on previous occurrences, the planning area is likely to see 0.6875 tornado events per year ranging from an EF1 to an EF2. There is a 4.30% chance a tornado will occur in any given year in the planning area.

Impact and Vulnerability

Tornadoes can cause significant damage to trees, building, and power infrastructure. They can cause fatalities, particularly when people are unable to get to a protective shelter. All areas, residents, structures, and critical facilities in Drew County are of high risk of tornado events. Mobile Homes are of the highest risk.

Because there is no defined geographic hazard boundary, all people and property in Drew County are exposed to the risk of damage from tornadoes. All structures in Drew County are vulnerable to tornadoes. Data for Drew County indicates a total of 9,773 dwelling-type structures valued at $448,005,166, and 429 Commercially-Improved structures valued at $144,814,900 that are all vulnerable to this hazard. Those structures not properly constructed or anchored could be damaged or destroyed. The most vulnerable to tornadoes are wood frame structures and manufactured homes. 51.41% of dwellings in Drew County are standard frame homes, 2.23% are mason/frame, 18.96% are mason veneer, and 27.40% are mobile homes. There are a total of 9,773 dwellings (homes) in Drew County, and 2,678 of those are mobile homes.[4] Damage to residential structures could cause hundreds to be without shelter, or try to live in unsafe conditions.

Utilities most vulnerable to tornado winds are electrical power (e.g. power generation facility, above ground transmission lines and sub-stations) and communication structures (radio towers, cell phone towers). Arcing power lines can cause power surges with can damage electrical components and equipment that are plugged in. Most transportation systems such as highways, railways are not highly vulnerable to tornadoes, but downed power lines and trees and limbs can delay travel until roads are cleared. This would not only affect the day to day traffic but also critical services such as emergency police, fire, and ambulance.

[4] Data from Arkansas CAMA Technology, Inc. (ACT) July 2016 (Contractor for Drew County Assessor's Office)

Vulnerable populations including retirement homes, schools and child care centers are located in about every section in the county.

All of the planning area would be affected due to the lost power, water, sewer, gas, and communications. Power and water outages would cause food spoilage and sanitation problems for communities. Hospitals, grocery stores and other critical need and economically important facilities are damaged and closed for extended periods. The School Districts located in Drew County could be closed for extended periods due to these outages or possible damage to building structures on school campuses. The school buses are also vulnerable to damage or may face disruption due to unclear roadways and bridges. Employment would be affected from school closings.

Businesses and local government infrastructure often suffer extensive damage in tornados as well as the death of people, wildlife and livestock. Employment is often affected because of businesses that close due to the tornado damage and loss of business. Even with the advances in meteorology, tornado warning times may be issued in a short period of time.

3.4.9 Wildfire

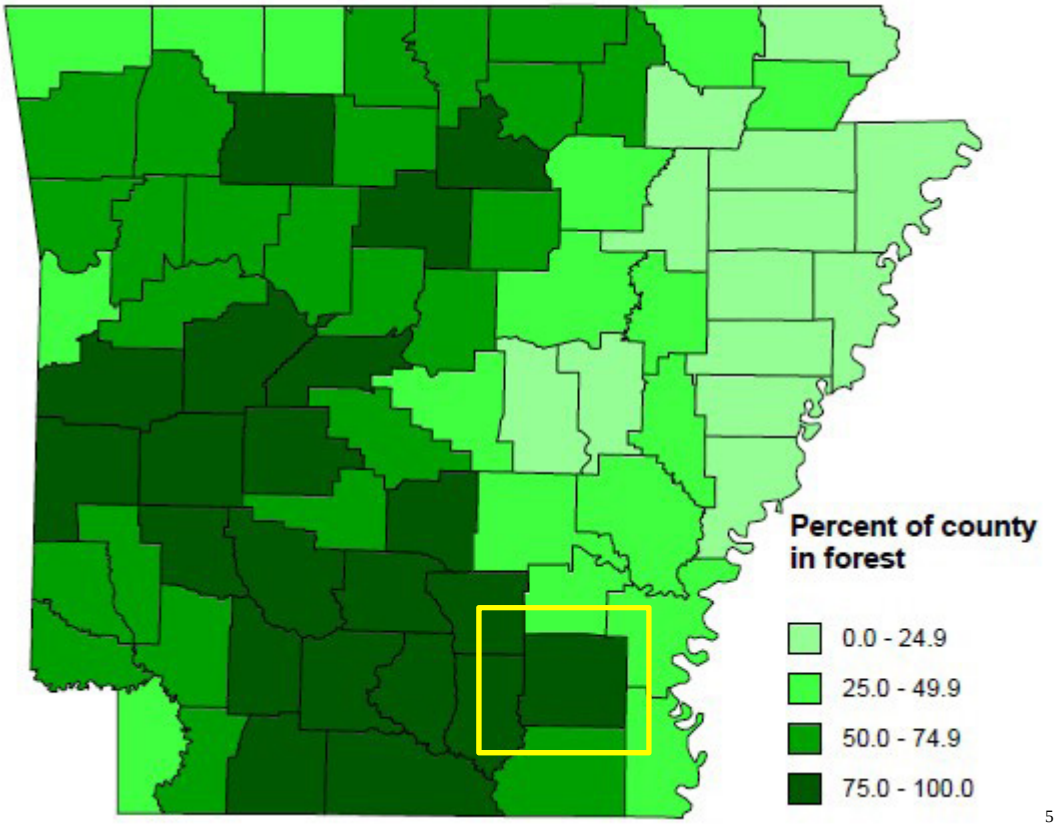
A wildfire is any outdoor fire that is not controlled, supervised, or arranged that spreads through vegetative fuels, exposing and possibly consuming structures. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. There are essentially two types of fires. They are known as wildland fires and Wildland-Urban Interface (WUI) fires. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. A WUI fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels. Areas with a large amount of wooded, brush and grassy areas are at highest risk of wildfires. Additionally, areas anywhere that have experienced prolonged droughts or are excessively dry are also at risk of wildfires. WUI is further described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

Location

The Wildland Urban Interface (WUI) Risk Index is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes.

Drew County and any jurisdiction located in zones that inhibit the primary factors of fuel, topography, and weather is susceptible to wildfire. These three factors can predict wildfire behavior in WUI areas and wildland areas. Large amount of wooded, brush, and grassy areas are considered fuel that promotes the spread of wildfires. Topography affects the movement of air over the ground surface, and the slopes of terrain will change the rate of speed that the fire spreads. Lastly, areas that have experienced prolonged droughts or excessive dry spells can predict wildfires. For WUI fires, any location that intermixes with wildland fuel and human development along with topography and weather are at risk to wildfire. The entire county possesses some type of fuel, whether grass, agriculture, forestry, shrubs, structures, or other vegetation types. An estimated 75-100% of Drew County is forest.

Maps for each plan participant showing the location of areas at risk for wildfire are included in the next section.



[5]

Extent

Based on Arkansas Forestry Commission data from 2011 through 2015, 3,192 acres have burned in Drew County. The most acres burned in a year in the County were 1,866 acres in 2012; the #1 cause of the fires that year was "Incendiary". The fewest acres burned in a year were 168 acres in 2015, which was caused by "debris".

The Fire Intensity Scale (FIS) Scale, retrieved from the Southern Wildfire Risk Assessment, specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on weighted average of four percentile weather categories. Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the planning area. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

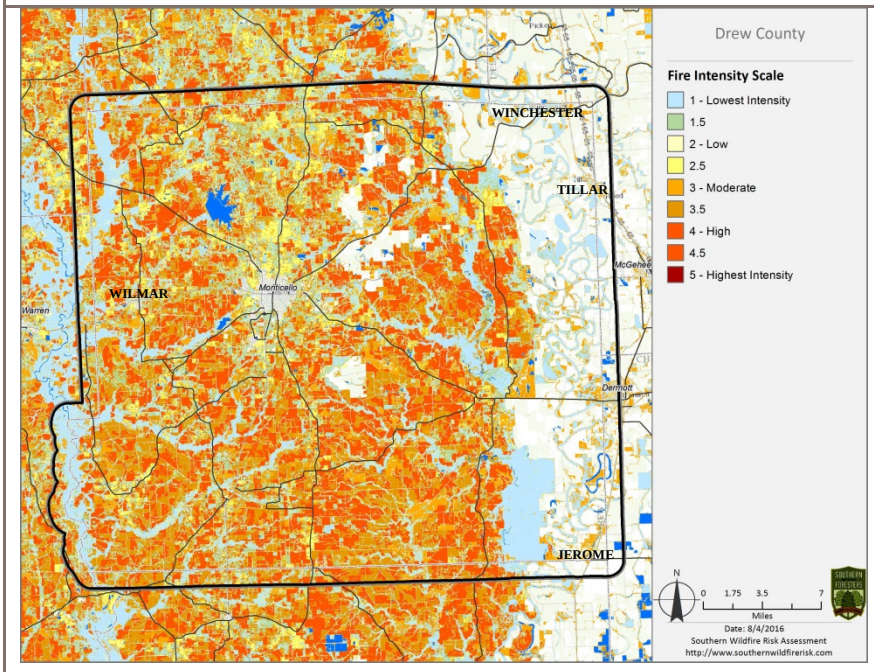
Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

Fire Intensity Scale (FIS)		
Class 1	Very Low Fire Intensity	Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

[5] Arkansas Forestry Commission Annual Report 2015

Class 2	Low Fire Intensity	Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
Class 3	Moderate Fire Intensity	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential to cause harm or damage to life and property.
Class 4	High Fire Intensity	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
Class 5	Very High Fire Intensity	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

The Fire Intensity Scale for Drew County, the cities of Jerome, Monticello (including the campuses of the Drew Central and Monticello School Districts, and the University of Arkansas at Monticello), Tillar, Wilmar and Winchester, shows the locations, impact and vulnerability of wildfire. As indicated on the below map, the planning area could see a Class 1-4 on the FIS.



Characteristics Fire Intensity Scale- Acres for Drew County

Class	Acres	Percent
Non-Burnable	115,070	18.9%
1 Lowest Intensity	92,852	15.2%
1.5	57,702	9.5%
2 Low	16,495	2.7%
2.5	34,776	5.7%
3 Moderate	56,464	9.3%
3.5	102,864	16.9%
4 High	133,099	21.8%
4.5	0	0.0%
5 Highest Intensity	0	0.0%
Total	**609,322**	**100.0%**

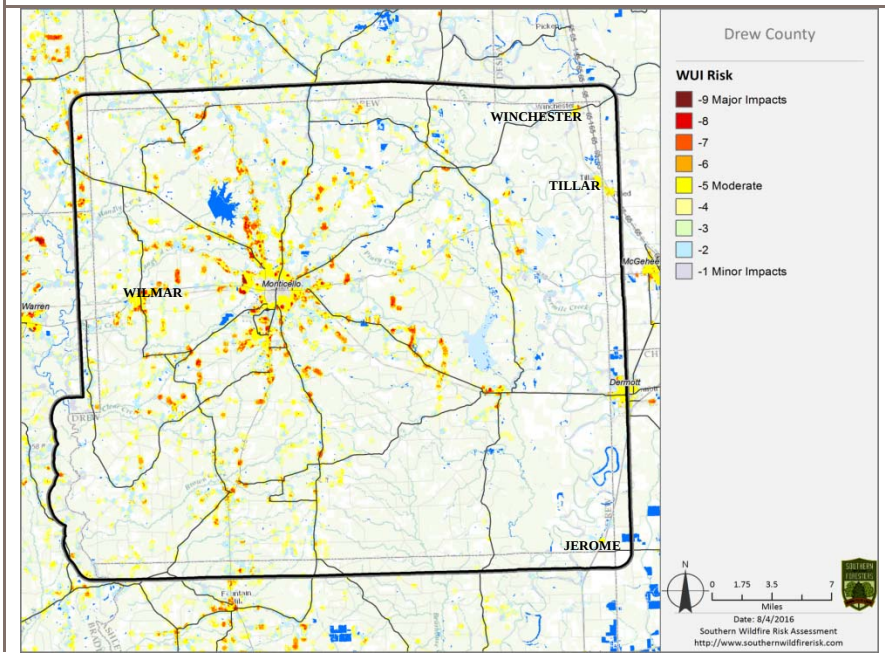
The WUI Risk Index is derived using a Response Function modeling approach. Response functions are a method of assigning a net change in the value to a resource or asset based on susceptibility to fire at different intensity levels, such as flame length. The WUI Risk Index range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9 while areas with low housing density and low flame lengths are rated -1. To calculate the WUI

Risk Index, the WUI housing density data was combined with Flame Length data and response functions were applied to represent potential impacts for all unique conditions of WUI housing density and flame length. The response functions were defined by a team of experts based on values defined by the SWRA Update technical team. By combining flame length with the WUI housing density data, you can determine where the greatest potential impact to homes and people is likely to occur.

Flame Length is used as a measure of fire intensity. With the WUI Risk Index the analysis incorporates penetration into urban fringe areas so that outputs better reflect real world conditions for fire spread and impact in urban interface areas. With this enhancement, houses in urban areas adjacent to wildland fuels are incorporated into the WUI risk modeling.[6]

A summary of the WUI Risk Index for the entire planning area (Drew County as a whole) is provided in the table below. The majority of the planning area is at a 2-4 risk index level. Risk indexes for each participating jurisdiction are depicted in the following maps.

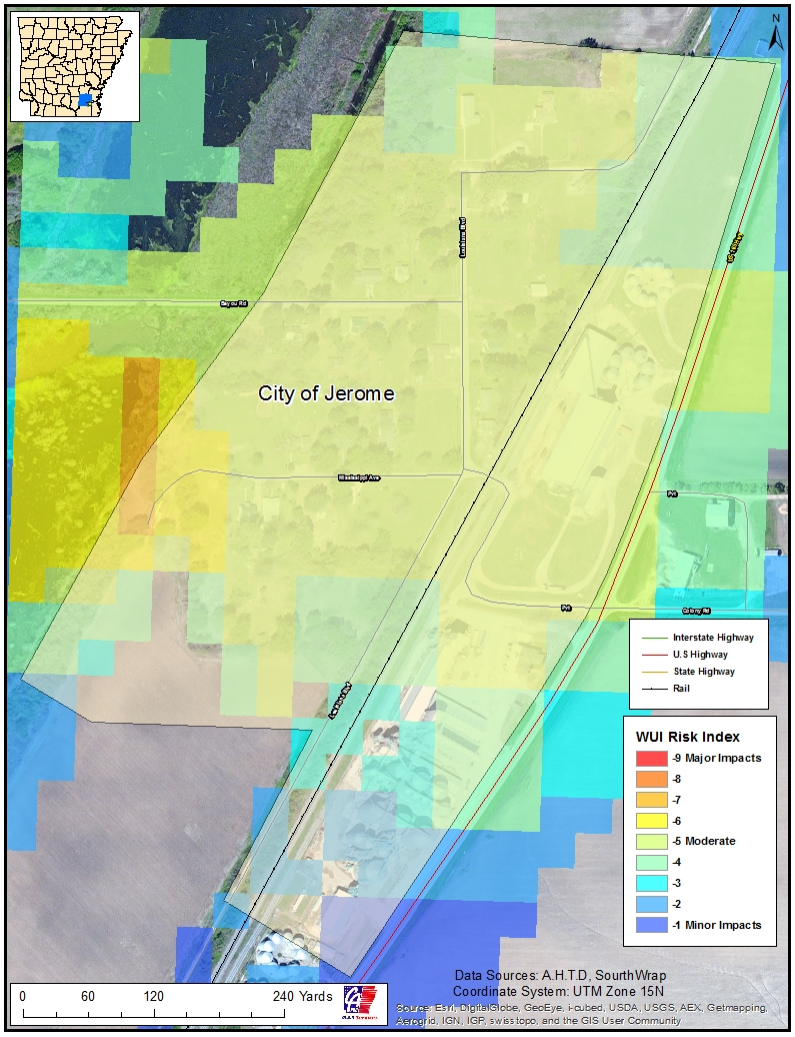
WUI Risk Index for Drew County

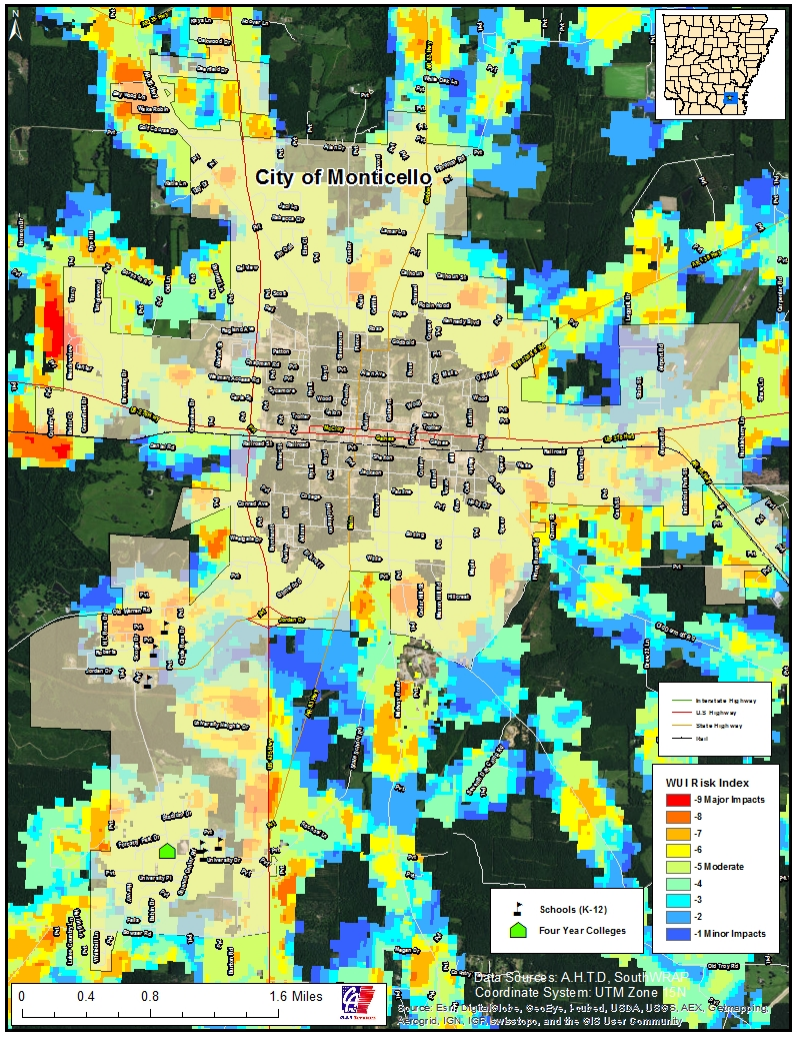


Class	Acres	Percent
-9 Major Impacts	36	0.0%
-8	728	0.6%
-7	4,068	3.6%
-6	6,513	5.8%
-5 Moderate	16,675	14.7%
-4	34,755	30.7%
-3	15,128	13.4%
-2	26,390	23.3%
-1 Minor Impacts	8,863	7.8%
Total	**113,156**	**100.0%**

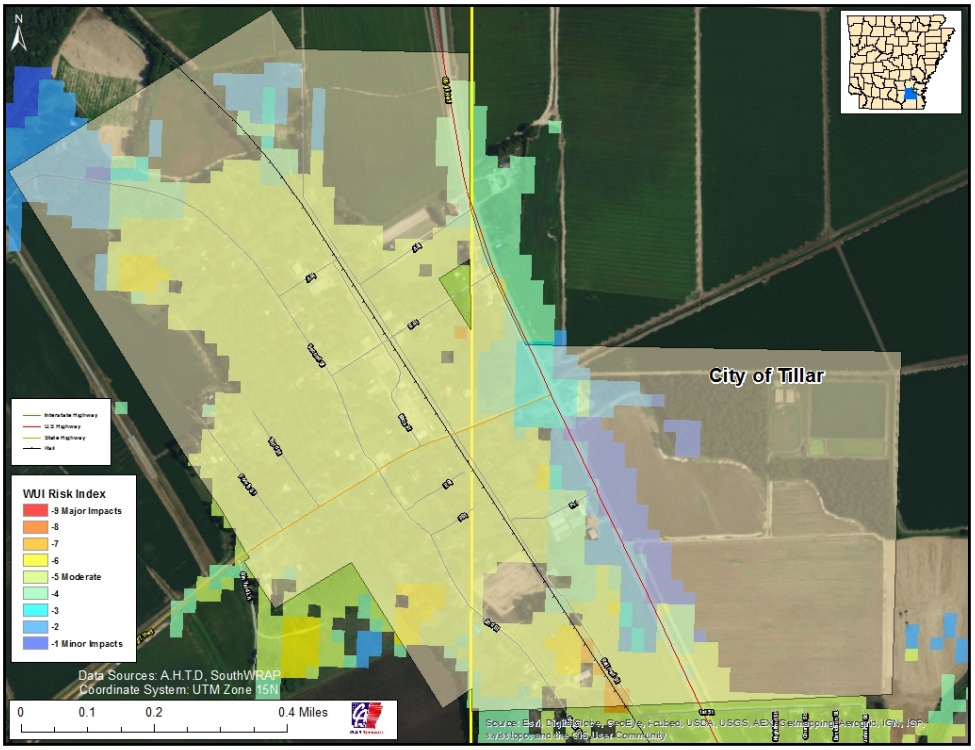
[6] Data from The Southern Group of State Foresters Wildfire Risk Assessment Portal https://www.southernwildfirerisk.com/map/index/public Assessed 8/3/16 The risk output maps are derived at a 30 meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local protection mitigation or prevention planning.

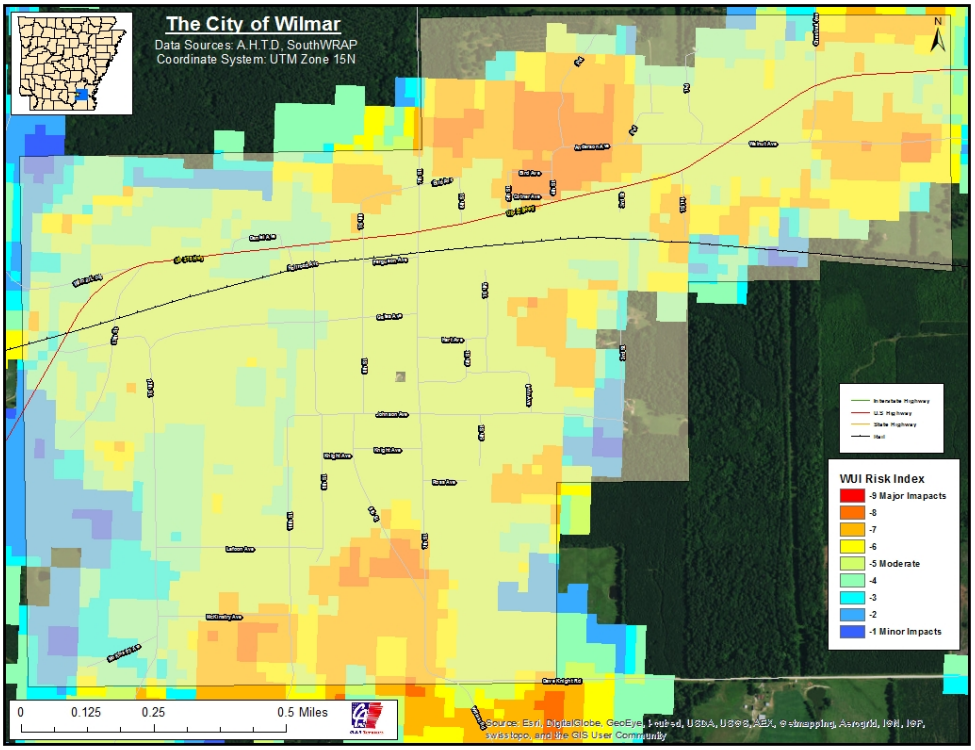
Risk Index Maps for other participating Jurisdictions:

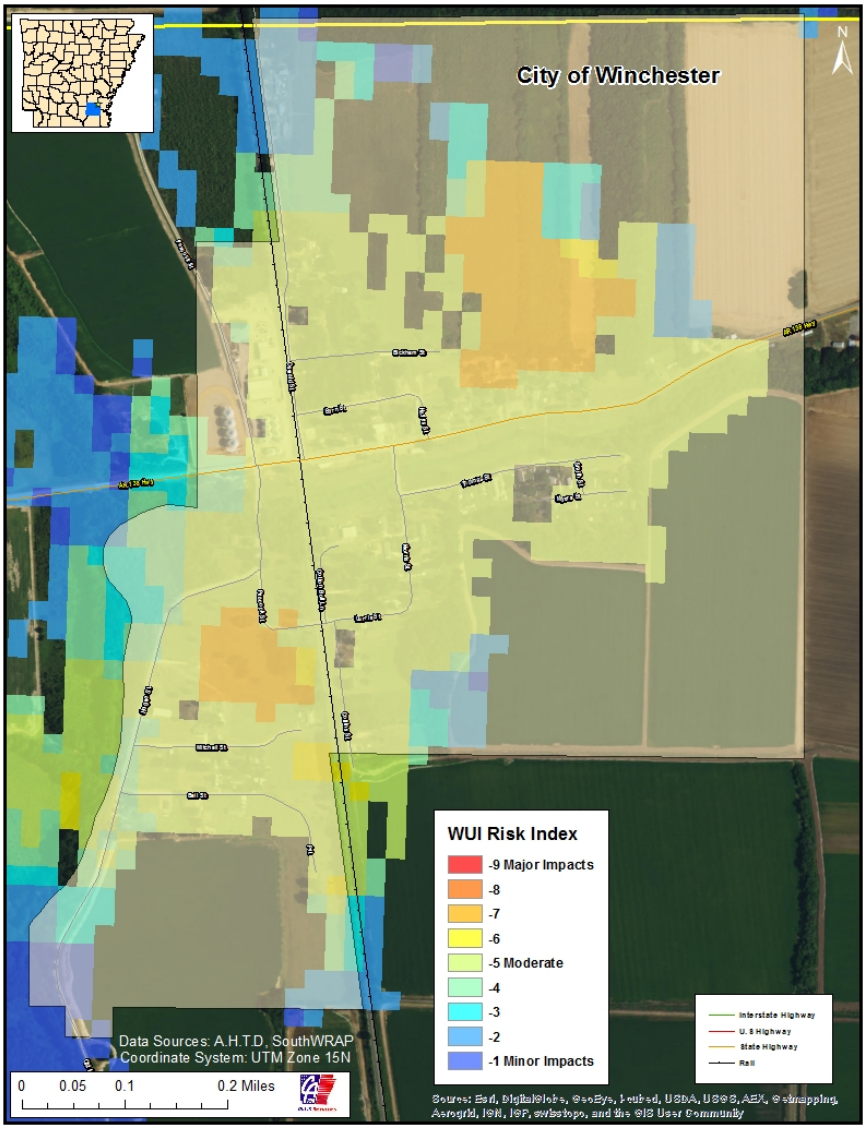




The above map for the City of Monticello is relevant for the Drew Central and Monticello School District Campuses as well as the UAM campus. They are labeled as "Schools (K-12)" and "Four Year Colleges", respectively.


City of Tillar
WUI Risk Index
-9 Major Impacts
-8
-7
-6
-5 Moderate
-4
-3
-2
-1 Minor Impacts
Data Sources: A.H.T.D, SouthWRAP
Coordinate System: UTM Zone 15N
0 0.1 0.2 0.4 Miles


The City of Wilmar
Data Sources: A.H.T.D, SouthWRAP
Coordinate System: UTM Zone 15N
WUI Risk Index
-9 Major Impacts
-8
-7
-6
-5 Moderate
-4
-3
-2
-1 Minor Impacts
0 0.125 0.25 0.5 Miles



Previous Occurrences

There have been 130 wildfire events reported between 2011 and 2015 by the Arkansas Forestry Commission.

Wildfire Summary

Years	Number	Total Acres Burned	5 Year Average # of Fires	5 Year Average # of Acres Burned
2011	33	405		
2012	35	1866		
2013	21	637		
2014	15	116		
2015	26	168		
	130	**3192**	26	638.4

Probability of Future Events

Based on previous occurrences, the planning area is likely to see 32.5 wildfire events per year of varying severities. There is an 812.5% chance a wildfire will occur in the planning area in any given year.

Impact and Vulnerability of Wildfire

For the Drew County project area, it is estimated that 17,255 people or 83 percent of the total project area population (20,758) live within the WUI. There are 9,773 Housing units in Drew County with a total value of $448,005,166 that could be affected by wildfire. There are 10 State-owned bridges and 6 critical facilities that are vulnerable to wildfire.

WUI- Population and Acres[7]

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	1,535	8.9%	72,987	59.1%
1hs/40ac to 1hs/20ac	1,448	8.4%	20,957	17.0%
1hs/20ac to 1hs/10ac	2,427	14.1%	15,305	12.4%
1hs/10ac to 1hs/5ac	2,181	12.6%	7,315	5.9%
1hs/5ac to 1hs/2ac	2,542	14.7%	3,909	3.2%
1hs/2ac to 3hs/1ac	7,122	41.3%	2,955	2.4%
GT 3hs/1ac	0	0.0%	0	0.0%
Total	**17,255**	**100.0%**	**123,426**	**100.0%**

The majority of the planning area's population (7,122) is in a density area of 1 house /2 acres to 3 houses/1 acre, meaning the majority of the planning area's population is vulnerable to wildfire.

Fire Fighters are the most vulnerable populations during wildfires. Drew County has experienced three deaths of fire fighters in one wildfire due to heat exhaustion. Other vulnerable populations are those that live in a High Intensity area (FIS), the population in the dense housing area referenced in the paragraph above, and those that reside in wood frame structures or manufactured homes, especially the elderly and children.

Location	Wood/Frame Structures	Manufactured Homes
Entire County	5,024	2,678

[7] Excerpts from the Southern Wildfire Risk Assessment Summary Report for Drew County: WUI housing density is categorized based on the standard Federal Register and U.S. Forest Service SILVIS data set categories, long considered a de facto standard for depicting WUI. However, in the SWRA WUI data the number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements for fire protection planning activities. While units of the actual data set are in *houses per sq. km*., the data is presented as the *number of houses per acre* to aid with interpretation and use by fire planners in the South.
In the past, conventional wildland urban interface data sets, such as USFS SILVIS, have been used to reflect these concerns. However, USFS SILVIS and other existing data sources do not provide the level of detail for defining population living in the wildland as needed by Southern state WUI specialists and local fire protection agencies.
The new SWRA WUI 2012 dataset is derived using advanced modeling techniques based on the SWRA Where People Live (housing density) dataset and 2012 LandScan population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The primary difference between the WPL and WUI is that populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by a wildfire. Simply put, the SWRA WUI is the SWRA WPL data with the urban core areas removed.
Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers. The following table shows the total population for each WUI area within the project area.

3.4.10 Winter Storm

Severe winter storms, which may include heavy snowfall, ice storms, winter storms, and/or strong winds, affect every state in the continental United States. Areas where such weather is uncommon, such as Arkansas, are typically disrupted more severely by severe winter storms than are regions that experience this weather more frequently.

The National Weather Service (NWS) defines **snow** as a steady fall of snow for several hours or more. **Heavy snow** is defined as either a snowfall accumulating to 4 inches in depth in 12 hours or less, or snowfall accumulation to 6 inches or more in depth in 24 hours or less. In states such as Arkansas, where lesser accumulations can cause significant impacts, lower thresholds may be used. A **blizzard** means that the following conditions prevail for a period of three hours or longer: 1) sustained wind or frequent gusts to 35 miles an hour or greater; and 2) considerable falling and/or blowing snow (i.e., reducing visibility to less than 1/4 mile). **Sleet** is defined as pellets of ice composed of frozen or mostly frozen raindrops or refrozen partially melted snowflakes. These pellets of ice usually bounce after hitting the ground or other hard surfaces. **Heavy sleet** is a relatively rare event defined as the accumulation of ice pellets covering the ground to a depth of 0.5 inch or more.

Freezing rain or **freezing drizzle** occurs when rain or drizzle freezes on surfaces such as the ground, trees, power lines, vehicles, streets, highways, etc. Small accumulations of ice can cause driving and walking difficulties while heavy accumulations produce extremely dangerous and damaging conditions. An **ice storm** is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of 0.25 inches or greater.

A combination of severe winter weather types occurring over a wide area is usually called a **winter storm**. Winter-storm formation requires below freezing temperatures, moisture, and lift to raise the moist air to form the clouds and cause precipitation. Lift is commonly provided by warm air colliding with cold air along a weather front. Various causes exist for winter storms in the United States. Winter storms in Midwestern and plains states typically develop over southeast Colorado on the lee side of the Rockies. These storms move east or northeast and use both the southward plunge of cold air from Canada and the northward flow of moisture from the Gulf of Mexico to produce ice, snow, and sometimes blizzard conditions. These fronts may push deep into the interior regions, sometimes as far south as Florida.

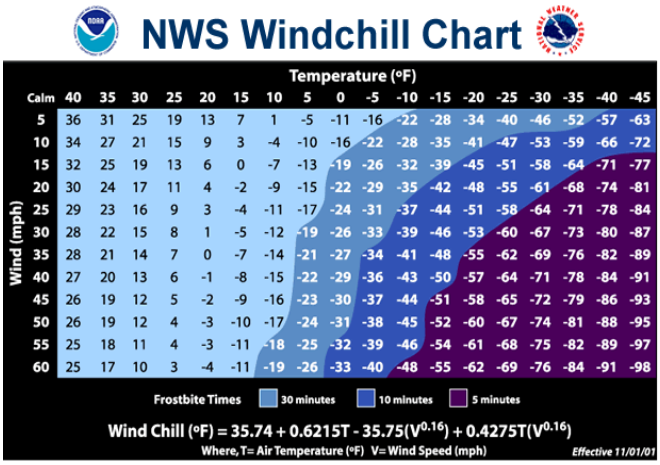
Location

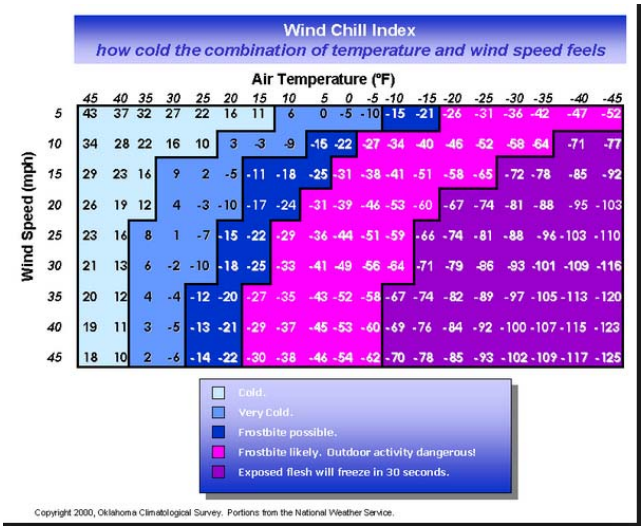
All areas of Drew County are equally susceptible to severe winter storm events.

Extent

According to National Climatic Data Center (NCDC) and National Weather Service Data, typical snow accumulations in Drew County during heavy snow and winter storm events ranges from 1 inch to 8 inches. Typical ice storm accumulations range from 1/10 of one inch to 1 and 1/2 of inches. When severe winter storm events do occur (the worse typically associated with ice), they are usually wide-spread over the area and impede the movement of vehicles – limiting regular movement of traffic, causing accidents and limiting responsiveness of emergency services – and can down power and communications lines and seriously damage some structures, thus creating potentially critical conditions for the entire area.

Students may be kept inside by the determination of the building principals if there are extreme cold temperatures. Wind chill would be the determining factor in keeping students inside. Some districts initiate monitoring for wind chill is below 32 degrees, some 40 degrees.





Previous Occurrences

There have been 33 countywide winter storm events between 2000 and 2016. There were 3 Ice Storm events between 2000 and 2016.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	55.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	01/27/2000	15:00	CST	Winter Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/13/2000	04:00	CST	Winter Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/26/2000	00:00	CST	Ice Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/28/2000	05:00	CST	Ice Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/05/2002	13:00	CST	Winter Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/25/2003	02:16	CST	Winter Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/26/2003	03:14	CST	Ice Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	04/07/2007	07:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	04/08/2007	06:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	01/25/2008	10:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	03/07/2008	09:00	CST-6	Winter Storm		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	04/15/2008	05:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/16/2008	02:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/23/2008	04:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/28/2009	18:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	04/07/2009	06:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	01/29/2010	05:00	CST-6	Winter Weather		0	0	5.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/11/2010	16:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	01/09/2011	11:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/04/2011	02:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/09/2011	10:00	CST-6	Heavy Snow		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/13/2012	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/25/2012	20:30	CST-6	Winter Weather		0	0	50.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	01/14/2013	10:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	01/15/2013	09:30	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/06/2013	12:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/07/2013	19:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/09/2013	18:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	12/09/2013	18:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/07/2014	18:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/10/2014	19:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/11/2014	17:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	03/03/2014	04:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	02/16/2015	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	03/04/2015	23:00	CST-6	Winter Weather		0	0	0.00K	0.00K
DREW (ZONE)	DREW (ZONE)	AR	01/22/2016	02:00	CST-6	Winter Weather		0	0	0.00K	0.00K
Totals:								0	0	55.00K	0.00K

In 1994 an ice storm caused a power outage in the Town of Jerome for over a week.

Probability of Future Events

Based on previous occurrences, the planning area is likely to see 2.25 winter storm events per year of varying severities. There is 14.06% chance a winter storm event will occur in the planning area in any given year.

Impact and Vulnerability

The occurrence of severe winter weather has a substantial impact on communities, utilities, transportation systems, and agriculture, and often results in loss of life due to accidents or hypothermia. Severe winter weather hazards include snowstorms, ice storms, storms with strong winds, and extreme cold. Heavy snow from a snowstorm can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns.

Heavy accumulations of ice or snow commonly result in collapse of structural damage to buildings. The damage may be caused directly by the excessive weight of the ice/snow accumulation, or by ice-laden trees or branches falling on structures. Homes, business, as well as weaker nonresidential structures commonly sustain structural damage. Poultry houses in Arkansas are particularly at risk. Additional agricultural revenues are lost because of the time it takes to rebuild the poultry houses.

Heavy accumulations of ice from ice storms or heavy snow can also bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the damage. Arcing power lines can cause power surges with can damage electrical components and equipment that are plugged in. Power and communications disruptions are common consequences of ice storms and heavy snow. The monetary values of power and communications losses to businesses are significant but difficult to estimate.

Accumulations of ice and snow may also cause extreme hazards to motorists. Motorists in Drew County are generally unaccustomed to driving on slick roads resulting in an increase in traffic accidents, some of which may result in fatalities. Travel is hampered by ice or heavy snow because the state lacks sufficient snow removal equipment and road treatments (sand, salt) because of the infrequent occurrence of severe winter weather events. The cost of the numerous traffic accidents, as well as the cost of business and school closings that occur due to hazardous travel conditions, are difficult to estimate.

Winter storms are sometimes accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines.

The elderly are at increased risk for hypothermia because the skin thins with age. Accidents involving gas heaters and fires for warmth could also occur when not properly supervised, or ventilation is poor when used indoors.

SECTION 4- Mitigation Strategy

The Drew County Hazard Mitigation plan includes a mitigation strategy that provides the Drew County'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 by funding through county, city and school district taxes, yearly budgets and passing ordinances.

The following capabilities describe what the County, Cities, School Districts and University may or may not have to implement and maintain mitigation efforts, are addressed in the existing authorities, policies, programs and resources available to accomplish hazard mitigation;

The cities of Jerome, Monticello, Tillar, Wilmar and Winchester each are different in terms of staffing, funding, policies and program giving them the ability to carry out their local hazard mitigation goals. 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 flood prone and other hazard areas through land use planning implement retrofit construction plans, brace equipment, and provide emergency preparedness information to area residents through FEMA brochures.

All participating jurisdictions would be dependent upon grant funding to assist with larger mitigation projects, such as safe rooms and heavy duty generators to back up and maintain electrical power for critical facilities. The Cities would need assistance in financing drought communication and early warning systems, heating and cooling centers.

There are five incorporated municipalities in Drew County in addition to Drew County government. Communities range in size. Jerome, Tillar, Wilmar, and Winchester all have populations less than 1,000, and therefore have less capacity and resources to reduce losses in the future when compared to Monticello and unincorporated Drew County. Each of the School Districts and Universities follow their respective jurisdiction's policies and programs. These education institutions also have varying resources to implement mitigation activities. It is likely grant funds may be needed to help all jurisdictions implement identified mitigation projects.

4.1 Mitigation Goals and Objectives

Based upon the results of the local and State risk assessments, the Drew 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 Drew 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 Drew County due to natural disasters.

Objective 1.1	Identify, describe, and characterize the natural hazards to which Drew County is susceptible
Objective 1.2	Assess the risk of each hazard including probability and frequency, exposure, and consequences
Objective 1.3	Examine feasible mitigation opportunities appropriate for the identified hazards and prioritize those opportunities.
Objective 1.4	Implement mitigation actions to reduce loss of lives and property
Objective 1.5	Identify mitigation opportunities for long-range planning consideration
Objective 1.6	Encourage members of the Drew County Local Emergency Planning Committee (LEPC) and other stakeholders to include mitigation measures in emergency planning efforts
Objective 1.7	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.

Objective 2.1 Hold regular LEPC meetings to discuss mitigation actions with city officials, County emergency office, and private sectors

Objective 2.2 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.

Objective 3.1 Update Hazard Mitigation plan every 5 years

Objective 3.2 Inquire grant information from Arkansas Department of Emergency Management, and Planning and Development District

Goal 4- Protect existing properties from natural disasters.

Object 4.1 Protect existing structures from natural hazards using cost-effective approaches

4.2 Implementation of Mitigation Actions

The mitigation actions are prioritized based upon their effect on the overall risk to life and property. Ease of implementation, community and agency support and ease of obtaining 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 and Environmental. Prioritization can therefore be made taking each of these categories into account, so that nothing is overlooked when considering which actions may be best for each jurisdiction to consider.

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 persons. 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, Arkansas Forestry Service, Arkansas Natural Resources Commission and. 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 pressures 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 Drew County Office of Emergency Management (DCOEM) will be responsible for evaluating actions among competing actions. The HMPT prioritized the list of mitigation actions by conducting a cost-benefit review. This review was conducted by; first considering the number of people who would be affected by a chosen project, determining the area the project would cover, considering how critical the structures were within in the project area, and which structure were most critical, and finally how would it benefit the entire community. The DCOEM 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.*

Unless otherwise stated in the Mitigation Actions/Projects Table in Section 4.4, all Drew County actions are the responsibility of the director of Drew County Office of Emergency Management, the County Judge and the Drew County Quorum Court. The Cities of Jerome, Monticello, Tillar, Wilmar and Winchester actions are the responsibility of their Mayors and City Councils. The actions for the School Districts of Drew Central and Monticello will be the responsibility of their Board Administration and Superintendents. And the actions for the University of Arkansas at Monticello will be the responsibility of the Chancellor and the Board of Visitors.

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 also, includes funding and support for enacting and enforcing building codes and zoning ordinances, and developing public education programs to alert residents to risks and how they can reduce hazard losses. Plans will be made to earmark resources for implementing these actions.

Drew County, the Cities of Jerome, Monticello, Tillar, Wilmar and Winchester, the Drew Central School District, the Monticello School District, and the University of Arkansas at Monticello all participated in the planning process and each has least two actions that will benefit their entities.

For the purpose of developing the Drew County Hazard Mitigation Plan, mitigation actions are categorized into five types;

- Local plans and regulations
- Structure and infrastructure projects
- Natural systems protection
- Education and awareness programs
- Other (may lend more toward preparedness, recovery or response capabilities)

All of the following Mitigation Actions meets all criteria for STAPLEE.

4.3 Previous Mitigation Actions

Below is a summary of progress of the mitigation actions determined in the 2008 Drew County Mitigation Plan. Those not completed were deferred due to lack of resources. The "Update Status" is as follows:
C=Completed
PC= Partially Complete; some action is still a need, and was partially deferred due to lack of resources
NLR= No Longer Relevant
D= Deferred

Action	Hazard	Priority Level	Projected Timeline	Responsible Jurisdiction	Update Status
Asses the adequacy of the city's emergency early warning systems & seek grant funding for changes/additions needed	tornado, high wind, severe storm, severe winter storm, flood, landslide, dam/levee failure, earthquake, wildfire	High	Assess by 2008 (Wilmar 2009)	Monticello, Tillar, Jerome, Winchester, Wilmar	C
Distribute copies of FEMA's ***Are you Ready? An In-Depth Guide to Citizen Preparedness*** **to residents through local County Office of Emergency Services**	Severe storms, tornadoes, high winds, severe winter storms, wildfire, flood, extreme heat, dam failure, earthquake	High	2008	Drew County	D
Distribute FEMA Information through County Office of Emergency Services and local insurance companies on the importance of tree pruning by homeowners, businesses and local governments as actions they can take as a deterrent to windblown debris during **severe storms, tornados,** and **high winds** to lessen damage from ice-laden vegetation during **winter storms**, and to reduce fuel for **wildfire**. Pruning near new and existing buildings will lessen damage from these events.	Severe Storms, tornados, high winds, severe winter storms, wildfire	High	Est. Completion Date 2008	Drew County, Monticello, Winchester, Tillar, Jerome	D
Ensure accessibility to vital services by acquiring emergency power supply for any critical facility which lacks same	tornado, high wind, severe storm, severe winter storm, flood, landslide, dam/levee failure, earthquake, wildfire	High	2008	Wilmar	D
Extend or enlarge drainage ditches to prevent **flooding** at (specified locations)	Flood	High	2010	Wilmar	D
Seek funding to construct safe rooms on all district campuses	Tornado, High Wind, Severe Storm	High	2011	Monticello School District	D
Seek funding to install Early Warning System on campus or in City	Tornado, high wind, severe storm, flood, wildfire, dam failure, earthquake	High	2011; 2010	Drew Central School District, University of Arkansas Monticello	C
Promote the use of **drought** resistant landscape plants by local governments as a water conservation measure	Drought	Low	2008	Wilmar	D

Action	Hazard	Priority Level	Projected Timeline	Responsible Jurisdiction	Update Status
Seek funding to construct safe rooms on UAM campus	Tornado, High Wind, Severe Storm	Low	2012	University of Arkansas Monticello	D
Seek funding to purchase emergency medical supplies and train all staff to use	Tornado, High Wind, Severe Storm, Flood, Wildfire, Earthquake	Low	2009	Monticello School District	D
Establish burn restrictions and water conversation measures to be enacted for localized **drought** conditions	Drought	Medium	2007	Wilmar	D
Open cooling centers for vulnerable populations (elderly, those without air conditioning) during periods of **extreme heat** & publicize locations at the County Courthouse, City Halls and public libraries	Extreme Heat	Medium	2008	Wilmar	D
Promote awareness among students about hazard mitigation issues	Tornado, High Wind, Severe Storm, Flood, Severe Winter Storm, Wildfire, Extreme Heat, Earthquake	Medium	2010	Drew Central School District	D
Seek funding to acquire portable generators for all campuses to maintain communication in event of outage	Tornado, High Wind, Severe Storm, Severe Winter Storm	Medium	2010	Monticello School District	D
Seek funding to acquire portable generators for all critical facilities to keep all emergency services online	Tornado, High Wind, Severe Storm, Severe Winter Storm	Medium	2011	University of Arkansas Monticello	PC
Seek grant funding to mitigate drainage at locations which repetitively experience flash **floods**	Flood	Medium	2010	Wilmar	D

Additional Mitigation Projects Completed:

- The City of Monticello has completed some drainage improvements
- The City of Monticello currently has a Hydrology and Hydraulic Study for Flood-Prone Areas underway

4.4 Mitigation Actions/Projects

Actions from the 2008 plan that were deferred, and that the HMPT would still like to accomplish will be repeated on the table below, and are indicated in *italics*.

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
D-01	Develop and implement a County-Wide drought communication plan to facilitate timely communication of relevant information to officials, decision makers, school administration, emergency managers and the general public	Drought	Local Plans and Regulations	Medium	Non-Applicable	2016-2022	Staff Time of HMPT	Quorum Court, City Councils, DCOEM, School Boards, UAM Board and State Partners	All plan participants
D-02	Develop new or upgrade existing water delivery systems to eliminate breaks and leaks allowing for water conservation	Drought	Structure and Infrastructure Projects	High	Non-Applicable	2016-2022	City and County Government, Water Suppliers, USDA or other grant funding	Monticello Water Department, Montrose Water Department, Murry Water, Wilmar Waterworks, Winchester Water Department	All participating cities
D-03	Adopt ordinances that incorporate drought tolerant or xeriscape practices to reduce dependence on irrigation	Drought	Natural Systems Protection	Low	New and Existing	2016-2022	Existing city personnel	City Councils	All participating cities
D-04	Educate citizens on water saving techniques such as installing low-flow water saving showerheads and toilets, running dishwashers and washing machines only when they are full and checking for leaks in plumbing and dripping faucets for water conservation	Drought	Education and Awareness Programs	Low	Non-Applicable	2016-2022	County, Cities, and local water suppliers; State Technical Assistance, FEMA resources	City Councils	Drew County and all participating cities

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
D-05	Educate farmers on soil and water conservation practices that foster soil health and improve soil quality to help increase resiliency and mitigate the impacts of droughts, such as practicing contour farming by farming along contour lines to slow water runoff during rainstorms and prevent soil erosion, allowing the water time to absorb into the soil.	Drought	Education and Awareness Programs	Low	Non-Applicable	2016-2022	USDA, County and Co-operative Extension Offices	DCOEM, HMPT	Drew County
D-06	Install low-flow water pressure regulators and valves in schools and other public buildings for water conservation	Drought	Structure and Infrastructure Projects	Medium	New and Existing	2016-2022	City and County Government, Schools	County, City, School and UAM Maintenance Personnel	All plan participants
D-07	Install rain collection systems to use for landscaping for water conservation	Drought	Structure and Infrastructure Projects	Low	Non-Applicable	2016-2022	School and University Staff and Budget, Grant Resources	School Boards and UAM Board of Visitors	Both School Districts and University
D-08	Develop and implement a plan to determine future drought mitigation action items such as water rationing and aquifer replenishment	Drought	Local Plans and Regulations	Medium	Non-Applicable	2016-2022	Staff Time of HMPT	HMPT	All plan participants
DF-01	Conduct inspections, maintenance and enforcement programs on dams to ensure structural integrity (NFIP consideration; CRS 330 Outreach, CRS 350 Flood Protection Information)	Dam Failure	Local Plans and Regulations	High	New and Existing	2016-2022	Existing County and local resources	Drew County Quorum Court, DCOEM, Monticello City Council and State partners	Drew County and City of Monticello
DF-02	Adopt Ordinances that limit development in areas that could be affected by flooding caused by a dam failure.	Dam Failure	Local Plans and Regulations	High	New and Existing	2016-2022	County and City of Monticello Staff Time, State Technical Assistance	Quorum Court, Monticello City Council, DCOEM and State Partners	County and the City of Monticello
DF-03	Implement regulations that limit road access over Lake Monticello Dam to prevent compaction, which could result in structural integrity loss	Dam Failure	Local Plans and Regulations	Medium	New and Existing	2016-2022	Drew County and City of Monticello Staff Time, State Technical Assistance	City of Monticello	City of Monticello

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
DF-04	To correct data deficiency, develop an Emergency Action Plan, or conduct a flood inundation study of Seven Devils Swamp Dam	Dam Failure	Local Plans and Regulations	Low	New and Existing	2016-2022	Drew County Staff Time, State Technical Assistance, Professional Engineer	Drew County	Drew County
E-02	Develop and implement an outreach program to encourage homeowners to secure furnishings and utilities to prevent injuries and damage during an earthquake	Earthquake	Education and Awareness Programs	Medium	New and Existing	2016-2022	County, City, School and UAM Staff, FEMA and State Resources/Technical Assistance	DCOEM, HMPT	All plan participants
E-03	Conduct seismic retrofitting for critical public facilities most at risk to earthquakes	Earthquake	Structure and Infrastructure Projects	Low	Existing	2016-2022	County, City, School and UAM operating budgets, FEMA Grant Resources	Quorum Court, City Councils and School Boards for Each Jurisdiction	All plan participants
F-01	Acquire and demolish, elevate, relocate or flood proof flood-prone structures	Flood	Structure and Infrastructure Projects	High	New and Existing	2016-2022	County and City operating budgets, property owner funds and FEMA Grant Resources	DCOEM, Property Owners, City Councils	County and all participating cities
F-02	Upgrade drainage structures such as culverts, detention ponds, drains and bridges for increased water capacity allowing for flood prevention	Flood	Structure and Infrastructure Projects	High	New and Existing	2016-2022	Existing County and City resources; Grant funding	Quorum Court and City Councils for each participating jurisdiction	County and all participating cities
F-03	Conduct county-wide NFIP workshops for newly elected officials and the public	Flood	Education and Awareness Programs	Low	New and Existing	2016-2022	Existing County and City resources, State and Federal Resources/Technical Assistance	DCOEM and City Floodplain Managers	County and cities of Monticello, Tillar, Wilmar and Winchester
F-04	Join the National Flood Insurance Program (NFIP) and adopt a local floodplain ordinance	Flood	Local Plans and Regulations	High	New and Existing	2017	City of Jerome Staff Time and State Technical Assistance	Jerome City Council	City of Jerome
F-05	Make flood mitigation drainage improvements especially at Wills & S. Main, N. Gabbert St, Western Pines Park Bridge, Godfrey Ditch, Hwy 278, Hwy 425, and Market Street Apartments	Flood	Structure and Infrastructure Projects	High	New and Existing	2016-2022	City Funds and FEMA Grants	City of Monticello Floodplain Manager and DCOEM	City of Monticello and Drew County

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
F-06	Obtain FEMA Risk MAP data once available for Bayou Bartholomew and incorporate into plan update	Flood	Local Plans and Regulations	High	Non-Applicable	2016-2022	FEMA and HMPT Staff Time	HMPT	Drew County
F-07	Install larger drainage structure at Florence Road	Flood	Structure and Infrastructure Projects	High	New and Existing	2016-2017	County Funds and Grants from ADEM or FEMA	DCOEM	Drew County
F-08	Obtain information via HAZUS or a flood study to correct flood data deficiency	Flood	Other	High	Non-Applicable	2016-2022	FEMA, CAPDD, County, City, School and UAM Operating Budgets	HMPT	All plan participants
F-09	Participate in the Community Rating System (CRS), which rewards communities that exceed the minimum NFIP requirements	Flood	Local Plans and Regulations	Low	New and Existing	2016-2022	Existing local and county government resources; State Technical Assistance	Quorum Court and City Councils for each NFIP and Mitigation Plan participating jurisdiction	County and all Cities of Monticello, Tillar, Wilmar and Winchester
F-10	Develop an open space acquisition, reuse, and preservation plan targeting flood hazard areas	Flood	Local Plans and Regulations	Low	New and Existing	2016-2022	Existing local and county government resources; State Technical Assistance	Quorum Court and City Councils for each participating jurisdiction	County and all participating cities
MH-01	Purchase heavy-duty **generators** to back up and maintain electrical power for critical facilities, schools, shelters and nursing homes to maintain power and water supply during disasters.	ALL HAZARDS: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunder Storm, Tornado, Wildfire, Winter Storm	Structure and Infrastructure Projects	High	New and Existing	2016-2022	Existing County, local, and schools resources and possible grant funds	Quorum Court, City Councils and School Boards for each jurisdictions, and UAM Board of Visitors	All plan participants
MH-02	Purchase all-hazard NOAA weather radios in all schools, city halls, churches, assisted living facilities, hospitals, nursing homes, day care facilities, businesses, industries, or other locations where large numbers of people congregate; provide information to public on importance of having and how to acquire	ALL HAZARDS: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunder Storm, Tornado, Wildfire, Winter Storm	Education and Awareness Programs	High	Non-Applicable	2016-2022	Public funds, private funds and grant funds	HMPT	All plan participants

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
MH-03	Provide mitigation information and resources for extreme weather conditions through an active education and outreach program with specific plans and procedures for at risk populations	ALL HAZARDS: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunder Storm, Tornado, Wildfire, Winter Storm	Education and Awareness Programs	Low	Non-Applicable	2016-2022	Existing FEMA literature; HMPT Staff Time	DCOEM and Cities	County and all participating cities
MH-04	Implement Code RED Weather Warning early telephone warning system designed to automatically deliver targeted weather notifications for the immediate threats of severe weather warnings and flash flood warnings within moments of being issued by the National Weather Service throughout the County	Dam Failure, Flood, Thunderstorm, Tornado and Winter Storm	Education and Awareness Programs	Medium	Non-Applicable	2016-2022	Existing County Resources	Drew County	All plan participants
MH-05	Pass an Ordinance that establishes burn restrictions and water conservation measures when conditions are favorable for drought	Drought, Wildfire	Local Plans and Regulations	Low	New and Existing	2016-2022	Existing County and City resources	County Quorum Court and City Councils of each participating city	County and all participating cities
MH-06	Brace equipment (such as mechanical equipment, chillers and emergency generators) whose failure might disrupt the operation of a critical facility (including hospitals and schools)	Earthquake, Flood, Tornado, Thunderstorm	Structure and Infrastructure Projects	High	New and Existing	2016-2022	Existing County, State and local resources, Potential State and Federal Grants	Quorum Court, City Councils, School Boards for each participating jurisdiction, and UAM Board of Visitors	All plan participants
MH-07	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	Earthquake, Thunder Storm, Tornado, Winter Storm	Structure and Infrastructure Projects	Medium	New and Existing	2016-2022	Public funds, private funds and grant funds	Utility companies serving Drew County	All plan participants

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
MH-08	Apply window film to windows in public schools and public buildings to prevent shattering	Earthquake, Thunderstorm and Tornado	Structure and Infrastructure Projects	Medium	New and Existing	2016-2022	Existing County, State, local and grant resources; Building maintenance staff of Drew Central and Monticello Schools, UAM, each City and Drew County	Quorum Court, City Councils and School and University Boards for each jurisdiction; Building maintenance staff for each plan participant	All plan participants
MH-09	Provide education about the use of clips and anchors in new construction and retrofitting existing structures	Earthquake, Tornado	Education and Awareness Programs	Low	New	2016-2022	City and County Personnel, State and FEMA education materials	HMPT less schools and UAM	County and all participating cities
MH-10	Establish heating and cooling centers to protect exceptionally vulnerable populations from the impacts of Extreme Heat and Winter Storm events through identifying specific at risk populations in the event of long-term power outages	Extreme Heat, Winter Storm	Structure and Infrastructure Projects	High	Existing	2016-2022	Existing County, local resources, school locations and possible grant funds	HMPT	All plan participants
MH-11	Create a database within each fire district to track those individuals at high risk of death, such as small children elderly, shut-ins, homeless, and those requiring medical attention or medical equipment that require transportation to heating or cooling centers	Extreme Heat, Winter Storm	Education and Awareness Programs	High	Non-Applicable	2016-2022	Existing City and fire departments funding	DCOEM and Fire Departments	County and all participating cities
MH-12	Construct safe rooms within new and existing public buildings, such as schools, libraries, and community centers	Thunderstorm, Tornado	Structure and Infrastructure Projects	High	New and Existing	2016-2022	Existing County, local, and schools resources and FEMA Grant Funds	Quorum Court, City Councils, School Boards and UAM Board of Visitors for all plan participants	All plan participants
MH-13	Educate the public on the benefits of installing a safe room/shelter at residences	Thunderstorm, Tornado	Education and Awareness Programs	Low	New and Existing	2016-2022	Existing County, local, state and Federal resources	Quorum Court and City Councils for each participating jurisdiction	County and all participating cities

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
MH-14	Install surge protection devices on all communications infrastructure and critical facilities to prevent equipment damage and damage to electrical systems and components	Thunderstorm, Tornado, Winter Storm	Structure and Infrastructure Projects	High	New and Existing	2016-2022	Existing County, City, School and University resources; grant funding	Quorum Court, City Councils, School Boards for each jurisdiction and UAM Board of Visitors	All plan participants
MH-15	*Seek funding to purchase emergency medical supplies and train staff to use*	*ALL HAZARDS: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunder Storm, Tornado, Wildfire, Winter Storm*	*Other*	*Medium*	*Non-Applicable*	*2016-2022*	*Existing local, state and federal resources*	*Quorum Court, City Councils and School Boards for each jurisdiction*	*All plan participants*
MH-16	Implement a public awareness program to regularly trim trees, especially those near power lines and buildings	Thunderstorm, Wildfire and Winter Storm	Education and Awareness Programs	Low	New and Existing	2016-2022	County and City Personnel, Electricity providers	Quorum Court and City Councils for each participating jurisdiction	County and all participating cities
MH-17	Keep trees that are on public or school property regularly trimmed, especially those near power lines and buildings	Thunderstorm, Tornado, Wildfire and Winter Storm	Natural Systems Protection	Low	New and Existing	2016-2022	County, City, School and UAM Personnel, Electricity providers	Quorum Court, City Councils, School Boards for each jurisdiction and UAM Board of Visitors	All plan participants
MH-18	Develop a mass emergency coordination plan to prepare for refugees from other parts of the country should a catastrophic disaster occur	ALL HAZARDS: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunder Storm, Tornado, Wildfire, Winter Storm	Other	Low	Non-Applicable	2016-2022	HMPT Staff Time	DCOEM	Drew County

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
MH-19	Implement mitigation construction techniques for construction of new school and public facilities including the use of anchors and clips	Earthquake, Tornado	Structure and Infrastructure Projects	Medium	New	2016-2022	County, City, School and UAM Construction Budgets; State and FEMA grants	County Quorum Court, City Councils and School Boards for each participating jurisdiction and UAM Board of Visitors	All plan participants
TS-01	Install hail resistant roofing and window coverings, shutters and laminated glass in window panes, especially at critical facilities and schools	Thunderstorm	Structure and Infrastructure Projects	Medium	New and Existing	2016-2022	Existing county, local and school resources; Possible grant funding	HMPT	All plan participants
TS-02	Install lightning protection devices and methods, such as lightning rods and grounding, on communications infrastructure and other critical facilities	Thunderstorm	Structure and Infrastructure Projects	Medium	New and Existing	2016-2022	Existing county, local and school resources or grant funding	Quorum Court, City Councils, School Boards for each jurisdiction and UAM Board of Visitors	All plan participants
WF-01	Create and adopt a land use plan to address density and quantity of development in wildfire hazard areas, emergency access management, landscaping and water supply	Wildfire	Local Plans and Regulations	Medium	New and Existing	2016-2022	County, Cities and local fire departments; State Technical Assistance	DCOEM, Fire Departments, Quorum Court, all City Councils of all Participating Cities	County and all participating cities
WF-02	Join the Arkansas Fire Wise Program	Wildfire	Local Plans and Regulations	High	New and Existing	2016-2022	County, Cities and local fire departments; State Technical Assistance	DCOEM and Fire Departments	County and all participating cities
WF-03	Implement regular controlled burns in rural areas to mitigate the spread and intensity of wildfire	Wildfire	Natural Systems Protection	High	New and Existing	2016-2022	Rural and City Fire Departments	DCOEM	Drew County and all participating cities
WF-04	Install roof coverings, sheathing, flashing, skylights, roof and attic vents, eaves, and gutters that conform to ignition-resistant construction standards in new and existing public and school buildings	Wildfire	Structure and Infrastructure Projects	Low	New	2016-2022	County, City, School District and University operating budgets; Potential grant funding	Quorum Court, City Councils, School Boards for each jurisdiction and UAM Board of Visitors	All plan participants

Action #	Action	Associated Hazard	Type	Priority	Address New or Existing Buildings	Timeline	Projected Resources	Responsible Party	Jurisdiction
WF-05	Educate homeowners and property managers about ignition-resistant construction standards for construction materials such as roof coverings, sheathing, flashing skylights, roof and attic vents, eaves and gutters	Wildfire	Education and Awareness Programs	Medium	New and Existing	2016-2022	County and City existing personnel, state technical assistance, FEMA education materials	HMPT	Drew County and all participating cities
WS-01	Add building insulation to walls and attics of public and school buildings to help maintain heat during a power outage	Winter Storm	Structure and Infrastructure Projects	Medium	New and Existing	2016-2022	County, City, School District and University operating budgets; Potential grant funding	Quorum Court, City Councils, School Boards for each jurisdiction and UAM Board of Visitors	All plan participants
WS-02	Educate homeowners and property managers about the benefits of adding insulation to walls and attics to help maintain heat during a power outage	Winter Storm	Education and Awareness Programs	Low	New and Existing	2016-2022	County and City existing personnel, state technical assistance, FEMA education materials	HMPT	Drew County and all participating cities

SECTION 5: Acronyms

ADEM	Arkansas Department of Emergency Management
ANRC	Arkansas Natural Resources Commission
CAPDD	Central Arkansas Planning and Development District
CAV	Community Assistance Visit
CFR	Code of Regulations
CRS	Community Rating System
DCOEM	Drew County Office of Emergency Management
DMA 2000	Disaster Mitigation Act of 2000
EAP	Emergency Action Plan
EF	Enhanced Fujita
EOP	Emergency Operations Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance (Grant)
FR	Final Rule
GIS	Geographic Information System
HAZUS	Hazards United States (Software Program)
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMPT	Hazard Mitigation Planning Team
IBC	Internal Building Code
ISO	International Standards Organization
LEPC	Local Emergency Planning Committee
LOMR	Letter of Map Revision
MOU	Memorandum of Understanding
NCDC	National Climatic Data Center
NFIP	National Flood Insurance Program
NIMS	National Incident Management System
NLCD	National Land Cover Dataset
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OEM	Office of Emergency Management
PA	Public Assistance (Grant)
PDM	Pre-Disaster Mitigation (Grant)
PDM	Pre-Disaster Mitigation Program
PGA	Peak Ground Acceleration
Risk MAP	Risk Mapping Assessment and Planning

SD	School District
SEAEDD	Southeast Arkansas Economic Development District
SHMO	State Hazard Mitigation Officer
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic
SWRA	Southern Wildfire Risk Assessment
UALR	University of Arkansas at Little Rock
UAM	University of Arkansas at Monticello
UCC	Uniform Construction Code
USGS	United State Geological Survey
WUI	Wildland Urban Interface

SECTION 6: Plan Adoption

Attached are approved resolutions the County, cities and school districts passed after FEMA approved the Drew County Hazard Mitigation Plan.

6.1 Resolutions

Resolution 2017-3

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of **Drew County,** Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, **Drew County** desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE **Quorum Court**, OF **Drew County,** Arkansas:

That **Drew County,** Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints the Drew County OEM to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 28 day of March, 2017.

Robert Akin, County Judge

ATTEST:

Secretary/Clerk

FILED
DATE 3/28/17
LYNA GULLEDGE
COUNTY AND PROBATE CLERK
COUNTY OF DREW
BY
TIME 11:55 AM/PM

Resolution # 2017-01

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of the **City of Jerome,** Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, the **City of Jerome** desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE **City Council**, OF THE **City of Jerome,** Arkansas:

That the **City of Jerome,** Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints the Mayor to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 21st day of March, 2017.

Glenn Reynolds
Mayor Glenn Reynolds

ATTEST:

Judy Sandlin
Secretary/Clerk

17-18

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of the **City of Monticello,** Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, the **City of Monticello** desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE **City Council**, OF THE **City of Monticello,** Arkansas:

That the **City of Monticello,** Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints Andrea Chambers to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 28th day of March, 2017.

Mayor David Anderson

ATTEST:

Secretary/Clerk

RESOLUTION # 2017 – 2

A RESOLUTION OF TILLAR, ARKANSAS Adopting the Hazard Mitigation Plan for Drew County, Arkansas.

Sponsored by

WHEREAS, certain areas of the Town of Tillar, Arkansas are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damage to people's property within the area and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA – approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts, and university;

NOW, THEREFORE, BE IS RESOLVED BY THE City Council OF THE Town of Tillar, Arkansas:

That the Town of Tillar, Arkansas hereby adopts those portion of the plan relating to and protecting its jurisdictional area against all hazards, and

Appoints Dale Ethridge to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented tot eh governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation plan.

(END OF RESOLUTION)

PASSED, APPROVED AND ADOPTED this 13 day of March, 2017.

Mayor

Town Recorder/Treasurer

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of the City of Wilmar, Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, the City of Wilmar desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE City Council, OF THE City of Wilmar, Arkansas:

That the City of Wilmar, Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints the Mayor to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 11 day of April, 2017.

Carley Jackson
Mayor Carley Jackson

ATTEST:

Amanda Orr
Secretary/Clerk

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of the **City of Winchester,** Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, the **City of Winchester** desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE **City Council**, OF THE **City of Winchester,** Arkansas:

That the **City of Winchester,** Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints the **Mayor** to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this **8th** day of **May**, 2017.

Mayor General Alexander

Mayor General Alexander

ATTEST:

Jacqueline T. Trotter Recorder-Treasurer

May 10 17 07:46a City Of Winchester 18703927900 p.2

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of the **Drew Central School District,** Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, the **Drew Central School District** desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE **School Board**, OF THE **Drew Central School District,** Arkansas:

That the **Drew Central School District,** Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints the Billy Williams to assure that the Hazard Mitigation Plan be reviewed at least annually and that ~~any~~ needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 9th day of March, 2017.

Billy Williams

Superintendent Billy Williams

ATTEST:

Secretary/Clerk

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of the **Monticello School District,** Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, the **Monticello School District** desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE **School Board**, OF THE **Monticello School District,** Arkansas:

That the **Monticello School District,** Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints the Assistant Superintendent to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 14th day of March, 2017.

Sandra Lanehart
Superintendent Sandra Lanehart

ATTEST:

Secretary/Clerk
President

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR DREW COUNTY, ARKANSAS

WHEREAS, certain areas of the **University of Arkansas at Monticello,** Arkansas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties within the area; and

WHEREAS, the **University of Arkansas at Monticello** desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA- approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Drew County, with the assistance of Central Arkansas Planning and Development District, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically the cities, school districts and university;

NOW, THEREFORE, BE IT RESOLVED BY THE **Board of Visitors**, OF THE **University of Arkansas at Monticello,** Arkansas:

That the **University of Arkansas at Monticello,** Arkansas hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, and

Appoints the **University Chief of Police** to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 14th day of March, 2017.

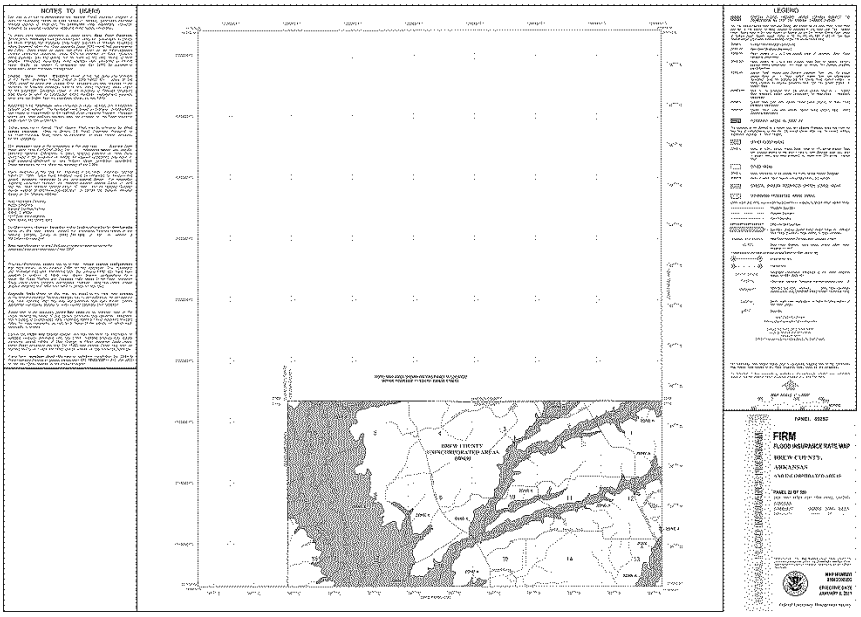
Chancellor Karla Hughes

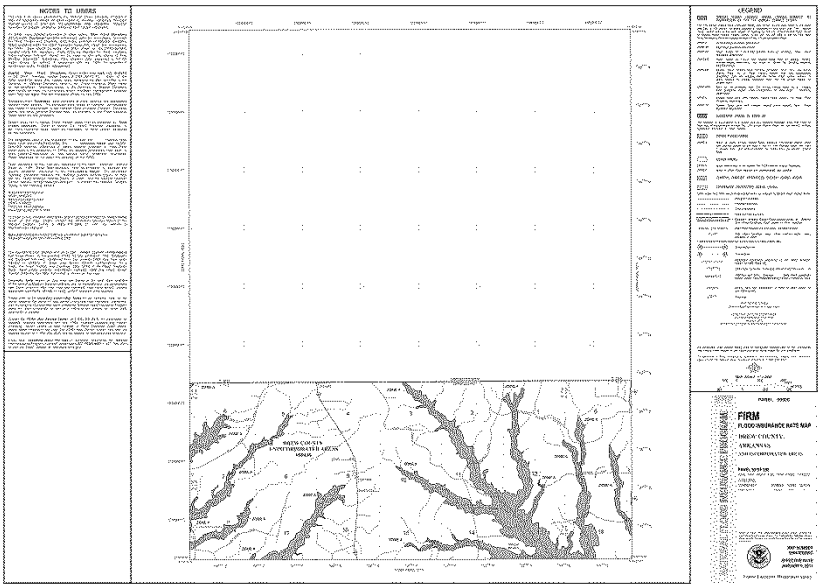
ATTEST:

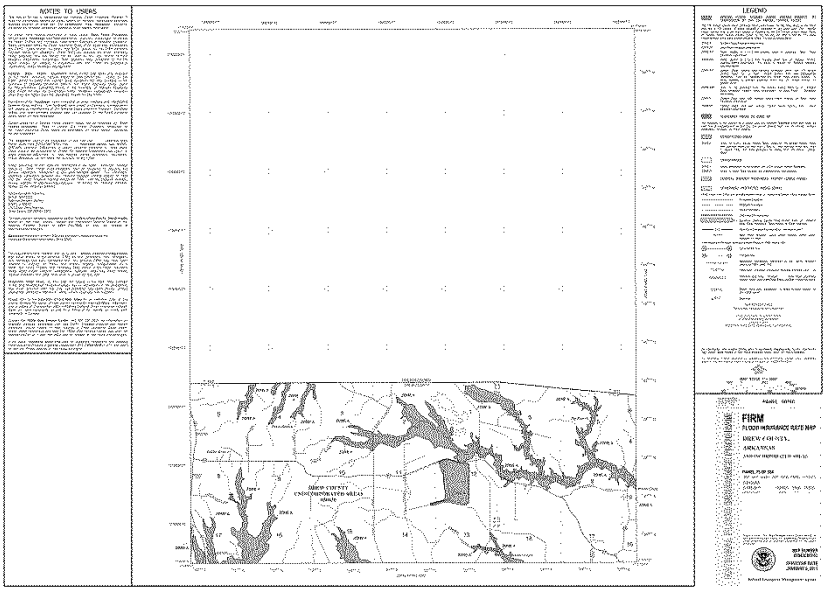
Assistant to the Chancellor/Keeper of Records

SECTION 7: Appendix

Appendix A FIRM Panels Effective January 6, 2011



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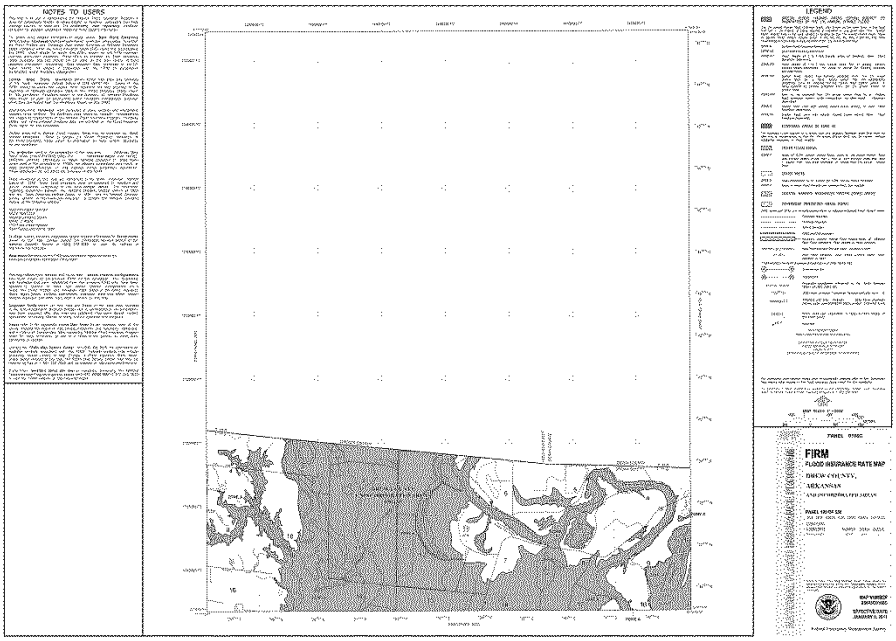
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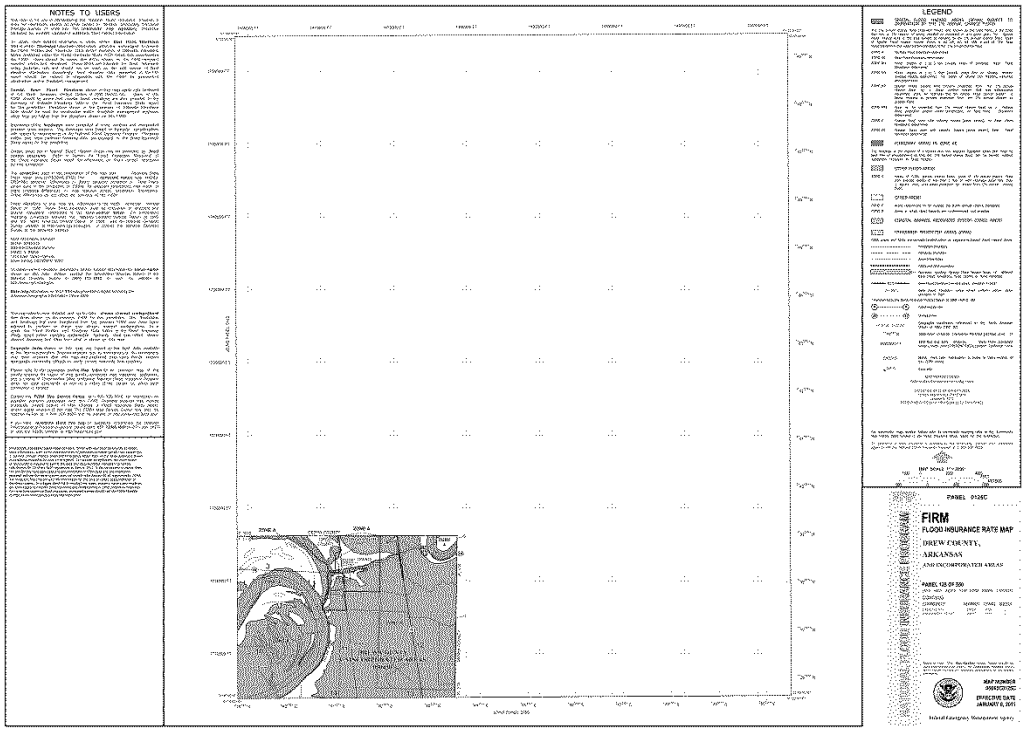
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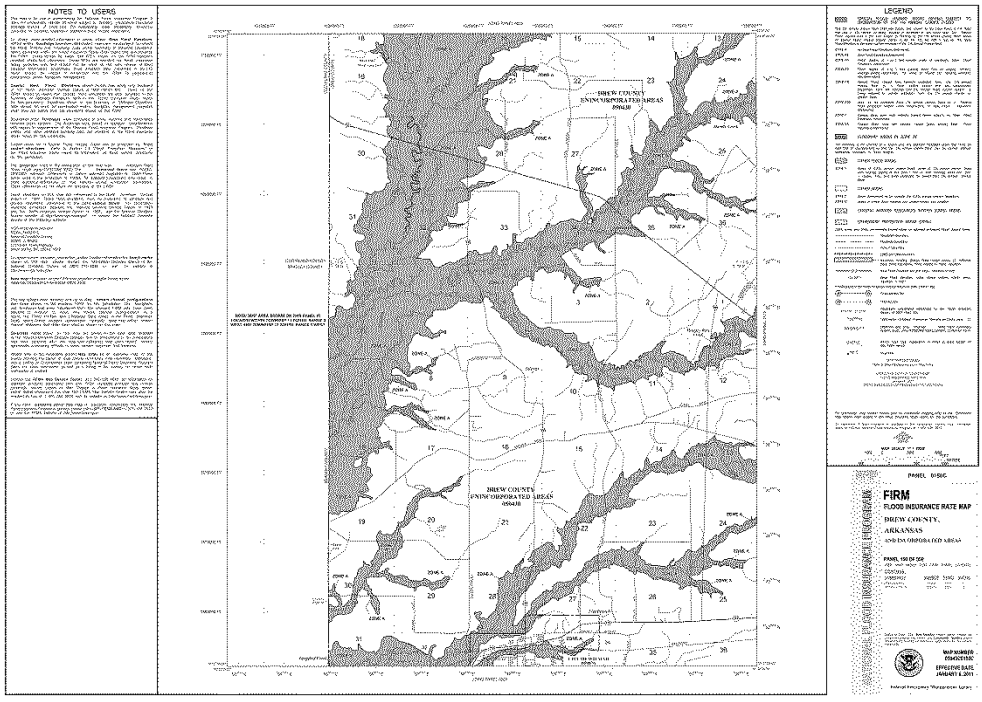
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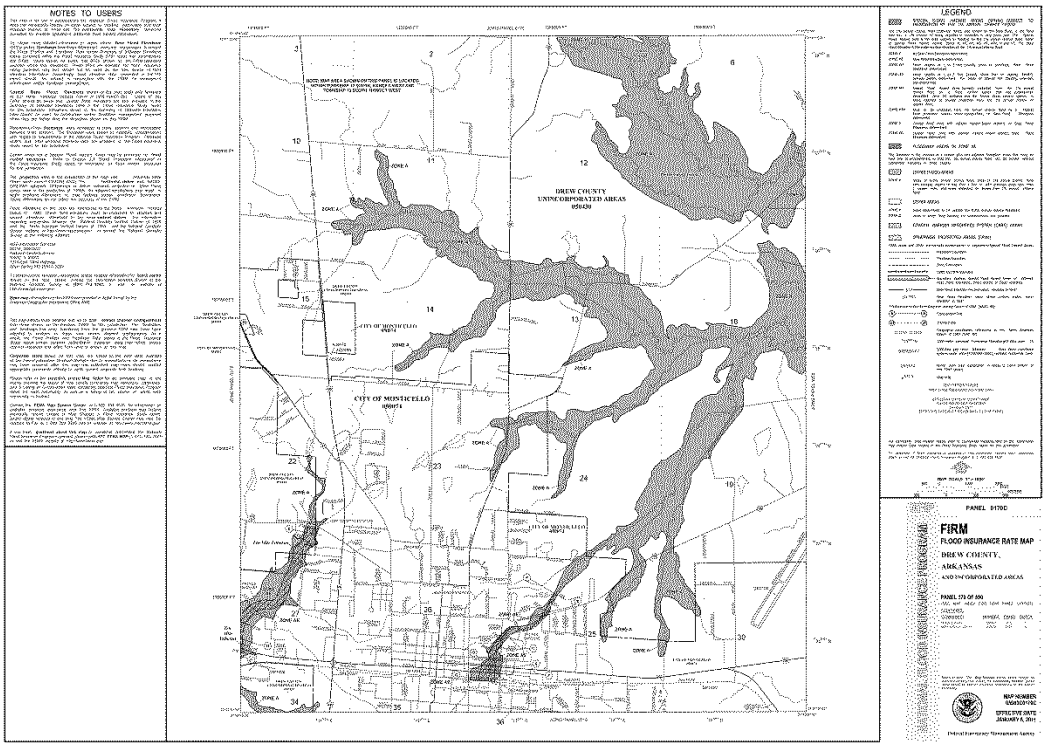
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ARKANSAS
AND INCORPORATED AREAS
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MAP NUMBER
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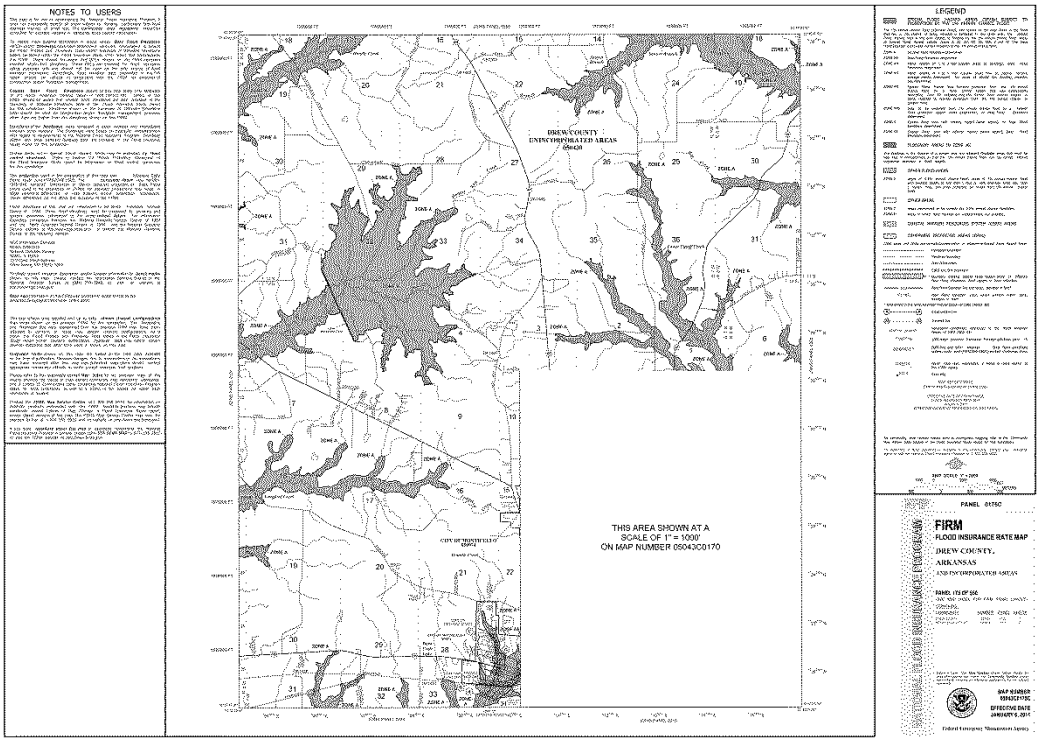
EFFECTIVE DATE
JANUARY 6, 2011
Federal Emergency Management Agency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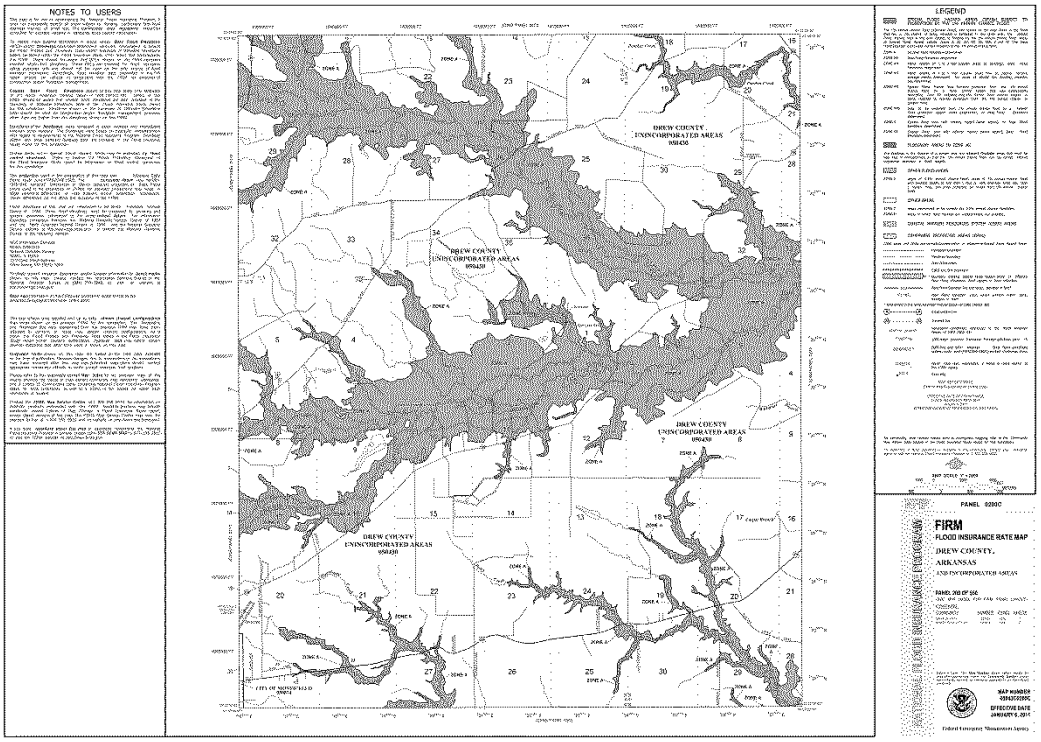
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CITY OF MONTICELLO
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ARKANSAS
AND INCORPORATED AREAS
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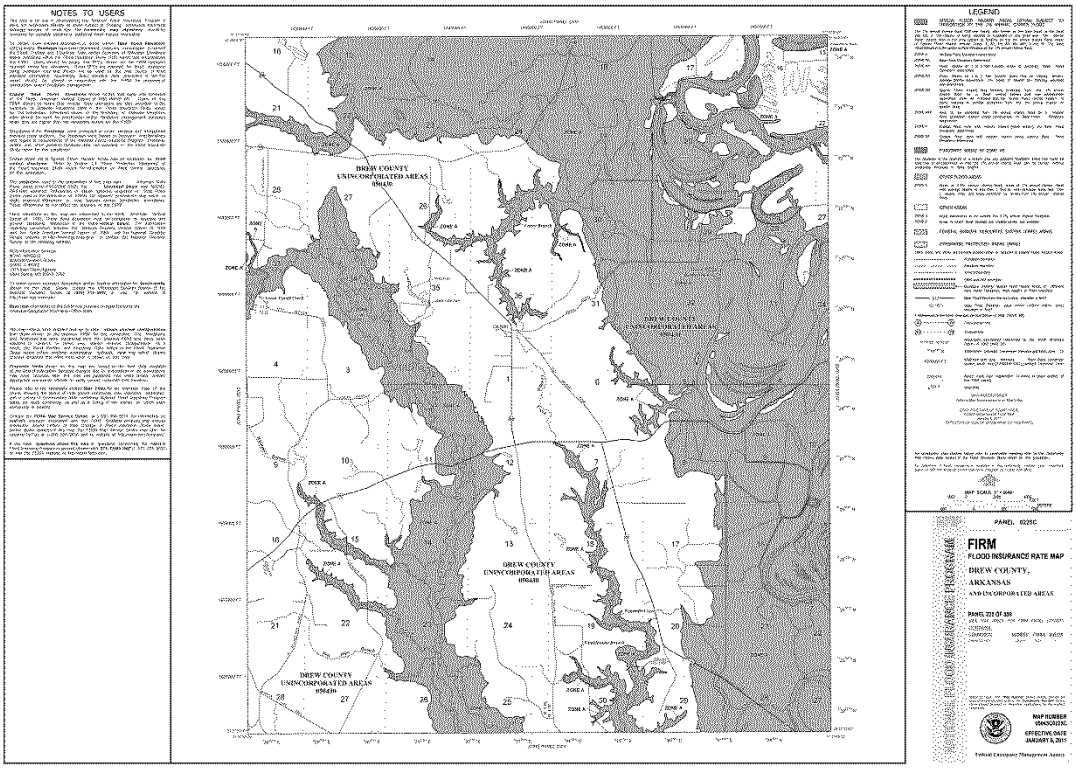
Federal Emergency Management Agency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AND INCORPORATED AREAS
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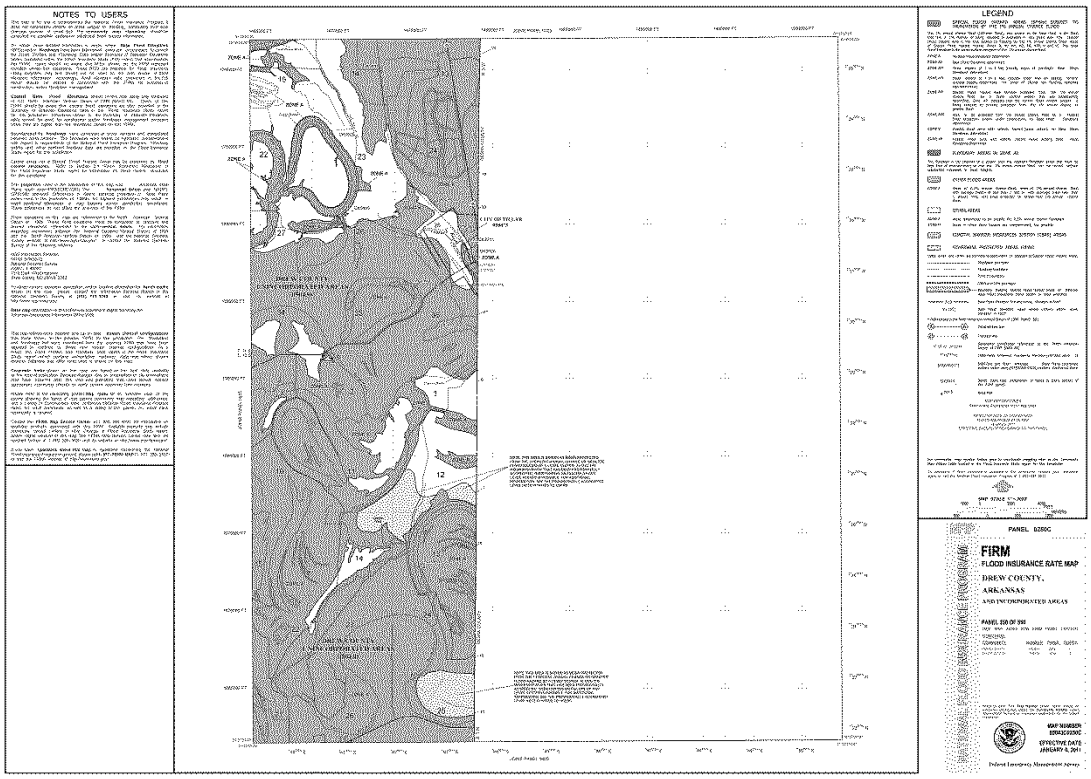
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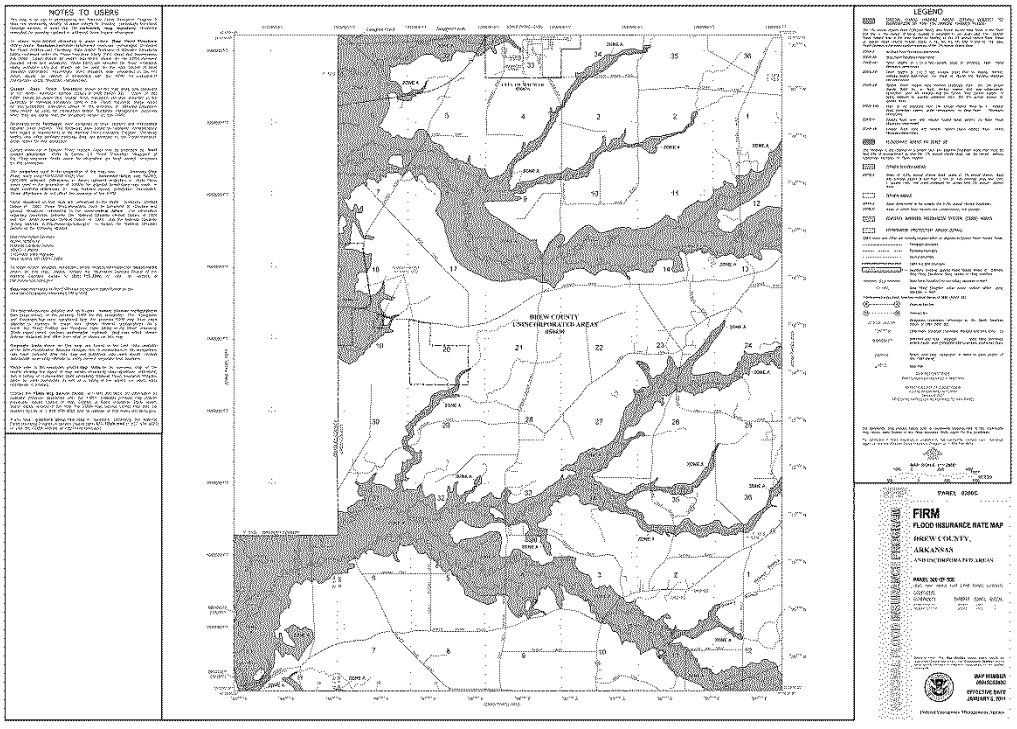
EFFECTIVE DATE
JANUARY 6, 2011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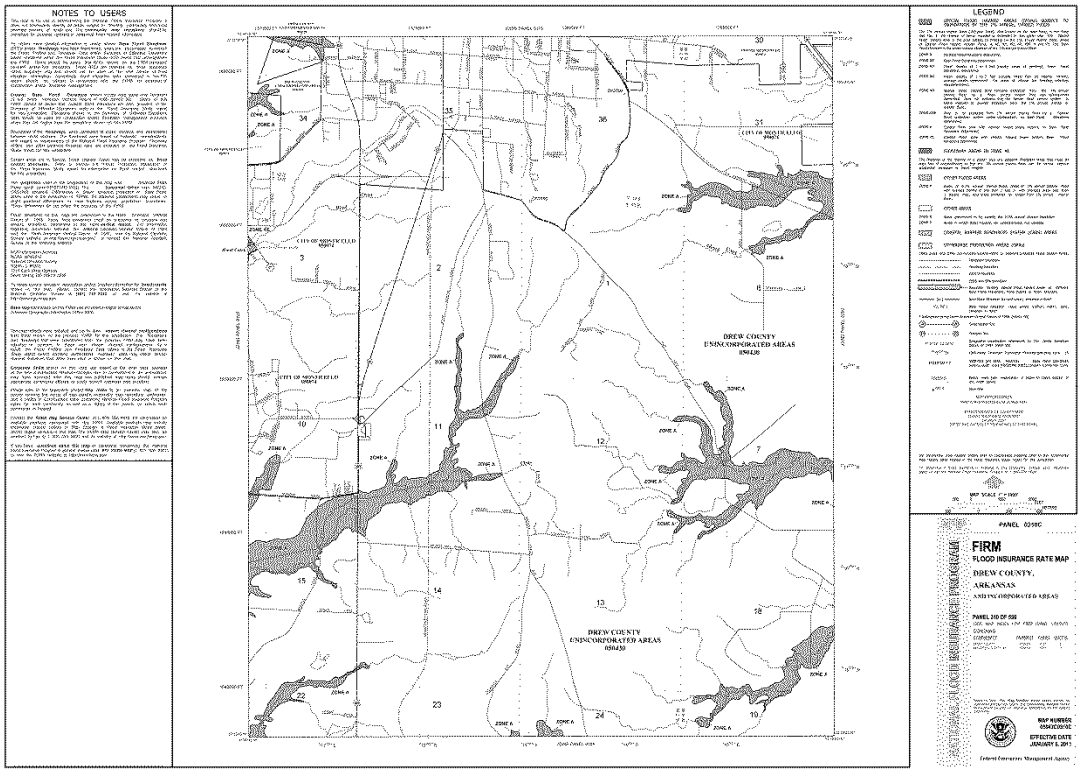
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AND INCORPORATED AREAS
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UNINCORPORATED AREAS
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CITY OF MONTICELLO
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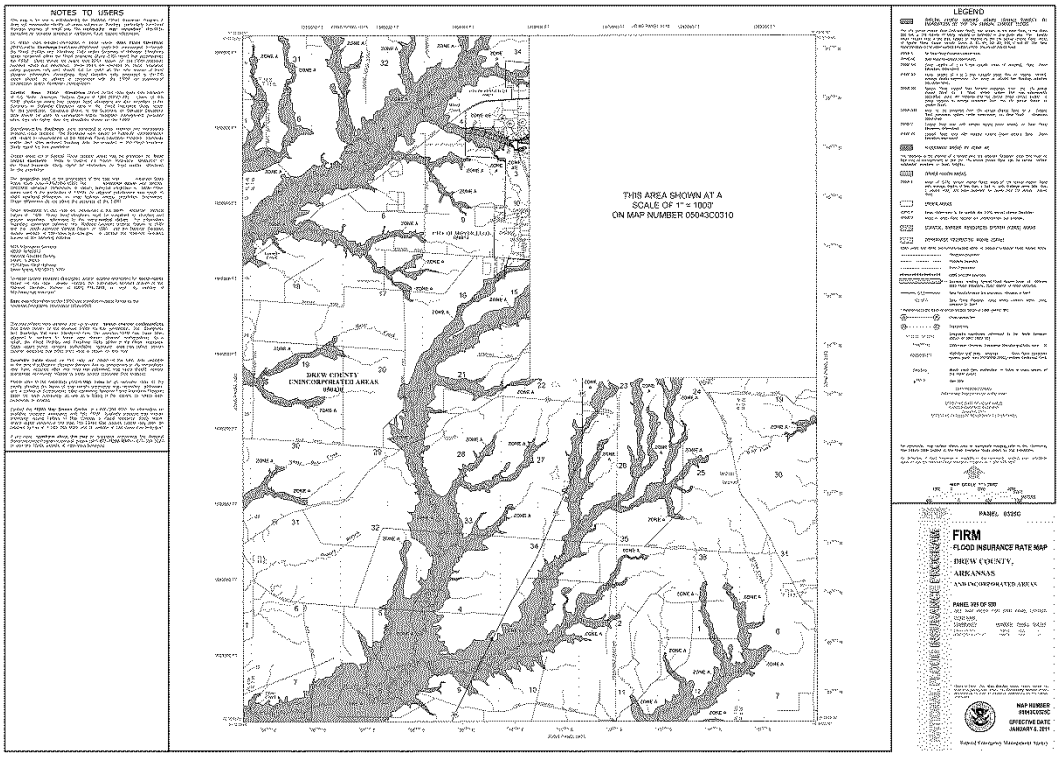
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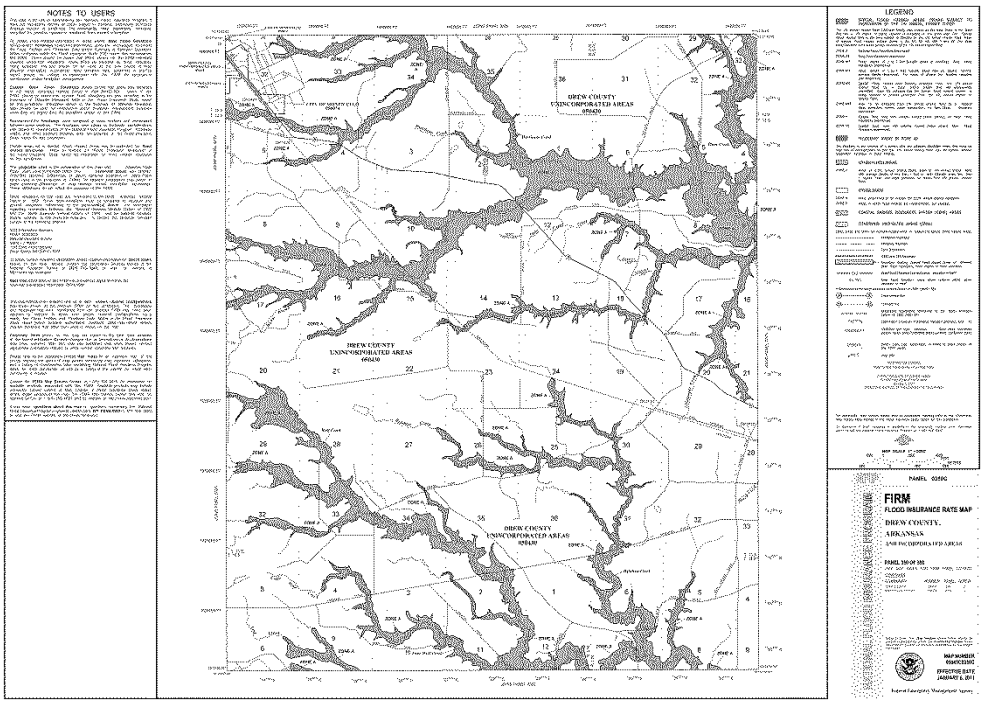
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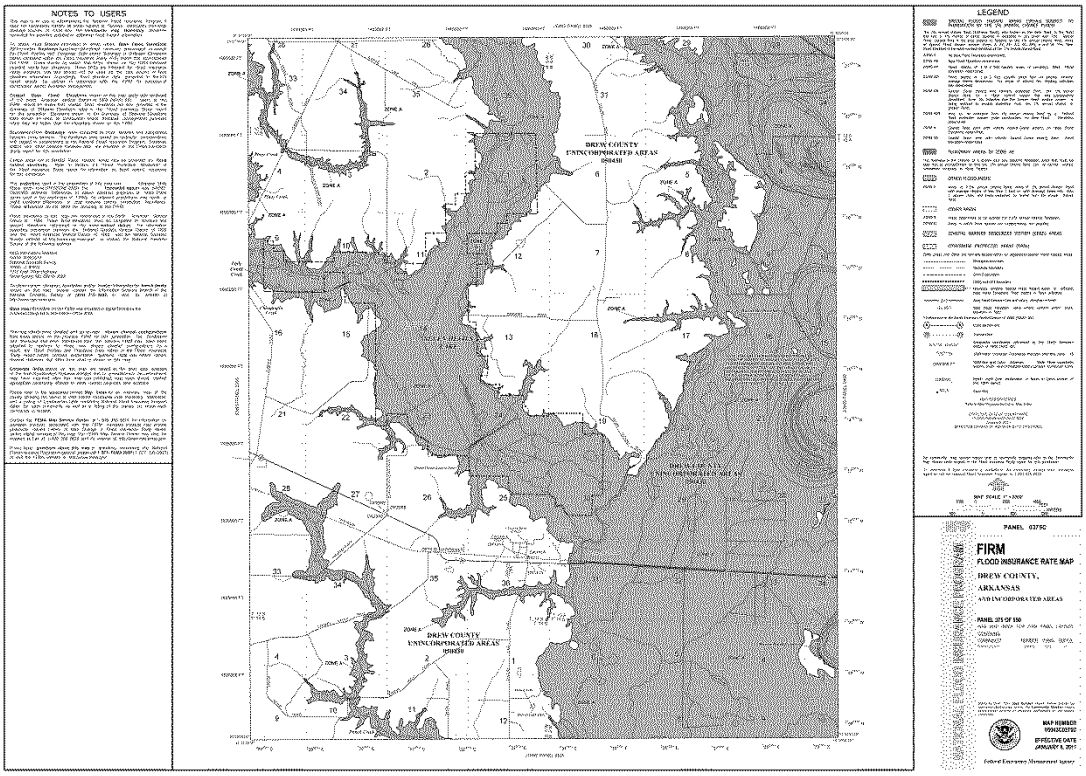
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AND INCORPORATED AREAS
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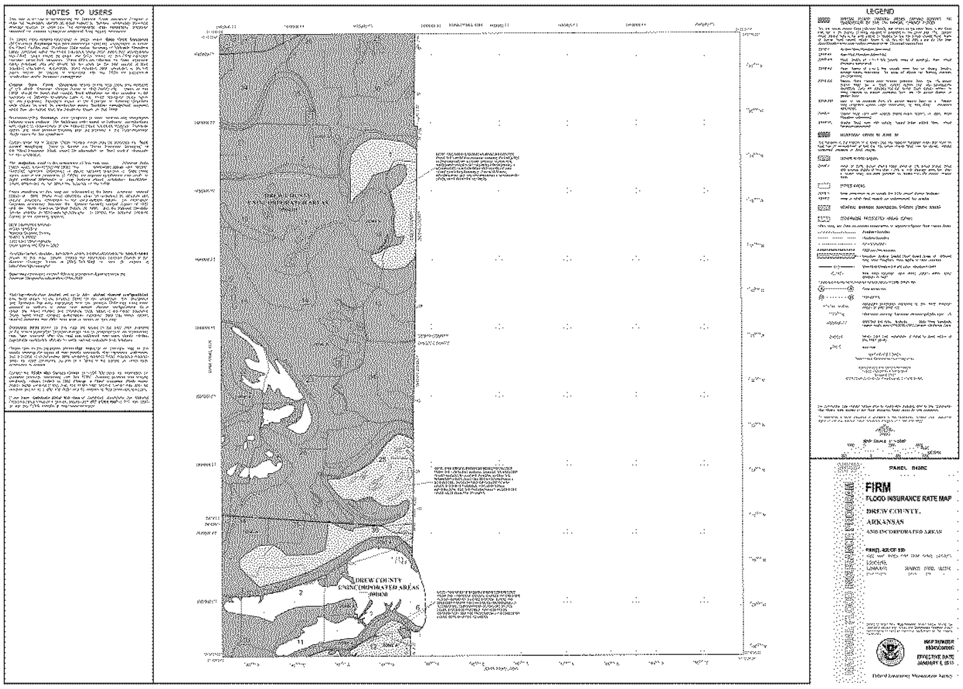
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ARKANSAS
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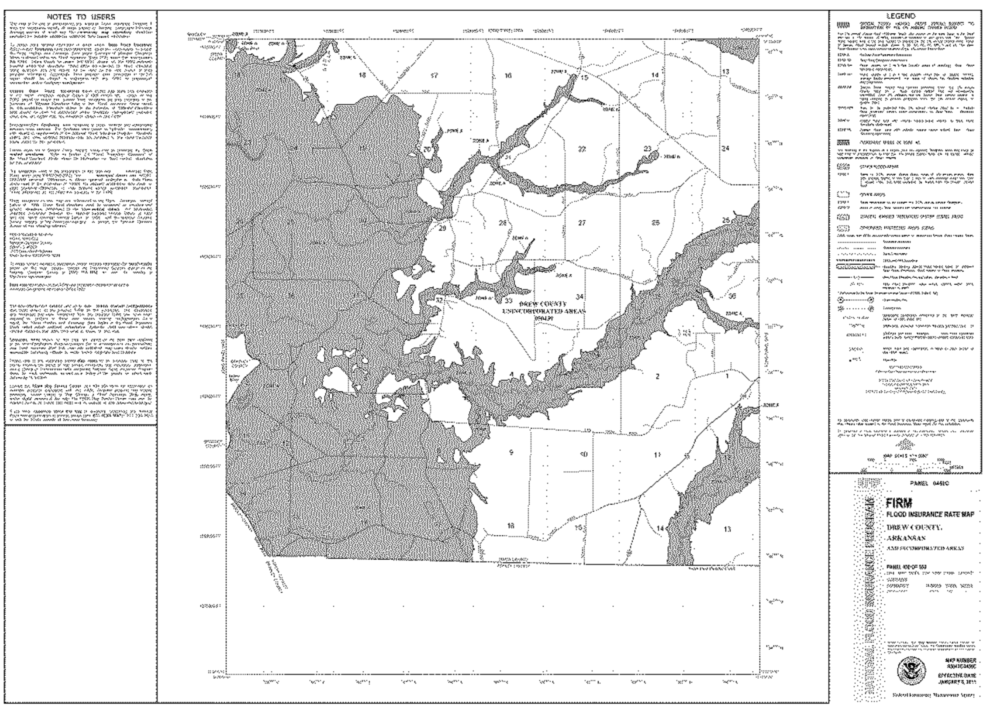
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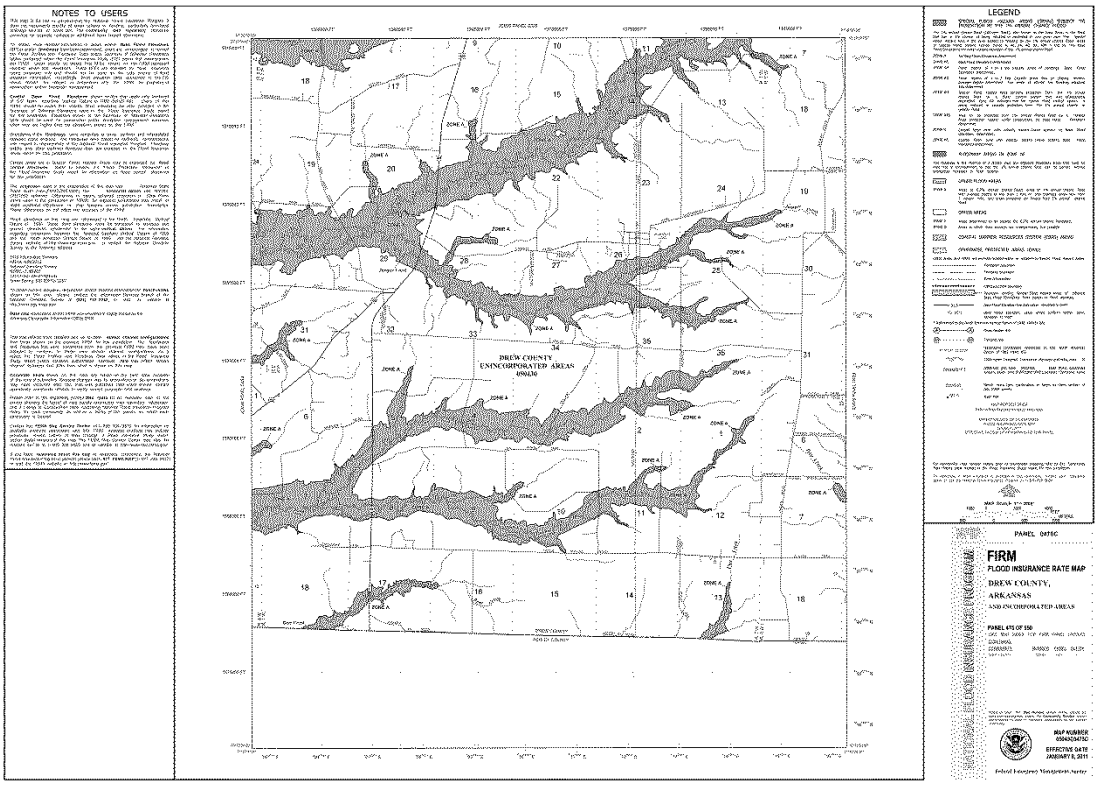
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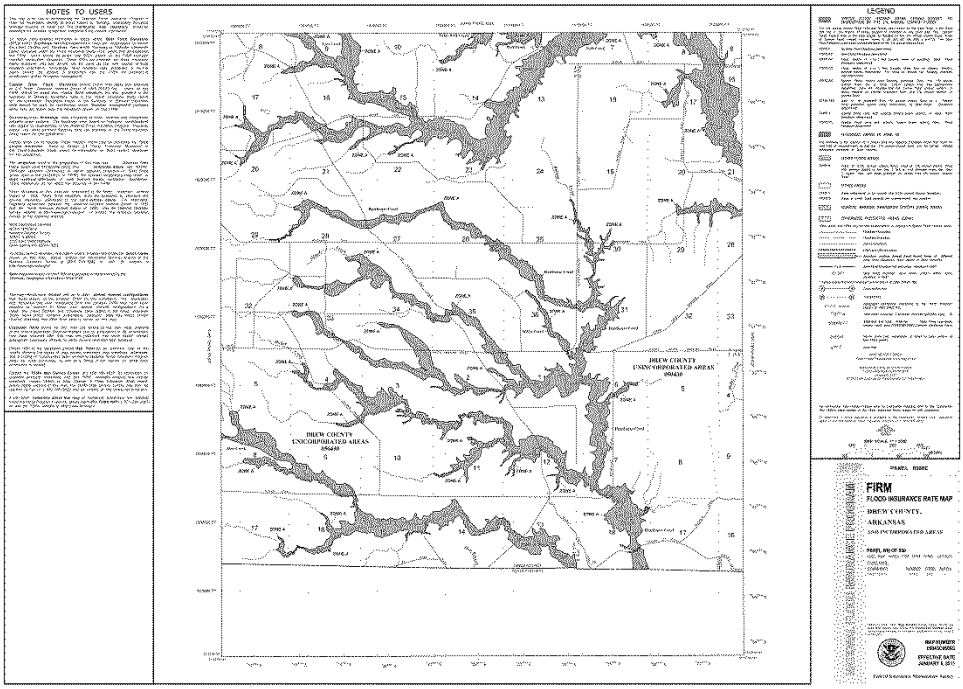
EFFECTIVE DATE
JANUARY 6, 2011
Federal Emergency Management Agency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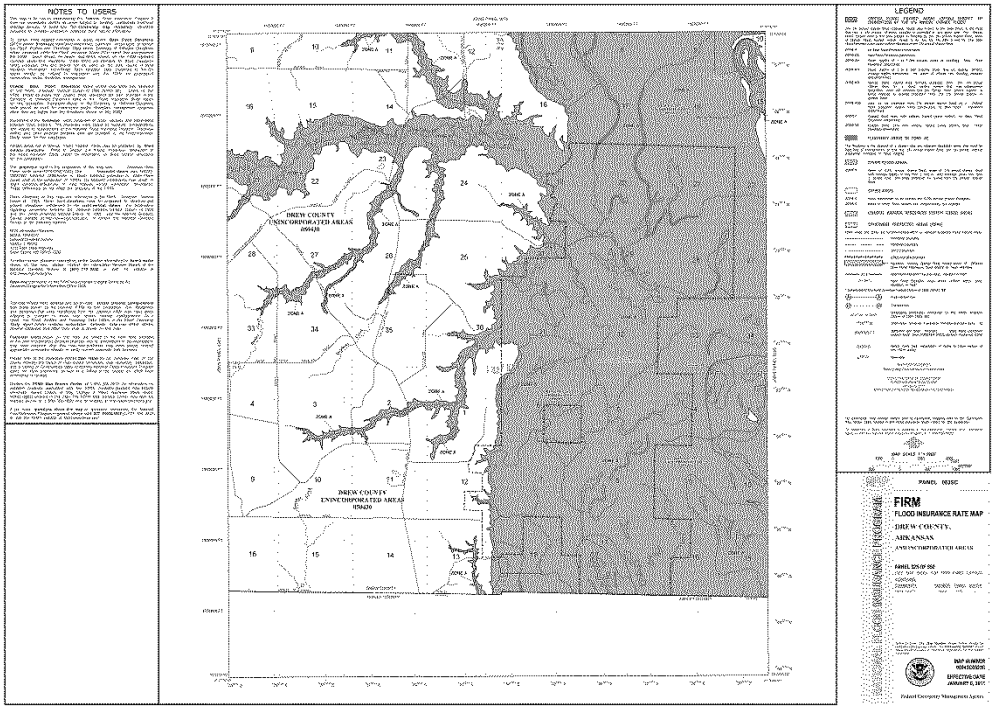
Federal Emergency Management Agency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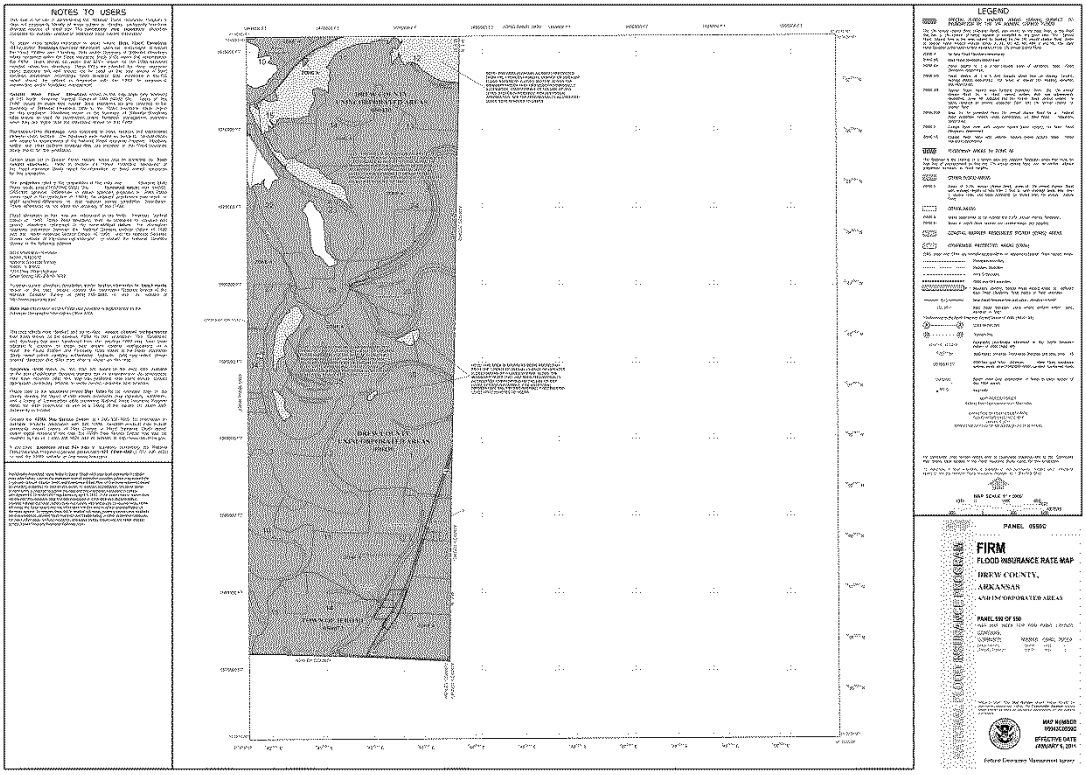
EFFECTIVE DATE
JANUARY 6, 2011
Federal Emergency Management Agency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050420
EFFECTIVE DATE
JANUARY 6, 2011
Federal Emergency Management Agency