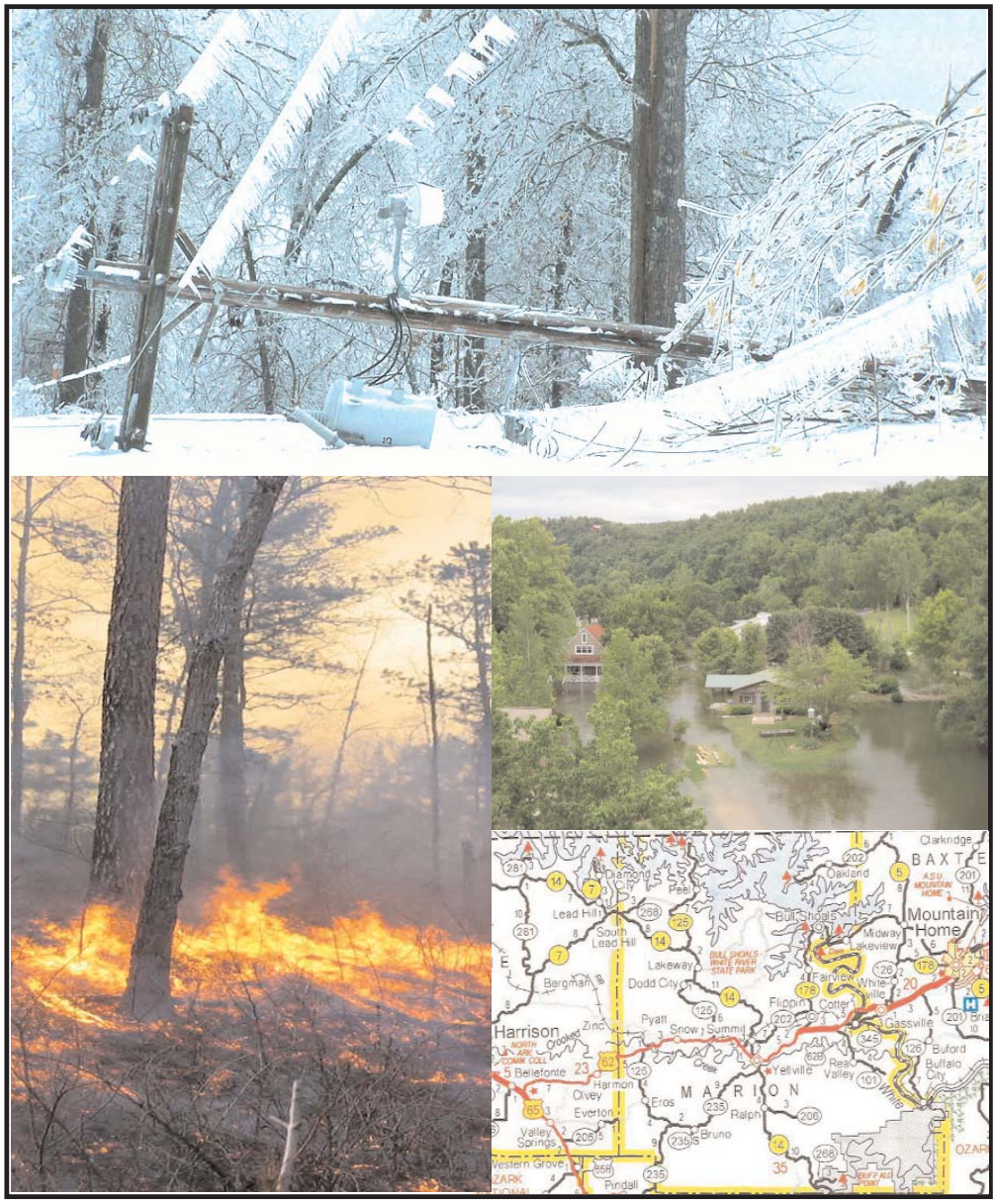
Marion County, Arkansas
Multi-Hazard Mitigation Plan



Including Cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville
School Districts of Flippin, Ozark Mountain (Bruno-Pyatt Campus) and Yellville-Summit

Primary Point of Contact: Carlos Parker, Marion County Emergency Operations Manager,
P.O. Box 777, Yellville, AR 72687, (870) 449-5353 cparker_mcoem@yahoo.com

March 2012

Table of Contents

Note: The format of this plan is written to conform with the FEMA Local Hazard Mitigation Plan Review Crosswalk, July 1, 2008. That is why you see references to "Elements," such as "Element A, Locations," etc. That is what they're called in the review format.

Chapter I: Introduction

Purpose, Authority

The Marion County Hazard Mitigation Plan, designed to enhance mitigation actions, was financed through an HMGP grant from the Arkansas Department of Emergency Management and the Federal Emergency Management Agency. The project ID is FEMA-1819-DR-AR-#1. Contents do not necessarily reflect FEMA's views or policies.

It has been prepared with guidance from FEMA's Local Multi-Hazard Planning Guidance of July 1, 2008, FEMA's Mitigation How-To publications (386 series) and the Arkansas 2010 Hazard Mitigation Plan. Guidance and assistance from the staff of ADEM and FEMA Region VI are incorporated.

This plan conforms with the Robert T. Stafford Disaster Mitigation Act of 2000.

It includes all of unincorporated Marion County and its five incorporated cities: Bull Shoals, Flippin, Pyatt, Summit and Yellville. (All additional places mentioned are unincorporated.) Also included are the county's three school districts: Ozark Mountain (Bruno-Pyatt campus), Flippin and Yellville-Summit.

Goals

1. Reduce loss of life and property by assessing each natural hazard, including probability, frequency, exposure and consequences, and implement actions that are formulated from assessments. **2.** Provide a framework and coordination to encourage all levels of government and public and private organizations to undertake mitigation to minimize disasters and use mitigation in recovery.

Topography, Climate

Marion County is in North Central Arkansas. It is virtually rectangular and about 30 miles from north to south and 21 miles from east to west. It is bordered on the north by Missouri, on the west by Boone County, on the south by Searcy County and on the east by Baxter County. White River, the second-largest Arkansas watershed, forms most of the eastern boundary between Marion and Baxter counties. Total area: about 637 square miles, or about 373,632 acres and includes 3,460 acres of water in bodies of less than 40 acres and in streams less than one-eighth of a mile wide.

The county is within two physiographic areas of the Ozark Highland. The Salem Plateau is exposed across northern and eastern Marion County. The Springfield Plateau is exposed in parts of west central and across most of southern Marion County.

The Buffalo River bisects the southern boundary. Crooked Creek is the third major watershed and bisects the central part of the county.

The northern part of the county is drained by Bull Shoals Reservoir, built on the White in 1951 and managed by the U.S. Army Corps of Engineers, with a surface area of 34,000 acres.

In winter the average daily temperature is 37F (average daily minimum, 25F); in summer, 77F and 89F, correspondingly.

Average annual precipitation: 43 inches. Of this, 24 inches usually falls April-September. In two years out of 10, rainfall in April-September is less than 19 inches. Thunderstorms occur about 60 days each year.

Average seasonal snowfall: nine inches.

Average relative humidity is 60% in midafternoon and 80% at dawn.

Source: Soil Survey of Baxter and Marion Counties, U.S. Department of Agriculture.

Census Overview

Marion County: Land area, 637 square miles. Population 16,653. Total housing units: 9,354; occupied, 7,411. Density: 26 persons per square mile.

Bull Shoals: Northeastern county, on shores of Bull Shoals Lake. Land area: 5 square miles. Population: 1,950. Density: 390 persons per square mile.

Flippin: East central. Land area: 1.8 square miles. Population 1,355. Density: 753 persons per square mile.

Pyatt: West central. Land area: 1.28 square miles. Population 221. Density: 173 persons per square mile.

Summit: Central, adjacent to Yellville to the south. Land area: 1.23 square miles. Population 604. Density: 491 persons per square mile.

Yellville: Central, county seat. Land area: 2.55 square miles. Population 1,204. Density: 472 persons per square mile.

Jurisdiction	2000	2010	% change
County	16,140	16,653	+3.18
Bull Shoals	2,000	1,950	-2.50
Flippin	1,357	1,355	-0.14
Pyatt	253	221	-12.65
Summit	586	604	+3.07
Yellville	1,312	1,204	-8.23
Unincorporated	10,632	11,319	+6.46

Housing Units	Number	Percent
Countywide:	9,354	100%
Occupied Units:	7,411	79%
Unoccupied Units:	1,943	21%

Unemployment in Marion County

Month, Year	Percent
December 2011	8.5%
March 2011	9.9%
March 2010	10.7%
March 2008	5.1%
March 2000	4.2%

Schools Overview

Flippin District

Campus is within in Flippin city limits; district includes eastern third of unincorporated county, north to south. One of each: Elementary, Junior and Senior High Schools.

Full-time teachers: 85*
Grade span: K-12
College-bound seniors: 80%
Number of students 807
Discretionary Dollars Per Pupil: $9,648

Yellville-Summit District

Campus is within Yellville city limits; district includes roughly the central third of unincorporated county, north to south. One of each: Elementary, Junior and Senior High Schools.

Full-time teachers: 85*
Grade span: K-12
College-bound seniors: 75%
Number of students 820
Discretionary Dollars Per Pupil: $9,901

Ozark Mountain District

Has three campuses: Bruno-Pyatt, St. Joe and Western Grove. Only Bruno-Pyatt is in Marion County. Bruno-Pyatt is in the unincorporated county; the part of the district that Bruno-Pyatt serves is roughly the western third of the unincorporated county as well as the city of Pyatt. The figures are for Bruno-Pyatt only, which has one of each: Elementary, Junior and Senior High Schools.

Full-time teachers: 24*
Grade span: K-12
College-bound seniors: 70%
Number of students: 223
Discretionary Dollars Per Pupil: $6,023

(An additional 17 students who would otherwise attend this campus, and are included in funding for this district, are isolated by Bull Shoals Lake and attend school in Missouri.)

Note: Teachers include all certified staff, such as counselors, specialists and administrators.

Development Trends

Traditionally, the economy of Marion County has been based on a balance of tourism, agriculture, timber, light commercial business and limited manufacturing. Census figures show dramatic growth from 1960 to 2000, but little between 2000 and 2010.

In the last few years the area has seen a significant jobs drain, mostly from manufacturing. In 2003, manufacturing hit a high point with 42.2% of jobs; in 2009, it accounted for 29%. Unemployment was 4.2% in March 2000 and 8.5% in December 2011.

Since the 1960s, Marion County has been a strong draw for comparatively affluent retirees from the Upper Midwest. This trend slowed with the recession but is expected to rebound.

This is reflected in census figures. In 2000, 20% of the population was 65 and older, compared with the national average of 12.4%.

The 2010 census showed that Marion County has the second-oldest median age in the state, at 50.1 years, up six years from the 2000 census data. Nearly one is four Marion County residents is over 65.

Many retirees live in unincorporated areas spread along Bull Shoals Lake and the White River, in single-family units. This may be one reason the unincorporated area of the county grew while the towns lost population.

As baby boomers retire, future housing development can be expected to be more prevalent in these areas, where retirees tend to build homes. Significantly, these homes are in or adjacent to the White River floodplain.

Estimated median household income in 2009, the most recent year for which figures are available, in inflation-adjusted dollars was $31,772, compared to $51,425 nationally.

The LMI (low-to-moderate-income) rate for the county is 40.8%. Bull Shoals, primarily a resort and retirement community, has the lowest rate at 37.7%. Others are: Flippin, 56.1%; Pyatt, 60.5%; Summit, 47.2%, and Yellville, 41.2%.

Values of Taxable Structures

The Marion County Final Assessor's Abstract for 2010, the most recent for which figures are available, reflects the following property values for structures that are taxable. They do not include exempt structures such as municipal and county buildings or fire houses.

Agricultural improved:	$225,229,950
Commercial improved:	61,735,700
Residential improved:	406,205,000
Mobile homes:	19,949,125
Total	**$713,119,775**

Chapter II: Plan Adoption

Multi-Jurisdictional Plan Adoption

Adoption by the governing bodies of the participating jurisdictions demonstrates their commitment to fulfilling the mitigation goals outlined in the plan. Adoption legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

A sample resolution is in this chapter. When the jurisdictions adopt the plan, copies of the actual resolutions will be placed in the Appendix.

Points of Contact for Jurisdictions

County of Marion
County Judge James “Pete” Giles
P.O. Box 545
Yellville, AR 72687
870-449-6231 (Judge’s Office)

City of Bull Shoals
Mayor Bruce Powell
P.O. Box 390
Bull Shoals, AR 72619
870-445-4775 (City Hall)

City of Flippin
Mayor James "J.J." Hudson
P.O. Box 35
Flippin, AR 72634
870-453-8300 (City Hall)

City of Pyatt
Mayor Kenneth Hancock
P.O. Box 35
Pyatt, AR 72672
870-427-3433 (City Hall)

City of Summit
Mayor
P.O. Box 365
Summit, AR 72677
870-449-4332 (City Hall)

City of Yellville
Mayor Shawn Lane
P.O. Box 647
Yellville, AR 72687
870-449-4142 (City Hall)

Flippin School District
Dale Query, Superintendent
210 Alford St.
Flippin, AR 72634
870-453-2270 (school office)

Larry Ivens, Superintendent
Yellville-Summit School District
1124 North Panther Avenue
Yellville, AR 72687
870-449-4061 (school office)

Ozark Mountain School District
Joe Hulsey, Superintendent
205 S. Highway 65
St. Joe, AR 72675
439-2213, Ext. 12 (school office)

RESOLUTION NO. _____

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR (City/County)

WHEREAS, certain areas of _____County/City, (State), 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, _____County/City 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, the (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 and school districts;

NOW, THEREFORE, BE IT RESOLVED BY THE City Council/Quorum Court OF THE _____County/City:

That _____County/City, (State) hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, 2005-2010; 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 _____, 2012.

APPROVED:

_____ _____ _____

County Judge Mayor School Superintendent

ATTEST:

Chapter III: Planning Process

Documentation of the Planning Process

Elements A-E: The planning process began on Aug. 31, 2010, when Marion County was awarded a grant to prepare the plan. (FEMA-18-19-DR-AR). The process followed the guidelines laid out in the FEMA 386 series; a summary of this process was explained in the initial public meeting. (See minutes of the meeting on Pages 6-7.)

Additional documentation can be found in the activity log the Appendix.

Following discussions with the Arkansas Department of Emergency Management, it was decided that Marion County Grants Administrator Sheila Daniel would lead the development of the plan and would write it, working with county Emergency Operations Manager Carlos Parker.

On. Sept. 29 Daniel and Parker met with ADEM Hazard Mitigation officials Josh Rogers and Amanda Merrill at ADEM headquarters in North Little Rock to discuss procedural issues and how the development of plan would be accomplished.

County and municipal elections were held in November and several new officials were elected, so the formal public process couldn't begin until those new officials took office in January.

On Jan. 18 Daniel attended the monthly meeting of the county's fire chiefs and briefed them on the plan and their role. All fire chiefs subsequently supplied data about their individual departments for inclusion in the plan.

Daniel then began reaching out to community leaders, after consulting with Parker and County Judge James "Pete" Giles, to identify potential team members. On Feb. 12, Daniel spoke to a joint meeting of the the Friends of the North Fork and White Rivers and Master Naturalists of North Central Arkansas to explain the plan's purpose and process. Several leaders at this meeting expressed interest in having input on the plan.

On Feb. 28, Daniel spoke to the Mid-Marion County Rotary Club, whose members included some who later joined the planning team.

After consulting with the volunteers who had come forward, and city and county officials, the first planning meeting was set for March 28, 2011. A story inviting the public to attend ran in the Mountaineer Echo, the county's only news outlet, and personalized invitations were sent to 43 individuals, including community and business leaders, all mayors, county officials and school superintendents and members of the Local Emergency Planning Committee.

The public was invited to review the draft plan before submission to FEMA, with eight days for public comment after a notice March 1, 2012, in the Mountaineer Echo in Flippin. (See Page III 14.) No comments received.

A final public hearing will be held contingent upon FEMA Approvable Pending Adoption (APA) status and before local plan adoption.

Specific to Element E in crosswalk: Review and Incorporation of other plans, studies, reports, etc. Other plans, studies, reports and technical data reviewed and used for reference or as sources were the FEMA FIRMS, Nation Climatic Data Center, state GIS data, Marion County Emergency Operations Plan; the Arkansas HMP and those of Cleburne, Johnson, Saline and Washington counties. The mayors and public works directors and mayors of the cities referenced their ordinances and codes, as did the the county judge. Other external reports used: the U.S. Army Corps of Engineers Bull Shoals Dam Flood Emergency Action plan, Soil Survey of Baxter and Marion Counties, the Marion County Health Unit 2003 Study of Public Health, the U.S. Census, Marion County Electronic Field Study 2001 by Pictometry International Corp. These and other sources are cited throughout the plan.

State of Arkansas

COUNTY OF MARION

JAMES "PETE" GILES - COUNTY JUDGE

P.O. Box 545
300 East Old Main
Yellville, Arkansas 72687

870-449-6231
Fax: 870-449-4369
mcjudge@yellville.net

March 18, 2011

Steven G. Sanders Jr., President
NATCO Communications Inc.
P.O. Box 209
Flippin, AR 72634

Dear Mr. Sanders,

The Disaster Mitigation Act of 2000 made it a federal requirement that any community wishing to apply for a federal mitigation grant must participate in the development of a hazard mitigation plan. Marion County has received a federal grant through the Arkansas Department of Emergency Management to develop a multi-jurisdictional plan that includes the schools and cities.

We greatly welcome NATCO's participation in the planning process. Your input will help ensure our eligibility for federal mitigation grants, which can fund such things as school and public safe rooms and drainage projects, including road improvements.

The county will hold an initial planning meeting at 10 a.m. March 28 in the main courthouse courtroom in Yellville. If you cannot attend, please send a representative. Ideally, this would be your operations manager. The meeting should last no longer than one hour. Marion County Grants Administrator Sheila Daniel will explain the planning process, describe the activities required of each participating jurisdiction, and will provide information to all those who wish to participate.

If you have questions, please call Ms. Daniel at 870-449-6238, or email her at: sheila_daniel@yahoo.com.

Sincerely,

James L Giles

James (Pete) Giles

Letters of invitation were sent to:

Mayors and Police Chiefs

City of Bull Shoals
Mayor Bruce Powell
Police Chief John Thompson
(later replaced by Daniel Sutterfield)

City of Flippin
Mayor James "J.J." Hudson
Police Chief Bruce Mayfield
(later replaced by Dusty Smith)

City of Pyatt
Mayor Kenneth Hancock
(policing handled by county sheriff)

City of Summit
Mayor Robert Pugsley
(policing handled by county sheriff)

City of Yellville
Mayor Shawn Lane
(policing handled by county sheriff)

County Officials

Assessor Glenda Treat
County and Circuit Clerk Dee Carleton
County Collector Cathy Brightwell
County Sheriff Roger L. Vickers
County Treasurer Shirley Ply
Justice of the Peace John M. Kennedy
Justice of the Peace William Stahlman
Planning Board Chairman Rob McMath
Building Inspector Ken Rigmaiden

School Superintendents

Dale Query, Flippin
Joe Hulsey, Ozark Mountain
Larry Ivens, Yellville-Summit

Fire Chiefs

(These three volunteered to represent chiefs on the team at a meeting of all chiefs to discuss the plan on Jan. 18, 2011.)
Keith Katcher, Flippin
Luci Soltysik, Oakland-Promise Land
Ken Kenny, Rea Valley

Community Leaders and LEPC Members

Mike Parkinson, District Technician, and
Karla Axel, Administrative Assistant
Crooked Creek Conservation District

Gerald Hammon, President
Gerald Hammon Realty

Carol Short, Chairman
Bull Shoals Planning Commission

Gay Vekovius, community activist

Tim Spinks, Manager
Flippin Walmart

Randy Hopper, President
Fishing Holdings, LLC (Ranger Boats)

Tom Hill, President and CEO
Micro Plastics, Inc.

Judy Loving, President and CEO
Twin Lakes Community Bank

Tracy Fancher, District Operations Manager
U.S. Army Corps of Engineers

Valerie Shipman, Administrator
Marion County Health Unit

Walter Reed, Chairman
Baxter-Marion Rural Water District

Steven G. Sanders, President
NATCO Communications, Inc.
(North Arkansas Telephone Co.)

Michael L. Selby, President
Florentine Corp.

Jamie Stringfellow, District Customer Service Manager
Entergy Arkansas

Brent Mitchell
Bull Shoals Fire Chief

Lisa Mitchell, county 911 Coordinator

Sandy Evans, assistant to OEM

Janet Hall
Baxter Regional Home Health

Janie Pugsley
Baxter Regional Medical Center

Key Query, Administrator
Marion County Dept. of Human Services

Mike Rotenberry
Arvest Bank, Yellville

John Vanscoy, Maintenance Supervisor
Ranger Boats, Flippin

Thursday, Mar

The Mountaineer ECHO

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www.flippinonline.com

County to host grant meeting

The Disaster Mitigation Act of 2000 made it a federal requirement that any community wishing to apply for a federal mitigation grant must participate in the development of a hazard mitigation plan. Marion County has received a federal grant through the Arkansas Department of Emergency Management to develop a multi-jurisdictional plan that includes the schools and titles.

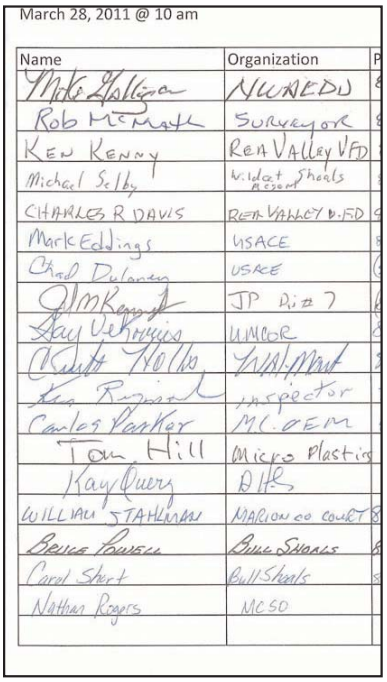
The county will hold an initial planning meeting at 10:00 a.m. on Monday, March 28 in the courtroom on the top floor of the main courthouse in Yellville. The meeting should last no longer than one hour.

Marion County Grants Administrator Sheila Daniel will explain the planning process, describe the activities required of each participating jurisdiction, and will provide information to all those who wish to participate.

For questions or more information, contact Daniel at 870-449-6238 or email sheila_daniel@yahoo.com

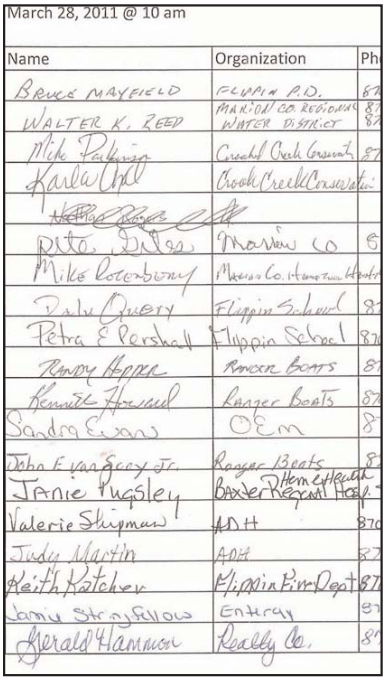
This story ran on Page 1 of the March 17, 2011, edition of the Mountaineer Echo newspaper in Flippin, AR. It is the county's only news outlet.

SIGN IN SHEET
HAZARD MITIGATION MEETING



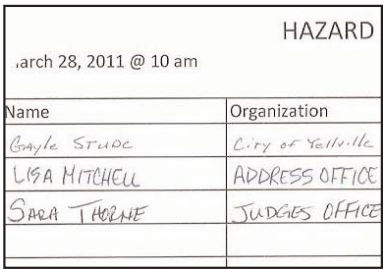
March 28, 2011 @ 10 am

Name	Organization	P
Mike Galligan	NWAEDD	
Rob McMath	Surveyor	
Ken Kenny	Rea Valley VFD	
Michael Selby	Wildcat Resort	
Charles R Davis	Rea Valley V.F.D	
Mark Eddings	USACE	
Chad Dulaney	USACE	
John M Kennedy	JP Dist 7	
Gay Vekovius	UMCOR	
Kurt Hollis	Walmart	
Ken Rigmaiden	Inspector	
Carlos Parker	MC OEM	
Tom Hill	Micro Plastics	
Kay Query	DHS	
WILLIAM J STAHLMAN	MARION CO. COURT	
Bruce Powell	Bull Shoals	
Carol Short	Bull Shoals	
Nathan Rogers	MCSO	



March 28, 2011 @ 10 am

Name	Organization	Ph
Bruce Mayfield	Flippin P.D.	
Walter K. Reed	Marion Co. Regional Water District	
Mike Parkinson	Crooked Creek Conservation	
Karla Axel	Crooked Creek Conservation	
[illegible]		
Pete Giles	Marion Co	
Mike Rotenberry	Marion Co. Home Health	
Dale Query	Flippin School	
Petra E Pershall	Flippin School	
Randy Hopper	Ranger Boats	
Kenneth Howard	Ranger Boats	
Sandra Evans	OEM	
John E Vanscoy Jr.	Ranger Boats	
Janie Pugsley	Baxter Regional Home Health	
Valerie Shipman	ADH	
Judy Martin	ADH	
Keith Katcher	Flippin Fire Dept	
Jamie Stringfellow	Entergy	
Gerald Hammon	Realty Co.	



HAZARD

March 28, 2011 @ 10 am

Name	Organization
Gayle Stude	City of Yellville
LISA MITCHELL	ADDRESS OFFICE
SARA THORNE	JUDGES OFFICE

Note: Personal contact information has been hidden for privacy.

1. Mike Galligan, Northwest Arkansas Economic Development District
2. Rob McMath, county planning chairman
3. Ken Kenny, Rea Valley VFD chief
4. Michael Selby, Wildcat Resort owner
5. Charles R. Davis, Rea Valley VFD member
6. Mark Eddings, USACE
7. Chad Dulaney, USACE
8. John M. Kennedy, Justice of the Peace
9. Gay Vekovius, UMCOR (United Methodist Church emergency volunteer group)
10. Kurt Hollis, Walmart
11. Ken Rigmaiden, county building inspector
12. Carlos Parker, county OEM
13. Tom Hill, CEO Micro Plastics
14. Kay Query, county DHS administrator
15. Bill Stahlman, Justice of the Peace
16. Bruce Powell, Bull Shoals Mayor
17. Carol Short, Bull Shoals Planning Chief
18. Nathan Rogers, sheriff's deputy
19. Bruce Mayfield, Flippin police chief
20. Walter K. Reed, Marion County Water District president
21. Mike Parkinson, Crooked Creek Conservation District
22. Karla Axel, Crooked Creek Conservation District
23. Pete Giles, Marion County Judge and City of Pyatt Public Works Director
24. Mike Rotenberry, Marion Co. Home Health
25. Dale Query, Flippin Superintendent
26. Petra Pershall, Flippin School District
27. Randy Hopper, Ranger Boats President
28. Kenneth Howard, Ranger Boats
29. Sandy Evans, OEM office
30. John Vanscoy, Ranger Boats
31. Janie Pugsley, Baxter Regional Home Health
32. Valerie Shipman, Ark. Dept. of Health
33. Judy Martin, Ark. Dept. of Health Admin.
34. Keith Katcher, Flippin Fire Chief
35. Jamie Stringfellow, Entergy
36. Gerald Hammon, realtor
37. Gayle Stude, Yellville Public Works chief
38. Lisa Mitchell, 911 address office
39. Sara Thorne, county judge's office

Minutes of the Marion County Hazard Mitigation Initial Planning Meeting
March 28, 2011
Courtroom of the Marion County Courthouse

An open public meeting for the Marion County Hazard Mitigation Plan was led by Sheila Daniel, Marion County Grants Administrator, to start the planning process. Assisting was Carlos Parker, Marion County Emergency Operations Manager. A total of 39 people, including elected officials and members of the public, were in attendance.

Ms. Daniel outlined the necessary steps to complete the mitigation plan to make Marion County eligible to receive funds from the FEMA Hazard Mitigation Grant Program and others.

The attendees discussed how to move forward with the plan and there was general agreement on the following components of three basic phases, as outlined in FEMA publication 386-1:

Assess the Risk: Identify natural hazards and assess their consequences, both historically and in the future. Determine if certain areas of the county are affected more by specific hazards and discuss the impacts on county infrastructures such as roads, buildings and critical facilities. Identify critical facilities within the county, which are those that provide essential products and/or services to the general public and/or preserves the welfare and quality of life. Examples of critical facilities are nursing homes, fire stations, police departments, schools and courthouses.

Develop the Mitigation Plan: This phase establishes possible ways to avoid or minimize the undesired effects and to prioritize them.

Implement the plan and monitor progress: This addresses how to implement specific mitigation projects that may change day-to-day operations. Discussion included how to ensure that the plan stays effective and how future revisions can be made.

The floor was opened to discussion about all components of the plan, and several attendees had questions about the National Flood Insurance Program. They were as follows:

Is there a fee associated with joining this program? Answer: There is no fee to join and it is not mandatory to join, but there are incentives available if the cities and counties do join. By joining, assistance would be available for mitigation in flood-prone areas.

Is there any reason Marion County has not participated previously in the NFIP? Answer: Marion County Justice of the Peace Bill Stahlman explained that it had been brought before the Quorum Court in 2008, with public hearings and input from the state Department of Natural Resources, but that a vote had not been taken. He said there were too many residents who felt that this was giving the government more control of their land. Some who were present at the hearing in 2008 said there had been misconceptions that the program involved imminent domain. It was also mentioned that there had been concerns about rules as to what people could and could not do with their property.

Flippin School District representatives said they had attended a FEMA workshop on incorporating safe rooms into the schools and were told that there must be a mitigation plan in place before federal funds would be available to build the safe rooms.

A resort owner shared that federally funded mortgages are required to obtain flood insurance and that the banks can force you to purchase flood insurance from privately owned insurance companies at a hefty price.

Realtor Gerald Hammon stated that that flood insurance or the lack of it affects real estate sales.

Marion County Judge James "Pete" Giles encouraged the attendees to talk to their neighbors and let their Quorum Court representatives know their feelings on this subject.

Mike Galligan of the Northwest Arkansas Economic Development District, who is also a Marion County resident, informed the crowd that the multijurisdictional plan Ms. Daniel is working on is the FEMA-approved way to approach hazard mitigation and encompasses much more than flood insurance. He said that after the plan is approved, then the flood insurance issue could be brought before the Quorum Court if there was sufficient interest. Mr. Galligan strongly encouraged people to join the planning committee to work on the Mitigation Plan.

Ms. Daniel distributed household surveys to be returned to her with the goal of assessing the level of public concern about various natural hazards, as well as to gauge general preparedness of households. She then asked for volunteers to sign up for the planning committee. Several came forward to volunteer after adjournment.

The meeting was adjourned at 11:20 a.m.

Sara Thorne
Administrative Assistant
Marion County Judge's Office

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Household Surveys: In the days following the initial meeting, surveys were distributed via the schools, cities and rural fire departments and 348 were returned, representing a wide cross-section of county residents. The planning committee used these surveys to gauge the level of concern among the public about various hazards, in order to guide them as they considered possible mitigation actions. These are the numbers of respondents who indicated they were concerned, very concerned or extremely concerned about the following hazards: dam break, 98; drought, 183; earthquake, 19; flooding, 148; hail, 234; tornado, 278; wind, 18; snow and ice, 302. A sample copy of the survey follows on the next page.

Household Natural Hazard Preparedness Questionnaire

We would appreciate your taking the time to fill out this questionnaire. Your responses will contribute to the preparation of the Marion County Pre-Disaster Mitigation Plan. Your answers will help the county gauge household preparedness for disasters and will help in determining how best to reduce risk and loss from natural hazards. The information you provide will be used to improve preparedness activities in your community, county and the state overall. No individual answers will be reported. Please return your answers to the place or person where you got this questionnaire, or send to the address on the last page.

NATURAL HAZARD INFORMATION 1. In the past ten years, which of the following natural disasters in this area have you or someone in your household experienced?

___ Drought ___ Landslide ___ Wind (significant damage)

___ Fire X Hail X Snow, ice

___ Flood ___ Tornado ___ Other (specify) _____

2. How concerned are you about the following disasters in this area? (Please circle number.)

Disaster	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Dam Break	1	2	3	4	(5)
Drought	1	2	3	(4)	5
Earthquake	1	2	3	4	(5)
Flooding	1	2	(3)	4	5
Landslide	1	2	3	4	(5)
Hail	1	(2)	3	4	5
Tornado	1	(2)	3	4	5
Snow, Ice	(1)	2	3	4	5
Wildfire	1	2	(3)	4	5
Wind	1	(2)	3	4	5
Other	1	2	3	4	5

3. Have you ever received information about how to make your family and home safe from natural disasters? X Yes ___ No (If No, skip to Question 4)

3.1 If YES, how recently?

___ Within the last six months ___ Between 2 and 5 years ago

___ Between 6 and 12 months ago ___ 5 years or more ago

X Between 1 and 2 years ago

3.2 From what entities have you received information about how to make your family and home safer from natural disasters? (Please check all that apply.)

X Newspaper	X Schools	___ Chamber of Commerce
___ Television	X Fire Department	___ Public workshop/meetings
___ Radio	___ Books	___ At work
___ Mail	___ Magazine	___ Billboards
___ Internet	___ Colleges	
___ Fact sheet or brochure	___ Other (please specify) _____	

4. For each of the following activities, check whether you have done, plan to do in the near future, have not done or are unable to do. (Please check only one answer for each category.)

Preparedness Activity	Have Done	Plan to Do	Not Done	Unable
Attended meetings or received written information on natural disasters or preparedness.		X		
Talked with family about what to do in emergency.	X			
Developed a family emergency plan.	X			
Prepared a disaster supply kit.	X			
In last two years, has anyone in your family taken CPR?		X		

5. What steps, if any, have you or someone in your household taken to prepare for a natural disaster? (Check all that apply.)

Have in place in case of disaster:

- [X] Stored food
- [X] Stored water
- [X] Flashlights
- [X] Batteries
- [X] Battery-powered radio
- [X] First-Aid kit
- [X] Fire extinguisher
- [X] Smoke detectors in house
- [ ] Disaster supply kit
- [ ] Received First Aid or CPR training
- [ ] Fire escape plan
- [X] Learned how to cut off utilities
- [X] Made a family emergency plan
- [ ] Family reconnection plan
- [ ] Other (please explain)

_____

6. Does your household have flood insurance coverage?

- [ ] Yes
- [X] No (If yes, skip to Question 8.)

6.1 If No, what is the MAIN reason? (Please choose only one.)

- [ ] Not located in flood plain
- [X] Not available
- [ ] Never considered it
- [ ] Deductibles too high
- [ ] Not familiar with/don't know about it
- Other reason _____

7. Does your household have earthquake insurance?

- [ ] Not available
- [ ] Not necessary
- [X] Never considered it
- [ ] Deductibles too high
- [ ] Not familiar with/don't know about it
- Other reason _____

NATURAL HAZARD RISK REDUCTION

8. Was the possible occurrence of a natural hazard an issue when you were buying or moving into your current house? ___ Yes X No

9. What modifications for tornadoes or earthquakes have you made to your house?

Nonstructural	**Structural**
___ Anchor bookcases, cabinets to wall	___ Built tornado shelter or safe room
___ Secure water heater to wall	X Secure home to foundation
___ Put latches on drawers and cabinets	___ Install hurricane clips to tie down roof
___ Fit gas appliances w/flexible connections	___ Brace unreinforced chimney
___ Others (please explain)	___ Brace unreinforced masonry, concrete walls

Other comments:

---

10. Which of the following incentives, if any, would motivate you to take additional steps to better protect your family and home from a natural disaster? (Check all that apply.)

X Insurance discount	X Tax break or incentive
___ Low-interest loan	___ None
___ Lower new home construction costs	___ Mortgage discount

11. How concerned are you that an act of terrorism is going to occur in this area? (Circle)

Extremely concerned Very concerned Concerned Somewhat concerned (Not concerned)

12. Your age: ___ Under 20 ___ 20-39 X 40-59 ___ 60 or over

13. Your gender: X Female ___ Male

14. Your level of education:

___ Grade school or less	X Four-year college degree
___ Some high school	___ Postgraduate degree
___ High school graduate/GED	___ Some college or technical school

15. Your general place of residence: Community Flippin

ZIP code 72634 County Marion

16. How long have you lived in Marion County?

___ Less than one year ___ 1-5 years ___ 5-9 years X 10-19 years ___ 20 or more years

17. Do you have access to the Internet, either at home or some other place? X Yes ___ No

18. Do you own or rent? X Own ___ Rent

19. Which best describes your home:

X Single-family ___ Duplex ___ Apartment (3-4 units) ___ Apartment (5 units or more)

___ Condo ___ Manufactured or mobile home Other _____

20. Please feel free to add any comments in this space.

I need to do more to prepare. This survey made me think about it.

Please return this questionnaire to the person or place that gave it to you, or mail to Sheila Daniel, Marion County Grants Administrator, P.O. Box 545, Yellville, AR 72687. You may also reply by email to: sheila_daniel@yahoo.com

Thank you for participating!

Planning Team Members and Participation of Jurisdictions

For more details and meeting dates, see Activity Log in the Appendix.

City of Bull Shoals

Members: Mayor Bruce Powell, Public Works Director Bill Stahlman, Planning Chief Carol Short.

Participation: Attended initial public planning meeting, completed assessment form, distributed Household Survey, worked with plan writer Sheila Daniel on issues specific to Bull Shoals in face-to-face conferences and via email and phone calls, identified mitigation actions.

City of Flippin

Members: Mayor J.J. Hudson, Public Works Director Steven Berg.

Participation: Katcher attended initial public planning meeting; Hudson and Berg subsequently met with Daniel and communicated with her via email and phone. Completed assessment form, distributed Household Survey, identified mitigation actions.

City of Pyatt

Members: Mayor Kenneth Hancock, Public Works Director Pete Giles.

Participation: Giles attended initial public planning meeting and met with Daniel and Parker numerous times; Hancock communicated with phone. Completed assessment form, distributed Household Survey, identified mitigation actions.

City of Summit

Member: Mayor Robert Pugsley.

Participation: Met with Daniel and Parker and communicated via phone. Completed assessment form, distributed Household Survey, identified mitigation actions.

City of Yellville

Members: Mayor Shawn Lane, Public Works Director Gayle Stude.

Participation: Stude attended initial public planning meeting and Lane and Stude subsequently met with Daniel and Parker. Completed assessment form, distributed Household Survey, identified mitigation actions.

County of Marion

Members: County Judge James Pete Giles, EOM Carlos Parker, Deputy EOM Sandy Evans, County Planning Chairman Rob McMath.

Participation: All attended initial public planning meeting and met with Daniel and Parker numerous times; Parker and Evans assisted Daniel in collecting and tabulating data. Completed assessment form, distributed Household Survey, identified mitigation actions.

Ozark Mountain School District

Members: Supt. Joe Hulsey, Bruno-Pyatt Elementary Principal Bob Ricketts.

Participation: Hulsey, whose office is in Boone County, talked with Daniel by phone because of the distance impediment. He delegated chief responsibility to Bob Ricketts, because he is at the only campus that is in Marion County. Ricketts met with Daniel numerous times, supplied all data needed about district, completed assessment form and distributed Household Survey. He and Hulsey identified mitigation actions.

Flippin School District

Members: Supt. Dale Query, Federal Coordinator for District Compliance Petra Pershall.

Participation: Both attended initial public planning meeting and met with Daniel numerous times, supplied all data on district, completed assessment form, distributed Household Survey, identified mitigation actions.

Yellville-Summit School District

Members: Supt. Larry Ivens, Federal Coordinator for District Compliance Donna Tennison.

Participation: Met with Daniel numerous times, supplied all data on district, completed assessment form, distributed Household Survey, identified mitigation actions.

The Mountaineer ECHO

1277 Hwy. 178 N

P.O. Box 1199

Flippin, AR 72634-1199

(870) 453-3731 Fax (870) 453-3071

AFFIDAVIT OF INSERTION

This is to certify that the advertisement for Marion County Judge's Office entitled

Comment Notice

appeared in the following edition(s) of The Mountaineer newspaper, P.O. Box 1199, Flippin, AR 72634:

March 1, 2012

PUBLIC COMMENT NOTICE

The initial draft of the Marion County Multi-Hazard Mitigation Plan is open for public comment today until 4: 30 p.m. March 8. Copies are on view at the County Library in Yellville, Bull Shoals Library and County Judge's Office, 105 S. Berry, Yellville.

Direct comments to Grants Administrator Sheila Daniel, P.O. Box 545, Yellville, AR 72687, 870-449-6238, or sdaniel@yellville.net.

Legal No. 120301-PCN
Mar. 1, 2012

Co-publisher/Advertising Manager

efore me on this 24th day of February, 2012.

Jane H. Estes

Notary Public

Jane H. Estes
NOTARY PUBLIC
Marion County Arkansas
Commission #12359093
Expires March 1, 2017

Chapter IV: Risk Assessment

Identifying Hazards

This plan will address all natural hazards that can affect Marion County. They were identified by reviewing the 2010 Arkansas Hazard Mitigation Plan and FEMA guidance (386 series), data and individual assistance from the National Climatic Data Center (NCDC) storms data base, the National Weather Service, the Arkansas Geological Survey, the U.S. Department of Agriculture's Soil Conservation Service, the Arkansas Forestry Commission, the Army Corps of Engineers, reviews of previous emergency declarations, survivors of previous disasters and other longtime residents, first responders, firefighters, emergency personnel, local health officials, flood ordinances, newspaper accounts and city and county officials.

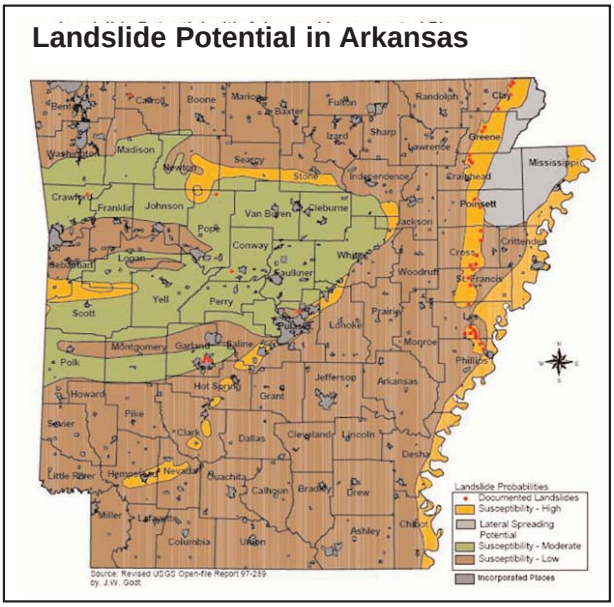
There are no repetitive loss properties in Marion County. Complete lists of NCDC events are within each chapter except severe storm, which is in the Appendix because of its extensive length.

Public input was sought by distributing 700 household preparedness surveys, with 348 responses. They included questions about which disasters respondents have experienced and are concerned about. Results are on Page 7 of Chapter III.

Hazards that affect some other parts of Arkansas but not Marion County will not be addressed. They are *landslides*, *expansive soils and extreme heat*. Landslides and expansive soils were eliminated after studying data from the Arkansas state plan that show negligible susceptibility to these hazards, and when no data on such occurrences could be found after consulting the historical record and experts from the pertinent agencies listed above.

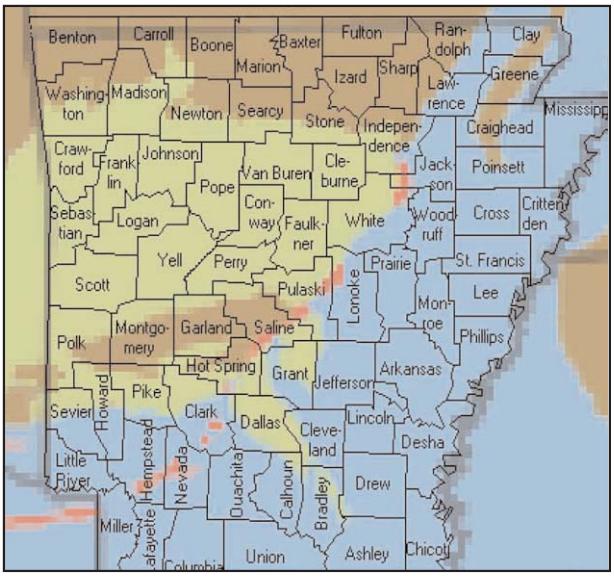
Further, landslides and expansive soils are not an issue because if they were to occur, they would not endanger lives or affect infrastructure. Here are two maps to support these conclusions.

Landslide Potential in Arkansas



Source: USGS, UALR GIS Laboratory

Expansive Soils in Arkansas



Source: USGS

This full map, including legend, is in the Appendix. The legend states that brown areas, which include Marion County, "are underlain by soils with little to no clays with swelling potential."

Extreme heat will not be addressed because the mitigation committee found no evidence of current public concern about it, and no evidence of previous problems relating to extreme heat. No deaths have been attributed to heat. None of the 348 household survey respondents mentioned extreme heat as a concern.

Carlos Parker, county OEM director, said the courthouse has always been available as a cooling center at any time, and the fact is broadcast during a heat advisory or warning. *Yet, no one has ever sought shelter there.* One of the hottest spells on record occurred the first week of August, 2011, with six days above 100 and a record of 112 set on Aug. 3. Normal high is 90, yet even in this historic event no one sought shelter and there was no emergency.

This is a rural, mountainous, shady, wet county. Of 637 square miles, only 7.4 are incorporated. Population: 16,653. Sixty-eight percent live in the unincorporated county. Many have a creek on their property or are next to a lake or river. The county rarely sees power outages in the summer, and it only is during storms, not due to excessive demand.

There is no NWS station in the county. The NCDC uses temperature data from Mountain Home in Baxter County. The NCDC lists four heat events (although one is a high of 100 for one day only so we discount it and add August 2011, which is not yet listed). CPRI total is only 1.0: Probability, Unlikely, 1 (every 15.25 years). Magnitude, Negligible, 1. Severity, Negligible, 1. Warning time, 24+ hours, 1.

The Calculated Priority Risk Index

We are using the CPRI method to assist us in assessing risk, a formula created by Visual Risk Technologies to factor probability, magnitude, severity and warning time. Each factor is given a nominal weight and there are specific guidelines to measure characteristics of each hazard.

These are the weights and choices:

Probability (.45): Likely (3), Possible (2), Unlikely (1). **Magnitude (.15):** Catastrophic (4), Critical (3), Limited (2), Negligible (1). **Severity (.25):** Catastrophic (4), Critical (3), Limited (2), Negligible (1). **Warning Time (.15):** Less than 6 hours (4), 6 -12 hours (3), 12-24 hours (2), 24 hours+ (1).

Thus, Probability (.45 x Value) + Magnitude (.15 x Value) + Severity (.25 x Value) + Warning Time (.15 x Value)=CPRI.

Probability, characteristics

3. Likely: Event probable within next three years. Has up to 1 in 3 years' chance of occurring, or 33% in any year. History of events is greater than 20% but less than or equal to 33% likely each year. Event is "Likely" to occur.

2. Possible: Event probable within next five years. Has up to 1 in 5 years' chance of occurring, or 20% in any year. History of events is greater than 10% but less than or equal to 20% likely each year. Event could "Possibly" occur.

1. Unlikely: Event possible within next 10 years. Event has 1 in 10 years' chance of occurring, or history is 10% or less in any year. Event is "Unlikely" but possible.

Magnitude and Severity, Characteristics

4. Catastrophic: Multiple deaths. Critical facilities shut down 30 or more days. Over 50% of property severely damaged.

3. Critical: Injuries or illness cause permanent disability. Critical facilities shut down at least two weeks. Over 25% of property severely damaged.

2. Limited: No permanent disability caused. Critical facilities shut down more than one week. * More than 10% of property severely damaged.

1. Negligible: Injuries or illnesses treatable with first aid. Minor quality of life lost. Critical facilities shut down 24 hours or less. Less than 10% of property severely damaged.

Warning Time

4. Less than 6 hours.

3. Six to 12 hours.

2. Twelve to 24 hours.

1. 24 or more hours

An event's warning time is the notice time the public typically has before the event, based on previous events. *(See table on next page.)*

Hazard	Probability (X .45)	Magnitude (X .15)	Severity (X .25)	Warning Time (X .15)	CPRI
Dam Break	Unlikely,1	Catastrophic, 4	Catastrophic, 4	6-12, 3	2.50
Drought	Possible, 2	Negligible, 1	Negligible, 1	24+, 1	1.45
Extreme Heat	Unlikely,1	Negligible, 1	Negligible, 1	24+, 1	1.00
Earthquake	Unlikely, 1	Negligible, 1	Negligible, 1	-6, 4	1.45
Flood	Likely, 3	Limited, 2	Limited, 2	6-12, 3	2.60
Severe Storm	Likely, 3	Negligible,1	Negligible, 1	-6, 4	2.35
Snow, Ice	Likely, 3	Catastrophic, 4	Catastrophic, 4	12-24, 2	3.25
Straight Wind	Unlikely, 1	Negligible, 1	Negligible, 1	-6, 4	1.45
Tornado	Likely, 3	Catastrophic, 4	Catastrophic, 4	-6, 4	3.55
Wildfire	Likely, 3	Negligible, 1	Negligible, 1	-6, 4	2.35

Note: The category of Severe Storm includes Hail, High Winds, Lightning and Thunderstorm Winds as listed by the National Climatic Data Center.

Recent Major Disaster Declarations

Cost includes total of federal, state and local shares. These six disasters are the only ones for which the county still has financial records. No serious injuries or lives lost.

YEAR, DISASTER NUMBER	DESCRIPTION	TOTAL COST
2011 -- # 1975	Severe storms, flooding	$212,874 (preliminary)
2009 -- # 1861	Severe storms, flooding	$287,261
2009 -- # 1845	Severe storms, flooding	$337,096
2009 -- # 1819	Severe winter storm (ice)	$3,747,909
2008 -- # 1751	Severe storms, flooding	$318,231
2008 -- # 1744	Severe storms, tornado	$39,505

Previous Major Disaster Declarations

This list was taken from the FEMA Web site. No damage totals are given on the FEMA site for Marion County, and the county and state have no such records.

YEAR	DATE	DESCRIPTION	DISASTER #
2004	05/07	Storms, flooding	# 1516
2000	12/29	Winter storm	# 1354
1996	04/23	Tornado	# 1111
1990	05/15	Storms, flooding	# 865
1982	12/13	Storms, flooding	# 673
1972	01/27	Storms, flooding	# 321
1969	02/15	Storms, flooding	# 254

Emergency Declarations

This list was also taken from the FEMA Web site. No damage totals are given on the FEMA site for Marion County, and the county and state have no such records.

YEAR	DATE	DESCRIPTION	DISASTER #
2009	01/28	Severe winter storm	# 3301
2005	09/02	Katrina remnants	# 3215
1976	12/03	Drought	# 3019

State-Declared Disasters

On the next four pages are reports for Marion County from State of Arkansas declarations, provided by Veronica Villalobos-Pogue, PDM Grants Manager and Federal Mitigation Grant Coordinator, Arkansas Department of Emergency Management.

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Marion

County

Proclamation # / Date of Proclamation	Proclamation Award	Description and date of Incident	County Award
		12/2/1982	$0.00
12/03/1982 12/3/1982	$200,000.00	*Severe storms Dec.2-3, 1982, resulting in the loss of lives, personal injuries, destruction of homes and businesses and other losses. President declared 42 counties for disaster assistance.(Amendments to orig. state proclamation were made throughout 1982, in 1983 and 1984). By Act 511 of 1973, as amended, do hereby declare a state of emergency exists and do hereby establish the sum of $200,000 in the Disaster Assistance Fund to provide disaster relief to those counties affected.Several counties were later added by way of Addendum (Memorandums from the Governor's Office).*	
		2/13/1989	$0.00
03/02/1989 3/2/1989	$300,000.00	*Destructive and heavy rains occurring Feb. 13-20, 1989 have caused great damage to public facilities in several counties. By Act 511 of 1973, as amended, do hereby declare a state of emergency exists and do hereby establish the sum of $ 300,000 in the Disaster Assistance Fund to provide disaster relief to those counties affected.*	

Note: Dollar amounts shown here reflect the amount a county may have received for special circumstances. However a $0.00 shown here does not mean that the county received no funds.

Proclamation # / Date of Proclamation	Proclamation Award	Description and date of Incident	County Award
		11/5/1994	**$0.00**
D 94-26 11/30/1994	**$125,000.00**	*Severe storms which, occurred Nov. 5, 1994 and continued through Nov. 27, 1994, have caused great damage to public facilities. By Act 511 of 1973, as amended, do hereby declare that a state of disaster emergency exists and do hereby release for Individual Assistance from the Governor's Disaster Fund $50,000 for supplemental disaster relief to the affected individuals and for Public Assistance $75,000 for the repair &/or restoration of their public facilities. Hereby invoke executive powers under Section 8, Act 511 of 1973 , further waive the established meals and lodging limits for which state employees may be reimbursed while providing disaster assistance.*	To receive Public Assistance Funds
		11/5/1994	**$0.00**
D 94-27 1/9/1995	**$25,000.00**	*Severe storms which, occurred Nov. 5, 1994 and continued through Nov. 27, 1994, have caused great damage to public facilities. These citizens and local government require supplemental assistance to recover from these losses. By Act 511 of 1973, as amended, do hereby amend Proclamation of Nov. 30, 1994 to authorize funds from the Governor's Disaster Fund for the Individual Assistance Program in the amount of $25,000.*	To receive Public Assistance Funds
		12/12/2000	**$0.00**
DR 01-01 1/4/2001	**$1,325,000.00**	*Severe winter weather that began Dec. 12, 2000 has continued to cause great damage to private property and public facilities. By Act 511 of 1973, as amended, do hereby amend Proclamation DR 00-18/00-19 to include the following counties; do hereby authorize funds from the Emergency Response Fund in the amount of $75,000, the Individual Assistance Fund $250,000 and $1,000,000 from the Governor's Disaster Fund. Hereby invoke executive powers under Section 8, Act 511 of 1973. Presidential Disaster Declaration on Dec. 29, 2000.*	

Note: Dollar amounts shown here reflect the amount a county may have received for special circumstances. However a $0.00 shown here does not mean that the county received no funds.

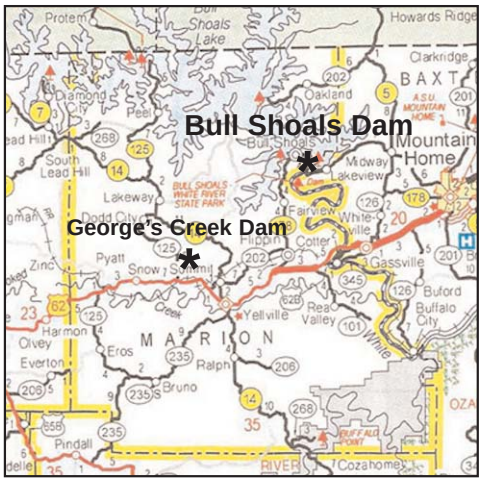
Proclamation # / Date of Proclamation	Proclamation Award	Description and date of Incident	County Award
		12/12/2000	**$0.00**
DR 01-05 2/5/2001	**$400,000.00**	*Severe winter weather that began Dec. 12, 2000 has continued to cause great damage to private property and public facilities. By Act 511 of 1973, as amended, do hereby amend Proclamation DR01-01; do hereby authorize additional funds from the Emergency Response Fund in the amount of $50,000, and the Individual Assistance Fund $350,000 from the Governor's Disaster Fund. Hereby invoke executive powers under Section 8, Act 511 of 1973. Presidential Disaster Declaration on Dec. 29, 2000.(See Proclamation's DR 00-18 and its amendments DR 00-19, 00-21, 01-02).*	
		12/12/2000	**$0.00**
DR 01-07 2/28/2001	**$200,000.00**	*Severe winter weather that began Dec. 12, 2000 has continued to cause great damage to private property and public facilities. By Act 511 of 1973, as amended, do hereby amend Proclamation DR01-01; do hereby authorize additional funds from the Individual Assistance Fund in the amount of $200,000 from the Governor's Disaster Fund. Hereby invoke executive powers under Section 8, Act 511 of 1973. Presidential Disaster Declaration on Dec. 29, 2000.(See Proclamation's DR 00-18 and its amendments DR 00-19, 00-21, 01-02, 01-05).*	
		12/12/2000	**$0.00**
DR 01-11 3/26/2001	**$200,000.00**	*Severe winter weather that began Dec. 12, 2000 has continued to cause great damage to private property and public facilities. By Act 511 of 1973, as amended, do hereby amend Proclamation DR01-01; do hereby authorize additional funds from the Individual Assistance Fund in the amount of $200,000 from the Governor's Disaster Fund. Hereby invoke executive powers under Section 8, Act 511 of 1973. Presidential Disaster Declaration on Dec. 29, 2000.(See Proclamation's DR 00-18 and its amendments DR 00-19, 00-21, 01-02, 01-05, 01-07).*	

Note: Dollar amounts shown here reflect the amount a county may have received for special circumstances. However a $0.00 shown here does not mean that the county received no funds.

Proclamation # / Date of Proclamation	Proclamation Award	Description and date of Incident	County Award
		12/12/2000	**$0.00**
DR 03-33 9/25/2003	**$500,000.00**	*Severe winter weather that began Dec. 12, 2000 caused great damage to private property and public facilities. By Act 511 of 1973, do hereby amend Proclamation DR 00-18 and its amendments (DR 00-19, 00-21, 01-01, 01-02 & 01-05), to include an additional $500,000 under the Public Assistance program. This money will be used to pay the State share of funding under FEMA 1354-DR-AR.*	

Note: Dollar amounts shown here reflect the amount a county may have received for special circumstances. However a $0.00 shown here does not mean that the county received no funds.

Dam Failure Profile



NPDP ID	AR00160
Dam Name	Bull Shoals
Other Dam Name	Bull Shoals Lake
Year of Completion	1951
State ID	00820
Is in NID	Yes
Is in Operation	Yes
Longitude	-92.57
Latitude	36.36
State	AR
County	Baxter
Town Section	
River	White
Owner Name	Ceswl
Owner Type	Federal
Dam Types	Concrete Gravity
NID Core	Homogenous dam; Concrete; Known;
Crest Length	2256
Dam NID Height	282
Structral Height	282
Hydraulic Height	238
Dam Volume	2100000
NID Type	Rock
Max Storage Capacity	5408000
Normal Storage Capacity	3048000
NID Storage Capacity	5408000
Surface Area	454400
Drainage Area	6063
Primary Purpose	Flood Control and Storm Water Management
Secondary Purpose	Hydroelectric
Hazard Classification	High
EAP	Yes
Is State Regulated	No

National Performance of Dams Program, Stanford University

A dam is a barrier constructed across a watercourse for the purpose of storage control or diversion of water. The Arkansas Legislature defines a dam as "any barrier, including one for flood detention, designed to impound liquid volumes." (AR Code Annotated Section 15-22-201 through 15-22-222). Dams typically are constructed of earth, rock, concrete or mine tailings.

In hydrologic terms, it is any artificial barrier that impounds or diverts water. The dam is generally hydrologically significant if it is: **1.** 25 feet or more in height from the natural bed of the stream and has a storage of at least 15 acre-feet or **2.** Has an impounding capacity of 50 acre-feet or more and is at least six feet above the natural bed of the stream.

A dam failure is the collapse, breach, or other failure resulting in downstream flooding. *Source: Association of State Dam Safety Officials, July 2000.*

Element A: Locations. Marion County has two dams.

Bull Shoals Dam: It holds Bull Shoals Reservoir, a high-hazard (Class C) dam that extends across the northern part of Marion County and into Missouri. The table on this pages gives its specifications. To assess risk, we are using the U.S. Army Corps of Engineers' Bull Shoals Dam Flood Emergency Action Plan, updated 2010. On the following pages are maps showing areas that are predicted to be inundated (covered) during failure of the dam concurrent with a spillway design flood.

Although it is classified as a high-hazard dam, the USACE 2010 report says, "The possibility is extremely remote" that failure will occur. See criteria for this on the next page.

TABLE E-1: HAZARD POTENTIAL CLASSIFICATION FOR CIVIL WORKS PROJECTS

CATEGORY [1]	LOW	SIGNIFICANT	HIGH
Direct Loss of Life [2]	None expected (due to rural location with no permanent structures for human habitation)	Uncertain (rural location with few residences and only transient or industrial development)	Certain (one or more extensive residential, commercial or industrial development)
Lifeline Losses [3]	No disruption of services – repairs are cosmetic or rapidly repairable damage	Disruption of essential facilities and access	Disruption of critical facilities and access
Property Losses [4]	Private agricultural lands, equipment and isolated buildings	Major public and private facilities	Extensive public and private facilities
Environmental Losses [5]	Minimal incremental damage	Major mitigation required	Extensive mitigation cost or impossible to mitigate

Notes:

1. Categories are based upon project performance and do not apply to individual structures within a project.
2. Loss of life potential based upon inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the extent of development and associated population at risk, time of flood wave travel and warning time.
3. Indirect threats to life caused by the interruption of lifeline services due to project failure, or operation, i.e., direct loss of (or access to) critical medical facilities or loss of water or power supply, communications, power supply, etc.
4. Direct economic impact of value of property damages to project facilities and down steam property and indirect economic impact due to loss of project services, i.e., impact on navigation industry of the loss of a dam and navigation pool, or impact upon a community of the loss of water or power supply.
5. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond which would normally be expected for the magnitude flood event under a without project conditions.

Bull Shoals Dam feeds the tailwaters of the White River, which forms the eastern boundary of Marion County. In the following pages, we have traced the projected inundation area only on the right bank of the White, which is all that Marion County includes. (The left bank is in Baxter County.)

A dam failure would unleash a high-velocity wall of water over 200 feet high, destroying virtually everything in its path.

Populated areas extend from the dam to Buffalo City, a distance of 30.5 miles. The county assessor's office has identified 329 parcels in the inundation area with structures valued at $40,349,900. More discussion of the area at risk is in the Vulnerability Assessment. The dam also serves as a bridge on Arkansas State Highway 178, which connects Baxter and Marion counties. It would be wiped out.

Two other highway bridges would be completely covered with water, severely damaged or possibly wiped out. They are the main U.S. Highway 62/412 bridge and the bridge on 62/412 Business. This highway is the main transportation artery across northern Arkansas. The Missouri and North Arkansas Railroad bridge would also be completely covered and subject to complete destruction. (See Vulnerability Assessment.)

River Maps Explained

A CD containing high-resolution jpgs of the aerial maps is submitted with this plan. Names of jpgs are indicated below each aerial map.

The USACE Bull Shoals Dam Flood Emergency Action Plan defines dam failure as "Any condition resulting in the uncontrolled release of water other than over or through an uncontrolled spillway or outlet works."

It also spells out the impact of a dam failure at three key points along the Marion County border. ***River mile*** is defined as "the distance measured along the channel above the mouth," which is at the Arkansas River in southeastern Arkansas. ***Arrival time*** is "the elapsed time between arrival of dangerously high flows immediately downstream from the dam and arrival of dangerously high flows at a point downstream." ***Peak time*** is "elapsed time after assumed event until peak elevation occurs."

When conditions are normal, the depth of the river from the center of the channel to the bank is generally no more than an average of 15 feet. It is often as shallow as 5 to 10 feet when generation from the dams is low. The term ***"channel base elevation"*** means the elevation at the bottom of the river in the deepest part of the channel.

Only three points in Marion County are specified regarding impact in the USACE emergency plan. They are:

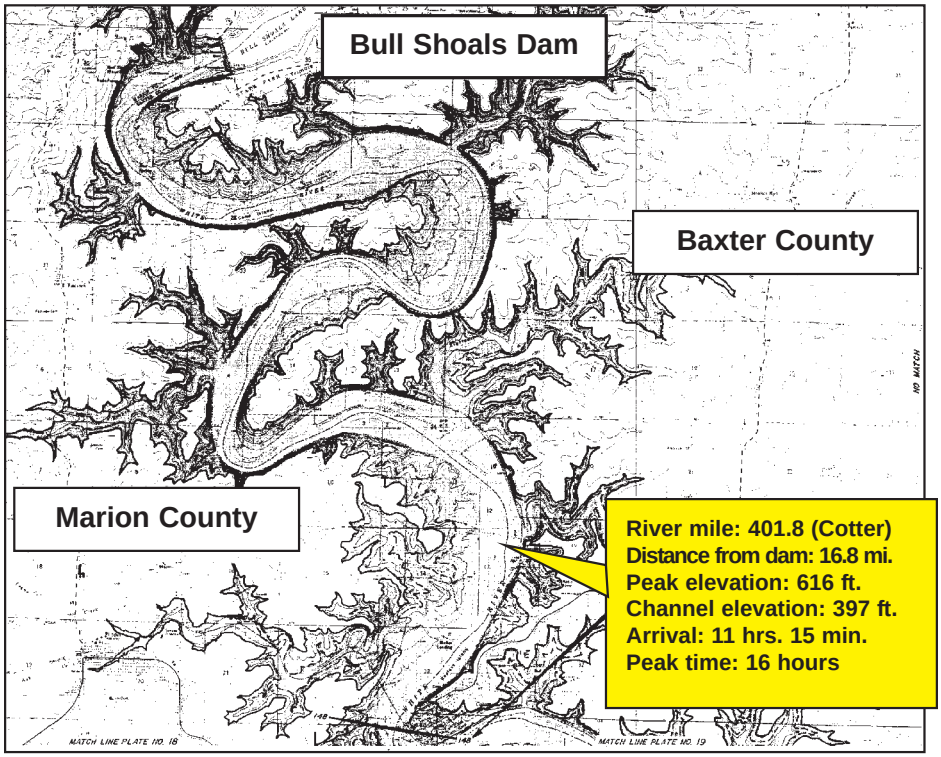
River mile 401.8: The town of Cotter, which is on the Baxter County side. Distance from dam, 16.8 miles. Arrival time: 11 hours, 15 minutes. Peak time: 16 hours. Peak elevation: 616.2 feet. Channel base elevation: 397 feet.

River mile 394.9: Mouth of Crooked Creek. Distance from dam, 23.7 miles. Arrival time: 17 hours, 45 minutes. Peak time: 22 hours, 30 minutes. Peak elevation: 586.8 feet. Channel base elevation: 385 feet.

River mile 388.1: Mouth of Buffalo River,. Distance from dam, 30.5 miles. Arrival time: 32 hours, 15 minutes. Peak time: 37 hours. Peak elevation: 560.4 feet. Channel base elevation: 375 feet.

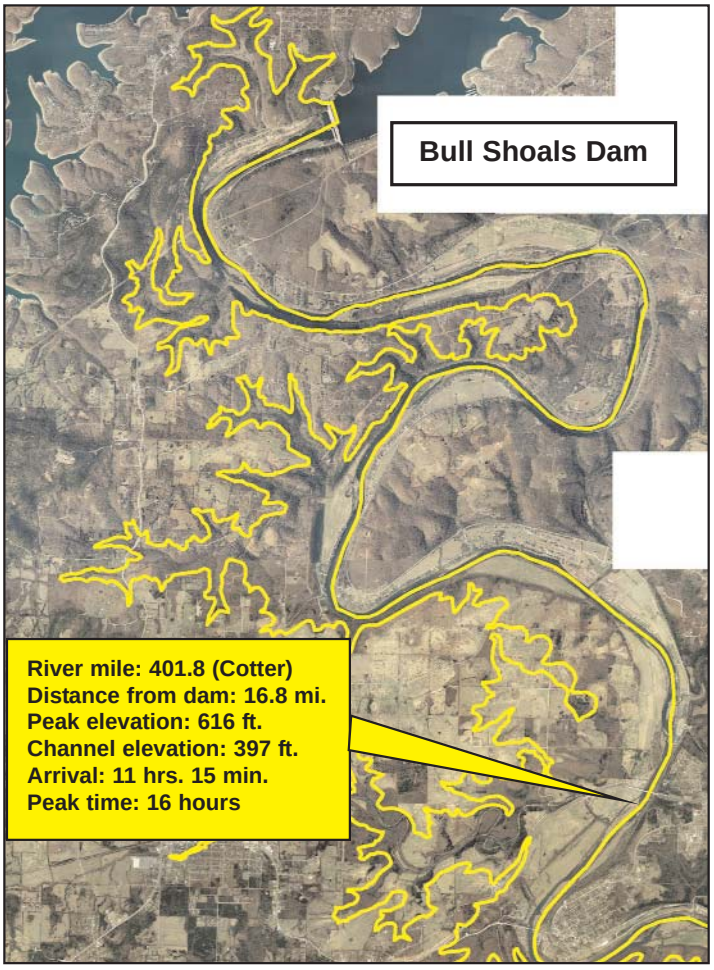
We show these three points on the maps that follow. We have transferred the outline of the inundation area in the USACE maps onto maps in Pictometry International's 2011 Marion County Electronic Field Study and added other points of reference.

George's Creek Dam is in the central, rural part of the county, has only a small building in the inundation area. It is regulated by the Arkansas Natural Resources Commission and is a Class A, or low risk, dam. A page of data from the ANRC is included, as well as an aerial view and a topo map.



U.S. Army Corps of Engineers

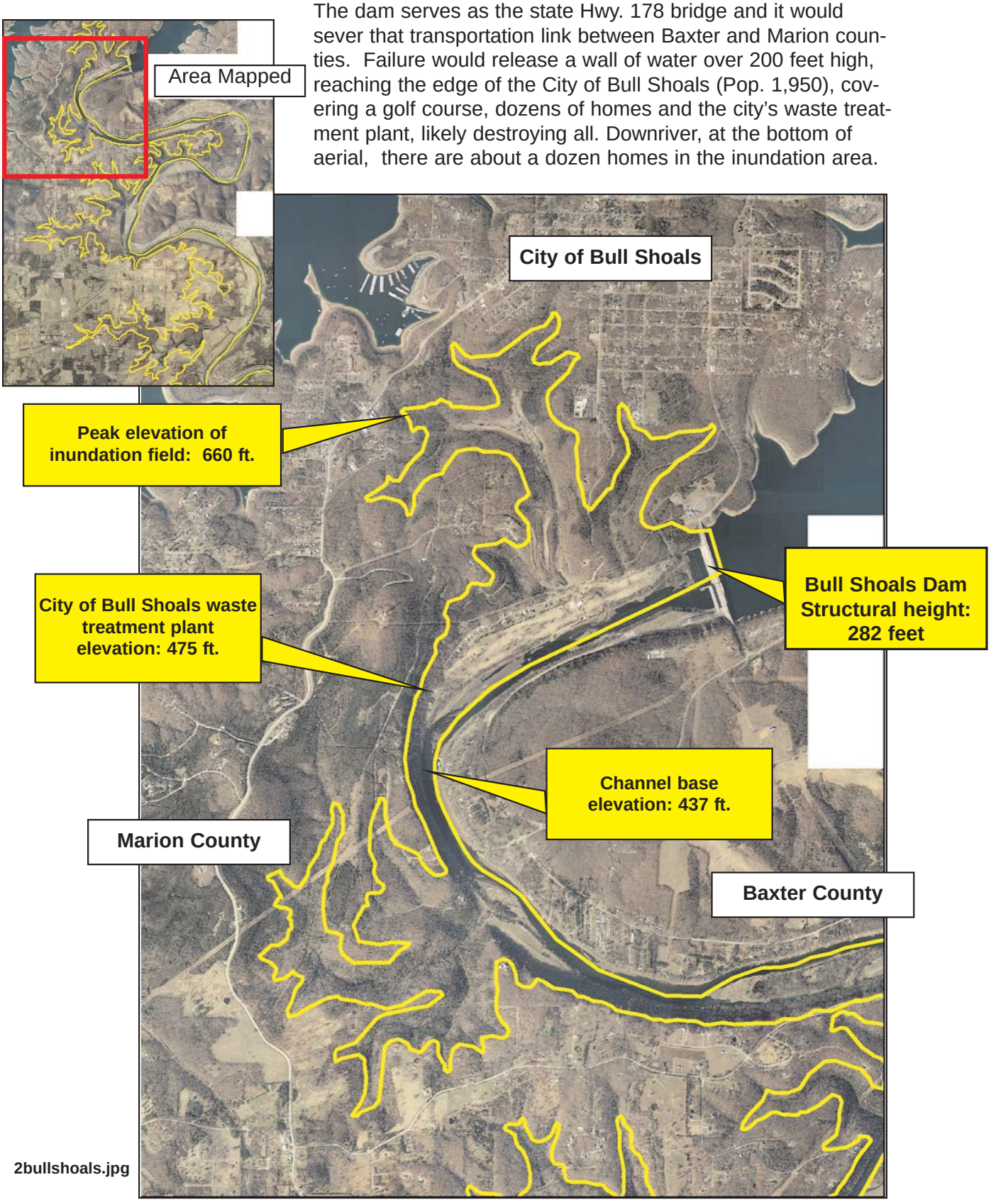
The White River separates Marion and Baxter counties. Marion is on the right bank. The map above is from the U.S. Army Corps of Engineers Bull Shoals Lake Emergency Action Plan and shows the peak inundation areas in the event of dam failure. At right is the same area overlaid on Marion County's Electronic Field Study, done by Pictometry International Corp. in 2011. Blank areas on these and subsequent maps indicate the limits of the study. Areas of inundation outlined in yellow on the aerial are in Marion County only. Following pages show this map in more detail.



JAMIE CRAIGHEAD and SHEILA DANIEL, Marion County Pictometry International Corp. Marion County Field Study

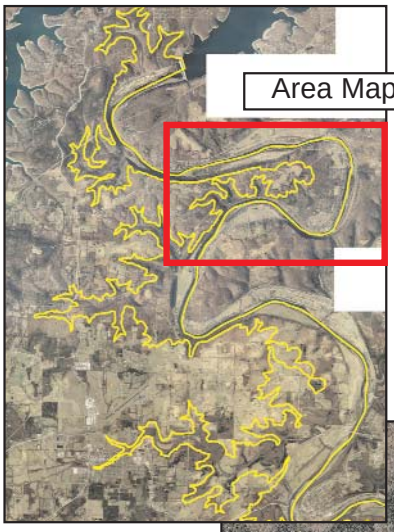
1dam-cotter.jpg

The dam serves as the state Hwy. 178 bridge and it would sever that transportation link between Baxter and Marion counties. Failure would release a wall of water over 200 feet high, reaching the edge of the City of Bull Shoals (Pop. 1,950), covering a golf course, dozens of homes and the city's waste treatment plant, likely destroying all. Downriver, at the bottom of aerial, there are about a dozen homes in the inundation area.

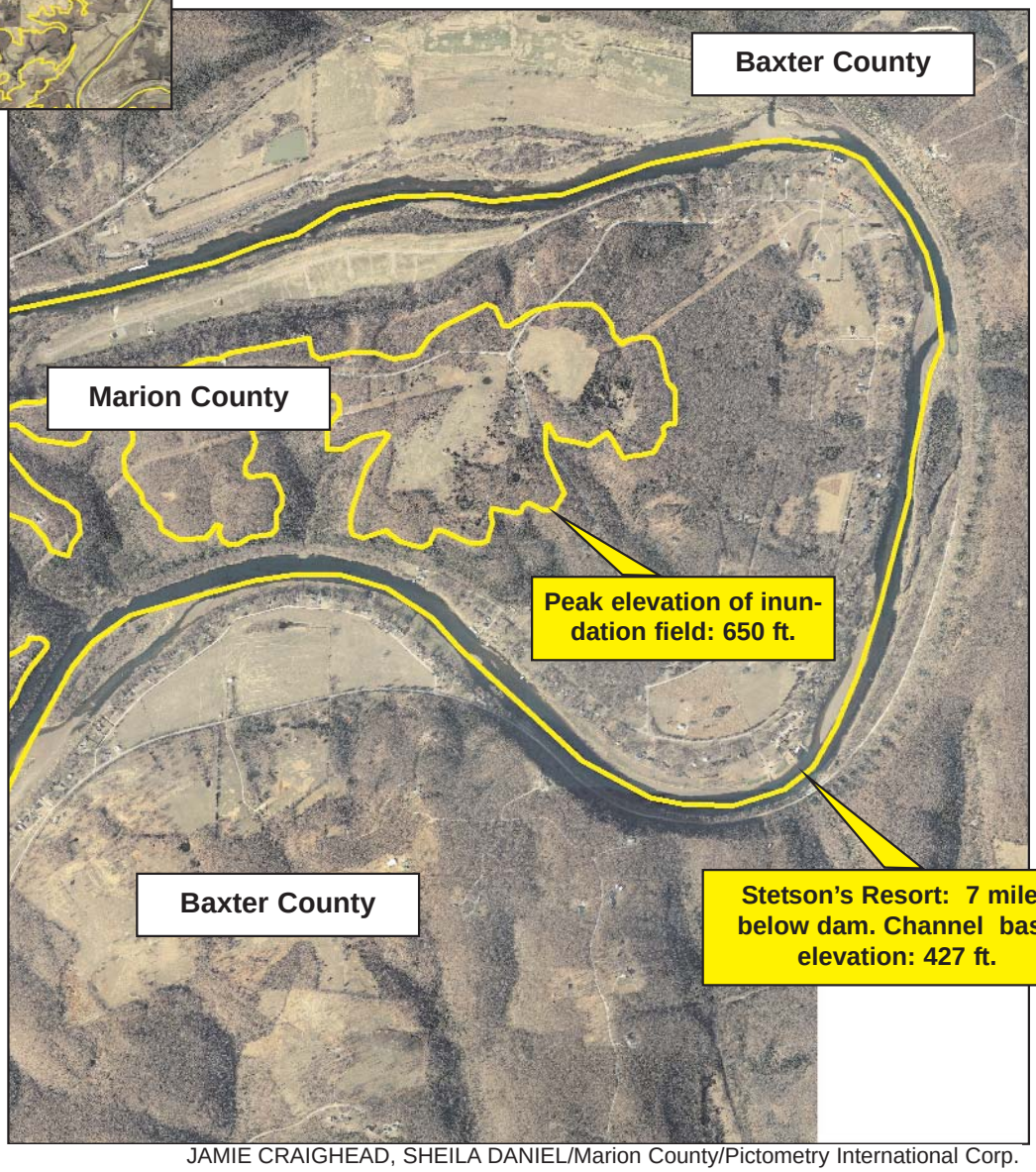


2bullshoals.jpg

JAMIE CRAIGHEAD, SHEILA DANIEL/Marion County/Pictometry International Corp.

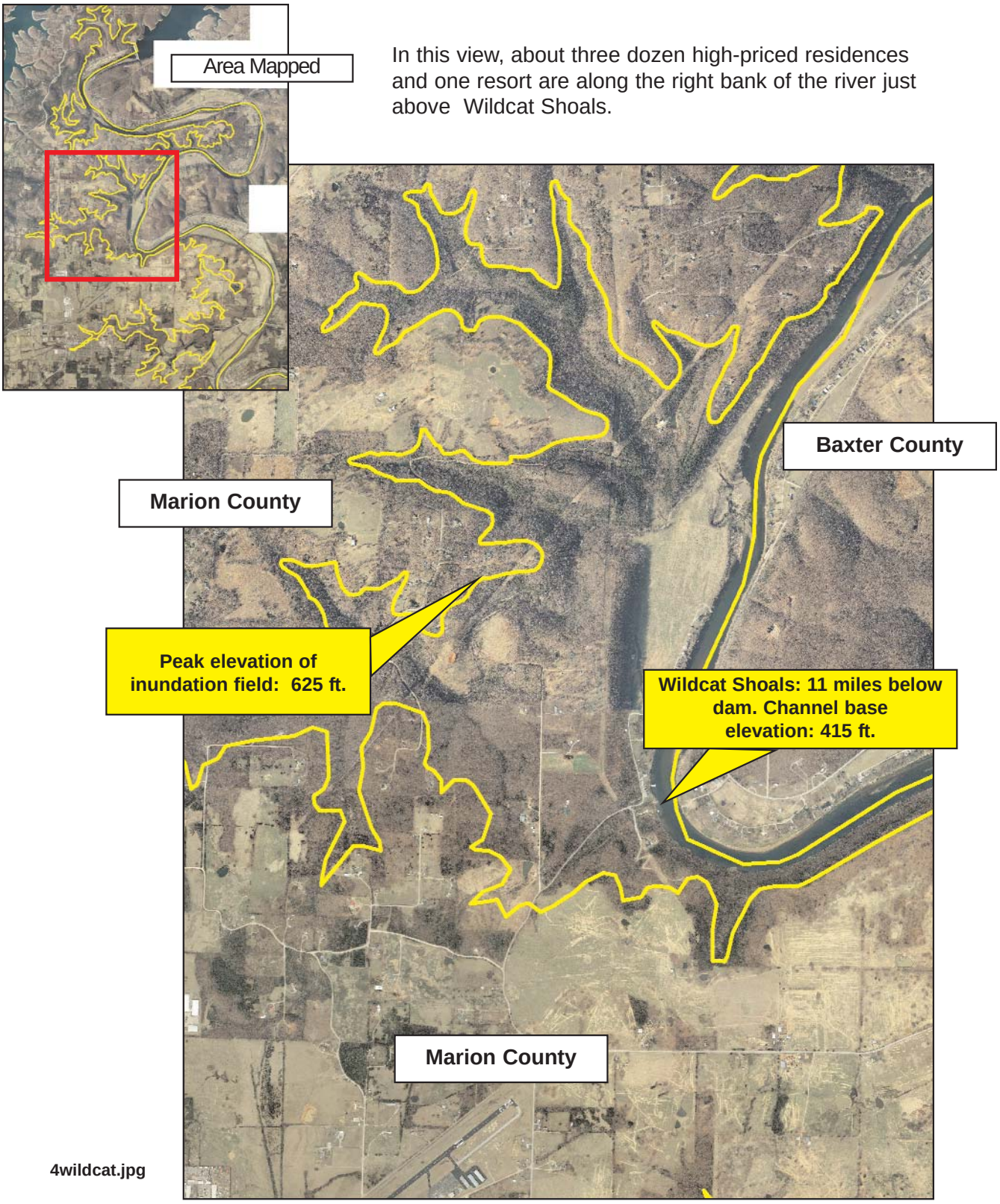


The inundation area on the right bank of the big bend in this photo is the most densely populated along the river on the Marion County side. It includes three resorts and dozens of high-priced homes that would be covered by up to 200 feet of water or more. They likely would be swept away into a growing debris field.



3bigbend.jpg

JAMIE CRAIGHEAD, SHEILA DANIEL/Marion County/Pictometry International Corp.

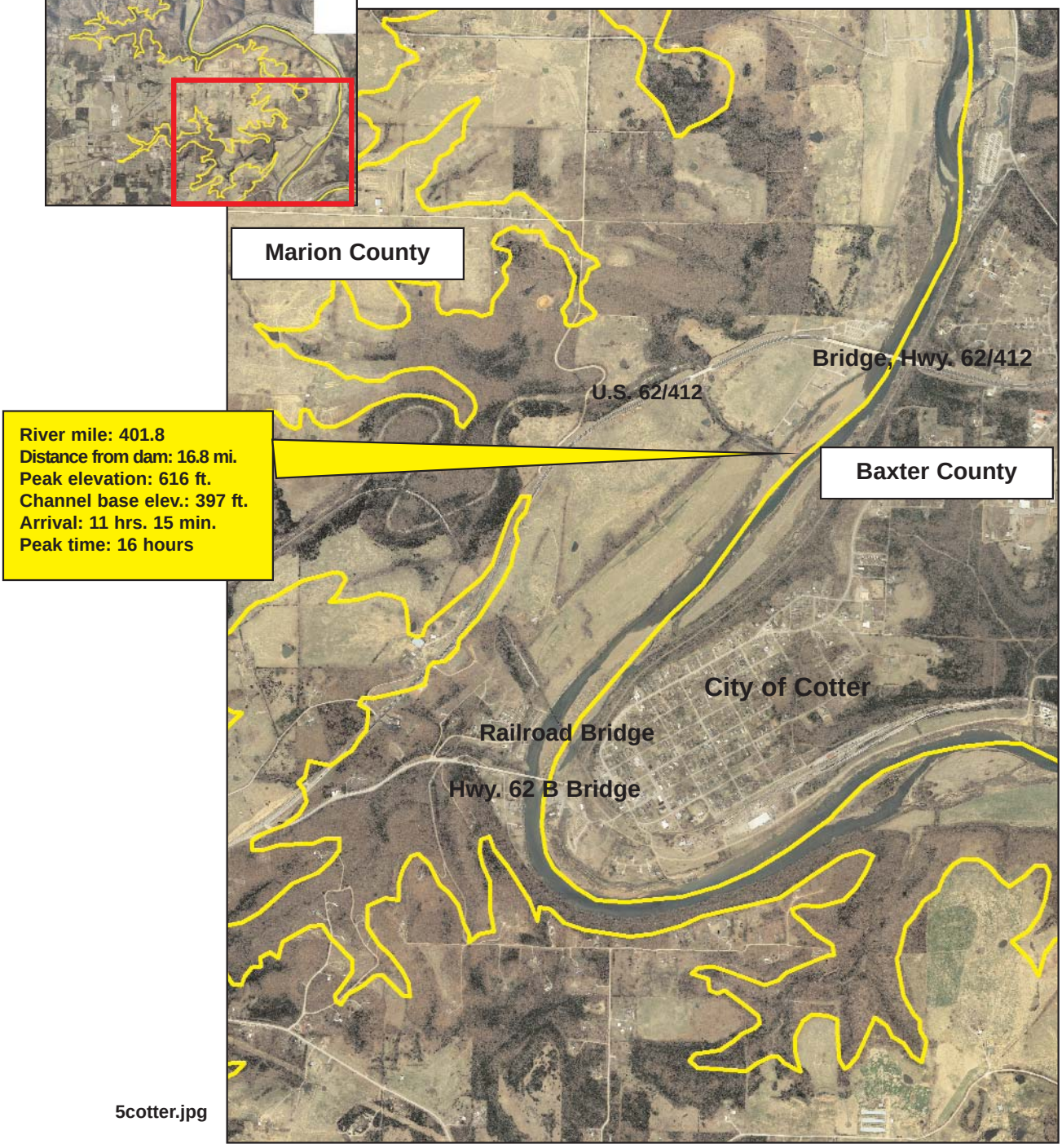


In this view, about three dozen high-priced residences and one resort are along the right bank of the river just above Wildcat Shoals.

4wildcat.jpg

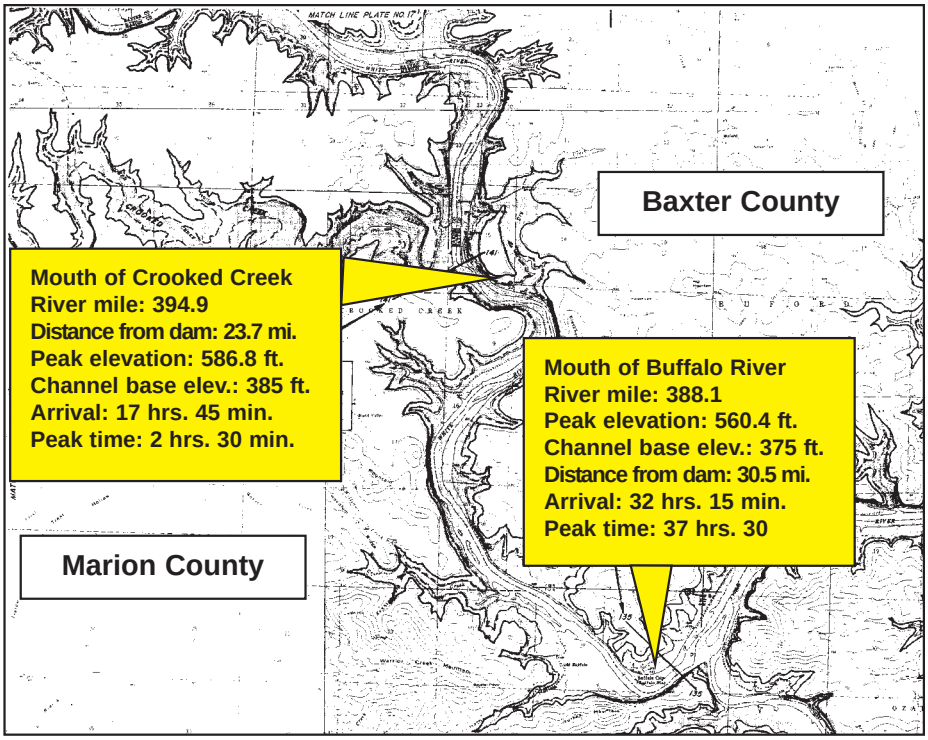
JAMIE CRAIGHEAD, SHEILA DANIEL/Marion County/Pictometry International Corp.

This aerial shows the river just above and including the City of Cotter in Baxter County. On the Marion County side, there are two campground resorts, several expensive houses, businesses and a church. The inundation zone encompasses much of U.S. Hwy. 62/412, a major east-west artery across the state. Two highway bridges and a railroad bridge would be severely damaged or destroyed.



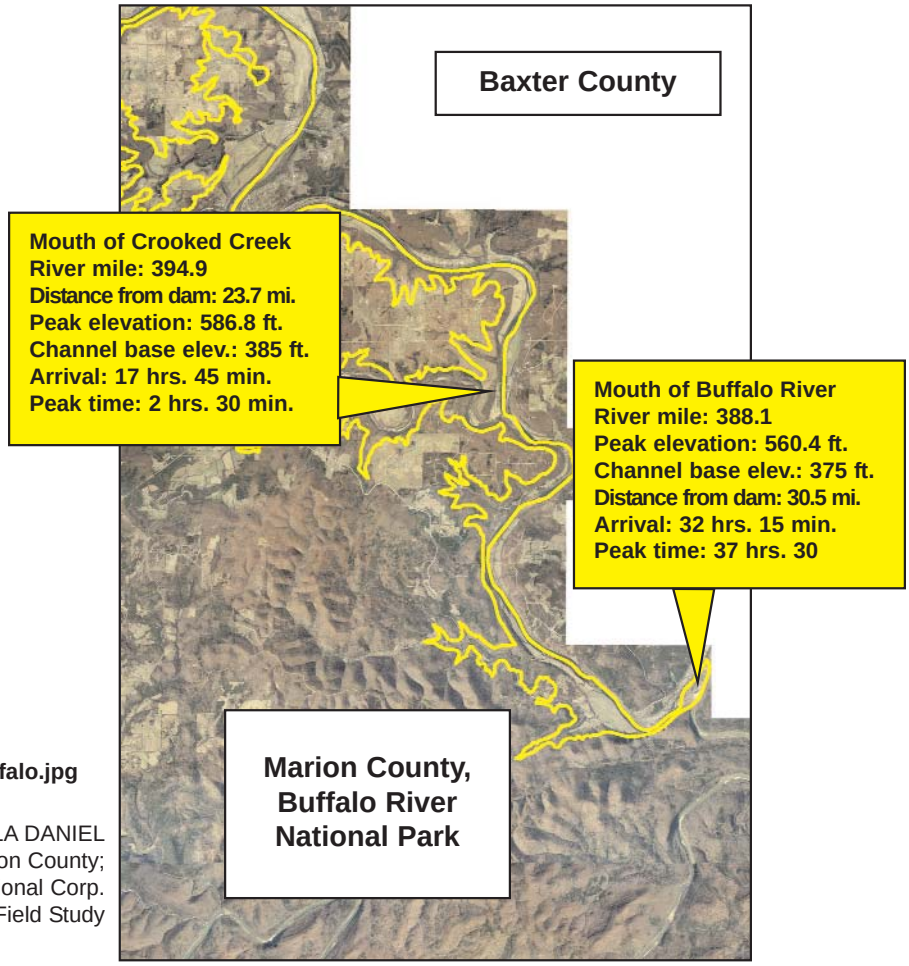
5cotter.jpg

JAMIE CRAIGHEAD, SHEILA DANIEL/Marion County/Pictometry International Corp.



U.S. Army Corps of Engineers

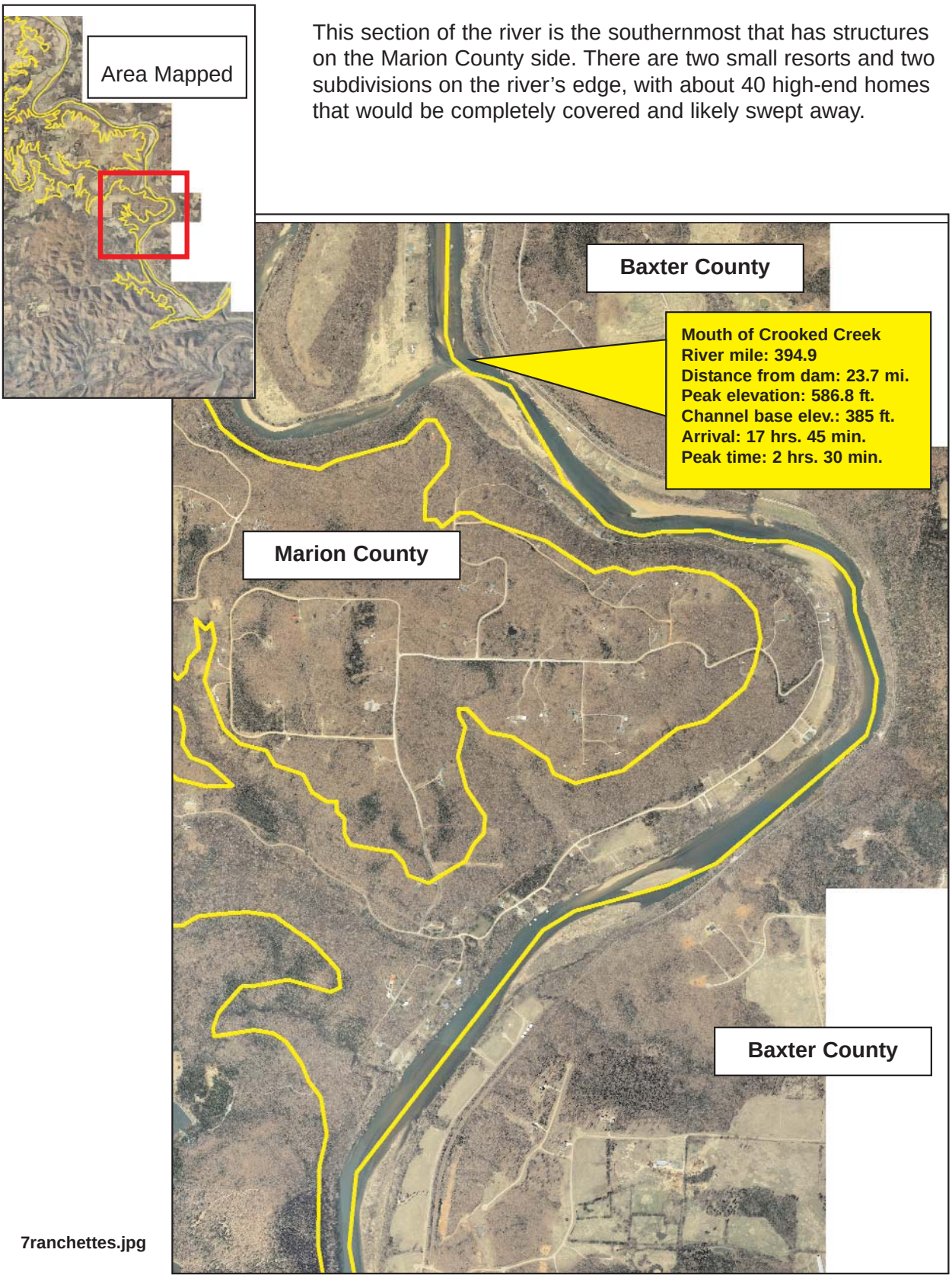
These maps show the White River inundation zone from the City of Cotter in Baxter County to the mouth of the Buffalo River. Below the Buffalo there are no structures; it is the Buffalo River National Park Wilderness Area. Just below the mouth of Crooked Creek are two subdivisions that have a number of expensive homes. The next page will zoom in on them.



6cotter-buffalo.jpg

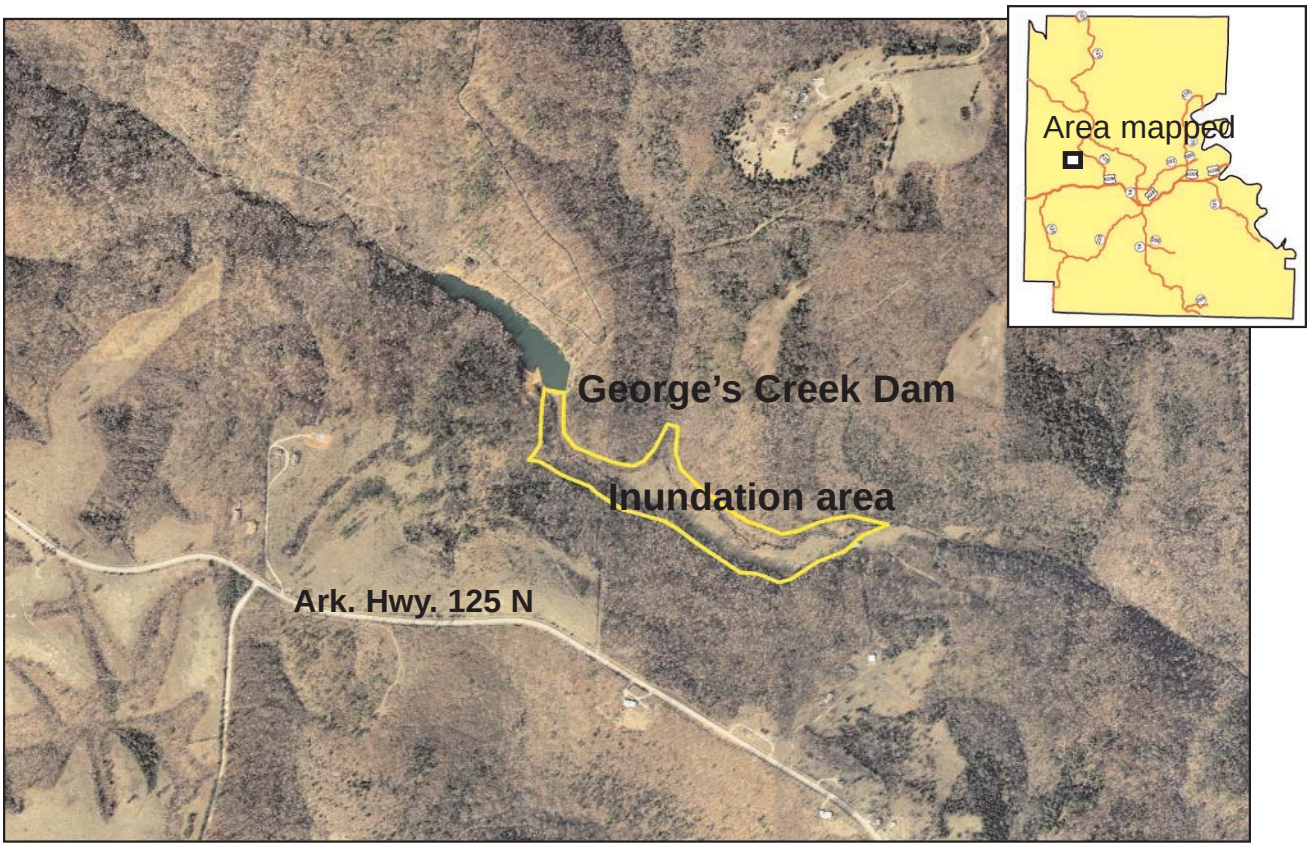
JAMIE CRAIGHEAD, SHEILA DANIEL
Marion County;
Pictometry International Corp.
Marion County Field Study

This section of the river is the southernmost that has structures on the Marion County side. There are two small resorts and two subdivisions on the river's edge, with about 40 high-end homes that would be completely covered and likely swept away.



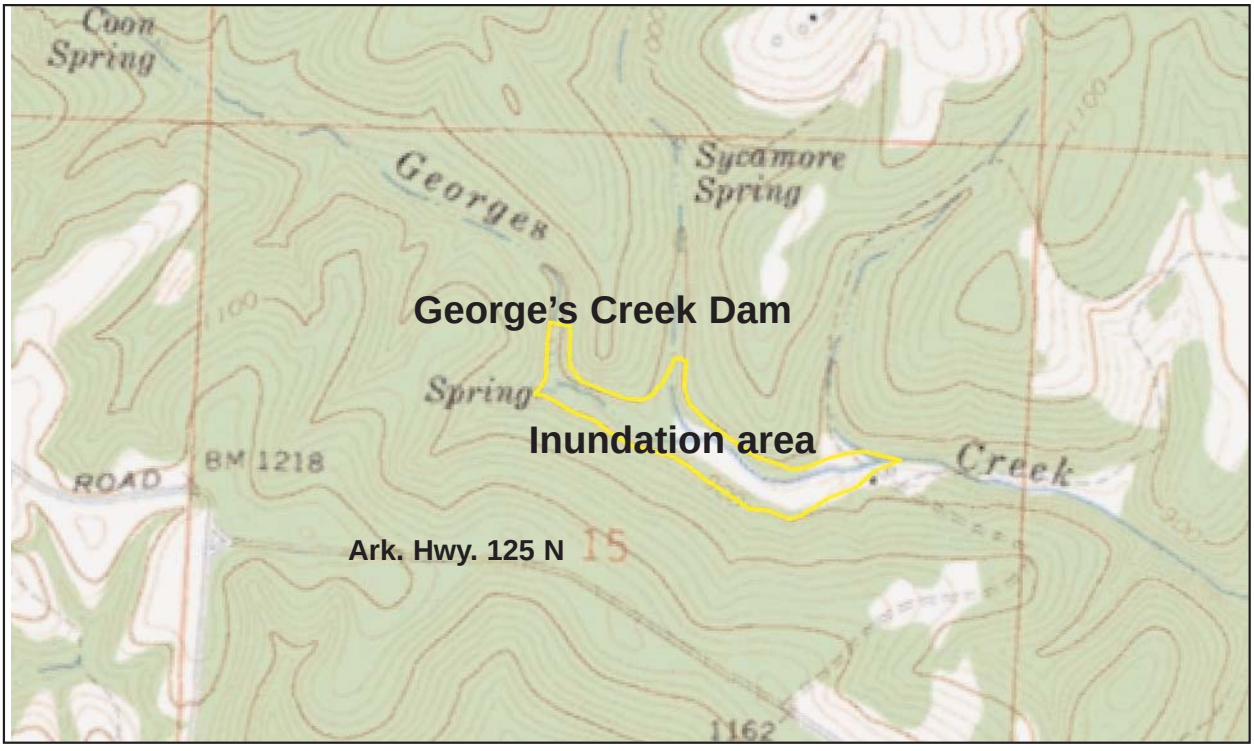
7ranchettes.jpg

JAMIE CRAIGHEAD, SHEILA DANIEL/Marion County/Pictometry International Corp.



8georgescreek.jpg JAMIE CRAIGHEAD/Marion County Assessor's Office/Pictometry International Corp.

George's Creek Dam: In central rural Marion County, regulated by Arkansas Natural Resources Commission, rated Class A, low risk. Inundation area traced in yellow. For recreational use with only one structure on the lower edge of the inundation zone. Impact of a break: negligible.



JAMIE CRAIGHEAD/Marion County Assessor's Office/Pictometry International Corp.

DAMS PERMIT:	263	ARNUM:	AR01462
PERMIT_STAT:	CNR	ARNUMBER:	1462
ISSUE_DATE:	1/24/1987	HAZARD:	L
EXP_DATE:	1/21/2037	INSP_SET:	0

DAM_NAME:	GEORGE CREEK DAM
POP_NAME:	WALLACE DAM
RIVER_STREAM:	SPRING CREEK
BASIN:	UPPER WHITE

George's Creek Dam is also called Wallace Dam.

This fact sheet was furnished by Alvin Simmons, Engineer Supervisor in the Dam Safety/Flood Plain Management section of the Arkansas Department of Natural Resources.

This page is reproduced exactly as it was furnished by Mr. Simmons. This box is positioned to cover private information about the owner.

COUNTY:	MARION
S_T_R:	S15,T19N,R17W
LAT_DEG:	36
LAT_MIN:	17
LAT_SEC:	56
LON_DEG:	92
LON_MIN:	46
LON_SEC:	13
SEISMIC_ZONE:	1
QUADNAME:	PYATT, AR
BINDER:	3692
SHEET:	C7
DAM_TYPE:	RE
LENGTH-ft:	135
DAM_HGT-ft:	24
STR_HGT-ft:	0
HYD_HGT-ft:	0
PURPOSES:	R
MAX_VOL ac-ft:	33
NORM_VOL ac-ft:	28
SEDI_VOL:	0
DRAIN_AREA sq mi:	1.5
MAX_SURF ac:	0
NORM_SURF ac:	5
MAX_DISCHG cfs:	0
MIN_REL cfs:	0
YEAR_COMP:	1982
PHASE_1:	N
UNSAFE:	N
NRCS:	N
AFF_CITY:	NONE
AFF_CITY_DIS mi:	000
PRIV_ON_FED:	N
REG_AGENCY:	ANRC
E_A_P:	NR
TABLETOP_LAST:	
EAP_ATTENDEE:	
LAST_INSP:	11/15/1990
INSPECTOR:	AS
FOLLOW_UP:	1/2/1991

data sheet printed 4/22/2011

Source: Arkansas Natural Resources Commission

Element B for Bull Shoals Dam: Extent (magnitude, severity). CPRI Index total: 2.5 Probability, 1 (unlikely; no previous events); magnitude, 4 (catastrophic); severity, 4 (catastrophic); warning time, 3 (six to 12 hours).

Element C for Bull Shoals: Previous occurrences. None

Element D for Bull Shoals: Probability of future events. Unlikely.

Element B for George's Creek Dam: Extent (magnitude, severity). CPRI total, 1.3. Probability 1, (unlikely; no previous events); magnitude, 1 (negligible); severity, 1 (negligible); warning time, 3, (six to 12 hours).

Element C for George's Creek: Previous occurrences. None

Element D for George's Creek: Probability of future events. Unlikely.

Vulnerability Assessment
Bull Shoals Dam

Element A: Overall summary. This dam represents a low probability but high consequence scenario. Loss of life is certain. Places suffering catastrophic losses would be the City of Bull Shoals and unincorporated areas in the 30.5-mile-long White River Valley.

A wall of water over 200 feet high would be unleashed. Economic impact would be severe; the reservoir and the river are the basis of the county's tourism industry, which accounts for $41 million in business each year. There would be disruption of critical facilities and highway access. Extensive loss of public and private facilities. Environmental losses would require extensive mitigation cost or be impossible to mitigate.

Element B: Impact on jurisdictions. The City of Bull Shoals and the eastern edge of unincorporated Marion County for 30.5 miles along the river and valley. Flippin, Pyatt, Summit and Yellville would not be directly affected by water, nor would the schools districts of Yellville-Summit or Ozark Mountain. The Flippin School District campus would not be affected but some bus routes would be.

The water first would reach the southwestern edge of the Bull Shoals (Pop. 1,950), a golf course, several dozen homes and the city's wastewater treatment plant. It would be destroyed, leaving the city without sanitation.

The county assessor's office has identified 329 parcels in the inundation area containing at least 400 structures with a total value of $40,349,900. All would be completely covered with water and most destroyed, including eight resorts, six businesses, a church, about 300 single-family homes and about 100 barns and out buildings.

Transportation links would be severed. The dam serves as a bridge on Arkansas State Highway 178, which connects Baxter and Marion counties.

The main U.S. Highway 62/412 bridge and the bridge on 62/412 B would be covered and either be destroyed or rendered inoperable for weeks to months.

Interstate commerce would be severely disrupted because 62/412 is the main east-west artery across northern Arkansas. It carries 8,700 vehicles a day, according to the Arkansas Highway and Transportation Department.

A bridge serving the Missouri and North Arkansas Railroad, with links to the rest of the United States, would also be completely covered and likely destroyed.

Vulnerability Assessment
George's Creek Dam

Element A: Overall Summary. No loss of life expected, no disruption of services, losses only to private agricultural land, minimal environmental damage.

Element B: Impact on Jurisdictions. The only area affected would be 1.5 square miles of unincorporated Marion County, containing one structure. Unaffected would be the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville and the school districts of Flippin, Yellville-Summit and Ozark Mountain.

Drought Profile

Drought is a deficiency of moisture that results in adverse impacts on people, animals or vegetation over a sizable area. *Source: NOAA glossary.*

The Palmer Drought Severity Index is the most effective in determining long-term drought, a matter of several months. It uses zero as normal and drought is shown in terms of minus numbers. For example, minus two is moderate drought, minus three is severe and minus four is extreme. It is standardized to the local climate. *Source: Arkansas All-Hazard Mitigation Plan, 2010.*

Palmer Classifications	
4.0 or more	extremely wet
3.0 to 3.99	very wet
2.0 to 2.99	moderately wet
1.0 to 1.99	slightly wet
0.5 to 0.99	incipient wet spell
0.49 to -0.49	near normal
-0.5 to -0.99	incipient dry spell
-1.0 to -1.99	mild drought
-2.0 to -2.99	moderate drought
-3.0 to -3.99	severe drought
-4.0 or less	extreme drought

Element A: Location. All of the county is affected by drought: all unincorporated areas; the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville, and the school districts of Flippin, Yellville-Summit and Ozark Mountain.

Element B: Extent (magnitude, severity). The CPRI index total is 1.45. Probability, 2 (PDSI classification range of -1.0 to -4.0 or less every 3.8 years); magnitude, 1 (negligible); severity, 1 (negligible); warning time, 1 (more than 24 hours).

Element C: Previous occurrences. There have been 30 events classified as "drought," and another 12 classified as "dry spell." The table below spells these out, and the chart on the next page gives a visual representation.

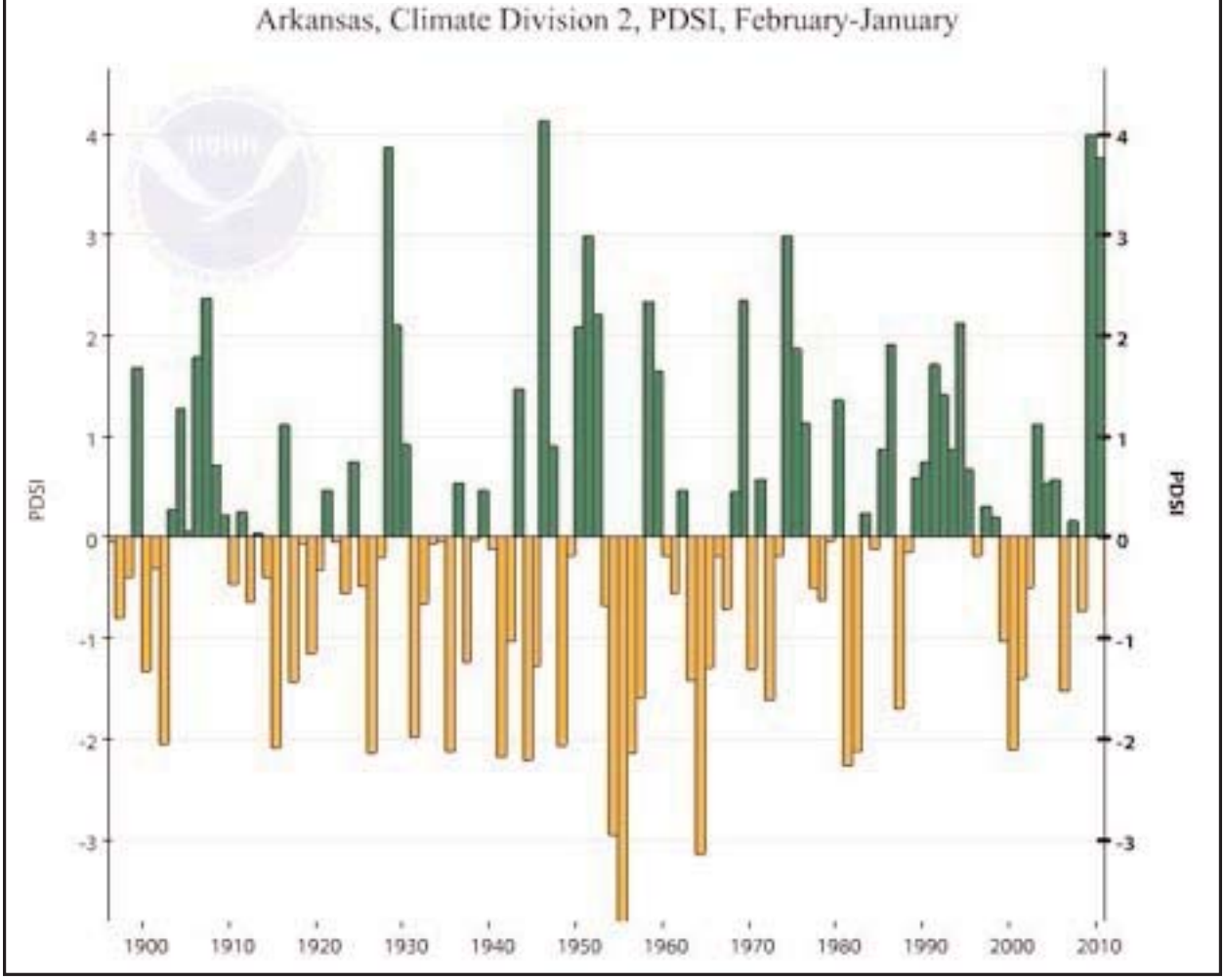
Marion County's Drought History

Arkansas Climate Division 2, which includes Marion County, has seen 42 events since 1897 ranging from the Palmer Drought Severity Index classifications of "dry spell" to "extreme drought." Thirty years were classified as having drought. Based on this history, the county can expect a drought every 3.8 years. Using the Calculated Priority Risk Index, a drought in the county is deemed possible. CPRI Index: 1.45.

YEAR	CLASS, PDSI	YEAR	CLASS, PDSI	YEAR	CLASS, PDSI
1897	dry spell, -0.80	**1942**	mild drought, -1.04	**1970**	mild drought, -1.31
1900	mild drought, -1.33	**1944**	moderate drought, -2.21	**1972**	mild drought, -1.62
1902	moderate drought, -2.05	**1945**	mild drought, -1.28	**1977**	dry spell, -0.50
1912	dry spell, -0.65	**1948**	moderate drought, -2.07	**1978**	dry spell, -.63
1915	moderate drought, -2.09	**1953**	dry spell, -0.68	**1981**	moderate drought, -2.27
1917	mild drought, -1.43	**1954**	moderate drought, -2.95	**1982**	moderate drought, 2.13
1919	mild drought, -1.15	**1955**	extreme drought, -4.13	**1987**	mild drought, -1.70
1923	dry spell, -0.56	**1956**	moderate drought, -2.15	**1999**	mild drought, -1.03
1926	moderate drought, -2.14	**1957**	mild drought, -1.60	**2000**	moderate drought, -2.11
1931	mild drought, -1.98	**1961**	dry spell, -0.56	**2001**	mild drought, -1.40
1932	dry spell, -0.66	**1963**	mild drought, -1.42	**2002**	dry spell, -0.50
1935	moderate drought, -2.13	**1964**	severe drought, -3.14	**2006**	mild drought, -1.53
1937	mild drought, -1.24	**1965**	mild drought, -1.29	**2008**	dry spell, -0.73
1941	moderate drought, -2.18	**1967**	dry spell, -0.56	**2011**	dry spell, -0.78

Source: National Climatic Data Center

Palmer Drought Severity Index for Marion County, 1896-2010



Source: National Climatic Data Center

This chart reflects the raw data presented on page V 22. Marion County is part of Arkansas Climate Division 2.

Notable Previous Events

Dust Bowl: Many summers from 1931 through 1937 were hot and dry, although the climate division that includes Marion County was not as severely affected as other parts of the state. Old-timers interviewed for this plan said residents relied on wild game because most local livestock herds had to be slaughtered for lack of hay and water. As time went on, "there wasn't even a rabbit to be found," one said.

1940s-1950s: These decades saw nine droughts in 20 years. Statewide, 1954 and 1953 were bad drought years, but in this area the only extreme drought of the decade was in 1955.

1976: In this year, Marion County was included in an emergency declaration for drought, yet the Palmer index for that year shows Climatic Division 2 in the plus category, with PDSI 1.13.

2000: A dry period began in July and only 0.02 inches of rain was recorded in August. In the Sept. 21 edition of the county's only paper, the weekly Mountaineer Echo, it was reported that farmers were beginning to be in serious trouble with water sources for livestock.

Curiously, there is only passing mention of dry weather in the August editions of 2000. The drought broke on Sept. 24, with 1.53 inches of rain recorded. The Echo reported that some areas received two to three inches. The weather thereafter returned to normal ranges.

Sources: Interviews with residents, Mountaineer Echo newspaper, National Weather Service, Arkansas All-Hazard Mitigation Plan, 2010.

Element D: Probability of future events. Based on previous events, the probability of Marion County experiencing a drought is every 3.8 years.

Vulnerability Assessment

Element A: Overall summary. There has been no recorded loss of human life attributed to drought in Marion County.

According to NOAA, all areas of life are impacted by drought, including hydrological effects (depletion of water sources) damage to animal species, wind and water erosion and air quality. Drought directly impacts agriculture (lower yields, insect infestation and plant disease), livestock (reduced productivity, delayed breeding, increased miscarriages, increased mortality rates, decreased stock weights), trees and other vegetation, pets and wildlife. Public health and safety are also threatened.

Element B: Impact on jurisdictions. All jurisdictions in Marion County are affected: unincorporated areas; the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville; and the school districts of Flippin, Yellville-Summit and Ozark Mountain. Virtually all of the county is rural. In a land area of 637 square miles, only 7.4 square miles are incorporated.

1. Water supplies: The cities of Bull Shoals, Flippin, Summit and Yellville are served by the Mid-Marion Water Authority, which draws from Bull Shoals Reservoir. The Flippin and Yellville-Summit school district campuses are served by them as well. Pyatt and the Bruno-Pyatt school campuses draw from well water. In previous years of moderate to severe drought, Bull Shoals Reservoir has reached low levels, although the water supply has not been threatened. The wells that serve Pyatt and the Bruno-Pyatt schools have never had a shortage problem. However, there is a need to educate the public on conservation should the situation arise. Unincorporated areas are served by individual wells.

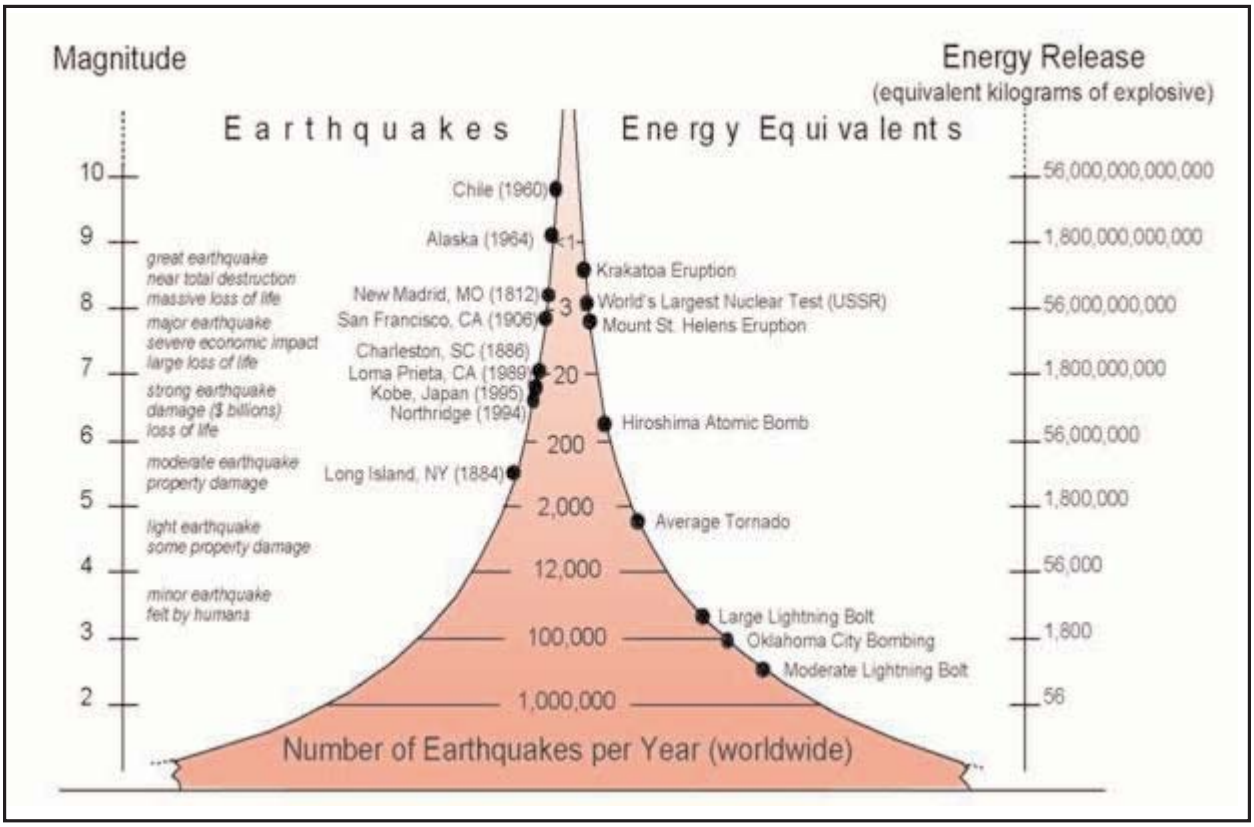
2. Damage to animals, agricultural industry: Livestock and poultry and their products account for 98.8% of farm production in the county. The average size of a farm is 272 acres and there are 526 farms. Agricultural employment accounts for 364 jobs in a work force of about 5,200. Farm revenue accounts for $36.4 million, $32.2 million of that from livestock. This industry would be the chief one at risk for monetary losses.

The Marion County Final Assessor's Abstract for 2010 shows the assessed value of agricultural buildings at $225,229,950. These buildings would be primarily barns and poultry houses.

3. Public health: Dust particulates would be a concern in the county, because it has 1,700 miles of unpaved roads. According to a 2003 study by the county health unit, 13% of residents have asthma and 25% characterized their health as poor, and 39 percent of adults reported at least one day a month of poor health.

4. Public safety: Rural areas are particularly threatened by fire because rural volunteer fire departments draw water from ponds and streams, which are depleted by drought.

Sources: NOAA, U.S. Census Bureau, Marion County Health Unit 2003 Study of Public Health, University of Arkansas Division of Agriculture.



Source: Arkansas Geological Survey

This chart shows energy equivalents related to magnitude of quakes. Only two quakes have been recorded in Marion County: magnitude 2.0 on June 16, 1984, and magnitude 2.8 the next day. The energy released by each, as shown in the graph, would range from something slightly more than a lightning bolt to something less than the 1995 Oklahoma City bombing.

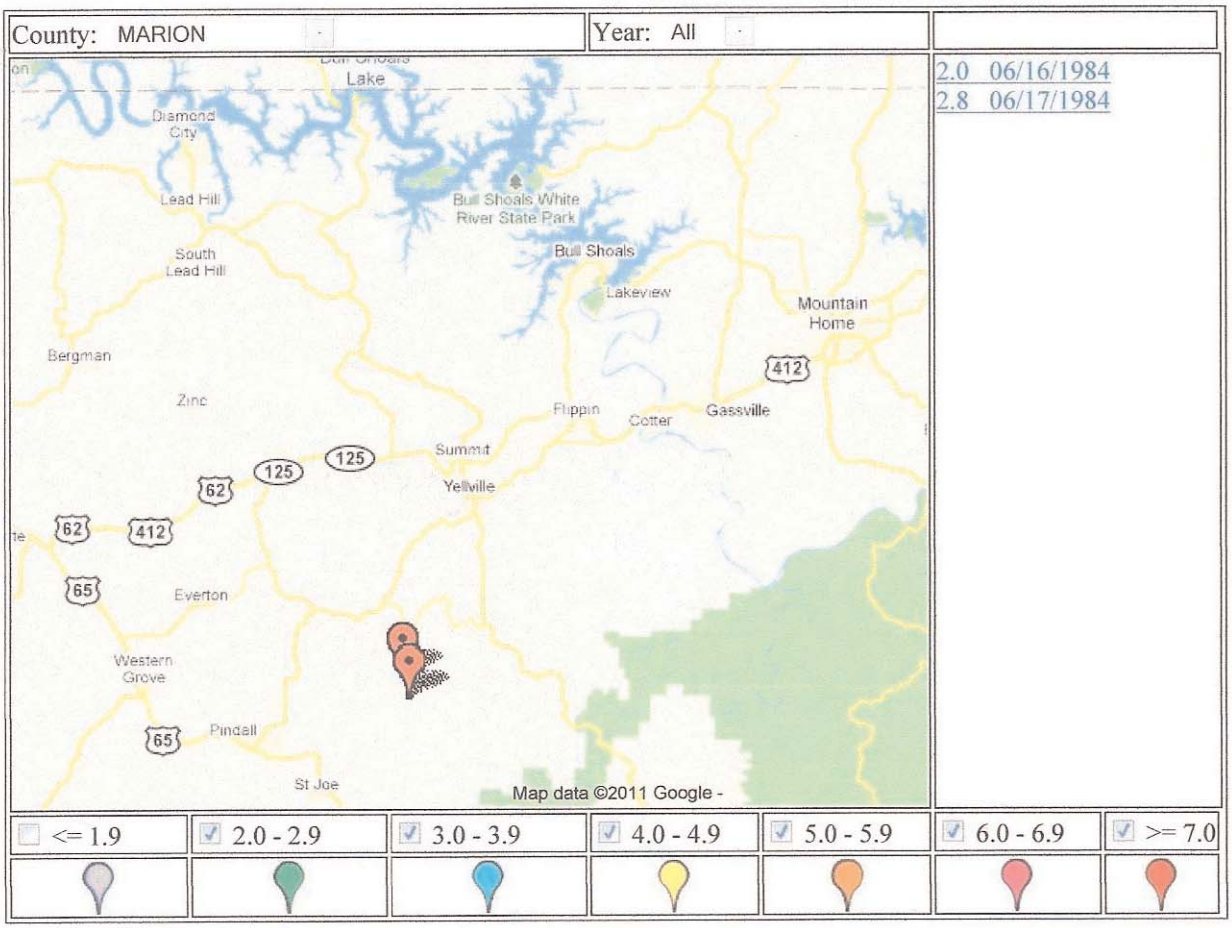
Earthquake Profile

An earthquake is the shaking or vibration of the earth caused by the sudden release of energy, usually as a result of rupture or movement of rocks along a fault. It generates seismic waves radiating from the fault surface. If the energy of the waves is strong enough, people and structures will be affected. The focus of a quake is the point of the initial rupture within the earth; the epicenter is the point on the ground surface directly above the focus.

Two scales are primarily used to gauge a quake. The Moment Magnitude Scale gives a comprehensive measure of total energy released. It was developed in the 1970s, replaced the Richter scale and was calibrated so that it roughly matches Richter's numbers up to 7.0 or so. The Modified Mercalli Intensity Scale measures severity of ground shaking in terms of damage to structures, disturbance to ground surface and reaction of animals and people. *Sources: USGS, Massachusetts Institute of Technology.*

Element A: Location. All of Marion County is slightly susceptible to a quake: unincorporated areas; Bull Shoals, Flippin, Pyatt, Summit and Yellville, and school districts of Flippin, Yellville-Summit and Ozark Mountain.

Element B: Extent. CPRI index total, 1.45. Probability, 1 (unlikely, only two have ever been recorded); magnitude, 1 (negligible), severity, 1 (negligible); warning time, 4 (less than six hours). The CPRI index was calculated using data from the Magnitude and Mercalli scales.



Source: Arkansas Geological Survey

Element C: Previous occurrences in Marion County. Only two quakes with epicenters within Marion County have been recorded and are shown in the map above. Both were near the unincorporated rural community of Maumee on the Buffalo River.

Date: June 16, 1984
Long: -92.737000, **Lat.** 36.091000
Magnitude, 2
Location: Maumee
No depth or description given by USGS.
Date: June 17, 1984
Long: -92.743000, Lat. 36.106000
Magnitude, 2.8
Location: Maumee
No depth or description given by USGS, and no mention in local papers or historical records.

Notable events elsewhere in Arkansas.

1811-1812. New Madrid Earthquakes: The main shocks in this zone, which includes northeastern Arkansas, were Dec. 16 (magnitude 7.7), Jan. 23 (M7.5) and Feb. 7 (M7.7). Uplift and subsidence of land , 3 to 6 meters over area of 2,600 kilometers. A 40-mile-long lake, St. Francis, was formed.

Jan. 4, 1843: Near Marked Tree in New Madrid Zone (magnitude 6.0). Structural damage extending to Memphis, southwestern Tennessee, northwestern Mississippi.

Source: Arkansas Geological Survey

Element D: Probability of future events.

Originating in Marion County, unlikely.

In New Madrid Zone: USGS and Center for Earthquake Research and Information at University of Memphis estimate probability of magnitude 7.7 to 8 in next 50 years as 7% to 10%. Magnitude 6.0 or larger in next 50 years, 25% to 40%.

Modified Mercalli Intensity Scale

The Modified Mercalli Intensity Scale measures the intensity, thus effect, of earthquakes. It uses a scale of I to XII and does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects.

The following is an abbreviated description of the 12 levels of Modified Mercalli intensity.

I. Not felt except by a very few under especially favorable conditions.

II. Felt only by a few persons at rest, especially on upper floors of buildings.

III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.

IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.

V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.

VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X+. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. Damage total. Lines of sight and level are distorted. Objects thrown into air.

Abridged from The Severity of an Earthquake, a U.S. Geological Survey general interest publication.

Comparison of Magnitude Scale to Intensity Scale

Magnitude 1.0-3.0=I Intensity
Magnitude 3.0-3.9=II-III Intensity
Magnitude 4.0-4.9=IV-V Intensity
Magnitude 5.0-5.9=VI-VII Intensity
Magnitude 6.0-6.9=VII-IX Intensity
Magnitude 7 and higher=VIII Intensity or higher
Source: U.S. Geological Survey

Vulnerability Assessment

Element A: Overall summary. *Marion County is designated by FEMA as a host county for earthquake evacuees.* This is because we are at very low risk.

There has been no recorded loss of life attributed to an earthquake in Marion County. The largest quake in Marion County, magnitude 2.8, would have a negligible effect, equal to I or II on the Mercalli intensity scale.

A major quake in the New Madrid Seismic Zone would have stronger effects. The largest quake recorded in the New Madrid Zone is 7.7.

A study published by the Mid-America Earthquake Center in 2008 estimated that in a 7.7 New Madrid quake, Marion County could experience a range of up to VI intensity levels.

Element B: Impact on jurisdictions. Based on a 7.7 quake in the New Madrid Seismic Zone, all jurisdictions would face an virtually equal albeit very slight risk of damage: unincorporated Marion County; the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville; and the school districts of Flippin, Yellville-Summit and Ozark Mountain.

It would be felt by everyone, frightening many. Some dishes and windows would be broken and unstable objects would be overturned. Pendulum clocks might stop, some heavy furniture would move and there were be some instances of fallen plaster. Unreinforced masonry buildings and chimneys would also be susceptible to damage or collapse. These types of structures are scattered throughout the county but there is no concentration of them in any locality. There is also a risk of being hit by books or other items on shelves, or broken mirrors.

Flood Profile

Flood: Any high flow, overflow, or inundation by water which causes or threatens damage.

Flash Flood: A rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters.

Source: NOAA glossary.

Riverine Flood: A flood caused by precipitation, runoff or snowmelt over a relatively large watershed causing flooding over wide areas and cresting in over eight hours. Has relatively low velocity, cover a larger area than flash floods and take longer to recede. *Source: Arkansas All Hazard Mitigation Plan, 2010.*

Marion County has no repetitive loss properties. It is susceptible to flash and riverine flooding, with a special caveat. The only large watershed is the White River, which has three U.S. Army Corps of Engineers dams upstream: Bull Shoals, Table Rock, Beaver. We are in the first 30 miles of the tailwaters of Bull Shoals, so when large dam releases occur, it is an emergency and the alert is given within eight hours or less--i.e., flash flooding. In rare cases these large releases have lasted several days. All other events are flash flooding in smaller creeks in the county.

Element A: Location. The White River Valley and all creek bottoms are susceptible to flash flooding. However, as seen on NFIP panel 0504500005A and validated by the FEMA Map Store, the cities of Pyatt and Summit are not mapped. Neither has flood plains nor is an NFIP participant. Summit had a one-time water-related problem in 2008 with two sewage lift stations, caused simply by ground saturation in heavy rains and a plugged drainage ditch. It will have been corrected with a HUD IKE II grant by the time this plan is approved. Pyatt had a one-time problem, also in 2008, with a low-water bridge that runs over a ditch that filled during heavy runoff from a hill. It has been fixed. The school campuses of Flippin, Yellville-Summit and Bruno-Pyatt are on high ground and have never experienced flooding.

Element B: Extent. CPRI index total, 2.60. Probability, 3 (likely); magnitude, 2 (limited); severity, 2 (limited); warning time, 3 (six to 12 hours).

Element C: Previous occurrences. Since April 30, 1950, 24 flood events have been recorded by the National Climatic Data Center, ***but we believe there are only 22 events, as you will see below.*** The table is at the end of this profile. We will discuss only events in which there were deaths, injuries, or property or crop damage.

Description:

Event: River Flood

Begin Date: 07 May 1993, 0000 CST

Begin Location: Not Known

End Location: Not Known

Magnitude: 0 Fatalities: 0 Injuries: 0

Property Damage: $500K Crop Damage: $5M

NOTE: The NCDC database lists Baxter and Marion Counties as being the zones affected, but this is an error. The following discussion, from the NCDC, is all about the Arkansas River, far south of us. We are including it only because it is in the database.

Description: West Central to Central Arkansas Heavy rains across eastern Oklahoma and western Arkansas brought ries along the Arkansas River at several locations. The flood began on May 7th, when the river rose above flood stage at Van Buren.

Event: Flash Flood

Begin Date: 04 Nov 1994, 0730 CST

Begin Location: Rea Valley

End Location: Not Known

Magnitude: 0 Fatalities: 0 Injuries: 0

Property Damage: $50K Crop Damage: $0

Description: Heavy rains caused flooding of many roads in and around Rea Valley, which includes the Crooked Creek watershed in the southeastern part of the county.

Event: Flash Flood

Begin Date: 05 Nov 1994, 0215 CST

Begin and End Locations: Not Known

Magnitude: 0 Fatalities: 0 Injuries: 0

Property Damage: $50K Crop Damage: $0

Description:Heavy rains caused flooding of numerous roads and low bridges throughout Marion County. Several of the roads and bridges were washed out in areas. *Because this event and the previous one happened on consecutive days and the property damage is the same, we believe the two events are one.*

Event: Flash Flood

Begin Date: 03 Jan 2005, 01:40:00 PM CST

Begin Location: Rush

Begin LAT/LON: 36°08'N / 92°34'W

End Date: 03 Jan 2005, 01:40:00 PM CST

End Location: Rush

End LAT/LON: 36°08'N / 92°34'W

Magnitude: 0 Fatalities: 1 Injuries: 0

Property Damage: $0 Crop Damage: $0

Description: An elderly couple was returning to their home and found a low water crossing on Rush Creek flooded. They got out of the truck and attempted to cross the creek on foot at an old road bed that crossed the creek nearby. The water was too swift and they were swept downstream. The 88 year old man survived, but his 87 year old wife did not.

Event: Flash Flood

Begin Date: 03 Mar 2008, 15:53:00 PM CST

Begin Location: 1 Mile South West of Peel

Begin LAT/LON: 36°25'N / 92°46'W

End Date: 03 Mar 2008, 15:53:00 PM CST

End Location: 1 Mile Northeast of Oakland .

End LAT/LON: 36°27'N / 92°33'W

Magnitude: 0 Fatalities: 0 Injuries: 0

Property Damage: $15K Crop Damage: $0

EVENT NARRATIVE: Low water bridges were covered and some gates were closed over the roads.

EPISODE NARRATIVE: Showers and thunderstorms built into the northwest half of Arkansas arly morning on the 3rd. One to three inches of rain fell with locally over four inches.

Event: Flash Flood

Begin Date:18 Mar 2008, 10:13:00 AM CST

Begin Location: 2 Miles North Northeast of Bull Shoals Lake

Begin LAT/LON: 36°29'N / 92°48'W

End Date: 19 Mar 2008, 08:00:00 AM CST

End Location: 2 Miles East Northeast of Price Place.

End LAT/LON: 36°29'N / 92°34'W

Magnitude: 0 Fatalities: 0 Injuries: 0

Property Damage: $1M Crop Damage: $0

EVENT NARRATIVE: Water rescues were performed by helicopter halfway between Flippin and Fairview just off Arkansas Highway 178. Many low water crossings were flooded. Arkansas Highway 235 was flooded near Bruno. There was one rescue from a home in Pyatt.

EPISODE NARRATIVE: Very heavy rain began developing late on the 17th in northern and western Arkansas and continued on the 18th as a powerful storm system approached from Texas. The system dredged copious moisture from the Gulf of Mexico and sent it toward Arkansas with a deep southerly wind flow. Well above normal precipitable water was noted, which enhanced rainfall efficiency.

Event: Flash Flood

Begin Date: 19 Sep 2009, 15:13:00 PM CST

Begin Location: 4 Miles West Southwest of Bull Shoals Lake.

Begin LAT/LON: 36°21'N / 92°41'W

End Date: 19 Sep 2009, 17:30:00 PM CST

End Location: 1 Mile NNE of Fairview.

End LAT/LON: 36°21'N / 92°36'W

Magnitude: 0 Fatalities: 0 Injuries: 0

Property Damage: $2K Crop Damage: $0

EVENT NARRATIVE: Minor flooding occurred on county roads near Bull Shoals.

EPISODE NARRATIVE: Moisture levels remained high. Scattered showers and a few thunderstorms popped up and were nearly stationary across Arkansas on the morning and early afternoon of the 19th.

Event: Flood
Begin Date: 30 Oct 2009, 05:30:00 AM CST
Begin Location: 2 Miles West of Price Place
Begin LAT/LON: 36°28'N / 92°37'W
End Date: 30 Oct 2009, 17:00:00 PM CST
End Location: 1 Mile Northeast of Price Place.
End LAT/LON: 36°29'N / 92°34'W
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $100K Crop Damage: $0
EVENT NARRATIVE: Flooding damaged many county roads.

EPISODE NARRATIVE: A large storm system in the Rockies headed through the Plains into the upper Midwest on the 29th. Rain increased ahead of the system, and became widespread in Arkansas. Meanwhile, a cold front arrived from the west. Because the system was so far to the north, it did not give the front much push. The front slowed down, which prolonged the rain. The result was widespread flash flooding, which gave way to areal flooding and river flooding. Winds changed direction and speed up through the atmosphere, a favorable condition for tornadoes. However, instability was sufficient only in southern Arkansas for the development of tornadoes.

Event: Flash Flood
Begin Date: 11 Jul 2010, 21:40:00 PM CST
Begin Location: 1 Mile West of Summit.
Begin LAT/LON: 36°15'N / 92°42'W
End Date: 12 Jul 2010, 05:00:00 AM CST
End Location: Summit.
End LAT/LON: 36°15'N / 92°40'W
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $2K Crop Damage: $0
EVENT NARRATIVE: There were multiple reports of street flooding in Yellville.

EPISODE NARRATIVE: An unusually moist, tropical-like air mass settled over Arkansas on the 11th through 13th. Periodic areas of low pressure aloft moving through the area set off rounds of showers and thunderstorms. Some of the storms became severe. With the very moist air over the state, some flash flooding also resulted. The first round of storms moved across the middle of Arkansas on the afternoon and early evening of the 11th. This was followed quickly by another round of storms in northern Arkansas late on the evening of the 11th. Scattered storms redeveloped over the northern and central sections of the state on the afternoon of the 12th and continued into the early morning hours of the 13th.

Event: Flood
Begin Date: 26 Apr 2011, 02:00:00 AM CST
Begin Location: 5 Miles North West of Peel
Begin LAT/LON: 36°28'N / 92°49'W
End Date: 30 Apr 2011, 23:59:00 PM CST
End Location: 2 Miles North of Oakland
End LAT/LON: 36°28'N / 92°34'W
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $200K Crop Damage: $0
EVENT NARRATIVE: Widespread area flooding occurred.

EPISODE NARRATIVE: From the 24th through the 27th, the arrival of a slow-moving cold front and several low pressure areas aloft triggered several rounds of thunderstorms. Tornadoes, severe storms, and flash flooding resulted. Widespread areal flooding followed the flash flooding. Some of this flooding was due to heavy rain, while some of it was caused by water from rivers, creeks, and bayous backing up onto the land. On the evening of the 25th, devastating tornadoes affected several areas in central Arkansas. More than 140,000 electric customers in Arkansas lost power. Heavy rains during this period were the beginning of the Great Flood of 2011 in Arkansas. Much of the flooding lasted well into May, and some even continued all the way to late June.

Event: Flood

Begin Date: 01 May 2011, 00:00 AM CST

Begin Location: 5 Miles North West of Peel

Begin LAT/LON: 36°28'N / 92°49'W

End Date: 10 May 2011, 23:59:00 PM CST

End Location: 2 Miles North of Oakland

End LAT/LON: 36°28'N / 92°34'W

Magnitude: 0 Fatalities: 0 Injuries: 0

Property Damage: $500K Crop Damage: $250K

EVENT NARRATIVE: Some campsites around Bull Shoals Lake were closed. Part of the Buffalo National River was closed due to flooding, flood damage and debris piles.

EPISODE NARRATIVE: Flooding was widespread in Arkansas, beginning early in May. The flooding was caused by heavy rain April 30-May 2; high water flowing from Missouri; and backwater flooding from rivers and large creeks and bayous.

MARION COUNTY EVENT NARRATIVE: On May 24 the Corps of Engineers began an emergency record releases from Bull Shoals Dam. The initial release was 35,000 cubic feet per second, subsequently increasing it to a maximum release on May 26 of 60,000 cfs, the equivalent of 33 Olympic-sized pools of water per second. The White River was out of its banks in Marion County for five days, flooding areas in the upper tailwater that had never flooded before. Three resorts had water in some of their structures and water entered five residential homes. None was insured. Many boat docks were damaged from the high and rapid flow. The events that began in April and continued into June were all part of federal disaster declaration #1975. The final cost is still not determined.

Element D: Probability of future events. There have been 22 flood events in the last 60 years, so the probability is one event every 2.72 years.

Vulnerability assessment:

Element A: Overall summary. One life has been lost as a result of flooding as defined in this profile. Although there are no repetitive loss properties, roads and bridges in many parts of the county are suspectible to flooding and therefore pose safety risks to emergency vehicles, school buses and motorists and pedestrians in general.

Element B: Impact on jurisdictions. None of the campuses of the school districts of Flippin, Ozark Mountain or Yellville- Summit are in flood zones and have never flooded. Pyatt and Summit do not have flood maps and are not in flood zones, as explained in Element A, Location, on page IV 28. Bull Shoals, Flippin and Yellville do have areas in flood zones.

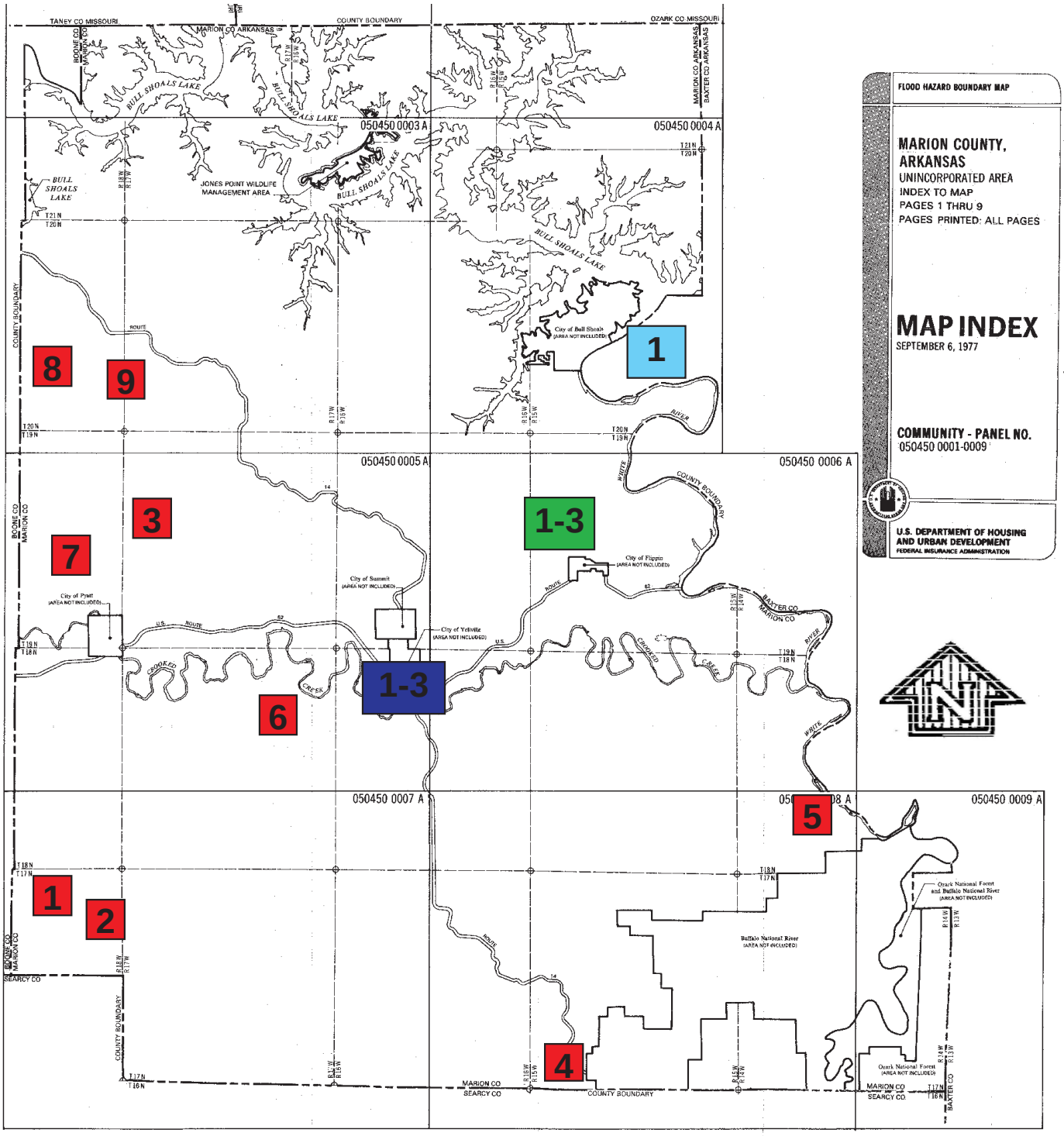
The waste treatment plant for Bull Shoals is in an A Zone near White River, which should permanently mitigated with floodwalls. However, it has never flooded. The highest water ever recorded, which was in May, 2011, was eight feet below the plant. Although Bull Shoals is on the shore of Bull Shoals Lake, Corps of Engineers property extends to or above the top of the maximum flood pool storage elevation, so the city limits don't extend into the flood plain on the lake.

Flippin, Yellville and the unincorporated county have several trouble spots that are overrun with water and frequently damaged in nearly every significant event--with as little as three to four inches of rain in a 12-hour period.

Flippin has a one-lane bridge on Crane Creek and two low-water slabs on Fallen Ash Creek that need to be replaced with box culverts and the roadways raised.

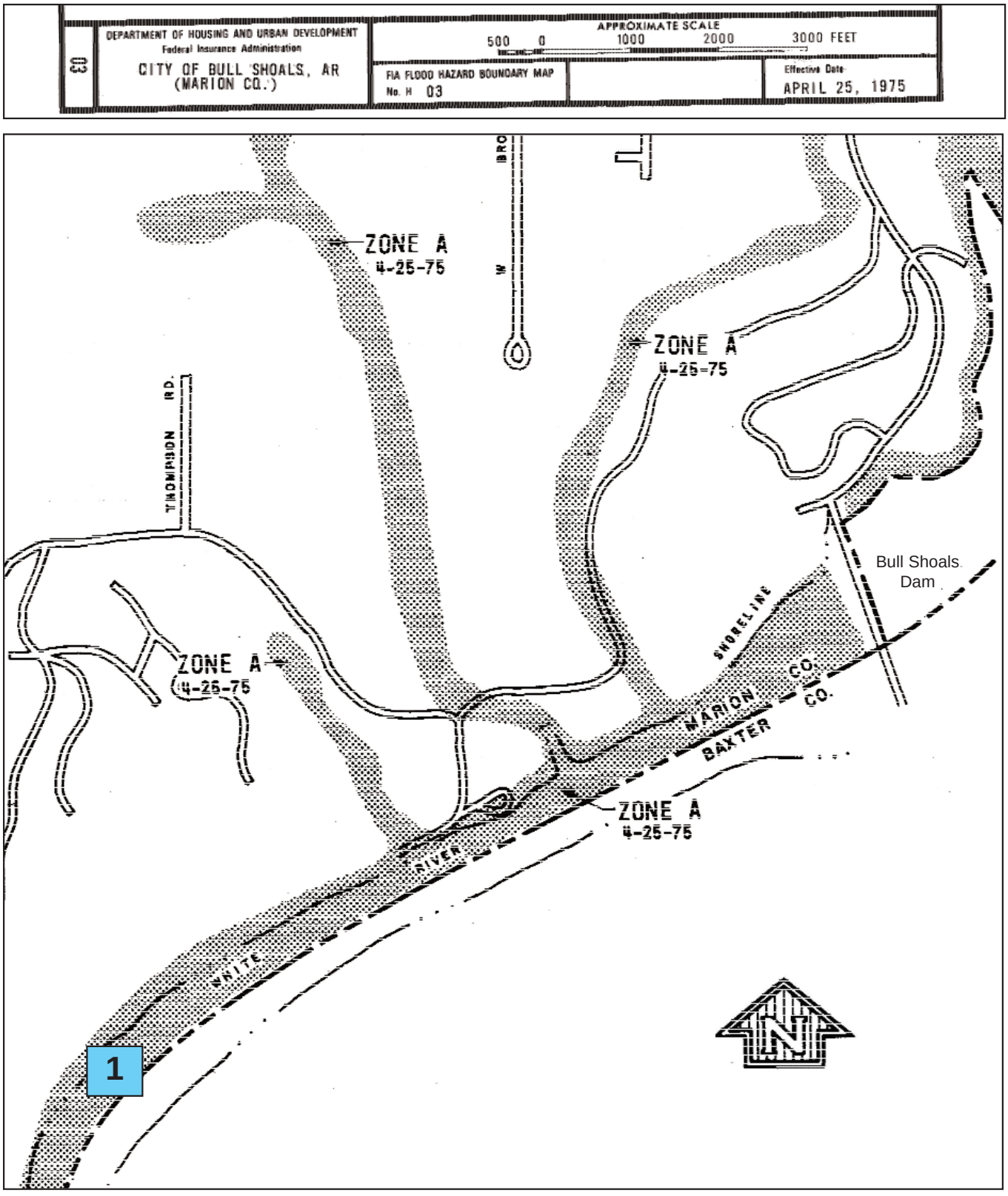
Yellville has three heavily trafficked low-water slabs on Town Branch Creek that are often flooded--two on Fifth Street, on either side of State Hwy. 14, and a third at Wickersham and 4th streets.

The county has nine low-water crossings and slabs in the southern and western areas of the county that are hazardous and need replacing with box culverts, with the roadways raised above the floodplain. All these are mapped on subsequent pages.

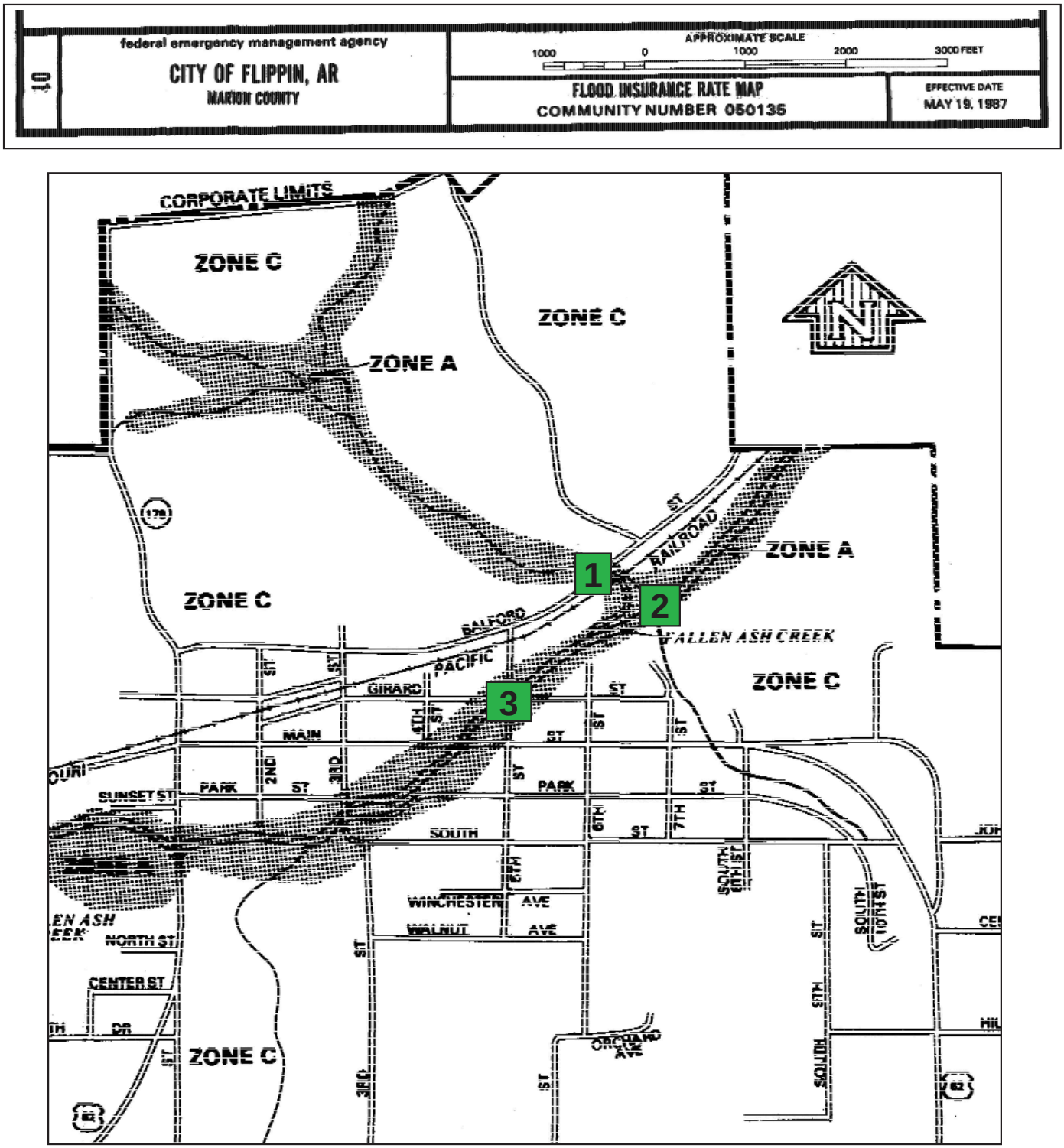


These projects constitute the worst infrastructure flooding problems in the county, as identified by the jurisdictions. They are detailed in subsequent pages. The unincorporated sites are ranked in order of need, but in following pages are grouped by proximity.

Color key: Bull Shoals Flippin Yellville Unincorporated



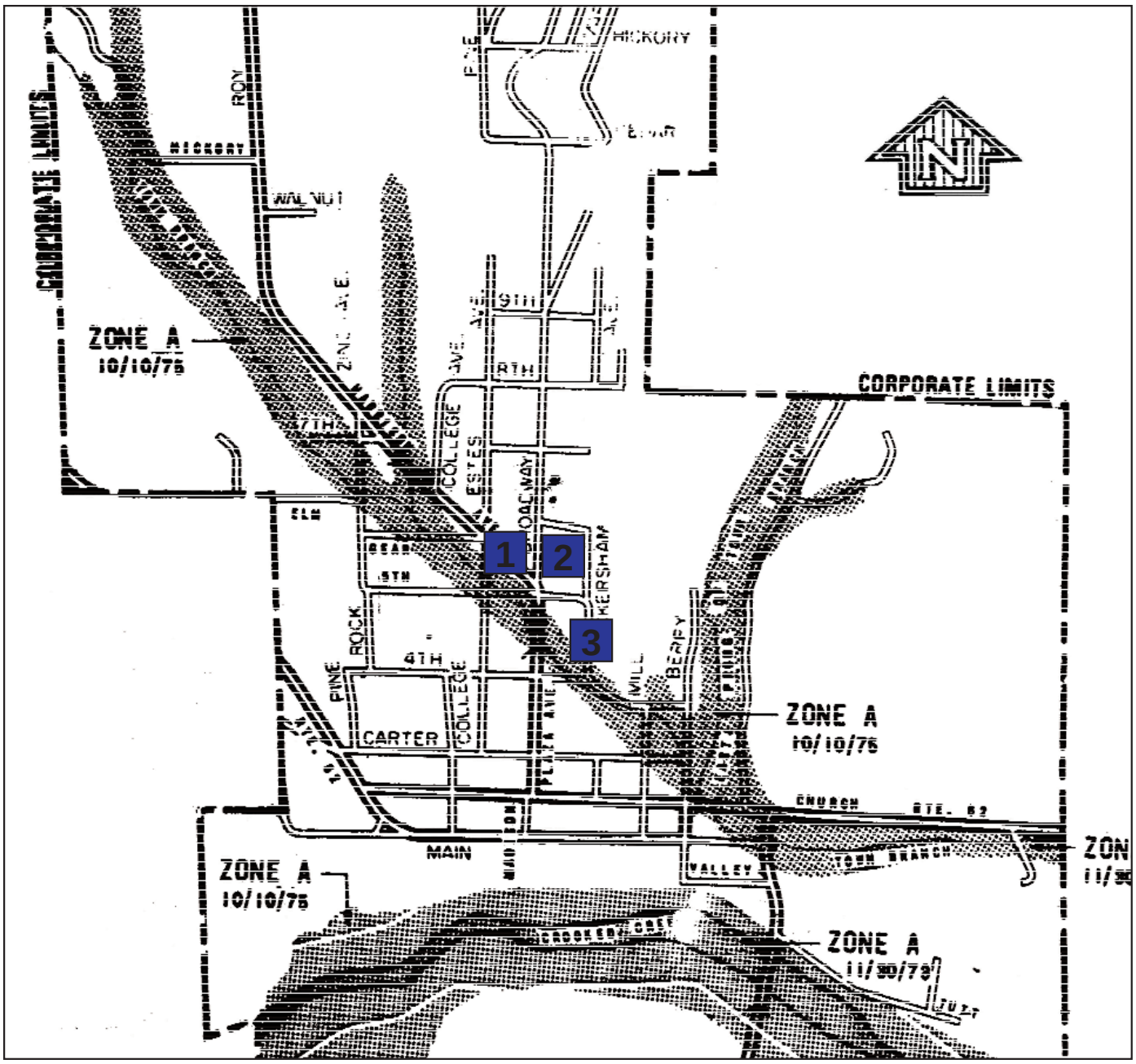
1 City of Bull Shoals Waste Treatment Plant: Needs floodwall around plant. Estimated cost: $2.5 million.



1 Alford Street and Crane Creek: One-lane bridge needs replacing with box culverts and raising roadway above floodway. Estimated cost: $150,000.

2 8th Street on Fallen Ash Creek: Low water bridge needs replacing with box culverts and raising roadway above floodway. Estimated cost: $80,000.

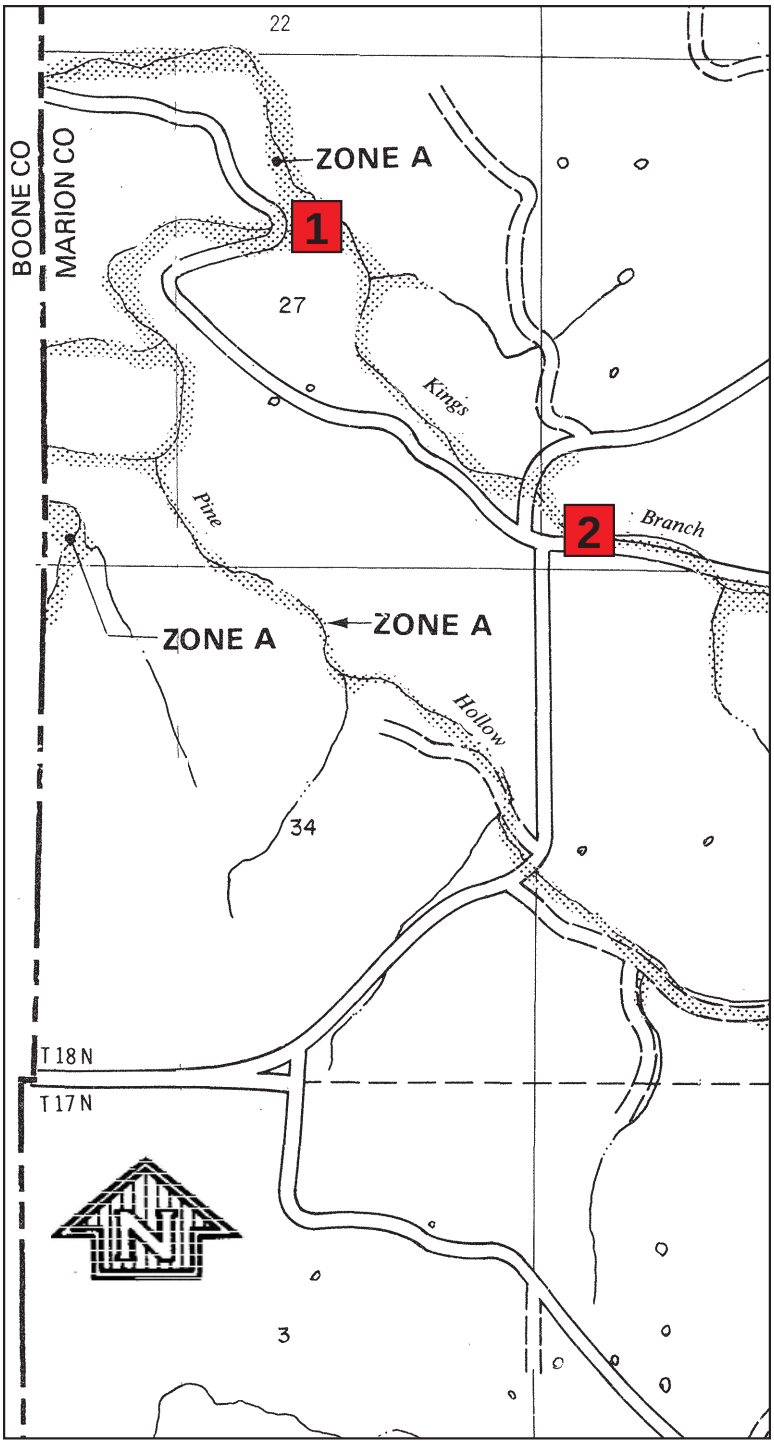
3 Girard at 6th Street over Fallen Ash Creek: Low water bridge needs replacing with box culverts, raising road above floodway. Estimated cost: $80,000.



1 5th Street west of state Hwy. 14 over Town Branch: Low water bridge needs replacing with box culverts, raising road above floodway. Estimated cost: $120,000.

2 5th Street east of Hwy. 14 over Town Branch: Low water bridge needs replacing with box culverts, raising road above floodway. Estimated cost: $120,000.

3 4th Street and Wickersham over Town Branch: Low water bridge needs replacing with box culverts, raising roadway above floodway. Estimated cost: $120,000.



MARION COUNTY, ARKANSAS

UNINCORPORATED AREA

PAGE 7 OF 9

(SEE MAP INDEX FOR PAGES NOT PRIN

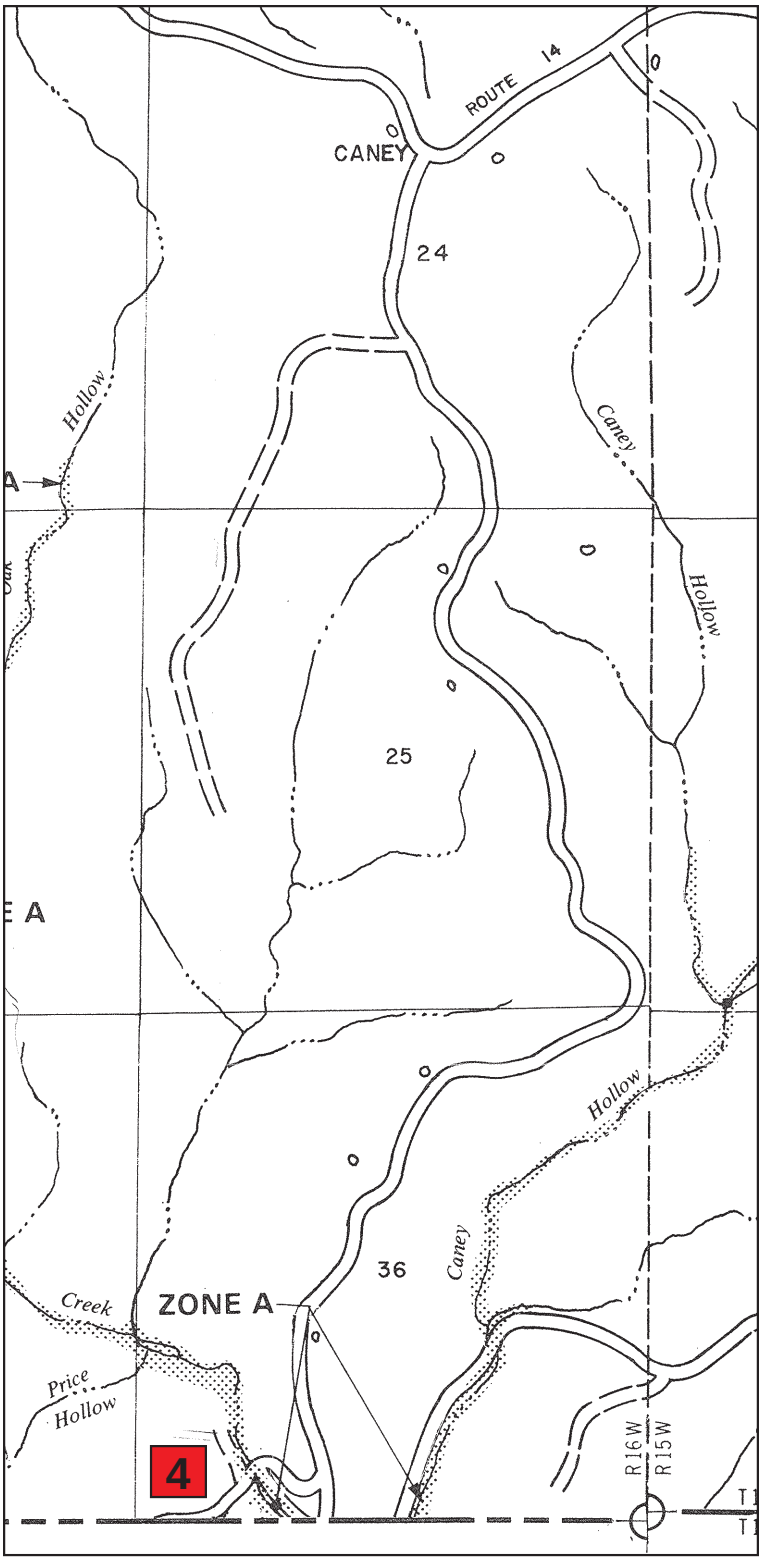
EFFECTIVE DATE:
SEPTEMBER 6, 1977

COMMUNITY - PANEL NO.
050450 0007 A

APPROXIMATE SCALE IN FEET
2000 0 2000

1 County Road 4021 on Clear Creek: Replace slab and raise roadway above floodplain. Estimated cost: $150,000.

2 County Road 4021 on King's Branch: Replace slab and raise roadway above floodplain. Estimated cost: $120,000.



MARION COUNTY, ARKANSAS

UNINCORPORATED AREA

PAGE 8 OF 9

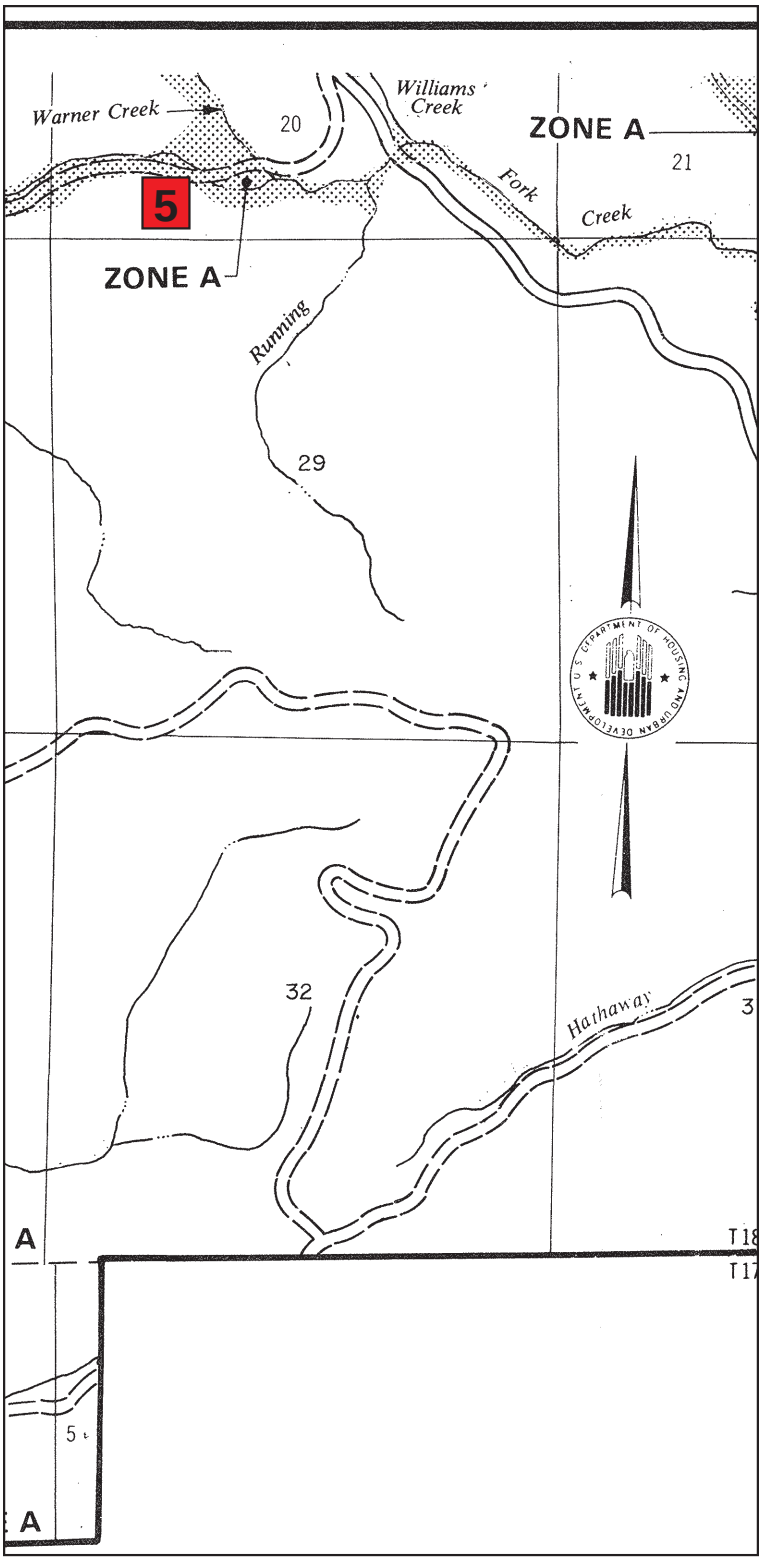
(SEE MAP INDEX FOR PAGES NOT PRI

EFFECTIVE DATE:
SEPTEMBER 6, 1977

COMMUNITY - PANEL NO.
050450 0008 A

APPROXIMATE SCALE IN FEET
2000 0 2000

4 County Road 5028 on Water Creek: Replace slab and raise roadway above floodplain. Estimated cost: $110,000.



MARION COUNTY, ARKANSAS

UNINCORPORATED AREA

PAGE 8 OF 9

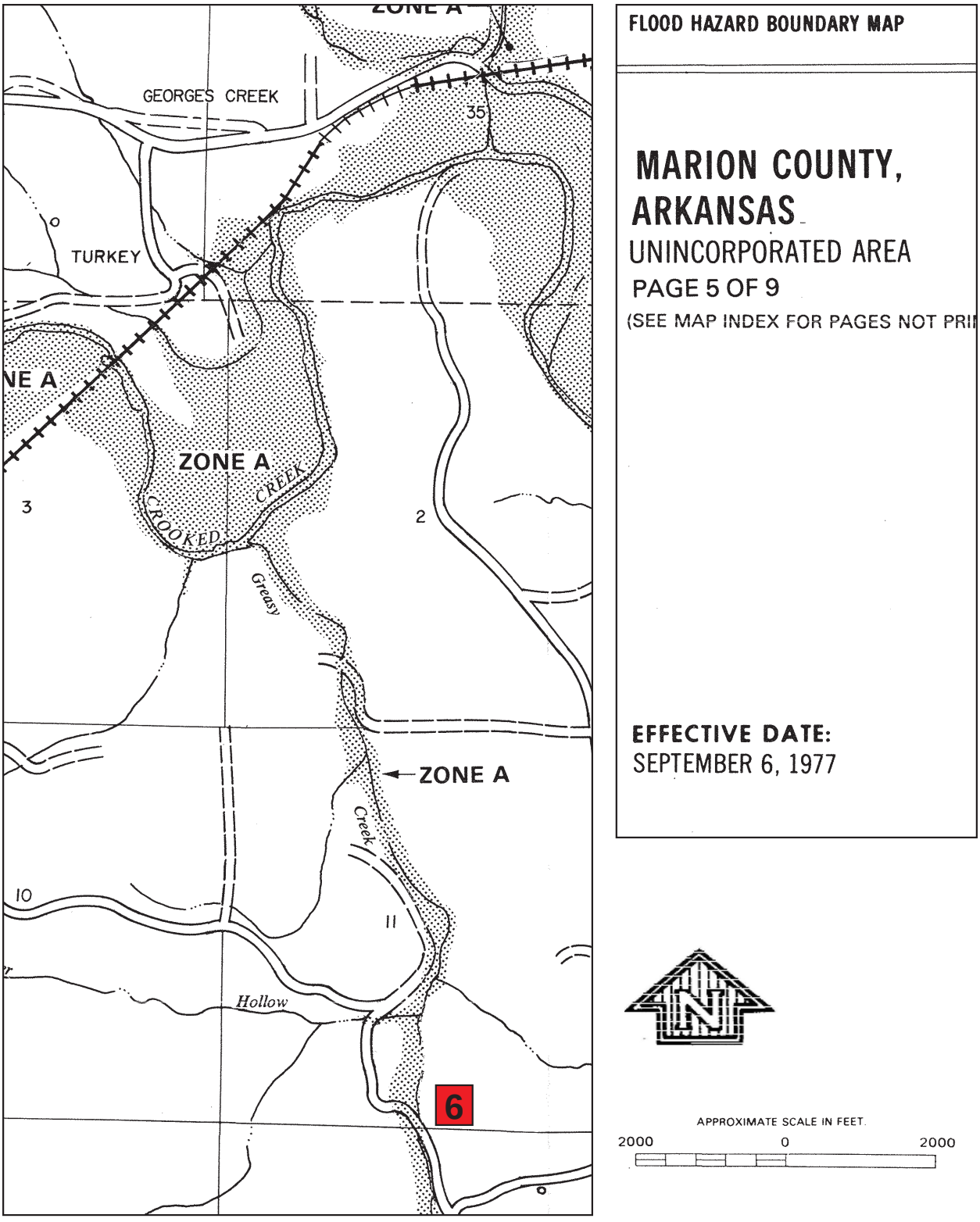
(SEE MAP INDEX FOR PAGES NOT PRI

EFFECTIVE DATE:
SEPTEMBER 6, 1977

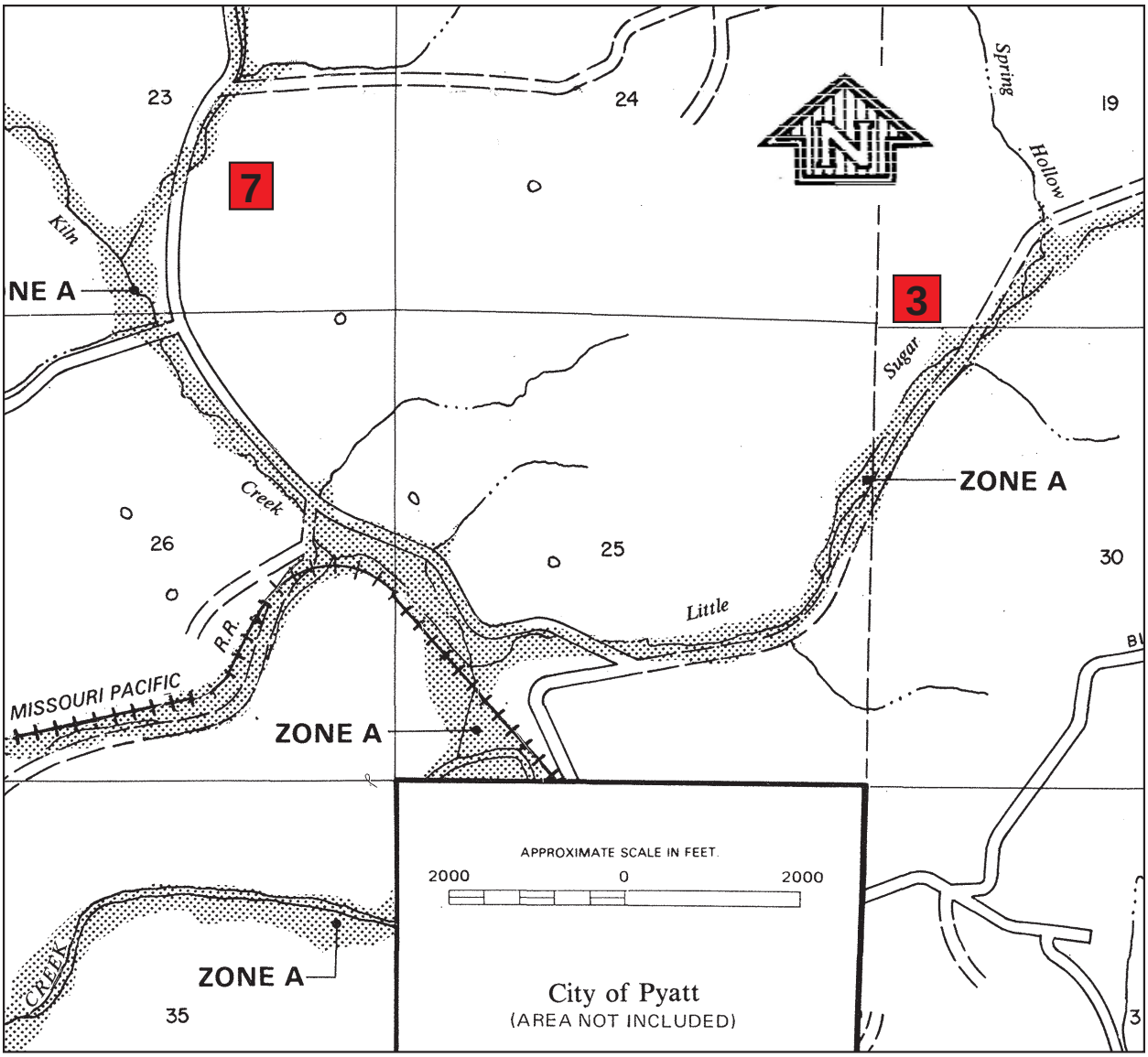
COMMUNITY - PANEL NO.
050450 0008 A

APPROXIMATE SCALE IN FEET
2000 0 2000

5 County Road 6065 on Warner Creek: Replace slab and raise roadway above floodplain. Estimated cost: $100,000.



6 County Road 4044 on Greasy Creek: Replace slab and raise roadway above floodplain. Estimated cost: $90,000.



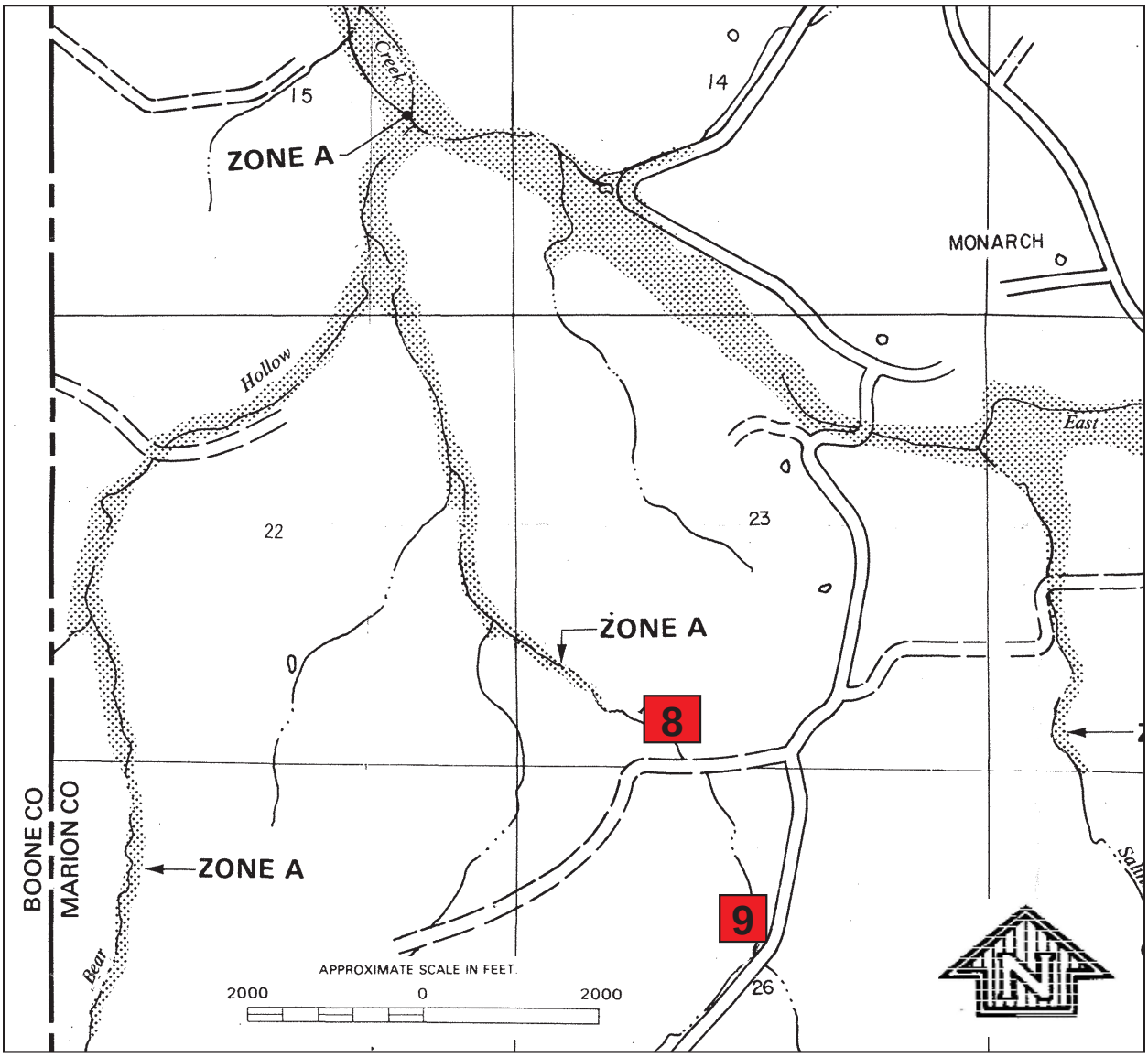
MARION COUNTY, ARKANSAS
UNINCORPORATED AREA
PAGE 5 OF 9
(SEE MAP INDEX FOR PAGES NOT PRI

EFFECTIVE DATE:
SEPTEMBER 6, 1977

COMMUNITY - PANEL NO.
050450 0005 A

3 County Road 3022 on Sugar Orchard Creek: Replace two slabs and raise road above floodplain. Estimated cost: $120,000.

7 County Road 3021 on Tar Kiln Creek: Replace slab, raise road above floodplain. Estimated cost: $120,000.



MARION COUNTY, ARKANSAS
UNINCORPORATED AREA
PAGE 3 OF 9
(SEE MAP INDEX FOR PAGES NOT PRIN

EFFECTIVE DATE:
SEPTEMBER 6, 1977

COMMUNITY - PANEL NO.
050450 0003 A

8 County Road 3010 on East Horton Creek: Replace slab and raise road above floodplain. Estimated cost: $70,000.

9 County Road 3005 on Jaybird Branch: Replace slab, raise road above floodplain. Estimated cost: $60,000.

DOC >NOAA >NESDIS >NCDC Search Field: Search NCDC

Query Results

24 FLOOD event(s) were reported in Marion County, Arkansas between 04/30/1950 and 11/30/2011.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Arkansas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 ARZ004 - 005	05/07/1993	0000	River Flood	N/A	0	0	500K	5.0M
2 Rea Valley	11/04/1994	0730	Flash Flood	N/A	0	0	50K	0
3 MARION	11/05/1994	0215	Flash Flood	N/A	0	0	50K	0
4 Rea Vly	07/12/1998	01:40 AM	Flash Flood	N/A	0	0	0	0
5 Flippin	07/12/1998	02:10 AM	Flash Flood	N/A	0	0	0	0
6 Fairview	05/04/1999	06:30 PM	Flash Flood	N/A	0	0	0	0
7 Countywide	06/17/2000	10:40 AM	Flash Flood	N/A	0	0	0	0
8 Countywide	12/16/2001	08:00 PM	Flash Flood	N/A	0	0	0	0
9 Countywide	03/19/2002	08:00 AM	Flash Flood	N/A	0	0	0	0
10 Countywide	04/23/2004	04:30 AM	Flash Flood	N/A	0	0	0	0
11 Countywide	04/23/2004	10:25 AM	Flash Flood	N/A	0	0	0	0
12 Countywide	04/24/2004	06:18 AM	Flash	N/A	0	0	0	0

			Flood					
13 Rush	01/03/2005	01:40 PM	Flash Flood	N/A	1	0	0	0
14 Countywide	01/12/2005	10:45 PM	Flash Flood	N/A	0	0	0	0
15 Bruno	04/24/2006	03:30 PM	Flash Flood	N/A	0	0	0	0
16 Peel	03/03/2008	15:53 PM	Flash Flood	N/A	0	0	15K	0K
17 Bull Shoals Lake Wes	03/18/2008	10:13 AM	Flash Flood	N/A	0	0	1.0M	0K
18 Yellville	03/31/2008	17:05 PM	Flash Flood	N/A	0	0	0K	0K
19 Fairview	07/16/2009	02:45 AM	Flash Flood	N/A	0	0	0K	0K
20 Bull Shoals Lake Eas	09/19/2009	15:13 PM	Flash Flood	N/A	0	0	2K	0K
21 Price Place	10/30/2009	05:30 AM	Flood	N/A	0	0	100K	0K
22 Summit	07/11/2010	21:40 PM	Flash Flood	N/A	0	0	2K	0K
23 Peel	04/26/2011	02:00 AM	Flood	N/A	0	0	200K	0K
24 Peel	05/01/2011	00:00 AM	Flood	N/A	0	0	500K	250K
				TOTALS:	1	0	2.419M	5.250M

Severe Storm Profile

This hazard profile includes hail, lightning and thunderstorm winds. Thunderstorm: A local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder. Hail: Showery precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud. Lightning: A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud. *Source: NOAA glossary.*

Element A: Location. All of Marion County is susceptible to severe storms: unincorporated areas, Bull Shoals, Flippin, Pyatt, Summit and Yellville, and the school districts of Flippin, Yellville-Summit, Ozark Mountain.

Element B: Extent. CPRI index total, 2.35. Probability, 3 (likely); magnitude, 1 (negligible); severity, 1 (negligible); warning time, 4 (less than six hours).

Element C: Previous occurrences. Since Jan 1, 1950, 110 thunderstorm winds have been recorded by the National Climatic Data Center; 96 hail events and 3 lightning events. Complete tables appear in the Appendix. We will discuss only the events for which deaths, injuries, property damage or crop damage was recorded.

Event: Lightning
Begin Date: 02 Jun 2007, 16:40:00 PM CST
Begin Location: Yellville
Begin LAT/LON: 36°13'N / 92°40'W
End Date: 02 Jun 2007, 16:40:00 PM CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $ 25.0K
Crop Damage: $ 0.0K

EVENT NARRATIVE: Lightning struck the county courthouse. There was damage to the outside of the building, as well as several computers inside the courthouse.

EPISODE NARRATIVE: A mesoscale convective vortex (a small low pressure area left behind by previous thunderstorms) arrived in southwest Arkansas on the 2nd. Cool air aloft moved over much warmer conditions near the ground, with showers and thunderstorms popping up quickly.

Event: Lightning
Begin Date: 17 Oct 2007, 23:30:00 PM CST
Begin Location: 1 Mile South of Bull Shoals
Begin LAT/LON: 36°22'N / 92°34'W
End Date: 17 Oct 2007, 23:30:00 PM CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $2K Crop Damage: $ 0K

EVENT NARRATIVE: Lightning knocked down a large tree. The tree caused minor damage to the garage of a house.

EPISODE NARRATIVE: Moisture from the Gulf of Mexico advanced rapidly northward on Oct. 17. A warm front moved into Arkansas and sparked a number of severe afternoon thunderstorms the afternoon. It pushed eastward across the state and continued into the early morning hours of the 18th.

Event: Hail
Begin Date: 10 Mar 2010, 19:05:00 PM CST
Begin Location: 1 Mile SE of Flippin
Begin LAT/LON: 36°15'N / 92°35'W
End Date: 10 Mar 2010, 19:05:00 PM CST
End Location: Not Known
Magnitude: 1.50 inches
Fatalities: 0 Injuries: 0
Property Damage: $ 25.0K Crop Damage: $ 0.0K

EVENT NARRATIVE: Half dollar to ping pong ball size hail fell for about 2 minutes, damaging some vehicles.

EPISODE NARRATIVE: A low pressure system passed just to the north of Arkansas on the 10th. A trailing cold front pushing south met with Gulf moisture to trigger thunderstorms during the afternoon and evening. Many dropped hail and a few produced tornadoes.

Event: Thunderstorm Winds
Begin Date: 11 Apr 1994, 1930 CST
Begin Location: 4 Miles West of Peel
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $ 50.0K Crop Damage: $ 0.0

DESCRIPTION: Thunderstorm winds destroyed three barns and downed some power lines.

Event: Thunderstorm Wind
Begin Date: 15 Apr 2001, 01:55:00 AM CST
Begin Location: 6 Miles South East of Flippin
Begin LAT/LON: 36°12'N / 92°31'W
End Date: 15 Apr 2001, 01:55:00 AM CST
End Location: 6 Miles South East of Flippin
End LAT/LON: 36°12'N / 92°31'W
Magnitude: 50 kts. Fatalities: 0 Injuries: 0
Property Damage: $8.0K Crop Damage: $0.0
Description:Two buildings sustained minor wind damage from severe thunderstorms.

Event: Thunderstorm Wind
Begin Date: 22 Apr 2008, 10:00:00 AM CST
Begin Location: Flippin
Begin LAT/LON: 36°16'N / 92°36'W
End Date: 22 Apr 2008, 10:00:00 AM CST
End Location: Not Known
Magnitude: 50 kts. Fatalities: 0 Injuries: 0
Property Damage: $25.0K Crop Damage: $0.0K
EVENT NARRATIVE: Barn destroyed on County Road 5014. EPISODE NARRATIVE: Severe thunderstorms from Missouri swept into northern Arkansas early on April 22.

Event: Thunderstorm Wind
Begin Date: 11 Jul 2010, 21:55:00 PM CST
Begin Location: 4 Miles ENE of Bull Shoals Lake
Begin LAT/LON: 36°29'N / 92°46'W
End Date: 11 Jul 2010, 21:55:00 PM CST
End Location: 1 Mile North of Peel
End LAT/LON: 36°27'N / 92°46'W
Magnitude: 52 kts. Fatalities: 0 Injuries: 0
Property Damage: $5.0K Crop Damage: $0.0K
EVENT NARRATIVE: Several trees were blown down near Highway 125 Park and north of Peel.

EPISODE NARRATIVE: An tropical-like air mass settled over Arkansas July 11-13. Low pressure aloft set off rounds of showers and thunderstorms. Some became severe. Some flash flooding also resulted. Storms hit northern Arkansas late on July 11, redeveloped on th 12th and continued into the 13th. Event: Thunderstorm Wind

Begin Date: 06 Aug 2011, 20:00:00 PM CST
Begin Location: Fairview
Begin LAT/LON: 36°19'N / 92°36'W
End Date: 06 Aug 2011, 20:00:00 PM CST
End Location: Not Known
Magnitude: 52 kts. Fatalities: 0 Injuries: 0
Property Damage: $ 5.0K Crop Damage: $ 0.0K
EVENT NARRATIVE: A severe thunderstorm blew trees down. EPISODE NARRATIVE: Hot weather on Aug. 5-8 and a weak, nearly stationary front resulted in a few severe thunderstorms.

Element D: Probability of future events. There have been 209 lightning, hail and thunderstorm events in 60 years; probability in any year is 3.48 events.

Vulnerability assessment:

Element A: Overall summary. There has been no recorded loss of life from severe storms as defined in this profile. But we have seen thunderstorm winds of up to 65 knots . The Beaufort Wind Scale on Page 9 of the Appendix details the effects of wind on a scale of 0 to 12, with 12 being highest beginning at 64 knots. Therefore, we can expect to see such strong winds in the future. At 64 knots, weak structures such as barns can be blown down and power lines and trees can be downed. These things have happened in the past. All structures in the county are vulnerable to power loss from lightning or wind causing downed lines.

Of most concern is damage to electrical devices that might disrupt critical communication. Mobile homes are more vulnerable to severe weather, and have a total assessed value of $19,949,125. State law requires tie-downs for mobile homes and specifies how they're secured.

Hail of from .75" to 2.75" in diameter has been recorded, so can be expected again. The NOAA Hailstorm Intensity scale on Page 4 of the Appendix indicates details the level of destruction that can occur on a scale of 0 to 10. At 2.75" diameter, expect widespread damage to vegetation, glass, vehicles and aircraft, roofs, brick walls pitted, paint and wood scored, and serious injuries to humans, livestock and wildlife.

Element B: Impact on jurisdictions. All of unincorporated Marion County is vulnerable to power outages and damage to buildings. The school districts of Flippin, Ozark Mountain and Yellville- Summit have the greatest clusters of valuable buildings, so could face higher consequences. Bull Shoals, Flippin, Pyatt, Summit and Yellville have greater population density than rural areas and clusters of business and industrial structures make them more vulnerable than the unincorporated county.

Snow, Ice Profile

Snow is precipitation in the form of ice crystals, mainly of intricately branched, hexagonal form and often agglomerated into snowflakes, formed directly from the freezing (deposition) of the water vapor in the air. 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 those of ¼" or greater.

Source: NOAA glossary.

Element A: Location. All of Marion County is susceptible to snow and ice storms: all unincorporated areas, the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville, and the school districts of Flippin, Yellville-Summit and Ozark Mountain.

Element B: Extent. CPRI index total, 3.25. Probability, 3 (likely); magnitude, 4 (catastrophic); severity, 4 (catastrophic); warning time, 2 (12 to 24 hours).

Element C: Previous occurrences. Since April 30, 1951, 54 snow and ice events have been recorded by the National Climatic Data Center . We will discuss only the storms that had injuries, deaths, crop and property damage. The NCDC tables appear at the end of this profile.

Event: Ice Storm
Begin Date: 18 Jan 1993, 0000 CST
Begin Location: Not Known
End Date: 19 Jan 1993, CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $500K Crop Damage: $0

Description:Freezing rain fell over northern and central Arkansas on the 18th and 19th. Many bridges and overpasses around the area became ice covered as well as a number of secondary roads. A large number of traffic accidents also occurred. Ice accumulation on trees and power lines resulted in power outages across parts of north central and northeast Arkansas. Approximately 8,000 customers were affected by the fallen power lines.

Event: Heavy Snow
Begin Date: 14 Feb 1993, 0000 CST
Begin Location: Not Known
End Date: 15 Feb 1993, CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $50M Crop Damage: $0

Description:Heavy snow fell across the northern part of Arkansas starting late on the 14th and continued until the afternoon of the 15th. Hardest hit was extreme northwestern and north-central Arkansas, where between 1 and 2 feet of heavy wet snow fell. Upwards of 100 poultry houses were damaged or destroyed by the weight of the snow. Thousands of birds were killed. Approximately 20,000 customers lost power. Some areas didn't have power restored for several days. Initially, damage was estimated at over $8.5 million.

Event: Ice Storm
Begin Date: 24 Feb 1993, 0000 CST
Begin Location: Not Known
End Date: 25 Feb 1993, CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $5M Crop Damage: $0

Description: A combination of snow and freezing rain fell across portions of northern and central Arkansas on the 24th and early on the 25th. Snowfall totals over northern areas of the state generally ranged from 2 to 4 inches. Significant accumulations of ice brought down trees and power lines. Approximately 43,000 customers were without power at one point during the storm. Numerous traffic accidents occurred on ice-covered roads and bridges.

Event: Winter Storm
Begin Date: 16 Jan 1994, 0000 CST
Begin Location: Northern And Central
End Date: 17 Jan 1994, ?CST CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $5M Crop Damage: $0

Description: A combination of snow, sleet and freezing rain fell over parts of northern and central Arkansas on the 16th and early on the 17th. The areas hardest hit by the storm were across north central and northeast Arkansas. Snow and ice accumulations over the northern sections ranged from one to five inches. A large number of trees and power lines were knocked down by the weight of the ice and snow. Many homes and businesses were damaged by fallen trees. Approximately 15,000 electric customers were without power at the height of the storm. Numerous traffic accidents occurred as a result of icy roads. Snow and ice remained on some roads for several days over northern Arkansas, as temperatures stayed below freezing.

Event: Winter Storm
Begin Date: 08 Feb 1994, 1800 CST
Begin Location: All Of Arkansas
End Date: 11 Feb 1994, 1200CST CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $500K Crop Damage: $0

Description: A combination of snow, sleet and freezing rain began falling across northern Arkansas late on the 8th and overspread the rest of the state on the 9th. The precipitation continued falling on the 10th and ended from the west early on the 11th. Many roads, bridges and overpasses across the state became hazardous due to the accumulation of ice and snow. Numerous traffic accidents resulted from the slick roads. Significant accumulations of ice and sleet brought down numerous trees and utility poles. A number of homes and businesses sustained structural damage by falling trees. Some communities in southeast Arkansas had virtually every power pole knocked down by the weight of the ice. At the height of the storm, approximately 120,000 customers were without power. In some cases, it took up to two weeks to get power restored to some areas. The damage was not as widespread over the rest of Arkansas. Some of the power companies were calling this the worst storm in their history. Preliminary estimates place the damage and cleanup costs at over $50 million.

Event: Winter Storm
Begin Date: 08 Mar 1994, 0600 CST
Begin Location: Northern And Central
End Date: 09 Mar 1994, 1500CST CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $5M Crop Damage: $0

Description: A mixture of snow, sleet, and freezing rain fell over parts of northern and central Arkansas beginning early on the 8th and continuing into the afternoon hours on the 9th. Northern parts of Arkansas were hardest hit, where snow accumulated up to 18 inches at some locations. Over central Arkansas, snow, sleet, and freezing rain made roads very hazardous. Numerous power outages occurred in the northern areas of the state as a result of the heavy snow. A number of buildings either collapsed or sustained damage due to the weight of the snow. A large number of poultry houses were destroyed, killing thousands of young chickens. The snow only stayed on the ground a few days as warmer weather quickly moved back into the area.

Event: Winter Storm
Begin Date: 03 Dec 2002, 10:00:00 PM CST
Begin Location: Not Known
End Date: 04 Dec 2002, 12:00:00 PM CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $3.7M Crop Damage: $0
Description: A mixture of snow, sleet and freezing rain starting falling on the afternoon of the 3rd over parts of north-central Arkansas. The precipitation gradually overspread the rest of the area by that evening and continued through the morning hours of the 4th. Snowfall accumulations of 1 to 3 inches were common over north-central Arkansas, with locally higher amounts between 3 and 5 inches in the higher elevations. Farther to the south and east in northern Arkansas, snow became less common and freezing rain and sleet predominated. A major ice storm occurred with total ice accumulations ranging from 1/4 inch up to near 1 inch. Roads were snow and ice covered and hazardous during the event with numerous traffic accidents reported. Power outages were widespread due to the weight of snow and ice on tree limbs and power lines. Approximately 50,000 customers lost power at the height of the storm. Twelve counties in the Little Rock County Warning Area were declared disaster areas due to the ice, with the cleanup cost estimated around 4 million dollars.

Event: Winter Storm
Begin Date: 23 Dec 2002, 09:00:00 PM CST
Begin Location: Not Known
End Date: 24 Dec 2002, 04:00:00 AM CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 2
Property Damage: $0 Crop Damage: $0
Description: Snow starting falling over parts of north-central Arkansas during the afternoon hours on the 23rd. The snow gradually overspread the rest of the area by the early evening hours. Snow accumulations from 3 to 6 inches were common in the counties along the Arkansas/Missouri border. Lesser amounts were reported farther south, with 1 to 3 inches of snow common. Some sleet and freezing rain mixed with the snow before the precipitation ended by early afternoon on the 24th. Roads were snow covered and hazardous with numerous traffic accidents reported. One accident occurred in Baxter County along Highway 101. A car flipped over with two people injured. Sporadic power outages were also reported due to the weight of snow and ice on tree limbs and power lines.

Event: Winter Weather
Begin Date: 11 Feb 2008, 06:00:00 AM CST
Begin Location: Not Known
End Date: 12 Feb 2008, 06:00:00 AM CST
End Location: Not Known
Magnitude: 0 Fatalities: 1 Injuries: 0
Property Damage: $0 Crop Damage: $0
Description:
EVENT NARRATIVE: Freezing rain accumulated on trees and roadways.
EPISODE NARRATIVE: A cold front pushed through Arkansas on February 10th, with a shallow cold Arctic air mass to follow. A system aloft arrived from southern Plains, with moisture overrunning the cold air. Patchy freezing rain and sleet developed in extreme northern Arkansas early on the 11th.

Event: Ice Storm
Begin Date: 26 Jan 2009, 13:00:00 PM CST
Begin Location: Not Known
End Date: 28 Jan 2009, 03:00:00 AM CST
End Location: Not Known
Magnitude: 0 Fatalities: 0 Injuries: 0
Property Damage: $50M Crop Damage: $0
EVENT NARRATIVE: The sheriff's office reported that 1/2 to 1 inch of freezing rain had accumulated by 5:30 AM on the 27th, with up to 2 inches of freezing rain and sleet combined.

EPISODE NARRATIVE: Freezing rain and sleet moved into northern and western Arkansas during the afternoon and early evening on the 26th, then spread rapidly eastward. By later on the night of the 26th, most of the precipitation was falling in the form of freezing rain. During the day of the 27th, almost continuous freezing rain fell across the north, with ice accumulating rapidly. Freezing rain continued in the north through the evening of the 27th, before turning over to light sleet and snow during the late night hours of the 27th and early on the 28th. The end result was a devastating, historic ice storm across northern Arkansas. Across the northern two rows of counties, ice accumulations were mainly in the 1 to 2 inch range, with a few greater totals at the highest elevations. The snow at the end of the winter weather episode was generally 2 inches. The ice storm knocked out electricity to more 300,000 electric customers statewide. More than 10,000 power poles were broken or toppled, and hundreds of miles of power lines fell to the ground. Thousands of transformers had to be replaced.

Entergy serves Marion County and could not provide a local breakdown. However, virtually all of the county initially lost power, with widespread outages of several days to more than a month in outlying areas. Power outages in unincorporated areas meant no water, because those areas are served by individual wells.

In Marion County, shelters were set up at the American Legion Hut in Yellville, the First Baptist Church in Bull Shoals, and the Church of Christ in Flippin. The Legion Hut was opened on Jan. 27 and housed 25 people. On Jan. 28, 58; Jan. 29, 70; Jan. 30, 52; Jan. 31, 56. On Feb. 1, meals began to be served. Feb. 1, 26 housed, 84 meals served; Feb. 2, 17 housed, 145 meals; Feb. 3, 20 housed, 169 meals; Feb. 4, 21 housed, 231 meals; Feb. 5, 20 housed, 225 meals; Feb. 6, 5 housed, 160 meals; Feb. 7, 3 housed, 70 meals; Feb. 8, 3 housed, 39 meals.

First Baptist in Bull Shoals was open to house and feed people Jan. 28-Feb.4. Totals: Jan. 28, 40 housed, 450 meals; Jan. 29, 40 housed, 450 meals; Jan. 30, 40 housed, 450 meals; Jan 31, 30 housed, 450 meals; Feb. 1, 20 housed, 300 meals; Feb. 2, 10 housed, 210 meals; Feb. 3, 2 housed, 60 meals.

Daily breakdowns are not available for the shelter in Flippin but on average it housed 50 people and fed 300 daily.

Element D: Probability of future events. There have been 54 snow and ice events in 60 years; probability, one event every 0.9 years.

Vulnerability assessment:

Element A: Overall summary. Three deaths and two injuries have been reported as a result of snow and ice events, according to the NCDC. We have seen up to two feet of snow and ice accumulations of 2 inches or more. All structures in the jurisdictions are vulnerable to power loss from snow and ice, with downed power lines causing outages lasting from a few hours to more than a month in some rural areas. Roof collapses have occurred and so can be expected in the future, particularly for poultry houses, potentially resulting in the deaths of thousands of birds. Downed trees have also caused transmission lines to fail and have damaged businesses and homes; this will happen again. Critical facilities are vulnerable to interruptions in power and physical damage.

Element B: Impact on jurisdictions. The school districts of Flippin, Ozark Mountain and Yellville- Summit are generally not immediately impacted by snow and ice because improved forecasts allow sufficient time to close the schools. But power loss and transportation issues have led to the closing of schools for several days at a time. Bull Shoals, Flippin, Pyatt, Summit and Yellville have greater population density than rural areas and clusters of business and industrial structures make them vulnerable to damage and detrimental economic impacts. Residents of the unincorporated county are most at risk for personal well-being because county-maintained roads become impassable for longer periods of time and power outages last longer. Poultry houses and other livestock operations are subject to devastating losses.

DOC >NOAA >NESDIS >NCDC Search Field: Search NCDC

Query Results

54 SNOW & ICE event(s) were reported in **Marion County, Arkansas** between **04/30/1950** and **08/31/2011.**

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Arkansas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 ARZ001>008 - 010 - 012>014	01/18/1993	0000	Ice Storm	N/A	0	0	500K	0
2 ARZ001>006 - 012 - 013	02/14/1993	0000	Heavy Snow	N/A	0	0	50.0M	0
3 ARZ001>008 - 010 - 012>014	02/24/1993	0000	Ice Storm	N/A	0	0	5.0M	0
4 Northern And Central	01/16/1994	0000	Winter Storm	N/A	0	0	5.0M	0
5 All Of Arkansas	02/08/1994	1800	Winter Storm	N/A	0	0	500K	0
6 Northern And Central	03/08/1994	0600	Winter Storm	N/A	0	0	5.0M	0
7 ARZ003>007 - 012>016 - 020>024 - 030 - 037>038 - 040	01/01/1996	10:00 PM	Heavy Snow	N/A	0	0	0	0
8 ARZ003>007 - 012>016 - 020>025 - 030>034 - 037>047 - 052>056	01/08/1997	06:00 AM	Winter Storm	N/A	0	0	0	0
9 ARZ003>007 - 012>016 - 020>025 - 030>034 - 037>047 - 052>057 - 062>063	02/13/1997	12:00 AM	Heavy Snow	N/A	0	0	0	0
10 ARZ003>007 - 012>016 - 021>025 -	01/01/1999	12:00 PM	Ice Storm	N/A	1	0	0	0

031>033 - 039 - 044>046								
11 ARZ003>007 - 012>016	03/14/1999	02:00 AM	Heavy Snow	N/A	0	0	0	0
12 ARZ003>007 - 012>016 - 021>025 - 030>034 - 037>047 - 052>057 - 062>069	01/27/2000	09:00 AM	Winter Storm	N/A	1	0	0	0
13 ARZ003>007 - 012>016 - 021>025 - 030>034 - 037>047 - 052>057 - 062>069	12/13/2000	01:00 AM	Winter Storm	N/A	0	0	0	0
14 ARZ003>007 - 012>016 - 021>025 - 030>034 - 037>047 - 052>057 - 062>069	12/25/2000	02:00 PM	Ice Storm	N/A	0	0	0	0
15 ARZ003>007 - 012>016 - 021>025 - 030>034 - 037>047 - 052>057 - 062>069	02/05/2002	08:00 AM	Winter Storm	N/A	0	0	0	0
16 ARZ003>007 - 012>016 - 023>025	03/01/2002	07:00 AM	Winter Storm	N/A	0	0	0	0
17 ARZ003>005 - 012>013 - 021>023 - 030>031 - 037>038 - 040	03/02/2002	08:00 AM	Winter Storm	N/A	0	0	0	0
18 ARZ003>007 - 012>016 - 023>025 - 033>034	12/03/2002	10:00 PM	Winter Storm	N/A	0	0	3.7M	0
19 ARZ003>005	12/23/2002	09:00 PM	Winter Storm	N/A	0	2	0	0
20 ARZ003>006 - 012>013	02/09/2003	11:56 AM	Heavy Snow	N/A	0	0	0	0
21 ARZ003>005	02/23/2003	04:00 PM	Winter Storm	N/A	0	0	0	0
22 ARZ003>004 - 014>015	12/12/2003	07:00 PM	Winter Storm	N/A	0	0	0	0
23 ARZ003>007 - 012>015 - 040	02/04/2004	09:00 PM	Winter Storm	N/A	0	0	0	0
24 ARZ004>007 - 012>016 - 021>025 - 030>034 - 037>047 - 052>056	12/22/2004	02:00 PM	Winter Storm	N/A	0	0	0	0

25 ARZ003>007 - 012>015	02/18/2006	03:00 AM	Winter Storm	N/A	0	0	0	0
26 ARZ003>005 - 012>013 - 021>023 - 030>031 - 038	01/21/2008	20:30 PM	Winter Weather	N/A	0	0	0K	0K
27 ARZ003>007 - 012 - 014	01/31/2008	06:00 AM	Winter Storm	N/A	0	0	0K	0K
28 ARZ003>007 - 012 - 014	01/31/2008	06:00 AM	Winter Weather	N/A	0	0	0K	0K
29 ARZ003>007 - 012	02/11/2008	06:00 AM	Winter Weather	N/A	1	0	0K	0K
30 ARZ003>007 - 012>015 - 023	02/21/2008	02:00 AM	Winter Weather	N/A	0	0	0K	0K
31 ARZ003>007 - 012>016 - 022>025 - 030>034 - 037>047 - 054	03/04/2008	02:00 AM	Heavy Snow	N/A	0	0	0K	0K
32 ARZ003>007 - 012>016 - 022>025 - 030>034 - 037>047 - 054	03/04/2008	02:00 AM	Winter Weather	N/A	0	0	0K	0K
33 ARZ004>007 - 013>016 - 022 - 038	03/06/2008	13:00 PM	Winter Storm	N/A	0	0	0K	0K
34 ARZ004>007 - 013>016 - 022 - 038	03/06/2008	13:00 PM	Winter Weather	N/A	0	0	0K	0K
35 ARZ003>005 - 007 - 012	12/10/2008	02:00 AM	Winter Weather	N/A	0	0	0K	0K
36 ARZ003>005	12/15/2008	01:00 AM	Winter Weather	N/A	0	0	0K	0K
37 ARZ003>007 - 012>015 - 023 - 031>032 - 034 - 037 - 039 - 044	12/23/2008	07:30 AM	Winter Weather	N/A	0	0	0K	0K
38 ARZ003 - 004	01/05/2009	22:00 PM	Winter Weather	N/A	0	0	0K	0K
39 ARZ003>005 - 042	01/26/2009	13:00 PM	Ice Storm	N/A	0	0	50.0M	0K
40 ARZ003>005 - 042	01/26/2009	13:00 PM	Winter Weather	N/A	0	0	0K	0K
41 ARZ004	02/28/2009	07:00 AM	Winter Weather	N/A	0	0	0K	0K
42 ARZ003>005 - 012	01/02/2010	23:00 PM	Heavy Snow	N/A	0	0	0K	0K
43 ARZ003>005 - 012	01/02/2010	23:00 PM	Winter	N/A	0	0	0K	0K

			Weather					
44 ARZ004 - 013 - 016 - 021 - 023	01/28/2010	20:00 PM	Winter Storm	N/A	0	0	0K	0K
45 ARZ004 - 012>013 - 042>043 - 045>046 - 054	02/08/2010	06:00 AM	Heavy Snow	N/A	0	0	0K	0K
46 ARZ004 - 012>013 - 042>043 - 045>046 - 054	02/08/2010	06:00 AM	Winter Storm	N/A	0	0	0K	0K
47 ARZ004 - 012>013 - 042>043 - 045>046 - 054	02/08/2010	06:00 AM	Winter Weather	N/A	0	0	0K	0K
48 ARZ004 - 014 - 025	01/09/2011	19:00 PM	Winter Weather	N/A	0	0	0K	0K
49 ARZ004 - 005	01/20/2011	04:00 AM	Winter Storm	N/A	0	0	0K	0K
50 ARZ004 - 013	02/01/2011	04:30 AM	Winter Storm	N/A	0	0	0K	0K
51 ARZ004 - 013	02/01/2011	04:30 AM	Winter Weather	N/A	0	0	0K	0K
52 ARZ004 - 014>016 - 034 - 047	02/04/2011	13:00 PM	Heavy Snow	N/A	0	0	0K	0K
53 ARZ004 - 014>016 - 034 - 047	02/04/2011	13:00 PM	Winter Weather	N/A	0	0	0K	0K
54 ARZ004	02/06/2011	22:00 PM	Winter Weather	N/A	0	0	0K	0K
				TOTALS:	3	2	119.680M	0

Straight-Line Wind Profile

Generally, any wind that is not associated with rotation, used mainly to differentiate them from tornadic winds. *Source: NOAA glossary.*

Element A: Location. All of Marion County is susceptible to straight-line winds: all unincorporated areas, the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville, and the school districts of Flippin, Yellville-Summit and Ozark Mountain.

Element B: Extent. CPRI index total, 1.45. Probability, 1 (unlikely); magnitude, 1 (negligible); severity, 1 (negligible); warning time, 4 (less than six hours).

Element C: Previous occurrences. Since Jan. 1, 1950, four strong winds have been recorded by the National Climatic Data Center since 1950; one high-wind event listed the NCDC's "high winds" category duplicates one of the four in the strong winds category. The table appears at the end of this profile.

Event: Strong Wind

Begin Date: 22 Dec 2007, 17:00:00 PM CST

Begin Location: Not known

End Date: 23 Dec 2007, 02:00:00 PM CST

End Location: Not Known

Magnitude: 33 kts. Fatalities: 0 Injuries: 0

Property Damage: $5.0K Crop Damage: $0K

EPISODE NARRATIVE: Strong, gusty west to northwest winds spread across Arkansas following the passage of a cold front on the afternoon and evening of the 22nd. Due to wet grounds from previous rains, the winds were strong enough to blow some trees down, and the falling trees then took down some power lines. Marion was among 10 counties listed by the NCDC as affected, so the property damage amount may or may not apply to Marion.

Event: Strong Wind (Also listed in High Wind category by the NCDC.)

Begin Date: 29 Jan 2008, 11:0:00 AM CST

Begin Location: 5.5 miles due south of Pyatt in southwestern Marion County.

End Date: 17 29 2008, 20:00:00 PM CST

End Location: Not Known

Magnitude: 48 kts. Fatalities: 0 Injuries: 0

Property Damage: $ 250.0K for 35 Arkansas counties; no figure available for Marion County. Crop Damage: $ 0.0K

EVENT NARRATIVE: We are omitting the event narrative given in the NCDC because it is not about Marion County. This is the account from Carlos Parker, Marion County Emergency Operations Manager: The event originated 5.5 miles due south of Pyatt in southwestern Marion County. The first damage was on County Road 4019, shifting a mobile home off its foundation. Across the street a small outbuilding was blown down. The stormed moved northwest across County Road 4021, where it damaged two mobile homes before crossing Arkansas Highway 125 South, blowing a barn onto the highway. It continued moving northeast for approximately the next seven miles through a wooded area, blowing down several trees.

EPISODE NARRATIVE: A strong cold front approached from the Plains during the morning of January 29. The front arrived during the early afternoon hours, and winds shifted to the northwest. Winds speeds of 30 to 40 mph were common, with gusts over 50 mph. Approximately 80,000 power outages occurred in the 35 Arkansas counties affected, but no power outage is known to have occurred in Marion County, except for structures affected.

Event: Strong Wind

Begin Date: 11 Dec 2010, 11:00:00 AM CST

Begin Location: Not Known

End Date: 12 Dec 2010, 20:30:00 PM CST

End Location: Not Known

Magnitude: 44 kts. Fatalities: 0 Injuries: 0

Property Damage: $ 25.0K Crop Damage: $ 0K

EPISODE NARRATIVE: A strong cold front moved across Arkansas on the 11th. Strong winds followed the front, bringing down some power lines and blowing over Christmas yard decorations. The winds ushered much colder air into Arkansas. Marion and four other counties were affected.

Event: Strong Wind
Begin Date: 01 Feb 2011, 11:00:00 AM CST
Begin Location: Not Known
End Date: 01 Feb 2011, 22:00:00 PM CST
End Location: Not Known
Magnitude: 28 kts. Fatalities: 0 Injuries: 0
Property Damage: $ 2K Crop Damage: $ 0

EPISODE NARRATIVE: A low-pressure center tracked across Arkansas on the 1st, taking a path from near Texarkana to the Missouri Bootheel. In the colder air to the northwest of the low, freezing rain and sleet occurred, then precipitation changed over to light snow. In the warmer air to the southeast of the low, widespread rain and thunderstorms occurred. After the low moved by, much colder, Arctic air rushed across the state, accompanied by strong winds. Wind gusts between 30 and 45 mph were common. The winds brought down tree limbs and power lines, knocking out electricity to more than 7,000 customers in four counties. Snow flurries occurred in many sections of the state on the night of the 1st and continued into the 2nd.

Element D: Probability of future events. There have been four straight-lin wind events in the last 60 years, so the probability is one event every 15 years.

Vulnerability assessment:

Element A: Overall summary. There has been no recorded loss of life from straight -line winds as defined in this profile. We have seen straight line winds of up to 48 knots.

The Beaufort Wind Scale on Page 9 of the Appendix details the effects of wind on a scale of 0 to 12, with 48 knots falling in the 10 range. The scale lists effects in this range as including trees being uprooted and considerable structural damage.

However, in the 2008 event detailed on page 54, the consequences were worse than the Beaufort scale suggests. A mobile home was shifted off its foundation, two other mobile homes were damaged, a small outbuilding was blown down and a barn was blown onto the highway. These are relatively unusual events but certainly pose a threat in the future. Even the strongest structures in the jurisdictions are vulnerable to power loss from wind, as a result of power lines or trees falling onto them and causing moderate to severe damage.

A chief concern is damage to electrical devices that might disrupt critical communication, and to critical facilities themselves. Mobile homes are more vulnerable to severe weather, as has been demonstrated, and have a total assessed value of $19,949,125. State law requires tie-downs for mobile homes and specifies how they're secured.

All structures in the county and cities are vulnerable to power loss from wind causing downed lines. However, the school campuses in the districts of Flippin, Ozark Mountain and Yellville-Summit have the greatest concentration of people on school days, so that heightens their vulnerability.

Element B: Impact on jurisdictions. The school districts of Flippin, Ozark Mountain and Yellville-Summit have clusters of valuable buildings and have hundreds of occupants on school days, so if damaged would face higher consequences, such as injuries to occupants and damage to structures. In some cases, schools could be forced to close for several days if damage is severe. Bull Shoals, Flippin, Pyatt, Summit and Yellville have greater population densities than rural areas and clusters of business and industrial structures make them more vulnerable than the unincorporated county.

The locations of mobile home parks are detailed in the tornado section on Page 61. In summary, they are in the cities of Bull Shoals, Flippin, Oakland, Summit, Yellville and one location on MC 8080 south of Bull Shoals. All these locations are vulnerable to damage and potential loss of life to occupants in high wind events.

NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)

National Climatic Data Center
U.S. Department of Commerce

DOC >NOAA >NESDIS >NCDC

Search Field: Search NCDC

Query Results

4 STRONG WINDS event(s) were reported in **Marion County, Arkansas** between **01/01/1950** and **02/28/2011.**

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Arkansas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 ARZ004 - 013 - 023 - 032 - 044 - 056 - 063>065 - 068	12/22/2007	17:00 PM	Strong Wind	33 kts.	0	0	5K	0K
2 ARZ003>007 - 012>016 - 021>025 - 030>034 - 037>047 - 052>057 - 062	01/29/2008	11:00 AM	Strong Wind	48 kts.	1	0	250K	0K
3 ARZ004 - 012 - 021 - 030 - 037	12/11/2010	11:00 AM	Strong Wind	44 kts.	0	0	25K	0K
4 ARZ004 - 013 - 031 - 033	02/01/2011	11:00 AM	Strong Wind	28 kts.	0	0	2K	0K
				TOTALS:	1	0	282K	0

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Tornado Profile

A violently rotating column of air, usually pendant to a cumulonimbus, with circulation reaching the ground. It nearly always starts as a funnel cloud and may be accompanied by a loud roaring noise. On a local scale, it is the most destructive of all atmospheric phenomena.

Source: NOAA glossary.

Element A: Location. All of Marion County is susceptible to tornadoes: all unincorporated areas; the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville, and the school districts of Flippin, Yellville-Summit and Ozark Mountain.

Element B: Extent. CPRI index total, 3.55. Probability, 3 (likely); magnitude, 4 (catastrophic); severity, 4 (catastrophic); warning time, 4 (less than six hours).

Element C: Previous occurrences. Since April 30, 1950, 18 tornadoes have been recorded by the National Climatic Data Center. All events use NCDC descriptions.

Event: Tornado
Begin Date: 12 Mar 1961, 1830 CST
Begin Location: Not known.
Begin LAT/LON: 36°10'N / 92°49'W
End Location: Not known.
End LAT/LON: 36°23'N / 92°35'W
Length: 19.80 Miles Width: 250 Yards
Magnitude: F1 Fatalities: 0 Injuries: 0
Property Damage: $ 250.0K
Crop Damage: $ 0.0
Description: None Reported

Event: Tornado
Begin Date: 07 May 1961, 0100 CST
Begin Location: Not known.
Begin LAT/LON: 36°07'N / 92°47'W
End Location: Not known.
End LAT/LON: 36°18'N / 92°40'W
Length: 14.20 Miles Width: 1760 Yards
Magnitude: F3 Fatalities: 3 Injuries: 9
Property Damage: $ 2.5M
Crop Damage: $ 0.0
Description: None Reported

Fujita Tornado Scale

This scale measures tornado damage severity. It assigns a numerical value based on wind speeds and categorizes tornadoes tornadoes from F0 to F5. Scale values above F5 are not used because wind speeds above 318 mph are unlikely.

F0 Intensity Phrase: Gale tornado. **Wind Speed:** 40-72 mph. **Type of Damage:** Some damage to chimneys, breaks branches off trees, pushes over shallow-rooted trees, damages sign boards.
F1 Intensity Phrase: Moderate tornado. **Wind Speed:** 73-112 mph. **Type of Damage:** The lower limit is the beginning of hurricane wind speeds, peels surface off roofs, mobile homes pushed off foundations or overturned, moving autos pushed off roads, attaches garages may be destroyed.
F2 Intensity Phrase: Significant tornado. **Wind Speed:** 113-157 mph. **Type of Damage:** Considerable damage. Roofs torn off frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted, light object missiles generated.
F3 Intensity Phrase: Severe tornado. **Wind Speed:** 153-206 mph. **Type of Damage:** Roof and some walls torn off well-constructed houses, trains overturned, most trees in forest uprooted.
F4 Intensity Phrase: Devastating tornado. **Wind Speed:** 207-260 mph. **Type of Damage:** Well-constructed houses leveled, structures with weak foundations blown off some distance, cars thrown and large missiles generated.
F5 Intensity Phrase: Incredible tornado. **Wind Speed:** 261-318 mph. **Type of Damage:** Strong frame houses lifted off foundations and carried considerable distances to disintegrate, automobile-sized missiles fly through the air in excess of 100 meters, trees debarked, steel reinforced concrete structures badly damaged.

Event: Tornado
Begin Date: 07 May 1961, 0215 CST
Begin Location: Not Known
Begin LAT/LON: 36°12'N / 92°30'W
End LAT/LON: 36°30'N / 92°18'W
End Location: Not Known.
Length: 23.50 Miles Width: 333 Yards
Magnitude: F3 Fatalities: 0 Injuries: 1
Property Damage: $ 2.5M
Crop Damage: $ 0.0
Description: None Reported

Event: Tornado
Begin Date: 24 Jan 1964, 1500 CST
Begin Location: Not Known
Begin LAT/LON: 36°16'N / 92°36'W
End Location: Not Known
Magnitude: F0 Fatalities: 0 Injuries: 0
Property Damage: $ 0.0K
Crop Damage: $ 0.0
Description: None Reported

Event: Tornado
Begin Date: 14 Dec 1971, 2330 CST
Begin LAT/LON: 36°15'N / 92°36'W
End LAT/LON: 36°18'N / 92°33'W
Length: 4.50 Miles Width: 880 Yards
Magnitude: F3 Fatalities: 0 Injuries: 8
Property Damage: $ 250.0K
Crop Damage: $ 0.0
Description: None Reported

Event: Tornado
Begin Date: 14 Aug 1976, 1647 CST
Begin LAT/LON: 36°31'N / 92°46'W
End Location: Not Known
Length: 0.10 Mile Width: 17 Yards
Magnitude: F0 Fatalities: 0 Injuries: 2
Property Damage: $ 250.0K
Crop Damage: $ 0
Description: None Reported

Event: Tornado
Begin Date: 26 Mar 1983, 1700 CST
Begin LAT/LON: 36°11'N / 92°51'W
End Location: Not Known
Length: 2.00 Miles Width: 293 Yards
Magnitude: F2 Fatalities: 0 Injuries: 0
Property Damage: $ 250.0K
Crop Damage: $ 0.0
Description: None Reported

Event: Tornado
Begin Date: 18 Nov 1985, 2112 CST
Begin LAT/LON: 36°11'N / 92°40'W
End LAT/LON: 36°18'N / 92°29'W
Length: 13.00 Miles Width: 440 Yards
Magnitude: F3 Fatalities: 3 Injuries: 13
Property Damage: $ 25.0M
Crop Damage: $ 0
Description: None Reported

Event: Tornado
Begin Date: 22 Apr 1996, 12:40:00 AM CST
Begin Location: 4 Miles West South West of Yellville.
Begin LAT/LON: 36°13'N / 92°44'W
End Date: 22 Apr 1996, 12:55:00 AM CST
End Location: 4 Miles North North East of Flippin.
End LAT/LON: 36°19'N / 92°34'W
Length: 12.00 Miles Width: 200 Yards
Magnitude: F2 Fatalities: 0 Injuries: 6
Property Damage: $ 1.0M
Crop Damage: $ 0.0
Description:The tornado touched down 3 1/2 miles southwest of Yellville.. It moved north-northeastward, passing just to the north of the town of Summit. The tornado then began moving in more of a northeasterly direction, passing just to the north of Flippin. and then lifted 4 miles north-northeast of Flippin.. A number of homes and some businesses sustained damage along the tornado's path. Several trailers were either damaged or destroyed. 6 people sustained minor injuries. A number of trees and power lines were also blown down. Initial estimates place the amount of damage at $1,000,000.

Event: Tornado
Begin Date: 26 Sep 1996, 07:05:00 AM CST
Begin Location: Bull Shoals
Begin LAT/LON: 36°23'N / 92°35'W
End Date: 26 Sep 1996, 07:10:00 AM CST
End Location: Bull Shoals
End LAT/LON: 36°23'N / 92°35'W
Length: 0.20 Mile Width: 40 Yards
Magnitude: F1 Fatalities: 0 Injuries: 0
Property Damage: $0 Crop Damage: $0
Description: An F1 tornado touched down briefly on the shoreline of Bull Shoals Lake. The tornado struck a marina, destroying much of the boat dock and damaging about 40 boats. Some trees near the marina were also knocked down.

Event: Tornado
Begin Date: 13 Jun 1998, 06:48:00 PM CST
Begin Location: 5 Miles South of Oakland
Begin LAT/LON: 36°23'N / 92°34'W
End Date: 13 Jun 1998, 06:48:00 PM CST
End Location: 5 Miles South West of Oakland
End LAT/LON: 36°23'N / 92°34'W
Length: 0.10 Mile Width: 50 Yards
Magnitude: F0 Fatalities: 0 Injuries: 0
Property Damage: $0 Crop Damage: $0
Description:A weak tornado was spawned near Oakland in northeast Marion County. The tornado was very brief and caused little if any damage.

Event: Tornado
Begin Date: 24 May 2000, 09:20:00 PM CST
Begin Location: 0 Mile North of Rea Valley.
Begin LAT/LON: 36°13'N / 92°32'W
End Date: 24 May 2000, 09:21:00 PM CST
End Location: 0 Mile North of Rea Valley.
End LAT/LON: 36°13'N / 92°32'W
Length: 0.40 Mile Width: 20 Yards
Magnitude: F1 Fatalities: 0 Injuries: 0
Property Damage:$0 Crop Damage:$0
Description: A weak tornado affected areas near Rea Valley in Marion County, which is about 3 miles south of Cotter (a Baxter County town) . The tornado was on the ground briefly, and knocked down a few large trees.

Event: Tornado
Begin Date: 23 Nov 2001, 09:10:00 PM CST
Begin Location: 3 Miles West North West of Eros.
Begin LAT/LON: 36°12'N / 92°54'W
End Date: 23 Nov 2001, 09:15:00 PM CST
End Location: 1 Miles West South West of Pyatt.
End LAT/LON: 36°15'N / 92°51'W
Length: 3.00 Miles Width: 100 Yards
Magnitude: F1 Fatalities: 0 Injuries: 0
Property Damage: $ 0 Crop Damage: $ 0
Description: The weak tornado moved from Newton County into Marion County about 2.6 miles west-northwest of Eros. The tornado traveled to the northeast for 3 miles before lifting 1.3 miles west-southwest of Pyatt.. Since the tornado moved across a rural portion of the county, damage along the path consisted of some downed trees.

Event: Tornado
Begin Date: 19 Apr 2003, 11:43:00 PM CST
Begin Location:7 Miles Southeast of Flippin.
Begin LAT/LON: 36°12'N / 92°31'W
End Date: 19 Apr 2003, 11:47:00 PM CST
End Location: 8 Miles East South East of Flippin.
End LAT/LON: 36°13'N / 92°28'W
Length: 1.00 Mile Width: 100 Yards
Magnitude: F1 Fatalities: 0 Injuries: 0
Property Damage: $0 Crop Damage: $0
Description: A weak tornado touched down about 7 miles southeast of Flippin. and traveled to the northeast into Baxter County. Damage consisted of a number of large trees being blown down.

Event: Tornado

Begin Date: 24 Apr 2003, 05:08:00 PM CST

Begin Location: 3 Miles South West of Peel

Begin LAT/LON: 36°24'N / 92°48'W

End Date: 24 Apr 2003, 05:16:00 PM CST

End Location: 2 Miles North East of Peel

End LAT/LON: 36°27'N / 92°45'W

Length: 4.90 Miles Width: 200 Yards

Magnitude: F1 Fatalities: 0 Injuries: 1

Property Damage: $0.0 Crop Damage: $0.0

Description: A weak tornado touched down 3.2 miles southwest of Peel and traveled to the northeast before lifting 1.7 miles northeast of Peel. The tornado damaged a church with a wall bowed out. Damage also occurred to the ceiling in the sanctuary. A travel trailer was also overturned with several homes suffering roof damage, mostly due to fallen trees or tree limbs. Also, a 60 by 40 foot shed was totally destroyed, with doors blown off a few turkey houses. Power lines and power poles were downed along with dozens of very large trees. Two vehicle were smashed by fallen trees. A woman was injured when her mobile home flipped over and was destroyed.

Event: Tornado

Begin Date: 22 Sep 2006, 04:12:00 PM CST

Begin Location: 2 Miles South South East of Rush

Begin LAT/LON: 36°06'N / 92°33'W

End Date: 22 Sep 2006, 04:12:00 PM CST

End Location: 2 Miles South South East of Rush

End LAT/LON: 36°06'N / 92°33'W

Length: 0.30 Mile Width: 25 Yards

Magnitude: F0 Fatalities: 0 Injuries: 0

Property Damage: $0.0 Crop Damage: $0.0

Description: A weak tornado was spawned in southern Marion County. The tornado was on the ground briefly about 2 miles south-southeast of Rush. The tornado had difficulty reaching the ground, and downed a few trees on a hilltop.

Event: Tornado

Begin Date: 05 Feb 2008, 17:02:00 PM CST

Begin Location: 3 Miles North West of Ware's Chapel

Begin LAT/LON: 36°12'N / 92°37'W

End Date: 05 Feb 2008, 17:11:00 PM CST

End Location: 3 Miles North North East of Rea Valley.

End LAT/LON: 36°16'N / 92°31'W

Length: 7.00 Miles Width: 880 Yards

Magnitude: F1 Fatalities: 0 Injuries: 1

Property Damage: $1.8M Crop Damage: $0.0K

EVENT NARRATIVE: A Red Cross survey indicated that 3 houses had major damage, 5 had minor damage, and 5 others were affected. In addition, 3 mobile homes were destroyed, 3 had major damage, and 2 had minor damage. Numerous trees and power lines were blown down as well. The tornado continued into Baxter County, just east-southeast of Cotter.

EPISODE NARRATIVE: Early on the 5th, a strong storm system approached from the Plains. Ahead of the system, breezy southerly winds provided well above normal temperatures and abundant moisture. Warmth and moisture destabilized the atmosphere and fueled developing thunderstorms. A cold front moved across the state causing numerous severe storms and several tornadoes. One of the tornadoes tracked from Yell County to Sharp County, staying on the ground for 121.84 miles. This track length set a record for the longest tornado path ever recorded in Arkansas. The continuous track was confirmed by two National Weather Service meteorologists who flew the track with the Civil Air Patrol. The final track was based on ground surveys, the Civil Air Patrol flight, and an aerial mapping flight performed for the Arkansas Forestry Commission.

Event: Tornado
Begin Date: 30 Apr 2010, 16:49:00 PM CST
Begin Location: Not Known
End Date: 30 Apr 2010, 16:52:00 PM CST
End Location: Not Known
Length: 1.00 Mile Width: 100 Yards
Magnitude: F1 Fatalities: 0 Injuries: 0
Property Damage:$40.0K Crops: $0.0K

EVENT NARRATIVE: An EF1 tornado caused roof and siding damage to six homes at Price Place. Numerous trees were uprooted or snapped. The tornado exited Marion County, Arkansas, north-northeast of Price Place and crossed into Ozark County, Missouri, south-southeast of Pontiac.

EPISODE NARRATIVE: Moisture from the Gulf of Mexico surged into Arkansas at the end of April, so conditions in the state became warm and humid. On the 30th, a strong area of low pressure aloft approached from the west, resulting in the development of thunderstorms. Wind shear, a change in wind direction and speed with height, was present. This created a favorable environment for the formation of tornadoes.

Element D: Probability of future events. There have been 18 in the last 60 years, so the probability is one event every 3.33 years.

Vulnerability assessment:

Element A: Overall summary. There have been six deaths recorded from tornadoes since Jan. 1, 1950, with 41 injuries Total property damage: $33.79 million.

The unincorporated county and the cities of Yellville, Bull Shoals and Flippin have seen tornadoes in the range of F0 to F3, with four of the 18 events in the F3 category.

The types of damage described in this section can be expected to happen again, as well as more severe destruction. The Fujita scale on Page 57 notes that an F3 is capable of tearing roofs and walls off well-constructed frame homes, demolishing mobile homes, overturning trains and uprooting most trees in its path. Other counties in the state have seen tornadoes in the F5 range, so we are subject to tornadoes of that scale, too. An F5 tornado would lift strong frame houses off their foundations, send automobile-sized projectiles through the air, debark trees and damage steel-reinforced concrete structures.

All structures in the county are vulnerable to power loss from wind causing downed lines. However, the school campuses in the districts of Flippin., Ozark Mountain and Yellville.-Summit have the greatest concentration of people on school days, so that heightens their vulnerability to damage, injuries and loss of life. Critical facilities are vulnerable as well. Mobile homes are more vulnerable to severe weather, and have a total assessed value of $19,949,125. State law requires tie-downs for mobile homes and specifies how they're secured so there is no need for local ordinances, as there might have been in the past.

Element B: Impact on jurisdictions. The school districts of Flippin, Ozark Mountain and Yellville- Summit have the greatest clusters of valuable buildings, so if hit would face higher consequences. Bull Shoals, Flippin, Pyatt., Summit and Yellville have greater population density than rural areas and clusters of business and industrial structures make them more vulnerable than the unincorporated county. All incorporated towns have mobile home parks. All have fewer than 25 units and the average number of units is 10 to 15. Here are the locations of all mobile home parks:

Bull Shoals: Hard Times Place, Lakeland Point, Pace's Ferry and Beacon Point. None has a storm shelter.

Flippin: Third Street, no shelter.

Oakland (unincorporated): Foxwood, which has a shelter, and Persimmon Point, which does not.

Summit: State Highway 202 West and also on 202 East. Neither has a shelter.

Yellville: College Street, 14th Street, Wickersham Street. None has a shelter.

Unincorporated County: MC 8080, just south of Bull Shoals.

Query Results

18 TORNADO(s) were reported in **Marion County, Arkansas** between **01/01/1950** and **02/28/2011.**

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Arkansas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 MARION	03/12/1961	1830	Tornado	F1	0	0	250K	0
2 MARION	05/07/1961	0100	Tornado	F3	3	9	2.5M	0
3 MARION	05/07/1961	0215	Tornado	F3	0	1	2.5M	0
4 MARION	01/24/1964	1500	Tornado	F0	0	0	0K	0
5 MARION	12/14/1971	2330	Tornado	F3	0	8	250K	0
6 MARION	08/14/1976	1647	Tornado	F	0	2	250K	0
7 MARION	03/26/1983	1700	Tornado	F2	0	0	250K	0
8 MARION	11/18/1985	2112	Tornado	F3	3	13	25.0M	0
9 Yellville	04/22/1996	12:40 AM	Tornado	F2	0	6	1.0M	0
10 Bull Shoals	09/26/1996	07:05 AM	Tornado	F1	0	0	0	0
11 Oakland	06/13/1998	06:48 PM	Tornado	F0	0	0	0	0
12 Rea Vly	05/24/2000	09:20 PM	Tornado	F1	0	0	0	0
13 Eros	11/23/2001	09:10 PM	Tornado	F1	0	0	0	0
14 Flippin	04/19/2003	11:43 PM	Tornado	F1	0	0	0	0
15 Peel	04/24/2003	05:08 PM	Tornado	F1	0	1	0	0
16 Rush	09/22/2006	04:12 PM	Tornado	F0	0	0	0	0
17 Ware's Chapel	02/05/2008	17:02 PM	Tornado	F1	0	1	1.8M	0K
18 Price Place	04/30/2010	16:49 PM	Tornado	F1	0	0	40K	0K
				TOTALS:	6	41	33.790M	0

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Wildfire Profile

Wildfire: Any free burning uncontainable wildland fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment. *Source: NOAA glossary.*

Element A: Location. All of Marion County is susceptible to wildfire because most of it is heavily wooded: unincorporated areas, the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville, and the school districts of Flippin, Yellville-Summit and Ozark Mountain.

Fires in Marion County

Year	Number of Fires	Acres Burned	Year	Number of Fires	Acres Burned
1991	23	334	**2002**	22	535
1992	26	2250	**2003**	22	1928
1993	27	543	**2004**	23	1527
1994	34	1896	**2005**	23	827
1995	58	2187	**2006**	46	723
1996	16	382	**2007**	27	425
1997	32	578	**2008**	11	85
1998	44	1293	**2009**	15	93
1999	32	586	**2010**	17	121
2000	24	507	**2011**	26	907
2001	25	945	**Totals**	550	11501

Average fires per year: 26.19. Average acres burned per year: 547.66.

Source: Marion County Office, Ark. Forestry Commission

Particular danger exists in the areas of wildland-urban interface, where human development meets or intermingles with wildland or vegetative fuels. The greatest danger areas are within the cities' limits, on the campuses and clearances around the schools, and within a three-mile radius of the cities' limits. These areas are shown on maps in subsequent pages.

Element B: Extent. CPRI index total, 2.35. Probability, 3 (likely); magnitude, 1 (negligible); severity, 1 (negligible); warning time, 4 (less than six hours).

Element C: Previous occurrences. The table shows events in Marion County since 1991. It was compiled after examining the fire reports in the county forester's office in Yellville and reports from the district.

Element D: Probability of future events. There have been 550 wildfires in 21 years, so the probability is 26.19 events every year.

Vulnerability assessment:

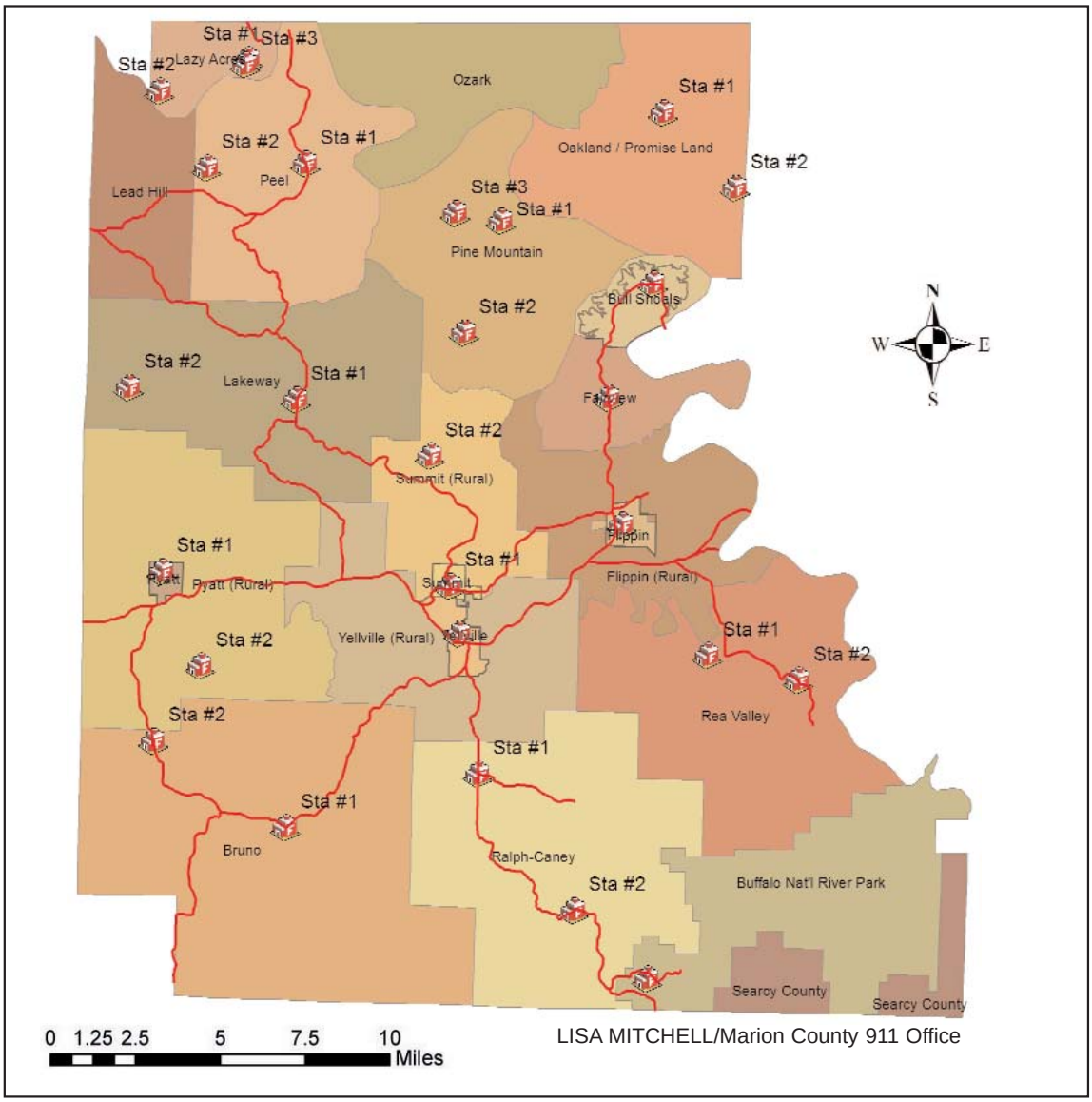
Element A: Overall summary. There has been no recorded loss of life from wildfires. The maps in this section show that wildfire control has been very good in the wildland urban interfaces and that the threat majority of fires occur in rural, heavily forested areas that are difficult to reach quickly.

Element B: Impact on jurisdictions. The school campuses of Flippin, Ozark Mountain and Yellville-Summit have the greatest clusters of valuable buildings. They would face higher consequences but the campuses have wide clearances around them. Bull Shoals, Flippin, Pyatt, Summit and Yellville have greater population density than rural areas and clusters of business and industrial structures make them more vulnerable to loss than the unincorporated county. If schools were hit by fire, they might have to close for days, resulting in longer school years and greater cost to the districts. Industries and retail businesses would suffer from the cost of repairs and loss of work days, resulting in loss of tax revenue to the cities and county. The greatest threat is to rural homes, barns, outbuildings. Whether inside city limits or out, residents could be displaced, and the county's and cities' budgets would be strained with the need to provide emergency housing.

Risk assessments and prescriptive burns to clear vegetation would ease the danger, as would outreach to the public regarding to the need to create lean, clean and green defensible spaces around structures.

New construction or retrofitting of critical facilities to be hazard-resistant, including fire resistant materials, needs to be addressed. although public opposition may prevent some jurisdictions from enacting ordinances.

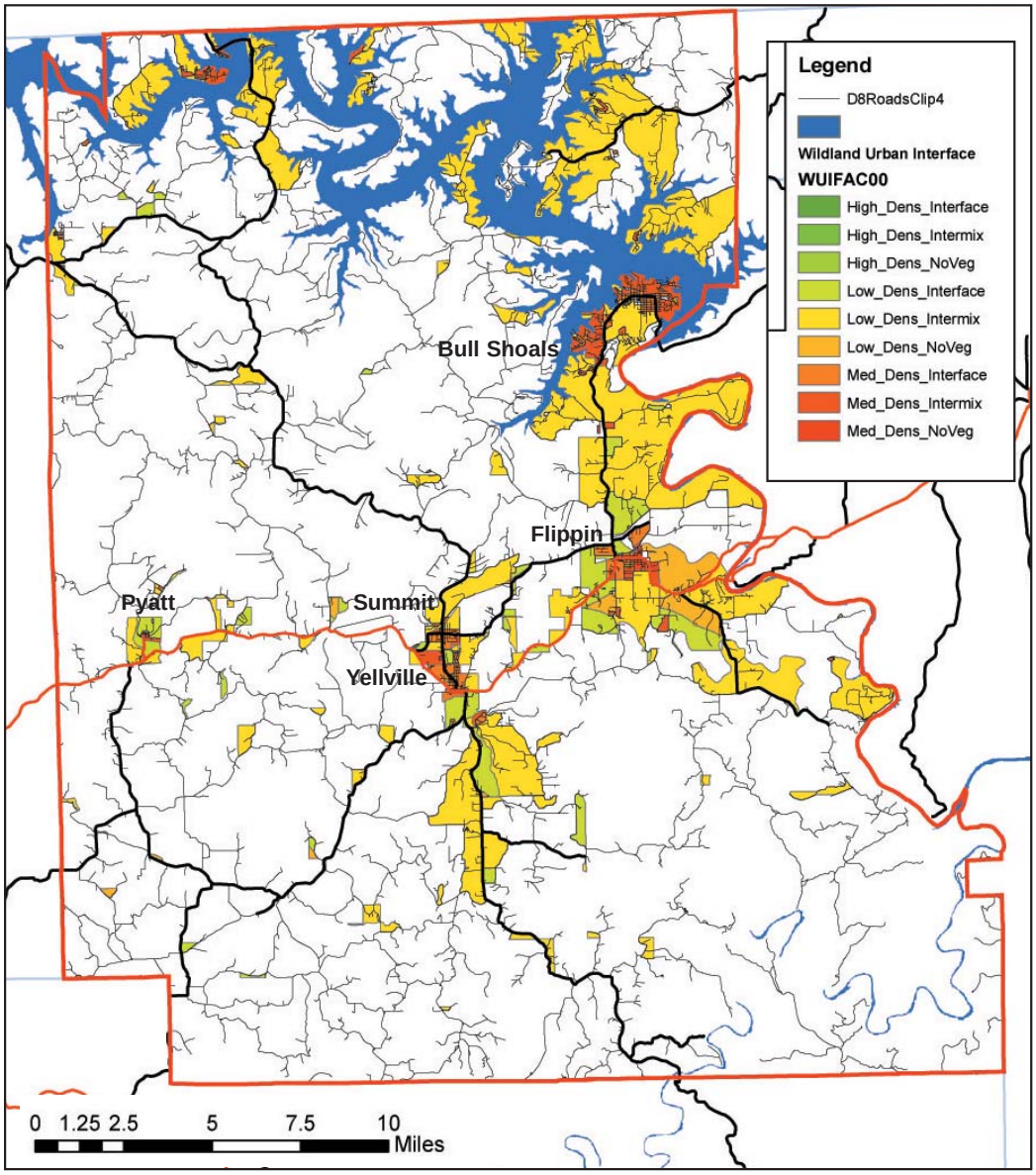
Marion County Fire Districts and Stations



ISO RATINGS

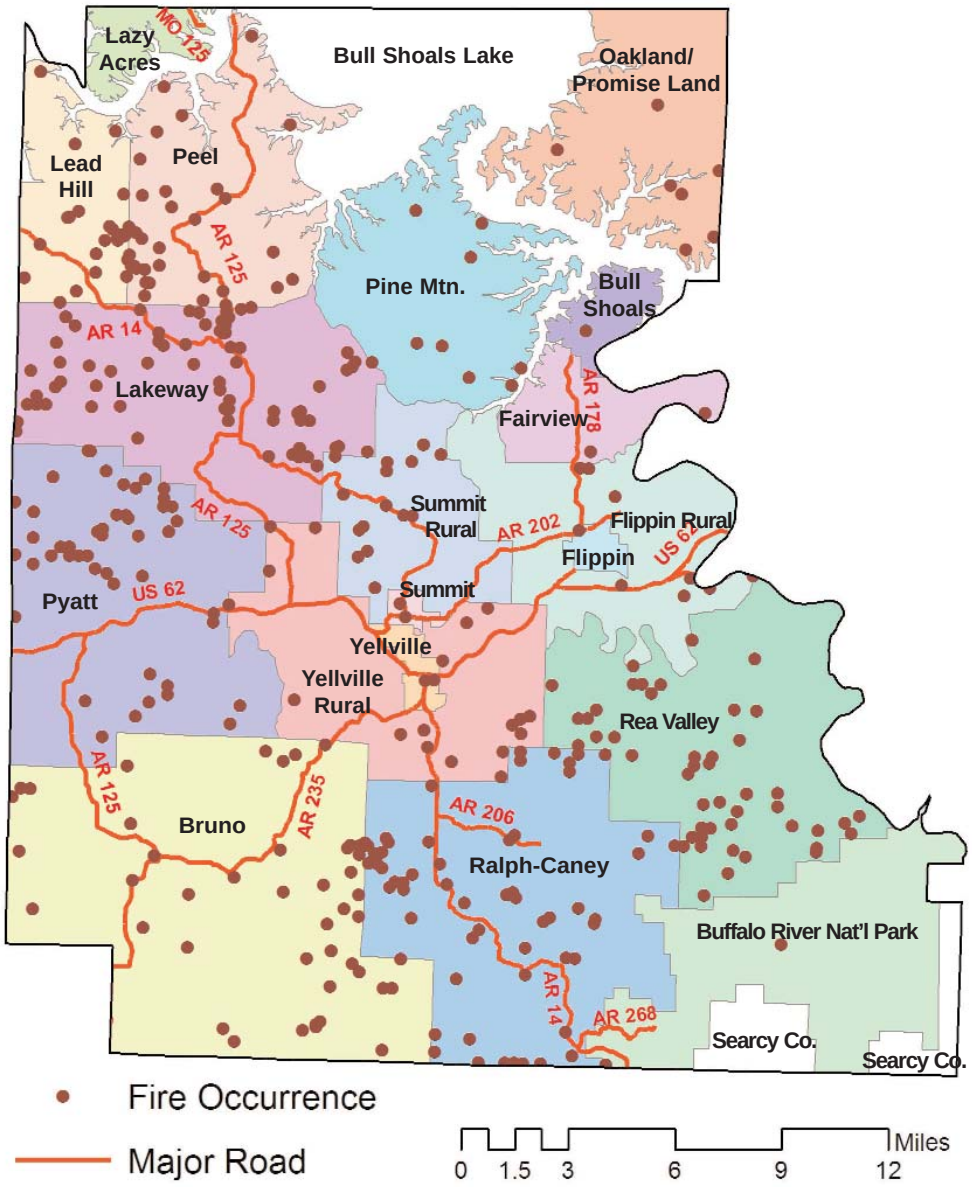
Bruno: 9
Bull Shoals: 5
Fairview: 4
Flippin: 5
Lead Hill: 9 county, 8 city
Lakeway: 9
Lazy Acres: 9
Oakland-Promise Land: 5
Peel: 9
Pine Mtn.: 9
Pyatt: 9
Ralph-Caney: 9
Rea Valley: 9
Summit: 5
Yellville: 4

Wildland Urban Interface Densities



SCOTT REED/Arkansas Forestry Commission

Fire Occurrence Areas, 1997-2010



JAMIE CRAIGHEAD/Marion County Assessor's Office/Arkansas Forestry Commission

Chapter V: Mitigation Strategy

Element A: Description of Goals

1. Reduce loss of life and property by assessing each natural hazard, including probability, frequency, exposure and consequences, and implement actions that are formulated from assessments. 2. Provide a framework and coordination to encourage all levels of government and public and private organizations to undertake mitigation to minimize disasters and use mitigation in recovery**.**

Capability Assessments: The capabilities of Marion County and cities participating in this plan address mitigation issues were determined by collecting information about each jurisdiction. Capability assessment data is incorporated back into the mitigation plan through the vulnerability analysis and NFIP sections.

The assessment findings for each jurisdiction are as follows:

Marion County:

Storm Water Management Ordinance: No
Stream Management Ordinance: No
Zoning Management Ordinance: No
Subdivision Management Ordinance: No
Erosion Management Ordinance: No
Floodplain Management Ordinance: No
Floodplain Plan published: No
Elevation Certificated: No
Member NFIP: No
Land Use Plan: No
Zoned: No
Building Code: Ark. Fire Prevention Code
ISO Ratings: For ratings of rural departments, see Fire Hazard in Chapter IV.
Previous mitigation plans, projects: No
Flood insurance claims: No
Electric service: Entergy
Water treatment: None
Wastewater Collection: None
Wastewater Treatment: None
Natural Gas: Source Gas
Telephone: North Arkansas Telephone Co. (NATCO), Yelcot
TV, Cable: NATCO, Yelcot

City of Bull Shoals:

Storm Water Management Ordinance: No
Stream Management Ordinance: No
Zoning Management Ordinance: Yes
Subdivision Management Ordinance: Yes
Erosion Management Ordinance: No
Floodplain Management Ordinance: Yes
Floodplain Plan published: No
Elevation Certificates: No*
Member NFIP: Yes Join Date: 9-1-04
Community #: 050394
Land Use Plan: Yes, 1996
Zoned: Yes, 2003
Building Code: Ark. Fire Prevention Code
ISO Rating: 5, in 2000
Previous mitigation plans, projects: Yes
Stormwater drainage, HUD Ike II funding, $339,000, underway
Flood insurance claims: No
Electric service: Entergy
Water treatment: Marion Co. Water Authority
Wastewater Collection: municipal
Wastewater Treatment: municipal
Natural Gas: Source Gas
Telephone: NATCO TV, Cable: NATCO

Note: The public works director is attending NFIP training March 12-15 and by the time this plan is adopted and will have brought the city into compliance with all NFIP requirements.

City of Flippin:

Storm Water Management Ordinance: No
Stream Management Ordinance: No
Zoning Management Ordinance: Yes
Subdivision Management Ordinance: Yes
Erosion Management Ordinance: No
Floodplain Management Ordinance: Yes
Floodplain Plan published: Yes

Elevation Certificates: Yes
Member NFIP: Yes Join Date: 5-19-87
Community #: 050135
Land Use Plan: Yes, 1977
Zoned: Yes, 1977
Building Code: Ark. Fire Prevention Code
ISO Rating: 5
Previous mitigation plans, projects: No
Flood insurance claims: No
Electric service: Entergy
Water treatment: Marion Co. Water Authority
Wastewater Collection: municipal
Wastewater Treatment: municipal
Natural Gas: Source Gas
Telephone: NATCO TV, Cable: NATCO

City of Pyatt:
Storm Water Management Ordinance: No
Stream Management Ordinance: No
Zoning Management Ordinance: No
Subdivision Management Ordinance: No
Erosion Management Ordinance: No
Floodplain Management Ordinance: No
Floodplain Plan published: No
Elevation Certificates: No
Member NFIP: No
Land Use Plan: No
Zoned: No
Building Code: Ark. Fire Prevention Code
ISO Rating: 9, in 1984
Previous mitigation plans, projects: No
Flood insurance claims: No
Electric service: Entergy
Water treatment: municipal
Wastewater Collection: none
Wastewater Treatment: none
Natural Gas: Source Gas
Telephone: NATCO TV, Cable: NATCO

City of Summit:
Storm Water Management Ordinance: No
Stream Management Ordinance: No
Zoning Management Ordinance: Yes
Subdivision Management Ordinance: No
Erosion Management Ordinance: No
Floodplain Management Ordinance: No
Floodplain Plan published: No
Elevation Certificates: No
Member NFIP: No
Land Use Plan: No
Zoned: Yes, 04/04/1989
Building Code: Ark. Fire Prevention Code
ISO Rating: 5
Previous mitigation plans, projects: No
Flood insurance claims: No
Electric service: Entergy
Water treatment: Marion Co. Water District
Wastewater Collection: City of Yellville
Wastewater Treatment: City of Yellville
Natural Gas: Source Gas
Telephone: Yelcot TV, Cable: Yelcot

City of Yellville:
Storm Water Management Ordinance: No
Stream Management Ordinance: No
Zoning Management Ordinance: Yes
Subdivision Management Ordinance: Yes
Erosion Management Ordinance: No
Floodplain Management Ordinance: Yes
Floodplain Plan published: Yes, 02/01/88
Elevation Certificates: Yes
Member NFIP: Yes, #050136
Land Use Plan: Yes, 1971
Zoned: Yes, 1971
Building Code: Ark. Fire Prevention Code
ISO Rating: 4, in 2004
Previous mitigation plans, projects: No
Flood insurance claims: Unknown
Electric service: Entergy
Water treatment: Marion Co. Water District
Wastewater Collection: City of Yellville
Wastewater Treatment: City of Yellville
Natural Gas: Source Gas
Telephone: Yelcot TV, Cable: Yelcot

Identification and Analysis of Mitigation Actions: Elements A, B, C

The mitigation actions table on the next three pages address these actions. An explanation of how they were assigned priorities is explained in the section on implementation.

Mitigation Action / Project	Associated Hazard	Rationale for Priority	Priority	New, Existing buildings	Est. Cost, Resources	Time frame	Administered/ responsible department	Jurisdiction
Use printed material, e-mail, press releases and educational programs to address each hazard identified to educate public on mitigation actions that can be taken.	Dam Failure, Drought, Earthquake, Flood, Severe Storm, Snow & Ice, Straight Line Wind, Tornado, Wildfire	Low-resource requirement and has proven good response & results.	Very High	Both new, existing	Low cost for ink, paper; no cost for FEMA and Ark. Forestry publications	Ongoing	County OEM; Supt. offices of Flippin, Yellville-Summit, Ozark Mtn. school districts; Mayors' offices of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Marion County; Flippin, Yellville-Summit, Ozark Mtn. School Dists; Bull Shoals, Flippin, Pyatt, Summit, Yellville
Construct safe room shelters.	Dam Failure, Earthquake, Flood, Severe Storm, Snow & Ice, Straight Line Wind, Tornado, Wildfire	Successful past results. Willingness by jurisdictions to apply & make local commitments. Can also be used as post-disaster shelters in schools and in county and city buildings. Mitigates loss of life during a storm and minimizes adverse public health effects afterward.	Very High	Both new, existing	$260,000 to $1 million depending on buildings, FEMA PDM and HMGP	One to two years after funding	County judge, Supt. offices of Flippin, Yellville-Summit, Ozark Mtn. school districts; Mayors' offices of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Marion County; Flippin, Yellville-Summit, Ozark Mtn. School Dists; Bull Shoals, Flippin, Pyatt, Summit, Yellville
Conduct prescriptive burns to clear vegetation for prevention of wildfire hazards.	Drought, Wildfire	Has been shown to save lives and protect property.	Very High	Both new, existing	Low cost, Forestry guidelines.	Ongoing	County rural fire chiefs; Chiefs of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Marion County, Bull Shoals, Flippin, Pyatt, Summit, Yellville
Anchor bookshelves and other heavy furniture to supporting walls in public buildings.	Earthquake and Tornado	Has been shown to save lives and protect property.	Very high	Both new, existing	Low cost, regular maintenance budgets	One year	County judge, Supt. offices of Flippin, Yellville-Summit, Ozark Mtn. school districts; Mayors' offices of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Marion County; Flippin, Yellville-Summit, Ozark Mtn. School Dists; Bull Shoals, Flippin, Pyatt, Summit, Yellville

Implement severe weather action plans for public facilities.	Dam Failure, Drought Earthquake, Flood, Severe Storm, Snow & Ice, SLW, Tornado, Wildfire	Lessen or eliminate problems with emergency response and business interruptions. (NFIP Considerations: CRS 310 Elevations Certifications, CRS 360 Flood Protection Assistance, CRS 510 Floodplain Mgmt. Planning, CRS 540 Drainage System Maintenance)	High	Both new, existing	Little cost except paper and ink; NFIP guidelines and publications as resources	One year	County OEM; Supt. offices of Flippin, Ozark Mtn. and Yellville-Summit school districts; Mayors' offices of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Marion County; Flippin, Ozark Mtn., Yellville-Summit School Dists; Bull Shoals, Flippin, Pyatt, Summit, Yellville
Acquire all-hazard radios for all public buildings and promote same for large businesses, churches and other locations where large numbers of people congregate.	Dam Failure, Earthquake, Flood, Severe Storm, Snow & Ice, SLW, Tornado, Wildfire	Participation at all public and private levels. (NFIP consideration: CRS 610 Flood Warning Program)	Very high	New and existing	Cost varies; local and county resources, PDM	One year	County OEM; Supt. offices of Flippin, Ozark Mtn., Yellville-Summit school districts; Mayors' offices of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Mar. County; Flippin, Ozark Mtn., Yellville-Summit School Dists; Bull Shoals, Flippin, Pyatt, Summit, Yellville
Use Pictometry and GIS tools to identify emergency response lifelines that are to be protected. New public buildings to be built to mitigate identified hazards when possible.	Dam Failure, Drought, Earthquake, Flood, Severe Storm, Snow & Ice, SLW, Tornado, Wildfire	Lifelines are essential to maintaining adequate response. (NFIP considerations: CRS 430 Protecting Bldg. Utilities, 510 Floodplain Mgmt. Planning, 610 Flood Warning)	High	New and existing	County and cities recently purchased Pictometry, will take employees time to implement.	Two years	County OEM; Mayors' offices of Bulls Shoals, Flippin, Pyatt, Summit, Yellville	Marion County, Bull Shoals, Flippin, Pyatt, Summit, Yellville
Include mitigation awareness efforts at all Marion County LEPC meetings.	Dam Failure, Drought, Earthquake, Flood, Severe Storm, Snow & Ice, SLW, Tornado, Wildfire	Continuation of water service is essential for response and mitigation. (NFIP consideration: CRS 510 Floodplain Mgmt. Planning)	High	New and existing	No cost; local and county resources.	Ongoing	County OEM; Supt. offices of Flippin, Ozark Mtn., Yellville-Summit school districts; Mayors' offices of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Marion County; Flippin, Ozark Mtn., Yellville-Summit School Dists; Bull Shoals, Flippin, Pyatt, Summit, Yellville
Build floodwall around waste treatment plant in Bull Shoals.	Dam Failure, Earthquake, Flood	Prevent damage to building to maintain service in disasters. (NFIP Considerations: CRS 430 Protecting Bldg. Utilities, CRS 450 Storm Water Mgmt., CRS 510 Floodplain Mgmt. Planning)	High	Existing	$2.5 million; PDM, FMA and HMGP	Two years after funding	Bull Shoals mayor and public works director	Bull Shoals

Replace 3 bridges and raise road above floodway at Alford St. & Crane Creek, 8th St. & Fallen Ash Creek and at Girard and 6th Streets.	Earthquake, Flood	Prevent repetitive flood damage. (NFIP Considerations: CRS 540 Drainage System Maintenance, CRS 510 Floodplain Mgmt. Planning)	High	Replace existing with new	$80,000 to $150,000 each; PDM, FMA and HMGP	One year after funding	Flippin mayor and public works director	Flippin
Replace 3 low-water bridges and raise road above floodway at 5th St. East and West of Hwy. 14 and 4th St. and Wickersham.	Earthquake, Flood	Prevent repetitive flood damage. (NFIP Considerations: CRS 540 Drainage System Maintenance, CRS 510 Floodplain Mgmt. Planning)	High	Replace existing with new	$120,000 each; PDM, FMA and HMGP	One year after funding	Yellville mayor and public works director	Yellville
Replace low-water crossing on County Roads 4021, 5028, 6065, 4044, 3021, 3022, 3010, 3005.	Earthquake, Flood	Prevent repetitive flood damage. (NFIP Considerations: CRS 540 Drainage System Maintenance, CRS 510 Floodplain Mgmt. Planning)	High	Replace existing with new	Projects range from $60,000 to $150,000; PDM, FMA and HMGP	One year after funding	County judge'	Marion County
Install permanent generators in all critical facilities and follow regular maintenance schedules.	Dam Failure, Drought, Earthquake, Flood, Severe Storm, Snow & Ice, SLW, Tornado, Wildfire	Continuation of water service essential for response and mitigation. (NFIP consideration: CRS 510 Floodplain Mgmt. Planning)	Very High	New and existing	$10,000 upward; Local resources limited. HMGP, PDM, FMA, HUD post-disaster assistance	One year after funding	County judge, Supt. offices of Flippin, Ozark Mtn., Yellville-Summit school districts; Mayors' offices of Bull Shoals, Flippin, Pyatt, Summit, Yellville	Marion County; Flippin, Ozark Mtn., Yellville-Summit School Dists; Bull Shoals, Flippin, Pyatt, Summit, Yellville
Implement water usage monitoring and regulation of water usage during periods of severe drought.	Drought	Cost is minimal, implementation by county and city officials reduces the risk of water shortages.	Very High	N.A.	Low cost, regulatory action	Ongoing.	Mayors' offices of Bull Shoals, Flippin, Pyatt Summit and Yellville. (Individual wells serve unincorporated areas.)	Bull Shoals, Flippin, Pyatt, Summit and Yellville.

National Flood Insurance Program (NFIP) Compliance: Element A

Marion County: The county does not participate in the NFIP. Two public hearings were held in 2008 on the subject of joining, and the matter was revisited in 2010 as this plan was being formulated. Economic considerations--specific to the rural portions of the county--that would result in hardship to individuals and businesses, as well as county revenue as a whole, have caused there to be virtually no support for the NFIP.

Bull Shoals: Participates in NFIP, Community # 050394. A new floodplain manager will have been trained and accredited by the time this plan is adopted and will have brought city into compliance. It will then work toward meeting Community Rating System (CRS) requirements as part of this plan in order to lower insurance rates.

Flippin: Participates in NFIP. Community # 050135. Has certified manager, floodplain management ordinance, floodplain published, maintains elevation certificates, no repetitive claims. With this plan, is working toward meeting CRS requirements.

Pyatt: Does not participate. Does not have a FEMA flood map. Does not have a floodplain. Had one problem with a culvert crossing over a ditch in 2008, caused by runoff from a hill, which was corrected. No other known history of problems, according to longtime residents and officials.

Summit: As the name indicates, is on high ground. Does not participate. Does not have a FEMA flood map. Does not have a floodplain. Had one problem in 2008 with two lift stations; associated with heavy ground saturation and leaves collecting from runoff; currently being corrected. No other known history of problems, according to longtime residents and officials.

Yellville: Participates in NFIP. Community #050136. Has certified manager, floodplain management ordinance, floodplain published, maintains elevation certificates, no repetitive claims. With this plan, is working toward meeting CRS requirements.

Flippin School District: Does not participate, but the campus is in the city limits of Flippin, which does.

Ozark Mtn. School District, Bruno-Pyatt Campus: Does not participate and is in the rural part of Marion County, which does not participate, either.

Yellville-Summit School District: Does not participate, but the campus is in the city limits of Yellville, which does.

Element B: CRS considerations were included in the mitigation action tables on the preceding pages for all jurisdictions and they were considered in assigning priority, giving all actions with CRS considerations a Very High priority.

Implementation of Mitigation Actions:

Element A

The actions were prioritized by using a FEMA-approved method called STAPLEE, an acronym for categories of consideration called Social, Technical, Administrative, Political, Legal, Economic and Environmental.

All actions in this plan are assigned either a High or Very High Priority.

Very High Priority actions were those deemed necessary to meeting goals as well as those that fit well with the STAPLEE criteria.

High Priority Actions were those deemed necessary to meeting the plan's goals but not meeting either all of the STAPLEE criteria or other criteria, particularly technical feasibility of cost-effectiveness.

All actions have been deemed environmental sound.They are not listed in the order they may be implemented. Availability of funding and will cause some actions to begin before others. It's important that all very high priority actions should begin as soon as possible.

These are the sources of information for the STAPLEE categories:

Social: Members of city, county and state agencies had input throughout the planning process. In this small county, many political leaders are also business and professional leaders, so therefore the planning team was a de facto representation of private partnerships, local residents and community-selected spokespersons. Care was taken not to duplicate existing ordinances. Plan will be incorporated into County Emergency Operations plan. Members of the public and media were invited to key meetings throughout process and the plan was made available for public comment.

Technical: The following were consulted as to the technical feasibility of the various projects: Marion County Judge, Emergency Operations Manager, Marion County Road Department, Mayors and Public Works Directors of the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville, and the superintendents of the school districts of Flippin, Yellville-Summit and Ozark Mountain. All had their suggestions incorporated into the plan. The county judge, school superintendents and public works chiefs provided cost estimates.

Administrative: Staffing for implementation of the plan will rely chiefly on existing officials and employees of the jurisdictions and agencies involved. When seeking grants and other assistance, the plan participants are likely to need help from regional, state and federal agencies.

Political: The Marion County judge, mayors of Bull Shoals, Flippin, Pyatt, Summit and Yellville and the superintendents of Flippin, Yellville-Summit and Ozark Mountain were took lead roles in planning and no conflicts are anticipated by its adoption.

Legal: The Marion County Judge, mayors of all cities and all school superintendents participated in planning and approved all the goals and mitigation actions. No conflicts are anticipated by its adoption and we see no significant legal issues for the projects selected.

Economic: Economic issues were chief among those discussed by all participants. Each saw positive mitigation effects for all the actions ultimately chosen, but no entity has budgets for any significant expenditures. We are each doing our utmost just to make ends meet and preserve critical services. We will need to rely on grants to implement major projects, such as school safe rooms.

Environmental: No averse effects on the environment are anticipated from any of the actions chosen, but some constructions projects may need to undergo formal environmental review and we are mindful of that.

Elements B, C, D: The actions table addresses how the mitigation strategy will be implemented, administered, the time frame, and the cost-benefit considerations.

Chapter VI: Plan Maintenance Process

Monitoring, Evaluating and Updating the Plan Elements A and B:

FEMA requires a plan update within five years and recommends that the plan be reviewed and updated annually or after a hazard occurrence to determine the effectiveness of programs and to reflect changes in land development or programs that may affect mitigation priorities.

Marion County will do an annual review and update, and this is how:

1. Within a year of the plan's adoption, it will form a Hazard Mitigation Plan Evaluation Subcommittee from the existing Local Emergency Planning Committee (LEPC) that represents all jurisdictions. In the interest of continuity, the subcommittee will generally be made up of the same officials, or those who succeed them, who made up the original planning committee. Other LEPC members will be invited to join the subcommittee if they desire. The director of the county Office of Emergency Management will chair the subcommittee.

2. Members will be responsible for monitoring and evaluating the progress of all mitigation goals and actions in the plan. Each jurisdiction will present their updates to the LEPC at its August meeting. If they aren't able to attend, they'll give written recommendations to the Emergency Operations Manager (EOM) or his designee to be presented to the LEPC. The subcommittee will review and evaluate each goal and action to ensure they're addressing current or expected conditions. The subcommittee will also review the plan's risk assessment chapter to see if it should be updated. Those identified in the plan as being responsible for implementation of the mitigation actions or projects will report on the status of each and will evaluate which implementation methods are working well, any difficulties encountered, how coordination efforts are proceeding and which strategies, if any, should be revised.

3. Updates to the plan will be made to community and jurisdiction information and capabilities in Chapters I and V, Risk Assessment (Chapter IV) if needed, and Mitigation Strategy (also in Chapter V). The mitigation actions will be monitored twice a year to see what projects have been completed, and a report given to the EOM or his designee via email, by phone or in person.

4. The public will be given an opportunity to comment and participate in committee meetings at each step of the evaluation and will be kept informed via newspaper announcements and posting of public notices at the courthouse, city halls and schools. Every effort will be made to maintain public participation during the monitoring and evaluation process.

5. After the August meeting each year, the EOM or his designee will update the plan and submit it to the subcommittee at its subsequent quarterly meeting in November, as well as to the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification. Comments and recommendations offered by subcommittee members and the state officer will be incorporated into the plan update. Jurisdictional changes will be provided by that jurisdiction. Changes pertaining to more than one jurisdiction as well as public comments will be given to the full LEPC for review.

Incorporation into Existing Planning Mechanisms Elements A and B:

1. Any changes in the Marion County Emergency Operations Plan will be incorporated into the Mitigation Plan as it undergoes its regular updates, and vice versa. If other county plans are created as time goes by, they will also be incorporated into the Mitigation Plan. The EOM or designee will be responsible, working with panel members representing the county.

To elaborate, the EOM or his designee will be responsible for ensuring that the mitigation goals, actions and projects are incorporated into future county Planning Board activities and to make sure any new ordinances are in line with the Mitigation Plan by advising the Quorum Court of any potential conflicts as ordinances are considered.

2. After adoption of the Mitigation Plan, the county will require participating cities to address hazards in their comprehensive plans and land use regulations. (In effect, the cities agree to this when they adopt the plan.)

Goal 1 in the Mitigation Plan directs the county and cities to reduce loss of life and property by assessing each natural hazard, including probability, frequency, exposure and consequences, and implement actions that are formulated from assessment. Goal 2 is to provide a framework and coordination to encourage all levels of government and public and private organizations to undertake mitigation to minimize disasters and use mitigation in recovery.

The EOM and, if warranted, the county Planning Board will provide technical assistance to cities if they need help implementing any requirements in the Mitigation Plan. For example, the EOM can provide literature to address each hazard and educate the public on how mitigate them.

3. The mayors of cities and superintendents of schools in the plan will follow local laws and guidelines when incorporating the Mitigation Plan into their existing plans. Any jurisdiction without previous plans will be encouraged to develop zoning plans and other land ordinances. Jurisdictions incorporating the Mitigation Plan into their existing plans will set up meetings to discuss which areas pertain to them.

After these discussions, each incorporating mechanism will follow their local laws or guidelines necessary for implementation through public meetings. After each update of the Marion County Hazard Mitigation Plan, participating jurisdictions will be informed of the changes so they can reflect them in their individual plans.

4. The Marion County Hazard Mitigation Plan will be incorporated into the Arkansas Hazard Mitigation Plan. The risk assessment and mitigation strategies will be incorporated into the state plan during its updating process at the time designated. Marion County will incorporate the mitigation plan into the County Emergency Operations Plan and any county land use ordinances or plans by following the laws set forth by the county government.

5. Within one year of the formal adoption of the Marion County Hazard Mitigation Plan, the policies listed above will be incorporated into the process of existing planning mechanisms.

Continued Public Involvement Element A

The county Mitigation Plan Evaluation Subcommittee members are responsible for the annual monitoring, evaluation and update of the plan. Although they represent the public to some extent, all members the public will be given the opportunity to comment on the plan. This is how:

1. Copies of the plan will be kept at all public libraries. The front page of the plan has the address, phone and email of the county emergency operations manager, who is the primary point of contact for the plan.

2. At this writing, the county does not have an active web site. If it is reactivated, the plan and any proposed changes will be posted, along with an email address and a phone number where people can direct their comments.

3. A public announcement inviting all interested parties will be made before each quarterly LEPC meeting, including, of course, the meeting in which the Hazard Mitigation Plan Evaluation Subcommittee reviews and evaluates the plan. This meeting will provide a public forum for concerns, opinions or suggestions regarding the plan. The EOM and the LEPC will publicize and host this meeting. Afterward, the subcommittee will review comments and made changes to the plan as deemed appropriate.

Appendix

This map is referenced on page 1 of Chapter IV: Risk Assessment. It is included as part of the justification for not including the hazard of expansive soils in this mitigation plan.

NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)

National Climatic Data Center
U.S. Department of Commerce

DOC >NOAA >NESDIS >NCDC Search Field: Search NCDC

Query Results

3 LIGHTNING event(s) were reported in Marion County, Arkansas between 04/30/1950 and 11/30/2011.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Arkansas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Yellville	07/22/1998	01:10 PM	Lightning	N/A	0	0	0	0
2 Yellville	06/02/2007	16:40 PM	Lightning	N/A	0	0	25K	0K
3 Bull Shoals	10/17/2007	23:30 PM	Lightning	N/A	0	0	2K	0K
				TOTALS:	0	0	27K	0

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Modified NOAA/TORRO Hailstorm Intensity Scale

Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

This scale from NOAA is included to provide context to the hail reports on the next four pages. It is also referenced in Chapter IV, Page 45.

DOC >NOAA >NESDIS >NCDC Search Field: Search NCDC

Query Results

96 HAIL event(s) were reported in Marion County, Arkansas between 04/30/1950 and 11/30/2011.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Arkansas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 MARION	05/11/1967	1835	Hail	1.00 in.	0	0	0	0
2 MARION	05/07/1973	1300	Hail	1.75 in.	0	0	0	0
3 MARION	11/09/1984	1540	Hail	1.00 in.	0	0	0	0
4 MARION	07/25/1986	1755	Hail	1.50 in.	0	0	0	0
5 MARION	09/14/1987	1630	Hail	1.75 in.	0	0	0	0
6 MARION	04/03/1989	1624	Hail	1.75 in.	0	0	0	0
7 MARION	07/18/1989	1335	Hail	1.75 in.	0	0	0	0
8 MARION	03/21/1991	1840	Hail	1.75 in.	0	0	0	0
9 MARION	03/21/1991	2230	Hail	0.75 in.	0	0	0	0
10 MARION	03/05/1992	1956	Hail	0.75 in.	0	0	0	0
11 MARION	03/18/1992	1630	Hail	0.88 in.	0	0	0	0
12 Yellville	03/30/1993	1815	Hail	1.00 in.	0	0	0	0
13 Peel	05/07/1994	0700	Hail	1.00 in.	0	0	0	0
14 Flippin	05/25/1994	1355	Hail	0.88 in.	0	0	0	0
15 Oakland	07/24/1994	1700	Hail	1.75 in.	0	0	0	0
16 Bull Shoals	07/24/1994	1715	Hail	0.75 in.	0	0	0	0
17 Yellville	07/24/1994	1730	Hail	0.75 in.	0	0	0	0
18 Bull Shoals	11/03/1994	1118	Hail	1.00 in.	0	0	0	0
19 Bruno	11/03/1994	1615	Hail	0.88 in.	0	0	0	0

20 MARION	12/19/1994	2004	Hail	0.88 in.	0	0	0	0
21 Bull Shoals	04/10/1995	1449	Hail	0.75 in.	0	0	0	0
22 Bruno	04/10/1995	1826	Hail	0.88 in.	0	0	0	0
23 Lakeway	04/10/1995	1826	Hail	1.88 in.	0	0	0	0
24 Pyatt	04/10/1995	1826	Hail	0.88 in.	0	0	0	0
25 Yellville	04/10/1995	1828	Hail	1.75 in.	0	0	0	0
26 Bruno	05/14/1995	1500	Hail	0.75 in.	0	0	0	0
27 Bull Shoals	05/24/1995	1914	Hail	0.75 in.	0	0	0	0
28 Bull Shoals Lake	06/05/1995	2018	Hail	0.75 in.	0	0	0	0
29 Rea Valley	10/02/1995	1539	Hail	0.75 in.	0	0	0	0
30 Flippin	11/10/1995	2019	Hail	1.00 in.	0	0	0	0
31 Yellville	03/05/1996	06:44 PM	Hail	0.88 in.	0	0	0	0
32 Yellville	03/05/1996	08:30 PM	Hail	1.75 in.	0	0	0	0
33 Flippin	03/05/1996	08:45 PM	Hail	1.00 in.	0	0	0	0
34 Pyatt	03/15/1996	12:25 AM	Hail	1.00 in.	0	0	0	0
35 Bull Shoals Lake Wes	03/15/1996	12:26 AM	Hail	0.75 in.	0	0	0	0
36 Rea Vly	03/15/1996	12:45 AM	Hail	0.75 in.	0	0	0	0
37 Pyatt	04/19/1996	07:10 PM	Hail	1.00 in.	0	0	0	0
38 Yellville	04/19/1996	07:16 PM	Hail	0.75 in.	0	0	0	0
39 Lakeway	04/22/1996	12:54 AM	Hail	1.00 in.	0	0	0	0
40 Peel	04/28/1996	06:37 AM	Hail	0.75 in.	0	0	0	0
41 Peel	05/02/1996	06:35 PM	Hail	0.75 in.	0	0	0	0
42 Oakland	06/06/1996	02:15 PM	Hail	0.75 in.	0	0	0	0
43 Peel	06/18/1996	07:44 PM	Hail	0.75 in.	0	0	0	0
44 Yellville	07/29/1996	02:40 PM	Hail	0.75 in.	0	0	0	0
45 Yellville	03/01/1997	01:20 PM	Hail	0.75 in.	0	0	0	0
46 Bull Shoals	06/27/1997	01:35 PM	Hail	0.88 in.	0	0	0	0
47 Fairview	03/05/1998	03:35 PM	Hail	0.75 in.	0	0	0	0
48 Peel	05/02/1998	04:34 PM	Hail	0.88 in.	0	0	0	0
49 Pyatt	05/06/1998	02:45 PM	Hail	0.88 in.	0	0	0	0
50 Flippin	05/09/1998	08:29 AM	Hail	0.75 in.	0	0	0	0
51 Oakland	06/11/1999	08:45 AM	Hail	0.75 in.	0	0	0	0
52 Peel								

	07/01/1999	11:10 AM	Hail	0.75 in.	0	0	0	0
53 Flippin	08/11/1999	03:30 PM	Hail	0.75 in.	0	0	0	0
54 Peel	05/18/2000	03:51 PM	Hail	1.00 in.	0	0	0	0
55 Snow	05/24/2000	09:05 PM	Hail	0.75 in.	0	0	0	0
56 Yellville	05/24/2000	09:10 PM	Hail	0.75 in.	0	0	0	0
57 Yellville	04/15/2001	01:50 AM	Hail	1.00 in.	0	0	0	0
58 Yellville	04/15/2001	01:50 AM	Hail	1.75 in.	0	0	0	0
59 Flippin	04/15/2001	01:55 AM	Hail	1.00 in.	0	0	0	0
60 Pyatt	06/14/2001	07:35 PM	Hail	0.75 in.	0	0	0	0
61 Flippin	01/23/2002	06:50 PM	Hail	0.75 in.	0	0	0	0
62 Peel	05/01/2002	09:05 PM	Hail	1.75 in.	0	0	0	0
63 Peel	12/18/2002	02:20 PM	Hail	0.75 in.	0	0	0	0
64 Yellville	04/04/2003	04:19 PM	Hail	0.75 in.	0	0	0	0
65 Yellville	04/04/2003	05:00 PM	Hail	0.75 in.	0	0	0	0
66 Yellville	04/04/2003	05:15 PM	Hail	0.75 in.	0	0	0	0
67 Pyatt	04/24/2003	04:42 PM	Hail	1.75 in.	0	0	0	0
68 Snow	04/24/2003	04:45 PM	Hail	1.75 in.	0	0	0	0
69 Yellville	04/24/2003	05:15 PM	Hail	2.75 in.	0	0	0	0
70 Flippin	05/02/2003	12:00 AM	Hail	0.75 in.	0	0	0	0
71 Bull Shoals	05/02/2003	12:25 AM	Hail	0.75 in.	0	0	0	0
72 Oakland	07/20/2003	05:49 PM	Hail	0.75 in.	0	0	0	0
73 Bull Shoals	04/21/2004	04:30 PM	Hail	0.88 in.	0	0	0	0
74 Flippin	07/15/2004	05:50 PM	Hail	0.88 in.	0	0	0	0
75 Peel	04/21/2005	03:20 PM	Hail	0.75 in.	0	0	0	0
76 Peel	06/30/2005	05:55 PM	Hail	0.75 in.	0	0	0	0
77 Yellville	04/02/2006	02:39 PM	Hail	1.25 in.	0	0	0	0
78 Flippin	04/02/2006	02:42 PM	Hail	1.25 in.	0	0	0	0
79 Yellville	04/24/2006	02:15 PM	Hail	1.75 in.	0	0	0	0
80 Peel	04/24/2006	02:20 PM	Hail	1.75 in.	0	0	0	0
81 Bull Shoals	04/24/2006	02:36 PM	Hail	1.50 in.	0	0	0	0
82 Peel	04/26/2006	02:28 PM	Hail	1.00 in.	0	0	0	0
83 Bruno	08/10/2006	01:25 PM	Hail	0.88 in.	0	0	0	0
84 Bush								

	03/01/2007	05:50 AM	Hail	1.75 in.	0	0	0K	0K
85 Yellville	06/02/2007	16:45 PM	Hail	0.75 in.	0	0	0K	0K
86 Monarch	06/15/2008	18:15 PM	Hail	1.75 in.	0	0	0K	0K
87 Fairview	05/08/2009	10:20 AM	Hail	0.75 in.	0	0	0K	0K
88 Flippin	03/10/2010	19:05 PM	Hail	1.50 in.	0	0	25K	0K
89 Dodd City	04/19/2011	16:45 PM	Hail	1.50 in.	0	0	0K	0K
90 Oakland	04/19/2011	17:06 PM	Hail	1.00 in.	0	0	0K	0K
91 Peel	04/19/2011	17:55 PM	Hail	1.50 in.	0	0	0K	0K
92 Snow	05/12/2011	19:12 PM	Hail	1.25 in.	0	0	0K	0K
93 Peel	07/07/2011	16:00 PM	Hail	1.00 in.	0	0	0K	0K
94 Peel	07/07/2011	16:00 PM	Hail	1.50 in.	0	0	0K	0K
95 Bull Shoals	07/07/2011	16:25 PM	Hail	1.00 in.	0	0	0K	0K
96 Flippin	07/07/2011	16:56 PM	Hail	1.25 in.	0	0	0K	0K
				TOTALS:	0	0	25K	0

The Beaufort Wind Scale

In 1806 Admiral Sir Francis Beaufort of the British Navy devised a wind velocity scale to enable the captains of sailing ships to accurately assess wind speeds at sea. Though the original scale dealt with purely maritime effects, it has since been modified for land.

The Beaufort Scale for use on land

Beaufort Force	Description	Effects on land	Speed		
			knots	km/h	mph
0	Calm	Smoke rises vertically.	Less than 1	Less than 1	Less than 1
1	Light Air	Direction of wind shown by smoke drift, but not by wind vanes.	1 - 3	1 - 5	1 - 3
2	Light breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind.	4 -6	6 - 11	4 -7
3	Gentle breeze	Leaves and small twigs in constant motion; wind extends light flag.	7 - 10	12 - 19	8 - 12
4	Moderate breeze	Raises dust and loose paper; small branches are moved.	11 - 16	20 - 29	13 - 18
5	Fresh breeze	Small trees in leaf begin to sway; crested wavelets form on inland waters.	17 - 21	30 - 39	19 - 24
6	Strong breeze	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.	22 - 27	40 - 50	25 - 31
7	Near gale	Whole trees in motion; inconvenience felt when walking against the wind.	28 - 33	51 - 61	32 - 38
8	Gale	Breaks twigs off trees; generally impedes progress.	34 - 40	62 - 74	39 - 46
9	Strong gale	Slight structural damage occurs (chimney-pots and slates removed).	41 - 47	75 - 87	47 - 54
10	Storm	Seldom experienced inland; trees uprooted; considerable structural damage occurs.	48 - 55	88 - 101	55 - 63
11	Violent storm	Very rarely experienced; accompanied by wide-spread damage.	56 - 63	102 - 117	64 - 73
12	Hurricane	Whole hangars disappear.	>64	>119	>74

High winds are not dependent upon Thunderstorms. They can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses; they can also result from strong frontal systems, or gradient winds.

The Beaufort Wind Scale is included to provide context to the thunderstorm wind reports on subsequent pages, as well as straight-line wind reports on page 56 of Chapter IV. It is referenced on pages 45 and 55 of Chapter IV.

Query Results

110 THUNDERSTORM WINDS event(s) were reported in Marion County, Arkansas between 04/30/1950 and 11/30/2011.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Arkansas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 MARION	06/14/1963	1630	Tstm Wind	0 kts.	0	0	0	0
2 MARION	04/03/1964	1900	Tstm Wind	64 kts.	0	0	0	0
3 MARION	08/17/1974	1930	Tstm Wind	65 kts.	0	0	0	0
4 MARION	08/17/1974	1930	Tstm Wind	65 kts.	0	0	0	0
5 MARION	06/05/1975	0600	Tstm Wind	0 kts.	0	0	0	0
6 MARION	08/26/1980	1615	Tstm Wind	0 kts.	0	0	0	0
7 MARION	04/02/1982	1740	Tstm Wind	0 kts.	0	0	0	0
8 MARION	05/13/1986	2300	Tstm Wind	0 kts.	0	0	0	0
9 MARION	08/01/1986	2040	Tstm Wind	0 kts.	0	0	0	0
10 MARION	04/13/1987	1404	Tstm Wind	0 kts.	0	0	0	0
11 MARION	05/03/1987	1710	Tstm Wind	0 kts.	0	0	0	0
12 MARION	05/08/1988	1700	Tstm Wind	0 kts.	0	0	0	0
13 MARION	07/18/1988	1345	Tstm Wind	0 kts.	0	0	0	0
14 MARION	05/26/1990	0650	Tstm Wind	0 kts.	0	0	0	0
15 MARION	06/21/1990	1925	Tstm Wind	0 kts.	0	0	0	0
16 MARION	07/03/1991	1050	Tstm Wind	56 kts.	0	0	0	0

17 MARION	06/24/1992	1750	Tstm Wind	0 kts.	0	0	0	0
18 MARION	07/02/1992	2130	Tstm Wind	0 kts.	0	0	0	0
19 MARION	07/02/1992	2130	Tstm Wind	0 kts.	0	0	0	0
20 MARION	07/04/1992	1300	Tstm Wind	0 kts.	0	0	0	0
21 MARION	07/26/1992	1745	Tstm Wind	0 kts.	0	0	0	0
22 MARION	08/10/1992	2050	Tstm Wind	0 kts.	0	0	0	0
23 Peel	04/11/1994	1930	Thunderstorm Winds	0 kts.	0	0	50K	0
24 Bruno	11/03/1994	1615	Thunderstorm Winds	56 kts.	0	0	0	0
25 Yellville	07/04/1995	2025	Thunderstorm Winds	52 kts.	0	0	0	0
26 Bull Shoals	11/10/1995	2015	Thunderstorm Winds	0 kts.	0	0	0	0
27 Rea Vly	04/19/1996	08:00 PM	Tstm Wind	52 kts.	0	0	0	0
28 Pyatt	04/22/1996	12:35 AM	Tstm Wind	50 kts.	0	0	0	0
29 Pyatt	06/06/1996	03:00 PM	Tstm Wind	50 kts.	0	0	0	0
30 Bull Shoals	06/17/1996	04:30 PM	Tstm Wind	50 kts.	0	0	0	0
31 Flippin	07/08/1997	09:30 PM	Tstm Wind	50 kts.	0	0	0	0
32 Yellville	07/14/1997	06:00 PM	Tstm Wind	50 kts.	0	0	0	0
33 Yellville	08/14/1997	04:50 PM	Tstm Wind	50 kts.	0	0	0	0
34 Flippin	08/14/1997	05:05 PM	Tstm Wind	50 kts.	0	0	0	0
35 Oakland	05/06/1998	08:15 PM	Tstm Wind	50 kts.	0	0	0	0
36 Yellville	07/22/1998	01:00 PM	Tstm Wind	50 kts.	0	0	0	0
37 Summit	07/22/1998	01:10 PM	Tstm Wind	50 kts.	0	0	0	0
38 Yellville	07/22/1998	01:10 PM	Tstm Wind	50 kts.	0	0	0	0

39 Flippin	08/10/1998	03:20 PM	Tstm Wind	50 kts.	0	0	0	0
40 Bruno	11/10/1998	02:25 AM	Tstm Wind	50 kts.	0	0	0	0
41 Yellville	11/10/1998	02:35 AM	Tstm Wind	50 kts.	0	0	0	0
42 Fairview	11/10/1998	02:40 AM	Tstm Wind	50 kts.	0	0	0	0
43 Bull Shoals	05/17/1999	11:30 AM	Tstm Wind	50 kts.	0	0	0	0
44 Peel	07/27/1999	04:23 PM	Tstm Wind	50 kts.	0	0	0	0
45 Yellville	01/03/2000	06:03 AM	Tstm Wind	50 kts.	0	0	0	0
46 Peel	05/24/2000	08:48 PM	Tstm Wind	50 kts.	0	0	0	0
47 Peel	05/24/2000	08:48 PM	Tstm Wind	50 kts.	0	0	0	0
48 Peel	05/24/2000	08:50 PM	Tstm Wind	50 kts.	0	0	0	0
49 Peel	05/24/2000	08:55 PM	Tstm Wind	50 kts.	0	0	0	0
50 Oakland	05/24/2000	09:00 PM	Tstm Wind	50 kts.	0	0	0	0
51 Oakland	05/24/2000	09:00 PM	Tstm Wind	50 kts.	0	0	0	0
52 Oakland	05/24/2000	09:00 PM	Tstm Wind	50 kts.	0	0	0	0
53 Oakland	05/24/2000	09:00 PM	Tstm Wind	50 kts.	0	0	0	0
54 Summit	05/24/2000	09:00 PM	Tstm Wind	50 kts.	0	0	0	0
55 Oakland	05/24/2000	09:02 PM	Tstm Wind	50 kts.	0	0	0	0
56 Snow	05/24/2000	09:05 PM	Tstm Wind	50 kts.	0	0	0	0
57 Summit	05/24/2000	09:05 PM	Tstm Wind	50 kts.	0	0	0	0
58 Yellville	05/24/2000	09:05 PM	Tstm Wind	50	0	0	0	0

				kts.				
59 Yellville	05/24/2000	09:07 PM	Tstm Wind	50 kts.	0	0	0	0
60 Yellville	05/24/2000	09:10 PM	Tstm Wind	50 kts.	0	0	0	0
61 Yellville	05/24/2000	09:10 PM	Tstm Wind	50 kts.	0	0	0	0
62 Flippin	05/24/2000	09:12 PM	Tstm Wind	50 kts.	0	0	0	0
63 Flippin	05/24/2000	09:13 PM	Tstm Wind	50 kts.	0	0	0	0
64 Rea Vly	05/24/2000	09:15 PM	Tstm Wind	50 kts.	0	0	0	0
65 Rea Vly	05/24/2000	09:20 PM	Tstm Wind	50 kts.	0	0	0	0
66 Bull Shoals	07/20/2000	09:55 AM	Tstm Wind	50 kts.	0	0	0	0
67 Pyatt	07/20/2000	09:55 AM	Tstm Wind	50 kts.	0	0	0	0
68 Pyatt	07/28/2000	05:45 PM	Tstm Wind	52 kts.	0	0	0	0
69 Flippin	07/28/2000	06:03 PM	Tstm Wind	50 kts.	0	0	0	0
70 Yellville	02/09/2001	07:05 AM	Tstm Wind	50 kts.	0	0	0	0
71 Yellville	04/15/2001	01:50 AM	Tstm Wind	50 kts.	0	0	0	0
72 Flippin	04/15/2001	01:55 AM	Tstm Wind	50 kts.	0	0	8K	0
73 Oakland	05/17/2001	08:50 PM	Tstm Wind	52 kts.	0	0	0	0
74 Flippin	08/09/2001	07:20 PM	Tstm Wind	50 kts.	0	0	0	0
75 Pyatt	09/08/2001	06:25 PM	Tstm Wind	50 kts.	0	0	0	0
76 Pyatt	01/23/2002	06:45 PM	Tstm Wind	50 kts.	0	0	0	0
77 Flippin	01/23/2002	06:55 PM	Tstm Wind	50 kts.	0	0	0	0

78 Yellville	03/09/2002	03:50 AM	Tstm Wind	50 kts.	0	0	0	0
79 Bull Shoals	05/08/2002	11:50 PM	Tstm Wind	50 kts.	0	0	0	0
80 Oakland	07/18/2002	02:45 PM	Tstm Wind	50 kts.	0	0	0	0
81 Peel	05/06/2003	07:45 PM	Tstm Wind	50 kts.	0	0	0	0
82 Eros	03/04/2004	08:00 PM	Tstm Wind	50 kts.	0	0	0	0
83 Yellville	03/04/2004	08:03 PM	Tstm Wind	50 kts.	0	0	0	0
84 Flippin	03/04/2004	08:10 PM	Tstm Wind	50 kts.	0	0	0	0
85 Flippin	05/30/2004	02:50 PM	Tstm Wind	50 kts.	0	0	0	0
86 Yellville	07/04/2004	08:25 AM	Tstm Wind	50 kts.	0	0	0	0
87 Yellville	11/01/2004	08:20 AM	Tstm Wind	50 kts.	0	0	0	0
88 Eros	01/12/2005	08:20 PM	Tstm Wind	65 kts.	0	0	0	0
89 Fairview	09/28/2005	05:20 PM	Tstm Wind	50 kts.	0	0	0	0
90 Yellville	03/09/2006	03:30 PM	Tstm Wind	50 kts.	0	0	0	0
91 Flippin	03/09/2006	03:35 PM	Tstm Wind	58 kts.	0	0	0	0
92 Peel	04/24/2006	02:20 PM	Tstm Wind	50 kts.	0	0	0	0
93 Yellville	07/21/2006	03:40 PM	Tstm Wind	50 kts.	0	0	0	0
94 Bull Shoals	08/14/2006	03:40 PM	Tstm Wind	50 kts.	0	0	0	0
95 Rea Vly	09/22/2006	05:45 PM	Tstm Wind	50 kts.	0	0	0	0
96 Yellville	06/02/2007	16:40 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
97 Peel	07/15/2007	19:15 PM	Thunderstorm	50	0	0	0K	0K

			Wind	kts.				
98 Oakland	10/17/2007	21:20 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
99 Bull Shoals	10/17/2007	21:25 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
100 Flippin	04/22/2008	10:00 AM	Thunderstorm Wind	50 kts.	0	0	25K	0K
101 Summit	05/02/2008	05:30 AM	Thunderstorm Wind	50 kts.	0	0	0K	0K
102 Lakeway	05/10/2008	19:30 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
103 Fairview	07/03/2008	17:15 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
104 Lakeway	07/12/2008	20:45 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
105 Peel	07/12/2008	20:45 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
106 Flippin	07/12/2008	20:55 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
107 Flippin	07/12/2008	21:00 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
108 Summit	07/16/2009	00:40 AM	Thunderstorm Wind	50 kts.	0	0	0K	0K
109 Bull Shoals Lake Wes	07/11/2010	21:55 PM	Thunderstorm Wind	52 kts.	0	0	5K	0K
110 Fairview	08/06/2011	20:00 PM	Thunderstorm Wind	52 kts.	0	0	5K	0K
				TOTALS:	0	0	93K	0

Activity Log for Planning Process

Documentation of Planning Process

This is the activity log referred to on Page 1 of Chapter III, detailing how each jurisdiction participated in this plan's development.

Aug. 30, 2010: Marion County awarded grant to write the plan; County Grants Administrator Sheila Daniel designated to lead development and write it.

Sept. 29: Daniel and County OEM Carlos Parker met at ADEM headquarters in North Little Rock with state HMP officials Josh Rogers and Amanda Merrill for a briefing on development.

Jan. 18, 2011: County Judge Pete Giles met with Daniel and it was decided the he, Carlos Parker and Daniel would constitute the planning team for the county. Giles also said that Pyatt Mayor Kenneth Hancock had designated him as the point man for Pyatt's participation because he is Pyatt's public works director.

That night, Daniel and Parker briefed a countywide meeting of fire chiefs on how the plan would benefit them and what their roles would be.

Jan. 21: Daniel and Parker met to further refine plans for development, discuss invitation list to first meeting.

Feb. 28: Daniel spoke to joint meeting of Friends of the North Fork and White Rivers and Master Naturalists of North Central Arkansas, encouraging members to participate.

Feb. 28: Daniel spoke to Mid-Marion County Rotary, encouraging members to participate.

March 3: Daniel held phone conferences with the school superintendents of Flippin, Yellville-Summit and Ozark Mountain to explain the planning process. Y-S and Ozark Mtn. said they would not be able to attend the March 28 public meeting; they were briefed afterward and given materials distributed at the meeting. Ozark Mtn. Supt. Joe Hulsey designated Bruno-Pyatt Elementary Principal Bob Ricketts as his point man on the plan, because Bruno-Pyatt is the only school campus in Marion County. Hulsey's office is in Boone County.

March 15: At monthly countywide fire chiefs meeting, the chiefs took copies of the Household Survey to distribute. This included the fire chiefs of Bull Shoals, Flippin, Pyatt, Summit and Yellville, as well as those in unincorporated communities.

March 18: Daniel met with Bull Shoals mayor, public works director and planning chief to discuss their participation.

March 28: Initial public meeting. Representatives of the cities of Bull Shoals, Flippin, Pyatt and Yellville attended, as well as the school district of Flippin. Those present took copies of the Household Survey to distribute, or provided their emails so that the survey could be sent to them in the event they needed additional copies.

March 31: Daniel conferred with Flippin Police Chief Keith Katcher at Flippin City Hall on city's capabilities; he filled out capability assessment form and subsequently briefed Mayor J.J. Hudson on participating in the plan. Also returned household surveys the city had collected.

April 18: Daniel attended LEPC meeting and afterward met with Yellville Mayor Shawn Lane and Public Works Director Gayle Stude about participation in the plan, including tentative projects and other mitigation actions.

April 20: Daniel met with Ozark Mtn./Bruno-Pyatt Elementary Principal Ricketts to give him Household Surveys to distribute and to begin discussing possible mitigation actions for the district. Later that day she met with Yellville-Summit Supt. Larry Ivens and teacher Donna Tennison for the same purposes. Both districts submitted preliminary lists of actions.

April 21: Daniel met with Flippin Supt. Dale Query and Federal Coordinator for District Compliance Petra Pershall to discuss possible mitigation actions for the district; a preliminary list was drawn up.

They also returned to Daniel many completed surveys.

May 3: Yellville-Summit School District delivered copies of completed surveys.

May 4: Daniel and Summit Mayor Robert Pugsley discussed how the plan could benefit that city and began discussing possible mitigation actions; copies of household survey were placed at City Hall for the public to complete. Copies of the surveys were placed at Yellville City Hall for the public, as well. Also on that day, Daniel met again with Bull Shoals officials and they drew up tentative mitigation actions and returned completed surveys.

May 17: At the monthly meeting of all county and city fire chiefs, a large number of completed surveys were returned, including from the cities of Bull Shoals, Flippin, Pyatt, Summit and Yellville.

July 15: Daniel met with Flippin Mayor J.J. Hudson and Public Works Director Steven Berg. Discussed possible mitigation projects and tentatively settled on two low-water crossings that need mitigation. Also discussed tentative list of other actions.

July 22: Daniel, County OEM Parker, Deputy. OEM Sandy Evans and County Judge Giles discussed tentative mitigation actions and areas in the county that are vulnerable to various hazards.

Sept. 27: Daniel discussed mitigation actions and NFIP compliance with Flippin Public Works Chief Berg. She also met with Bull Shoals Mayor Bruce Powell and Public Works Director Bill Stahlman on their efforts to become compliant with NFIP. Stahlman will be the new floodplain administrator and attend the next possible training session. Mitigation actions were further refined.

Oct. 6: Daniel met again with Powell and Stahlman to follow up on discussions begun in previous meetings. They decided to designate construction of a flood wall around the city's waste treatment plant as a project for the plan.

Dec. 1: County Judge Giles, after conferring with his road department, delivered list of mitigation projects to be pursued.

Dec. 2: Yellville Public Works Chief Stude identified three mitigation projects. Bull Shoals Mayor Powell and Public Works chief Stahlman withdrew possible mitigation projects that were urgent and needed immediate correction, and confirmed they would have only one project in the plan.

Dec. 13: Bull Shoals Planning Chief Carol Short and Daniel discussed mitigation actions.

Jan. 30, 2012: Pyatt Public Works Director Pete Giles completed city's capability assessment and discussed possible mitigation actions with Daniel.

Feb. 6: Yellville-Summit Supt. Ivens and Bull Shoals Mayor Powell approved final choices for mitigation actions and projects and emailed Daniel to notify her.

Feb. 8: Daniel met with Summit Mayor Robert Pugsley to review Summit's hazard history. Pugsley made final choices for mitigation actions. Marion County Judge met with OEM Carlos Parker and Daniel to make final choices for mitigation actions. Then, acting for the City of Pyatt as public works director, Pete Giles put Pyatt Mayor Kenneth Hancock on speaker phone and they reviewed Pyatt's role in the plan and made final choices for mitigation actions, with Daniel and Parker participating.

Feb. 9: Daniel held phone conferences with Flippin Mayor J.J. Hudson and Public Works Director Steven Berg, Yellville Mayor Shawn Lane, Flippin Supt. Dale Query and Bruno-Pyatt Elementary Principal Bob Ricketts on behalf of Ozark Mountain Supt. Joe Hulsey. All chose final mitigation actions.