Pope County, Arkansas

Hazard Mitigation Plan

2020-2022 UPDATE

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Section 1: Introduction

Figure 1.1 Pope County Arkansas

1.1 General Description

Hazards are part of the world around us. The occurrence of floods, hurricanes, tornadoes, winter storms, earthquakes, wildfires, and other hazardous events are inevitable. These hazards are natural phenomena we cannot control. These events damage the ecological environment. Fire destroys forests. High winds and tornadoes uproot trees. Earthquakes alter the very landscape and floods can quickly reclaim natural floodplains. Despite their destructiveness, these occurrences are part of the natural system.

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

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

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

term reduction of hazard vulnerability. The goal of mitigation is to save lives and reduce property damage.

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

The goals of this Pope County Hazard Mitigation plan are to reduce the loss of life and decrease property losses in Pope County due to natural disasters. It also provides a framework enabling the coordination of all levels of government with public and private organizations to undertake mitigation. This whole community approach to mitigation has specific planning objectives to minimize damage due to disasters. These five specific objectives are:

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

The Pope County Hazard Mitigation Plan has been developed to assess the ongoing natural hazard mitigation activities in Pope County. It evaluates additional mitigation measures that should be undertaken and outlines a strategy for implementation of mitigation projects. This plan is a multi-jurisdictional plan. The Planning Area includes the six municipalities within the County: Atkins, Dover, Hector, London, Pottsville, and Russellville. It includes all unincorporated Pope County: Appleton, Augsburg, Caglesville, Lost Corner, Moreland, Nogo, Scottsville, Tilly, Treat, and Walnut Grove. It also includes the five school districts located in Pope County: the Atkins, Dover, Hector, Pottsville, and Russellville School Districts as well as Arkansas Tech University. The school in London is in the Russellville School District.

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

mitigation. In addition, the communities may meet comprehensive planning requirements and achieve community goals.

This update includes information pertaining to disasters that have impacted the Planning Area since the last revision. This document helps in obtaining information to better mitigate hazards in areas within the county that are prone to certain disasters. The plan has been updated as of 2022 to validate and provide current data. However, the priorities of the participants remain unchanged.

1.2 Community Information

1.2.1 Topography

Pope County is in west-central Arkansas. The county is bordered on the north by Newton and Searcy Counties, on the east by Van Buren and Conway Counties, on the south by Yell and Logan Counties, and on the west by Johnson County, Arkansas. It is irregular in shape, ranges from about 16 to 25 miles in width, and is about 42 miles in length. The total area of the county is 822 square miles, or 526,080 acres, according to the 1974 Census of Agriculture. The land area is 519,810 acres, or 812 square miles, which includes 1,085 acres of water in bodies less than 40 acres and streams less than one-eighth of a mile in width.

Acreage in crops and pasture has gradually been decreasing as more and more land is used for urban development. In 1976, an estimated 24,000 acres was used for urban and built-up land in the county. The use of this soil survey to help make land use decisions is discussed in the section "General soil map units."

Except for those soils on the Arkansas River flood plain, the soils in Pope County are generally low in nitrogen, potassium, phosphorus, calcium, and organic matter. Many of the soils suitable for cultivation are subject to the hazard of erosion. Poor surface drainage or internal drainage and the susceptibility to flooding are limited in places. Many soils are poorly suited for crops and pasture because of stony conditions, shallow depth to bedrock, high content of course fragments within the surface layer, or combinations of these features.

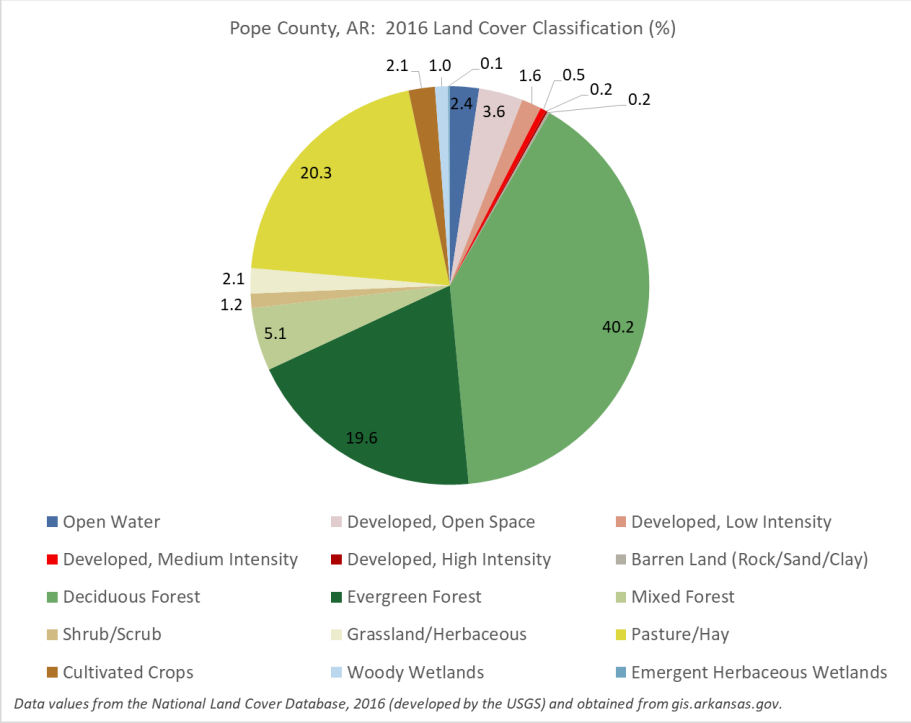
About 60 percent of the county is mountainous and hilly. These areas are scattered throughout the county, and the elevation ranges from about 450 feet at the base of the hills and mountains to 2,128 feet at the top of Walker Mountain in the Boston Mountains. The soils in most of these areas are too steep for intensive use. The soils are used mainly for woodland and for native pasture. Some of the less sloping soils are suitable for improved pasture, and some of the soils in narrow valleys are suitable for truck crops.

About 40 percent of the county is level to gently sloping hilltops and mountain tops, valley fill, and alluvial sediments. The elevation ranges from about 300 feet in the southeastern part of the county to about 1,000 feet atop the valley ridges. Except for the intensively farmed soils on bottom lands along the Arkansas River, the soils in the level to gently sloping areas are used mainly for forage crops.

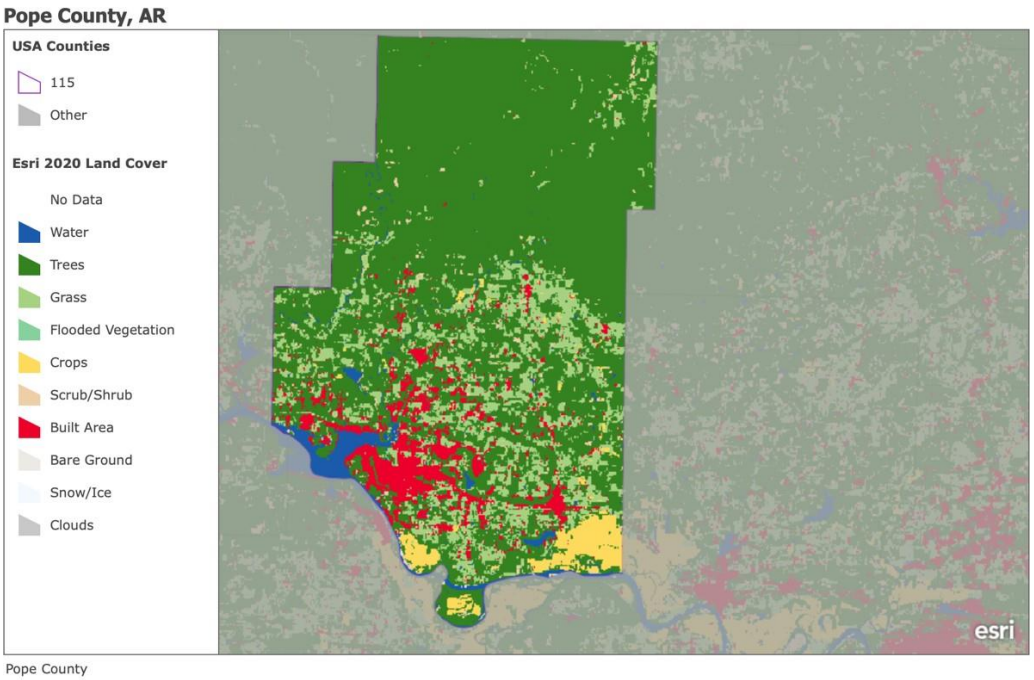
More recently, farming has become more diversified and generally less intensive. In the area of ridges and valleys, beef cattle, hogs, poultry, turkeys, broiler chickens, and laying hens provide most of the farm income. Some farms have a small acreage of orchards, vineyards, vegetables, or a combination. On the bottom lands along the Arkansas River, flood control use of improved crop varieties, and

improved soil management techniques have led to the expansion of cropland onto nearly all the flood plain. Most of the soils used for woodland on the bottom land along the river have been cleared. The natural drainage has been improved for more reliable crop production on the wet soils.

Figure 1.2 2016 Pope County Land Use



Information in figure 1.2 obtained from the Center for Advanced Spatial Technologies at the University of Arkansas. Information in Figure 1.3 below, obtained from ArcGIS.



Pope County

1.2.2 Physiography

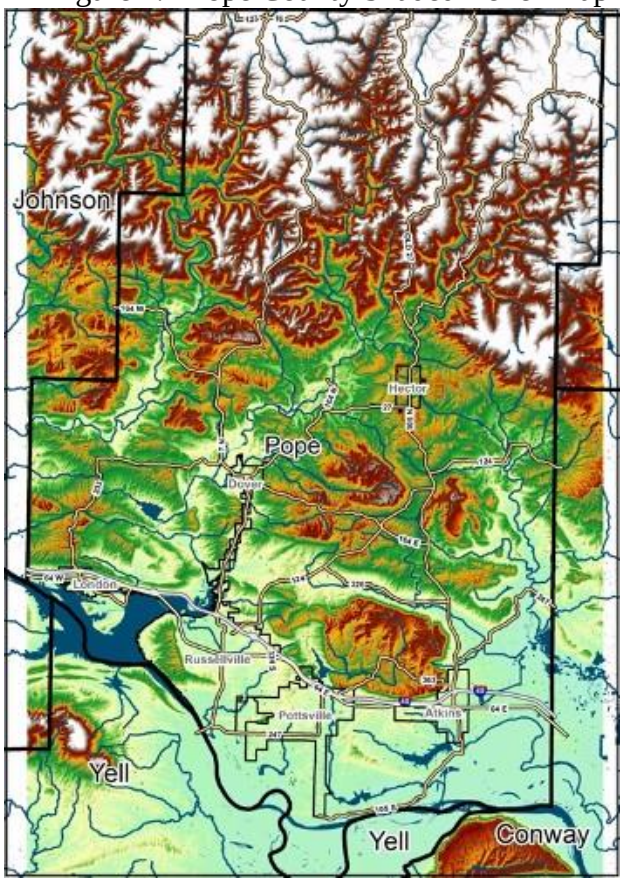
The Arkansas River flows eastward and forms the southern boundary of the county. A relatively narrow flood plain parallels the course of the river. The most fertile soils in the county, those of the Dardanelle, Rilla, and Roxana series, are in this area. The flow of the Arkansas River is regulated by major flood control impoundments upstream and by a series of locks and dams forming a navigable channel. The Arkansas River is navigable to barge traffic all year. The river provides recreational fishing, boating, and waterfowl hunting.

The Boston Mountain range is in the northern part of Pope County. In this area steep, stony mountains rise from the Arkansas Valley. The area is drained by Big Piney Creek and by the North Fork, the Middle Fork, and the East Fork of the Illinois Bayou. The Boston Mountains are capped by sandstone. The sides are interbedded sandstone and shale. The slopes range from 3 to 65 percent.

The Arkansas Valley, which makes up most of the rest of the county, consists of rolling, flat-topped hills, long narrow ridges, and broad valleys. The hilltops and ridges are capped with hard sandstone. The hillsides and valleys are mostly underlain by shale. The slopes range from 0 to 45 percent. This area is drained by streams including the Illinois Bayou, Galla Creek, Gum Log Creek, and West Fork Point Remove Creek.

The main soils on the mountains and hills are Mountainburg, Enders, and Nella soils. Linker and Mountainburg soils dominate the ridges. Leadvale and Taft soils dominate the broad valleys. Ground water is insufficient for large scale irrigation. Domestic water is mainly supplied by dug wells and drilled wells. The majority of livestock water is supplied by ponds and creeks.

Figure 1.4 Pope County Shaded Relief Map



1.2.3 Climate

Pope County is hot in summer, especially at low elevations. It is moderately cool in winter, especially on mountains and high hills. Rainfall is relatively heavy and well distributed throughout the year. Snow falls nearly every year. However, snow cover commonly lasts less than a few days.

In winter the average temperature is 43 degrees F and the average daily minimum temperature is 30 degrees. The lowest temperature on record, which occurred in Russellville on February 2, 1951, is -14 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred on July 13, 1954, is 113 degrees.

Of the total annual precipitation, 26 inches, or 54 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 21 inches. The heaviest 1-day rainfall during the period of record was 6 inches at Russellville on August 13, 1957. Thunderstorms occur on about 60 days each year, and most occur in summer.

Average seasonal snowfall is 3 inches. The greatest snow depth at any one time during the period of record was 8 inches. On the average, there is seldom a day with at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in mid-afternoon is about 50 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The percentage of possible sunshine is 70 percent in summer and 50 percent in winter. The prevailing wind is from the northeast. Average wind speed is highest, 9 miles per hour, in spring.

1.2.4 Major River/Watersheds

Pope County crosses 4 watersheds.

11010005 Buffalo River Watershed

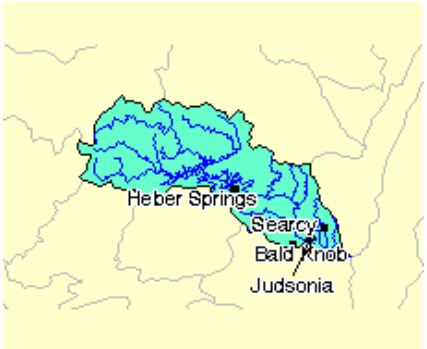
The Buffalo River Watershed covers part of the extreme Northern Part of Pope County. This only affects a very small area of unincorporated Pope County.

Figure 1.5 Buffalo River Watershed

Figure 1.6 Little Red River Watershed

11010014 Little Red River Watershed

The Little Red Watershed covers only a very small amount of the Northeastern Section of Pope County. This watershed only affects a very small portion of unincorporated Pope County.



11110202 Dardanelle Reservoir Watershed

The Dardanelle Watershed covers the majority of Pope County from Russellville to the Northern sections of Pope County. This watershed affects the areas of London, Dover, Russellville, and Hector.

Figure 1.7 Dardanelle Reservoir Watershed

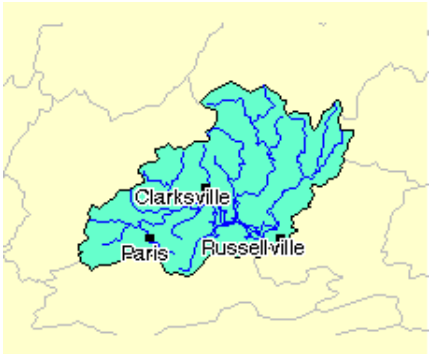
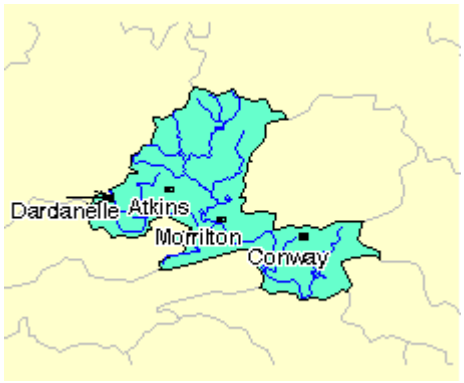


Figure 1.8 Lake Conway-Point Remove Watershed

11110203 Lake Conway-Point Remove Watershed

Lake Conway-Point Remove Watershed covers the Eastern Sections of Pope County. This watershed affects the areas of Atkins and Pottsville.



1.2.5 Population and Demographics

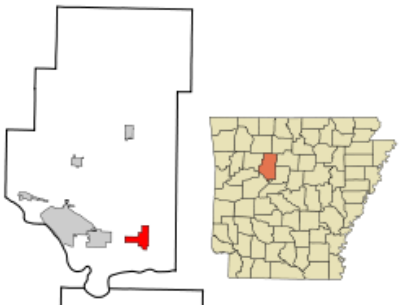
The following are fact sheets providing population, demographics, social, economic, and housing information from the 2020 Census for each of the incorporated cities and Pope County. https://www.census.gov/quickfacts/popecountyarkansas

Pope County

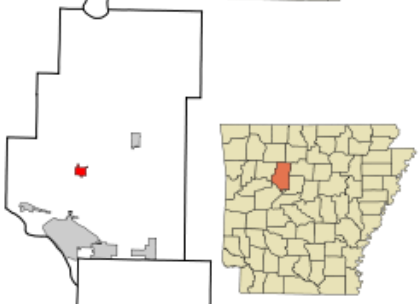
A County Judge and Quorum Court govern Pope County. County Boards consist of Library, Ambulance Service, Facilities Board and Equalization Board. Russellville is the county seat.

As of 2020 census there were 63,381 people with 2.6% growth since the 2010 census. Pope county has 22,863 households. The population density for Pope County is 78.1/mi². There are 26,479 housing units as of the 2020 census.

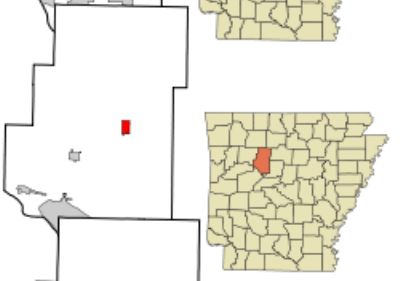
There were 22,863 households out of which 22.86% were children under the age of 18 and 16.2% were persons 65 years of age or older. The average household size was 2.65.



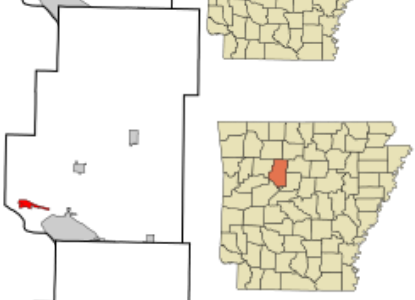
Atkins – As of the census of 2020, there were 2,859 people and 1,164 households. The population density for the City of Atkins is 466/mi². There were 1,286 housing units as ofthe 2020 census.



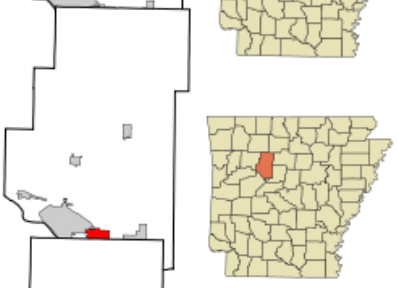
Dover – As of the census of 2020, there were 1,337 people which is a -3.0% growth rate. There were 676 households. The population density is 472.9mi².



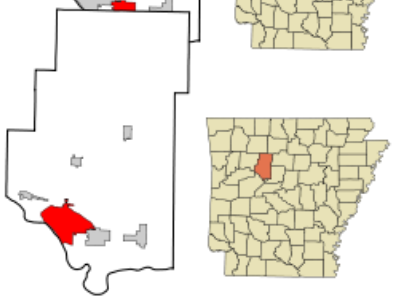
Hector – As of the census of 2020, the population was 411. There are 204 households in the City of Hector. The population density was 75.4k/m (193.95mi²). There were 204 housing units at an average density of 34.2/km² (88.7/mi²).



London – As of the census of 2020, there were 936 people, 429 housing units in the city. The city had a decrease in of -9.9%. The population density is 295.27/sq mile.



Pottsville- As of the 2020 census the population stood at 3,140 with a growth rate of 10.6%, The city has 1,181 housing units, the city has 1,031 households and 840 families. The population density is 89.59/km² (232.04/mi²) inhabitants per square mile.



Russellville-Russellville has a Mayor-Council form of government with four wards and two aldermen from each ward. City commissions are made up of volunteers with an alderman as liaison with each commission. The commissions are Airport, Civil Service, Recreation and Parks, Planning Board of Adjustments, and City Corporation (water and sewer). As of the 2020 census [2], there were 28,940 people, 9,824 households, and 12,102 housing units. The population density was 1,022.54/sq mile (394.80/km2).

School Districts

There are five school districts in Pope County: Atkins, Dover, Hector, Pottsville, and Russellville. Schools in London are part of the Russellville School District. There are 22 schools in Pope County.

Table 1.1 Pope County Public Schools

PRIMARY SCHOOLS (10)	
Atkins Elementary School	Hector Elementary School
Center Valley Elementary School	London Elementary School
Crawford Elementary School	Oakland Heights Elementary School
Dover Elementary School	Pottsville Elementary School
Dwight Elementary School	Sequoyah Elementary School

MIDDLE SCHOOLS (5)	
Atkins Middle School	Pottsville Middle Grades
Dover Middle School	Russellville Middle School
Russellville Upper Elementary School	

JUNIOR HIGH SCHOOLS (2)	
Pottsville Junior High School	Russellville Junior High School

HIGH SCHOOLS (5)	
Atkins High School	Pottsville High School
Dover High School	Russellville High School
Hector High School	

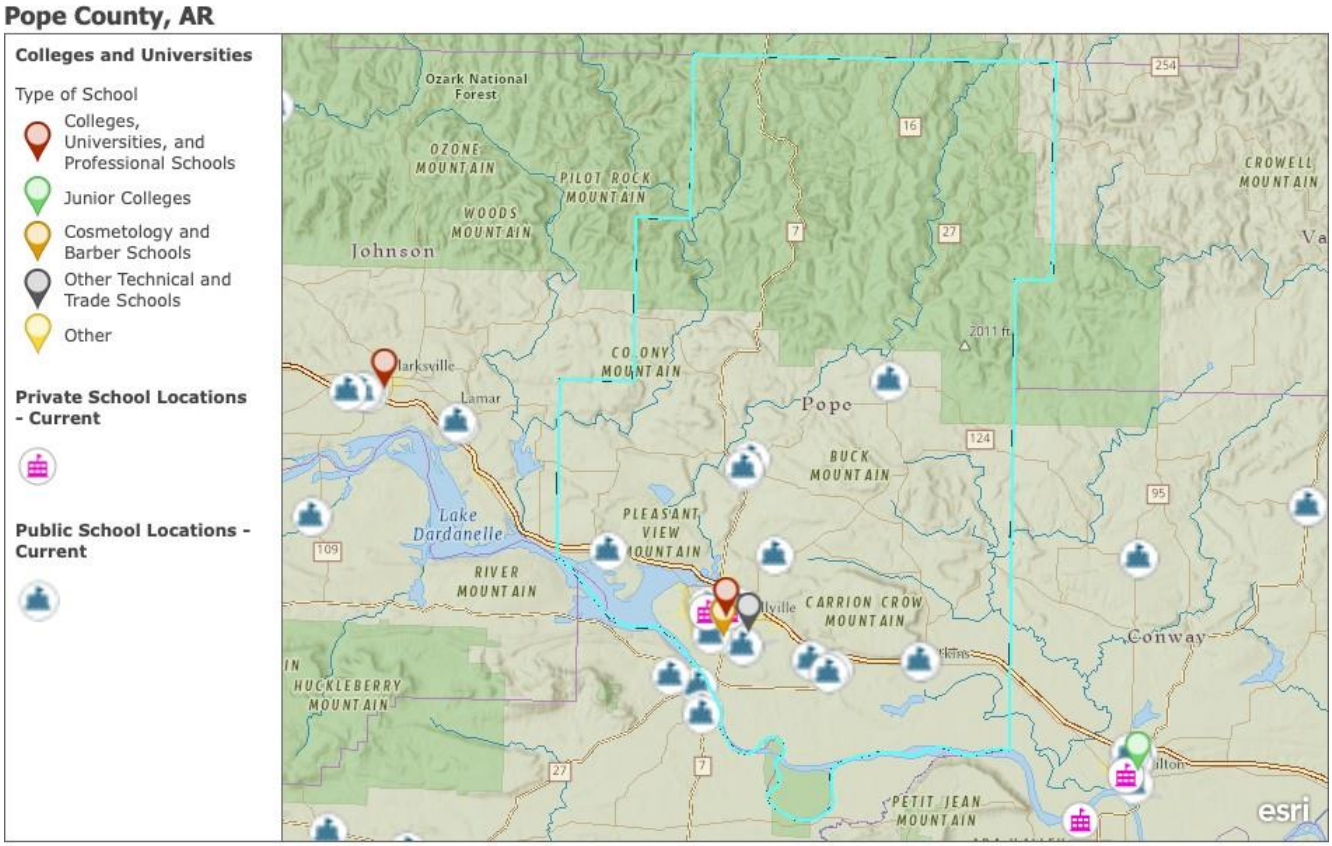
Universities

Arkansas Tech University located 1605 Coliseum Drive, Russellville, AR. The following lists general information about the university.

Founded in 1909 as the Second District Agricultural School
Enrollment is 9,640 as of Fall 2022
Enrollment has grown 13.5% since 2013.
Arkansas Tech University has a total undergraduate enrollment of 8,901 (fall 2021), with a gender distribution of 44% male students and 56% female students. At this school, 29% of the students live in college-owned, -operated or -affiliated housing and 71% of students live off campus.
New Construction since 1997 includes:

- Ross Pendergraft Library & Technology Center
- Doc Bryan Student Services Center
- Hull Physical Education Addition
- McEver Science Addition
- University Commons Apartments
- Nutt Residence Hall
- Williamson Hall Addition
- Paine Hall Renovation
- Norman Hall
- Chartwells Women's Sports Complex
- Baswell Residence Hall
- Baseball Field Renovation
- Rothwell Hall
- M Street Residence Hall

Figure 1.9 Pope County Area Schools, Colleges



Pope County

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1.2.6 Economy

Data from the 2020 census shows there to be 63,381 people with 2.6 percent growth since the 2010 census. Russellville, the county seat, had a population of 28,940. Most of the people in the county, including more than half of the farmers, work in industries or support businesses in the Russellville area. Pope is one of 75 counties in Arkansas. It is not part of a Metropolitan Area. Its 2020 population ranks it 13th largest in the state.

The 2020 Census data found 14.1% of the Pope County population lived at or below the poverty line. In comparison, Data USA reports 18.8% of the Pope County population lived at or below the poverty line in 2019.

According to the 2020 census, total employment was 55.7%, down slightly from 2010 census. The decrease is slightly lower than the state at 57.8% during the same period.

The county employment rank of growth was 10th among the 75 counties in the state for 2020. DataUSA 2019 information shows the largest industries in Pope County are Manufacturing, Healthcare, Social Assistance, and Educational Services.

Management, professional, and related occupations accounted for 27.7% of the local employment. This was followed by sales and office occupations at 23%; service occupations at 15.2%; production,

transportation, and material moving occupations with 22.2%, service occupations with 15.2%, and natural resources, construction, and maintenance occupations with 10.1%.

Pope County's per capita income of $25,546 (2020 census) was slightly lower than the state average of $27,724.

Of the adult population in Pope County, 24.6% had a college degree, higher than the state with 23.8%. 15.1% did not have a high school diploma versus 12.8% for the state.

Russellville is the home of St. Mary's Regional Medical Center, four medical clinics, and twenty specialist clinics. Hospital services include neurosurgery, diagnostic radiology through CAT Scan and MRI, nuclear medicine, physical and respiratory therapy, clinical laboratory and pathology, cardiopulmonary and special procedures/cardiac catheterization laboratory, EKG, home health care and 24-hour emergency service with full-time physician coverage.
For more information, please contact St. Mary's Regional Medical Center, 1808 West Main Street, Russellville, AR 72801; 479-968-2841; fax 479-968-8189. Emergency medical flight service is also available through Survival Flight, Air Evac, Arkansas Children's Hospital and Baptist Hospital in Little Rock.

Russellville is the commercial and retail trade center for the Arkansas River Valley. The trade area, a 50-mile radius, represents over 150,000 people. Due to the trade area, Russellville offers many services and amenities not usually found in communities its size.

1.2.7 Future Development

The recently formed River Valley Regional Intermodal Facilities Authority is working to develop a new multi-modal industrial facility in Russellville. This facility will consist of a slack water harbor, rail service, and a four-lane truck by-pass connecting to Interstate 40. The facility will also contain over 700 acres of available industrial property with access roads and all utilities in place.

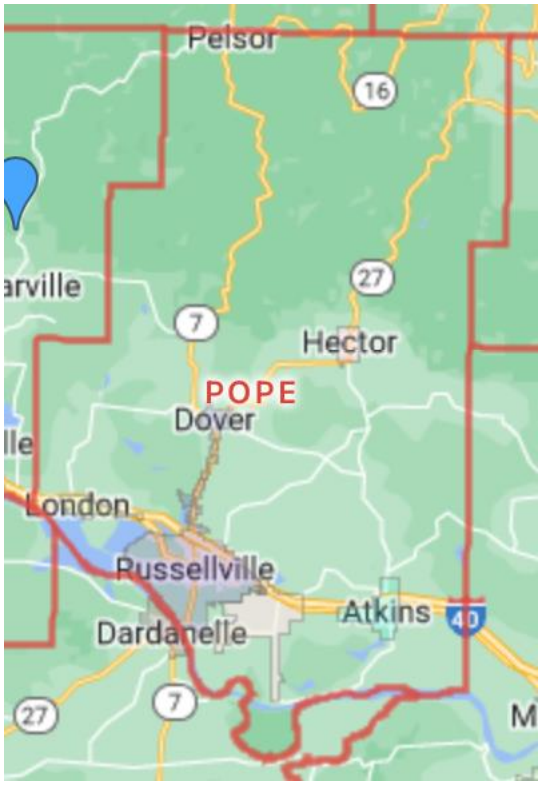
The Arkansas River Valley Intermodal Facilities project would include local roadway access to Interstate (I-40) highway connections via State Highway 7 and access to the Dardanelle Russellville Railroad development. A slack water harbor along the McClellan-Kerr Arkansas River Navigation System (MKARNS), which would connect the intermodal facilities to the U.S. Inland Waterway System, would be constructed. Additional services at the intermodal facility would include on-site rail/truck transfers, truck/water transfers, rail/water transfers, freight tracking, a foreign trade sub-zone, warehousing, distribution, consolidation, just-in-time inventory services, and material storage capabilities.

Additionally, plans are being made to build a casino and a Buc-ee's travel center in Russellville. This development will provide more jobs and a larger economy but eliminate green space. Other business may be attracted to the area stimulating population growth.

These changes in and around Pope County will impact the Planning Area. Population growth will require expanded emergency services and sheltering. Facilities serving as warming/cooling stations may become inadequate. As developed areas expand into forested and green areas, climate and flood zones are affected. Urbanizing once forested areas places people in the path of wildfire hazards and displaces wildlife. Evacuation routes will need to be re-evaluated. This will require the planning committee to perform studies on the effects of land use, climate, and population. It will also require future mitigation strategies to infrastructure, communications, and protective sheltering needs.

Section 2: Capability Assessment

2.1 Pope County in Arkansas



Pope County is a member of the National Flood Insurance Program, Community Identification Number 050458C. Their initial Flood Hazard Boundary Map was 12/20/77, the initial Flood Insurance Rate Map identified 07/01/09, current effective map date 03/21/19, and Reg-Emergency Date 07/01/09.

Pope County participates in the NFIP by assisting residents with filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain. The floodplain manager monitors the construction process to ensure compliance. The county plans to continue to stay in compliance with the NFIP, by participating in the Community Assistance Visit (CAV) with FEMA/ISO staff members and with members of the Arkansas Natural Resource Commission (ANRC). The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations.

Pope County and the unincorporated areas of Pope County continually evaluate for structures:

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

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

2.2 City of Atkins in Pope County

The City of Atkins is a member of the National Flood Insurance Program, Community Identification Number 050304C. Their initial Flood Hazard Boundary Map was 07/18/75, the initial Flood Insurance Rate Map identified 07/06/82, current effective map date 03/21/19, and Reg-Emergency Date 07/06/82.

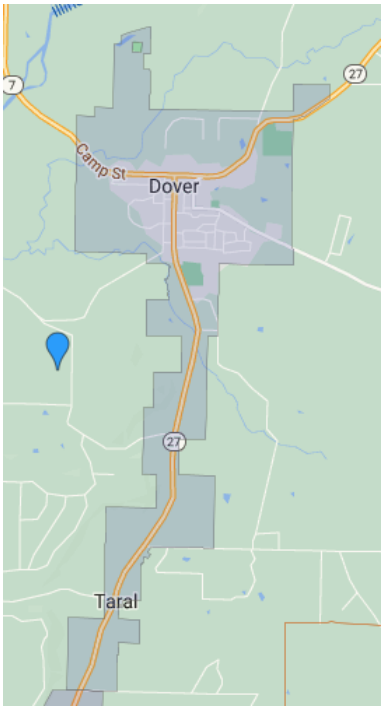
The City of Atkins participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain. The floodplain manager monitors the construction process to ensure compliance. The city plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The City of Atkins and Pope County continues to evaluate structures that are:

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

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

2.3 City of Dover in Pope County



City of Dover is a member of the National Flood Insurance Program, Community Identification Number 50321. Their initial Flood Hazard Boundary Map was 04/18/75, the initial Flood Insurance Rate Map identified 03/15/83, current effective map date 03/02/10, and Reg-Emergency Date 03/15/83.

The City of Dover participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain. The floodplain manager monitors the construction process to ensure compliance. The city plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The City of Dover and Pope County continues to evaluate structures that are:

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

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

2.4 City of Hector in Pope County

City of Hector is a member of the National Flood Insurance Program, Community Identification Number 50254. Their initial Flood Hazard Boundary Map was 03/25/75, the initial Flood Insurance Rate Map identified 03/02/10, current effective map date 03/02/10, and Reg-Emergency Date 03/09/18.

The City of Hector participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain. The floodplain manager monitors the construction process to ensure compliance. The city plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The City of Hector and Pope County continues to evaluate structures that are:

- In need of improvements

- Substantially damaged
- Located within the floodplain

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

2.5 City of London in Pope County

City of London is a member of the National Flood Insurance Program, Community Identification Number 050340. Their initial Flood Hazard Boundary Map was 08/29/75, the initial Flood Insurance Rate Map identified 07/13/82, current effective map date 03/02/10, and Reg-Emergency Date 07/13/82.

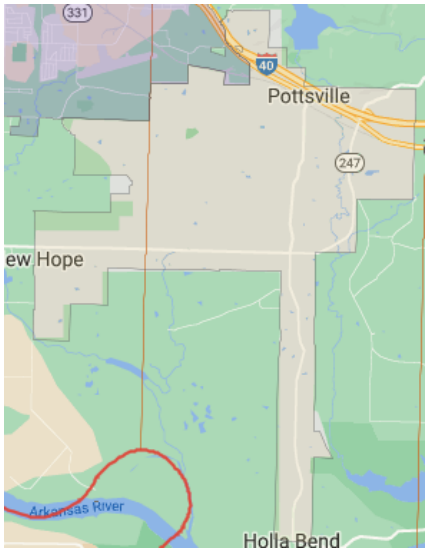
The City of London participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain. The floodplain manager monitors the construction process to ensure compliance. The city plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The City of London and Pope County continues to evaluate structures that are:

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

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

2.6 City of Pottsville in Pope County



City of Pottsville is a member of the National Flood Insurance Program, Community Identification Number 5102177. Their initial Flood Hazard Boundary Map was 04/25/75, the initial Flood Insurance Rate Map identified 03/02/10, current effective map date 03/02/10, and Reg-Emergency Date 04/15/82.

The City of Pottsville participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain. The floodplain manager monitors the construction process to ensure compliance. The city plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

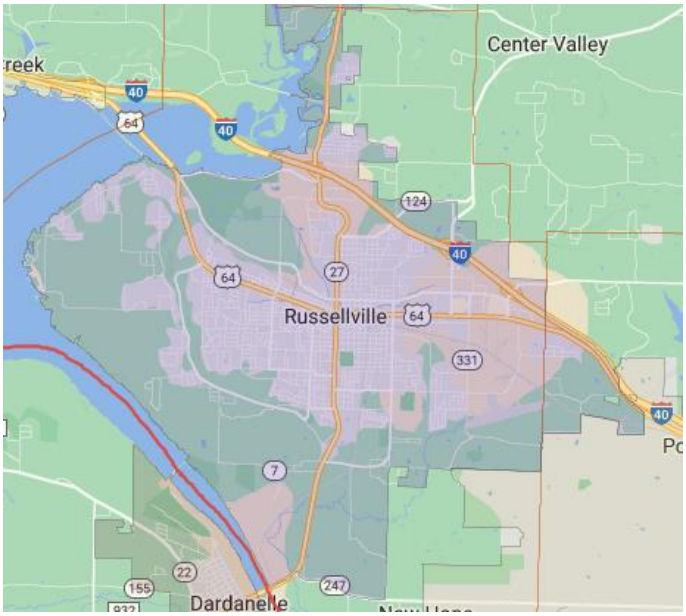
The City of Pottsville and Pope County continues to evaluate structures that are:

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

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

2.7 City of Russellville in Pope County

City of Russellville is a member of the National Flood Insurance Program, Community Identification Number 50178. The initial Flood Insurance Rate Map identified 07/17/70, current effective map date 04/17/12, and Reg-Emergency Date 07/18/70.



The City of Russellville participates in the NFIP by assisting the residents with filling out documents for the NFIP and educating citizens about the NFIP program. Permits are issued for those wishing to build in the floodplain. The floodplain manager monitors the construction process to ensure compliance. The city plans to continue to participate through continuing floodplain education and staying in compliance with NFIP.

The City of Russellville and Pope County continues to evaluate structures that are:

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

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

	Atkins	Dover	Hector	London	Pottsville	Russellville
Adopted Storm Water Management Ordinances	No	N/A	No	N/A	No	Yes
Adopted Stream Management Ordinances	No	N/A	No	N/A	No	N/A
Adopted Zoning Management Ordinances	Yes	N/A	No	6/5/2019	Yes	Yes
Adopted Subdivision Management Ordinances	Yes	N/A	No	6/5/2019	Yes	Yes
Adopted Erosion Management Ordinances	No	N/A	No	N/A	No	
Adopted Floodplain Management Ordinances	Yes	Yes	Yes	Ordinance #144	Yes	Yes
Floodplain Management Plan Published Date	7/06/1982			3/16/2007		
Floodplain Management Last Delineation Date					N/A	
Elevation Certificates Maintained	Yes	N/A	No	No	No	
National Flood Insurance Program Community	Yes	Yes	Yes	Yes	Yes	Yes
National Flood Insurance Join Date	7/18/1975	4/18/1975	3/9/2018	8/29/1975	4/25/1975	7/18/1970
NFIP Community Number	050304 005 A	050321	050254	#050340	05102177	050178
FFIP Community Rating System Number		N/A		N/A	N/A	N/A
NFIP CRS Effective Date		N/A		N/A	N/A	N/A
Land Use Plan	Yes	N/A	No	No	Yes	Yes
Land Use Plan Last Update	5/1999	N/A		N/A	2/28/2005 (Working on new one now)	12/2020
Community Zoned	Yes	N/A	No	Yes	Yes	Yes
Zoned Date	1976	N/A		6/5/2019	6/17/1994	Between August 1959 and 1962
Established Building Codes	No	N/A		Yes	Yes	Yes
Building Codes Last Updated		N/A		1999	N/A	2012
Type of Building Codes		N/A		SBCCI	Standard Building Code, National Electrical Code, Arkansas Plumbing Code, Arkansas Mechanical Code, Arkansas Fire Code	Arkansas Fire Prevention Code Vol. 1, 2, 3 (IFC, IBC, IRC)

	Atkins	Dover	Hector
Local Electric Utilities	Entergy	Entergy	Entergy
Local Water Treatment	Atkins Water Works	Dover Public Works	Tri-County
Local Water Distribution	Atkins Water Works	Dover Public Works	Tri-County
Local Wastewater Collection	Atkins Water Works	Dover Public Works	
Local Wastewater Treatment	Atkins Water Works	Dover Public Works	
Local Natural Gas Utilities	CenterPoint Energy	SUMMIT Energy, ArLA	Center Point Energy
Local Telephone Utilities	CenturyLink	CenturyLink, Suddenlink Communications	CenturyTel
Community has a Fire Insurance Rating	Yes	Yes	Yes
Fire Insurance Rating	3	4	
Fire Insurance Rating Date	1/01/06	2004	
Previous Mitigation Plans, Projects, and Actions	Safe Rooms completed in the Public Schools in Atkins Flood Insurance Claims	Installation of Safe Rooms at the Dover Elementary School and the High School. Plans to install a saferoom at the Middle School which will be the only school left to get one.	Two of the buildings that house the High School are saferooms.
Flood Insurance Claims	No		No
	The Atkins City Council has the authority to write ordinances enforcing safe practices and mitigation actions to be accomplished for the safety of the citizens and visitors of Atkins. The school can write policies affecting the actions of the schools. City personnel are a part of the Pope County LEPC and the mitigation committee and support the plan.	The Dover City Council has the authority to write ordinances enforcing safe practices and mitigation actions to be accomplished for the safety of the citizens and visitors of Dover. The school can write policies affecting the actions of the schools. City personnel are a part of the Pope County LEPC and the mitigation committee and support the plan.	The Hector City Council has the authority to write ordinances enforcing safe practices and mitigation actions to be accomplished for the safety of the citizens and visitors of Hector. The school can write policies affecting the actions of the schools. City personnel are a part of the Pope County LEPC and the mitigation committee and support the plan.

	London	Pottsville	Russellville
Local Electric Utilities	Entergy	Entergy	Entergy
Local Water Treatment	City Corporation (Russellville)	Atkins Water Company	Russellville City Corporation
Local Water Distribution	City of London	Pottsville Water Company	Russellville City Corporation
Local Wastewater Collection	City of London	Pottsville Water & Sewer Dept.	Russellville City Corporation
Local Wastewater Treatment	City of London	Pottsville Water & Sewer Dept.	Russellville City Corporation
Local Natural Gas Utilities	Reliant Energy Arkla	CenterPoint Energy	CenterPoint Energy
Local Telephone Utilities	CenturyTel, Suddenlink	CenturyTel	CenturyLink, Suddenlink Communications
Community has a Fire Insurance Rating	Yes	Yes	Yes
Fire Insurance Rating	5	4	2
Fire Insurance Rating Date	6/16	3/01/2006	2017
Previous Mitigation Plans, Projects, and Actions	A safe room was constructed at the London Elementary School	Safe Rooms constructed at all the schools in the Pottsville School District	Safe Rooms have been installed in all Public Schools in Russellville including the London Elementary School and Center Valley Elementary School which are outside the city limits. Drainage projects ongoing in the city of Russellville with a containment pond that has been constructed off 12th Street
Flood Insurance Claims	No	No	
	The London City Council has the authority to write ordinances enforcing safe practices and mitigation actions to be accomplished for the safety of the citizens and visitors of London. The London Elementary School is a part of the Russellville School District and will have policies written for them by the Russellville School District. City personnel are a part of the Pope County LEPC and the mitigation committee and support the plan.	The Pottsville City Council has the authority to write ordinances enforcing safe practices and mitigation actions to be accomplished for the safety of the citizens and visitors of Pottsville. The school can write policies affecting the actions of the schools. City personnel are a part of the Pope County LEPC and the mitigation committee and support the plan.	The Russellville City Council has the authority to write ordinances enforcing safe practices and mitigation actions to be accomplished for the safety of the citizens and visitors of Russellville. The school can write policies affecting the actions of the schools. City personnel are a part of the Pope County LEPC and the mitigation committee and support the plan.

2.8 Primary Capability Categories:

The tables below expand on each of the jurisdiction's capabilities with primary capabilities listed below. In each primary category, every Jurisdiction is represented with responses under all subcategories they are capable of. This provides a visual of the areas open for improvements. All jurisdictions participated in completing their portions to ensure accuracy and to better depict the needs across the county. See Appendix B for other documentation containing capability assessments.

- Fire ISO Ratings
- Planning and Regulatory Capabilities
- Administrative and Technical Capabilities
- Financial Capabilities
- Education and Outreach Capabilities

Pope County FDID Numbers		
Number	**Fire Department**	**ISO**
58000	Atkins Fire Department	3
58001	Appleton Fire Department	5
58002	Dover City Fire Department	3
58003	Dover Rural Fire Department	6
58004	Hector Fire Department	6
58005	London Fire Department	5
58007	Pottsville Fire Department	4
58008	Crow Mountain Fire Department	5
58009	Martin Township Fire Department	6
58010	Moreland Fire Department	6
58011	Linker Mountain Fire Department	4
58012	Bayliss Fire Department	9
58300	Russellville Fire Department	2
58301	Hatley Fire Department	9
58302	Pea Ridge Fire Department	6

Capability Assessment							
	Pope County	Atkins	Dover	Hector	London	Pottsville	Russellville
Comprehensive Master Plan			x	x		x	x
Capital Improvements	x	x	x	x	Street work in progress. Resolution on this street work. Water $12,000 budgeted	Working on treatment plant	x
Economic Development Plan			x				x
Local Emergency Operations Plan	x	x	x	x	With the County	x	x
Continuity of Operations Plan	x		x	School has a nuclear planning & response evacuation site		x	
Transportation Plan	x					x	x
Stormwater Management Plan			x	Part of the NFIP Flood zoning in city ordinance	10 years old and not their plan		x
Community Wildfire	In progress		x		With Rural fire dept	Fire department has one	In progress
Zoning Ordinance	x	x	x	Flood zoning only	x	x	x
Subdivision Ordinance		x	x		x	x	x
Floodplain Ordinance	x	x	x	x	x	x	x
Building Codes	County does not have its own building codes	Follow the State Recommendations for Building codes requirements. These are 2021 Fire Code , 2021 International Mechanical Code, 2018 Arkansas Fuel Gas Code, 2018 Plumbing Code, Electrical Code. These codes can be found at https://codes.iccsafe.org/codes/arkansas					
Acquisition of land for open space			x	x	if it is for sale but not condemn		

Capability Assessment (continued)						
	Atkins School District	Dover School District	Hector School District	Pottsville School District	Russellville School District	Arkansas Tech University
Comprehensive Master Plan		x	x	x	x	
Capital Improvements		x	Just finished campus improvement capital project		Related to HVAC systems and in the stadium (need some at elementary)	
Economic Development Plan					Working on one with the Chamber	x
Local Emergency Operations Plan		x	Working on safety/security plan	x	x	x
Continuity of Operations Plan		x	x	x	Connected with ESSER and IT has a plan	x
Transportation Plan		x			x	x
Stormwater Management Plan						x
Community Wildfire						
Zoning Ordinance				x	City	
Subdivision Ordinance				x	City	x
Floodplain Ordinance			City		City	x
Building Codes: School Districts follow State Recommendations and can be found at https://codes.iccsafe.org/codes/arkansas		2021 Fire Code 2021 International Mechanical Code 2018 Arkansas Fuel Gas Code 2018 Plumbing Code Electrical Code			2021 Fire Code 2021 International Mechanical Code 2018 Arkansas Fuel Gas Code 2018 Plumbing Code Electrical Code	2021 Fire Code 2021 International Mechanical Code 2018 Arkansas Fuel Gas Code 2018 Plumbing Code Electrical Code
Acquisition of land for open space						

Administrative and Technical Capabilities							
	Pope County	Atkins	Dover	Hector	London	Pottsville	Russellville
Pope County Local Emergency Planning Committee	x	x	x	x	x	x	x
Planning Commission	x	x	x		x	x	x
Mutual Aid Agreements	x	x	x	x	x	x	x
Maintenance Programs to Reduce Risk	x	x		Part of AR Municipal property program (have insurance through them)		Vehicle plans	x
Floodplain	x	x	x	x	x		x
Emergency Manager	x	x	x		x		x
Community Grant Writers	x	x	x	x	x	x	x
GIS / HAZUS			x			x	x
Warning Systems	x	x	x	2 storm warning sirens	x	Water shed text messages	x
Civil Engineer			Contracted	One on retainer	Contract with Crafton Tull		x
Hazard Data and Information	x	x			x		x

Administrative and Technical Capabilities (continued)						
	Atkins School District	Dover School District	Hector School District	Pottsville School District	Russellville School District	Arkansas Tech University
Pope County Local Emergency Planning Committee	x	x	x	x	x	**x**
Planning Commission				x	x	
Mutual Aid Agreements	x	x	x	x	x	**x**
Maintenance Programs to Reduce Risk		x	x	x	x	**x**
Floodplain			x		x	
Emergency Manager					x	**x**
Community Grant Writers					x	**x**
GIS / HAZUS		x	x		City/county	
Warning Systems		x	x	x	x	**x**
Civil Engineer					City	
Hazard Data and Information		x			Need help with asbestos	**x**

Financial Capabilities							
	Pope County	Atkins	Dover	Hector	London	Pottsville	Russellville
Fees for water, sewer, gas, or electric services		Water & Sewer	Water & Sewer		Water & Sewer	Water & Sewer	Water & Sewer
Capital improvements project funding	x	x	x		Applying for grant to repave streets.		x
Community Development Block Grant	x	x	Not in last 4 years	Not applied			x
Federal Funding Programs	x	x		ARP funding only	Stimulus money only	ARP funding only	x
State Funding Programs	x	x	Rec'd street aid funding 2022 totaling $273,000	x	ANRC grants for sewer system	DOT grant in 2019	x
Impact fees for new development							
Authority to levy taxes for specific purposes	x	x		x		x	x
Other		Received CDBG in 2020-water park/splash					

Financial Capabilities (continued)						
	Atkins School District	Dover School District	Hector School District	Pottsville School District	Russellville School District	Arkansas Tech University
Fees for water, sewer, gas, or electric services						
Capital improvements project funding	x	x		x	x	
Community Development Block Grant						
Federal Funding Programs	x	x	x	x	x	
State Funding Programs	x	x	x	x	x	
Impact fees for new development					x	
Authority to levy taxes for specific purposes					x	

Education and Outreach Capabilities							
	Pope County	Atkins	Dover	Hector	London	Pottsville	Russellville
Non-Profit Organizations for environmental protection, emergency preparedness, or access to assist functional needs populations	x	x			Open to them, but do not have any located in London		x
Ongoing Public Education Program or information program	x	x	x	x	x	x	x
Natural Disaster or safety related school programs	x	x	x				x
Firewise Communities Certification	Appleton & Hector			x			
Public-private partnership initiatives addressing disaster related	x	x			County only		x
Storm Ready Certification							

Education and Outreach Capabilities (continued)						
	Atkins School District	Dover School District	Hector School District	Pottsville School District	Russellville School District	Arkansas Tech University
Non-Profit Organizations for environmental protection, emergency preparedness, or access to assist functional needs populations					x	
Ongoing Public Education Program or information program	x	x	x	x	x	x
Natural Disaster or safety related school programs		x			x	x
Firewise Communities Certification						
Public-private partnership initiatives addressing disaster related					x	
Storm Ready Certification						x

Atkins School District, Dover School District, Hector School District, Pottsville School District, Russellville School District and Arkansas Tech University meet at a minimum on an annual basis to evaluate their jurisdictions capabilities, determine appropriate planning goals, and coordinate improvement efforts.

Section 3. Plan Adoption

3.1 Multi-Jurisdictional Plan Adoption

In addition to unincorporated areas of Pope County, six cities within Pope County are included in this plan. The cities are Atkins, Dover, Hector, London, Pottsville, and Russellville. The following school districts in Pope County are also included in this plan: Atkins, Dover, Hector, Pottsville, Russellville, and Arkansas Tech University.

All communities listed below adopted the Pope County Mitigation Plan in 2015. Each jurisdiction will adopt this plan once FEMA has approved this update to the Mitigation Plan.

The Pope County Hazard Mitigation plan was reviewed and approved by the following Promulgation Authority:

Approved by:

Signature: _____
Name: Ben Cross
Title: County Judge
Organization: Pope County

Signature: _____
Name: Rowdy Street
Title: Mayor
Organization: City of Atkins

Signature: _____
Name: Roger Lee
Title: Mayor
Organization: City of Dover

Signature: _____
Name: John Riley
Title: Mayor
Organization: City of Hector

Signature: _____
Name: Eddie Price
Title: Mayor
Organization: City of London

Signature: _____
Name: Randy Tankersley
Title: Mayor
Organization: City of Pottsville

Signature: _____
Name: Fred Teague
Title: Mayor
Organization: City of Russellville

Signature: _____
Name: Lori Edgin
Title: Superintendent
Organization: Atkins School District

Signature: _____
Name: Josh Daniels
Title: Superintendent
Organization: Dover School District

Signature: _____
Name: Mark Taylor
Title: Superintendent
Organization: Hector School District

Signature: _____
Name: Larry Dugger
Title: Superintendent
Organization: Pottsville School District

Signature: _____
Name: Dr. Ginni McDonald
Title: Superintendent
Organization: Russellville School District

Signature: _____
Name Dr. Robin Bowen
Title: Arkansas Tech University-President
Organization: Arkansas Tech Universit

RESOLUTION NO. _____

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

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

WHEREAS 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, 2013; and

WHEREAS, to assist cities and counties in meeting this requirement, Pope County, has initiated development of a county wide, multi-jurisdiction Hazard Mitigation Plan the county and all jurisdictions in the county, specifically county, cities, universities, and school districts.

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

That County/City, (State) hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards, 2014-2018; 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_____, 2020.

APPROVED:

_____ _____ _____
County Judge Mayor School Superintendent

ATTEST:

_____
Secretary/Clerk

Section 4. Planning Process

4.1 Multi-Jurisdictional Planning Participation

This Hazard Mitigation Plan is multi-jurisdictional with a planning area including all of the unincorporated Pope County and six municipalities within the County including the Cities of Atkins, Dover, Hector, London, Pottsville, and Russellville. The following school districts in Pope County are also included in this plan: Atkins, Dover, Hector, Pottsville, and Russellville.

All jurisdictions listed above actively participated in the planning process from its inception. Each jurisdiction provided at least one representative to participate on the planning team, with larger jurisdictions providing more members. Planning team members actively participated in meetings, solicited input from members of their communities, and ensured all jurisdiction information was reflected in the plan. A description of the planning process, including a list of planning team members from each jurisdiction, is provided in Mitigation Planning Process Section. The following page contains a table summarizing the types of participation for each jurisdiction. This will continue to be the process by which Pope County reviews the Mitigation plan.

Table 4.1 Jurisdictional Participation in Planning Process

Jurisdiction	Nature of Participation/Involvement
Pope County	County Judge Ben Cross, Pope County OEM Justin Drittler & Bill Teeter, Pope County Sheriff office Shane Jones & Rodney McNeese, Pope County Floodplain Manager Jeanette Hale, and all attended planning meetings, assisted in providing historical data, completed and/or shared assessment forms, and public information. Brice Gunter provided detailed maps of disaster events in Pope County.
City of Atkins	Mayor Sweet provided information for the planning process meetings, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD, and County, helped with sharing public information & survey.
City of Dover	Mayor Roger Lee provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
City of Hector	Mayor John Riley provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
City of London	Mayor Eddie Price provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
City of Pottsville	Mayor Randy Tankersley provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
City of Russellville	Mayor Richard Harris, Public Works- Kenneth Duvall, FPM-Ben Gray, and Russellville City Corp- Holli Hall attended planning meetings, provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.

Atkins School District	Superintendent Lori Edgin provided historical data, critical facility forms completed, completed capabilities assessments, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
Dover School District	Superintendent Josh Daniels provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
Hector School District	Superintendent Mark Taylor provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
Pottsville School District	During the mitigation planning cycle, the School Superintendent Larry Dugger physically attended meetings, provided historical data, completed critical facility forms, received minutes, and completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
Russellville School District	Supt Dr. Ginni McDonald, Asst. Superintendent Jeff Holt and Transportation Director Christopher King attended planning meetings, provided information for the planning process, historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
State of Arkansas	The Arkansas Geological Survey was helpful in providing earthquake information. The Arkansas Highway and Transportation department was instrumental in providing information pertaining to mitigation activities to bridges and roads. The Arkansas Division of Emergency Management assisted in providing data, contact information, useful tool demonstrations to obtain mapping information and other data. The Sanitarian from Arkansas Department of Health participated in the planning process along with the local Health Department Administrator.
Arkansas Tech University	Heath Whorton with ATU attended planning meetings, provided information for the planning process to get ATU included in the plan, provided historical data, completed capabilities assessment, participated in calls and emails with WCAPDD and the County, helped with sharing public information & survey.
United States	USFS provided information on fire threats. The National Climatic Data Center provided data needed to determine the threat of disasters in the area. 2020 Census data was received from the United States Census Bureau. Personnel with the Arkansas Forestry Commission assisted in providing information on wildfires. USACE attended meeting and provided critical information on dams.
Private	Russellville City Corp staff members assisted in providing utility information and historical data. ANO Provided data and attended planning meeting. Entergy operations personnel helped provide technical data and attended planning meetings.
Non-Profit	Rebecca Renteria and Misty Sutton of the Red Cross Disaster Program Services participated in the planning process.

4.2 Documentation of the Planning Process

4.2.1 Updating the Plan

During the recent five (5) years, various meetings were held. Mitigation meetings were held during the LEPC (Local Emergency Planning Committee Meeting). Discussions at these meetings ranged from ongoing projects to future considerations. The Hazard Mitigation Committee met to discuss issues with the Plan. Meetings were open to the public and published in local media. Projects discussed included bridge construction, safe room construction, road improvements, landslide mitigation, and flood mitigation. Flood mitigation discussed the construction of a basin by widening of Prairie Creek to prevent flooding in parts of Russellville due to drainage issues. Discussions with individuals outside of meetings were also conducted.

Schools provided updates to mitigation activities they were involved with. Schools advised that safe rooms have been installed with FEMA grant funding. West Central AR Planning and Development (WCAPDD) also assisted with information for the plan and with update corrections to the plan. Floodplain managers in the county also assisted in the updates to the plan.

Meetings were not held in each participating jurisdiction; however, all participating jurisdictions were involved in the planning process either by email, conference calls, or zoom/teams' meetings. All LEPC & committee members are sent e-mails to inform them when the committee will meet. The public was made aware of the meetings through the news media.

Public involvement was included by posting the Natural hazard mitigation survey to the County and WCAPDD's website. The survey results are listed in Appendix A. These surveys were an essential tool in evaluating the community's concern with each risk. The public was also able to provide input during the public review process. Members of the ATU emergency management team provided further information.

Mitigation Goals were discussed in the meeting to ensure the goals for the plan have not changed. Projects that were identified in the 2015 plan were reviewed for completion. Items not complete will be found in Section 6 Mitigation Strategy.

Effort to make this and future updates useful and relevant will continue to be made by the planning team. This will be accomplished by incorporating more members into the planning team. A more diverse planning team is a positive representation of our inclusive communities, and this plan. This will mean encouraging more businesses and the general public to step up and be a voice for their communities. Representation for our most vulnerable communities is especially needed. According to FEMA, vulnerable communities are those less likely to prepare for hazard. They are less likely to respond to warning and more likely to die, suffer injuries and have proportionately higher material losses. They will have more psychological trauma and face more obstacles during the phases of response, recovery, and reconstruction. This whole community approach to mitigation will ensure that as population, economics, land use and climate change, this plan will purposefully change, maintaining its relevancy and use. These topics may be more generalized in this update to serve as building blocks for future updates.

A list of the planning team members is provided below.

Table 4.2 Planning Team Members

NAME	Position Held or Location	Email	Contact Number
Ben Gray	Russellville Floodplain Manager	bgray@rsvlar.org	(479)968-2406
Jeanette Hale	Pope County Flood Plain Manager	jeanette.hale@ar.acdenet.net	(479)968-3497
Alan Bradley	Dover Floodplain Manager	alanbradley@centurytel.net	(479)264-2376
Eddie Price	London Mayor/Floodplain Manager	london_cityhall@yahoo.com	(479)293-4513
Justin Drittler	Pope County OEM	jdrittler@popeco911.org	(479)968-1800
Bill Teeter	Pope County OEM	bteeter@popeco911.org	(479)968-1800
John Riley	Hector Mayor	jbenriley@gmail.com	(479)967-1520
Mark Taylor	Hector Schools	mark.taylor@hectorschools.net	(479)284-2021
Rowdy Sweet	Atkins Mayor	rowdy.sweet@popecountyar.gov	(479)641-2900
Jody Jenkins	Atkins Schools	jody.jenkins@atkinsschools.org	(479)641-7871
Randy Tankersley	Pottsville Mayor	rtankersley@cityofpottsville.com	(479)968-3029
Larry Dugger	Pottsville Schools	larry.dugger@pottsvilleschoolsorg	(479)968-8101
Roger Lee	Dover Mayor	mayorofdover@suddenlinkmail.com	(479)331-3270
Josh Daniels	Dover Schools	josh.daniels@doverschools.net	(479)331-2916
Richard Harris	Russellville Mayor	rharris@rsvlar.org	(479)968-2098
Mark Gotcher	Russellville Schools	mark.gotcher@russellvilleschools.net	(479)968-1306
Ben Cross	County Judge	popecountyjudge@popecountyar.gov	(479)968-7487
Heath Whorton	ATU Emergency Management	mwhorton1@atu.edu	(479)886-8488
Kenneth Duvall	Russellville Public Works	kduvall@rsvlar.org	(479)968-2406
Rebecca Renteria	American Red Cross Disaster Programs Services	Rebecca.Renteria2@redcross.org	(479)353-8097
Misty Sutton	American Red Cross Disaster Programs Services	Misty.Sutton2@redcross.org	(479)224-1897
Brian Martin	Arkansas Department of Health Sanitarian	Brian.D.Martin@arkansas.gov	(479)968-6004
Jaynie Jones	Pope County Health Dept. Administrator	jaynie.jones@arkansas.gob	(479)968-6004
Gary Simmons	Pope County Road Dept.	gary.simmons@popecountyar.gov	(479)968-6400

During the Mitigation Planning Process for Pope County, neighboring communities within the county were involved in different ways. Pope County Coordinator was brought into the discussion of prioritizing hazards and mitigation projects for Pope County. Since the surrounding counties have mutual aid agreements with Pope County, these were also reviewed and discussed in the planning process. Other agencies such as the Health Department and Soil and Water Conservation District were asked to attend mitigation planning meetings and provide input on the plan. Through the survey questionnaires distributed throughout the county, numerous businesses also provided input on disaster concerns and mitigation preparedness.

A key component to the development of a quality mitigation plan as well as integration of this Plan into other plans in the county is buy-in and developing key relationships. Pope County Emergency Management and the County and City staffs strive to develop and maintain these relationships to work together to accomplish common goals. This committee was comprised of key individuals who will be involved in other planning processes and can bring mitigation goals and objectives with them to future planning sessions. Participants are invited to the meeting via e-mail. The meeting agenda, along with the minutes to the previous meeting are sent. The process to develop this plan has brought a heightened awareness of concerns and changes in mitigation projects to local officials that will carry forward. It is a focus of this committee to have this Plan readily accessible to any interested parties for use in the future. This Plan will be utilized for future Emergency Operation Plans and pre-flood plans. It will also be provided to all local jurisdictions for any planning efforts that may take place. The county floodplain administrator has been integrally involved in this plan and will be utilizing the information for future decision making.

Planning Process Summary/Timeline:

- Departments presented what they can provide to the community during disasters. These were held during the LEPC meetings.
- April 2020 - Meetings held by LEPC/Mitigation Committee to discuss the update to the plan both in person and via teleconference due to the pandemic. These were held quarterly- April/July/October/January
- Survey was provided from May 2020 to June 2020 to the public. 111 respondents completed the survey.
- Meetings were held with ADEM and FEMA for individual training and assistance.
- 2021 LEPC meeting - presentation from AT&T on FirstNet network dedicated to first responders.
- April, May, and July 2022 meetings - focused on the hazard mitigation update to ensure participation was reached with each jurisdiction. Goals were assessed, actions updated, Risk and Hazard updated and assessed.
- August 2022 - all capabilities were assessed.
- October 2022 - final mark through was done prior to public review and FEMA assistance.
- October 2022, Final Meeting with ATU - ensured participation and accurate information for their representation in the plan.
- November/December 2022 - Public review and submission to ADEM.

This plan will continue to be reviewed by the LEPC committee and the subcommittee on Hazard Mitigation annually. This plan will also continue to be available for viewing by the public in the local libraries in the county, in the Pope County Courthouse, the Pope County Office of Emergency Management Office and on the WCAPDD website.

During the next planning cycle, the Pope County LEPC will review its Mitigation Sub-committee to determine the personnel needed to serve on the committee. The committee will change as needed to meet the needs of the county, cities, and schools. Committee members will be chosen from each jurisdiction having stake in the Pope County Hazard Mitigation Plan. This will provide for better feedback from all parties with an interest in the plan. A change in the meetings will also take place to facilitate the involvement from all parties.

See Appendix B for planning meeting documentation.

4.2.2 Household Natural Hazards Preparedness Questionnaire

Resident Questionnaires
Description: The general public was widely reached by the Pope County Natural Hazards Questionnaire. Questionnaires were published to Pope County's website, the Planning and Development District's website and shared by the Russellville Chamber of Commerce. Information was relayed to news agencies to advertise for the survey. The questionnaire was distributed throughout Pope County by county officials, school administrators, school principals, city and rural fire department volunteers, law enforcement personnel and other emergency service providers. There were 111 respondents to the survey. The household questionnaires were used to help prioritize the hazards needing to be included in the mitigation plan.

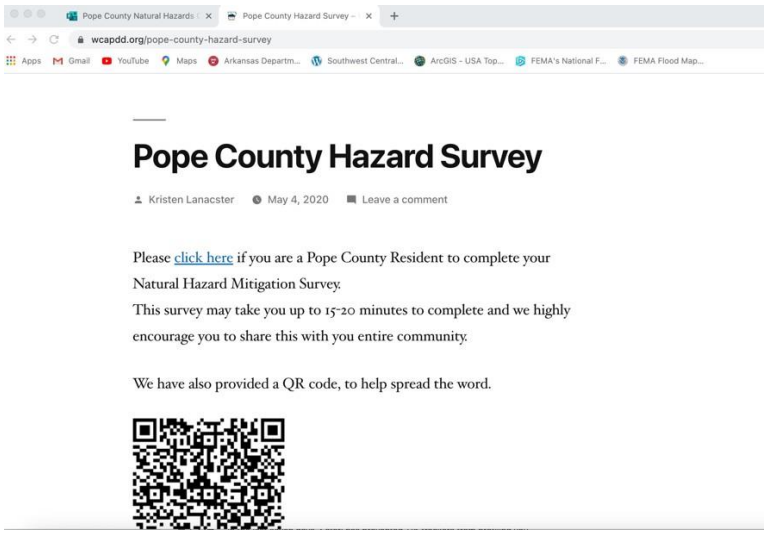
Results of the Household Questionnaire for Pope County

The Pope County Hazard Mitigation Plan Public Survey was completed by 111 respondents. The results of this survey are included in Appendix A.

Proof of Publication

A survey was published on Pope County's website, West Central Arkansas Planning and Development Districts Website (https://wcapdd.org/pope-county-hazard-survey), shared widely across social media and emailed out from the Russellville Chamber of Commerce to include public opinion on mitigation activities in Pope County. 111 people completed the survey with the results listed above.
Also, the Local Emergency Planning Committee was an open forum for the public to voice their opinions and hear information about the Mitigation Plan.

Figure 4.3 Public Survey excerpt from www.wcapdd.org



Technical Information Reviews

Existing plans, studies, reports, and technical information relevant to mitigation planning were collected and reviewed by planning team members. This information was used to identify existing, planned, and potential mitigation initiatives designed to reduce Pope County's vulnerability to natural hazards. The State of Arkansas Mitigation Plan goals section was closely reviewed before the goals were completed for the Pope County Mitigation Plan. The US Census 2020 for Pope County was reviewed to complete the population and demographics section as well as the future growth of Pope County. Land use maps, zoning maps, and building codes were reviewed for each jurisdiction and compiled into the city assessments. A list of all the documents that were reviewed is included below.

- State of Arkansas Hazard Mitigation Plan
- Pope County Emergency Operations Plan
- Pope County Soil Conservation Survey
- US Census 2020 – Pope County

Section 5. Risk Assessment

Risk Assessment, as defined by FEMA, is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards by assessing the vulnerability of people, buildings, and infrastructure to natural hazards. Assessment of risk for this plan followed the methodology described in FEMA publication 386-2 "*Understanding Your Risks – Identifying Hazards and Estimating Losses*". This publication outlines the four-step process that was followed in the planning process:

1) Identify Hazards
2) Profile Hazard Events
3) Inventory Assets
4) Estimate Losses

Risk assessment provides the foundation for the rest of the mitigation planning process. The risk assessment process focuses attention on areas most in need by evaluating populations and facilities that are most vulnerable to natural hazards and to what extent injuries and damages may occur. It tells you:

- The hazards to which your state or community are susceptible.
- What these hazards can do to physical, social, and economic assets.
- Which areas are most vulnerable to damage from these hazards; and
- The resulting cost of damages or costs avoided through future mitigation projects.

In addition to benefiting mitigation planning, risk assessment information also allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets.

5.1 Hazard Identification

Hazard Identification, the process of identifying hazards threating a given area, is the first step in the risk assessment process. Pope County identified twelve natural hazards posing a significant risk to Pope County and its residents. Each have a complete profile in this hazard mitigation plan. These hazards were identified through an extensive process utilizing input from Planning Team members, research of newspapers and other historical records, review of existing plans and reports, discussions with hazard experts, internet research, the State Mitigation Plan, the FEMA 1997 publication "Multi Hazard – Identification and Risk Assessment", and information provided by FEMA and ADEM.

The planning team performed research on past disasters. Information was compiled from sources like NCDC, NOAA, National Weather service, ANRD, Arkansas Forestry, and Southern Wildfire. Risk was assessed for each of the hazards potentially affecting Pope County.

Provided factors of the assessment are:

- Type
- Location
- Previous occurrences
- Extent
- Impact
- Probability of Future events

Probability
The probability for each identified hazard event for Pope County was determined using the provided factors above based upon previous occurrences and the timeframe of which those occurrences took place.

Magnitude/Severity
Magnitude/Severity, also known as "Extent", is the range of anticipated intensities of the identified hazards.

Hazard Vulnerability/Impact Summary
Impacts are the consequences of effects of each hazard on the participant's assets identified in the vulnerability assessment.

Assessments for each disaster is based on the identification and research process mentioned above, the detailed information for which is presented by the following pages under each hazard profile.

Presidential Disaster Declarations in Pope County
Note: Dollar amounts shown under County Award 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.

Table 5.4 Presidential Disaster Declarations up to 2022

Proclamation # and Date	Proclamation Award	Description and Date of Incident	County Award
77-17		3/1/77	$8,190.00
6/1/77	$107,025.00	Devastating **rains with resultant flooding,** Spring of 1977; caused significant damage to the bridges and road systems of several counties. Initial estimates report damages to exceed $713,000. Governor's Emergency Fund to be used for disaster relief. The sum of $1,829.55 to defray expenses necessary in connections with Flood Damage Surveys to be performed by the State Hwy Department.	

12/3/82 12/31/82	$200,000.00	12/2/82 **Severe storms** Dec. 2-3, 1982, resulted in the loss of lives, personal injuries, destruction of homes and businesses and other losses. President declared 42 counties for disaster assistance (Amendment to orig. state proclamation were made through 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).	$0.00
3/2/89 3/2/89	$300,000.00	2/13/89 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 $300,00 in the Disaster Assistance Fund to provide disaster relief to those counties affected.	$0.00
DR 97-19 3/1/97	$250,000.00	3/1/97 **Tornadoes, damaging winds, and flash flooding** beginning 03-01-97 and continued. These citizens and local government required supplemental assistance to recover from these losses. By Act 511 of 1973, as amended proclamations 97-01, -02, -03, -04, -05, -06, -07 & -11 to authorize an additional $250,000 from the Governor's Disaster Fund under the Public Assistance Program. To be used to provide supplemental disaster relief to the affected political subdivisions and at the discretion of the O.E.S. to defray both program and administrative cost. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00

DR 97-05		3/1/97	
3/5/97	$0.00	**Tornadoes, damaging winds, and flash flooding** beginning 03-01-97 and continued. By Act 511 of 1973, as amended, do hereby amend proclamations 97-01, -02, -03 & -04 to include the following counties: Proclamation DR 97-03: authorize funds from the Governor's Disaster Fund in the amount of $400,000 under the Individual Assistance Program and $400,000 Public Assistance, and $250,000 for Hazard Mitigation. These funds are to be used by the State O.E.S. to provide supplemental disaster relief to the affected individuals and political subdivisions. Such funds will be used at the discretion of the State O.E.S. to defray both program and costs of administration. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00
DR 97-11		3/1/97	
4/18/97	$300,000.00	**Tornadoes, damaging winds, and flash flooding** beginning 03-01-97 and continued. These citizens and local government require supplemental assistance to recover from these losses. By Act 511 of 1973, as amended, do herby amend proclamations 97-01, -02, -03, -04, -05, -06, & -07 to authorize an additional $300,000 from the Governor's Disaster Fund for the Individual Assistance Program. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00

DR 98-01		1/4/98	
1/9/98	$0.00	**Severe Storms, flooding** occurring January 4- 8, 1998, have caused great damage to public and private facilities. By Act 511 of 1973, as amended, do hereby authorize funds from the Governor's Disaster Fund under the Public Assistance Program in an amount to be determined as soon as damage surveys are completed for the affected counties. To be used by the O.E.S. to provide supplemental disaster relief to the affected political subdivisions. These funds will be used at the discretion of the State O.E.S. to defray both program and administrative cost. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00
DR 98-05		3/1/97	
4/9/98	$200,000.00	**Tornadoes, damaging winds, and flash flooding** beginning 03-01-97 and continued. These citizens and local government require supplemental assistance to recover from these losses. By Act 511 of 1973, as amended, do hereby amend proclamation 97-01, (add'l amendments -02, -03, -04, -05, -06, -07 & -11) to authorize an additional $200,000 from the Governor's Disaster Fund under the Public Assistance Program. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00
DR 98-27		3/1/97	
11/10/98	$100,000.00	**Tornadoes, damaging winds, and flash flooding** beginning 03-01-97 and continued. These citizens and local government require supplemental assistance to recover from these losses. By Act 511 of 1973, as amended, do hereby amend proclamations 97-01, (and its amendments DR 97-02, -03, -04, -05, -06, -07, -11, & -19) to authorize an additional$100,000 from the Governor's Disaster Fund under the Public Assistance Program. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00

DR 98-29		3/1/97	
12/22/98	$275,000.00	**Tornadoes, damaging winds, and flash flooding** beginning 03-01-97 and continued. These citizens and local government require supplemental assistance to recover from these losses. By Act 511 of 1973, as amended, do hereby amend proclamations 97-01, (and its amendments DR 97-02, -03, -04, -05, -06, -07, -11, & -19, 98-27) to authorize an additional $275,000 from the Governor's Disaster Fund under the Public Assistance Program. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00
DR 99-25		3/1/97	
10/29/99	$262,000.00	**Tornadoes, damaging winds, and flash flooding** beginning 03-01-97 and continued. These citizens and local government require supplemental assistance to recover from these losses. By Act 511 of 1973, as amended proclamation 97-02 to authorize an additional $262,000 in the Public Assistance Program. Hereby invoke executive powers under Section 8, Act 511 of 1973, as amended.	$0.00
DR 01-01		12/12/00	
1/4/01	$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.	$0.00

DR 01-05		12/12/00	
2/5/01	$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 DR 01-01; 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).	$0.00
DR 01-07		12/12/00	
2/28/01	$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 DR 01-01; 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).	$0.00
DR 01-11		12/12/00	
3/26/01	$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 DR 01-01; 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).	$0.00

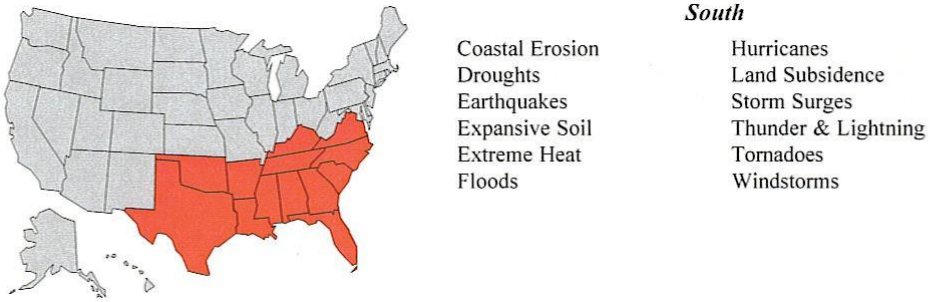
DR 03-33	$500,000.00	12/12/00	$0.00
9/25/03		**Severe winter weather** that began Dec. 12, 2000, has continued to cause great damage to private property and public facilities. By Act 511 of 1973, as amended, do hereby amend Proclamation DR 01-18 and its amendments (DR 00-19, 00-21, 01-01, 01-02 & 01-05), to include an additional $500,000 under the Public Assistance program. This money will be used to pay the State share funding under FEMA 1354-DR-AR.	
DR 1751	$231,186	March/ 18/ 2008	$0.00
3/19/2008		**Severe thunderstorms tornadoes and flooding** began March 18th, 2008, damaging public and private facilities in several counties. Due to the amount of damage, $231,186 was granted by Act 511 of 1973 for disaster relief.	
EM 3215	$4,658.89	9/2/05	$0.00
9/2/05		**Arkansas Hurricane Katrina** began August 29, 2005. Due to the high numbers of evacuees migrating to Arkansas, the county and city exhausted their financial resources on county care centers for housing. By Act 511 of 1973; $4,658.89 was granted to the public assistance program.	
DR-1744	$297,222	2/5/08	$0.00
2/7/08		**Severe storms, tornadoes, and flooding** on February 5, 2008, caused significant damage to several counties. Due to the amount of loses, citizens and local government required assistance. Enacting Act 511 of 1973 assistance of $297,222.16 was granted to Arkansas for public assistance.	

DR-1845	$174,818.72	4/27/09	$0.00
6/16/2008		**Severe storms, tornadoes, and flooding** on April 27, 2009, caused significant damage to several counties. Due to the amount of loses, citizens and local government required assistance. Enacting Act 511 of 1973 assistance of $174,818.72 was granted to Arkansas for public assistance.	
DR-1819	$61,953	1/26/2009	$0.00
2/6/09		**Sever winter storms** on affected several counties causing power outages and disruption of businesses. Due to exhausted resources, $61,953 was granted by Act 511 of 1973 for disaster relief to help aid in the recovery process.	
DR-4441	$8,582,911	5/21/2019	$0.00
6/8/19		**Severe storms and flooding** began May 21, 2019, and caused significant damage to several counties. Due to the amount of damage, citizens and local government required assistance. Enacting Act 511 of 1973 assistance of $8,582,911.00 was granted to Arkansas for public assistance.	

Hazards Prevalent in the South

Although occasional events of a particular natural hazard can occur in any area of the United States, most tend to occur more frequently in some areas than in others. Figure 5.1 lists the hazards that are more prevalent in the South. Source: Compiled by FEMA, 1995

Figure 5.1 Hazards Prevalent in the South



Based upon the different types of research described above, the list of natural hazards considered as potentially affecting Pope County and its residents include tornado, severe winter storm, severe thunderstorm, high wind, wildfire, severe hailstorm, drought, flood, extreme heat, landslide, expansive soils, dam failure and earthquake. A list of these hazards, including how and why they were identified, is presented in Table 5.5.

Table 5.5 Hazards Identified in Pope County

Hazard	How Identified	Why Identified
Dam Failure	Information from local government and State Solid & Water Resources Commission regarding locations and conditions of dams.	□ Potential for failures exist, although close inspections minimize risk failures. □ Risk will be to the cities of Atkins, Pottsville, Russellville, and unincorporated portions of Pope County.
Drought	National Weather Service Data NOAA Mercalli Scale and pga.	□ A past emergency was declared in the State for drought □ State Mitigation Plan
Earthquake	Research by the United State Geological Survey (USGS) Modified Mercalli Scale and pga.	□ This event is possible in the Planning area. □ The county is an area of .05 to .10 pga.
Extreme Heat	Review of NCDC Severe Storms Database National Weather Service's Input and data Public input	□ The entire Planning area is affected by extreme heat almost every year. □ Extreme heat has potential to cause loss of life through heat strokes and sun strokes.
Flood	Review of past disaster declarations Review of FIRM's Input from County Floodplain Manager Public Input	□ Pope County is affected by flooding every year. Cities of Atkins, Russellville, Pottsville, Dover, Atkins, London and the school districts of Pottsville, and Russellville, Atkins, and Dover are also affected. □ Floods have caused extensive damage and loss of life in the County in the past.
Hailstorm	Review of NCDC Severe Storms Database National Weather Service Input and data Public Input	□ The entire Planning area has been affected by hailstorms. □ Hailstorms cause damage to property and crops in the county.
High Winds	Review of NCDC Severe Storms database National Weather Service Input and data Public Input.	□ The entire Planning area experiences several severe high winds events annually. □ Some events have caused damage to structures and less commonly loss of life.
Landslide	USGS Landslide Hazard Maps Local geology and topography	□ This event is possible but not likely to happen or affect a large population.

Thunderstorm	Review of NCDC Severe Storms Database National Weather Service input and Data Public input	□ The entire Planning area is affected by severe storms bringing heavy rains, hail, lightning, and high winds □ Severe thunderstorms have caused extensive damage to county.
Tornado	Review of past disaster declarations Review of NCDC Severe Storms Database National Weather Service input and Data Public input	□ The entire Planning area could experience a tornado event. □ Tornadoes have caused extensive damage and loss of life to the county. Particularly, Russellville, Atkins, and Appleton.
Wildfire	Arkansas Forestry Commission statistics and input. Public input	□ The entire Planning area has experienced wildfires. Wildfire can cause extensive damage to the county.
Winter Storm	Review of past disaster declarations Review of NCDC Severe Storm Database National Weather Service Input and data Media Data Public Input	□ The entire Planning area experiences severe winter storms every few years. The northern part of the county is more susceptible due its higher elevation. □ Winter Storms have caused extensive damage to the county.

An additional perspective was gained from results of a Household Natural Hazards Questionnaire distributed throughout the county to determine which natural hazards ordinary citizens perceive as threatening. The questionnaire listed nine of some of the area's most prevalent kinds of natural disasters. A write-in "other" choice was included in case other disaster types were not included among the questionnaire's list of choices. Even with the questionnaire's omissions considered, its results clearly portrayed citizens' foremost concerns: tornados and winter storms. This finding is consistent with the hazards assessments, which show these two disaster types as the most critical in terms of probability, magnitude, severity, and warning time.

The Planning Team will conduct additional surveys in the future to better address the issue of citizens' concerns. Future surveys will include a complete listing of disaster types by the questionnaire and will obtain attain a larger and more representative sample of residents.

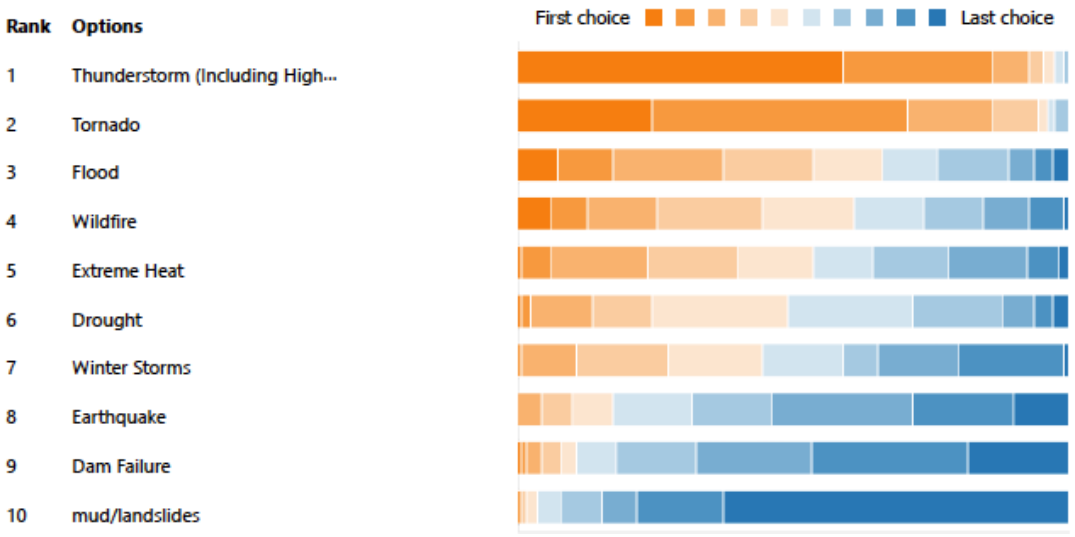
Household Natural Hazards Questionnaire Results

Intended to gain public input into the mitigation planning process, questionnaires were distributed to households throughout the county in 2020 through the county's website. It was publicized in meetings and on River Valley Leader and by the Russellville Chamber of Commerce. Questionnaires were also distributed at planning meetings and through the Pope County Office of Emergency Services. One hundred and eleven (111) surveys were completed and returned. Though not a scientific survey, the questionnaire did provide an opportunity for citizens to input into the planning process. As mentioned, additional surveys need to be conducted to expand the sample base and improve the survey's statistical reliability. The disasters listed on the survey will be updated to mirror the Plan's.

Figure 5.2 provides the results of the questionnaire regarding which disasters pose the highest degree of threat to the community.

Figure 5.2 Pope County Natural Hazards Questionnaire Results
Visualization of 111 respondents Degree of threat

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



Based on the responses received from the Pope County Natural Hazards Questionnaire, the disasters citizens are most concerned about are, in order of concern: Thunderstorm (Including High Winds/Lightning/Hail), Tornado, Flooding, Wildfire, and Extreme Heat. Whereas in 2015, the disasters citizens were most concerned about, in order of concern: Severe Thunderstorms, High Wind, Extreme Heat, and Drought.

Following is a detailed assessment of the risks associated with each of the natural hazards which could potentially affect the area. Included is information on previous occurrences of hazard events and on the probability of future events.

Not all parts of Pope County are equally exposed to each hazard. Table 5.6 below shows which hazard each jurisdiction is susceptible to. A summary of how each hazard affects each jurisdiction follows.

Table 5.6 Matrix of Hazards for All Areas Inside Pope County

Hazard	Unincorporated Pope Co.	City of Atkins	Atkins School District	City of Dover	Dover School District	City of Hector	Hector School District	London	City of Pottsville	Pottsville School District	City of Russellville	Russellville School District	Arkansas Tech University
Dam Failure	√	√							√	√	√		
Drought	√	√	√	√	√	√	√	√	√	√	√	√	√
Earthquake	√	√	√	√	√	√	√	√	√	√	√	√	√
Extreme Heat	√	√	√	√	√	√	√	√	√	√	√	√	√
Flood	√	√	√	√	√			√	√	√	√	√	√
Hailstorm	√	√	√	√	√	√	√	√	√	√	√	√	√
High Winds	√	√	√	√	√	√	√	√	√	√	√	√	√
Landslide	√	√		√		√		√	√		√		
Thunderstorm	√	√	√	√	√	√	√	√	√	√	√	√	√
Tornado	√	√	√	√	√	√	√	√	√	√	√	√	√
Wildfire	√	√		√		√		√	√		√		√
Winter Storm	√	√	√	√	√	√	√	√	√	√	√	√	√

5.1.1 Dam Failure

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is the collapse, breach, or other failure resulting in downstream flooding.

A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water covering an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

Dam failures can result from natural events, human-induced events, or a combination thereof. Failures due to natural events such as earthquakes or landslides are significant because there is generally little or no advance warning. The most common cause of dam failure is prolonged rainfall producing flooding.

According to data from the Arkansas Soil and Water Conservation Commission Dam Safety Program, no failure of a permitted dam has occurred in Pope County or anywhere in the State of Arkansas. Permitted dams are those exceeding 25 feet in height and impound at least 50 acre-feet of water. Smaller, non-permitted dams have failed or been overtopped on occasion in Arkansas, although records of these events are not kept. These non-permitted dams are generally low hazard dams lacking engineering design and have not caused significant damage in the past. Based on this limited data and considering current design and inspection requirements, failure of permitted dams is a possible event. Failure of small, non-permitted dams may occur, but the effects are not expected to be significant.

Table 5.7 Signs of Potential Dam Failure

Signs of Potential Dam Failure	
Seepage	The appearance of seepage on the downstream slope, abutments, or downstream area is cause for concern. If the water is muddy and is coming from a well-defined hole, material is probably being eroded from inside the embankment and a potentially dangerous situation can develop.
Erosion	Erosion on the dam and spillway is one of the most evident signs of danger. The size of erosion channels and gullies can increase greatly with slight amounts of rainfall.
Cracks	Cracks are of two types: traverse and longitudinal. Traverse cracks appear perpendicular to the axis of the dam and indicate settlement of the dam. Longitudinal cracks run parallel to the axis of the dam and may be the signal for a slide, or slump on either face of the dam.
Slides and Slumps	A massive slide can mean catastrophic failure of the dam. Slides occur for many reasons and their occurrence can mean a major reconstruction effort.
Subsidence	Subsidence is the vertical movement of the foundation materials due to failure of consolidation. Rate of subsidence may be so slow that it can go unnoticed without proper inspection. Foundation settlement is the result of placing the dam and reservoir on an area not having suitable strength or over collapsed caves or mines.
Structural	Conduit separations or ruptures can result in water leaking into the embankment and the subsequent weakening of the dam. Pipe collapse can result in hydraulic failures due to diminished capacity.
Vegetation	A prominent danger signal is the appearance of "wet environment" types of vegetation such as cattails, reeds, mosses and other wet area vegetation. These types of vegetation can be a sign of seepage.
Boils	Boils indicate seepage water exiting under some pressure and typically occur in areas downstream of the dam.
Animal Burrows	Animal burrows are a potential danger since such activity can undermine the structural integrity of the dam.
Debris	Debris on dams and spillways can reduce the function of spillways, damage structures and valves and destroy vegetative cover

Source: FEMA 333; Federal Guidelines for Dam Safety, Hazard Potential Classifications for Dams, October 1998

Table 5.8 U.S. Army Corp of Engineers Dams: Hazard Potential Classification			
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

(Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams -FEMA 333)

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 consider 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.

Geographic Area Affected by Dam Failure

Table 5.9 Number of Dams by Classification

Hazard Categories	Number of Dams
High	2
Significant	5
Low	10
Undetermined	0
Total	**17**

High Risk Dams

Table 5.10 West Fork Point Remove Site 8 Dam

Record	1802
Dam Name	West Fork remove Creek WID Site 8
Other Name	
Dam Former Name	
NID ID	AR 00338
River	Poe Creek
NID Height	66.5
NID Storage	2183
Year Completed	1964
Draining Area	4.4
Hazard	High
Owner Type	Pope
Owner Name	Point Remove Creek Watershed Improvement District
Longitude	-92.8583
Latitude	35.439

The West Fork Remove Creek Site Eight is located near Appleton in a nonresidential area. There are no residents at the base or near this dam. In the event of dam failure, pastureland and fields would be flooded.

Arrow points to highlighted area where flooding would occur in the event of dam failure.

Figure 5.3 Map of West Fork Point Remove Site 8 Inundation Area

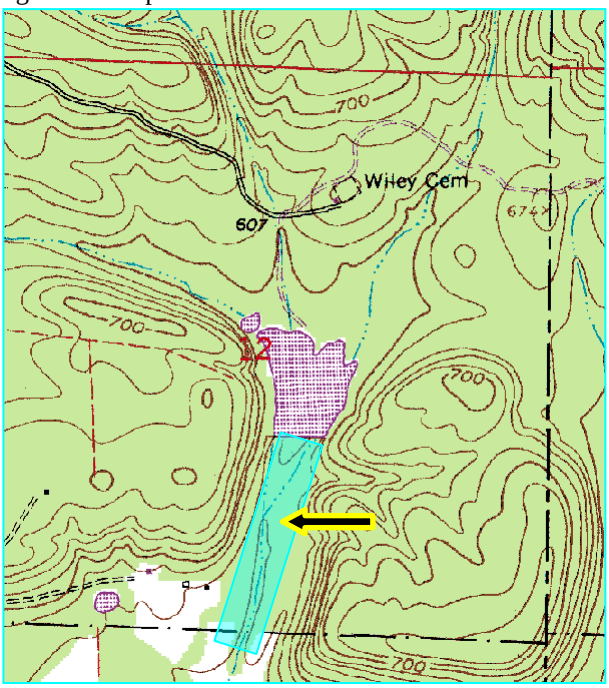
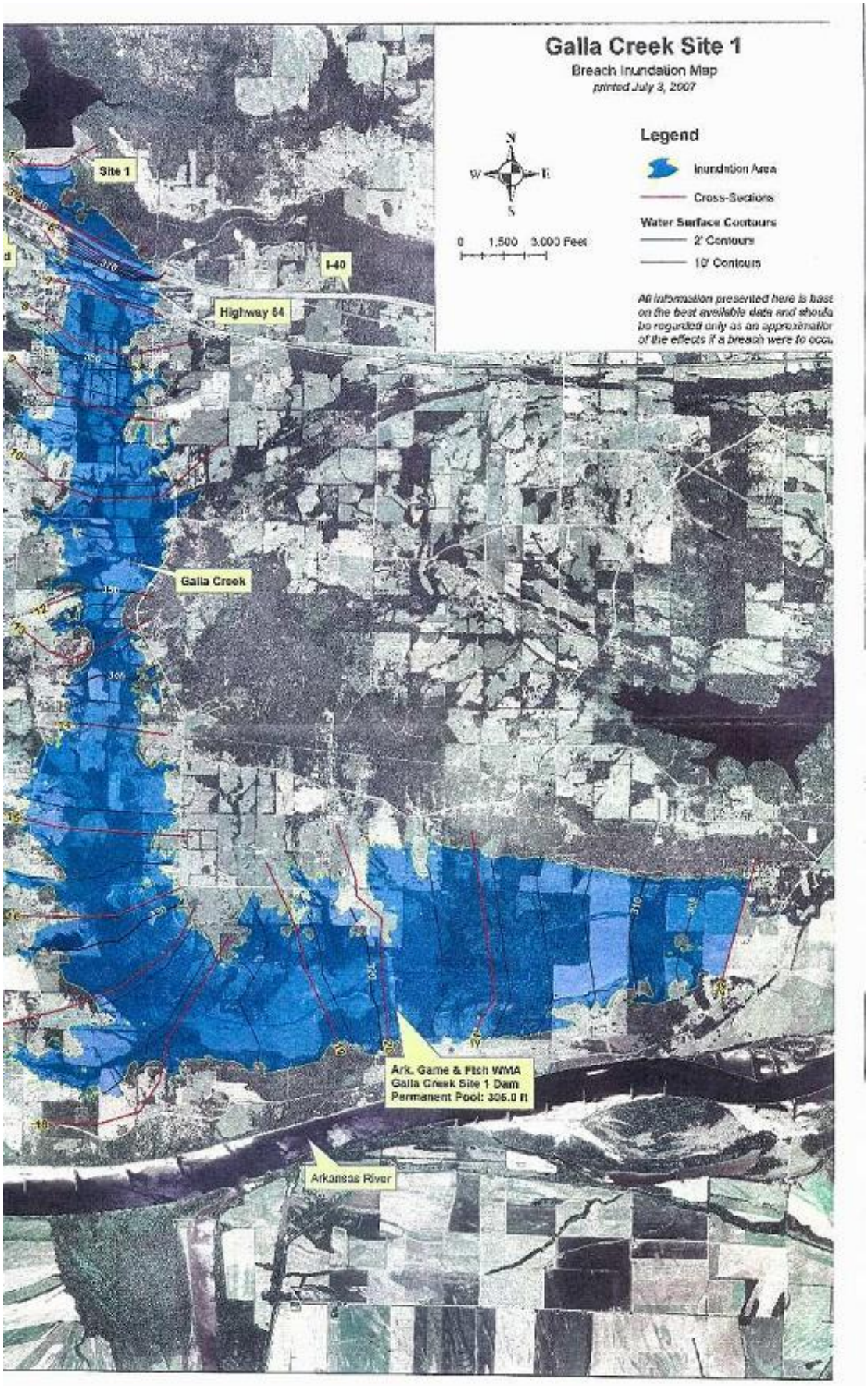


Table 5.11 Galla Creek WID Site 1 Dam

Record	2414
Dam Name	Galla Creek Site 1
Other Name	
Dam Former Name	
NID ID	AR01136
River	Galla Creek Cove Branch
NID Height	95
NID Storage	19000
Year Completed	1975
Draining Area	21.9
Hazard	High
Owner Type	Pope
Owner Name	City of Atkins
Longitude	-93.0513
Latitude	35.2608

Identified below is the Galla Creek Watershed Lake Dam according to the Arkansas Dam Locations website. This dam belongs to the City of Atkins; however, it is in Pottsville in an open area. There are residences, businesses, railroad tracks, and major roads to the south of the dam. In the event of dam failure, the affected areas include pasturelands, open fields, businesses, homes, railroad tracks and major roads. Map provided by Atkins Water Department.

Figure 5.4 Galla Creek Site 1 Inundation Area



Significant Risk Dams

Table 5.12 West Fork Point Remove Site 11 Dam

Record	1805
Dam Name	West Fork Point Remove Creek WID Site 11
Other Name	West Fork Point Remove Creek Site 11 Dam
Dam Former Name	
NID ID	AR 00341
River	Cedar Creek
NID Height	95.9
NID Storage	4414
Year Completed	1964
Draining Area	7.4
Hazard	
Owner Type	
Owner Name	Point Remove Creek Watershed Improvement District
Longitude	-92.87
Latitude	35.3728

West Fork Point Remove Creek WID Site 11 is in a non-residential area. In the event of dam failure there would be flooding in pastures and fields. The inundation zone does include Griffin Flat Road, Gaddie Road, and Ford Cemetery Road. No major damage is expected.

Arrow points to highlighted area where flooding would occur in the event of dam failure.

Figure 5.5 West Fork Point Remove Site 11 Dam

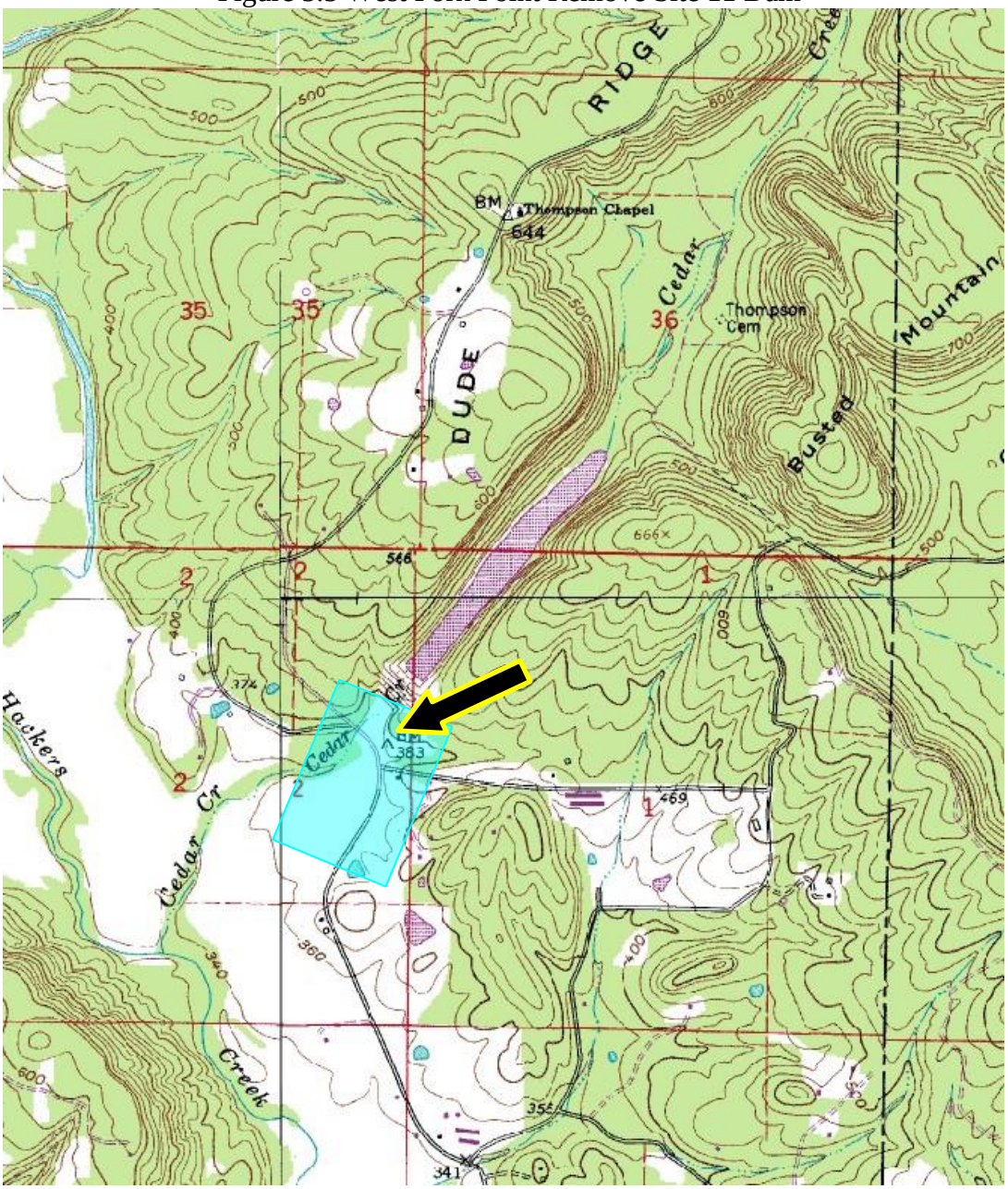


Table 5.13 West Fork Point Remove Site 19 Dam

Record	1808
Dam Name	West Fork Point Remove Creek WID Site 19
Other Name	
Dam Former Name	
NID ID	AR 01135
River	Isabell Creek
NID Height	54
NID Storage	4420
Year Completed	1965
Draining Area	8
Hazard	
Owner Type	
Owner Name	Point Remove Creek Watershed Improvement District
Longitude	-92.966
Latitude	35.3706

West Fork Point Remove Creek WID Site 19 is in a non-residential area. In the event of dam failure there would be flooding in pastures and fields.

Arrow points to highlighted area where flooding would occur in the event of dam failure.

Figure 5.6 Map of West Fork Point Remove Site 11 Inundation Area

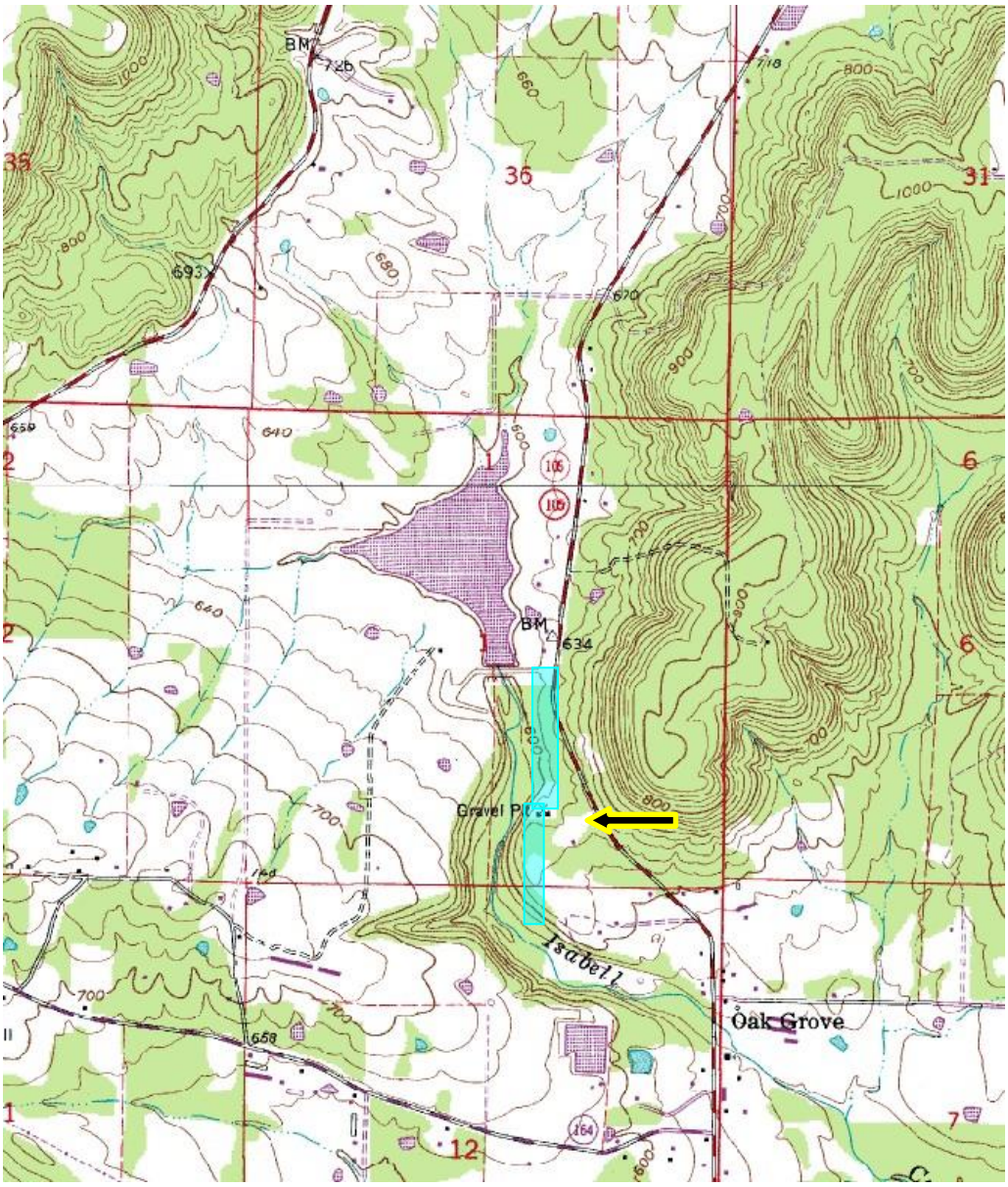


Table 5.14 Jones Lake Dam

Record	2413
Dam Name	Jones Lake Dam
Other Name	
Dam Former Name	
NID ID	AR00135
River	Galla Creek TR
NID Height	25
NID Storage	135
Year Completed	1956
Draining Area	0.2
Hazard	
Owner Type	
Owner Name	J.C. Jones
Longitude	-93.033
Latitude	35.2383

Jones Lake Dam is in a non-residential area. In the event of dam failure there would be flooding in pastures and fields.

Arrow points to highlighted area where flooding would occur in the event of dam failure.

Figure 5.7 Map of Jones Lake Dam Inundation Area

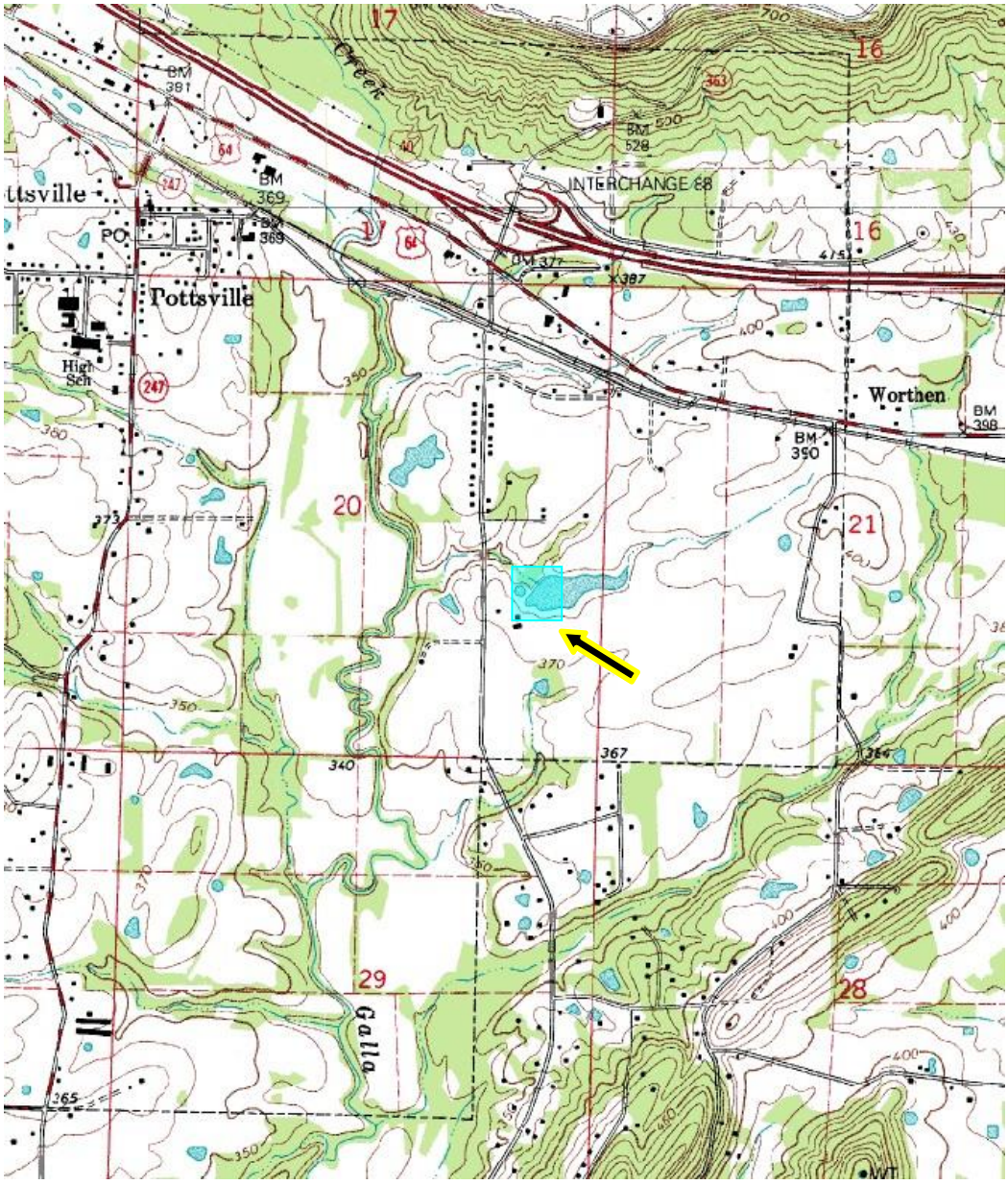


Table 5.15 Huckleberry Creek Dam

Record	2695
Dam Name	Huckleberry Creek Dam
Other Name	
Dam Former Name	
NID ID	AR0152
River	Huckleberry Creek
NID Height	110
NID Storage	23342
Year Completed	1995
Draining Area	8.4
Hazard	
Owner Type	
Owner Name	City Corporation Russellville Water and Sewer
Longitude	-93.1903
Latitude	35.3722

Huckleberry Creek Dam is a water supply for the city of Russellville, Arkansas. The dam spans across Huckleberry Creek, a tributary of the Illinois Bayou, immediately upstream of the mouth of Huckleberry Creek. The lake is filled by the flow of Huckleberry Creek and supplemented by pumping into the lake from the nearby Illinois Bayou. Lake water is withdrawn from an intake structure constructed in the lakebed near the dam and is piped by gravity flow through a pipeline into the Russellville water treatment plant, for treatment and distribution to Russellville water customers. The water treatment plant is approximately 90 feet lower than the lake surface. Construction began on the lake with the clearing of the lakebed and dam area in November 1993. Construction on the dam, pumping station, and pipeline began in May1994, and all major construction was completed in February 1996.
Filling of the lake with pumps began in January 1996, and the lake reached full capacity with water flowing over the spillway crest on June 12, 1996.

Table 5.16 Huckleberry Creek Dam Information

Size of Drainage Basin	5,440 acres (8.5 sq. miles)
Normal Elevation (Spillway Crest)	elev. 460
Minimum Elevation	elev. 415
Volume when Full (elev. 460)	5.8 billion gallons
Volume at Elev. 415	945 million gallons
Surface Area When Full (elev. 460)	508 acres
Surface Area at elev. 415	187 acres
Normal Yield of Drainage Basin	2 million gallons /day (mgd)
Supply Capacity, drought years	greater than 40 mgd for 120 days (el. 460- el.415)
Pumping Units (3)	2 at 400 hp;11,000 gpm
	1 at 200 hp; 5,600 gpm
Pipeline Length and Material	19,000 ft. total length all pipe 48-inch diameter 5- welded steel bayou crossings ductile iron buried pipe on land

The highlighted area is where flooding could occur in the basin area in the event of dam failure. All potential residents located near the basin have elevated home above the flood zone.

Figure 5.8 Map of Huckleberry Creek Dam Inundation Area

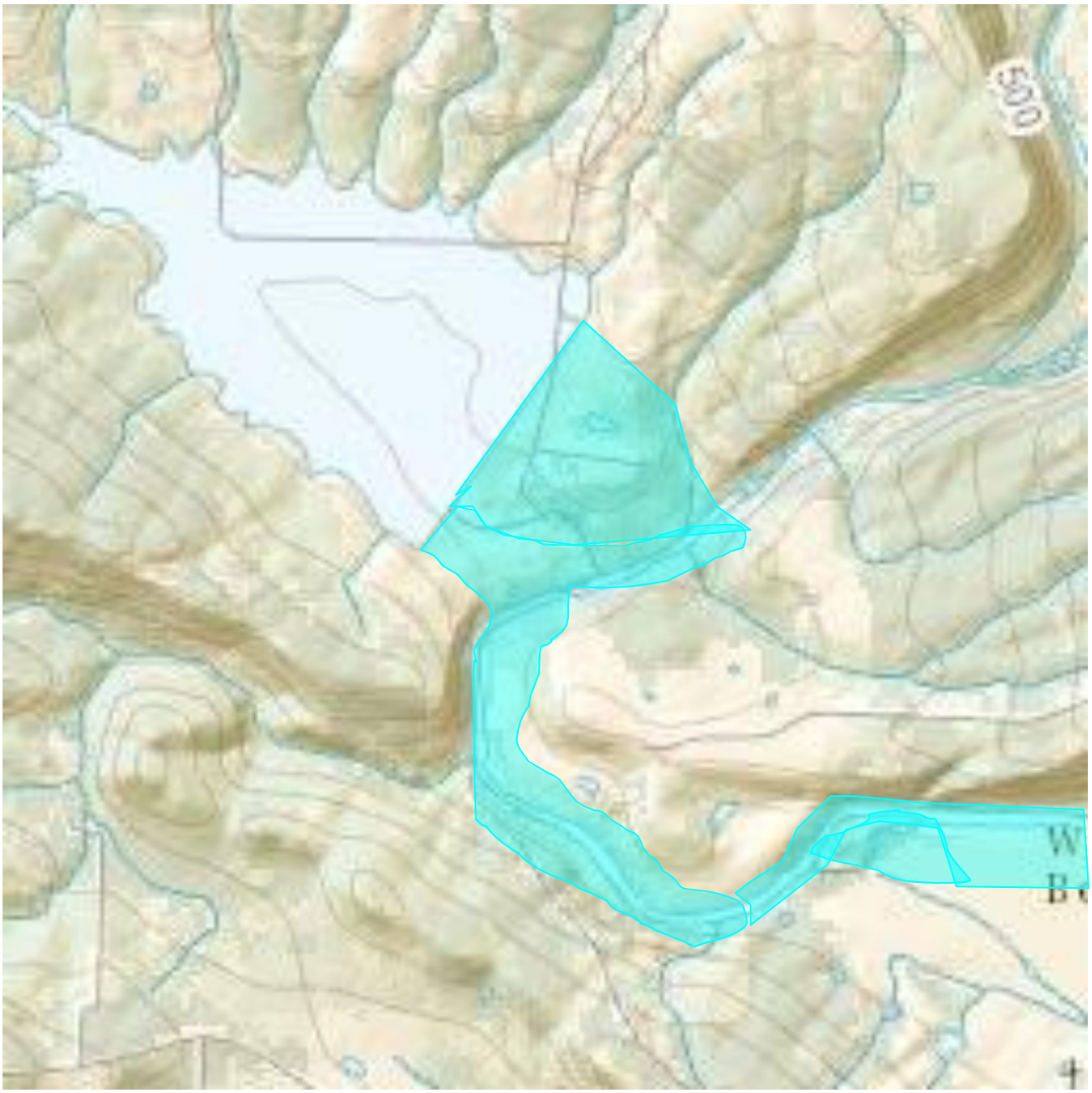
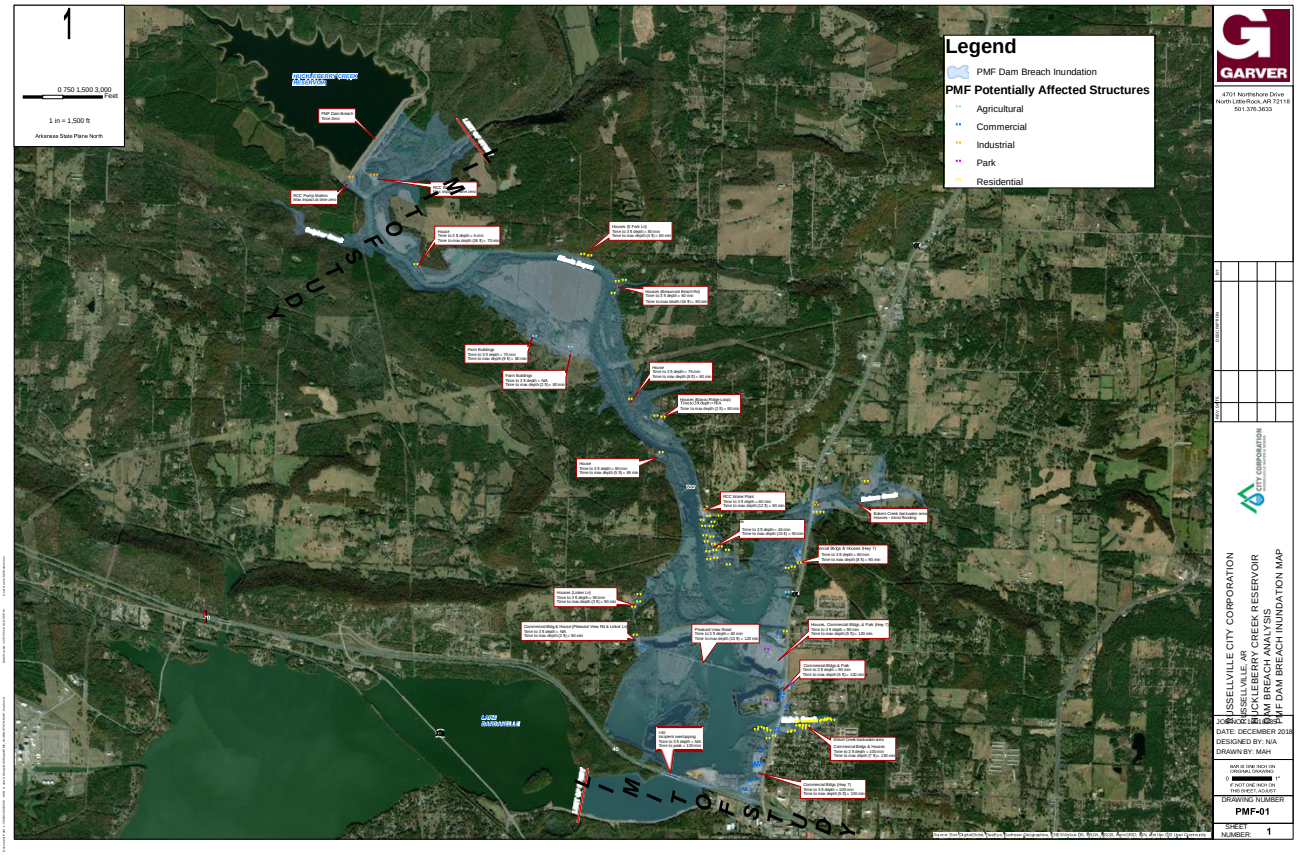


Figure 5.9 HUCKLEBERRY CREEK RESERVOIR DAM BREACH ANALYSIS
PMF DAM BREACH INUNDATION MAP



Huckleberry Creek Reservoir Dam Breach Analysis Hydraulic Study Report included in Appendix B.

Table 5.17 Lake Atkins Dam

Record	1740
Dam Name	Lake Atkins Dam
Other Name	
Dam Former Name	
NID ID	AR00271
River	Horsehead Branch
NID Height	25
NID Storage	13928
Year Completed	1946
Draining Area	10
Hazard	
Owner Type	
Owner Name	Arkansas Game and Fish Commission
Longitude	-92.94
Latitude	35.2158

Lake Atkins Dam has a very large inundation area. Most of the area is covered by pastureland. A few houses, Highway 105 South, and North Shore Drive will also be in the inundation area.

Figure 5.9 Lake Atkins Dam Inundation Map

Low-Risk Dams

Pope County has 10 dams that are considered low risk dams. Due to the low-risk dams having minimal to no impact on residences within Pope County, they have been removed. All the low-risk dams affect pastureland and wooded areas. No residents are affected by flooding from a dam failure.

Possible Impact of Climate Change

The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding would have minimal impact on dam failure but will be noted to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use

Population and land use changes inside the dam's inundation areas will require reevaluation of the risk and vulnerability of a dam failure by the planning team.

Previous Dam Failure Occurrences

There have been no dam failures occurrences recorded for the county or state.

Probability of Future Dam Failure Events

Since there are no documented reports of dam failures, estimating the probability of future events isn't feasible. However, the most likely probability of dam failure will occur due to external factors such as a natural or man-made disaster.

Magnitude / Severity of Dam Failure Hazards

Dam failure could lead to a tremendous loss of lives and destruction of property.

Dam failure can be the result of natural or man-made hazards. The failure of dams is frequently caused by factors such as internal piping or leakage. Once the water volume in the dam is higher than its full capacity, water drainage through the spillway takes place. The two factors which influence the potential severity of a full or partial dam failure include: (1) The amount of water impounded; and (2) The density, type, and value of development and infrastructure located downstream. (City of Sacramento Development Service Department, 2005)

Property that is flooded may have short-term and long-term damage. The dam failure can alter the earths landscape. Sediment and materials trapped in the waterflow may settle in new areas or contaminate drinking water/farmland.

The magnitude of a dam failures is assessed in the inundation areas for each dam identified in the maps above.
The possibility of dam failure is so remote, the severity of such an event is considered limited but the magnitude tremendous.

The worst-case scenario for a dam failure in Pope County would be the Galla Creek Dam Site 1 (Table 5.12). This would affect around 20 residences, 1 school, and 12 businesses. The Union Pacific railway could be affected by a failure of the dam. Highway 64, a major thoroughfare would be closed in Pottsville where Galla Creek crosses the highway. Interstate 40 could also be affected. The severity of a failure of the other Pope County dams is minimal. The affected areas include pastureland.

Hazard Vulnerability/Impact Summary
Structures in and around Atkins, Pottsville, Russellville, and some parts of the unincorporated areas of Pope County are vulnerable to dam-failure floods. Residential housing, infrastructure and critical facilities are located beyond floodplains and are not located downstream of the dams. Structures in the inundation zone would be subjected to the effects of dam-failure floods including flash floods, higher flood elevations, and potentially high-water velocity. Areas of highest vulnerability to dam-failure flooding (those with habitable or high value structures) are indicated by a high hazard rating. Each dam listed in the National Inventory of Dams is assigned a high, significant, or low hazard classification based on potential of loss to life and property should the dam fail. The hazard classification is not an indicator of the adequacy of a dam or its physical integrity. Hazard classification is updated continually based on development and changing demographics upstream and downstream.

Two of Pope County's dams are considered high hazard because of the potential loss of life and/or property that could occur should the dam fail. In the event of dam-failure pastureland, fields, businesses, a few homes, and a school would be affected. The major damage to property would be to marine vehicles and businesses located near the water.

All high hazard class dams that are permitted by the state (those with a height of 25 feet or greater or with a storage of 50 acre-feet or more) are required to have Emergency Action Plans. No dam-failure flood inundation studies have been completed for any other dam in Pope County. Because of the lack of Emergency Action Plans and inundation maps for most dams in Pope County, the vulnerability to structures to dam-failure flooding is only generally known.

The extent of damage caused by a dam failure could be anywhere from a small leak making the creek rise out of its banks to the Galla Creek Site 1 Dam having a total failure and flooding houses, business, roads, railroad tracks, and 2 schools downstream. The schools are the Pottsville Junior High and Pottsville High School. These schools could be damaged by a major failure of the dam or roads to the school could be flooded with a moderate failure.

Multi-Jurisdictional Risk Assessment
People, property, and infrastructure located downstream of dams could be subject to devastating damage in the event of failure. Structures in and around London, Dover and Dover Schools, Hector and Hector Schools, and some parts of the unincorporated areas of Pope County are not vulnerable to dam-failure floods. Residential housing, infrastructure and critical facilities are located beyond floodplains and are not located downstream from dams. Dam failures are often cited as secondary effects of natural disaster and are not named as the primary hazard causing the disaster declaration. In the event of dam failure with any of the two high-risk dams, pastureland and fields would be the area affected.

Based on the history, there have been no dam failures in Pope County, which will make dam failures possible.

5.1.2 Drought Hazard Profile

Droughts can be grouped as meteorological, hydrologic, agricultural, and socioeconomic. Representative definitions commonly used to describe the types are summarized below:

- *METEOROLOGIC DROUGHT* is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- *HYDROLOGIC DROUGHT* is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- *AGRICULTURAL DROUGHT* is defined principally in terms of soil moisture deficiencies relative to water demands of plant life, usually crops.
- *SOCIOECONOMIC DROUGHT* associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought.

Geographic Area Affected by Drought
All participants of Planning Area are equally likely to experience drought. Schools may experience water shortages and school closures during major droughts.
Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding would have potential impact on the Drought hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time. These changes will require an evaluation of the risk and vulnerability by the planning team.

Population and Land Use
Population changes would raise the risk and vulnerability of droughts by raising the water usage in the Planning Area. Changes in land use could place more demand on existing water supplies. Depending on magnitude and severity of the drought, land use could be drastically altered due to devastated crop lands and dried out forests. These changes will require reevaluation of the risk and vulnerability by the planning team.

Economic Impact
Depending on the magnitude and severity of the drought, devastation of crop lands and water availability would mean in a reduction of food and water for people, livestock, and wildlife. Failed crops could lead to economic failure for farmers, creating a chain-reaction to the Planning Area's economy. These changes will require an evaluation of the risk and vulnerability by the planning team.

Previous Drought Occurrences
There have been 15 previous occurrences of drought within Pope County from 1994 to June 2022. When a drought has occurred, every city, school district, and unincorporated parts of Pope County have been affected. These have ranged from mild (D0) to extreme droughts (D4). Each drought that has occurred in the County has rated differently on the Drought Severity Scale.

A long-term drought which began in the spring of 1998, created a dry spell beginning July 2000 and continuing through October 2000 in most parts of Arkansas. A heat wave set in by mid-August with widespread 100-degree temperatures across the state through early September. On September 8th, the Governor of Arkansas asked all 75 counties in Arkansas to be declared agriculture disaster areas. With foliage drying, grass fires become numerous.

The Droughts of 1953 and 1954: A statewide drought during the summer and fall of 1953 resulted from 100-degree weather through the month of September and even into early October in some areas. In 1954, a heat wave covered Arkansas from June 7 through September 10 with an accompanying drought. There was 100-degree weather 16 out of 17 days and 10 consecutive 100-degree days during that period.

The Dust Bowl Drought: Arkansas was involved in a prolonged drought during the 1930's resulting from dust storms. This resulted in additional economic hardship to go along with the depression. Many summers from 1930 through 1939 were hot and dry. The worst dust storm in Arkansas came during 1934. The first dust storm was on April 11 and several others followed through the spring and summer.

Probability of Future Drought Events
Based on previous events, Pope County has a 54% probability the area will experience droughts of various degrees of severity. These droughts could range from D0 to D4 on the Severity Scale.

Magnitude / Severity of the Drought Hazard

According to past events, Pope County and the cities and school districts within Pope County has been subject to several droughts. These have ranged on the scale from D0 to D2. However, all participants could experience D0 to D4.

Table 5.18 Drought Severity Classification

Drought Classification

Home > About > About the Data > Drought Classification

			Ranges				
Category	Description	Possible Impacts	Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • some lingering water deficits • pastures or crops not fully recovered	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Source: U.S. National Drought Mitigation Center.

Hazard Vulnerability/Impact Summary

Based on historical events, there is no evidence drought has any impact on structures. The primary affects are on agriculture, livestock, water supply and timber plantations. The most vulnerable population is farmers, elderly and homeless. A widespread drought would affect all participants of the county plan.

The possibility of long-term drought could have a severe economic impact on the county in millions of dollars. We are only able to estimate the countywide economic impact due to lack of historical records per jurisdictions.

Drought impacts are often grouped as economic, environmental, and social.
Economic impacts due to drought include:

- Farmers/ranchers may lose earnings due lower yields and poor crop quality.
- Timber industry may be affected when trees die.
- Businesses may struggle due to supply and demand.
- Strain on utility operations.
- Cost of food may increase.

Environmental impacts due to drought include:

- Losses or destruction of fish and wildlife habitat

- Lack of food and drinking water
- Low or no water levels in reservoirs, lakes, and ponds
- Wind and water erosion of soils, reducing soil quality.

Social impacts due to drought include:

- Mental and physical stress on people
- Health problems related to low water flow.
- Loss of human life
- Reduced incomes
- Fewer recreational activities

5.1.3 Earthquake Hazard Profile

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

Geographic Area Affected by Earthquakes

The entire Planning Area could potentially experience earthquakes. There are no defined geographic hazard boundaries for earthquakes.

Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).

These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change

The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding would have no impact on earthquake hazards. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use

Population changes do affect the Planning Area's impact/risk from an earthquake. Higher populated areas are at a higher risk and may see a greater impact than sparsely populated areas. As the population increases or decreases, the strain on life saving services and abilities will also change.

Depending on magnitude and severity of the earthquake, the landscape of the Planning Area could be altered. Earthquakes can trigger mudslides, moving rock, trees and debris into people and structures. They can cause soil liquefaction, fissures and even fires. Changes in soil density would impact the ability to support roads, houses, businesses, schools, and buried cables/pipes. Urbanized areas are more susceptible to earthquake damage than undeveloped rural areas. Urbanized areas would have a higher need for earthquake mitigation such as building codes.

Due to the distance of the Planning Area from an established fault, it is not likely to receive significant loss of life or structure damage. The need for further research and development for the Planning Area due to earthquakes can be reevaluated during the next update.

Economic Impact

Depending on the magnitude and severity of the earthquake, devastation of structures and loss of life could be significant. Damage could cause business closures, compounding the economic impact. Additionally, soil changes due to an earthquake could impact agriculture. This could cause devastation to cropland, livestock, and poultry farms. Damaged infrastructure, such as roads and bridges, would have an immediate and long-term economic impact.

Due to the distance of the Planning Area from an established fault, an economic impact from earthquakes is unlikely. The need for further research and development for the Planning Area due to earthquakes can be reevaluated during the next update.

Previous Earthquake Occurrences

According to https://www.volcanodiscovery.com/region/257913/earthquakes/pope/archive/1994-01-01-2022-10-17.html "Between Jan 1, 1994 and Oct 17, 2022, Pope was shaken by 4 quakes of magnitude 4.0 or above, 62 quakes between 3.0 and 4.0, and 1213 quakes between 2.0 and 3.0. There were also 900 quakes below magnitude 2.0 which people don't normally feel."

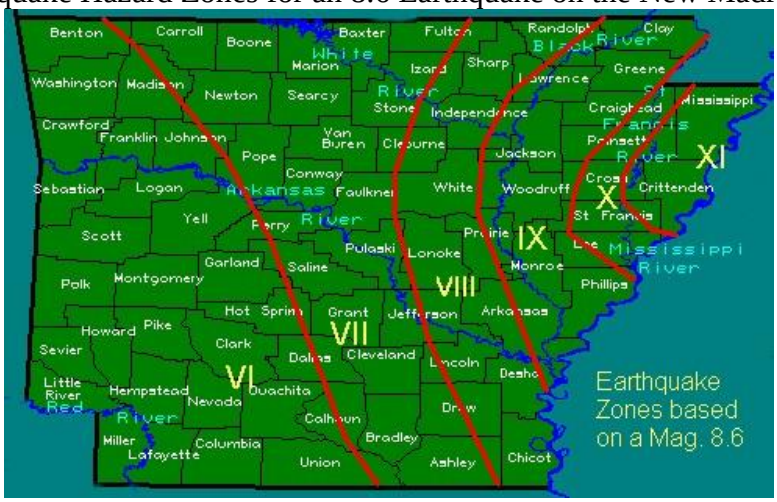
Probability of Future Earthquake Events

Pope county has a 14.2% probability of an Intensity III or above earthquake and a 100% probability of an Intensity II and below earthquakes.

Magnitude/Severity of the Earthquake Hazard

The most significant earthquake risk to Pope County is from a major event from the New Madrid fault. Per Figure 5.10, Pope County is located in the VI and VII levels of the XII levels of Modified Mercalli Intensity Scale based on an 8.6 Richter earthquake within the New Madrid Seismic Zone. This would result in an a .05 to .10 peak ground acceleration (pga) coefficient, which means it has some possibility of seismic hazard. The potential magnitude and severity are considered critical.

Figure 5.10 Possible Modified Mercalli Intensity based on an 8.6 Richter magnitude earthquake Arkansas Earthquake Hazard Zones for an 8.6 Earthquake on the New Madrid Fault System



Although Pope County is vulnerable to the effects of a major earthquake in the region, it is unlikely a significant earthquake will affect the area. Per Table 5.19 below, the damage in western Arkansas would be slight, even from an intense, 8.6 Richter event from the New Madrid fault.

Table 5.19. Mercalli Intensity Scale

Mercalli Intensity	Damage Description
I	Not felt except by a very few under especially favorable conditions. (Negligible)
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing. (Negligible)
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated. (Negligible)
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably. (0.015g-0.02g)
V	Felt by nearly everyone; many awakened. Some dishes, windows broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other objects sometimes noticed. Pendulum clocks may stop. (0.03g-0.04g)
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster and damage chimneys. Damage slight. (0.06g-0.07g)
VII	Everybody runs outdoors. 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. Noticed by persons driving cars. (0.10g-0.15g)
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed. (025g-0.30g)
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. Ground cracked conspicuously. Underground pipes broken. (0.50g-0.55g)
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks. (More than 0.60g)
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Waves seen on ground. Lines of sight and level are distorted. Objects thrown into the air.

Hazard Vulnerability/Impact Summary

Building types most vulnerable to ground shaking are those constructed of unreinforced masonry and concrete. Masonry structures and concrete structures comprise approximately 12% of structures in the planning area, although many of these are reinforced. Infrastructure most vulnerable to earthquakes includes all utility distribution lines (water, wastewater, natural gas) and facilities. Transportation infrastructure most vulnerable to earthquakes includes highway bridges and railway bridges.

Another factor to vulnerability of a structure to earthquakes include proximity to the earthquake epicenter

and the underlying soil or bedrock characteristics. Pope County is in an area with a .05 to .10 peak ground acceleration (PGA) coefficient, which means it has some possibility of seismic hazard. However, the county has no damage documented from the historical record of earthquakes. Though Pope County may be vulnerable to the effects of a major earthquake in the region, it is unlikely an earthquake will affect the area at a significant level.

Based on an 8.6 Richter earthquake, in the New Madrid Seismic Zone, Pope County is geographically (Catastrophic Planning NMSZ Scenario) located in an area with the potential to experience Level VI and VII of the XII levels of Modified Mercalli Intensity (Table 5.). In other words, the damage in western Arkansas would be slight, even from an intense, 8.6 Richter event.

Multi-Jurisdictional Risk Assessment

Earthquake events could affect the entire Planning Area at any time. Thus, the threat is countywide and multi-jurisdictional even though it is considered rare in the Planning Area.
Russellville has 45% of the Planning area's population (61,754), assessed real estate, business and personal property equaling $396,499,275.00. If an earthquake were to affect the Russellville area, it would result in more damage to lives and property than any other portion of the county due to it being the highest population and largest employment area.

5.1.4 Extreme Heat

Extreme heat is characterized by a combination of very high temperatures and exceptionally humid conditions. When persisting over time, it is called a heat wave.

Geographic Area Affected by Extreme Heat
There is no defined geographic hazard boundary for extreme heat. Extreme heat generally affects people rather than property. All areas within the Planning Area are equally likely to experience an extreme heat event.

Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the Extreme Heat hazard as temperatures rise and fall and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use
Population changes would raise the risk and vulnerability of an Extreme Heat event. A higher population will increase the strain on emergency services, water supply, and transportation. The electrical grid may be strained resulting in shortages or blackouts.

Per the National Integrated Heat Health Information System (HEAT.gov), the most vulnerable population to extreme heat events are children, older adults, people experiencing homelessness, people with pre-existing health conditions, outdoor workers, emergency responders, and low-income communities. These populations are found throughout the Planning Area. As vulnerable populations grow, additional mitigation actions such as cooling stations may become necessary. Currently, the existing cooling stations receive little use. Should this change, the planning team will reevaluate during the next update.

As areas become more urbanized, extreme heat situations are magnified due to the urban heat island phenomenon. Per the EPA, this is where “buildings, roads, and other infrastructure absorb and re-emit the sun’s heat more than natural landscapes”. Depending on magnitude and severity of the heatwave, land use could be drastically altered due to devastated crop lands and dried out forests. If needed, this type of impact on the planning area can be reevaluated for risk and vulnerability by the planning team during the next update.

Economic Impact
Extreme heat events impact the economy in a variety of ways. Labor productivity is reduced. Crop

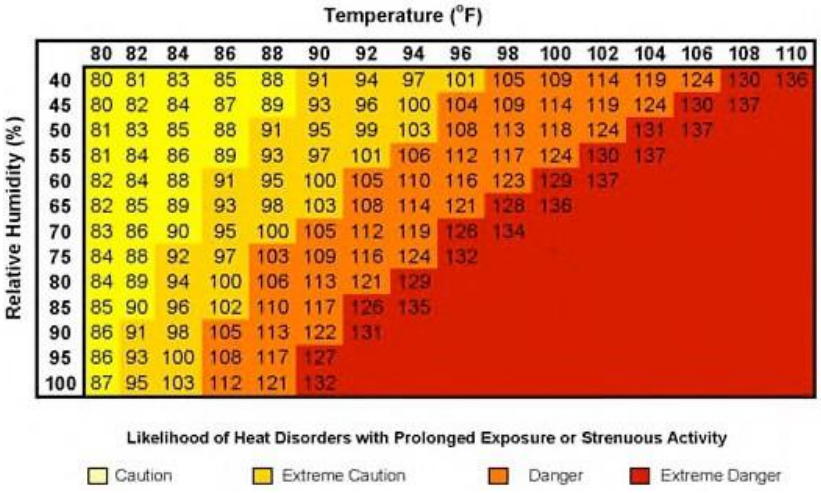
yields are reduced. Livestock and poultry may be lost due to the heat. Infrastructure such as the electrical grid can be damaged or unstable, resulting in a loss of business and lost inventory. Water consumption and energy use soars, impacting individual's and business's bills. Studies show economies slow during heat waves. Long term effects impact education and long-term earnings.

Previous Extreme Heat Occurrences
NCDC Database reports: 2 Extreme Heat and 9 Heat event(s) were reported in Pope County, Arkansas between 01/01/1950 and 6/31/2022.

Probability of Future Extreme Heat Events
Based on historical records for the county, there is a 15.27% probability of future Extreme Heat occurrences per year.

Magnitude / Severity of Extreme Heat Hazard
Using best available data from the National Weather Service, information was pulled from the Dardanelle station. The July 2022 summarized average daily maximum temperature was 91.5 degrees and the average daily humidity for July 2022 was 72%. Averaging the HI at 105 degrees based off the Chart below.
Pope County and all plan participants can range in the categories of Caution to Extreme Danger on the Heat Index/Heat Disorders chart. Primarily all participating jurisdictions experience the Extreme Caution during an extreme heat event.

Table 5.20 Heat Index Chart (Temperature & Relative Humidity)



Hazard Vulnerability/Impact Summary
Structures are not affected by extreme heat. It primarily affects agricultural and livestock producers. Excessive heat in combination with drought can result in crop loss, increased water consumption for irrigation, reduced milk production by dairy cattle, heat stress and possible loss of livestock along with increased water consumption by livestock.

Extreme heat will affect everyone on a different scale. When temperatures reach into the 100 and above with heat indexes of 105 and above, the likelihood of a power failure is greatly increased.

The most vulnerable population to extreme heat events are children, older adults, people experiencing homelessness, people with pre-existing health conditions, outdoor workers, emergency responders, and low-income communities. Extreme heat threatens all parts of the Planning Area.

Figure 5.11 Heat Index/Heat Disorders

Category	Heat Index	Health Hazards
Extreme Danger	130º F - Higher	Heat Stroke / Sunstroke is likely with continued exposure
Danger	105º F – 129º F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90º F - 105º F	Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.
Caution	80º F - 90º F	Fatigue possible with prolonged exposure and/or physical activity.

Multi-Jurisdictional Risk Assessment

Any given extreme heat event affects the entire Planning Area. Thus, the threat is countywide and multi-jurisdictional, always affecting the entire county and all its jurisdictions when it occurs. No structures are vulnerable to this hazard. The vulnerable targets include the elderly population, people who work out in the weather, agriculture, and livestock.

5.1.5 Flood Hazard Profile

Flood is general and temporary condition of partial or complete inundation of normally dry land areas.

In steep, narrow valleys, flooding usually occurs quickly, is of short duration, and floodwaters are likely to be rapid and deep. In relatively flat floodplains, areas may remain inundated for days or even weeks, but floodwater are typically slow moving and relatively shallow, and may accumulate over long periods of time.

Flash floods are characterized by a rapid rise in water level, high velocity, and large amounts of debris. They can tear down trees, undermine buildings and bridges, and scouring new channels. Major factors in flash flooding are the intensity and duration of rainfall and the steepness of watershed and stream gradients. The amount of watershed vegetation, the natural and artificial flood storage areas and the configuration of the stream bed and floodplain are also important.

Geographic Area Affected by Floods
Some critical facilities are considered in or near a flood prone area. These facilities include: the Pope County Courthouse, Arkansas State Regional Health Department, Russellville Police Training Center, Russellville Hughes Community Center, Russellville Sewer Treatment Plant, Russellville Middle School and Upper Elementary 5th Grade Complex, Dwight Elementary School, Atkins Water Treatment Plant, Pottsville High School, Pottsville Bus Garage, all facilities at Arkansas Tech are in a flood prone area.

Arkansas Tech University, Russellville School District and the city of Russellville are also in an area that could be flooded if there were to be a failure of the Russellville Levee. All participants of Planning Area are equally likely to experience flooding.

Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

*Flood maps can be found in Appendix B.

Duties of the Floodplain Manager include:
The Floodplain Managers ensure the adoption for Floodplain ordinances and regulation of development in the floodplain. Education of flood awareness and preparedness is also a part of their tasks.

Table 5.21 Floodplain Managers

Name	Contact Number	Areas Covered
Jeanette Hale	(479)968-3881 Ext. 3	All unincorporated areas plus Atkins, Pottsville, and Hector.
Ben Gray	(479)968-2406	City of Russellville
Roger Lee	(479)331-3270	City of Dover
Eddie Price	(479)293-4513	City of London

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding would have potential impact on the Flooding hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use
Population growth and urbanization alter the natural landscape. This results in loss/addition of natural landscaping such as trees, grass, and rock. Building structures influence climate and the natural path of water flow. Population growth/density will place a larger number of people at risk for injury or death. Population growth will increase the need for mitigation measures to protect people, property, resources, and wildlife.

Vulnerable populations in flooding are those located in floodplains. Individuals with mobility restrictions are particularly vulnerable as well as older adults, children, and economically challenged individuals. Mitigation strategies include planning and zoning, flood plain protection, property acquisition and relocation, and public education projects.

If there is a significant change in population or land use during the next update, the Planning Team will readdress mitigation strategies.

Previous Flood Occurrences
There have been 43 Flood events from 1994 – 2022 according to NCDC. These floods have affected a major portion of Pope County. The have been 7 documented repetitive flood losses and 2 severe repetitive flood losses in Pope County.
These events occurred as follows:

- 7 for Russellville
- 3 for Atkins
- 2 For Dover
- 2 For London
- 29 For Pope County

Table 5.28 RL/SRL List

Community Name	County Name	NFIP Insured	Occupancy 1	RL/SRL
RUSSELLVILLE, CITY OF	POPE COUNTY	NO	OTHR- NONRES	RL
RUSSELLVILLE, CITY OF	POPE COUNTY	NO	OTHR- NONRES	RL
RUSSELLVILLE, CITY OF	POPE COUNTY	NO	OTHR- NONRES	SRL
RUSSELLVILLE, CITY OF	POPE COUNTY	NO	OTHR- NONRES	SRL
RUSSELLVILLE, CITY OF	POPE COUNTY	NO	SINGLE FMLY	RL
RUSSELLVILLE, CITY OF	POPE COUNTY	YES	BUSI- NONRES	RL
RUSSELLVILLE, CITY OF	POPE COUNTY	NO	OTHR- NONRES	RL
RUSSELLVILLE, CITY OF	POPE COUNTY	NO	SINGLE FMLY	RL
RUSSELLVILLE, CITY OF	POPE COUNTY	YES	BUSI- NONRES	RL

Probability of Future Flooding Events
Since there were 43 flood events in a 28-year span, it is extremely likely a flood event will occur every year within the Planning Area.

Magnitude/Severity of the Flood Hazard
All participating jurisdictions experienced one inch to three feet of water inundation in vulnerable structures and roadways. Typically, a maximum of only one foot of water is experienced. The Provided Base Level Engineering Maps in Appendix B depict flood depth within areas of Pope County can be greater than 5 feet.

Hazard Vulnerability/Impact Summary
Many of the structures located within floodplains were constructed prior to the adoption of the Floodplain ordinances.

Flooding poses many threats to residential and commercial properties. Buildings would experience significant damage, such as mold growth, water damage, structural and electrical damage. Household furnishings and business inventories can be lost. Severe flooding can cause extensive damage to public utilities and disruptions to the delivery of services. Loss of power and communications can be expected. Drinking water and wastewater treatment facilities may be temporarily out of operation. Flooded streets and roads block transportation and make it difficult for emergency vehicles to respond to calls for service. Floodwaters can washout sections of roadways and bridges. Most importantly, many fatalities can occur during flooding.

Economic Impact
Total cost of Property damage from flooding all together from 1994-2022 is approximately 5.925 million dollars.

Multi-Jurisdictional Risk Assessment
The city of Hector is not an area that is prone to flooding. There are some flood zones within the city limits, but these do not venture far from the creek channels. The Hector School District is not in a flood prone zone. Flooding is still a possibility.

With Pope County's population increase since the 2010 census at 2.6% and more businesses moving to the area, there is a potential increase in residential and commercial flooding.

Flood risk in the county varies by jurisdiction. For unincorporated areas of Pope County: The Flood Zone listed in the unincorporated areas of Pope County is Zone A, Arkansas River runs through Pope County and Yell County and on each side of the river is Zone A.

5.1.6 Hailstorm Hazard Profile

Hailstorm is an outgrowth of a severe thunderstorm in which balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain.

Geographic Area Affected by Hailstorms
All geographic areas within Pope County are equally susceptible to experience hailstorms including cities and school districts. There are no defined geographic hazard boundaries for High winds.
Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.
North: 35.72867203°(N) South: 35.11734772°(N) East: -92.81031799°(W) West: -93.29995728°(W)

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the Hailstorm hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use
Hail exposure value represents a community's building value (in dollars), population (in both people and population equivalence), and agriculture value (in dollars) exposed to hail (FEMA's National Risk Index). As the population and related building value increases, the hail exposure's value will correspondingly increase. Changes in land use, either in urbanization or agriculture, will also affect the impact of hail.

Vulnerable populations to hail damage would include farmers, ranchers and economically challenged populations who do not have sufficient shelter. It is for this reason the planning team has focused in the past few years on building covered walkways.

Economic Impact
Damage from hailstorms will cause a direct economic impact throughout the Planning Area. Hailstorms are unpredictable. Damage to crops has an economic impact to the farmer, as well as reducing food available to consumers and animals. Hail causes structural damage to buildings, vehicles, and other material assets. Infrastructure including the electrical grid can be damaged.

Changes to the frequency, magnitude, or severity will require an evaluation of the risk and vulnerability by the Planning Team.

Previous Hailstorm Occurrences
There have been 178 hail events from 1950 to 2022. Some of these have had hail up to 3.00 inches and causing extensive damage. Data is not available on the extent of damage.

Probability of Future Hailstorm Events
Because there is no defined geographic hazard boundary, all participants of the plan are exposed to risk

from damage from hailstorms. Based on past events, there is 100% probability the Planning Area will experience hailstorm events in the future.

Magnitude / Severity of the Hailstorm Hazard
There are no geographic hazard boundaries. All people and property in the Planning Area are exposed to risk from damage from hailstorms.

The National Weather Service criteria for a severe thunderstorm alert for hail is predicted hail greater than 1 inch in diameter. Hail stones are considered destructive when they exceed 1.75 inches in diameter. The largest hailstones recorded in Arkansas were 5 inches in diameter. Pea or golf ball sized hailstones are not uncommon in severe storms.

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

Table 5.33 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 dented, brick walls pitted
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 damage to aircraft bodywork
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.

Pope County could receive from penny (.75") to Softball (4.5") size hail. The problems begin when we have received half-dollar (1.25") size hail. This can cause severe damage to vehicles and structures. If anyone were to be hit by this size hail, there could be serious injuries.

Hazard Vulnerability/Impact Summary
Hailstorms can cause extensive property damage affecting both urban and rural landscapes. Hailstones can destroy crops, livestock, and wildlife and can cause extensive damage to buildings (siding, stucco, brick, and other exterior building materials), including roofs, windows, and outside walls. Vehicles can be total losses.

Multi-Jurisdictional Risk Assessment

Hailstorm risk is not unique to specific areas of the Planning Area. The threat is countywide and in cities and school districts with no significant variation at the county or jurisdiction levels. Current mitigation efforts are focused on covered walkways for schools and businesses. Any further mitigation actions would need to be researched and discussed by the Planning Team.

5.1.7 High Wind Hazard Profile

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

Geographic Area Affected by High Winds
There is no defined geographic hazard boundary, all participants of Pope County plan, are exposed to risk from high winds.

Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the High Wind hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use
Population growth/density will place a larger number of people at risk for injury or death from high winds. Population growth will increase the need for mitigation measures to protect people, property, resources, and wildlife.

Agricultural land may experience increased wind erosion. Changes in forest structure, composition, and density may affect the amount of wind damage.

The most vulnerable populations to high wind related death, injury, or property damage are those individuals living in mobile homes or poorly constructed homes. Those in vehicles during a high-wind event are also at greater risk.

If there is a significant change in population or land use during the next update, the Planning Team will readdress mitigation strategies.

Economic Impact
Straight-line winds can damage homes and businesses. This can result in a loss of income to individuals and the community. Winds can also damage crops including forestry.

Changes to the frequency, magnitude, or severity of high wind events will require an evaluation of the risk and vulnerability by the Planning Team.

Previous High Wind Occurrences
Based on data from NCDC/NOAA only 7 High Wind/Strong Wind events have occurred from 1950 to 2022.

In May 2019, Atkins received over 80 mph winds. One individual was trapped in their house due to a fallen tree. Buildings were damaged, powerlines were knocked down, and debris was scattered. According to the National Weather Service, the damage was caused by a micro-burst. This is a sudden increase in wind speed that reached 80-90 mph.

Probability of Future High Wind Events
Because there is no defined geographic hazard boundary, all plan participants are exposed to risk from damage from high winds. Based off past events, there is 9.7% probability the county will experience high wind event in the following years.

Magnitude / Severity of the High Wind Hazard
The Beaufort Wind Scale, shown below, measures winds other than those associated with hurricane and tornado.
The Planning Area could be affected by high winds at any point and time. These winds could reach a force of 0 – 9 on the Beaufort scale. Winds usually reach in the range 0 – 6 with structural damage occurring in the high levels. There is no area in Pope County resilient to wind damage.

Table 5.34 Beaufort Wind Scale

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted; small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (13-20 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	41-47	Strong Gale	High waves (20 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs

10	48-55	Storm	Very high waves (20-30 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (30-45 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Hazard Vulnerability/Impact Summary
All participants of the Planning Area are equally vulnerable to damaging straight-line, high wind events. Types of structures most vulnerable to high winds include wood structures, manufactured housing, electrical power lines and poles, communication towers, airports, and windows in buildings of any construction type.

Strong winds can turn debris and objects into airborne missiles. Even heavy vehicles can be rolled over. Homes and large buildings can sustain damage from the direct force of winds. Broken windows and damaged roofs are common. Falling limbs and trees can contribute to property damage and cause casualties. Mobile homes and metal sheds can be destroyed, particularly if they are not anchored to a foundation. Construction sites are particularly dangerous, where partially constructed walls with little support can be blown over, sometimes resulting in casualties when strong winds strike ahead of a thunderstorm. Power and communications outages are also common. Storm debris scattered on roads and streets can disrupt transportation and delay emergency response vehicles.

Farm operations can also be heavily impacted by high winds. Livestock are at risk from windborne objects and falling limbs and trees, or they may be trapped in damaged barns or shelters. Winds can flatten field crops, such as corn, tobacco, and wheat; destroy orchard crops, such as apples and peaches; and even destroy large stands of valuable timber.

Multi-Jurisdictional Risk Assessment
Although high wind risk appears to vary at the statewide scale, there is no significant variation within the Planning Area. The entire Planning Area is at risk for high wind at varying degrees depending on other weather conditions that either add to or relieve this threat. Historically winds up to 80-90 degrees have impacted the planning area and could impact the planning area on any given day.

5.1.8 Landslide Hazard Profile

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

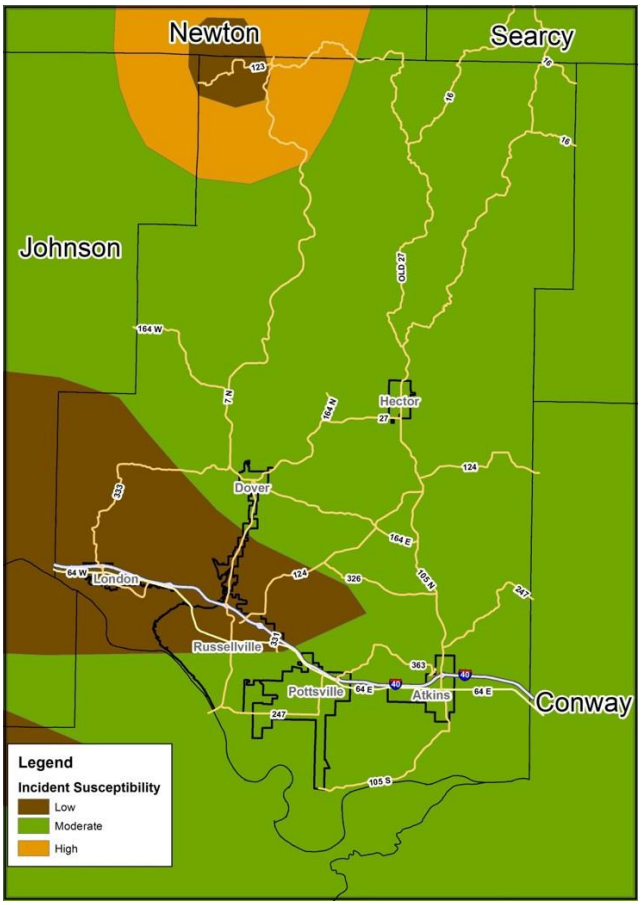
- *Slides* of soil or rock involve downward displacement along one or more failure surfaces. The material from the slide may be broken into several pieces or remain a single, intact mass.
- *Flows* are characterized by shear distributed throughout the mass of material.
- *Lateral Spreads* are large elements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

Geographic Area Affected by Landslides

Susceptibility to land sliding is defined as the probable degree of response of rocks and soils to natural or artificial cutting, loading of slopes, or to unusually high precipitation.

The Northwest area susceptibly is high, the West Central area susceptibly is low, but much of the county susceptibly is moderate.

Figure 5.31 Landslide Susceptibility Map



To complete the vulnerability analysis, a rating value of low, moderate, and high has been assigned based upon the percentage of landslide-prone soils within the county. These rating values correspond to the following descriptive terms:

1) Low Vulnerability – Less than 10-percent landslide-prone soils
2) Moderate Vulnerability – Between 10 and 20-percent landslide-prone soils
3) High Vulnerability – Over 20-percent landslide-prone soils within County

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the Landslide hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use
Rising levels of population and urbanization will directly change the risk of landslides. However, their impact on land use can increase the likelihood of landslides. Removal of forests and other landscaping can disrupt the stability of the soil and exposes the area to greater rainfall. This increases the risk of a catastrophic landslide. Landslides themselves can further destroy forests tracts, destroy wildlife habitats, and remove productive soils.

The populations who are most vulnerable are those living on hilly areas or slopes, especially those who are physically challenged.

The Planning Team will continue to monitor population and land use as it relates to landslides for the next planning update.

Economic Impact
Much of the landslide damage is not documented because it is either the result of another triggering process or it occurs out of site in unpopulated areas. The economic effect due to landslides could be:

- Industrial, agricultural, or forest productivity
- Damage to land or facilities
- Interruption of transportation systems
- Reduced real estate values.
- Loss of tax revenues due to devalued properties

If there is a significant change in population, land use or economic impact over the next five years, the Planning Team will readdress mitigation strategies needed due to landslides.

Previous Landslide Occurrences
Pope County had one landslide event that occurred in Pottsville and discovered by a landowner on April 18th, 2005. No damage to any structures or injuries were noted. There was another landslide in the Crow Mountain Area on Bradley Cove Rd. Another slide occurred on Highway 7, north of Dover. This slide was repaired by the Arkansas Highway and Transportation Department using strategies to prevent slides from occurring again. No known landslides have occurred since the previous plan.

Probability of Future Landslide Events
Historical experience dictates that landslide events in the Planning Area are considered a low possibility.

Based on previous landslide events since 2005, there is a 17.64% probability of future landslide occurrence.

Magnitude / Severity of Landslide

Because significant landslide events are rare in the Planning Area, the extent or severity of the landslide hazard is not well known. If there is a change in this data over the next five years, the Planning Team will form a committee to assess, research, document and address these changes. Landslide events are so rare that mitigation efforts have not been necessary at this time.

Landslide movement is measured using an extensometer. This instrument detects movement of the ground surface between stable ground and sliding ground. Landslide activity can also be measured using mapping or direct observations.

Figure 5.32 Landslide Measurement

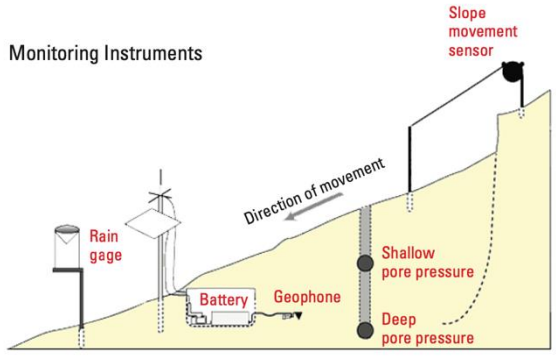
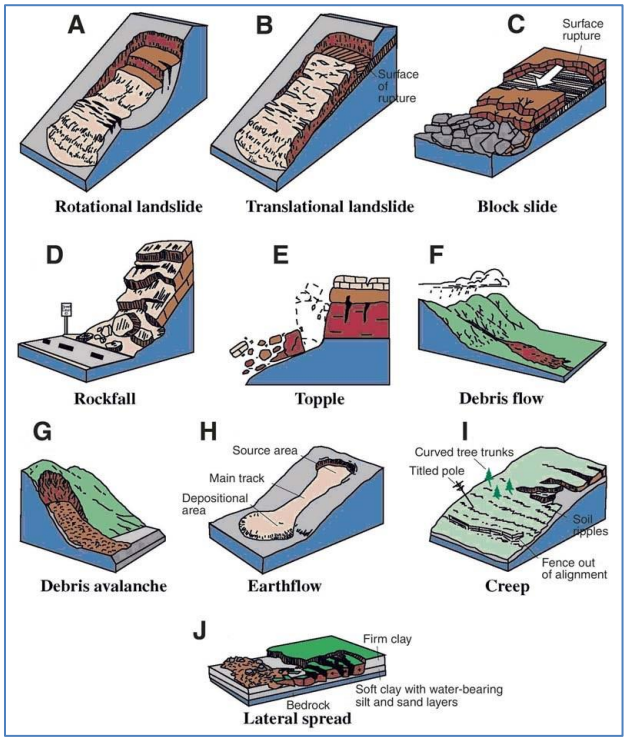


Figure B10. Example of a network for measurement and transmission of real-time landslide data. (Schematic from U.S. Geological Survey.)

As can be seen in the figure below, slope movement can occur in multiple ways. They typically start on steep hillsides. Landslides may occur with or without warning and travel up to 35 mph.



Examples of different types of landslide movement (modified from Cruden and Varnes, 1996).

Hazard Vulnerability/Impact Summary
Landslides could destroy or damage roads, railroads, bridges, mining facilities, parks and recreational areas, residential and commercial buildings, sewers, dams, reservoirs, forests, fisheries, and farms. Damage caused directly by landslides is largely undocumented or often miss reported.

For Pope County the areas of Atkins, Dover, Hector, and Pottsville that fall in the Moderate Vulnerability area, the townships and people living in the area are in low relief areas and not susceptible to landslides. The areas of Pope County that could be susceptible to the moderate or high risk are the roads and highways. Structures can be affected by landslides if they are built on or below steep slopes or cliffs. There are no known structures built on steep slopes or cliffs in Pope County. In Arkansas, falls and topples are not frequent in occurrences. There are no documented structures built beneath steep slopes in Pope County. Roads and Highways could be blocked or damaged by debris, causing delays and/or road closures.

Multi-Jurisdictional Risk Assessment
The Planning Area is located within an area having “low incident” and “moderate susceptibility” for landslides. Although landslides could occur throughout the Planning Area, there is no risk to the cities and schools within the county.

5.1.9 Thunderstorm Hazard Profile

Thunderstorms are formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as a warm and cold front, a sea breeze, or a mountain. All thunderstorms contain lightning. *Lightning* is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. Thunderstorms can bring heavy rains, strong winds, hail, lightning, and tornadoes.

Table 5.36 Types of Thunderstorms

Types of Thunderstorms
• **Single Cell** (pulse storms). Typically, last 20-30 minutes. Pulse storms can produce severe weather elements such as downbursts, hail, some heavy rainfall and occasionally weak tornados. This storm is light to moderately dangerous to the public and moderately to highly dangerous to aviation.
• **Multicell Cluster**. These storms consist of a cluster of storms in varying stages of development. Multicell storms can produce moderate size hail, flash floods and weak tornados. This storm is moderately dangerous to the public and moderately to highly dangerous to aviation.
• **Multicell Line**. Multicell line storms consist of a line of storms with a continuous, well-developed gust front at the leading edge of the line. Also known as squall lines, these storms can produce small to moderate size hail, occasional flash floods and weak tornados. This storm is moderately dangerous to the public and moderately to highly dangerous to aviation.
• **Supercell.** Even though it is the rarest of storm types, the supercell is the most dangerous because of the extreme weather generated. Defined as a thunderstorm with a rotating updraft, these storms can produce strong downbursts, large hail, occasional flash floods and weak to violent tornados. This storm is extremely dangerous to the public and aviation.

Geographic Area Affected by Thunderstorms

There is no defined geographic hazard boundary, all participants of Pope County plan, are exposed to risk from thunderstorms.

Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).

These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change

The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the Thunderstorm hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use

Population growth/density will place a larger number of people at risk for injury or death from thunderstorms. Population growth will increase the need for mitigation measures to protect people, property, resources, and wildlife.

Damage from thunderstorms can vary widely. Lightning and hail can cause death or injuries to people as well as damaging buildings, agriculture, and infrastructure. High winds can damage crops, forested areas, or structures. Excessive rainfall can cause localized flooding in both urban and rural areas.

The most vulnerable populations to thunderstorms are those individuals living in mobile homes, poorly constructed homes, or those economically challenged individuals without sufficient shelter.

Changes to the frequency, magnitude, or severity of thunderstorm events will require an evaluation of the risk and vulnerability by the Planning Team.

Economic Impact
Damage from thunderstorms will cause a direct economic impact throughout the Planning Area. Damage to crops has an economic impact to the farmer, as well as reducing food available to consumers and animals. Storms causes structural damage to buildings, vehicles, and other material assets. Infrastructure including the electrical grid can be damaged. Individuals and businesses lose income.

Changes to the frequency, magnitude, or severity of thunderstorms will require an evaluation of the risk and vulnerability by the Planning Team.

Previous Thunderstorm Occurrences
The have been 281 Thunderstorm events in Pope County from 1964-2022 according to National Centers for Environmental Information. The damages from these storms have ranged from minor damages to major damage. Some of these storms have created Tornado events also.

Probability of Future Thunderstorm Events
Based on previous thunderstorm events 1964-2022, there is a 100% probability of future thunderstorm occurrences within a year. Severe thunderstorm events occur on average once or twice per year.

Magnitude / Severity of the Thunderstorm Hazard
The entire Planning Area can experience SO 0 to SO 10 from the scale below. The entire Planning Area can expect at least one to two severe thunderstorms. These storms may range from mild to severe due to other weather conditions that may create a stronger storm or alleviate the threat.

Table 5.37 Thunderstorm Output Scale

Storm Output Level	Strokes Per 30 Minutes	Time Between Strokes	Brief	Notes
SO 0	0	N/A	Bust	No lightning seen, no thunder heard.
SO 1	1-2	15 - 30 mins	Weak	Very small, usually a thunderstorm that dissapates almost straight away.
SO 2	3-5	6 - 10 mins	Weak	Another small thunderstorm. Typical of the UK, a passing brief thundery shower.
SO 3	6-9	3 - 5 mins	Average	Often found at night in the UK, but usually one of the smallest night-time thunderstorms.
SO 4	10-19	1.5 - 3 mins	Average	A typical UK summertime thunderstorm, and also very common of a UK night-time thunderstorm.
SO 5	20-39	45 - 90 seconds	Average	A better thunderstorm, typical of most of Europe. Not so common (but do occur) in the UK.
SO 6	40-69	26 - 45 seconds	Strong	Another strong European entry, and something of a "typical" thunderstorm in much of the USA.
SO 7	70-99	18 - 26 seconds	Strong	Unlikely in the UK (but has happened) but more likely in Southern Europe or the USA. New thunder starts before old thunder ends.
SO 8	100-199	9 - 18 seconds	Intense	Not so common in Europe as it is in the USA, esp. Florida.
SO 9	200-299	6 - 9 seconds	Intense	Very common in Florida, USA. Rare in Europe.
SO 10	300+	1 - 6 seconds	Extreme	Can be anything up to (and over) 900 strikes per half an hour. Very intense, the sky would stay constantly lit if the strokes were strong.

SOstorms Thunderstorm Scale

Hazard Vulnerability/Impact Summary
All structures in the county are subject to damage from the thunderstorms. Storms can cause fires, damage electrical devices, cause structural damage, and damage to essential utility services. A major concern is damage affecting the operation of critical facilities (hospitals, emergency service operations, emergency communications systems, etc.).

Particularly prone to lightning strikes are communications towers and antennas.

Thunderstorm events in Pope County since 1964 have caused over $3.383M in property damage and a few human injuries. Most of the damage was due to resultant fires, damage to electrical apparatus due to lightning, and associated winds.

Multi-Jurisdictional Risk Assessment
There is no significant variation in the threat of thunderstorms across the Planning area.
The entire Planning Area can expect at least one to two severe thunderstorms. These storms may range from mild to severe due to other weather conditions that may create a stronger storm or alleviate the threat

5.1.10 Tornado Hazard Profile

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

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

Geographic Area Affected by Tornadoes
There are no defined geographic hazard boundaries for tornadoes; all people and property in Pope County including all cities and school districts, and Universities are exposed to the risk of damages from tornadoes.
Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the Tornado hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use
Population growth/density will place a larger number of people at risk for injury or death from tornadoes. Population growth will increase the need for mitigation measures to protect people, property, resources, and wildlife.

All aspects of land use are vulnerable to tornadoes. Tornadoes will cause extensive damage or destruction to any buildings. Crops and forests will be devastated. Infrastructure will be knocked out of service.

The most vulnerable populations to thunderstorms are those individuals living in mobile homes, poorly constructed homes, or those economically challenged individuals without sufficient shelter. Those in vehicles are also at risk during a tornado event. Individuals who cannot hear warnings are also at risk, whether due to hearing impairments or distant proximity to warning sirens or other broadcast messages.

Changes to the frequency, magnitude, or severity of tornadoes will require an evaluation of the risk and vulnerability by the Planning Team. Technological advances should continue to be evaluated by the planning team to provide as early of a warning as possible.

Economic Impact
A tornado can have a devastating impact on the economy. In addition to the direct economic damage

to homes, businesses, farms, infrastructure, and other material assess, there will be long term effects due to loss of income. Supplies to the community can be challenged.

Previous Tornado Occurrences
From 2015 to 2022 there have been 4 reported tornado events according to the NCDC. All three reported Tornados were rated EF-1 and resulted in approximately $70,000 in property damages.

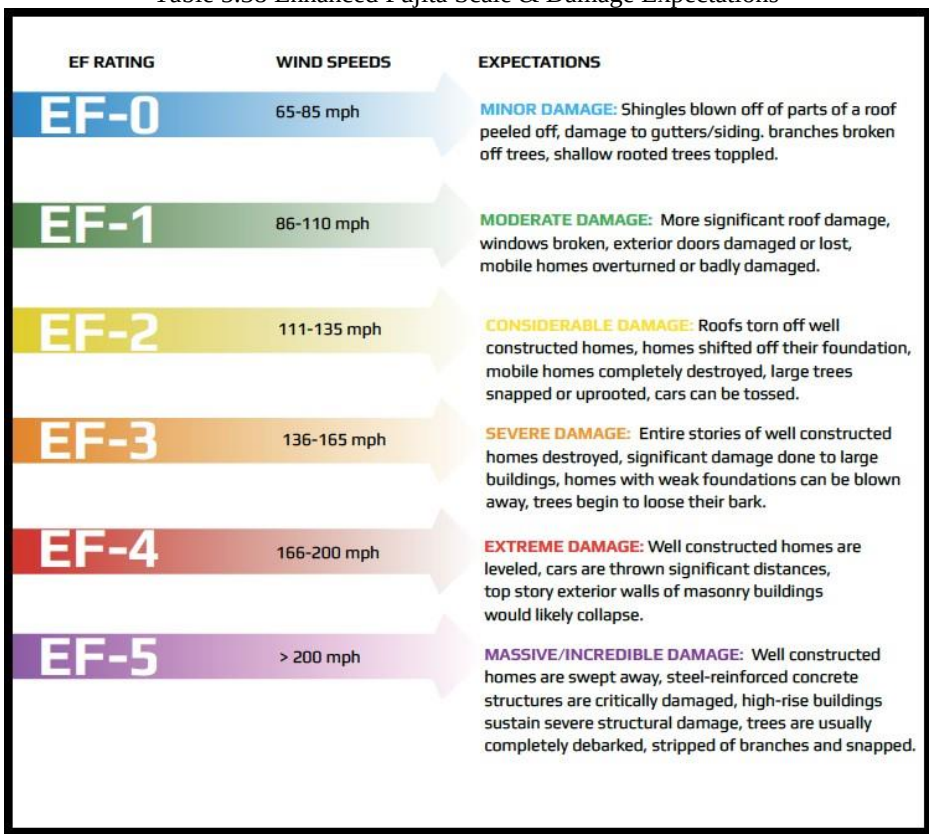
January 2008, one (1) person died after a tornado reportedly touched down in central Arkansas as severe thunderstorms swept across the state. The tornado hit the eastern part of Pope County one mile southeast of Appleton, causing damage to buildings and trees, then moved on to Conway County, touching down one mile west of Jerusalem.

February 5, 2008, an EF-3 tornado ripped through Atkins and brought winds estimated at 136-165 mph, killing five (5) and injuring at least 15 and destroying about 70 homes locally. This was over half of the fatalities in Pope County since 1950. This is the worst tornado Pope County had since 1950.

Probability of Future Tornado Events
Based on previous tornado events 2015-2022, there is a 57.14% probability of future tornado occurrences within a year.

Magnitude/Severity of the Tornado Hazard
At any one point and time, a tornado can touch down within the Planning Area causing very little damage or major damage. The entire planning area could have a tornado ranging from an EF0 to an EF5.

Table 5.38 Enhanced Fujita Scale & Damage Expectations



Hazard Vulnerability/Impact Summary
All structures in Pope County are vulnerable to tornadoes. The most vulnerable to tornadoes are wood frame structures and manufactured homes. An estimated 76% of structures within the Pope County mitigation planning area are wood frame structures, and an estimated 12% are manufactured homes. Utilities are also vulnerable to tornados including electrical power and communication structures. Airports, ports, and bus facilities are also vulnerable. All the critical facilities in the planning area are vulnerable to tornadoes. Humans, wildlife, and livestock are all vulnerable to tornados and airborne objects. All participants of the Pope County plan are susceptible to the impacts described in the EF scale above.

Multi-Jurisdictional Risk Assessment
The threat is countywide and with no significant variation at the county or jurisdiction levels.

Unique construction characteristics that may affect tornado risk include concentrations of manufactured homes, the most vulnerable construction type, in certain parts of the county. The highest concentration is in unincorporated, rural areas of the county, where most of the mobile homes are located. This poses a particular challenge to the county in terms of attempting to influence the anchoring of mobile home, which is difficult in the absence of building codes and a building permit process. There are also RV parks located in or near the City of Russellville and in different parts of unincorporated Pope County that could be full at certain times of the year. These also become full when Arkansas Nuclear One goes into an outage for refueling.

5.1.11 Wildfire Hazard Profile

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Geographic Area Affected by Wildfire
The area most affected by wildfire would be wooded areas such as timber plantations. The entire County possesses some type of fuel, whether grass, agriculture, forestry, shrubs, structures, or other vegetation types.
Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the wildfire hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use

The Planning Area continues to see a population growth outside of the city areas. This expansion into rural areas increases the wildland-urban interface (WUI) resulting in a greater vulnerability to wildfire. As structures and other human development intermix with undeveloped wildland, wildfire can move readily between structural and vegetation fuels.

Two aspects of wildfires must be considered for the at-risk population. The most vulnerable groups to the actual wildfire are those living in rural areas, especially those living in the WUI without fire-fighting services. Within this group, those with mobility issues are at greater risk. The effects of the wildfire smoke must also be considered. Older adults, children, and those with pre-existing respiratory and cardiovascular disease are especially vulnerable to smoke.

Mitigation strategies should be continually updated by the Planning Team as the population and land use develops.

Economic Impact
The economic impact can vary from fire and smoke damage to homes and businesses, crop destruction, loss of farm animals and poultry, restricted access through affected areas, loss of wildlife habitat, and loss of utilities. Health issues can also arise from smoke exposure, resulting in long term economic impact.

Previous Wildfire Occurrences

According to information from the Arkansas Forestry Commission, there have been 281 fires which burned 3346 areas between the years 1989 to 2004, and from 2005-2013 there were 202 fires burning 1902 acres. From 2013-2019 Pope County experienced 91 wildfires.

One fire in 2013 caused the evacuation of an area in the community of Pea Ridge, just north of the city of Atkins.

The Arkansas Forestry Commission does not keep records of fires inside incorporated areas or federal lands.

Table 5.43 Pope County Fires 2013-2019

Arkansas Wildfire Statistics 2013-2019, Pope County- from Arkansas Forestry Commission															
2013		2014		2015		2016		2017		2018		2019		**Totals**	
Fires	Acres	Fires	Acres	Fires	Acres	Fires	Acres	Fires	Acres	Fires	Acres	Fires	Acres	**Fires**	**Acres**
10	43	10	107	7	18	17	54	26	203	14	114	7	79	**91**	**618**

Probability of Future Wildfire Events

Based on previous wildfire events from 2005-2019, there is a 100% probability of future Wildfire occurrences within a year.

Magnitude/Severity of the Wildfire Events

The Southern Wildfire Fire Intensity Scales Below demonstrate extent of possible fire behavior output for all jurisdictions.

Table 5.44 Southern Wildfire Fire Intensity Scale-Pope County

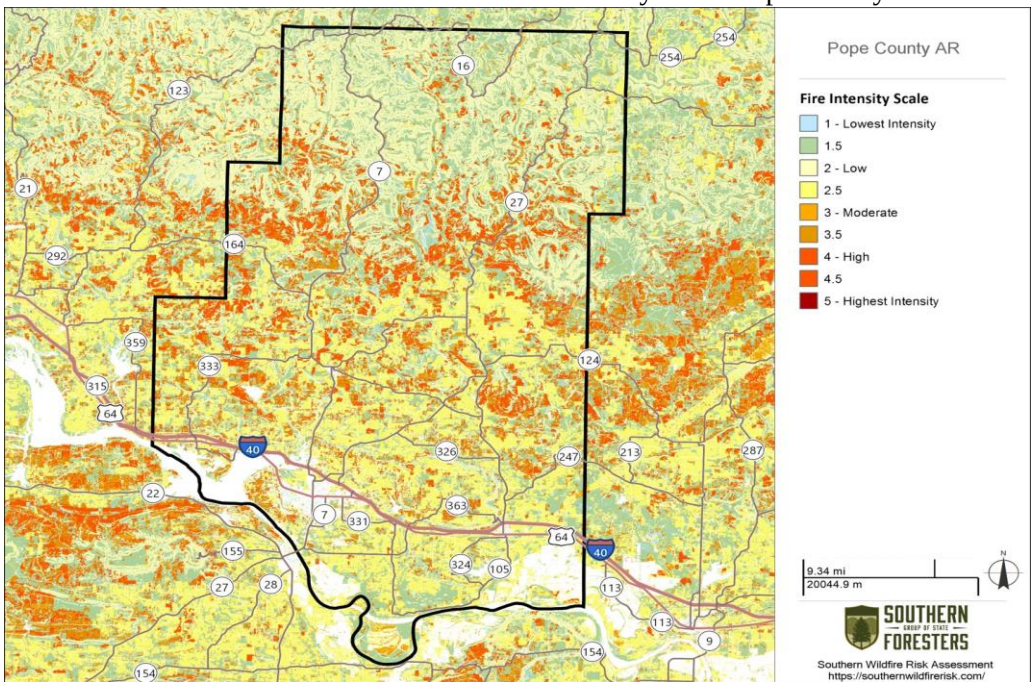


Table 5.44 Southern Wildfire Fire Intensity Scale-Atkins

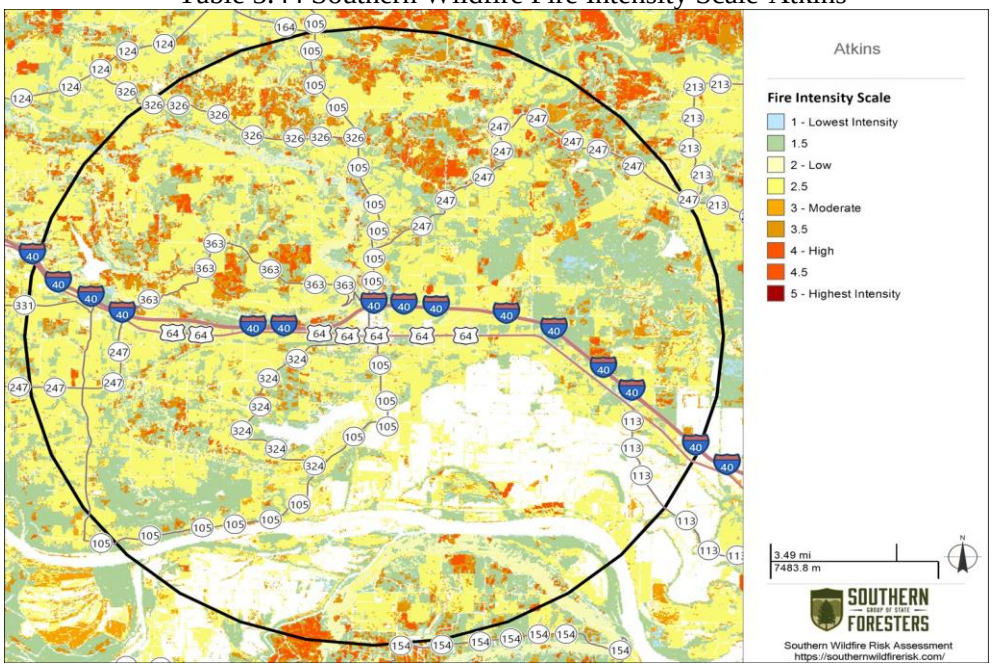


Table 5.44 Southern Wildfire Fire Intensity Scale-Dover

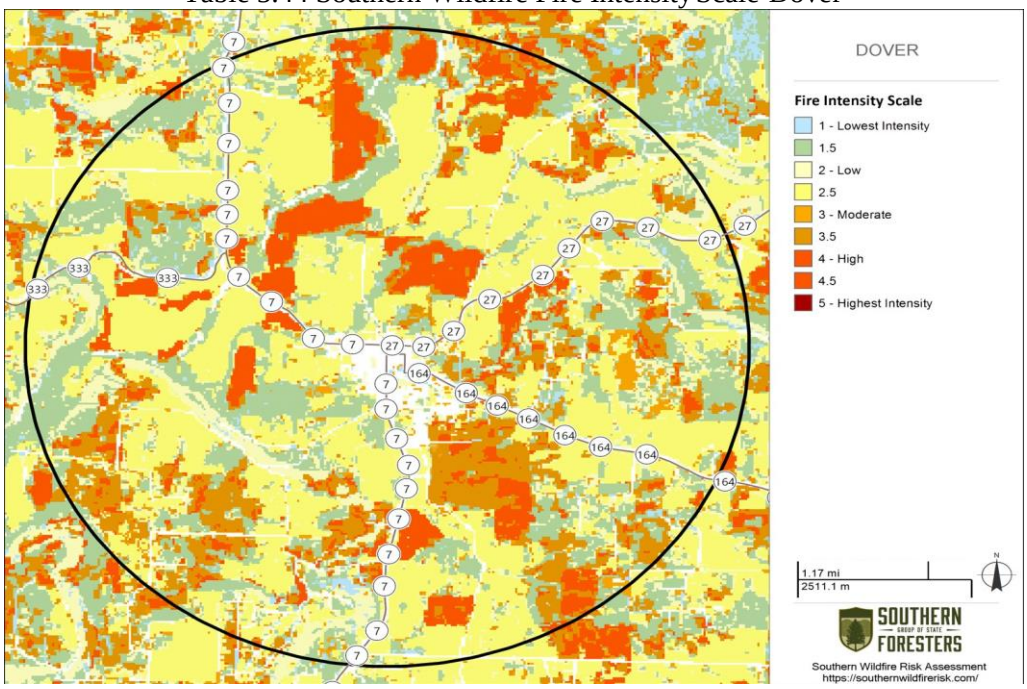


Table 5.44 Southern Wildfire Fire Intensity Scale-Hector

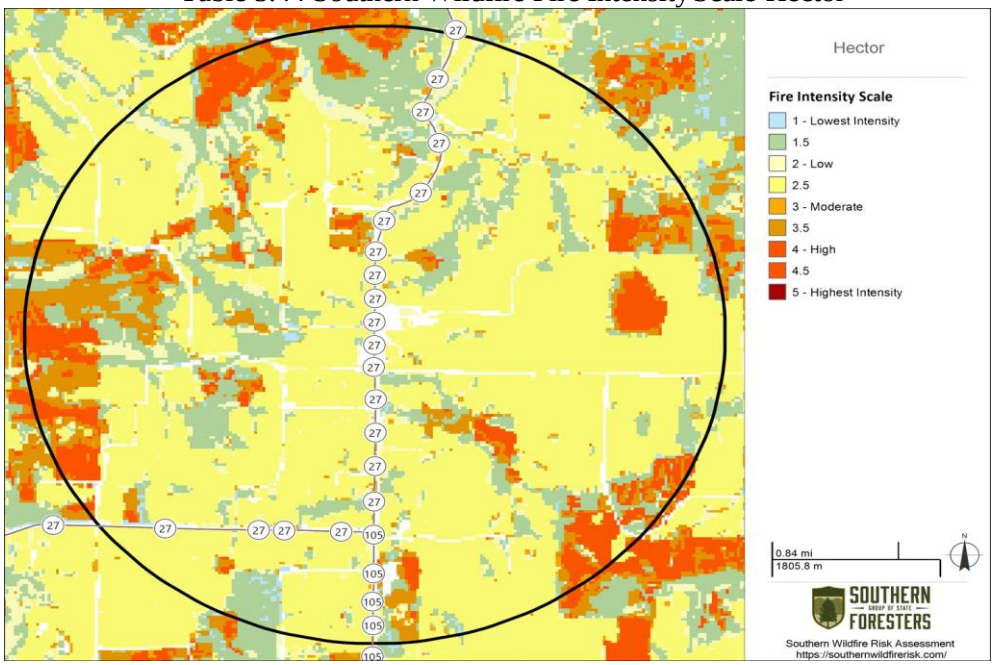


Table 5.44 Southern Wildfire Fire Intensity Scale-London

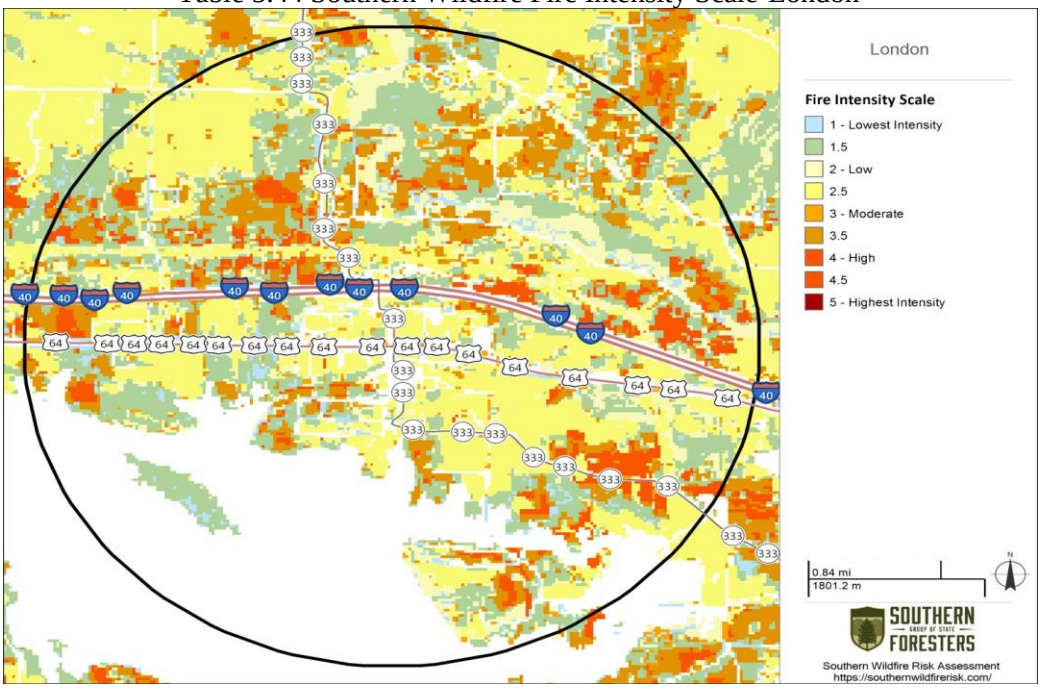


Table 5.44 Southern Wildfire Fire Intensity Scale-Pottsville

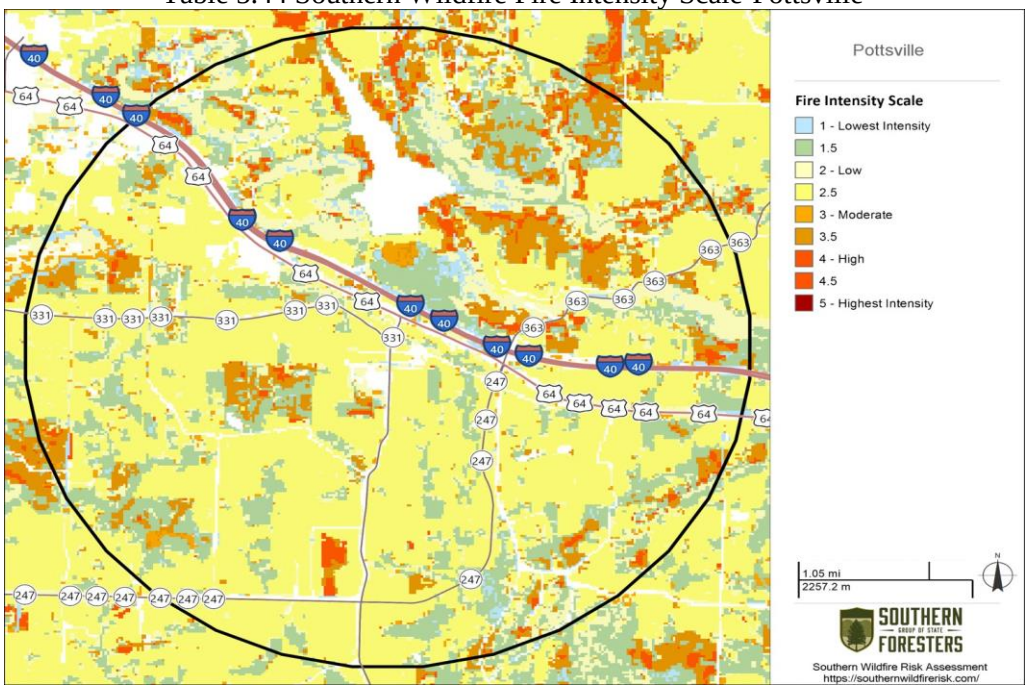
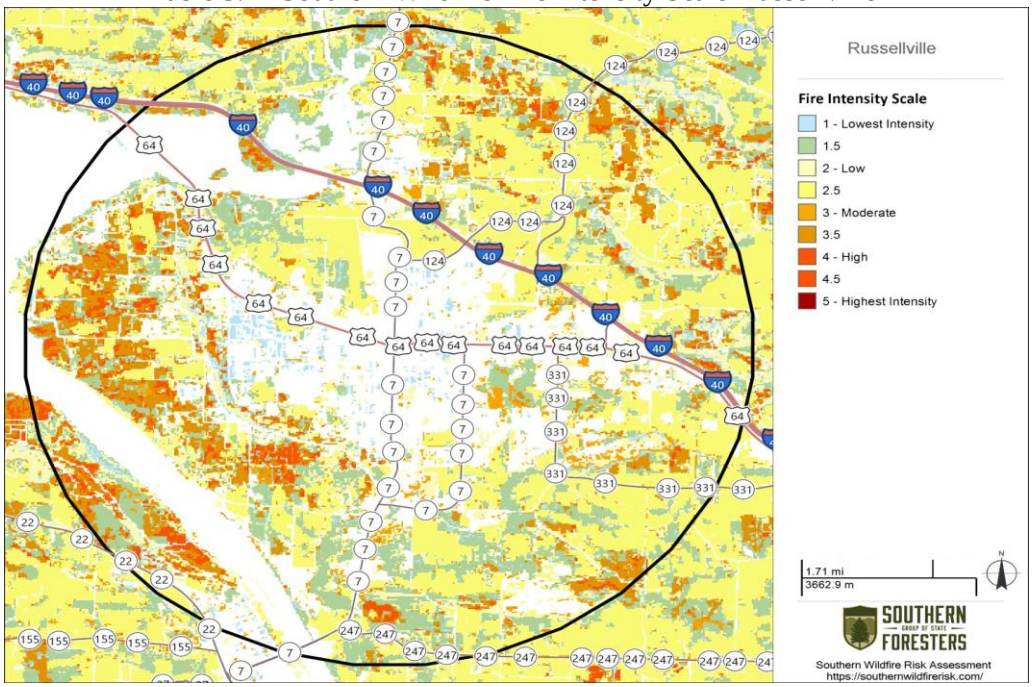


Table 5.44 Southern Wildfire Fire Intensity Scale-Russellville



Hazard Vulnerability/Impact Summary

The entire Planning Area possesses some type of fuel, whether grass, agriculture, forestry, shrubs, structures, or other vegetation types. The likelihood of wildfires is greater in rural or rural/urban interface locations. It is minimal to non-existent within the more urban parts, which is where most of the county's structures and people are located.

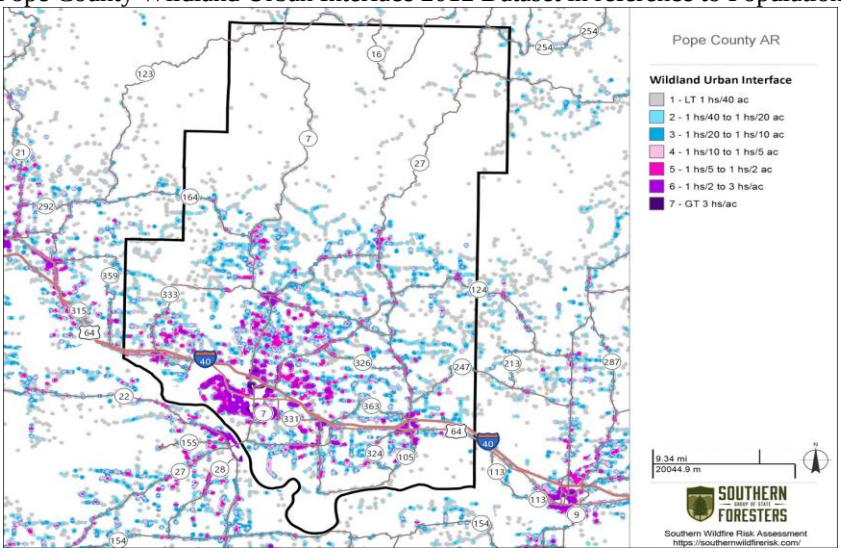
Structure location is the primary control on vulnerability to wildfire. Structures most vulnerable to

wildfire are those located within the wildland-urban interface (WUI) and wildland-urban intermix. These are areas where structures and other human development meet or intermix with undeveloped wildland. Although all building construction types within the WUI are vulnerable, the most vulnerable construction type is wood frame, which comprises approximately 61% of the structures in the area. The WUI creates an environment in which fire can move readily between structural and vegetation fuels. Its expansion in recent years has increased the likelihood that wildfires will threaten structures and people.

Structures, livestock, and people within the WUI area are susceptible to:

- Smoke damage
- Fire damage
- Loss of use/lack of access
- Loss of life
- Loss of Income
- Health issues
- Loss of wildlife habit
- Loss of homes
- Loss of utilities

Figure 5.33 Pope County Wildland Urban Interface 2012 Dataset in reference to Population and Acres



WUI – Population and Acres

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	1,257	2.2 %	63,445	39.0 %
	1hs/40ac to 1hs/20ac	2,089	3.7 %	30,173	18.6 %
	1hs/20ac to 1hs/10ac	3,739	6.6 %	24,254	14.9 %
	1hs/10ac to 1hs/5ac	5,916	10.5 %	19,149	11.8 %
	1hs/5ac to 1hs/2ac	11,520	20.4 %	15,580	9.6 %
	1hs/2ac to 3hs/1ac	26,355	46.7 %	9,477	5.8 %
	GT 3hs/1ac	5,528	9.8 %	455	0.3 %
	Total	**56,404**	**100.0 %**	162,533	100.0 %

Image and table above sourced from the Southern Wildfire Risk Assessment Report for Pope County, AR

With this map, we can determine where the most susceptible houses, businesses, and critical infrastructure are located, and try to determine their susceptibility to wildfire.

Multi-Jurisdictional Risk Assessment

The entire Planning Area is at risk to wildfire. Parts of Hector border heavily forested areas. The cities of Pottsville, Dover, Russellville, Atkins, and London have areas within their city limits that could be prone to wildfires. With Pope County having a 2.6% population increase since the 2010 census and more businesses moving to the area, the cities are growing into the forested areas creating a larger urban interface issue. This increases the potential impact on residential and commercial structures by wildfire. The Planning area can see from one to over two hundred acres burned with destruction varying on location of the fire.

5.1.12 Severe Winter Storm Hazard Profile

W*inter storm* is combination of severe winter weather types occurring over a wide area. Winter-storm formation requires below freezing temperatures, moisture, and lift to raise the moist air to form the clouds and cause precipitation. Lift is commonly provided by warm air colliding with cold air along a weather front. Severe winter storms include heavy snowfall, ice storms, winter storms, strong winds, extreme cold, and/or freezing fog.

Geographic Area Affected by Severe Winter Storms
There is no defined geographic hazard boundary, all participants of Pope County plan, are exposed to risk from Winter storms.

Pope County, Arkansas covers an area of approximately 831 square miles with a geographic center of 35.44227428°(N), -93.03517356°(W).
These are the far north, south, east, and west coordinates of Pope County, Arkansas, comprising a rectangle that encapsulates it.

North: 35.72867203°(N)
South: 35.11734772°(N)
East: -92.81031799°(W)
West: -93.29995728°(W)

Possible Impact of Climate Change
The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, and extreme flooding could have potential impact on the Winter Storm hazard and will be monitored in the next 5 years to continue to research nature-based solutions to mitigate all possibilities of potential increased impact. The probability of how climate changes effects future conditions is unknown because no studies have been conducted at this time.

Population and Land Use
Population growth/density will place a larger number of people at risk for injury or death from severe winter weather. Population growth will increase the need for mitigation measures to protect people, property, and resources.

Severe winter weather is a direct threat to buildings and infrastructure. Snow or ice accumulation on structures with flat roofs can cause a collapse. Ice accumulation on overhead power can disrupt power. This results in a loss of heating to homes and businesses, a disruption in supplies, and can result in fires. Freezing weather can burst water lines and cause additional damage. Snow and ice will make roads impassable for workers and emergency services.

The entire population of the Planning Area is at risk from severe winter storms. Those traveling are most at risk due to road conditions. The elderly may be at a higher risk due to health issues and isolation. Populations that are economically challenged will suffer greatly without help due to lack of shelter and supplies. Services they are dependent on during blue sky days may be unavailable when severe winter weather impacts the Planning Area. Knowing who and where these populations are ahead of winter weather will be necessary.

Economic Impact
A winter storm has a wide economic impact. Homes and business are damaged. Stores and factories are closed resulting in a loss of income. Widespread damage to crops, trees, and livestock/poultry affect the

farmers and ranchers in the Planning Area.

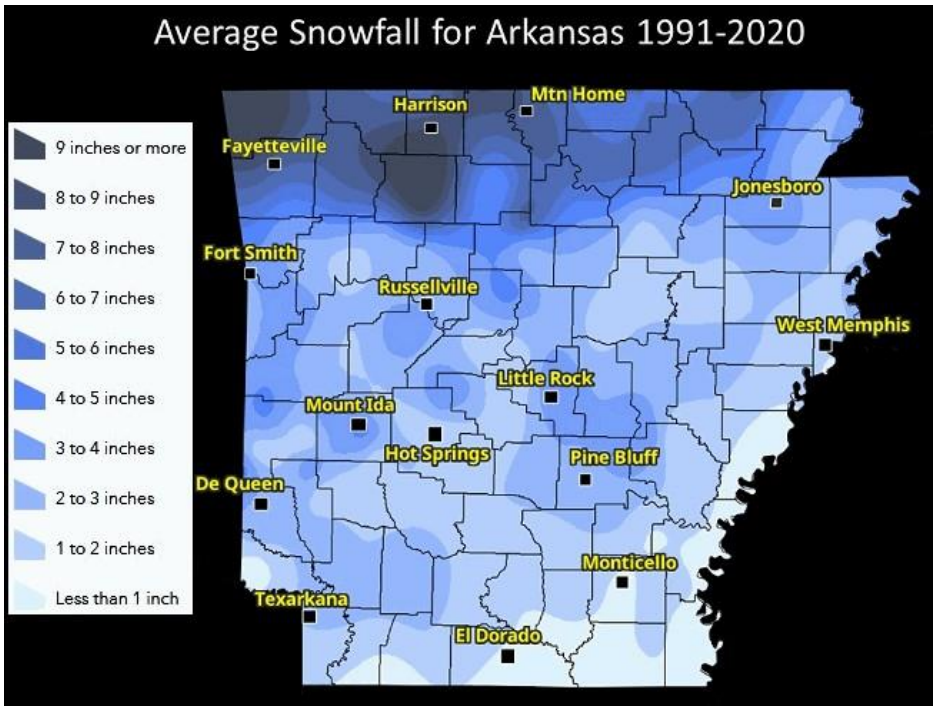
Heavy snow can disrupt school operations, emergency, and medical services. In rural areas, homes and farms may be isolated for days. The cost of snow removal, repairing damages, and loss of business can have a large economic impact on the entire Planning Area. However, this impact may be intensified for those that are economically challenged, small businesses and those reliant on income due to tourism.

Previous Severe Winter Storm Occurrences
There have been 33 previous winter storms record in Pope County between 1994 to June of 2022. These storms affected all parts of Pope County including all the cities and school districts within the county. Only one severe winter storm event, the December 2000 Severe Winter Storm (FEMA 1354-DR), has resulted in a Presidential Disaster Declaration in Pope County.

Probability of Future Severe Winter Weather Events
Based on previous Winter storm events 1994-2022, there is a 100% probability of future winter storm occurrences within a year.

Magnitude/Severity of Severe Winter Storm Hazards
According to National Climatic Data Center (NCDC) and National Weather Service Data, typical snow accumulations in Pope County during heavy snow and severe winter storm events ranges from 1 inch to 8 inches. Typical ice storm accumulations range from 1/10 of one inch to 1/2 of an inch.

Figure 5.36 Average annual snowfall across Arkansas



Source: National Weather Service's Website https://www.weather.gov/lzk/wxcntl3.htm

Hazard Vulnerability/Impact Summary

The occurrence of severe winter storms can have a substantial impact on the Planning Area.

Homes, businesses, buildings, utility systems, and transportation systems as well as weaker nonresidential structures are most vulnerable to structural damage. The abundant wood structures and manufactured houses in the planning area are much more vulnerable than steel, concrete, or masonry structures. Past storms indicate that poultry houses are particularly vulnerable. Heavy accumulations of snow and/or ice from winter storms can bring down trees, electrical wires, telephone poles and lines, and communication towers and damage roadways. Humans, livestock, and crops are vulnerable to the extreme cold temperatures and falling debris. The Planning Area's transportation systems are vulnerable to severe winter storms. Accumulations of ice and snow can be extremely hazardous to motorist. Motorist in Planning Area are not accustomed to driving on icy roads, causing an increase in traffic accidents.

Potential Winter Storm Impacts	
	No Impacts Impacts not expected.
	Limited Impacts Rarely a direct threat to life and property. Typically results in little inconveniences.
	Minor Impacts Rarely a direct threat to life and property. Typically results in an inconvenience to daily life.
	Moderate Impacts Often threatening to life and property, some damage unavoidable. Typically results in disruptions to daily life.
	Major Impacts Extensive property damage likely, life saving actions needed. Will likely result in major disruptions to daily life.
	Extreme Impacts Extensive and widespread severe property damage, life saving actions will be needed. Results in extreme disruptions to daily life.

Communication and power can be disrupted for days or weeks while utility companies repair the damages. Power and communication disruptions are common consequences of ice storms and heavy snow in the Planning Area.

Multi-Jurisdictional Risk Assessment

The threat of severe winter storms is a threat to the entire Planning Area. There are no areas of the Planning Area that would not be affected/impacted when severe winter storm occurs.

Historical data tells us that the Planning Area should expect to see at least one winter weather storm a year during the winter months and that the entire Planning Area will feel the impact. The impacts cannot be predicted at this time and would vary according to the chart above.

5.2 Vulnerability Assessment

5.2.1 Assessing Vulnerability: Overview

This section of the plan presents a determination of the Planning Area's vulnerability to the hazards described in the earlier sections of the plan. Specifically, it is a summary of the hazards' impacts to the area's vulnerable structures. Properly done, this information includes by type of hazard a general description of the types of structures (such as, buildings, infrastructure, and critical facilities) affected by the hazard and the extent of each hazard's impact to the vulnerable structures.

It should be noted that for this study, the County's Planning Team lacked the data sets necessary to fully determine vulnerability of the county's structures, community assets and critical facilities. To the extent this was achieved, or at least attempted for this report, the data set used was the HAZUS-MH MR2 (Version 1.2) May 2006 (Data, October 2006), which is a geo-database built on information from the 2000 U.S. Census.

The limitations of HAZUS-MH MR are that much of its database for this county proved to be out-of-date and inaccurate – such as, critical facilities and infrastructure that no longer exist were listed and newer facilities, some of which are now over five and ten years old, were not listed at all. For an area that is growing and constantly adding new facilities and infrastructure, which this county is, such inaccurate and incomplete data results in the analysis and presentation of unreliable information, subsequently leading to decision-making and conclusions which likely will not be correct.

Another significant limitation in data is the FEMA floodplain maps of the county. These lack accuracy in depicting floodplain boundaries and in geo-spatial reference to themselves and to other features (e.g., roads, creeks, topographical features, etc.). For accurately determining vulnerability of structures to flood hazards for mitigation planning purposes – not to mention the day-to-day management of the county's floodplain program – the lack of good floodplain maps presents a challenge. The county understands it is slated to receive modernized floodplain maps in the future, so this situation should soon improve.

As these data limitations are remedied – which they will be – this aspect of the County's mitigation planning will improve. For the present report, however, the Planning Team has utilized only what it considers to be reliable data, taking care not to present information that may not be correct or could possibly be misleading.

The consideration of impacts of hazards to the area's vulnerable structures are listed in Table 5.3, these are:

- Dam Failures
- Drought
- Earthquake
- Extreme Heat
- Flooding
- High Wind
- Hailstorms
- Landslides
- Thunderstorm
- Tornados
- Wildfires Winter Storms

This is not to say that the other lower-index hazards and their potential impacts are going to be ignored by the county in terms of its future mitigation efforts. The narrowing of hazards for consideration is for the purpose of developing strategies that focus the area's attention, planning and resources on mitigating those threats determined to be of the greatest concern and impact to the county.

5.2.2 Pope County Exposure Summary

The Hazard Mitigation Plan for Pope County identified critical facilities located in the County and the hazards to which these facilities are susceptible. A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the public, is otherwise necessary to preserve the welfare and quality of life in the County, or fulfills important public safety, emergency response, and/or disaster recovery functions.

The critical facilities identified in the County are storm shelters, hospitals and other health care facilities, gas, electric, and communication utilities, water and wastewater treatment plants, and schools.

The Pope County Planning Team used GIS and other modeling tools to map the County's critical facilities and determine which are most likely to be affected by hazards. The two hazards most likely to impact the county are tornados and floods. The analysis revealed the following information.

Flooding Hazard: A 100-year flood would have an impact on St. Mary's Regional Medical Center, 56,533 housing projects, 9 wastewater treatment plants.

Fire Hazard: In addition to critical facilities, the County contains at risk populations that were factored into the vulnerability assessment. These include a relatively large population of elderly residents with limited mobility.

An analysis of the County Comprehensive Plan of 2018 indicated that there is a slight but constant increase in residents expected over the next three years. It is apparent that most of the residential development is expected to occur in the already developed areas outside the 100-year floodplain. Some areas of future growth are in the urban-wildland interface. This trend held true regarding the 2020 census reports with a slight population increase of 2.6%. This has not resulted in an increased vulnerability risk to the identified hazards.

Critical facilities by jurisdiction are summarized in Table 5.47.

Table 5.45- Provides information from the US 2020 Census on Housing units, Median Housing unit cost, building permits, and information in reference to the vintage year (e.g., V2021) the final year of the series (2020 thru 2021).

Table 5.45 US 2020 Census Housing information QuickFacts

Housing	
Housing units, July 1, 2021, (V2021)	**27,065**
Owner-occupied housing unit rate, 2016-2020	72.4%
Median value of owner-occupied housing units, 2016-2020	$129,000
Median selected monthly owner costs -with a mortgage, 2016-2020	$993
Median selected monthly owner costs -without a mortgage, 2016-2020	$342
Median gross rent, 2016-2020	$698
Building permits, 2021	102

Pope County			
NAME	ADDRESS	CITY	ZIP CODE
Pope County Courthouse	100 West Main St.	Russellville	72801
Pope County Fair Grounds	511 South Knoxville Avenue	Russellville	72801
Pope County 9-1-1	#4 Emergency Lane	Russellville	72802
Pope County Sheriff's Office	#3 Emergency Lane	Russellville	72802
Pope County EMS Station 1	#3 County Complex Circle	Russellville	72802
Pope County EMS Station 2	102 Avenue 2 North East	Atkins	72823
Pope County EMS Station 3	1608 West Main Street	Russellville	72801
Pope County EMS Station 4	9736 Market Street	Dover	72837
Pope County EMS Station 5	1615 S Arkansas Ave.	Russellville	72801
Pope County Road Department	#5 County Complex Circle	Russellville	72802
Pope County Extension Agency	105 West B Street	Russellville	72801
Pope County OEM HQ	7975 US Highway 64 W	Russellville	72802
Pope County Health Unit	203 Weir Road	Russellville	72802
Arkansas State Regional Health Dept.	404 North El Paso Avenue	Russellville	72801
Pope County Library	116 East 3rd Street	Russellville	72801
Appleton Fire Department	71 North Main Street	Atkins	72823
Bayliss Fire Department	9641 State Road 333	Dover	72837
Crow Mountain Fire Department	1432 Crow Mountain Road	Russellville	72802
Dover Rural Fire Department	10230 West Camp Street	Dover	72837
Hatley Fire Department	3271 Landers Loop Road	Dover	72837
Linker Mountain Fire Department	775 Linker Mountain Road	Dover	72837
Martin Township Fire Department	15189 State Road 7 North	Dover	72837
Moreland Fire Department	11258 State Road 124	Russellville	72802
Pea Ridge Fire Department	6085 State Road 105 North	Atkins	72823

Public Works	716 North El Paso	Russellville	72802
Russellville Water Treatment Plant	112 Water Works Loop	Russellville	72802
Russellville Sewer Treatment Plant	404 Jimmy Lyle Road	Russellville	72802
Russellville Adult Education Center	1000 South Arkansas Avenue	Russellville	72801
High School	2203 South Knoxville Avenue	Russellville	72802
Junior High	2000 West Parkway Drive	Russellville	72802
Middle School	1203 West 4th Place	Russellville	72801
Crawford Elementary school	1116 Parker Rd.	Russellville	72801
Center Valley Elementary School	5401 State Road 124	Russellville	72802
London Elementary School	154 School Street	London	72847
Sequoyah Elementary School	1601 West 12 St.	Russellville	72802
Upper Elementary School	1203 West 4th Place	Russellville	72802
Oakland Heights Elementary School	1501 South Detroit	Russellville	72802
Dwight Elementary School	1300 West 2nd Place	Russellville	72802
Russellville School Bus Shop	1002 S Denver Ave.	Russellville	72801
St. Mary's Regional Medical Center	1608 West Main Street	Russellville	72801
River Valley kidney Center	3121 West 2nd Ct.	Russellville	72801
Lock and Dam	1640 Lock and Dam Road	Russellville	72802

Dover			
NAME	ADDRESS	CITY	ZIPCODE
City hall	8904 Market Street	Dover	72837
Dover Library	80 Library Road	Dover	72837
Police Department	8904 Market Street	Dover	72837
Dover Fire Department	9736 Market Street	Dover	72837
Dover High school	143 West Water Street	Dover	72837
Dover Middle School	135 College Street	Dover	72837
Dover Intermediate	203 College Street	Dover	72837
Dover Primary	75 Pine Hill Road	Dover	72837
Dover School Bus Shop	399 Pirates Loop	Dover	72837

Atkins			
NAME	ADDRESS	CITY	ZIPCODE
City Hall	310 North East 1st Street	Atkins	72823
Police Department	305 East Main Street	Atkins	72823
Atkins Public Works	102 South East 6th Street	Atkins	72823
Atkins Water Treatment	293 Galla Park Road	Atkins	72823
Atkins Library	216 North East 1st Street	Atkins	72837

Atkins Fire Department	104 Avenue 2 NE	Atkins	72823
Atkins Elementary	302 North West 5th Street	Atkins	72823
Atkins Middle School	302 Avenue 2 NW	Atkins	72823
Atkins High School	403 Avenue 2 North West	Atkins	72823
Atkins Public School Bus Shop	601 Ave 3 NW	Atkins	72823
Mathews Civic Center	108 W Main St.	Atkins	72823

Hector			
NAME	ADDRESS	CITY	ZIPCODE
City Hall	11356 State Road 27	Hector	72843
Police Department	11356 State Road 27	Hector	72843
Hector Public Library	11600 State Road 27	Hector	72843
Hector City Park	145 Maple Street	Hector	72843
Hector Fire Department	77 Spruce Street	Hector	72843
Hector Elementary School	11575 State Road 27	Hector	72843
Hector High School	11601 State Road 27	Hector	72843
Hector Bus Shop	171 Maple St.	Hector	72843
Hector Water Treatment Plant	13956 State Road 27	Hector	72843

Pottsville			
NAME	ADDRESS	CITY	ZIPCODE
City Hall	173 East Ash Street	Pottsville	72858
Police Department	52 2nd Street	Pottsville	72858
Fire Department	80 2nd Street	Pottsville	72858
Fire Department #2	25 Day Road	Pottsville	72858
Pottsville elementary School	87 South B Street	Pottsville	72858
Pottsville Middle School	6926 State Road 247	Pottsville	72858
Pottsville Junior High School	250 Apache Drive	Pottsville	72858
Pottsville High School	500 Apache Drive	Pottsville	72858
Pottsville Bus Garage	600 Apache Dr.	Pottsville	72858

London			
NAME	ADDRESS	CITY	ZIPCODE
City Hall	10460 Hwy 64	London	72847
Police Department	10460 Hwy 64	London	72847
Fire Department	10595 Hwy 64 West	London	72847
London City Shop	3731 SR 333	London	72847

ARKANSAS TECH UNIVERSITY			
NAME	ADDRESS	CITY	ZIPCODE
ATU Administration Bldg.	1509 N Boulder Ave.	Russellville	72801
ATU Alumni House	1313 N Arkansas Ave.	Russellville	72801
ATU Caraway Hall	1403 N Arkansas Ave.	Russellville	72801
Browning Hall	1505 N Boulder Ave.	Russellville	72801
ATU Tomlinson Hall	1507 N Boulder Ave.	Russellville	72801
ATU Public Safety	716 N El Paso Ave.	Russellville	72801
ATU McEver Hall	1701 N Boulder Ave.	Russellville	72801
ATU Jones Hall	1804 N Boulder Ave.	Russellville	72801
ATU Corley Bldg	1811 N Boulder Ave.	Russellville	72801
ATU Tucker Coliseum	1604 Coliseum Dr.	Russellville	72801
ATU Doc Bryan Student Services	1605 Coliseum Dr.	Russellville	72801
ATU University Commons Apartments	1711 Coliseum Dr.	Russellville	72801
ATU Energy Center	1815 Coliseum Dr.	Russellville	72801
ATU Williamson Hall	1205 N El Paso Ave.	Russellville	72801
ATU Thone Stadium at Buerkle Field	1302 N El Paso Ave.	Russellville	72801
ATU Stroupe Hall	1303 N El Paso Ave.	Russellville	72801
ATU Hull Physical Education Bldg.	1306 N El Paso Ave.	Russellville	72801
ATU Crabaugh Hall	1310 N El Paso Ave.	Russellville	72801
ATU Technionery Student Activities Bldg.	1502 N El Paso Ave.	Russellville	72801
ATU Nutt Hall	1505 N El Paso Ave.	Russellville	72801
ATU Chartwell's ATU Sports Complex	1815 N El Paso Ave.	Russellville	72801
ATU Paine Hall	1704 N Glenwood Ave.	Russellville	72801
ATU Stadium Suites	107 W L St.	Russellville	72801
ATU Tech Baseball Field	522 W L St.	Russellville	72801
ATU Rothwell Hall	106 W O St.	Russellville	72801
ATU WO Young Student Center	207 W O St.	Russellville	72801
ATU Baswell Techionery	306 W O St.	Russellville	72801
ATU Dean Hall	402 W O St.	Russellville	72801
ATU Brown Hall	501 W O St.	Russellville	72801
ATU Turner Hall	504 W O St.	Russellville	72801
ATU Ross Pendergraft Library and Tech. Center	305 W Q St.	Russellville	72801
ATU Witherspoon Bldg.	407 W Q St.	Russellville	72801
ATU Physical Plant	2419 Red Hill Ln.	Russellville	72801
ATU Farm	2603 Red Hill Ln.	Russellville	72801

ATU Garden Park Student Housing	513 W L St.	Russellville	72801
ATU Baswell Hall	1204 N El Paso Ave.	Russellville	72801
ATU Chambers Cafeteria	204 W O St.	Russellville	72801
ATU Wilson Hall	502 W M St.	Russellville	72801
ATU Hughes Hall	514 W M St.	Russellville	72801
ATU Critz Hall	1300 N Glenwood Ave.	Russellville	72801
ATU M Street Residence Hall	508 W M St.	Russellville	72801
ATU Norman Hall - Art Building	203 W Q St.	Russellville	72801
ATU Tucker Hall	411 W N St.	Russellville	72801
ATU Career Center	2201 South Knoxville	Russellville	72802

All line items in Table 5.47 highlighted in Yellow are locations that have been moved or updated since the previous plan.

Hazard Vulnerability/Impact Summary
The Hazard Vulnerability/Impact Summary statements have been moved to their respective sections within this plan.

Multi-Jurisdictional Risk Assessment
The Multi-Jurisdictional Risk Assessments have been moved to the respective sections within the plan.

Section 6. Mitigation Strategy

6.1 Local Hazard Mitigation Goals

The Planning team, local jurisdictions, and officials used the results of the local and State risk assessments to develop hazard mitigation goals and objectives. They selected goals and objectives that were determined to be most beneficial in sustainably reducing and enhancing the Planning Areas mitigation capabilities.

Goal 1. **Reduce the potential for loss of life, injury and economic damage created by exposure to natural hazards for residents of Pope County.**

- Objective 1.1 – Identify, describe, and characterize the natural hazards to which Pope County is susceptible.
- Objective 1.2 – Assess the risk of each hazard including the probability and frequency, exposure, and consequences.
- Objective 1.3 – Implement mitigation actions to reduce loss of lives and property.

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

- Objective 2.1 – Examine the feasible mitigation opportunities appropriate for the identified hazards and prioritize those opportunities.
- Objective 2.2 – Identify mitigation opportunities for long-range planning consideration.

All hazard mitigation plans are developed with the same purpose. The goal is to protect the life and safety of all. This has been and will continue to be the goal of the Pope County Hazard Mitigation Plan and the Planning Area.

6.2 Identification and Analysis of Mitigation Actions

The Planning Team has reviewed and updated the list of actions so that it reflects information that has changed in the last five years. The Planning Team has the same goals in mind. These goals are directed at sustainably reducing he effects of the twelve hazard types represented in this Hazard Mitigation Plan: dam failure, drought, earthquake, extreme heat, flood, high wind, hailstorm, landslide, thunderstorm, tornadoes, wildfire, and severe winter storms. For this purpose, tornado and high wind are combined, because mitigation measures are essentially the same for each.

The Planning Team focused on mitigation activities that would directly reflect the goals they have identified in section 6.1 of the Mitigation Plan. They identified a wide range of mitigation approaches based on the hazard analysis and risk assessment.

The Pope County Hazard Mitigation plan is written with the intent of incorporating it into other policies in the Planning Area. Inclusion of the Pope County Hazard Mitigation Plan is encouraged to be used as a resource and tool to all jurisdictions withing the Planning Area. Jurisdictions have always had this capability in the past. However, moving forward this plan will be written in a way that encourages jurisdictions and plan participants to place a higher focus on incorporating it into their plans and procedures. It is also determined that by adopting and participating in this plan each jurisdiction views this as incorporating the plan. Over the next five years the planning team will seek to physically incorporate this plan into other policies/procedures for the Planning Area, either by annex or hyperlink within other documents.

Pope County will continue to work on the activities from the previous plan which are in the table below. The participants within Pope County along with state partners have mitigation activities that are ongoing or are in the planning stages. These activities are listed below.

Hazard Mitigation Actions deemed to be most effective.

COMPLETED		
POPE COUNTY		Basis for inclusion:
Emergency Warning Sirens Hector, Pea Ridge, and Atkins.	November 2008	These population areas are not included in the siren coverage zones created by the Arkansas Nuclear One Emergency Planning Zone. ANO donated sirens to the county for use in public warning for installation by the county/community. These sirens are activated by local controls and maintained by the individual communities.
Bradley Cove Road Landslide Repair	May 2011	In May of 2009, portions of the roadbed and surface of Bradley Cove Road between the Cove and the top of Crow Mountain were lost in a slide. The cause was believed to be undersized drainage tiles not being able to handle water volume resulting in undercutting of the roadway. The roadbed was expanded and enlarged tiles were installed. In addition, the uphill side of the road shoulder, drainage ditch and cliff face were rip-wrapped with heavy rock and aggregate to reduce the chance of undercutting in the future and direct water flow through the enlarged tiles. This mitigation project should reduce the chances of road loss in the future.
School Safe Rooms/Public Shelters	2013	School design with large amounts of window space, long hallway access to the outside and span roof construction does not provide effective shelter. Most all Schools in Pope County, now have FEMA approved Safe Rooms built with the help of FEMA grants. These are also open to the public as public shelters for the communities surrounding the schools with access controlled by the school personnel.
Evacuation Signs	2017-2021	In large scale evacuations of Russellville or southern Pope County, signs indicating the primary motor evacuation routes are being installed to provide guidance to permanent residents and visitors. These signs will be used for a range of events from radiological emergencies at ANO to flooding caused by loss of the Prairie Creek pump station and or Lakefront dike for Lake Dardanelle. Interstate signs have already been installed and signage for major roads and residential streets are in the plans for the next 3 years.

Flood Mitigation Measures	2019	During the 500-year flood event of 2019, when projections for inundation became available, we immediately began mitigation measures. We utilized a combination of county and private resources to effectively raise and reinforce areas of our contiguous levee system that had degraded over time. Additionally, we assumed primary responsibility to levee across a state highway which resulted in the saving of over 18,000 acres of farmland to flood inundation. These mitigation efforts resulted in the savings of over $48 million dollars in revenue derived from agriculture to the state economy based on a survey done by Kent Dollar, C.P.A.
Critical infrastructure assessment		Pope County has embarked on a critical infrastructure assessment by "First Step Pavement Management", whereby all county roads, bridges, and drainage were reviewed to prioritize areas of concern, therefore allowing our public works to concentrate on replacement of tiles and drainage where it's needed most. (Analysis Cost: $18,000)
New salt/sand spreaders		Pope County has purchased two (2) new salt/sand spreaders to help mitigate winter conditions. (Cost: $50,000)
CITY OF RUSSELLVILLE		Basis for inclusion
Phoenix Avenue Connector Road tying West Main Street and West Parkway to North Arkansas Avenue/state Highway 7 North near Interstate-40	June 2013	1. Construction of the road, ditches and associated drainage tiles provided improved movement of water back to Prairie Creek. (Previously private properties on North Phoenix and portions of the west Arkansas Tech University farm retained rainwater and overflows from Prairie Creek for extended periods of time.) 2. This road now allows rapid access for emergency vehicles to reach medical facilities in west central Russellville. 3. Provides improved evacuation flow for the west central part of Russellville for rail transport accidents and public safety evacuations activities associated with the Arkansas Nuclear One Emergency Planning Zone.
Phoenix Avenue Union Pacific Railroad Overpass	April 2014	1. This overpass removes the barrier for the Phoenix Avenue Connector Road described above. 2. It allows rapid access for emergency vehicles to reach medical facilities in west central Russellville from the northern half of the city and all of Pope County. 3. Provides improved evacuation flow for the west central part of Russellville for rail transport accidents

		and public safety evacuations activities associated with the Arkansas Nuclear One Emergency Planning Zone. 4. It provides rapid access to emergency vehicles needing to access the north half of the city when multiple crossings may be closed due to rail traffic.
Permanent Flood Zone traffic control signs	April 2013	While the signage does not prevent flooding it does provide active public safety measures to protect and educate the public. It facilitates pre-designated locations in the city plan for public works to set up roadblocks in anticipated flooding conditions. This reduces manpower requirements by not impacting law enforcement resources for traffic control.
WACO Basin/West 12th Street Flood Basin Project		When subdivision developers in southwest Russellville started interfacing with city planning on developments that had flood plain issues, the city purchased 11 acres of property and created a water detainment basin to hold and dissipate slowly the typical flooding caused by heavy rainfall. This freed up approximately 35 acres for creation of the Overland Park Subdivision and will help in other future developments. New building code requirements also mandate the finished floor level of all homes in this area be one foot above surrounding grounds.
Construction of new Central Fire Station	2018	1. Current station is undersized, not a hardened structure, not seismic and does not meet the 2013 fire codes. It also does not have a safe room or area for an underground shelter to be installed. Therefore, it does not provide means for continuity of operations in the most probable of disaster events. 2. The new station is designed as a multi- story, five-bay, 18-20,000 sq. ft. structure and will meet hardened criteria for Type 1 or 2 construction for both high wind and seismic events. It will comply with the 2013 Fire Code including sprinklers. 3. The building includes a safe room (that doubles as a physical fitness room) which can be accessible to the general public. There are currently multiple projects underway in downtown to renovate areas above commercial businesses as urban apartments. There are no public shelters within a ½ mile radius. 4. The current intent is to utilize some of the new space to create a backup Emergency Operations Center for Pope County in the event that disaster incapacitates the current facility. In the event of a large-scale disaster like the Joplin, Missouri tornado, the backup EOC would become a fire coordination center for the Russellville Fire Department. All of this supports mitigation of loss of city property, improved public safety and improved capability for continuity of operations.

STATE OF ARKANSAS DISTRICT 8 HIGHWAY TRANSPORTATION DEPARTMENT IN POPE COUNTY		Basis for inclusion
Installation of cable barrier systems	2013	Purpose to serve as mitigation for head-on collisions when cars cross the median of I-40.
Replacement of bridge pier protective barrels with Guard Rail systems	2013	Replacement of the I-40 Bridges over the Illinois Bayou and Mill Creek (December 2013- west bound lanes)-Purpose to replace old worn bridges and pilings with 72-inch Drilled Shaft to Bedrock pilings that meet current seismic requirements to help prevent loss of key highway infrastructure
Completion of the HWY 247 Bypass south of Russellville	2012	Purpose to move large volumes of traffic off Hwy 7/Arkansas Avenue that would have normally gone through downtown Russellville enroute to Dardanelle. The construction of the road, its ditches and associated drainage structures improved the flow of water and reduced flooding in adjacent properties. Prior to this new road, old Hwy 247 had areas that would be underwater, and water puddled creating driving hazards.
Replacement of Water Navigation Lights on Arkansas River Bridge	September 2013	Purpose to replace 30-year-old high wattage but low output lights on the River Bridge with high output lights to improve visibility in all conditions and potentially prevent barge impacts from damaging the support structures and resulting in blocked navigation and material spills into the waterways.
Slide Repair and Mitigation Work on Hwy 7 North and Hwy 27	2011 & 2012	Purpose- multiple slides on Hwy 7 and one on Hwy 27 blocked key state roadways for months. To mitigate the chance of future slides from occurring, the state cut additional width into the uphill side and removed the roadbed weathered shale layers all the way to bedrock. They then bored support pilings into the bedrock. Next, they added back large stone and variable sized aggregate to provide a friction layer against the bedrock and repaved the road surface. Additional tile work and drainage helped ensure the continuity of the road.

TO BE COMPLETED IN 5 YEARS	
POPE COUNTY	Basis for inclusion:
Mass Notification System	1. Much of Pope County is rural with small communities, large areas of National Forrest lands and individual homes 2. Outdoor public warning sirens cover approximately 38,000 of the 62,000 residents 3. While NOAA Tone Alert Radios provide additional coverage for severe weather events and other emergencies, the upper 1/3 of the county does not have good reception from this alert source. 4. A Reverse 911 system would enhance the current outdoor warning system with indoor warning as well via phone, cell phone, text messages and emails. It also would provide warning coverage for the remainder of the county where sirens and tone alert radios are not available. Public warning and messaging are a vital part of mitigation by reducing injuries and fatalities. 5. This system ties into the efforts to create community safe rooms by providing early warning to allow the public to transition to public shelters when they do not have personal access to private shelters. 6. Local Community phone exchanges maintain only a fraction of the phone circuits necessary for local notification and are frequently jammed when events happen. Reverse 911 operates on direct dial phone lines from outside the area and can dial large numbers of residents per minute thereby mitigating the problem of restricted communications. This goal was completed in 2022 but was too expensive. Currently Genesis GenAlert is being considered as a replacement. Its function is more cost effective and practical.
Storm Ready	The County plans on working with the National Weather Service to participate in the Storm Ready Program. This will provide information to the county to better prepare the citizens for a storm. This program will assist the county in determining needs for notification of severe storms. ***Anticipated to be certified in 2023 for Pope County and ATU is Actively Certified.**
Firewise	The County will urge fire departments in the county to either update their Firewise Program or to begin the program in their community. This program will provide information to homeowners on how to better prepare their property for a wildfire. Clearing back debris, high grass, and trees from the house will provide better protection from a wildfire. ***Completed for Hector & Appleton but the remainder of the County not included at this time.**

CITY OF RUSSELLVILLE	Basis for inclusion
Elmira Union Pacific Railroad Overpass	1. The Union Pacific Railroad running east and west splits the city of Russellville in half. Based on the frequency of train traffic it is common for multiple crossings to be blocked at any given time. Construction of the overpass will allow rapid access for emergency vehicles to reach areas of southeastern and northeastern Russellville including the airport and large industrial facilities 2. Provides improved evacuation flow for the east central and southeast part of Russellville for rail transport accidents and public safety evacuation associated with the Arkansas Nuclear One Emergency Planning Zone. This project includes the extension of Weir Road south to Fairway Drive and Elmira and the creation of a roundabout at that location. **In the planning stages. 5 years**
Widening of Prairie Creek and Bridge at Commerce and Parkway	1. Widening of Prairie Creek especially in the area between" D" Street and El Paso Avenue reduces the 100-year flood elevation by two (2) feet. This will greatly reduce the frequency of flooding in the area of North Arkansas and Parkway in the area of City Mall. **Until funding is available this project is cancelled.**
STATE OF ARKANSAS DISTRICT 8 HIGHWAY TRANSPORTATION DEPARTMENT WITHIN POPE COUNTY	
There are several planned projects for Pope County in the next Five years including asphalt overlay, resurfacing and a few scheduled enhancements according to the ARDOT Pope County Summary of projects-included in Appendix B: • HWYS 64-331 • N. of old HWY 7-Newton co. Line • HWY 27 & Maple St. Sidewalks • HWY 326-El Paso Ave. - Russellville • Atkins-Conway Co. Line • Russellville Schoolhouse Trail Ph.2 • Lake Dardanelle State Park- HWY7 • I-40- Dover • Piney Creek Branch Str. & Apprs. • HWYS. 7, 124, & 326	

6.3 Implementation of Mitigation Actions

The mitigation actions are prioritized based upon their effect on the overall risk to life and property. Ease of implementation, community and agency support and ease of obtaining funding. The County and participating jurisdictions have used the STAPLEE method to prioritize mitigation actions. This method has the benefit that the Mitigation actions are considered in discrete categories of Social, Technical, Administrative, Political, Economic and Environmental. Prioritization was made by taking each of these categories into account, so that nothing was overlooked when considering which actions may be best for each jurisdiction to consider. Considerations are summarized in Table 6.2.

Pope County will continue to use this process to provide a real-world perspective of the effects of mitigation activities.

Table 6.1 Criteria used for prioritization of mitigation actions based on STAPLEE

Evaluation Category	Sources of Information
Social	Members of Local governments and the County Government were members of the Hazard Mitigation Planning Team and had input throughout the planning process. It must be noted that many small-town political leaders are also business or professional persons. They are also members of the LEPC. Existing community plans were and will be relied on wherever possible. Members of the media were contacted and invited to all attend all HMPT meetings.
Technical	The following persons/agencies were consulted as to the technical feasibility of the various projects: Arkansas Geological Commission, University of Arkansas Extension Service, Arkansas Soil and Water Conservation Commission, Arkansas Health Department, Arkansas Highway and Transportation Department, Arkansas Department of Environmental Quality, Arkansas Governor's Pre-Disaster Advisory Council, Arkansas Governor's Earthquake Advisory Council, and Arkansas Forestry Service. Arkansas Department of Emergency Management. All of these had their comments and suggestions incorporated.
Administrative	Staffing for proper implementation of the plan currently will rely largely on existing members of the various agencies involved. Technical assistance is available from various local and state agencies. Some local jurisdictions have incorporated Hazard Mitigation efforts in their jurisdictions Capital Improvement Plans. Operations costs are under discussion by the appropriate agency or department heads.
Political	The County Quorum Court has passed resolutions in support of mitigation activities involving floodplain ordinances, mitigation planning, fire districts, etc. The Governor of Arkansas issued an Executive Order in August of 2004 (EO 4-02) instructing all State Agencies to assist ADEM in mitigation planning and implementations of mitigation goals.
Legal	Members of the HMPT discussed legal issues. It was their opinion that no significant legal issues were involved in the projects selected by the Planning Team. However, where legalities may be an issue, this is noted.
Economic	Economic issues were the predominant issues discussed by all concerned. Each entity felt that the projects selected would have positive effects. However, these actions often have costs, sometimes hidden, imposed on the community, residents, and businesses. Funding for the various activities was a major concern as local budgets are always under pressures with existing and competing projects and activities. Where necessary, particularly for costly capital projects, outside grants would be relied on heavily.

Environmental	The Arkansas Geological Commission, Arkansas Department of Environmental Quality, Arkansas Forestry Commission, and Arkansas Soil and Water Conservation Commission were all consulted as to the environmental impact of the various projects, and it was felt that there would be no negative impact. Local environmental issues and concerns were also considered.

For explanations of how each action may be effective in providing multi-hazard mitigation, please refer to explanation Table 6.2.

Table 6.2 provides a comprehensive list of mitigation actions considered by the County and local jurisdictions. The table includes information on STAPLEE criteria listed in Table 6.1 as well as the responsible agencies, timelines for completion, rationale for action, and contribution to mitigation objectives. The Pope County Office of Emergency Management (PCOEM) will be responsible for evaluating actions among competing actions listed in the following table. No cost-benefits analyses are available. The PCOEM shall evaluate actions based on funding availability, comparative value to mitigation objectives, and consideration of economic benefits and environmental concerns of the communities. Actions are prioritized in three different categories: High need for immediate action, medium need for action, Low lacking in urgency.

All Pope County actions are the responsibility of the director of Pope County Office of Emergency Management. Atkins, Dover, Hector, London, Pottsville, and Russellville's actions are the responsibility of their mayors. The School Districts of Atkins, Dover, Hector, Pottsville, and Russellville will be the responsibility of their respective Superintendent.

This list of mitigation activities is ongoing and is important to the future of Pope County and the reduction of damages due to different natural disasters. The priorities of these have not changed. Each participating jurisdiction will continue to work and improve on these actions with the same priority as before. These actions have been reviewed over the past 5 years to determine their effectiveness and recently updated to continue effectively mitigating potential natural hazards.
Updates or changes may be highlighted in yellow and include reason for change on Table 6.3.

Table 6.2: Previous List of mitigation actions considered by Pope County and participating jurisdictions updated to reflect new actions as of 2022

Action	Hazard Addressed	Responsible Agency	Projected Timeline	Projected Resources	Priority	Contribution to Mitigation Objective	STAP LEE
Conduct inspections, maintenance and enforcement programs on dam and levees to ensure continued structural integrity	Dam Failure	Soil and Water Conservation	3 years	Existing county and local resources	Medium	Links Mitigation with Preparedness	Meets all Criteria
Provide "Community Education and Outreach" to local dam owners through training aides for Dam Safety and Resources.	Dam Failure	Soil and Water Conservation/Pope County	Every 3 to5 years	FEMA brochures distributed by OEM Office	Medium	Seeks to protect citizens and property.	Meets all Criteria
Ordinances to control water use.	Drought	Pope County/All cities	Removed	Existing County and local resources	Medium	Seeks to protect citizens and property.	Meets all Criteria
Implementation of water conservation measures for localized drought conditions.	Drought	Pope County Office of Emergency management	1-2 years	Existing County and local resources	Medium	Seeks to protect citizens and property.	Meets all Criteria
Monitor drought conditions and monitor water supply by checking for leaks to minimize water supply losses.	Drought	All Schools, Cities and Pope County	1 year with regular continuation.	Existing county resources, state resources.	Medium	Seeks to protect citizens.	Meets all criteria
Distribute copies of FEMA's "Earthquake Safety for Homeowners" through local county office of emergency services.	Earthquake	Pope County Office of Emergency Management	Replaced	FEMA information brochures distributed by PCOEM	High	Seeks to protect citizens and property.	Meets all Criteria
State and local highway departments review construction plans for all bridges to determine their susceptibility to collapse. Retrofit problem bridges.	Earthquake	County Road Dept/State Highway Dept.	Replaced	Existing State, County and local resources	High	Seeks to protect citizens and property.	Meets all Criteria
New construction or retrofits will be built to earthquake specifications per building codes.	Earthquake	All Schools, Cities and Pope County	3-5 years	Existing resources	Medium	Seeks to protect citizens and property	Meets all criteria

Action	Hazard Addressed	Responsible Agency	Projected Timeline	Projected Resources	Priority	Contribution to Mitigation Objective	STAP LEE
Determine areas deemed unsafe for earthquakes and determine the need for new facilities.	Earthquake	All schools	2 years	Existing Resources	Low	Seeks to protect citizens and property	Meets all criteria
Establishing and promoting accessible cooling centers/shelters for vulnerable, special needs, and at risk-population.	Extreme Heat	Pope County Office of Emergency Management	1-2 years	Existing County and local resources	High	eeks to protect citizens	Meets all Criteria
County and Communities to encourage utility companies to offer special arrangements for paying of utility bills.	Extreme Heat	Pope County/Individual Cities	1-2 years	Existing County and local resources	High	Seeks to protect citizens	Meets all Criteria
Increase public awareness of extreme heat risks and measures the public can take to reduce the risk.	Extreme Heat	Pope County OEM Office, Schools and Fire departments, Red Cross	1 year	Brochures distributed by Red Cross	High	eeks to protect citizens	Meets all Criteria
Schools should be prepared to keep students in during extreme heat days to prevent heat emergencies. Also, schools could be used as cooling centers during power outages during extreme heat days.	Extreme Heat	Schools	1 year	Existing Local resources	Medium	eeks to protect citizens	Meets all criteria
Adopting Ordinances that limit development in the floodplain, and limiting the density of development in the floodplain.	Flood	Pope County/Individual City's affected by floods	1 year		High	Seeks to protect citizens and property.	Meets all Criteria
Require floodplains be kept as open space.	Flood	Pope County/Individual City's affected by floods	3 years	Existing County and local resources	Medium	Seeks to protect citizens and property.	Meets all Criteria
Develop Water Drainage system to move the water to intended area, maintain system to keep sediment and debris clear so it can carry out its designed function.	Flood	County Road Dept/Individual City Street Dept/State Hwy Dept.	2-4 years	HMGP	High	Encourage assistance from all stakeholders	Meets all Criteria

Action	Hazard Addressed	Responsible Agency	Projected Timeline	Projected Resources	Priority	Contribution to Mitigation Objective	STAP LEE
All new roads will be built at least 1 foot above the base flood elevation. with existing roads to be raised to at least 1 foot above base flood elevation level.	Flood	County Road Dept/Individual City Street Dept/State Hwy Dept.	2-4 years	Existing County and local resources, PDM	High	Encourage assistance from all stakeholders	Updated to best Meet all Criteria
Evaluate the previous Hazus MH Data provided by Arkansas Tech University. Update the information with new census data to be utilized by the program.	Flood	Pope County/OEM	3-5 years	Existing County, state and federal resources	Low	Encourage assistance from all stakeholders	Updated to best Meet all Criteria
Determine critical facilities in or near flood prone areas and determine mitigation actions to prevent flooding of facilities.	Flood	Pope County OEM/Floodplain Manager's/ School Officials	2 years	Existing Resources for Pope County	Medium	Encourage assistance from all stakeholders	Meets all criteria
Stockpile sandbags for use during flooding of critical infrastructure and other residents, and determine appropriate locations to be utilized and stored for future use.	Flood	Pope County/Cities affected by flood/ Schools affected by floods	2-4 years	Existing resources	Medium	Seeks to protect citizens and property	Updated to best Meet all Criteria
Building codes to set construction standards, including minimum foundation requirements, in landslide-prone areas.	Landslide	Pope County/Individual City's affected by landslides	2 years	Existing County and local resources	Medium	Seeks to protect citizens and property.	Meets all Criteria
Use open space designation to keep landslides prone areas undeveloped. Zoning ordinances to create buffers between structures and high-risk areas.	Landslide	Pope County/Individual City's	1 year	Existing County and local resources, PDM	Medium	Seeks to protect citizens and property.	Meets all Criteria
New facilities built should have a study done to determine the susceptibility to landslides.	Landslide	Pope County, All cities, Schools	1 year	Existing County, Local, and School Resources	Low	Seeks to protect citizens and property	Meets all criteria
Stabilizing cliffs with terracing or plantings of grasses or other plants to hold soil together around susceptible schools.	Landslide	Schools	2 years	Existing, County, Local, and School Resources	Low	Seeks to protect citizens and property	Meets all criteria

Action	Hazard Addressed	Responsible Agency	Projected Timeline	Projected Resources	Priority	Contribution to Mitigation Objective	STAP LEE
Seek funding to build safe rooms in schools, homes, and mobile home parks, and other vulnerable areas.	ado, and High Winds	Pope County All Schools, Cities	1 year	PDM Funding	High	Seeks to protect citizens and property.	Meets all Criteria
Increase public awareness of tornado and high winds risks, safe rooms, wind construction methods, safe zones around homes and NOAA radio warning systems.	ado and High Winds	Pope County/Individual City's	1 year	Existing County and local resources, FEMA brochures	High	Seeks to protect citizens and property.	Meets all Criteria
Pass ordinances to require manufactured home and exterior attachments such as carports and porches be anchored.	ado and High Winds	Pope County/Individual City's	1 year	Existing County and local resources	Medium	Seeks to protect citizens and property.	Updated to best Meet all Criteria
Pass ordinance to require temporary disposal sites to cover debris or require fencing and locating away from heavily populated areas.	ado and High Winds	Pope County/Individual City's	1 year	Existing County and local resources	Medium	Seeks to protect citizens and property	Updated to best Meet all Criteria
Install surge protection, lightning protection devices on all communications infrastructure and critical facilities.	ado and High Winds	Pope County/ Local Cities/ All Schools	I year	Existing County, Local, and School Resources	Medium	Seeks to protect citizens and property	Meets all criteria
Install canopies over walkways from main buildings to exterior buildings or parking areas.	Hailstorm/ Extreme Heat/Thunderstorms	Pope County/ Local Cities/All Schools	2 years	Existing resources	Medium	Seeks to protect citizens	Updated to best Meet all Criteria
Policy to keep activities in the main buildings during storms, high heat days, or extremely cold days.	Hailstorm/ Extreme Heat/Thunderstorms/ Winter storm	All schools	1 year	Existing School resources	Medium	Seeks to protect citizens	Meets all Criteria
Broadcast information about fire watches and fire warnings through social media and fire departments.	Wildfire	City/Rural Fire Departments	1 year but to be continued	Existing County and local resources	High	Seeks to protect citizens and property.	Meets all Criteria

Action	Hazard Addressed	Responsible Agency	Projected Timeline	Projected Resources	Priority	Contribution to Mitigation Objective	STAPLEE
Promote "Firewise Communities" to fire departments and the public to help mitigate structural damage during wildfires.	Wildfire	City/Rural Fire Departments	1-2 years	FEMA and Local resources	Medium	Seeks to protect the citizens and property.	Meets all criteria
Require burn permits and restrict campfires and outdoor burning.	Wildfire	City/Rural Fire Departments	1 year	FEMA brochures distributed by PCOEM	Medium	Seeks to protect citizens and property.	Meets all Criteria
Determine the threat of wildfires in each jurisdiction within the county. Determine by the wildland urban interface area. Projects will be listed by city and rural areas.	Wildfire	Pope County OEM/Arkansas Tech University	2 years	Resources from ATU and Pope County OEM	Medium	Seeks to protect citizens and property.	Updated to best Meet all Criteria
Clear away trees and tall grass away from buildings threatened by wildfire, using federal recommendations.	Wildfire	Pope County, All Cities, All Schools	2 years	Current County, Local and School Resources	Medium	Seeks to protect citizens and property	Meets all criteria
Schools should participate in their local jurisdictions "Firewise" program by allowing pamphlets to be placed in the school for programs.	Wildfire	Schools	1 year	Local Resources	Low	Seeks to protect citizens and property	Meets all criteria
Include safety strategies for severe weather events in driver's education class.	Winter storms, Tornados-High winds, & Flooding	Pope County/Local Cities/ Schools	2 years	FEMA brochures distributed by PCOEM	High	Seeks to protect citizens and property.	Meets all Criteria
Local governments maintain adequate road and debris clearing capabilities.	Winter Storms	Pope County/Individual City's	3-5 years	FEMA brochures distributed by PCOEM	High	Seeks to protect citizens and property.	Updated to best Meet all Criteria

Action	Hazard Addressed	Responsible Agency	Projected Timeline	Projected Resources	Priority	Contribution to Mitigation Objective	STAP LEE
Buildings built or retrofitted by schools should meet load limits for snow accumulation on roofs.	Winter Storms	Pope County/Local Cities/ Schools	5-years	Existing County, Local, and School Resources	Low	Seeks to protect citizens and property	Meets all Criteria
Burying or otherwise protecting electric and other utility lines to prevent disruptions of power from ice, wind, or snow damage.	Winter Storms	Local Utility Companies	5-years	Existing County and local resources	High	Seeks to protect citizens and property.	Meets all criteria
Provide All Local Hazard Safety Materials throughout the county on the county Website as well as a link to social media.	All Hazards	Pope County/Local Cities/ Schools	1-5 years with changing social environment	Existing County and local resources	Medium	Links Mitigation with Preparedness & protect citizens and property.	Meets all Criteria
Identify problematic low water crossings and bridges with collapse susceptibility for elevation, replacement, and repair. (State and Local Road departments)	Flooding, Earthquakes	Pope County/Individual City's/ State and Local Road departments	3-5 years	Existing County and local resources	High	Seeks to protect citizens and property.	Meets all Criteria
Increase community participation in NFIP, Firewise, Storm ready and CRS Programs	Flooding, Wildfire, Tornados, Winter Storms	Pope County/Local Cities/ Schools	3 years	Existing County and local resources	Medium	Seeks to protect citizens and property.	Meets all Criteria
Develop publication to inform citizens of public saferooms and availability regarding time and capacity during severe weather events.	Extreme Heat, Winter storms, Tornados-High winds, & Flooding	Pope County/Local Cities/ Schools/ Local non-profit organizations	1-5 years with changing social environment	Existing County and local resources	Medium	Links Mitigation with Preparedness & protect citizens and property.	Meets all Criteria

Action	Hazard Addressed	Responsible Agency	Projected Timeline	Projected Resources	Priority	Contribution to Mitigation Objective	STAP LEE
Establish a list of local accessible cooling centers/shelters for vulnerable, special needs, and at-risk populations and promote county wide. (Local County agencies or Nonprofits)	Extreme Heat	Pope County Office of Emergency Management	1-2 years	Existing County and local resources	High	Seeks to protect citizens	Meets all Criteria
Provide encouragement by all Jurisdictions to utility companies to offer special arrangements for paying of utility bills and include list of contacts or services to at risk populations on public forum. (Private & Nonprofit)	Extreme Heat	Pope County/Individual City's	1-2 years	Existing County and local resources	High	Seeks to protect citizens	Meets all Criteria
Update inundation flood studies for all High and significant risk damns.	Dam Failure	Pope County Office of Emergency Management/ ANRD	5 years	Existing County and local resources	High	Seeks to protect citizens	Meets all Criteria
Gather landslide and geotechnical information to better determine potential landslide risk.	Landslide	Pope County Office of Emergency Management/ Arkansas Geological Survey	5 years	Existing County and local resources	Low	Seeks to protect citizens	Meets all Criteria
Gather climate change effects data to better determine the potential effects and risk associated with climate change	Climate Change	Pope County Office of Emergency Management/ Arkansas Game and Fish Commission	5 years	Data from the State Hazard Mitigation Plan and the Regional Weather Service Office	Low	Links Mitigation with Preparedness & protect citizens and property.	Meets all Criteria

6.4 Multi-Jurisdictional Mitigation Actions

Multi-jurisdictional and multi-hazard mitigation actions are listed in Table 6.1 above. Each jurisdiction within the County that participated in the planning process has at least one action that will benefit the jurisdiction, and each jurisdiction can participate in several multi-hazard mitigation actions. A list of mitigation actions by jurisdiction is provided in Tables 6.4.

Implementation and administration for all Pope County actions are the responsibility of the Director of the Pope County Office of Emergency Management. The mitigation actions of the cities of Atkins, Dover, Hector, London, Pottsville, and Russellville are the responsibility of the mayors. School Districts will be responsible for their own actions.

Jurisdictional Capacities:

Atkins, Dover, Hector, Pottsville, and Russellville School District

The local school districts utilize contracted engineers to assist with projects. They also utilize their own contractors for construction projects. Some assistance may be required of county, state and federal partners.

City of Atkins, Dover, London, Pottsville, and Hector

These jurisdictions have active City Councils, and work with contract engineers for projects within their jurisdictions. Due to the size of their communities, they may request assistance from county, state, or federal partners.

City of Russellville

The City of Russellville has an active City Council and has an engineer on staff. The city may rely on the county, state, and the feds for additional resources for large scale projects if needed. Most projects have been completed by the city on their own.

These multi-jurisdiction activities will continue to be very important to the future wellbeing of Pope County. All participating jurisdictions are willing to continue their work to help reduce the damages associated with disasters that occur within their community. The priorities that Pope County and the participating jurisdictions have put into place have not changed. During the next couple of years, participating jurisdictions will meet to discuss the progress of said actions and will determine a need to update the status of the actions.

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Conduct inspection, maintenance and enforcement programs on dam and levees to ensure continued structural integrity.	Existing	3 years	Dam Failure	√	√	√	Dam Failure does not impact City of Dover, City of Hector, Nor local school Districts				√	√	√	√	√	√	Updated to accurately reflect jurisdictions involved in hazard and participation
Provide Community Education and Outreach to locals in the community and Leaders through training aides for Dam Safety and Resources.	New and Existing	Every 3 to five years	Dam Failure	√	√	√					√	√	√	√	√	√	
Ordinances to control water use	Existing	Removed	Drought	√	√		√		√		√	√		√			Repetitive

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Implementation of water conservation measures for localized drought conditions	Existing	1-2 years	Drought	√	√	√	√	√	√	√	√	√		√	√	√	
Monitor drought conditions and monitor water supply by checking for leaks to minimize water supply losses	Existing	1 year with regular continuation	Extreme Heat	√	√	√	√	√	√	√	√	√		√	√	√	
Distribute copies of FEMA's "Earthquake Safety for Homeowners" through local county office of emergency services.	Existing	Replaced	Earthquake	√	√	√	√	√	√	√	√	√		√	√	√	Removed due to access of printable book. Replaced with all-hazard material online access

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
State and local Hwy Dept. will collaborate and review plans for all bridges to determine their structural integrity and retrofit problem bridges	New and existing	Repl aced	Earthquake	√	√		√		√		√	√		√			Replaced
New construction or retrofits should be built to earthquake specification per building codes	Existing	3-5 years	Earthquake	√	√	√	√	√	√	√	√	√	√	√	√	√	County has not adopted building codes yet due to leadership changes. Russellville adopted the IBC 2012 Standard building codes
Determine areas deemed unsafe for earthquake and determine the need for new facilities	Existing	2 years	Earthquake	√	√	√	√	√	√	√	√	√	√	√	√	√	

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Establish a list of local accessible cooling centers/shelters for vulnerable, special needs, and at-risk populations and promote county wide. (Local County agencies or Nonprofits)	New and existing	1-2 years	Extreme Heat	√	√	√	√	√	√	√	√	√	√	√	√	√	Updated to accurately reflect jurisdictions involved in hazard and participation

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Provide encouragement by all Jurisdictions to utility companies to offer special arrangements for paying of utility bills and include list of contacts or services to at risk populations on public forum. (Private & Nonprofit)	New and existing	1-2 years	Extreme Heat	√	√	√	√	√	√	√	√	√	√	√	√	√	Revised and updated with a clear purpose
Increase public awareness of extreme heat risks and measures the public can take to reduce the risk	Existing	1 year	Extreme Heat	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
Schools will be prepared to keep students in during	Existing	1 year	Extreme Heat			√		√		√			√					

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	New or Existing Infrastructure	Projected TimeLine	Hazard Addresses	Pope County	City of Atkins	Atkins School District	City of Dover	Dover School District	City of Hector	Hector School District	City of London	City of Pottsville	Pottsville School District	City of Russellville	Russellville School District	Arkansas Tech University	Updates and Comments
extreme heat days to prevent heat emergencies Schools will be used as cooling centers during power outages on extreme heat days during non-school hours																	
Adopting Ordinances that limit development in the floodplain and limiting the density of development	Existing	1-3 years	Flood	√	√		√				√	√		√		√	
Require floodplains be kept as open space.	Existing	1 year	Flood	√	√		√				√	√		√			

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Develop water drainage system to move the water to intended area, however the system must be maintained to keep sediment and debris clear so it can carry out its designed function.	New and Existing	2-4 years	Flood	√	√		√		√		√	√		√			
All new roads will be built at least 1 foot above the base flood elevation. with existing roads to be raised to at least 1 foot above base flood elevation level	**NEW**	2-4 years	Flood	√	√		√		√		√	√		√			Wording updated for NFIP requirement

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Evaluate the previous Hazus MH Data provided by Arkansas Tech University. Update the information with new census data to be utilized by the program	NEW	3-5 years	Flood High Wind. Tornado	√												√	Updated
Determine critical facilities in or near flood prone areas and determine mitigation actions to prevent flooding of facilities.	Complete		Flood	√	√	√	√	√			√	√	√	√	√	√	Completed. No flood prone critical facilities. Replaced with new action

Table 6.3 Mitigation Actions for the Planning Area																
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Stockpile sandbags and determine appropriate locations to be utilized and stored for future use	Complete and existing	2-4 years	Flood	√	√	√	√	√			√	√	√	√	√	√	Complete but updated and ongoing due to use during previous flood of 2019
Building codes to set construction standards, including minimum foundation requirements, in landslide-prone areas.	existing	1 year	Landslide	√	√		√		√		√	√		√			
Use open space designation to keep landslide prone areas undeveloped Zoning Ordinances may be used to create buffers between structures and high risk areas	existing	1 year	Landslide	√	√	√	√	√	√	√	√	√	√	√	√	√	

Table 6.3 Mitigation Actions for the Planning Area																
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New facilities built should have a study completed to determine the risk to landslides	existing	1 year	Landslide	√	√	√	√	√	√	√	√	√	√	√	√	√	
Stabilizing cliffs with terracing or planting grass/plants/ trees to hold soil together around susceptible schools	existing	2 years	Landslide	√	√	√	√	√	√	√	√	√	√	√	√	√	
Seek funding to build safe rooms I schools, homes, mobile home parks and other vulnerable areas.	New and existing	1 year	Tornado High Wind	√	√	√	√	√	√	√	√	√	√	√	√	√	
Increase public awareness of tornado and high wind risks, safe rooms, wind	existing	1 year	Tornado High Wind	√	√	√	√	√	√	√	√	√	√	√	√	√	This is often a constant battle due to changed is economy and funding

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	New or Existing Infrastructure	Projected TimeLine	Hazard Addresses	Pope County	City of Atkins	Atkins School District	City of Dover	Dover School District	City of Hector	Hector School District	City of London	City of Pottsville	Pottsville School District	City of Russellville	Russellville School District	Arkansas Tech University	Updates and Comments
construction methods, safe zones around homes and NOAA radio systems																	
Pass ordinances requiring mobile homes and exterior attachments such as carports and porches be anchored	New	1 year	Tornado High Wind	√	√		√		√		√	√		√			Updated to provide clarity and purpose as well as its feasibility
Pass ordinances to require temporary disposal sites to cover debris or require fencing and locating away from heavily populated areas	New	1 year	Tornado High Wind	√	√		√		√		√	√		√			Updated to provide clarity and purpose as well as its feasibility

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Install canopies over walkways from main buildings to exterior buildings or parking areas	New and Existing	2 years	Hail, Heat, Thunderstorm	√	√	√	√	√	√	√	√	√	√	√	√	√	Update to reflect entire planning area
Policy to keep activities in the main buildings during storms, high heat days, or extremely cold days	New and Existing	1 year	Hail, Heat, Thunderstorm	√	√	√		√		√			√		√	√	This will be updated as policies are updated, and capabilities change
Install surge protection, lightning protection devices on all communications infrastructure and critical facilities	Existing	1 year	Tornado. High Wind	√	√	√	√	√	√	√	√	√	√	√	√	√	As new equipment is installed this will continue to be an applied

Table 6.3 Mitigation Actions for the Planning Area																
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To minimize damage to public and private buildings, increase public awareness to structural bracing, shutter stabilization, laminated glass in windowpanes, and hail resistant roof shingles	New and Existing	1 year	Hail, Thunderstorm, Lighting	√	√		√		√		√	√		√		√	Updated to provide clarity and purpose as well as its feasibility
Distribute the brochures "Avoiding Wildfire Damage: A Checklist for Homeowners" through the assessor's office to each homeowner for early prevention.	New and Existing	1 year	Hail, Thunderstorm, Lighting	√	√		√		√		√	√		√			Updated

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Broadcast information about fire watches and fire warnings through social media and fire departments.	Existing	1 year	Wildfire	√	√		√		√		√	√		√			
Promote "Firewise Communities" to fire departments and the public to help mitigate structural damage during wildfires	New and Existing	1 year	Wildfire	√	√		√		√		√	√		√		√	
Require burn permits and restrict campfires and outdoor burning	Existing	1 year	Wildfire	√	√		√		√		√	√		√			City of Russellville does and the County does during bun ban procedures

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Determine the threat of wildfires in each jurisdiction within the county. Determine by the wildland urban interface area. Projects will be listed by city and rural areas	New and Existing	2 years	Wildfire	√	√		√		√		√	√		√			Updated to reflect entire planning area
Clear away trees and tall grass away from buildings threatened by wildfire, using federal recommendations.	New and Existing	2 years	Wildfire	√	√	√	√	√	√	√	√	√	√	√	√	√	

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Schools should participate in their local jurisdictions "Firewise" program by allowing pamphlets to be placed in the school for programs.	New	1 year	Wildfire			√		√		√			√		√	√	
Include safety strategies for severe weather events in driver's education class.	New and Existing	2 years	Winter storms, Tornadoes High winds, and flooding	√	√	√	√	√	√	√	√	√	√	√	√	√	Updated to reflect multiple hazards
Local governments maintain adequate road and debris clearing capabilities.	New and Existing	3-5 years	Winter Storms	√	√		√		√		√	√		√		√	
Buildings built or retrofitted by schools should meet load limits	Existing Updated	3-5 years	Winter Storms		√		√		√			√		√	√		Updated to reflect schools as previously stated

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
for snow accumulation on roofs.																	
Burying or otherwise protecting electric and other utility lines to prevent disruptions of power from ice, wind, or snow damage.	New and Existing	5 years	Winter Storms	√	√		√		√		√	√		√	√	√	Updated with clear intent for future mitigation
Provide All Local Hazard Safety Materials throughout the county on the county website as well as a link to social media.	**New**	1-5 years	All Hazards	√	√	√	√	√	√	√	√	√	√	√	√	√	Changing social environment will require this to be updated and a continuing process

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Identify problematic low water crossings and bridges with collapse susceptibility for elevation, replacement, and repair. (State and Local Road Department)	**New**	3-5 years	Flood, Wildfire, Tornado, Winder storm	√	√		√		√		√	√		√			
Increase community participation in NFIP, Firewise, Storm ready and CRS Programs	**New**	3 years	Extreme Heat, Winter Storms, Tornados, High Wind, Flooding	√	√	√	√	√	√	√	√	√	√	√	√	√	
Develop and publish items intended to inform citizens of public saferoom use regarding time and capacity during	**New**	1-5 years		√	√	√	√	√	√	√	√	√	√	√	√	√	Changing social environment will require this to be updated and a continuing process

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
severe weather events																	
Establish a list of local cooling centers/shelters for vulnerable, special needs, and at-risk populations and promote thru entire planning area.	New	1 year	Extreme Heat	√	√	√	√	√	√	√	√	√	√	√	√	√	
Update inundation flood studies for all High and significant risk dams to address deficiencies in plan	**New**	1-3 years	Dam Failure	√	√	√	Dam failure does not impact the City of Dover, the City of Hector, Dover School Districts or Hector School Districts				√						Updated to accurately reflect jurisdictions involved in hazard and participation

Table 6.3 Mitigation Actions for the Planning Area																
Mitigation Actions	**New or Existing Infrastructure**	**Projected TimeLine**	**Hazard Addresses**	**Pope County**	**City of Atkins**	**Atkins School District**	**City of Dover**	**Dover School District**	**City of Hector**	**Hector School District**	**City of London**	**City of Pottsville**	**Pottsville School District**	**City of Russellville**	**Russellville School District**	**Arkansas Tech University**	**Updates and Comments**
Gather landslide and geotechnical information to acquire more precise information for potential landslide risk.	**New**	5 years	Landslides	√	√	√	√	√	√	√	√						

√ = The jurisdiction will implement this action.

Section 7. Plan Maintenance Process

7.1 Monitoring, Evaluating, and Updating the Plan

FEMA regulations require a plan update within five years, The Planning Team has developed a method to ensure that monitoring, evaluation, and as needed updating of the Pope County Hazard Mitigation Plan occurs annually. The Planning Team will form a Hazard Mitigation Plan Evaluation Sub-Committee of the existing Pope County Local Emergency Planning Committee (LEPC). The LEPC consists of members from fire service, health officials, emergency management, law enforcement, community groups, transportation, hospital personnel, and emergency medical personnel, elected officials, and owners and operators of covered facilities. The Director of the Pope County Office of Emergency Management will be the initial Chair of the sub-committee or Planning Team Leader. The Planning Team Leader will contact the planning team committee, set up meeting dates, and ensure that each community will maintain a representative on the team.

The responsible party for overseeing and assuring plan updates is the Pope County Office of Emergency Management.

At this time, the maintenance procedures for the Mitigation Plan will be conducted at the LEPC meeting, which are held quarterly. Each community's representative will be responsible for monitoring and evaluating the progress of the mitigation strategies and actions in the plan pertaining to all plan participants of Pope Counties plan. The team members will monitor the plan by providing a mitigation planning update at each quarterly meeting. They will state the progress of each action and whether the action has been started, in progress, delayed, or completed. Those that have been started and/or are in progress will be moved to top of action list for review and replacement with new actions. Those delayed will be evaluated based on need/time/funds as to if they should be continued to be pursued as actions for the long-range planning process to become a more resilient Pope County.

The Mitigation sub-committee will meet annually or biannually to review and evaluate each goal and objective to determine their to changing situations in Pope County, as well as changes in State or Federal policy, and to ensure that they are addressing current and un/expected conditions. The Sub-committee will also review and evaluate the risk assessment portion of the plan to determine if this information should be updated, modified, or stay the same. The parties or agencies responsible for the various implementation actions (identified in Section 5 & Section 6) will report on the status of their projects and will evaluate which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

The Pope County Office of Emergency Management will then have three months to update and make changes to the plan before submitting it to the Sub-Committee members and the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification for this determination. Comments and recommendations offered by Sub-Committee members and the State Hazard Mitigation Officer will be incorporated into the plan update.

This will continue to be the process for monitoring, evaluating, and updating the plan as necessary. Unless a major disaster occurs, forcing a change to the plan, the plan will be updated every 5 years. The Pope County Hazard Mitigation Plan will be integrated into

- Pope County Local Emergency Operations Plan

- School District’s Crisis Plans in Pope County
- Pope County Soil Conservation Survey
- ATU Emergency Operations Plan
- Budget planning

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

7.2 Incorporation into Existing Planning Mechanisms

The Plan for Pope County to integrate the Mitigation plan includes the integration into the Pope County Emergency Operations Plan by including an appendix to the EOP and will incorporating the mitigation actions to be completed.

Pope County and plan participants currently use state laws pertaining to compliance with the Southern Building Code and the National Flood Insurance Program as well as state fire codes, to encourage compliance with its hazard mitigation programs.

The Planning Area will begin enforcement of the 2021 International Building Codes with Arkansas Revisions as mandated by the 2022 Legislative action. These existing mechanisms have hazard mitigation strategies integrated into them. Pope County, as every other county in the State, has a current Emergency Operations Plan that the last version of the hazard Mitigation plan was incorporated into.

Pope county incorporated the previous version of their hazard mitigation plan into their budget planning process in the quorum court including hazard mitigation projects and grant projects that they wished to complete as well as the HMGP grants to apply for updating the Hazard Mitigation plan.

The Hazard Mitigation Plan will become an annex of the EOP for future submissions. A copy of the Plan will be available for public view at the County Office of Emergency Management and ATU for any entity or citizen who wishes to see it. Copies will also be made available at public libraries, the county courthouse, and online. Other plan participants will be adopting the approved participants will follow local laws and guidelines when incorporating the Hazard Mitigation Plan in their existing plans that are relevant to Hazard Mitigation. Any participant without previous plans in place will be encouraged to develop zoning plans and other land ordinance plans to incorporate these mitigation strategies. After these discussions, each incorporating mechanism will follow their local laws or guidelines necessary for implementation through open forum public meetings. Each incorporating party will monitor the progress of any incorporated mitigation strategies and report the success or failure to the Emergency Operations Council for inclusion in its annual report. After each update of the Pope County Hazard Mitigation Plan, each incorporating participant will be informed of the changes so they can reflect these changes in their plans also.

More specifically, the Pope County Hazard Mitigation Plan will be incorporated into the State of Arkansas Hazard Mitigation Plan. The risk assessment and mitigation strategies will be incorporated into the State Hazard Mitigation Plan during their updating process every three years. Pope County will be incorporating the Pope County Hazard Mitigation Plan into the Pope County Emergency Operations Plan and county land use ordinances and/or plans by following the laws set forth by the county government. This process takes place during regular quorum court meetings. Cities may incorporate these plans into their existing land management plans, future development plans, and other plans and projects that pose a

loss due to hazards. Schools may also implement this plan into their project analysis for future building projects and the county, cities, and schools may use this plan for budgeting for projects important to the safety and wellbeing of the citizens of their communities.

The process will be continued into the next planning cycle. The entire Planning Area and its participants will continue to work hard to maintain a system of mitigation activities to reduce the amount of damage created by natural disasters. The Planning Team will work across the entire planning area to educate and prepare communities, so they are able to understand and prepare for the hazards that are prevalent to them. This will improve the decision process used to determine how and when hazards are mitigated to reduce the loss of life and resources.

7.3 Continued Public Involvement

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

Copies of the plan will continue to be catalogued and kept on hand at all of the public libraries in Pope County. Contained in the plan are the address, phone number, and e-mail of the Director of the Pope County Office of Emergency Management, the primary point of contact for the plan. Copies of the plan will continue to be kept at the Pope County Judge's Office and the Pope County 9-1-1/OEM Office.

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

There will also be a continued public involvement through newspaper articles and postings in public locations. In addition, the Planning Committee will make every attempt to ensure the public will be able to directly comment on and provide feedback about the Plan by posting the agenda and submitting meeting notice to the local media. This process will inform the county citizens on any changes or revisions of the Pope County Natural Hazard Mitigation Plan.

The public is an integral part of the planning process. The public's feedback will provide the mitigation sub-committee with information about all of Pope County and the cities and school districts to determine the best mitigation activities and to determine if the current activities are working.

Section 8. Acronyms

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

Section 9. Resolutions

Resolutions adopting the Pope County Hazard Mitigation Plan are attached, Cities of Atkins, Dover, Hector, London, Pottsville, Russellville, and Pope County. School districts are Atkins, Dover, Hector, Pottsville, and Russellville.

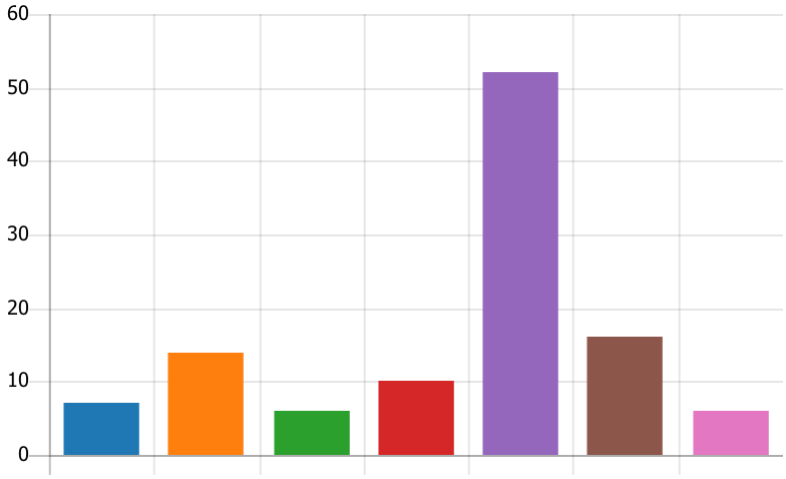
Appendix A-Public Questionnaire Results

Pope County Natural Hazards Questionnaire

111	11:08	Active	Ideas
Responses	Average time to complete	Status	

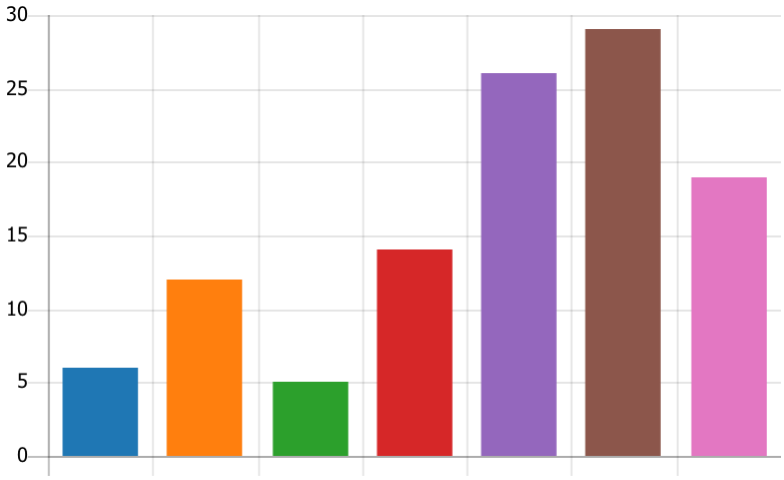
1. Please indicate the municipality you reside in:

Atkins	7
Dover	14
Hector	6
Pottsville	10
Russellville	52
Unincorporated Pope County	16
Other	6



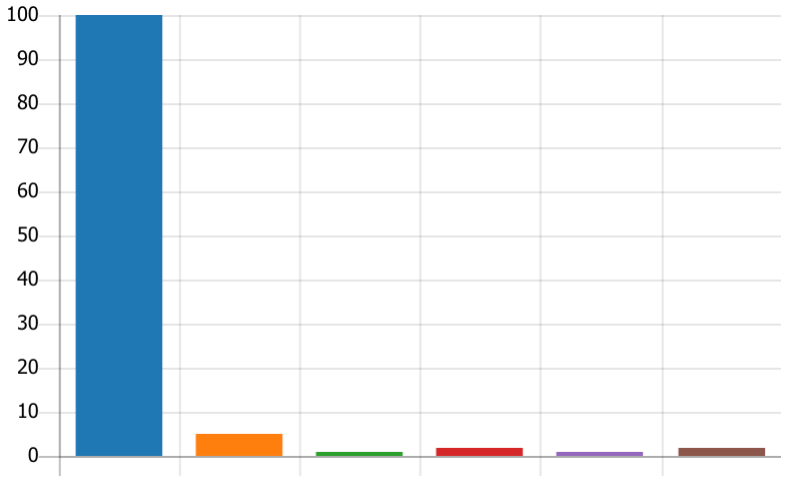
2. Campuses you visit:

Atkins School District	6
Dover School District	12
Hector School District	5
Pottsville School District	14
Russellville School District	26
Arkansas Tech University	29
Other	19



3. Are you responding as:

Citizen	100
Local Jurisdiction	5
Community Organization	1
Company	2
Non-Profit	1
Other	2



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

111
Responses

Latest Responses
"N/A"
"N/A"
"No"

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

Not Concerned	35
Somewhat Concerned	61
Very Concerned	15

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

111
Responses

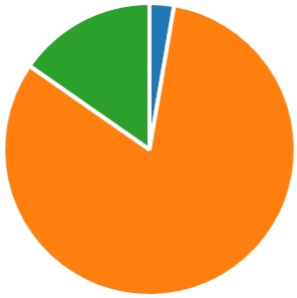
Latest Responses
"Natural disaster, nuclear disaster, epidemic"
"I BELIEVE IT IS ESSENTIAL TO HAVE A PLAN IN PLACE TO MITIGA
"I am concerned but not debilated by it. "

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

Yes	0
No	89
Not Sure	22

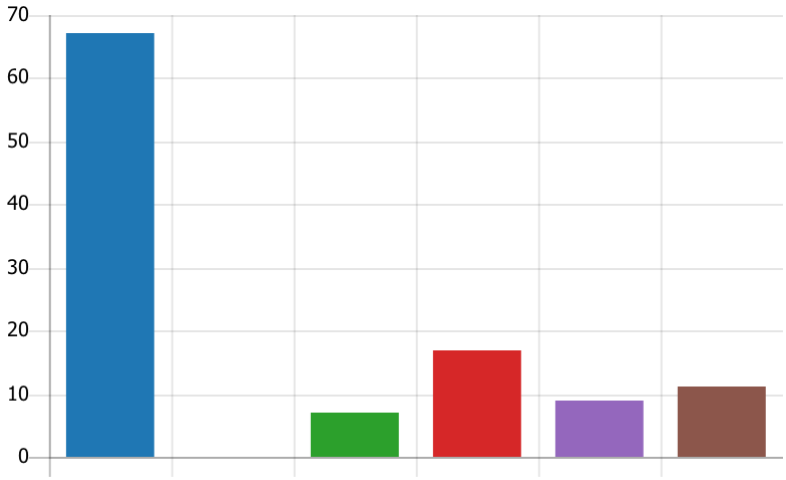
8. Do you have flood insurance on your home?

Yes	3
No	91
Not Sure	17



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

Not located in a floodplain	67
Located in floodplain but insu	0
Not necessary because it neve	7
Not necessary because my ho	17
Too expensive	9
Other	11

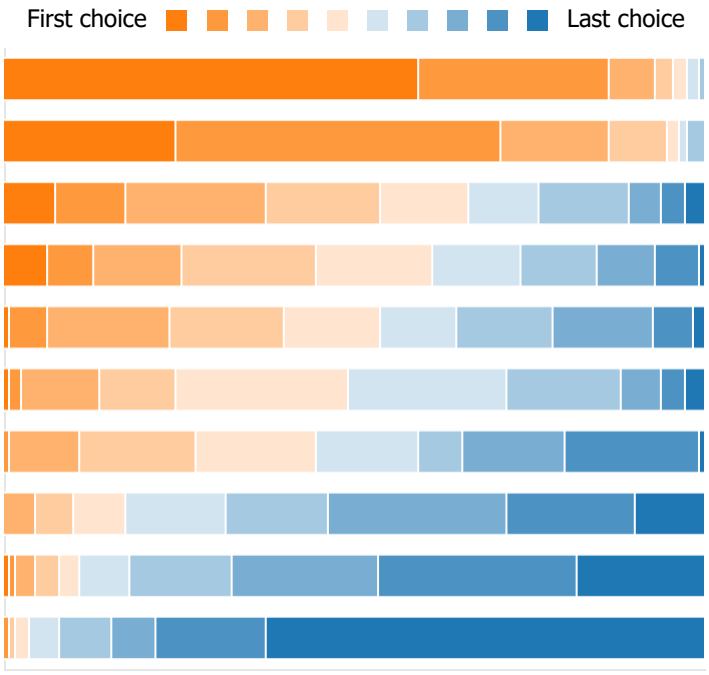


10. What is the most effective way for you to receive information about protecting your family and prepare your home from hazard events?

Television	31
Radio	10
Mail	27
Email	41
Public or School Meetings/Wo	2

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

1	Thunderstorm (ncluding High
2	Tornado
3	Flood
4	Wildfire
5	Extreme Heat
6	Drought
7	Winter Storms
8	Earthquake
9	Dam Failure
10	mud/landslides



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

111
Responses

Latest Responses
"Epidemic"
"N/A"
"No"

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

Yes	31
No	80

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

42
Responses

Latest Responses

15. Flood

76
Responses

Latest Responses
"N/A"
"Better drainage and flood zone knowledge. Where to go in an emer

16. Wildfire

74
Responses

Latest Responses
"LAND AREAS KEPT CLEAN AND TRIMMED"
"Fire Departments keep doing their good jobs and keep public notifi

17. Drought

65
Responses

Latest Responses
"Keep encouraging public to prioritize drought conditions. "

18. Earthquake

59
Responses

Latest Responses
"N/A"
"Have an earthquake plan and keep public informed on what to do. "

19. Sever Winter Storm

66
Responses

Latest Responses
"HAVE ESSENTIAL SUPPLIES ON HAND, COMMUNICATION WITH NE
"Keep public aware of potential hazards ahead of the winter storms. "

20. Thunderstorm (including high winds/lightning/hail)

63
Responses

Latest Responses
"SAME AS #19 ADD TAKE SHELTER"
"Keep public informed ahead of thunderstorm conditions. "

21. Tornado

69
Responses

Latest Responses
"SAME AS #20"
"Keep public informed ahead of tornado conditions. "

22. Dam Failure

57
Responses

Latest Responses
"N/A"
"Make dam inspections prioritized and educate public on what to do

23. Extreme Heat

57
Responses

Latest Responses
"HYDRATE, CHECK ON ELDERLY NEIGHBORS, SEEK SHADE, LIMIT P
"Keep public informed of pending extreme conditions and educate o

24. Mud/Landslide

54

Responses

Latest Responses

"N/A"

"Keep public informed of mud/landslide situations and educate how .

Appendix B-Supporting Documentation

NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Storm Events Database

Search Results for Pope County, Arkansas

Event Types: Flash Flood

30 events were reported between 01/01/1994 and 03/31/2022 (10317 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	28
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	10
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Column Definitions:
'Mag': Magnitude, 'Dth': Deaths, 'Inj': Injuries, 'PrD': Property Damage, 'CrD': Crop Damage

*Click on **Location** below to display details.*
Available Event Types have changed over time. Please refer to the Database Details for more information.

Sort By: Date/Time (Oldest)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	3.420M	0.00K
COUNTYWIDE	POPE CO.	AR	01/05/1998	03:00	CST	Flash Flood		0	0	0.00K	0.00K
SOUTHEAST PORTION	POPE CO.	AR	10/05/1998	21:50	CST	Flash Flood		0	0	0.00K	0.00K
RUSSELLVILLE	POPE CO.	AR	05/17/1999	16:00	CST	Flash Flood		0	0	0.00K	0.00K
DOVER	POPE CO.	AR	07/10/1999	17:30	CST	Flash Flood		0	0	0.00K	0.00K
EAST PORTION	POPE CO.	AR	02/16/2001	06:25	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	POPE CO.	AR	12/16/2001	15:30	CST	Flash Flood		0	0	0.00K	0.00K
NORTH PORTION	POPE CO.	AR	01/31/2002	12:00	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	POPE CO.	AR	03/19/2002	10:00	CST	Flash Flood		0	0	0.00K	0.00K
PELSOR	POPE CO.	AR	07/18/2002	09:30	CST	Flash Flood		0	0	0.00K	0.00K
RUSSELLVILLE	POPE CO.	AR	05/16/2003	14:30	CST	Flash Flood		0	0	0.00K	0.00K
RUSSELLVILLE	POPE CO.	AR	04/22/2004	01:30	CST	Flash Flood		0	0	0.00K	0.00K
SOUTH PORTION	POPE CO.	AR	04/24/2004	08:35	CST	Flash Flood		0	0	0.00K	0.00K
RUSSELLVILLE	POPE CO.	AR	01/13/2007	15:00	CST-6	Flash Flood		0	0	90.00K	0.00K
RUSSELLVILLE	POPE CO.	AR	09/09/2007	04:30	CST-6	Flash Flood		0	0	0.00K	0.00K
LONDON	POPE CO.	AR	03/18/2008	14:30	CST-6	Flash Flood		0	0	1.500M	0.00K
(RUE)RUSSELLVILLE MUNICI...	POPE CO.	AR	05/27/2008	06:45	CST-6	Flash Flood		0	0	0.00K	0.00K
AUGSBURG	POPE CO.	AR	06/13/2008	21:10	CST-6	Flash Flood		0	0	250.00K	0.00K
SAND GAP	POPE CO.	AR	09/03/2008	10:28	CST-6	Flash Flood		0	0	15.00K	0.00K
SIMPSON	POPE CO.	AR	05/06/2009	01:00	CST-6	Flash Flood		0	0	185.00K	0.00K
ATKINS	POPE CO.	AR	04/23/2010	15:04	CST-6	Flash Flood		0	0	0.10K	0.00K
RUSSELLVILLE	POPE CO.	AR	07/13/2011	15:45	CST-6	Flash Flood		0	0	25.00K	0.00K
LONDON	POPE CO.	AR	11/21/2011	19:30	CST-6	Flash Flood		0	0	1.000M	0.00K
MORELAND	POPE CO.	AR	01/12/2013	17:30	CST-6	Flash Flood		0	0	200.00K	0.00K
DOVER	POPE CO.	AR	01/12/2013	17:40	CST-6	Flash Flood		0	0	15.00K	0.00K
ATKINS	POPE CO.	AR	01/12/2013	17:40	CST-6	Flash Flood		0	0	15.00K	0.00K
ODITA	POPE CO.	AR	07/23/2014	14:25	CST-6	Flash Flood		0	0	125.00K	0.00K

GUM LOG	POPE CO.	AR	12/27/2015	22:05	CST-6	Flash Flood	0	0	0.00K	0.00K
ATKINS	POPE CO.	AR	06/05/2017	03:00	CST-6	Flash Flood	0	0	0.00K	0.00K
OAKLAND HGTS	POPE CO.	AR	08/15/2017	05:25	CST-6	Flash Flood	0	0	0.00K	0.00K
GUM LOG	POPE CO.	AR	09/02/2020	04:53	CST-6	Flash Flood	0	0	0.00K	0.00K
Totals:							0	0	3.420M	0.00K

NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Storm Events Database

Search Results for Pope County, Arkansas

Event Types: Flood

Pope county contains the following zones:
Pope

13 events were reported between 01/01/1994 and 01/31/2022 (10258 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	12
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	5
Number of Days with Event and Crop Damage:	4
Number of Event Types reported:	1

Column Definitions:
'Mag': Magnitude, 'Dth': Deaths, 'Inj': Injuries, 'PrD': Property Damage, 'CrD': Crop Damage

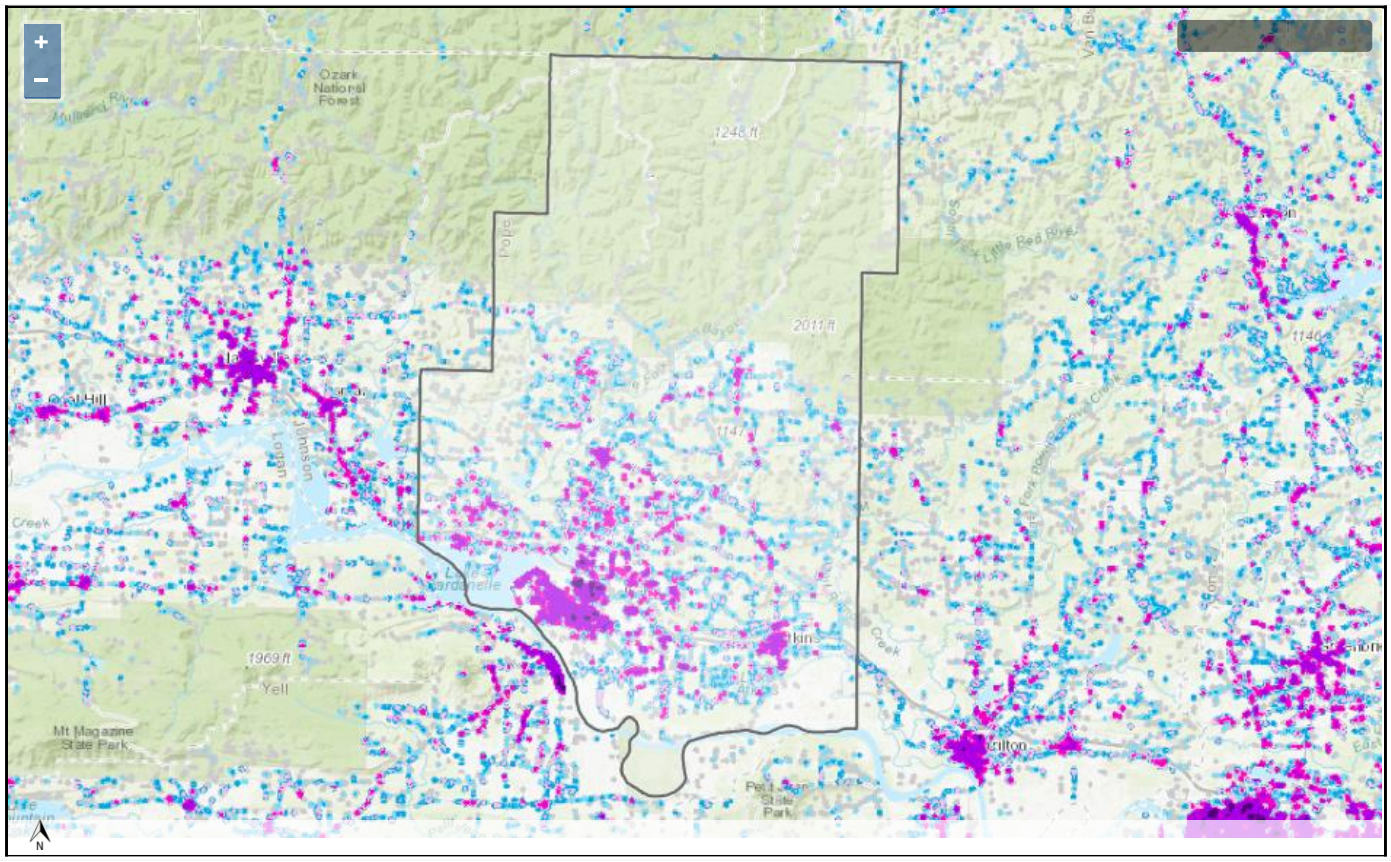
*Click on **Location** below to display details.*
Available Event Types have changed over time. Please refer to the Database Details for more information.

Sort By: Date/Time (Oldest)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	2.505M	1.625M
OAKLAND HGTS	POPE CO.	AR	04/24/2007	20:12	CST-6	Flood		0	0	0.00K	0.00K
ODITA	POPE CO.	AR	04/10/2008	12:00	CST-6	Flood		0	0	50.00K	100.00K
PELSOR	POPE CO.	AR	04/26/2011	02:00	CST-6	Flood		0	0	200.00K	0.00K
NORTH DARDANELLE	POPE CO.	AR	04/26/2011	05:40	CST-6	Flood		0	0	5.00K	25.00K
PELSOR	POPE CO.	AR	05/01/2011	00:00	CST-6	Flood		0	0	250.00K	1.000M
NORTH DARDANELLE	POPE CO.	AR	05/11/2015	03:00	CST-6	Flood		0	0	0.00K	0.00K
SOUTH NEW HOPE	POPE CO.	AR	05/26/2015	03:00	CST-6	Flood		0	0	0.00K	0.00K
OAKLAND HGTS	POPE CO.	AR	06/01/2015	00:00	CST-6	Flood		0	0	0.00K	0.00K
OAKLAND HGTS	POPE CO.	AR	12/28/2015	01:50	CST-6	Flood		0	0	0.00K	0.00K
OAKLAND HGTS	POPE CO.	AR	01/01/2016	00:00	CST-6	Flood		0	0	0.00K	0.00K
HUMPHREY	POPE CO.	AR	05/24/2019	18:05	CST-6	Flood		0	0	1.000M	500.00K
ODITA	POPE CO.	AR	06/01/2019	00:00	CST-6	Flood		0	0	1.000M	0.00K
NORTH DARDANELLE	POPE CO.	AR	04/29/2021	16:44	CST-6	Flood		0	0	0.00K	0.00K
Totals:								0	0	2.505M	1.625M

Pope County, AR

Topo base layer, Community Risk Assessment, Where People Live

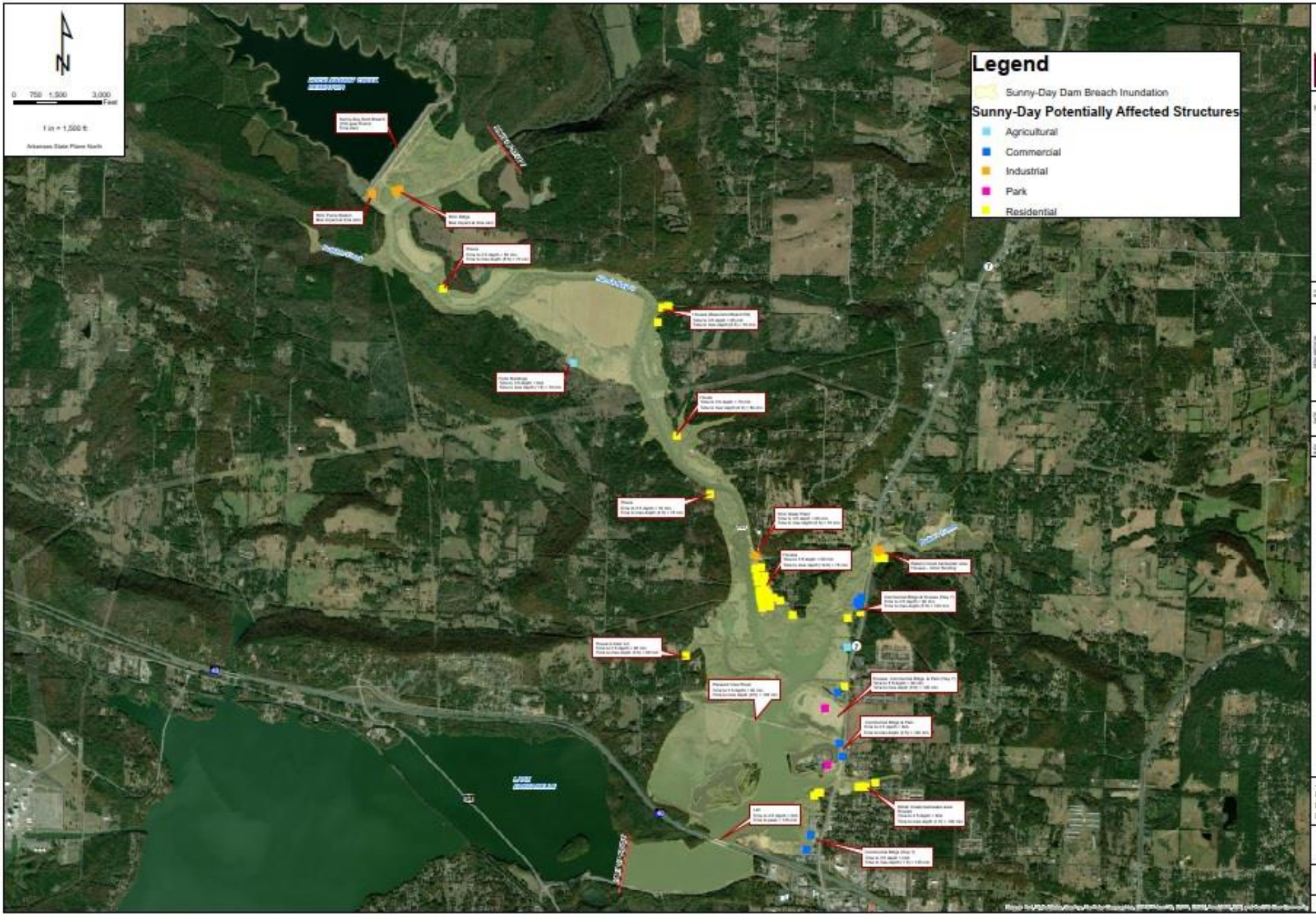


Report Created:
5/3/2022 - 10:36:34 AM

SGSF Wildfire Risk Assessment Portal
https://www.southernwildfirerisk.com

Where People Live

- No Data
- 1 - LT 1 hs/40 ac
- 2 - 1 hs/40 to 1 hs/20 ac
- 3 - 1 hs/20 to 1 hs/10 ac
- 4 - 1 hs/10 to 1 hs/5 ac
- 5 - 1 hs/5 to 1 hs/2 ac
- 6 - 1 hs/2 to 3 hs/ac
- 7 - GT 3 hs/ac



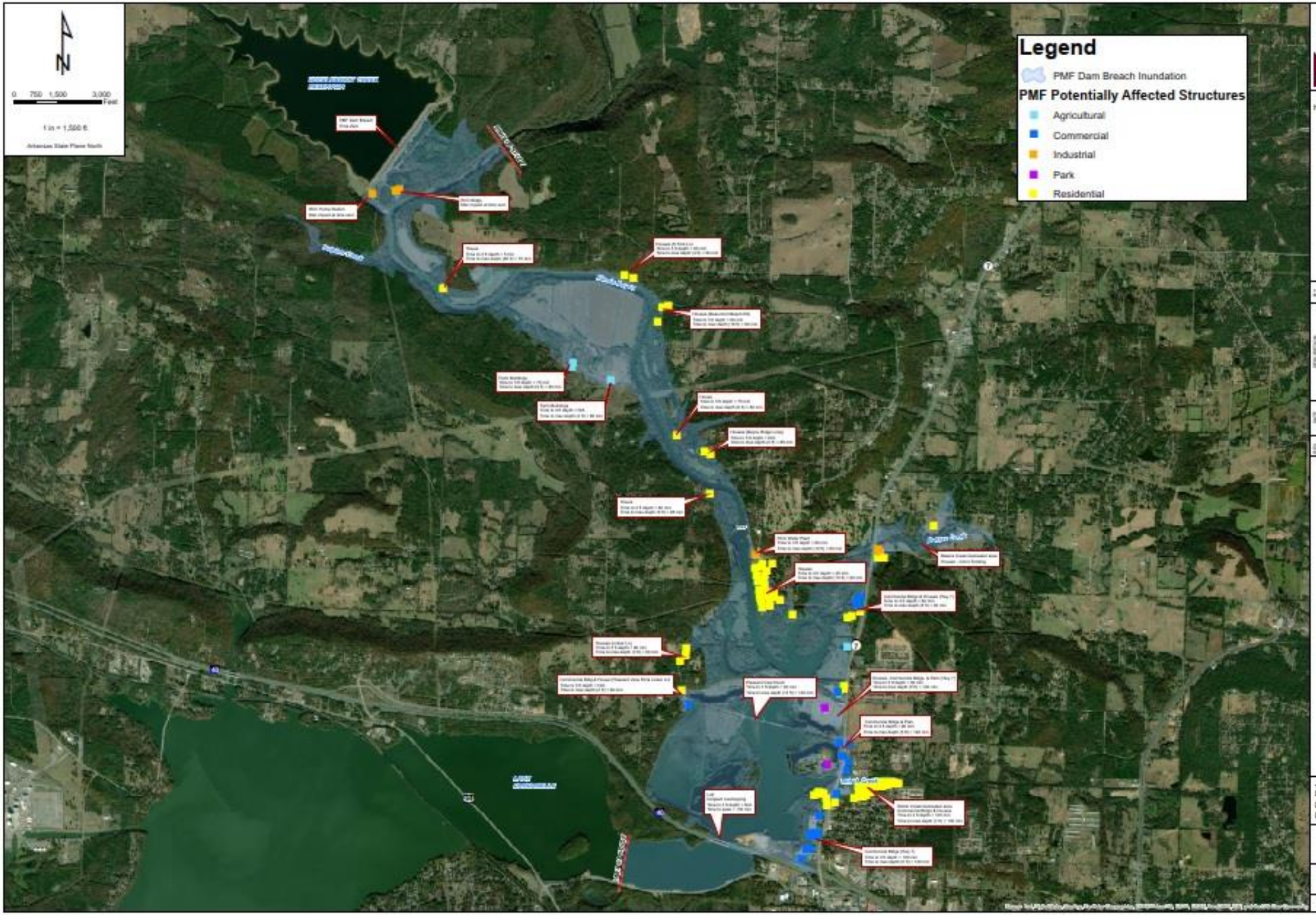
GARVER
4701 Northshore Drive
North Little Rock, AR 72118
501.370.3633

RUSSELLVILLE CITY CORPORATION
RUSSELLVILLE AR
HUCKLEBERRY CREEK RESERVOIR
DAM BREACH ANALYSIS
SUNNY DAY DAM BREACH INUNDATION MAP

JOB NO.: 18018335
DATE: DECEMBER 2018
DESIGNED BY: NA
DRAWN BY: MAH

DRAWING NUMBER
SD-01

SHEET NUMBER: 1



GARVER

4701 Northshore Drive
North Little Rock, AR 72118
501.376.3833

RUSSELLVILLE CITY CORPORATION
RUSSELLVILLE AR
HUCKLEBERRY CREEK RESERVOIR
DAM BREACH ANALYSIS
PMF DAM BREACH INUNDATION MAP

JOB NO.: 19018335
DATE: DECEMBER 2019
DESIGNED BY: NA
DRAWN BY: MAH

BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET SCALE AT

DRAWING NUMBER:
PMF-01

SHEET NUMBER: 1

Huckleberry Creek Reservoir
Dam Breach Analysis

Hydraulic Study Report

Russellville City Corporation
Russellville, Arkansas

Prepared by:

4701 Northshore Drive
North Little Rock, AR 72118

January 2, 2019

Garver Project No.: 18018335

Engineer's Certification

I hereby certify that this Dam Breach Analysis for the Huckleberry Creek Reservoir was prepared by Garver under my direct supervision for Russellville City Corporation.

Mark A. Hammons, PE
State of Arkansas PE License 9819

Table of Contents

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Inundation Map for PMF Dam Breach Event
Inundation Map for Sunny-Day Dam Breach Event

Disclaimer

The events simulated for this analysis represent failure of Huckleberry Creek Reservoir Dam. The probabilities of these events are undetermined, but are very low. The analysis was conducted to support dam reclassification and can be used for emergency planning, including the development of an Emergency Action Plan for the dam. The information in this report in no way reflects on the current condition of the dam (e.g., safety, structural integrity, flood routing capacity).

1.0 Project Information

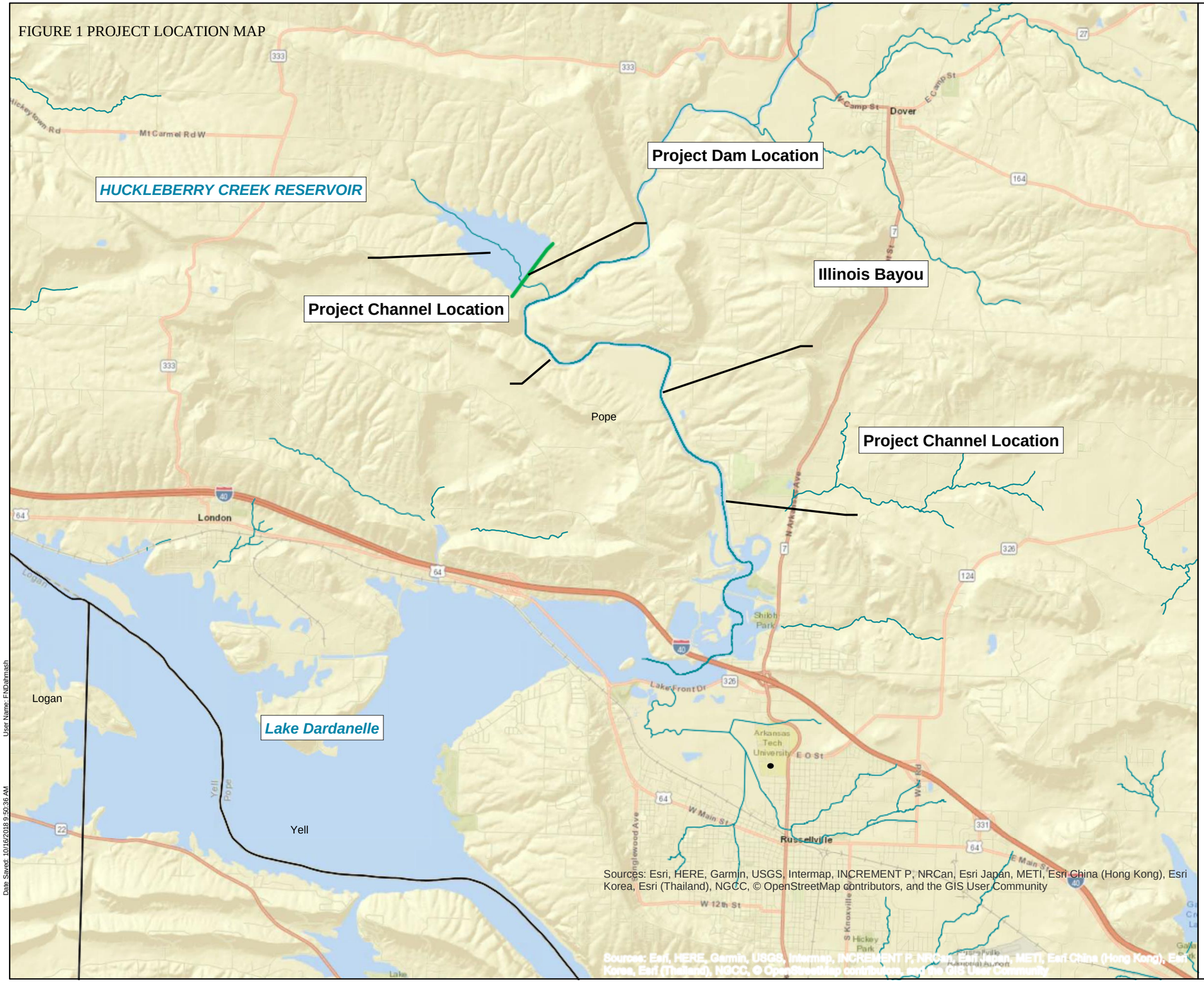
Pursuant to a request from the Arkansas Natural Resources Commission (ANRC), Russellville City Corporation (RCC) desires technical information to support a potential reevaluation of the hazard classification of Huckleberry Creek Reservoir Dam. The dam is currently classified as "large dam, significant hazard." The potential updated classification is "large dam, high hazard." The reevaluation involves development of hydrologic and hydraulic analysis and dam breach inundation mapping. This report discusses the hydrologic and hydraulic analysis and mapping developed for the project.

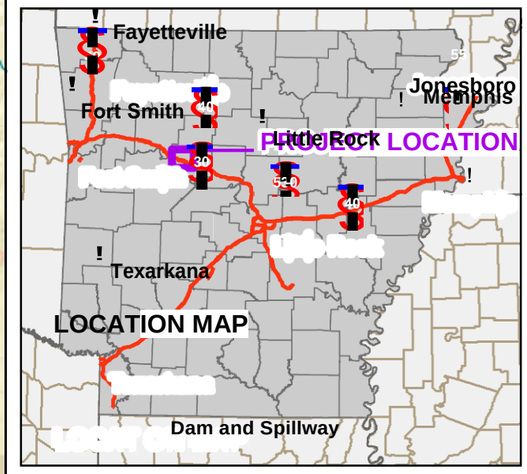
Huckleberry Creek Reservoir serves as a water supply reservoir. The reservoir was created by impounding Huckleberry Creek near its confluence with Illinois Bayou. Illinois Bayou flows generally from north to south in the project area downstream of Huckleberry Creek. Illinois Bayou is a tributary of Lake Dardanelle, which is impounded by Dardanelle Lock and Dam on the Arkansas River. The upstream limit of Lake Dardanelle on Illinois Bayou is considered to be the low-head dam/weir just upstream of the RCC Water Treatment Plant (WTP). The weir is approximately 4 stream miles downstream of the Huckleberry Creek Dam spillway. It is approximately 6.5 stream miles along Illinois Bayou from the Huckleberry Creek Dam spillway to the I-40 crossing of Illinois Bayou/Lake Dardanelle. Figure 1 shows the project location.

Two conditions were considered for the dam breach analysis and mapping:

1. The probable maximum precipitation (PMP) event on the Huckleberry Creek watershed, leading to the probable maximum flood (PMF) inflow into Huckleberry Creek Reservoir. The dam breach is triggered when the reservoir elevation reaches the top of the dam. The resulting PMF dam breach hydrograph is combined with the 100-year (1% annual exceedance probability, AEP) flood on Illinois Bayou. This is considered the PMF dam breach event on Illinois Bayou downstream of the confluence with Huckleberry Creek.
2. The 100-year (1% AEP) rainfall event on Huckleberry Creek watershed. The dam breach is triggered when the reservoir elevation reaches 10 feet below the top of dam, which is the spillway elevation. The resulting dam breach hydrograph is combined with the 25-year (4% AEP) flood on Illinois Bayou. This is considered the "sunny-day" dam breach event on Illinois Bayou downstream of Huckleberry Creek. The "sunny-day" terminology may be misleading because a flood event is used to trigger the dam breach event, but it is much less than the dam and spillway are designed to pass. The key characteristic of the sunny-day dam breach is that there is no expectation or warning of the dam failure. The sunny-day dam breach should be considered a sudden, catastrophic failure for unknown reasons. Although the hydrologic conditions are not as severe as the PMP, it is also a very low-probability event.

FIGURE 1 PROJECT LOCATION MAP





0 6,000 12,000 Feet

NAD83 State Plane Arkansas North

CITY CORPORATION
RUSSELLVILLE WATER & SEWER

GARVER

Document Path: L:\2018\18018335 - HCR H and H Study\GIS\Maps\Figure 1 (Project Location)updated.mxd
Date Saved: 10/16/2018 9:50:36 AM
User Name: FN\Dahmash

2.0 Sources of Information

The project area is located just north of Russellville, Arkansas in Pope County, in the west-central Arkansas region. Location coordinates for the dam spillway were determined using the USGS Russellville West, Arkansas quadrangle, with the approximate latitude and longitude of 35°22'10.62"N, 93°11'30.23"W. The quadrangle coordinates are based on the North American Datum of 1983 (NAD83).

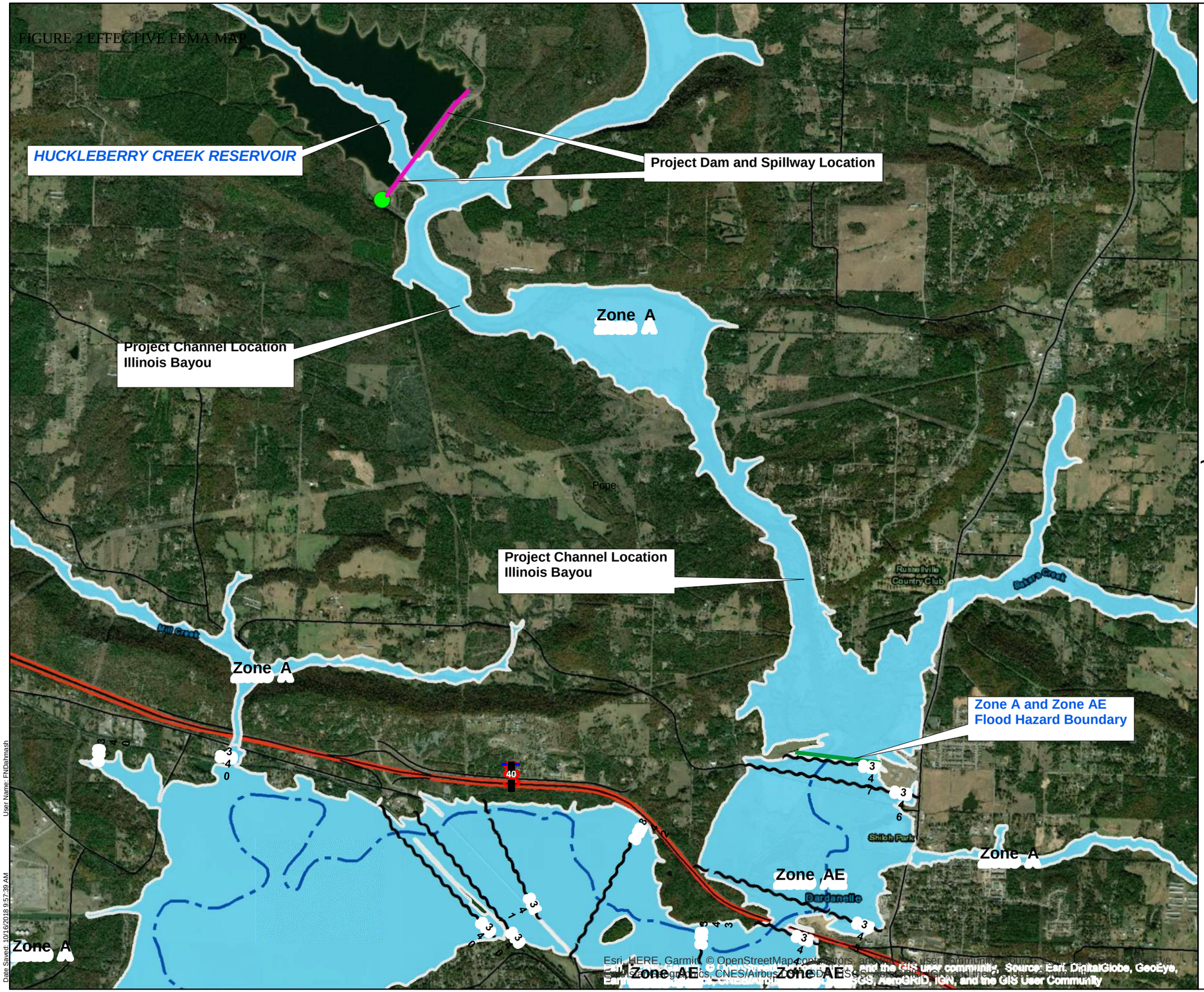
The project area is located within FEMA Flood Insurance Rate Map (FIRM) numbers 05115C0250E and 05115C0375E, (both with effective date of March 2, 2010) and 05115C0370F (effective date of April 17, 2012). The effective FEMA floodplain map based on FEMA National Flood Hazard Layer (NFHL) digital data is shown on Figure 2.

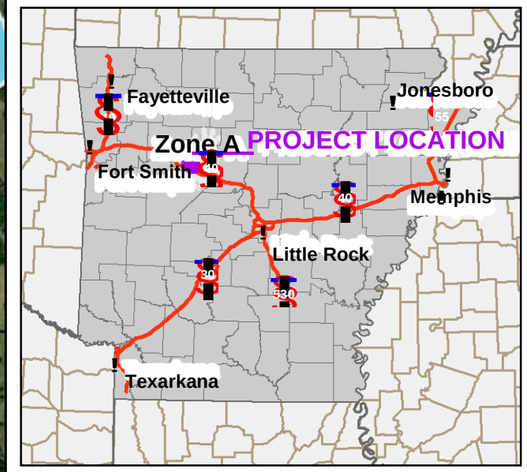
Most of Illinois Bayou in the project area is mapped as a Zone A floodplain (approximate area, no detailed study performed and Base Flood Elevations, BFEs, not determined). Beginning at a location approximately 900 feet upstream of the Pleasant View Road bridges, Lake Dardanelle is mapped as a Zone AE floodplain (detailed study performed and BFEs determined) with no regulatory floodway. The Pope County Flood Insurance Study (FIS) report number 05115CV000B (Revised April 17, 2012) provides the Illinois Bayou 100-year discharge at the Water Supply Dam location (125,000 cfs). This is assumed to be at the low-head dam/weir upstream of the RCC WTP and not at Huckleberry Creek Reservoir.

Recently published online information from FEMA indicates that a Base Level Engineering (BLE) study has been performed for Illinois Bayou. A BLE study includes limited-detail hydraulic modeling and is intended to supplant Zone A information. Garver attempted to obtain the BLE modeling data for Illinois Bayou from FEMA, but this data was not available within the schedule of this project. At most, the BLE hydraulic model might have formed a basis for the dam breach hydraulic modeling, but it is likely that it would have required significant augmentation or modification.

Based on a survey data request developed by Garver, RCC contracted with a local surveying firm to collect field survey to support this project. Field survey data was limited, consisting of 8 Illinois Bayou channel cross sections surveyed between the Huckleberry Creek Dam spillway and Lake Dardanelle. The vertical datum of the survey is North American Vertical Datum of 1988 (NAVD88). The field survey data was supplemented with available LiDAR to generate a full floodplain ground surface for the hydraulic models. The LiDAR data was downloaded as raster digital elevation model (DEM) tiles from the USGS National Map website. The raster DEMs were mosaicked into a seamless DEM covering the entire project area. The DEMs were projected to Arkansas State Plane North and elevations were converted to feet NAVD88. RCC also provided as-built plans for the Pleasant View Road and I-40 bridges over Illinois Bayou/Lake Dardanelle.

FIGURE 2 EFFECTIVE FEMA MAP





Dam and Spillway Location

Dam Emergency Spillway Location

EFFECTIVE BASE FLOOD ELEVATION (BFE)*

EFFECTIVE PROFILE BASELINE*

* Data taken from National Flood Hazard Layer (NFHL) DFIRM data for Pope County, AR. Effective panels are dated March 02, 2010.

0 3,000 6,000 Feet

NAD83 State Plane Arkansas North

CITY CORPORATION
RUSSELLVILLE WATER & SEWER

GARVER

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3.0 Hydrologic Analysis

3.1 Illinois Bayou FEMA Data and USGS Regional Regression Hydrologic Analysis

As previously discussed, effective FEMA hydrologic data for Illinois Bayou were available at the water supply dam location (low-head dam/weir upstream of RCC WTP) for the 100-year event. The information provided in the FIS report is given in Table 1. The methodology used to compute the Illinois Bayou peak discharge listed in the FIS report is unknown.

Table 1. Effective FEMA Summary of Discharges for Illinois Bayou

Flooding Source and Location	Drainage Area (sq. mi.)	100-Year Peak Discharge (cfs)
Illinois Bayou at the Water Supply Dam	336	125,000

For this study, a limited-detail hydrologic analysis of Illinois Bayou was performed using USGS regional regression equations for Arkansas Region A. USGS StreamStats version 4.2.1 was utilized to determine necessary characteristics of the watershed. The drainage point was set just downstream of Huckleberry Creek Reservoir Dam. The results of the USGS regional regression hydraulic analysis for Illinois Bayou are summarized in Table 2.

Table 2. USGS Regional Regression Equation Data and Results for Illinois Bayou at Confluence with Huckleberry Creek

Hydrologic Characteristic	Value
Drainage Area*	323 sq. mi.
Mean Basin Elevation*	1,110 ft
25-year Peak Discharge	55,700 cfs
100-year Peak Discharge	83,700 cfs

* Value determined using USGS StreamStats version 4.2.1.

Comparing Table 1 and Table 2 shows that the USGS regional regression equation 100-year peak discharge at the confluence of Huckleberry Creek is about 33% less than the FIS 100-year discharge at the low-head dam/weir upstream of the RCC WTP. Accounting for the difference in Illinois Bayou drainage area between the confluence with Huckleberry Creek and the low-head dam/weir downstream, the FIS discharge is still substantially higher. It was noted that the higher FIS discharge value falls near the upper end of the standard error of prediction of the USGS regional regression equations. Based on professional judgment, the USGS regional regression equation Illinois Bayou discharges were used in this analysis because they are based on current USGS methodology and because discharges for other storm events are available, as opposed to the FIS report, which lists only the 100-year discharge. The Illinois Bayou discharges were used in combination with computed dam breach flows from Huckleberry Creek for hydraulic modeling of Illinois Bayou.

3.2 Huckleberry Creek Reservoir HEC-HMS Hydrologic Analysis

An HEC-HMS hydrologic model of the Huckleberry Creek watershed and reservoir was developed for this analysis. The Huckleberry Creek drainage area and the longest flow path are shown in Figure 3, and the corresponding HEC-HMS model schematic is shown in Figure 4.

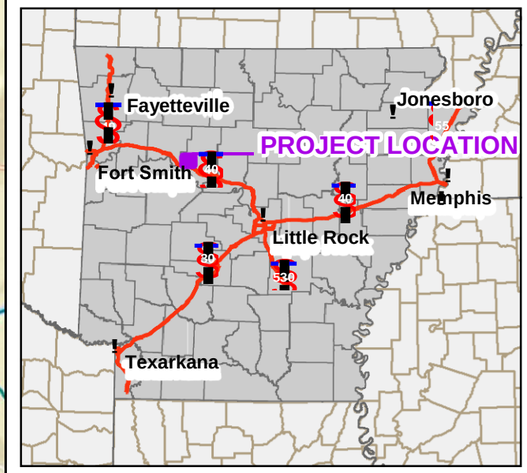
FIGURE 3 DRAINAGE BASIN MAP

Drainage Area = 8.29 sq. mi.

Longest Flow Path
4.744 Miles

HUCKLEBERRY CREEK RESERVOIR

Illinois Bayou



Drainage Point*

Project 10-85 Slope Points*

LongestFlowPath3D_Projected*

Main Streams

Project Drainage Basin*

* Determined using StreamStats version 4

0 3,000 6,000 Feet

NAD83 State Plane Arkansas North

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GARVER

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

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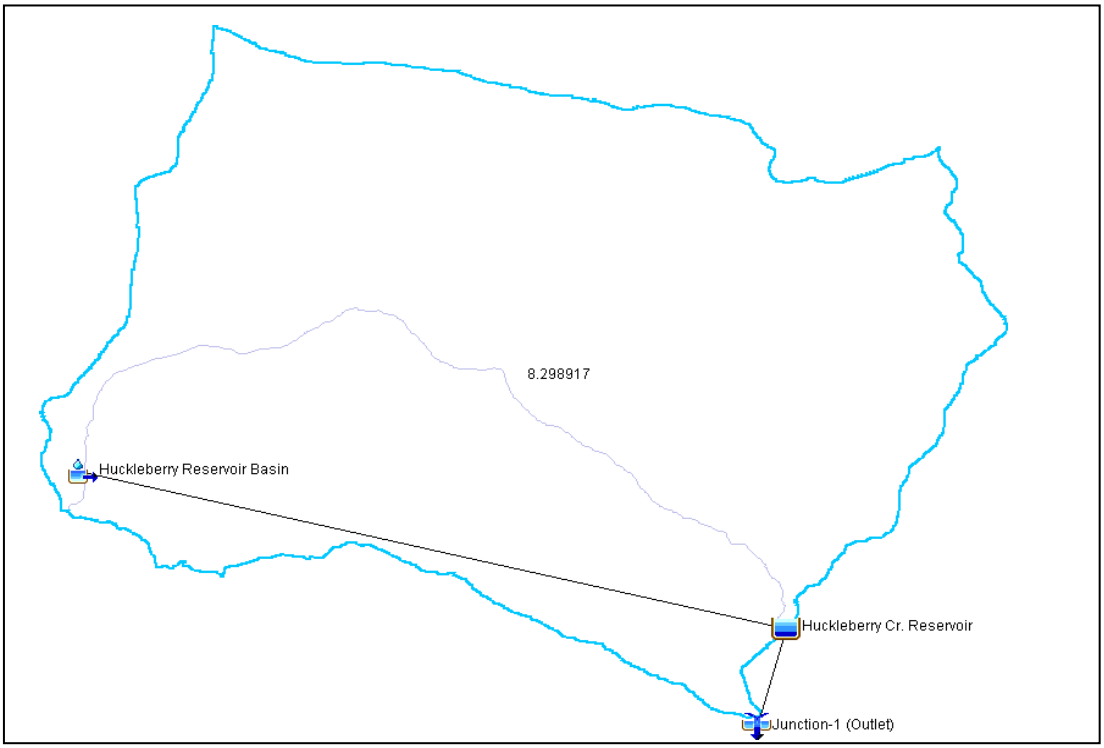


Figure 4. HEC-HMS Model Schematic for Huckleberry Creek Reservoir Drainage Area

The hydrologic modeling of the Huckleberry Creek drainage area and reservoir, as well as the dam breach simulation, was performed using HEC-HMS version 4.2.1. The NRCS (formerly SCS) curve number method was used for the rainfall-to-runoff transformation. The HEC-HMS model simulates the surface runoff given the precipitation rates and accounting for the watershed properties. It also performs reservoir routing based on the elevation-storage characteristics of the reservoir and performs dam breach calculations based on user input.

As previously discussed, the two Huckleberry Creek Reservoir hydrologic scenarios of concern for this analysis are the probable maximum precipitation (PMP) event and the 100-year (1% AEP) event. It should be noted that the PMP event has no associated probability, but is generally thought to be at least a 10,000-year (0.01% AEP) event. The PMP rainfall data was obtained from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Hydrometeorological Report HMR-51 and HMR-52. The 100-year event precipitation was obtained from NOAA Atlas 14.

The various temporal distributions of the all-season 5-minute incremental PMP were applied to the Huckleberry Creek Reservoir watershed using the time series precipitation gage option in HEC-HMS. Base flow was applied as a constant discharge based on average mean monthly discharge rate per drainage area estimate for USGS gage Huckleberry Creek near Augsburg, AR (07257693). The 72-hr cumulative PMP storm depth plot is shown in Figure 5, and the corresponding data is provided in Table 3 along with the incremental depth data.

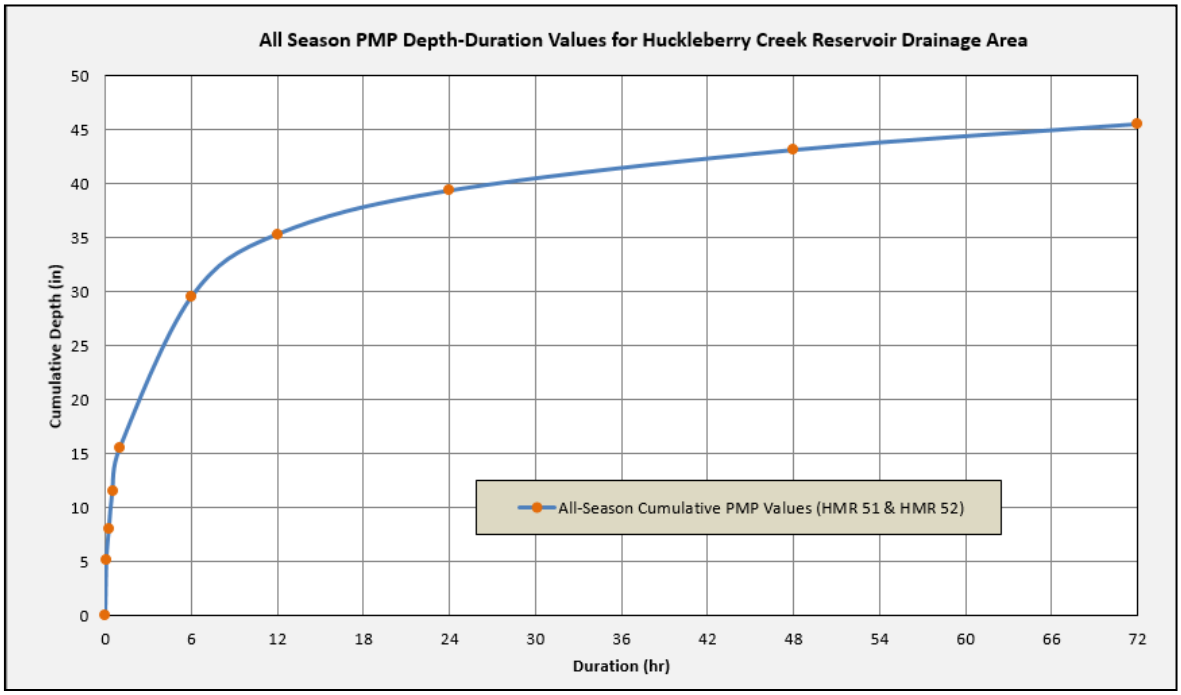


Figure 5. 72-hr Cumulative PMP Storm Depth

Table 3. 72-hr Cumulative and Incremental PMP Storm Depths

Duration (hour)	Cumulative PMP (inch)	Incremental PMP (inch)
0	0	0
0.083	5.09	5.09
0.25	7.98	2.90
0.5	11.55	3.57
1	15.48	3.93
6	29.50	14.02
12	35.33	5.83
24	39.38	4.05
48	43.14	3.77
72	45.54	2.40

3.2.1 Reservoir Characteristics and Dam Breach Parameters

The characteristics of the Huckleberry Creek Dam utilized in the HEC-HMS model are shown in Table 4. The data was obtained from the dam as-built drawings. The vertical datum correction between the as-built drawings (NGVD29) and NAVD88 was determined to be 0.075 feet at the project location (NAVD88 = NGVD 29 + 0.75 feet). The other coefficients are determined as recommended from the HEC-HMS Reference Manual.

Table 4. Huckleberry Creek Dam Characteristics Used in HEC-HMS Model

Parameter	Structural Element		
	Outlet	Spillway	Top of Dam
Elevation (ft NAVD88)	401.075	460.075	470.075
Area (ft^2)	12.566	N/A	N/A
Length (ft)	N/A	325	4250
Coefficient	0.6 (orifice)	2.6 (weir)	2.6 (weir)

In general, there is considerable uncertainty in dam breach parameters. The dam breach characteristics utilized in the HEC-HMS model are determined based on the Froehlich 2008 method, which is an established method for estimation of dam breach parameters. The specific parameters needed are provided in Table 5. The dam is designated as a rock-fill dam based on the plans and on the National Inventory of Dams (NID) designation. According to the HEC-HMS Reference manual and other related references, it is unlikely that a rock-fill dam would be breached internally (piping failure), but rather it will fail due to overtopping. Therefore, an overtopping breach in the main direction of flow is considered for this analysis. For the PMP dam breach, the trigger elevation for the breach is selected to be equal to the top of the dam. The Froehlich 2008 method recommends a range for the trigger elevation for overtopping breach scenarios from the top of the dam to around 2 feet below that elevation as deemed appropriate based on specific site and dam conditions and characteristics. For the PMP dam breach, the top of dam was chosen as the trigger elevation to maximize reservoir storage and thus maximize the dam breach outflow. For the sunny-day dam breach, the trigger elevation for the breach was selected to be the spillway elevation. Although this is in contradiction of the overtopping criterion, the sunny-day dam breach is by definition an unexpected failure. For both events, the initial reservoir elevation at the start of the simulation was set at the normal pool elevation, which is also the spillway elevation. For both simulations, the reservoir elevation drops slightly at the beginning of the simulation due to outflow from the pipe outlet before inflow from the watershed overcomes the capacity of the outlet(s) and the breach is triggered.

Table 5. Huckleberry Creek Reservoir Dam Breach Parameters Used in HEC-HMS Model

Parameter	Dam Breach Value/Method Utilized
Initial Reservoir Elevation (ft NAVD88)	460.075
Top Elevation (ft NAVD88)	470.075
Bottom Elevation (ft NAVD88)	380.075
Bottom Width (ft)	300
Left Slope (xH:1V)	1
Right Slope (xH:1V)	1
Development Time (hr)	1
Trigger Method	Reservoir Elevation
PMP Trigger Elevation (ft NAVD88)	470.075
Sunny-Day Trigger Elevation (ft NAVD88)	460.075
Breach Progression Method	Linear

3.2.2 Hydrologic Model Results

The computed PMP dam breach hydrograph for Huckleberry Creek Reservoir is shown in Figure 6. As expected, the peak outflow is extremely high (478,328 cfs) and the duration of high flows is very short; that is, the reservoir empties rapidly as a result of the dam breach. The dates on the x-axis in Figure 6 are arbitrary and are not intended to represent any actual event or time. The dam breach is triggered on January 3 at 12:40 AM, and the peak flow occurs at 1:50 AM. For input to the hydraulic model, the PMP dam breach hydrograph is combined with the Illinois Bayou 100-year peak discharge (83,700 cfs, Table 2). The underlying assumption is that during a PMP event on the Huckleberry Creek watershed, there will also be a simultaneous significant flood event on Illinois Bayou. This is a reasonable assumption since the storm event required to produce a PMP event on the Huckleberry Creek watershed will also produce heavy precipitation over a large area. The Illinois Bayou 100-year peak discharge is constant throughout the simulation.

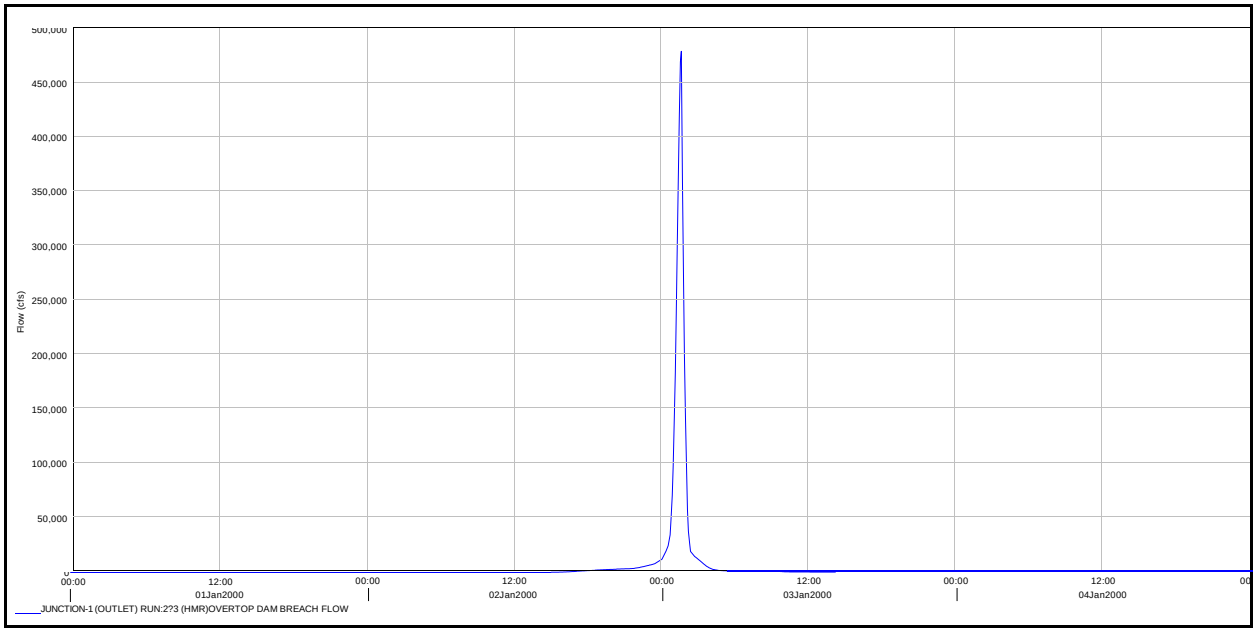


Figure 6. Huckleberry Creek Reservoir PMP Dam Breach Hydrograph

Figure 7 shows the computed hydrograph for the sunny-day event. The dam breach is triggered on January 1 at 12:30 AM and the peak flow occurs at 1:25 AM. The peak discharge is 373,450 cfs. For input to the hydraulic model, the PMP dam breach hydrograph is combined with the Illinois Bayou 25-year peak discharge (55,700 cfs,Table 2) for the same reasoning; that is, the storm that produces a 100-year event on the Huckleberry Creek watershed could also be expected to produce significant rain on the Illinois Bayou watershed.

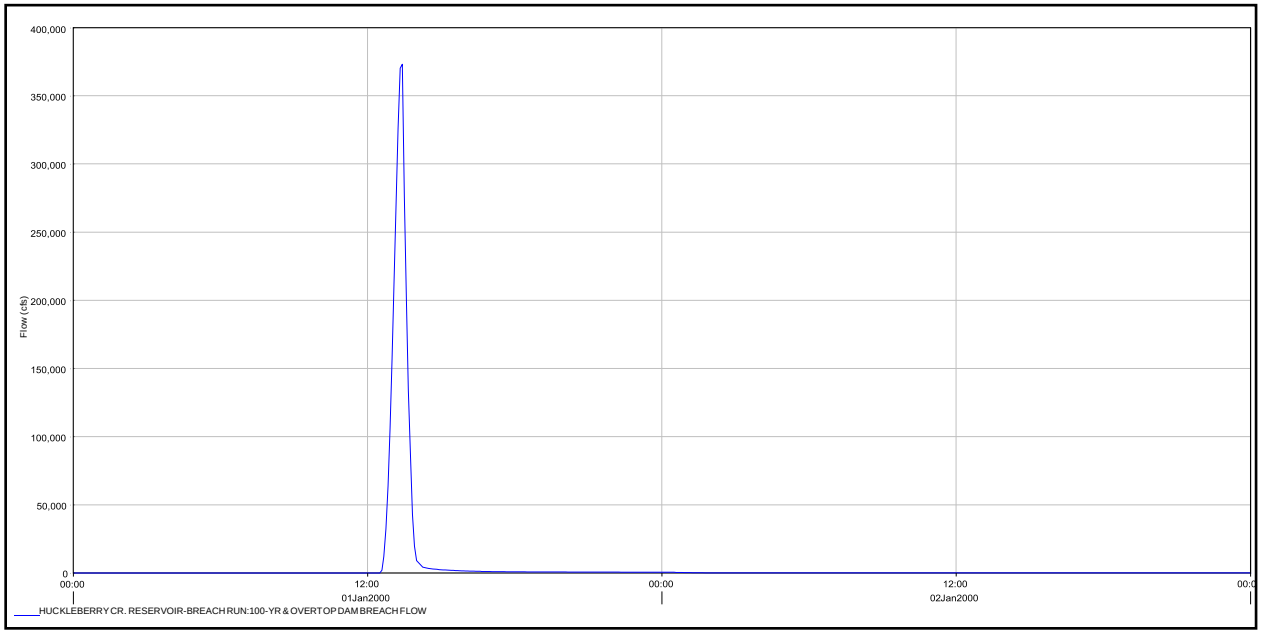


Figure 7. Huckleberry Creek Reservoir Sunny-Day Dam Breach Hydrograph

4.0 Hydraulic Modeling

The hydraulic analysis of Illinois Bayou for the Huckleberry Creek Reservoir dam breach scenarios was performed using one-dimensional (1D) unsteady state hydraulic modeling in HEC-RAS version 5.0.5 to determine flow rates and water surface elevations (WSELs) at locations of interest. The hydraulic model extends from just south of the Huckleberry Creek spillway Lake Dardanelle downstream of the I-40 bridges as shown in Figure 8.

4.1 Model Boundary Conditions

Boundary conditions must be specified at the upstream and downstream limits of the hydraulic model. For the PMP dam breach model, the upstream boundary condition is a hydrograph consisting of the combination of the Illinois Bayou 100-year peak flow (83,700 cfs) and the PMP dam breach hydrograph shown in Figure 6. The downstream boundary condition is the 100-year FEMA BFE on Lake Dardanelle near the downstream limit of the model (343 feet NAVD88). For the sunny-day dam breach model, the upstream boundary condition hydrograph is a combination of the Illinois Bayou 25-year peak flow (55,700 cfs) and the sunny-day dam breach hydrograph shown in Figure 7. The downstream boundary condition is the approximate Lake Dardanelle normal pool elevation (338 feet NAVD88).

The assumption that the entire dam breach hydrograph travels in the downstream direction is considered conservative for the purposes of this analysis. In reality, the dam breach flows would enter Illinois Bayou laterally and “slosh,” with part of the flow traveling upstream and part traveling downstream. This would have the effect of reducing peak discharges downstream. However, this phenomenon is difficult to simulate with a 1D hydraulic model and would require extending the model upstream an unknown distance (far enough to capture the extent of the upstream “slosh,” which can only be determined through trial and error). A two-dimensional (2D) model would capture the “slosh” effect much more accurately than

a 1D model. However, an extended 1D model or a 2D model is beyond the scope of this project. The model as developed is intended to depict a worst-case scenario for the purpose of providing information for re-classifying the dam and for emergency planning. From that standpoint, the model meets its objectives. If the most realistic results are desired, an extended 2D model is suggested.

4.2 Model Geometry

HEC-RAS model cross sections as shown in Figure 8 were located and oriented as required for proper hydraulic modeling of the floodplain. Unsteady dam breach models are notoriously difficult to execute due to the extreme steepness of the flood wave. Numerous iterations of cross section configurations were developed as the model was refined. The cross section layout captures major features in the floodplain including channel bends and variation in valley width.

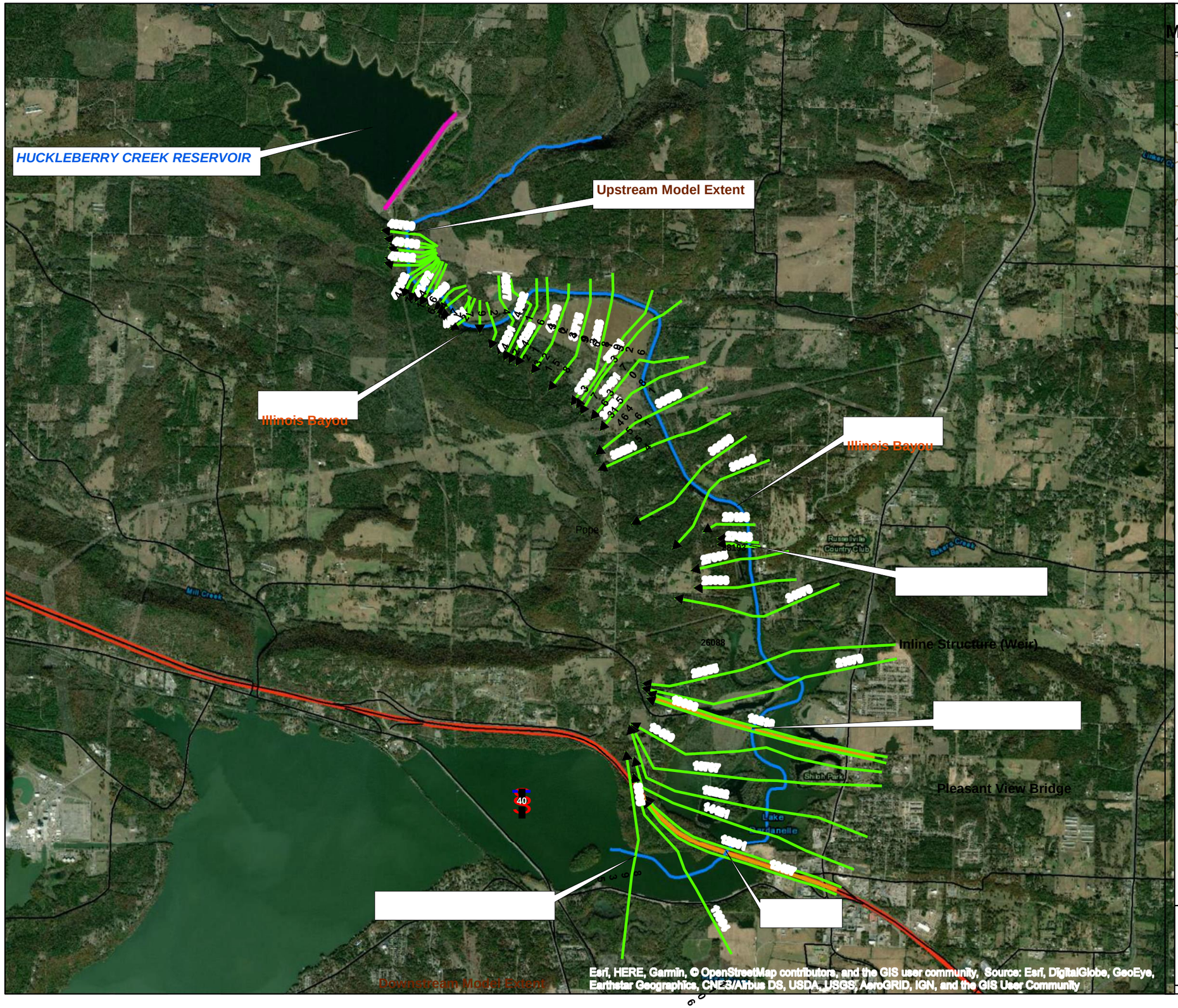
The overbanks of the floodplain were represented by LiDAR data. The channel bathymetry was based on extrapolation of limited field survey data provided by RCC. Because the focus of this analysis is extremely high dam breach flows, the channel bathymetry is relatively less important than it would be for lower discharges. The bathymetry of Lake Dardanelle was estimated based on available online depth charts of the lake.

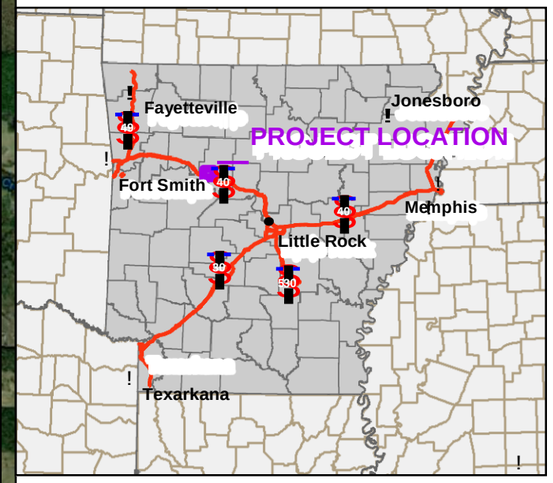
Bridges at Pleasant View Road and I-40 were incorporated into the model based on as-built plans and LiDAR. There are two bridge openings at Pleasant View Road. This required a multiple opening analysis in HEC-RAS to distribute the flow between the two bridges. The Pleasant View Road bridges and approach embankments are significantly overtopped for the dam breach peak flows considered in this analysis. The west Pleasant View Road bridge is shown in Figure 9.

The I-40 bridge crossing consists of dual parallel bridges, which were simulated as a single wide bridge opening in HEC-RAS – a standard hydraulic modeling approach. The I-40 roadway embankment was not overtopped in the hydraulic modeling, although it was very close for the PMP dam breach simulation. Figure 10 shows the I-40 bridges.

An inline weir (inline structure in HEC-RAS) was used to simulate the concrete low-head dam upstream of the RCC WTP. Survey points representing the weir profile were supplied by RCC. The average weir elevation is 346 ft NAVD88. In addition, there is an earthen berm in the right (west) overbank that ties into the weir location. The earthen berm was also included in the weir profile at an average elevation of 361.5 ft NAVD88. A Google Earth image of the weir and earthen berm location is shown in Figure 11.

FIGURE 8
MODEL GEOMETRY AND LAYOUT MAP





Cross Sections

Model Stream Reach

Bridges

Dam and Spillway Location

0 3,000 6,000 Feet

CITY CORPORATION
RUSSELLVILLE WATER & SEWER

G:\40 Bridge

L:\2018\18018335 - HCR H and H Study\GIS\Maps\Figure 8 (XS and Layout)Updated.mxd
User Name: FNDahmash
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Figure 9. West Pleasant View Road Bridge Downstream Face

Figure 10. I-40 Bridges over Illinois Bayou/Lake Dardanelle, Looking North

Figure 11. Low-Head Dam/Weir and Earthen Berm Upstream of RCC WTP

4.3 Roughness Coefficients

The Manning's *n* roughness coefficients for the channel and floodplain overbank areas were selected following the recommendations outlined in the HEC-RAS User Manual based on recent online aerial photography available in Google Earth and ArcGIS. In general, roughness regions were generalized to channel/lake, woods, pasture, and developed areas. The channel Manning's *n* value used was 0.045, which was selected because the channel banks typically are wooded and part of this area is included in the channel definition. The Manning's *n* value for wooded areas was 0.11 and pasture was 0.05. Developed areas were 0.08 or 0.085. All values were adjusted slightly at different cross sections as needed to account for variations in land use.

5.0 Hydraulic Model Results

The hydraulic model was executed with a 10-second timestep. Typically, a very small timestep is required for dam breach modeling due to the steepness of the flood wave. Too large of a timestep will result in excessive numerical diffusion. In this case, a 10-second timestep seemed to represent the best compromise between model stability and accuracy. The results were not found to be excessively sensitive to the timestep, within reason (e.g., timesteps that were too large produced unreasonable results or model divergence).

Flow and WSEL hydrograph results were reviewed at each cross section in the model to check for model instabilities. These hydrographs did not reveal any unacceptable abnormalities, so the model results were considered satisfactory for the project purposes. As previously stated, dam breach simulations are difficult to execute and some compromises are expected. In this case, the steep flood wave tended to cause critical depth or a supercritical solution at a couple of cross sections at the leading edge of the flood wave. This occurred at the location where the valley widens significantly (Wheeler Bend). A significant effort was expended in attempting to mitigate this effect, including many different cross section configurations, model timesteps, Manning's *n* values, etc. This was unable to be successfully mitigated, so it was accepted as an artifact of the rapid expansion in cross-sectional area that occurs as the valley widens in this location.

5.1 Tabular Results

In an unsteady-flow model, the model output can be voluminous. For the purposes of this project, the most important results are the maximum water surface profile, which is defined by the highest computed WSEL at each cross section. There is no specific time associated with the maximum water surface profile, since the WSEL peaks at a different time at each cross section. The maximum water surface profile is also used in the inundation mapping. This represents the maximum extent of flooding computed by the model at any point in the project area.

Tabular results for the PMP dam breach profile are shown in Table 6. Due to the large number of cross sections in the model, output is shown for selected cross sections (generally every other cross section until the spacing increases moving downstream in the reach).

Similarly, tabular results for selected cross sections for the sunny-day dam breach profile are shown in Table 7.

Table 6. Tabular Results at Selected Cross Sections for PMP Dam Breach

River Station	Q Total (cfs)	WSEL (ft NAVD88)	Channel Velocity (ft/s)	Top Width (ft)	Channel Froude Number
48789	504791.1	414.8	27.18	941.58	0.59
48366	522878.9	416.97	20.1	936.29	0.43
48031	529742.1	417.49	19.23	986.1	0.4
47692	540581.1	418.38	15.07	1318.88	0.32
47162	540233.4	417.97	17.08	1487.62	0.35
46733	537170.9	417.37	16.48	1094.01	0.34
46245	536486.2	417.65	13.11	1369.69	0.27
45564	535453.8	412.7	24.77	1016.35	0.54
45074	531621.3	410.04	27.99	935.28	0.6
44142	519785.7	410.79	22.74	831.13	0.48
42977	358487.9	395.01	15.05	1919.63	0.37
41632	362605.3	395.05	11.88	1874.36	0.29
40496	365622.1	395.13	7.06	2463.83	0.17
39715	368330.6	395.18	5.2	3199.15	0.13
38926	373223.2	395.21	4.6	3703.55	0.11
37616	375055.5	395.19	3.92	3715.21	0.1
37081	374899.6	395.17	4.05	3765.64	0.1
35461	373274.5	394.79	7.79	3049.44	0.18
34554	370358.8	393.66	14.03	2095.76	0.32
33538	362847.9	390.75	18.94	1217.63	0.46
32524	360887.2	389.12	18.09	1376.28	0.43
30856	358933.7	385.52	20.17	1353.81	0.5
30098	359181.4	384.61	18.49	1057.01	0.46
28193	358968.8	380.22	21.3	1136.77	0.56
27592	358997.1	379.59	16.9	1132.72	0.46
27512	**Inline Structure (Low-Head Dam/Weir)**				
27433	358835	368.28	13.25	1008.07	0.35
27005	356384.2	367.37	14.29	916.8	0.37
26088	356486.3	360.69	25.33	1176.21	0.78
24978	354307.3	360.08	17.3	1818.08	0.53
23355	338180	358.88	6.73	5184.16	0.22
21870	253162.8	358.13	6.01	5258.93	0.2
19218	252586.2	357.99	3.74	6139.21	0.13
19124.26	**Bridge Multiple Opening (Pleasant View Road)**				
19036	247581.6	357.67	3.51	6184.62	0.12
18400	245470.6	357.38	4.95	5908.68	0.18
16707	236678.5	355.54	9.81	6183.34	0.36
15262	238184.6	355.58	6.42	6201.6	0.23
14421	238507.8	355.46	5.14	6217.8	0.19
12831	238556.3	354.03	9.62	3976.78	0.33
12658.35	**Bridge (I-40)**				
12497	238428	346.77	15.6	1873.85	0.59
11064	238444.9	347.38	6.57	2003.98	0.27
8935	87988.8	343	4.36	1470.53	0.21

Table 7. Tabular Results at Selected Cross Sections for Sunny-Day Dam Brea

River Station	Q Total (cfs)	WSEL (ft NAVD88)	Channel Velocity (ft/s)	Top Width (ft)	Channel Froude Number
48789	358395.5	407.28	22.91	863.23	0.53
48366	376870.3	408.84	17.74	884.78	0.41
48031	382464.4	409.24	17.1	950.84	0.38
47692	387747.8	409.9	13.35	1256.36	0.3
47162	387658.7	409.45	15.34	1419.31	0.33
46733	387575.9	409.05	14.57	1054.6	0.32
46245	391263.1	409.22	11.74	1300.3	0.26
45564	383590	405.53	20.63	875.34	0.48
45074	384472.9	403.68	23.29	853.29	0.52
44142	386161.8	404.37	19.43	782.95	0.43
42977	254923.7	386.67	14.04	1279.28	0.38
41632	249572.5	386.69	10.87	1703.77	0.28
40496	249554.6	386.7	6.64	2396.78	0.18
39715	251882.6	386.74	4.82	2873.71	0.13
38926	251736.1	386.75	4.33	3532.71	0.11
37616	253398.7	386.74	3.58	3554.72	0.1
37081	253279.4	386.71	3.7	3533.56	0.1
35461	251956.7	386.33	7.22	2713.97	0.18
34554	249003.8	385.2	12.88	1729.08	0.32
33538	243905.3	382.82	16.16	996.62	0.43
32524	242879.8	381.65	14.75	1105.34	0.38
30856	241030.2	378.82	16.39	895.71	0.43
30098	241001.8	378.12	14.93	962.75	0.4
28193	240785.2	374.55	17.48	1107.92	0.5
27592	240764.1	374.12	13.45	1095.57	0.39
27512	**Inline Structure (Low-Head Dam/Weir)**				
27433	240721.9	362.08	10.57	969.59	0.31
27005	240568.4	361.47	11.3	888.12	0.32
26088	219850	356.25	19	1084.24	0.63
24978	179969.8	355.45	11.69	1709.65	0.38
23355	170773.3	354.7	4.48	5123.34	0.16
21870	168000.9	354.24	4.78	4622.24	0.18
19218	167905.5	354.06	3.09	5714.27	0.12
19124.26	**Bridge Multiple Opening (Pleasant View Road)**				
19036	149002.3	350.5	3.25	5279.03	0.14
18400	147494.8	350.26	4.21	5627.25	0.18
16707	141010.9	348.73	8.09	5449.42	0.33
15262	141244.9	348.4	5.75	5787.16	0.25
14421	141490.2	348.24	4.44	6099.79	0.2
12831	141432	346.69	8.67	986.69	0.33
12658.35	**Bridge (I-40)**				
12497	141033	343.46	10.91	1772.25	0.45
11064	141032	343.45	4.94	1973.18	0.23
8935	56162.2	338	4.35	1439.38	0.26

5.2 Mapping

For both the PMP and sunny-day dam breach events, the maximum water surface profile was mapped in RASMapper, a component of the HEC-RAS software. For each event, the inundated area was exported to an ArcGIS shapefile and final mapping was completed in ArcGIS. The inundated area mapping was extended upstream slightly to encompass the location of the dam and backwater areas were extended up tributaries as required.

Structures within the inundation area were located based on aerial photography and were classified according to type: Commercial, Residential, Agricultural, Industrial, and Park. The classifications were based on the aerial photographs and individual interpretation and may not be definitive. Although structures were identified based on the most recent available aerial photography, it is possible that new structures may have been constructed that are not reflected in the photographs.

Times to a selected threshold depth (3 feet) were estimated using RASMapper. The maximum depths were estimated using RASMapper and times to maximum depth were estimated from the hydrograph output at nearby cross sections. It is important to note that times listed are from time zero of the dam failure. For the case of the PMP event, there may be additional warning time available if reservoir levels are monitored. For the sunny-day event, it is assumed there would be no additional warning time since the event is unexpected and unpredictable by definition.

For locations with multiple structures, worst-case depths and arrival times are noted for planning purposes. The best use of these maps is to identify areas that would need to be notified/evacuated and the time scale required. As part of the Emergency Action Plan (EAP, not included in this project), contact information for each affected habitable structure will need to be identified.

The inundation maps were produced at 1”=1,500’ scale, and were prepared as 22”x34” plots. The inundation maps are included as attachments to this report.

6.0 Summary

This study determined the maximum discharge, maximum water surface elevation and flooding extent, and shows the inundation mapping due the postulated PMF and sunny-day dam breach events for Huckleberry Creek Reservoir. The analysis is based on present-day methodologies including the recommended Froehlich 2008 dam breach analysis method, one-dimensional unsteady hydraulic modeling, and GIS mapping.

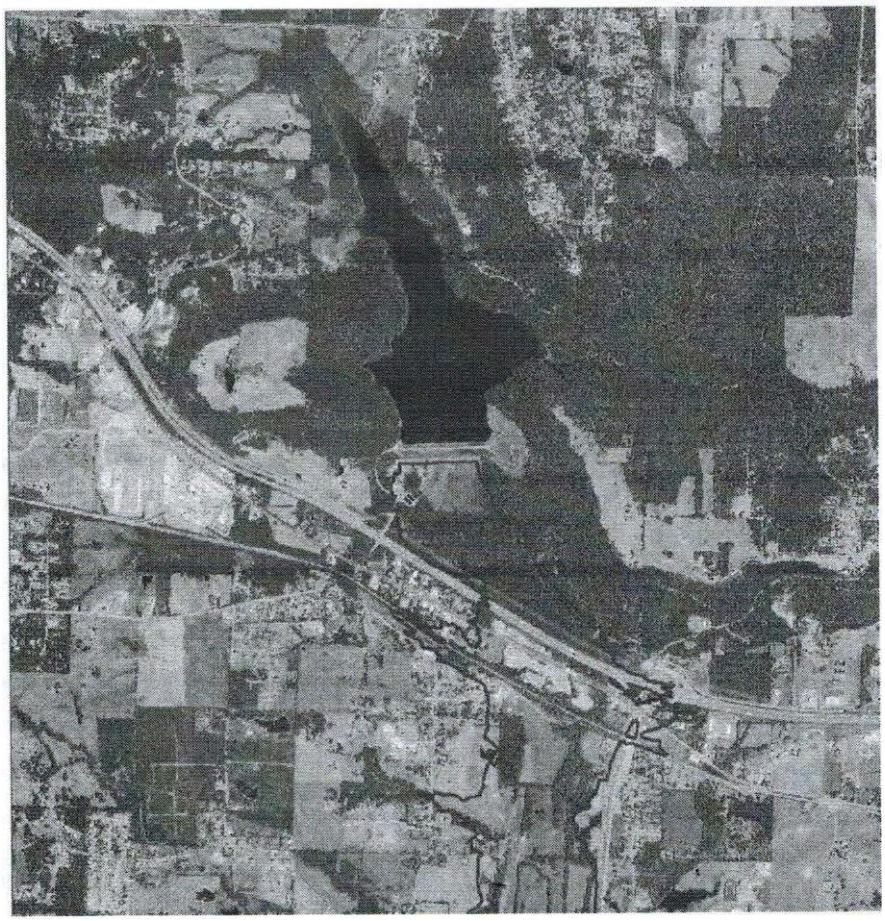
Due to the potentially affected structures in the inundated area downstream, there is the potential for loss of life downstream of the dam as a result of dam failure. Therefore, these results support re-classification of the dam to “large dam, high hazard.” The hazard classification does not reflect in any way on the current condition of the dam (e.g., safety, structural integrity, flood routing capacity).

Breach Inundation Report

Galla Creek Watershed

Site No. 1

Atkins, Pope County, Arkansas



Prepared for: Arkansas Natural Resources Commission

by: United States Department of Agriculture
Natural Resources Conservation Service
Little Rock, AR
October 2015

Abstract

Galla Creek Watershed Site No. 1 is a multipurpose (floodwater detention, municipal water supp ly, game and fish) earthen dam located over the corner of Sections 7,8,17, and 18 all in Town 07-North, Range 19-West, just west of Atkins, Arkansas and north of Pottsville, Arkansas in Pope County. The center of crest at the center of stream is located at latitude 35.26 degrees and longitude -90.05 degrees. The dam is located on Galla Creek which is directly tributary to the Arkansas River.

The dam was constructed in 1973 with the assistance of the Soil Conservation Service under the authority of the Watershed Protection and Flood Prevention Act (Public Law 83-566}. Sponsors for the project were the Pope County Conservation District, The City of Atkins, and the Arkansas Game and Fish Commission. Original plans were prepared by Muhlberger Engineers, Inc., Little Rock Arkansas. The project record drawing indicates the drainage area as 13,930 acres, or approximately 21.8 square miles. At normal pool elevation the reservoir covers about 220 acres and at maximum poo l about 730 acres. At maximum pool the dam impounds approximately 18,0b0 acre-feet of water.

The existing dam's top-of-embankment elevation is 463.0 feet NAVD88 and the average valley floor is at elevation about 380 feet-NAVD88 giving a height of approximately 83 feet. The dam has a riser and conduit-type principal spillway with crest elevation 429.0 feet-NAVD which controls the normal pool and a 300-foot-wide grass-lined auxiliary spillway on the left side (looking downstream) with crest elevation 448.8 feet-NAVD88.

The purpose of this study is to estimate a downstream zone of inundation as the result of a sudden breach of the Lake Elmdale Dam as an aide to developing or refining an emergency action plan. This report was prepared by the Natural Resources Conservation Service in partnership with the Arkansas Natural Resources Commission.

Report prepared by: *D* - - - - - - - - - - - - - - - - - Date: December 14, 2015

Daniel Carthel, NRCS

_____ Date: _____

Walter Delp, State Conservation Engineer, NRCS

Background

A breach inundation study was performed by the NRCS in 2005. This study howe ver was limited in that it only included the 1-40 and AR-6 4 bridges and terminated upstream of the railroad bridge.

NRCS fil es also included a 2007 flood inundation map which terminated in the WMA upstream of the Arkansas River Confluence. However, no computer routing files, or survey data could be found to support that map.

The purpose of this study is to upd ate the 2007 flood inundation map to include the recently constructed Russellville Bypass, AR-247, and bridge. This highway crosses the floodplain of Galla Creek downstream of the dam.

Failure Assumptions and Breach Hydrograph

A NRCS file memorandum dated September 27, 2005, indicates that Galla No. 1 has rehabilitation needs because of downstream safety hazards and states that rehabilitation may consist of raising the dam and/or widening the auxiliary spillway or new installation of a Roller compacted concret e (RCC) spillway. No further information was given or was found in the files indicating the result s of routings through the dam. Neither were routings of design floods performed for this study. However, given the memo and the relatively narrow, 300-foot-wide, auxiliary spillway it seems likely that spill way capacity may be undersized for a high hazard dam. Additionally, the freeboard between the auxiliary spillway crest and the top of dam is 14.2 feet. This indicates that large flows were intended to be passed through the auxiliary spillway. Since the time this dam was designed, significant advancements have been made in the assessment of the geologic integrity of soils and rock underlying auxiliary spillways. Recent experience with similar dams in this region of Arkansas using the erosion model incorporated into the SITES model suggest that spillways underlain with weathered shales and sandstone do not meet current NRCS integrity requirements.

Failure was therefore conservatively assumed to be the result of embankment overtopping initiated at a reservoir water sur face at the top of embankment elevation 463.0 feet-NAVD88. A flow of 45,000 cfs was assumed to be passing the auxiliary spillway prior to breach. ' The inundation maps prepared for this study are based on a breach discharge hydrograph due to a sudden breach of the dam with non-storm conditions downstream of the dam. The dam failure hydrograph utilized for this study is based on minimum peak breach discharge criteria presented in the NRCS document Technical Release 60 (TR-60), Earth Dams and Reservoirs.

The equations in TR-60 used for determining minimum peak breach discharge were empirically determined based on 39 historical dam failures with actual peak discharges reported. Of those 39 dams, 36 were earthen dams, two were concrete, and one was a mine dump dam. The enveloping equations were developed such that the predicted peak breach discharges for those historical dam failures would not be significantly less than the actual reported peak discharges

The input characteristics used by the peak breach equations are the depth of water at time of failure, width of the valley at time of failure, reservoir volume at time of failure, and cross- sectional area of the embankment at the breach location. For this studied dam failure was assumed to occur with the reservoir level near the crest of dam embankment elevation 463.0 feet NAVD88 input characteristics were assumed as :

Top of Dam Elevation	463.0 ft-NAVD88
Water Surface Elevation at Breach	463.0 ft-NAVD88
Valley Floor Elevation	380.0 ft-NAVD88
Length of Dam at WSE at Breach, L	2630 feet
Reservoir Storage at Breach, Vs	18,000 acre-feet
Embankment Top Width	24 feet
Upstream Slope	2.5:1
Downstream Slope	2.5:1
Wave & Stability Berms Widths	Not Applicable

The embankment configuration resulted in a dam cross-sectional area, A, of 19,215 sq. ft . Using:

$$OM_{ax} = 1{,}100(Br)^{1.35}$$

where Br is the breach factor (Vs * Hw)/A, and Hw is the height of the WSE at breach above the valley floor gave a minimum peak breach discharge, $_{0\ Max,}$ of 392,500 cfs. However, this calculated discharge is above the enveloping upper boundary equation:

$$OM_{ax} = 65(Hw^{1.85}) = 230{,}785 \text{ cfs. } <\!\!<\!\!<$$

The low er boundary was computed as:

$$OM_{ax} = 3.2(Hw^{512}) = 200{,}800 \text{ cfs.}$$

As a check, the Froelich equation in English units gives Qp = 40.1 $V^{0.29}$ $H1.2^{4}$ = 17 3 , 000 cfs.

A minimum peak breach discharge of 230,000 cfs was used for this study.
Using the peak breach discharge, a breach hydro graph was constructed assuming:

1. A near instantaneous breach; the rising limb of the hydrograph is near vertical.
2. The area under the hydrograph (volume of the breach event) is equal to the storage in the reservoir at the time of breach.
3. The falling limb is assumed to decay exponentially (subcritical downstream reach)

The hydrograph was used as the upstream boundary for a one-dimensional, un-steady HEC-RAS model with the first cross section located just downstream of the dam embankment. To ensure

that the entire channel had flow and to aide in numerical stability, an initial discharge (auxiliary spill way flow) of 45,000 ds was used. At 30 minutes the breach was assumed fully developed with the peak discharge of 230,000 cfs.

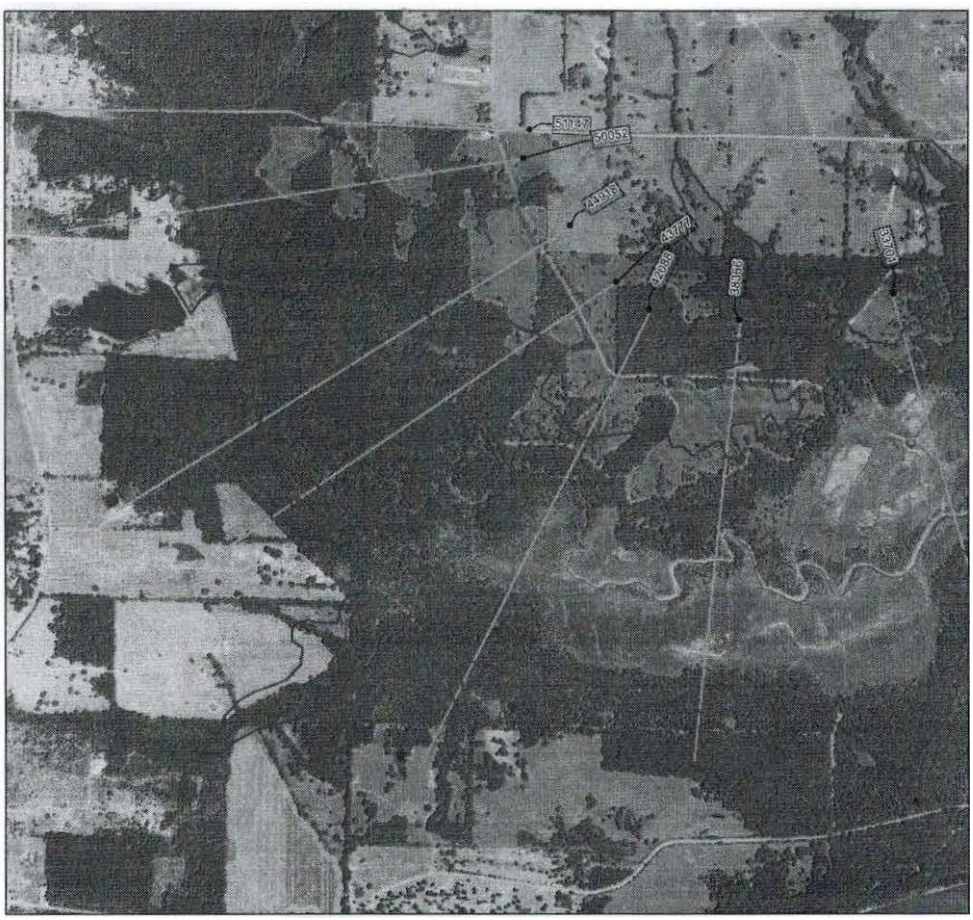
Breach Flood Routing Methodology

HEC-RAS version 4.1.0 was used to develop a one-dimensional unsteady flow model to route the breach hydrograph nearly 16.5 miles downstream of the dam to just upstream of the confluence of Galla Creek with the Arkansas River. The upstream boundary condition was the breach hydrograph described in the previous section. At the downstream boundary a normal depth condition was assumed with a friction slope of 0.0013 feet/ feet. The friction slope was estimated from contours on the USGS 7.5-minute quadrangle map.

Cross sections were obtained from a 1-meter LiDAR-based raster grid using the HEC-GeoRAS extension in ArcMap version 10.1. Since the LiDAR-based grid did not reflect the channel bottom, below the water, channel inverts were added to the sections to maintain bottom slope continuity and eliminate adverse slopes between surveyed sections at the bridges. The conveyance error between this method and that of obtaining field surveyed cross sections was judged to be negligible since conveyance in the channel is very small compared to that in the overbanks. Manning n-values were varied horizontally. For the channel an n-value of 0.05 was used. In the overbanks, n-values varied between 0.06 for open range and 0.100 for forested areas.

Six bridges and one culvert were modeled. These crossings along with sources of modeling data and assumptions are listed below in the downstream direction:

- The parallel bridges through 1-40 were modeled as a single bridge. Modeled according to a 2005 NRCS breach inundation study where field surveys were obtained. Approach roads utilized contours generated from a 1-meter LiDAR-based raster grid.
- The AR-64 highway bridge was modeled according to a 2005 NRCS breach inundation study where field surveys were obtained. Note, this bridge has recently been replaced and future studies may obtain more current survey data. However, given that the approach roads are overtopped by nearly 19 feet and given that the downstream railroad bridge creates significant backwater, the effect of outdated survey data at this bridge was judged to be small and of little consequence to the results obtained for this study. Approach roads utilized contours generated from a 1-meter LiDAR based raster grid.
- A railroad bridge was field surveyed for this study. Approach roads utilized contours generated from a 1-meter LiDAR-based raster grid.
- A 4-barrel box culvert through Ash Street was modeled using field surveys and data from a HEC-RAS study obtained from the Arkansas State Highway and Transportation Department. Approach roads utilized contours generated from a 1-meter LiDAR-based raster grid.



Galla Creek Watershed
Site No. 1 Dam

Flood Inundation of Galla Creek by Sunny Day Breach assuming reservoir level at top-of-dam elevation

0 0.2 0.4 0.8 Miles

Prepared by USDA-NRCS 2015

N

River Station ! feet)	Max W.S.E. {ft•NAVD88)	Tim e o f MaxWSE Jhrs:mlns)	Velocity Channel lft/sl	Total Distharse (cfs)
S1147	326.31	2:09	9.4	73583
S0052	324.40	2:14	6.6	73043
44918	320.95	2:27	6.6	70147
•3m	319 .67	2:34	5.5	66982
42088	318.06	2:48	3.6	62158
38366	317.09	2:59	3.3	59175
33701	316.22	3:10	2.6	55929

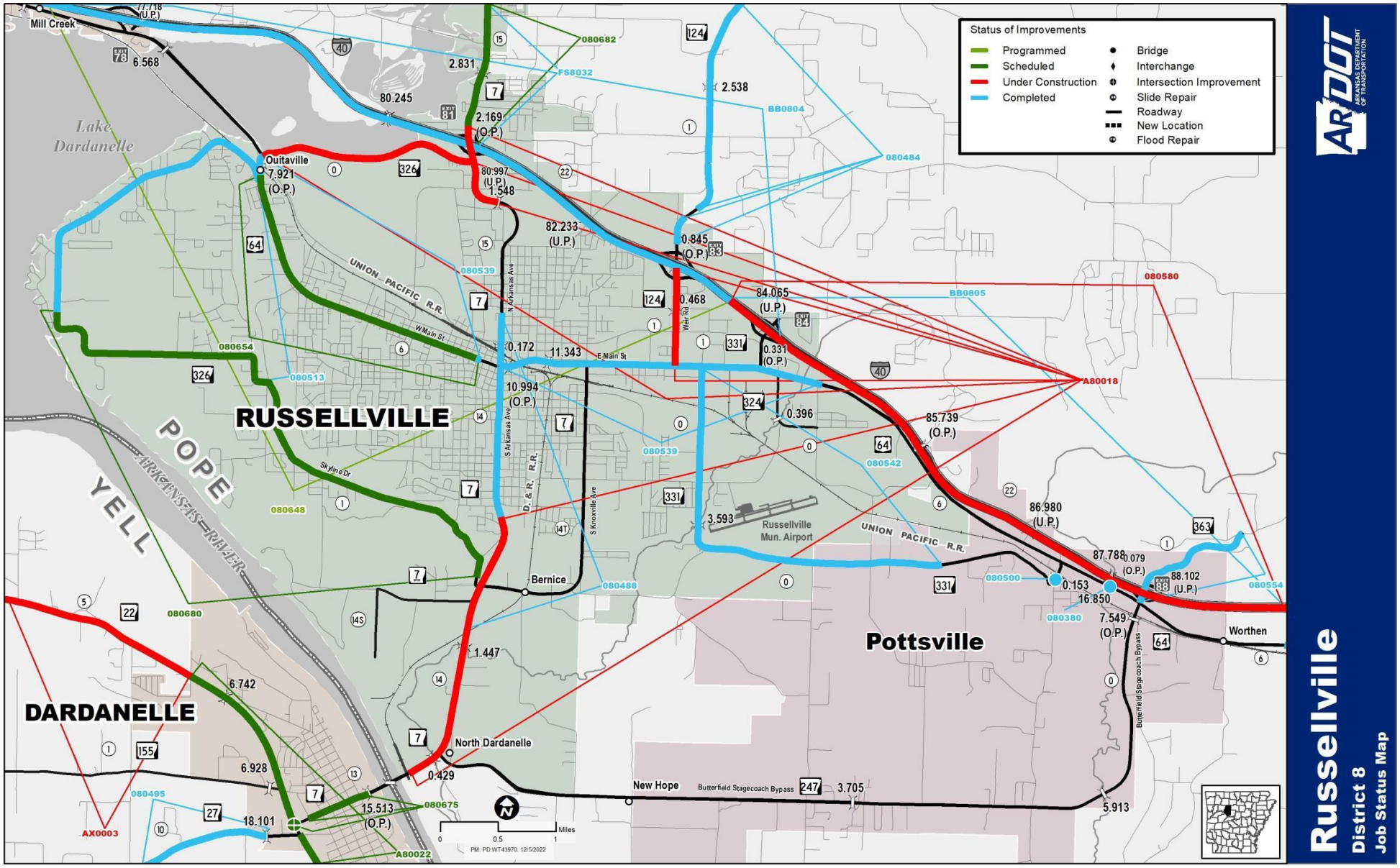
Legend

LJ Max_Inundation_pol)

-- XSCutllnes

Galla Creek Wid Site 1	
Dam Height (Ft)	95
Hydraulic Height (Ft)	28
Structural Height (Ft)	87
NID Height (Ft)	95
Dam Length (Ft)	2,645
Volume (Cubic Yards)	N/A
Year Completed	1975
NID Storage (Acre-Ft)	19,000
Max Storage (Acre-Ft)	19,000
Normal Storage (Acre-Ft)	4,200
Surface Area (Acres)	220
Drainage Area (Sq Miles)	22
Max Discharge (Cubic Ft / Second)	5,228

W Fork Pt Remove Creek Wid Site 10	
Dam Height (Ft)	52.5
Hydraulic Height (Ft)	36.8
Structural Height (Ft)	56
NID Height (Ft)	56
Dam Length (Ft)	N/A
Volume (Cubic Yards)	2,010
Year Completed	1964
NID Storage (Acre-Ft)	2,010
Max Storage (Acre-Ft)	2,010
Normal Storage (Acre-Ft)	102
Surface Area (Acres)	17
Drainage Area (Sq Miles)	5
Max Discharge (Cubic Ft / Second)	6,315


Status of Improvements
Programmed
Scheduled
Under Construction
Completed
Bridge
Interchange
Intersection Improvement
Slide Repair
Roadway
New Location
Flood Repair
ARDOT
ARKANSAS DEPARTMENT OF TRANSPORTATION
Russellville
District 8
Job Status Map
RUSSELLVILLE
Pottsville
DARDANELLE
POPE
YELL
ARKANSAS RIVER
Lake Dardanelle
Mill Creek
Ouitaville
Bernice
North Dardanelle
New Hope
Worthen
Russellville Mun. Airport
UNION PACIFIC R.R.
D. & R. R.R.
N Arkansas Ave
S Arkansas Ave
S Knoxville Ave
W Main St
E Main St
Skyline Dr
Weir Rd
Butterfield Stagecoach Bypass
080682
FS8032
080484
BB0804
080539
080580
BB0805
080654
080513
080542
A80018
080648
080488
080500
080554
080680
080380
080495
080675
AX0003
A80022
PM: PD:WT43970: 12/5/2022
Miles

SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No.	Job Name	Rte.	Sec.	Type Work	Status	Let Date	*Estimated* or Sub. Comp. Date	County Totals Length (Mi)	County Totals Cost	Project Totals Length (Mi)	Project Totals Cost
001725*	Oklahoma Line – North Terminal P.E. Addt'l Rte.-Sec.: Various	40	22	PE Only	Completed		Aug. 2021	-	$0	-	$2,296,302
001852*	Oht Trails Maintenance (S) Addt'l Rte.-Sec.: Franklin New; Johnson New; Searcy New	New		Enhancement	Completed	Jan. 2000	Mar. 2015	-	$6,200	-	$31,000
012351*	Districts 4, 5, 8 & 9 Bridge Preservation (2020) (S) Addt'l Rte.-Sec.: Various	7	14	Bridge Rehabilitation	Completed	May. 2020	Aug. 2021	0.10	$365,950	1.68	$6,147,965
012379	Specialized Bridge Deck Rehab. (2021) (S) Addt'l Rte.-Sec.: Various	40	22	Bridge Rehabilitation	Under Construction	Apr. 2021	*Mid 2023*	0.04	$425,824	1.80	$19,162,121
012397*	I-40 Cable Median Barrier Impvts. (S) Addt'l Rte.-Sec.: Crawford 40-11; Franklin 40-12; Johnson 40-21	40	22	Safety Improvements	Under Construction	Sep. 2022	*Mid 2025*	6.14	$2,443,736	20.96	$8,342,134
012408*	Districts 4, 8 & 9 Bridge Preservation (2022) (S) Addt'l Rte.-Sec.: Various			Bridge Rehabilitation	Under Construction	Jun. 2022	*Late 2023*	-	$443,025	-	$8,575,000
012427*	Districts 4, 8 & 9 Centerline Rumble Stripe Impvts. (S) Addt'l Rte.-Sec.: Various			Safety Improvements	Under Construction	May. 2022	*Late 2023*	-	$108,130	-	$1,990,253
080198*	Russellville Bypass P.E.	247	0	PE Only	Programmed			-	-	-	-
080366*	Educational Brochures OHV (S)			Miscellaneous	Completed	Mar. 2010	Jul. 2014	-	$2,850	-	$2,850
080376*	Dover – Newton Co. Line (Passing Lanes) P.E. Addt'l Rte.-Sec.: Pope 7-16	7	15	PE Only	Programmed			-	-	-	-
080380	Galla Creek Str. & Apprs. (Pottsville) (S)	64	6	Structure & Approaches	Completed	Jul. 2011	Apr. 2013	0.24	$2,452,060	0.24	$2,452,060
080389*	Hob Nob Rd. – Crow Mtn. Rd. (Russellville) P.E. Addt'l Rte.-Sec.: Pope 326-2	124	1	PE Only	Completed		Sep. 2022	1.05	$3,156,677	1.05	$3,156,677
080392	Newton Co. Line – South (Passing Lane) (S)	7	16	Passing Lanes	Completed	Jul. 2013	Oct. 2015	1.26	$2,931,262	1.26	$2,931,262
080417*	Dover Hwy. 7 Sidewalks (ATEP-11) (S)			Enhancement	Completed	Jun. 2013	Oct. 2015	-	$44,409	-	$44,409
080419*	Russellville W. Main St. Streetscaping (ATEP-11) (S)			Enhancement	Completed	Dec. 2012	Aug. 2021	-	$282,872	-	$282,872
080422	Dover – North (Passing Lanes) (S)	7	16	Passing Lanes	Completed	Oct. 2015	Mar. 2017	2.40	$6,341,246	2.40	$6,341,246
080443	White Oak Creek Str. & Apprs. (S)	64	6	Structure & Approaches	Completed	Jan. 2016	Sep. 2016	0.11	$1,243,957	0.11	$1,243,957
080464	Newton Co. Line – South (Passing Lane) (Ph. II) (S)	7	16	Passing Lanes	Completed	Oct. 2015	Sep. 2017	1.20	$3,921,213	1.20	$3,921,213
080476*	Orbit Trail (Russellville) (S)			Enhancement	Completed	Sep. 2013	Nov. 2016	-	$66,148	-	$66,148
080484	Hob Nob Rd. – Center Valley Rd. (S) Addt'l Rte.-Sec.: Pope New	124	1	Major Widening New Location	Completed	Dec. 2014	Jul. 2017	3.27	$16,084,352	3.27	$16,084,352

* Job not shown on county map.

SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No.	Job Name	Rte.	Sec.	Type Work	Status	Let Date	*Estimated* or Sub. Comp. Date	County Totals Length (Mi)	County Totals Cost	Project Totals Length (Mi)	Project Totals Cost
080488	D & R Railroad Spur – North (Overlay) (S)	7	14	Resurfacing	Completed	Apr. 2014	Oct. 2014	2.84	$1,055,892	2.84	$1,055,892
080497*	Arkansas Tourist Information Center (Big Piney) (S) Addt'l Rte.-Sec.: Johnson 40-21	40	22	Roadside Appurtenances	Completed	Dec. 2015	May. 2017	-	$1,797,594	-	$3,595,188
080500	Creek at L.M. 0.15 Str. & Apprs. (S)	331	0	Structure & Approaches	Completed	Sep. 2018	Feb. 2019	0.01	$389,394	0.01	$389,394
080506	Crooked Branch Str. & Apprs. (S)	7	15	Structure & Approaches	Completed	May. 2019	Jul. 2020	0.10	$1,835,817	0.10	$1,835,817
080513	Hwy. 64 – Skyline Dr. (Russellville) (Overlay) (S)	326	1	Resurfacing	Completed	Mar. 2016	Jan. 2017	5.11	$508,183	5.11	$508,183
080520*	Russellville Traffic Study (S)			Study	Completed	Nov. 2021	Nov. 2021	-	$240,208	-	$240,208
080524*	Arkansas Tech Connect Trail (RTP-15) (S)			Enhancement	Completed	Jun. 2017	Mar. 2020	-	$300,114	-	$300,114
080527*	Russellville Schoolhouse Trails (TAP) (S)			Enhancement	Completed	May. 2021	May. 2022	1.49	$468,563	1.49	$468,563
080529	Hector, Isabell & Alewine Creeks Strs. & Apprs. (S)	105	1	Structure & Approaches	Completed	May. 2020	Oct. 2021	0.32	$4,586,958	0.32	$4,586,958
080539	Hwy. 326 – Tyler Rd. (Russellville) (S)	64	6	Resurfacing	Completed	May. 2017	Apr. 2018	5.74	$2,734,210	5.74	$2,734,210
080540*	S. Church St. RR Signals Upgrade (Atkins) (S)			RR Crossing	Completed	Jun. 2017	Feb. 2022	-	$89,061	-	$89,061
080542	Hwy. 64 – Hwy. 64 (Pottsville & Russelville) (Sel. Sec.) (S)	331	0	Resurfacing	Completed	Feb. 2017	Dec. 2017	4.98	$857,571	4.98	$857,571
080546*	N. Commerce Ave. RR Signals Upgrade (Russellville) (S)			RR Crossing	Completed		Feb. 2020	-	$101,561	-	$101,561
080547	Dover – North (S) Addt'l Rte.-Sec.: Pope CS	27	11	Resurfacing	Completed	Jul. 2018	Jun. 2019	13.35	$3,637,928	13.35	$3,637,928
080554	I-40 – North (Sel. Secs.) (S) Addt'l Rte.-Sec.: Pope 363-2	363	1	Resurfacing	Completed	May. 2017	Mar. 2018	3.29	$658,174	3.29	$658,174
080557	Hwy. 105 – Hwy. 213 (S) Addt'l Rte.-Sec.: Conway 247-2	247	1	Resurfacing	Completed	Apr. 2018	Feb. 2019	7.00	$1,677,455	10.11	$2,422,725
080571*	USFS Moccasin Gap Vault Toilet (Motorized) (RTP-17) (S)			Enhancement	Programmed			-	< $1 M	-	< $1 M
080579	Atkins – Plumerville (S) Addt'l Rte.-Sec.: Conway 40-31	40	22	Resurfacing	Sub. Completed	Jun. 2020	Feb. 2022	5.05	$8,153,763	19.28	$31,129,614
080580	Hwy. 331 – Atkins (S)	40	22	Resurface & Shoulder	Under Construction	Apr. 2022	*Mid 2023*	10.08	$18,440,205	10.08	$18,440,205
080588	Pottsville – Atkins (S)	64	6	Resurfacing	Completed	Apr. 2020	Apr. 2021	4.33	$1,413,119	4.33	$1,413,119
080606*	Hwy. 7 Widening & Drainage Impvts. (Russellville) (S)	7	15	Miscellaneous	Scheduled	Aug. 2024		0.25	$5 - $10 M	0.25	$5 - $10 M
080608	Lake Dardanelle Str. & Apprs. (London) (S)	333	0	Structure & Approaches	Programmed			0.04	< $1 M	0.04	< $1 M
080616	Hwy. 124 Strs. & Apprs. (Pope Co.) (S)	124	2	Structure & Approaches	Scheduled	Sep. 2023		0.15	$1 - $3 M	0.15	$1 - $3 M
080621	McCoy & Little Creeks Strs. & Apprs. (S)	27	11	Structure & Approaches	Scheduled	Jun. 2023		0.44	$1 - $3 M	0.44	$1 - $3 M
080625*	Pottsville City Park Trail Ext. (RTP-18) (S)			Enhancement	Completed	Oct. 2019	Jul. 2020	-	$29,600	-	$29,600
080628*	Hwy. 7 Slide Repairs (Pope Co.)	7	16	Base Stabilization	Completed	Jun. 2019	Dec. 2019	0.44	$2,537,363	0.44	$2,537,363

* Job not shown on county map.

SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No. Job Name	Rte.	Sec.	Type Work	Status	*Estimated* or Sub. Comp. Let Date	County Totals Date	Length (Mi)	Project Totals Cost Length (Mi)		Cost
080638* Hwy. 7 Railroad Signals Upgrade (Russellville) (S)	7	14	RR Crossing	Programmed			-	< $1 M	-	< $1 M
080643* Hwy. 7T Railroad Signals Upgrade (Russellville) (S)	7	14T	RR Crossing	Programmed			-	< $1 M	-	< $1 M
080644* 4th St. Railroad Signals & Surf. (Russellville) (S)	CS		RR Crossing	Programmed			-	< $1 M	-	< $1 M
080648 Hwy. 64 – Hwy. 331 (S) Addt'l Rte.-Sec.: Johnson 40-21	40	22	Resurfacing	Programmed			12.18	$10 - $15 M	19.85	$15 - $20 M
080653* Hector Hwy. 27 & Maple St. Sidewalks (TAP-21) (S)			Enhancement	Programmed			-	< $1 M	-	< $1 M
080654 Hwy. 326 – El Paso Ave. (Russellville) (S)	64	6	Resurfacing	Scheduled	2024		2.70	< $1 M	2.70	< $1 M
080671* Russellville Schoolhouse Trail Ph. 2 (TAP) (S)			Enhancement	Programmed			-	< $1 M	-	< $1 M
080680 Lake Dardanelle State Park – Hwy. 7 (Russellville) (S)	326	1	Resurfacing	Scheduled	2024		5.11	$1 - $3 M	5.11	$1 - $3 M
080681* Hwy. 333 RR Signals Upgrade (London) (S)	333	0	RR Crossing	Programmed			-	< $1 M	-	< $1 M
080682 I-40 – Dover (S)	7	15	Resurfacing	Scheduled	2024		5.65	$3 - $5 M	5.65	$3 - $5 M
A80010* District 8 Resurfacing Program (2021) (S) Addt'l Rte.-Sec.: Various	16	8B	Resurfacing	Completed		Jun. 2022	36.06	$390,941	93.36	$1,004,551
A80011 Piney Creek Branch Str. & Apprs. (S)	333	1	Structure & Approaches	Under Construction	Apr. 2022	*Late 2023*	0.32	$2,154,818	0.32	$2,154,818
A80018 Hwys. 7, 124 & 326 (Sel. Secs.) (S) Addt'l Rte.-Sec.: Pope 7-15, 124-1, 326-0	7	14	Resurfacing	Under Construction	Nov. 2022		5.84	$6,989,531	5.84	$6,989,531
A80019* District 8 Resurfacing Program (2022) (S) Addt'l Rte.-Sec.: Johnson 21-1; Perry 113-4, 155-6; Yell 309-1	105	1	Resurfacing	Programmed			6.15	< $1 M	24.77	< $1 M
A80020* District 8 Resurfacing Program (2023) (S) Addt'l Rte.-Sec.: Various	105	1	Resurfacing	Programmed			26.44	< $1 M	97.40	$1 - $3 M
A80023 N. of Old Hwy. 7 – Newton Co. Line (S)	7	16	Resurfacing	Scheduled	Apr. 2023		16.13	$5 - $10 M	16.13	$5 - $10 M
A80025 Atkins – Conway Co. Line (S)	64	6	Resurfacing	Scheduled	Mar. 2023		4.96	$1 - $3 M	4.96	$1 - $3 M
BB0803 Hwy. 64 – Mill Creek (S) Addt'l Rte.-Sec.: Johnson 40-21	40	22	Resurfacing	Completed	Jul. 2014	May. 2015	5.16	$3,566,305	12.87	$8,698,304
BB0804 Mill Creek – Hwy. 331 (F)	40	22	Resurfacing	Completed	Nov. 2012	May. 2015	7.40	$42,378,010	7.40	$42,378,010
BB0805 Hwy. 331 – Atkins (S)	40	22	Resurfacing Safety Improvements	Completed	Apr. 2014	Oct. 2014	10.84	$6,710,022	10.84	$6,710,022
BB0806 Atkins – Plumerville (S) Addt'l Rte.-Sec.: Conway 40-31	40	22	Rehabilitation	Completed	Feb. 2013	Oct. 2013	4.33	$2,840,645	18.60	$12,350,633
C58001* Dover,hectr & Londn Ovrly & Srf. (Selsecs)(s)	CS		Resurfacing	Completed	Apr. 2017	Aug. 2017	4.44	$536,463	4.44	$536,463
C58003* Atkins Overlay (S)	CS		Resurfacing	Completed	May. 2020	Apr. 2021	1.64	$285,924	1.64	$285,924

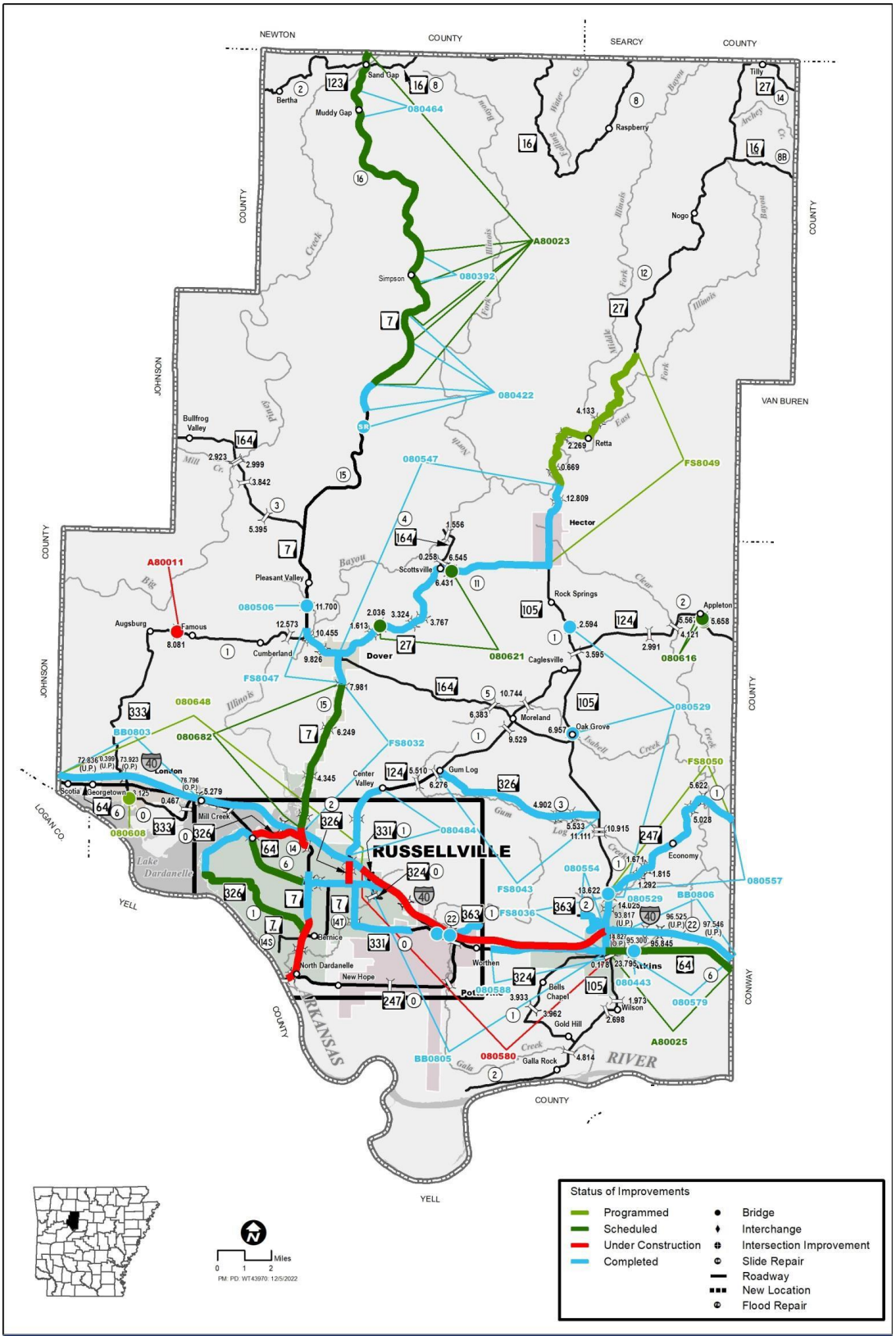
* Job not shown on county map.

SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No.	Job Name	Rte.	Sec.	Type Work	Status	Let Date	*Estimated* or Sub. Comp. Date	County Totals Length (Mi)	County Totals Cost	Project Totals Length (Mi)	Project Totals Cost
C58004*	Dover & Hector Overlay (S)	CS		Resurfacing	Programmed			3.11	< $1 M	3.11	< $1 M
C58005*	Pottsville Overlay (S)	CS		Resurfacing	Completed	Apr. 2021	Aug. 2021	1.20	$260,968	1.20	$260,968
C58006*	Russellville E. 16th St. Overlay (S)	CS		Resurfacing	Completed	Apr. 2021	Jul. 2021	1.00	$341,665	1.00	$341,665
C76020*	Dardanelle, Pttsvl& Rslvle Olay (Sel Secs)(s) Addt'l Rte.-Sec.: Yell CS	CS		Resurfacing	Completed	Jun. 2015	Sep. 2015	4.00	$388,015	5.86	$776,030
FS8032	I-40 – North (S)	7	15	Resurfacing	Completed	Apr. 2013	Sep. 2013	5.93	$2,583,946	5.93	$2,583,946
FS8036	Hwy. 64 – North (S)	105	1	Resurfacing	Completed	Jun. 2013	Oct. 2013	2.29	$513,214	2.29	$513,214
FS8043	Hwy. 124 – Hwy. 105 (S)	326	3	Resurfacing	Completed	Apr. 2014	Aug. 2014	6.68	$1,300,539	6.68	$1,300,539
FS8047	Linker Creek – North (S)	7	15	Resurfacing	Completed	Apr. 2014	Oct. 2014	2.87	$732,420	2.87	$732,420
FS8049	Hwy. 105 – North (S) Addt'l Rte.-Sec.: Pope 27-12	27	11	Resurfacing	Programmed			10.95	$1 - $3 M	10.95	$1 - $3 M
FS8050	Hwy. 105 – Hwy. 213 (S) Addt'l Rte.-Sec.: Conway 247-2	247	1	Resurfacing	Programmed			7.05	$1 - $3 M	10.17	$1 - $3 M
GF0878*	Lake Dardanelle Stte Prk Accss Pkg Lt Overlay			Resurfacing	Completed	May. 2016	May. 2016	-	$61,176	-	$61,176
GF0879*	Ar Nuclr 1 Accss(lk Dardanelle)pkg Lot Ovrlay			Roadside Appurtenances	Completed	Mar. 2015	Jun. 2015	-	$54,710	-	$54,710
GF0880*	Galla Creek (Galla Creek Wma)boat Ramp (S)			Miscellaneous	Completed	May. 2016	May. 2016	-	$14,811	-	$14,811
GF0884*	Bells Chpl Acs (Lk Atkins) Rd & Pk Lot Resurf			Roadside Appurtenances	Completed		Sep. 2020	-	$35,000	-	$35,000
SA5855*	Hwy. 333-East (Overlay) (S)	CR		Resurfacing	Completed	Apr. 2013	Jul. 2013	2.41	$223,578	2.41	$223,578
SA5856*	Russellville City Limits-Hwy. 124(OVERLAY)(S)	CR		Resurfacing	Completed	Jun. 2014	Oct. 2014	2.58	$364,847	2.58	$364,847
SA5857*	Pope County Surfacing No. 17 (S)	CR		Resurfacing	Completed	Jul. 2015	Oct. 2015	2.45	$320,566	2.45	$320,566
SA5858*	Pope County Overlay (Sel. Secs.) (S)	CR		Resurfacing	Completed	Aug. 2016	Nov. 2016	1.60	$191,252	1.60	$191,252
SA5859*	Pope County Overlay No. 2 (Sel. Secs.) (S)	CR		Resurfacing	Completed	Jul. 2017	Nov. 2017	3.90	$465,977	3.90	$465,977
SA5860*	Pope Co. Overlay No. 3 (Sel.secs.)(s)	CR		Resurfacing	Completed	Jul. 2018	Oct. 2018	3.15	$407,109	3.15	$407,109
SA5861*	Pope Co. Overlay No.4 (S)	CR		Resurfacing	Completed	May. 2019	Jul. 2019	2.10	$278,557	2.10	$278,557
SA5862*	Hwy. 7 - Hwy. 124 (Overlay) (S)	CR		Resurfacing	Completed	Feb. 2021	Aug. 2021	6.50	$808,395	6.50	$808,395
	Totals For All Projects In Pope County							**240.02**	**$193,717,298**		

* Job not shown on county map.



Pope County

District 8

Job Status Map

SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No.	Job Name	Rte.	Sec.	Type Work	Status	Let Date	*Estimated* or Sub. Comp. Date	County Totals Length (Mi)	County Totals Cost	Project Totals Length (Mi)	Project Totals Cost
001725*	Oklahoma Line – North Terminal P.E. Addt'l Rte.-Sec.: Various	40	22	PE Only	Completed		Aug. 2021	-	$0	-	$2,296,302
001852*	Oht Trails Maintenance (S) Addt'l Rte.-Sec.: Franklin New; Johnson New; Searcy New	New		Enhancement	Completed	Jan. 2000	Mar. 2015	-	$6,200	-	$31,000
012351*	Districts 4, 5, 8 & 9 Bridge Preservation (2020) (S) Addt'l Rte.-Sec.: Various	7	14	Bridge Rehabilitation	Completed	May. 2020	Aug. 2021	0.10	$365,950	1.68	$6,147,965
012379	Specialized Bridge Deck Rehab. (2021) (S) Addt'l Rte.-Sec.: Various	40	22	Bridge Rehabilitation	Under Construction	Apr. 2021	*Mid 2023*	0.04	$425,824	1.80	$19,162,121
012397*	I-40 Cable Median Barrier Impvts. (S) Addt'l Rte.-Sec.: Crawford 40-11; Franklin 40-12; Johnson 40-21	40	22	Safety Improvements	Under Construction	Sep. 2022	*Mid 2025*	6.14	$2,443,736	20.96	$8,342,134
012408*	Districts 4, 8 & 9 Bridge Preservation (2022) (S) Addt'l Rte.-Sec.: Various			Bridge Rehabilitation	Under Construction	Jun. 2022	*Late 2023*	-	$443,025	-	$8,575,000
012427*	Districts 4, 8 & 9 Centerline Rumble Stripe Impvts. (S) Addt'l Rte.-Sec.: Various			Safety Improvements	Under Construction	May. 2022	*Late 2023*	-	$108,130	-	$1,990,253
080198*	Russellville Bypass P.E.	247	0	PE Only	Programmed			-	-	-	-
080366*	Educational Brochures OHV (S)			Miscellaneous	Completed	Mar. 2010	Jul. 2014	-	$2,850	-	$2,850
080376*	Dover – Newton Co. Line (Passing Lanes) P.E. Addt'l Rte.-Sec.: Pope 7-16	7	15	PE Only	Programmed			-	-	-	-
080380	Galla Creek Str. & Apprs. (Pottsville) (S)	64	6	Structure & Approaches	Completed	Jul. 2011	Apr. 2013	0.24	$2,452,060	0.24	$2,452,060
080389*	Hob Nob Rd. – Crow Mtn. Rd. (Russellville) P.E. Addt'l Rte.-Sec.: Pope 326-2	124	1	PE Only	Completed		Sep. 2022	1.05	$3,156,677	1.05	$3,156,677
080392	Newton Co. Line – South (Passing Lane) (S)	7	16	Passing Lanes	Completed	Jul. 2013	Oct. 2015	1.26	$2,931,262	1.26	$2,931,262
080417*	Dover Hwy. 7 Sidewalks (ATEP-11) (S)			Enhancement	Completed	Jun. 2013	Oct. 2015	-	$44,409	-	$44,409
080419*	Russellville W. Main St. Streetscaping (ATEP-11) (S)			Enhancement	Completed	Dec. 2012	Aug. 2021	-	$282,872	-	$282,872
080422	Dover – North (Passing Lanes) (S)	7	16	Passing Lanes	Completed	Oct. 2015	Mar. 2017	2.40	$6,341,246	2.40	$6,341,246
080443	White Oak Creek Str. & Apprs. (S)	64	6	Structure & Approaches	Completed	Jan. 2016	Sep. 2016	0.11	$1,243,957	0.11	$1,243,957
080464	Newton Co. Line – South (Passing Lane) (Ph. II) (S)	7	16	Passing Lanes	Completed	Oct. 2015	Sep. 2017	1.20	$3,921,213	1.20	$3,921,213
080476*	Orbit Trail (Russellville) (S)			Enhancement	Completed	Sep. 2013	Nov. 2016	-	$66,148	-	$66,148
080484	Hob Nob Rd. – Center Valley Rd. (S) Addt'l Rte.-Sec.: Pope New	124	1	Major Widening New Location	Completed	Dec. 2014	Jul. 2017	3.27	$16,084,352	3.27	$16,084,352

* Job not shown on county map.

SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No.	Job Name	Rte.	Sec.	Type Work	Status	Let Date	*Estimated* or Sub. Comp. Date	County Totals Length (Mi)	County Totals Cost	Project Totals Length (Mi)	Project Totals Cost
080488	D & R Railroad Spur – North (Overlay) (S)	7	14	Resurfacing	Completed	Apr. 2014	Oct. 2014	2.84	$1,055,892	2.84	$1,055,892
080497*	Arkansas Tourist Information Center (Big Piney) (S) Addt'l Rte.-Sec.: Johnson 40-21	40	22	Roadside Appurtenances	Completed	Dec. 2015	May. 2017	-	$1,797,594	-	$3,595,188
080500	Creek at L.M. 0.15 Str. & Apprs. (S)	331	0	Structure & Approaches	Completed	Sep. 2018	Feb. 2019	0.01	$389,394	0.01	$389,394
080506	Crooked Branch Str. & Apprs. (S)	7	15	Structure & Approaches	Completed	May. 2019	Jul. 2020	0.10	$1,835,817	0.10	$1,835,817
080513	Hwy. 64 – Skyline Dr. (Russellville) (Overlay) (S)	326	1	Resurfacing	Completed	Mar. 2016	Jan. 2017	5.11	$508,183	5.11	$508,183
080520*	Russellville Traffic Study (S)			Study	Completed	Nov. 2021	Nov. 2021	-	$240,208	-	$240,208
080524*	Arkansas Tech Connect Trail (RTP-15) (S)			Enhancement	Completed	Jun. 2017	Mar. 2020	-	$300,114	-	$300,114
080527*	Russellville Schoolhouse Trails (TAP) (S)			Enhancement	Completed	May. 2021	May. 2022	1.49	$468,563	1.49	$468,563
080529	Hector, Isabell & Alewine Creeks Strs. & Apprs. (S)	105	1	Structure & Approaches	Completed	May. 2020	Oct. 2021	0.32	$4,586,958	0.32	$4,586,958
080539	Hwy. 326 – Tyler Rd. (Russellville) (S)	64	6	Resurfacing	Completed	May. 2017	Apr. 2018	5.74	$2,734,210	5.74	$2,734,210
080540*	S. Church St. RR Signals Upgrade (Atkins) (S)			RR Crossing	Completed	Jun. 2017	Feb. 2022	-	$89,061	-	$89,061
080542	Hwy. 64 – Hwy. 64 (Pottsville & Russelville) (Sel. Sec.) (S)	331	0	Resurfacing	Completed	Feb. 2017	Dec. 2017	4.98	$857,571	4.98	$857,571
080546*	N. Commerce Ave. RR Signals Upgrade (Russellville) (S)			RR Crossing	Completed		Feb. 2020	-	$101,561	-	$101,561
080547	Dover – North (S) Addt'l Rte.-Sec.: Pope CS	27	11	Resurfacing	Completed	Jul. 2018	Jun. 2019	13.35	$3,637,928	13.35	$3,637,928
080554	I-40 – North (Sel. Secs.) (S) Addt'l Rte.-Sec.: Pope 363-2	363	1	Resurfacing	Completed	May. 2017	Mar. 2018	3.29	$658,174	3.29	$658,174
080557	Hwy. 105 – Hwy. 213 (S) Addt'l Rte.-Sec.: Conway 247-2	247	1	Resurfacing	Completed	Apr. 2018	Feb. 2019	7.00	$1,677,455	10.11	$2,422,725
080571*	USFS Moccasin Gap Vault Toilet (Motorized) (RTP-17) (S)			Enhancement	Programmed			-	< $1 M	-	< $1 M
080579	Atkins – Plumerville (S) Addt'l Rte.-Sec.: Conway 40-31	40	22	Resurfacing	Sub. Completed	Jun. 2020	Feb. 2022	5.05	$8,153,763	19.28	$31,129,614
080580	Hwy. 331 – Atkins (S)	40	22	Resurface & Shoulder	Under Construction	Apr. 2022	*Mid 2023*	10.08	$18,440,205	10.08	$18,440,205
080588	Pottsville – Atkins (S)	64	6	Resurfacing	Completed	Apr. 2020	Apr. 2021	4.33	$1,413,119	4.33	$1,413,119
080606*	Hwy. 7 Widening & Drainage Impvts. (Russellville) (S)	7	15	Miscellaneous	Scheduled	Aug. 2024		0.25	$5 - $10 M	0.25	$5 - $10 M
080608	Lake Dardanelle Str. & Apprs. (London) (S)	333	0	Structure & Approaches	Programmed			0.04	< $1 M	0.04	< $1 M
080616	Hwy. 124 Strs. & Apprs. (Pope Co.) (S)	124	2	Structure & Approaches	Scheduled	Sep. 2023		0.15	$1 - $3 M	0.15	$1 - $3 M
080621	McCoy & Little Creeks Strs. & Apprs. (S)	27	11	Structure & Approaches	Scheduled	Jun. 2023		0.44	$1 - $3 M	0.44	$1 - $3 M
080625*	Pottsville City Park Trail Ext. (RTP-18) (S)			Enhancement	Completed	Oct. 2019	Jul. 2020	-	$29,600	-	$29,600
080628*	Hwy. 7 Slide Repairs (Pope Co.)	7	16	Base Stabilization	Completed	Jun. 2019	Dec. 2019	0.44	$2,537,363	0.44	$2,537,363

* Job not shown on county map.

SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No.	Job Name	Rte.	Sec.	Type Work	Status	Let Date	*Estimated* or Sub. Comp. Date	County Totals Length (Mi)	County Totals Cost	Project Totals Length (Mi)	Project Totals Cost
080638*	Hwy. 7 Railroad Signals Upgrade (Russellville) (S)	7	14	RR Crossing	Programmed			-	< $1 M	-	< $1 M
080643*	Hwy. 7T Railroad Signals Upgrade (Russellville) (S)	7	14T	RR Crossing	Programmed			-	< $1 M	-	< $1 M
080644*	4th St. Railroad Signals & Surf. (Russellville) (S)	CS		RR Crossing	Programmed			-	< $1 M	-	< $1 M
080648	Hwy. 64 – Hwy. 331 (S) Addt'l Rte.-Sec.: Johnson 40-21	40	22	Resurfacing	Programmed			12.18	$10 - $15 M	19.85	$15 - $20 M
080653*	Hector Hwy. 27 & Maple St. Sidewalks (TAP-21) (S)			Enhancement	Programmed			-	< $1 M	-	< $1 M
080654	Hwy. 326 – El Paso Ave. (Russellville) (S)	64	6	Resurfacing	Scheduled	2024		2.70	< $1 M	2.70	< $1 M
080671*	Russellville Schoolhouse Trail Ph. 2 (TAP) (S)			Enhancement	Programmed			-	< $1 M	-	< $1 M
080680	Lake Dardanelle State Park – Hwy. 7 (Russellville) (S)	326	1	Resurfacing	Scheduled	2024		5.11	$1 - $3 M	5.11	$1 - $3 M
080681*	Hwy. 333 RR Signals Upgrade (London) (S)	333	0	RR Crossing	Programmed			-	< $1 M	-	< $1 M
080682	I-40 – Dover (S)	7	15	Resurfacing	Scheduled	2024		5.65	$3 - $5 M	5.65	$3 - $5 M
A80010*	District 8 Resurfacing Program (2021) (S) Addt'l Rte.-Sec.: Various	16	8B	Resurfacing	Completed		Jun. 2022	36.06	$390,941	93.36	$1,004,551
A80011	Piney Creek Branch Str. & Apprs. (S)	333	1	Structure & Approaches	Under Construction	Apr. 2022	*Late 2023*	0.32	$2,154,818	0.32	$2,154,818
A80018	Hwys. 7, 124 & 326 (Sel. Secs.) (S) Addt'l Rte.-Sec.: Pope 7-15, 124-1, 326-0	7	14	Resurfacing	Under Construction	Nov. 2022		5.84	$6,989,531	5.84	$6,989,531
A80019*	District 8 Resurfacing Program (2022) (S) Addt'l Rte.-Sec.: Johnson 21-1; Perry 113-4, 155-6; Yell 309-1	105	1	Resurfacing	Programmed			6.15	< $1 M	24.77	< $1 M
A80020*	District 8 Resurfacing Program (2023) (S) Addt'l Rte.-Sec.: Various	105	1	Resurfacing	Programmed			26.44	< $1 M	97.40	$1 - $3 M
A80023	N. of Old Hwy. 7 – Newton Co. Line (S)	7	16	Resurfacing	Scheduled	Apr. 2023		16.13	$5 - $10 M	16.13	$5 - $10 M
A80025	Atkins – Conway Co. Line (S)	64	6	Resurfacing	Scheduled	Mar. 2023		4.96	$1 - $3 M	4.96	$1 - $3 M
BB0803	Hwy. 64 – Mill Creek (S) Addt'l Rte.-Sec.: Johnson 40-21	40	22	Resurfacing	Completed	Jul. 2014	May. 2015	5.16	$3,566,305	12.87	$8,698,304
BB0804	Mill Creek – Hwy. 331 (F)	40	22	Resurfacing	Completed	Nov. 2012	May. 2015	7.40	$42,378,010	7.40	$42,378,010
BB0805	Hwy. 331 – Atkins (S)	40	22	Resurfacing Safety Improvements	Completed	Apr. 2014	Oct. 2014	10.84	$6,710,022	10.84	$6,710,022
BB0806	Atkins – Plumerville (S) Addt'l Rte.-Sec.: Conway 40-31	40	22	Rehabilitation	Completed	Feb. 2013	Oct. 2013	4.33	$2,840,645	18.60	$12,350,633
C58001*	Dover,hectr & Londn Ovrly & Srf. (Selsecs)(s)	CS		Resurfacing	Completed	Apr. 2017	Aug. 2017	4.44	$536,463	4.44	$536,463
C58003*	Atkins Overlay (S)	CS		Resurfacing	Completed	May. 2020	Apr. 2021	1.64	$285,924	1.64	$285,924

* Job not shown on county map.

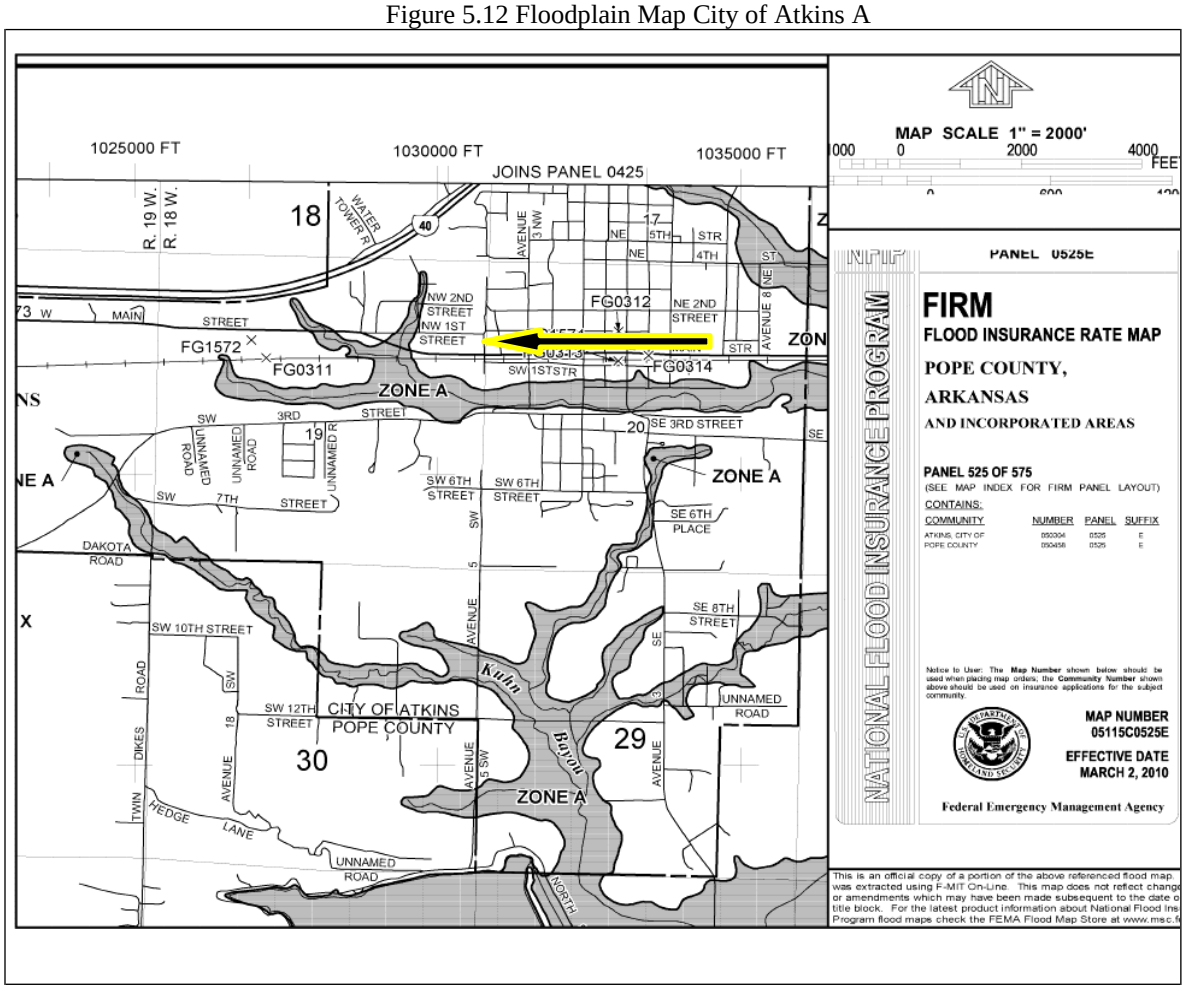
SUMMARY OF CONSTRUCTION PROJECTS

POPE COUNTY

Job No.	Job Name	Rte.	Sec.	Type Work	Status	Let Date	*Estimated* or Sub. Comp. Date	County Totals Length (Mi)	County Totals Cost	Project Totals Length (Mi)	Project Totals Cost
C58004*	Dover & Hector Overlay (S)	CS		Resurfacing	Programmed			3.11	< $1 M	3.11	< $1 M
C58005*	Pottsville Overlay (S)	CS		Resurfacing	Completed	Apr. 2021	Aug. 2021	1.20	$260,968	1.20	$260,968
C58006*	Russellville E. 16th St. Overlay (S)	CS		Resurfacing	Completed	Apr. 2021	Jul. 2021	1.00	$341,665	1.00	$341,665
C76020*	Dardanelle, Pttsvl& Rslvle Olay (Sel Secs)(s) Addt'l Rte.-Sec.: Yell CS	CS		Resurfacing	Completed	Jun. 2015	Sep. 2015	4.00	$388,015	5.86	$776,030
FS8032	I-40 – North (S)	7	15	Resurfacing	Completed	Apr. 2013	Sep. 2013	5.93	$2,583,946	5.93	$2,583,946
FS8036	Hwy. 64 – North (S)	105	1	Resurfacing	Completed	Jun. 2013	Oct. 2013	2.29	$513,214	2.29	$513,214
FS8043	Hwy. 124 – Hwy. 105 (S)	326	3	Resurfacing	Completed	Apr. 2014	Aug. 2014	6.68	$1,300,539	6.68	$1,300,539
FS8047	Linker Creek – North (S)	7	15	Resurfacing	Completed	Apr. 2014	Oct. 2014	2.87	$732,420	2.87	$732,420
FS8049	Hwy. 105 – North (S) Addt'l Rte.-Sec.: Pope 27-12	27	11	Resurfacing	Programmed			10.95	$1 - $3 M	10.95	$1 - $3 M
FS8050	Hwy. 105 – Hwy. 213 (S) Addt'l Rte.-Sec.: Conway 247-2	247	1	Resurfacing	Programmed			7.05	$1 - $3 M	10.17	$1 - $3 M
GF0878*	Lake Dardanelle Stte Prk Accss Pkg Lt Overlay			Resurfacing	Completed	May. 2016	May. 2016	-	$61,176	-	$61,176
GF0879*	Ar Nuclr 1 Accss(lk Dardanelle)pkg Lot Ovrlay			Roadside Appurtenances	Completed	Mar. 2015	Jun. 2015	-	$54,710	-	$54,710
GF0880*	Galla Creek (Galla Creek Wma)boat Ramp (S)			Miscellaneous	Completed	May. 2016	May. 2016	-	$14,811	-	$14,811
GF0884*	Bells Chpl Acs (Lk Atkins) Rd & Pk Lot Resurf			Roadside Appurtenances	Completed		Sep. 2020	-	$35,000	-	$35,000
SA5855*	Hwy. 333-East (Overlay) (S)	CR		Resurfacing	Completed	Apr. 2013	Jul. 2013	2.41	$223,578	2.41	$223,578
SA5856*	Russellville City Limits-Hwy. 124(OVERLAY)(S)	CR		Resurfacing	Completed	Jun. 2014	Oct. 2014	2.58	$364,847	2.58	$364,847
SA5857*	Pope County Surfacing No. 17 (S)	CR		Resurfacing	Completed	Jul. 2015	Oct. 2015	2.45	$320,566	2.45	$320,566
SA5858*	Pope County Overlay (Sel. Secs.) (S)	CR		Resurfacing	Completed	Aug. 2016	Nov. 2016	1.60	$191,252	1.60	$191,252
SA5859*	Pope County Overlay No. 2 (Sel. Secs.) (S)	CR		Resurfacing	Completed	Jul. 2017	Nov. 2017	3.90	$465,977	3.90	$465,977
SA5860*	Pope Co. Overlay No. 3 (Sel.secs.)(s)	CR		Resurfacing	Completed	Jul. 2018	Oct. 2018	3.15	$407,109	3.15	$407,109
SA5861*	Pope Co. Overlay No.4 (S)	CR		Resurfacing	Completed	May. 2019	Jul. 2019	2.10	$278,557	2.10	$278,557
SA5862*	Hwy. 7 - Hwy. 124 (Overlay) (S)	CR		Resurfacing	Completed	Feb. 2021	Aug. 2021	6.50	$808,395	6.50	$808,395
	Totals For All Projects In Pope County							**240.02**	**$193,717,298**		

* Job not shown on county map.

Figure 5.12 Floodplain Map City of Atkins A



The arrow points to the general area of schools in the Atkins.

Figure 5.13 Floodplain Map of City of Atkins B

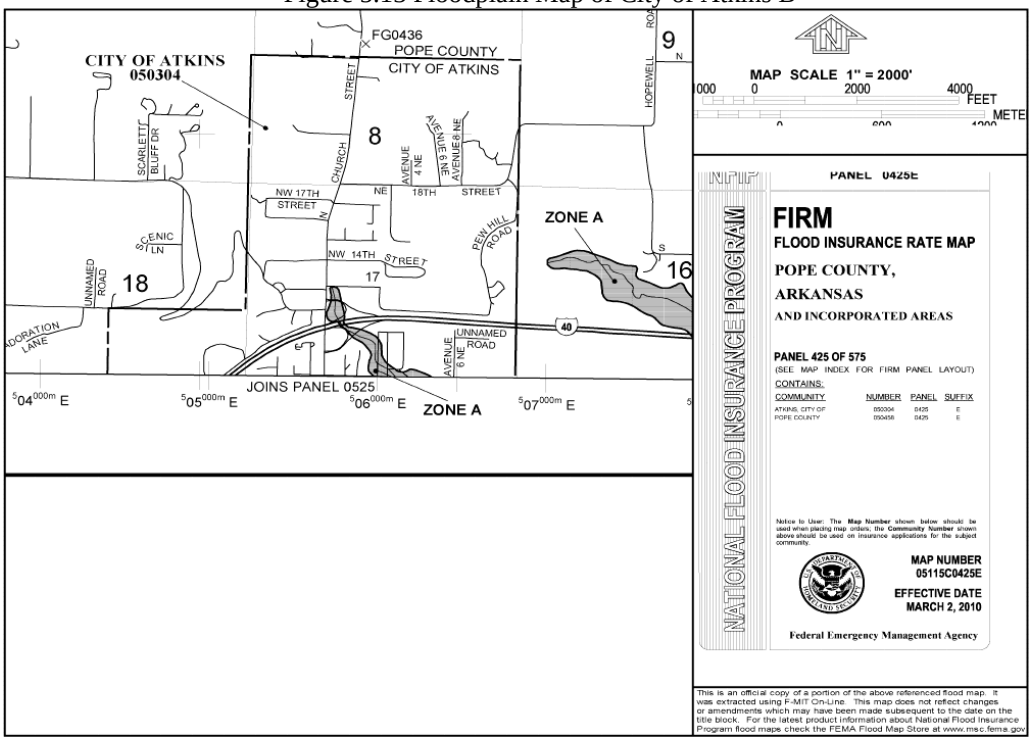


Figure 5.14 Floodplain Map of City of Atkins C

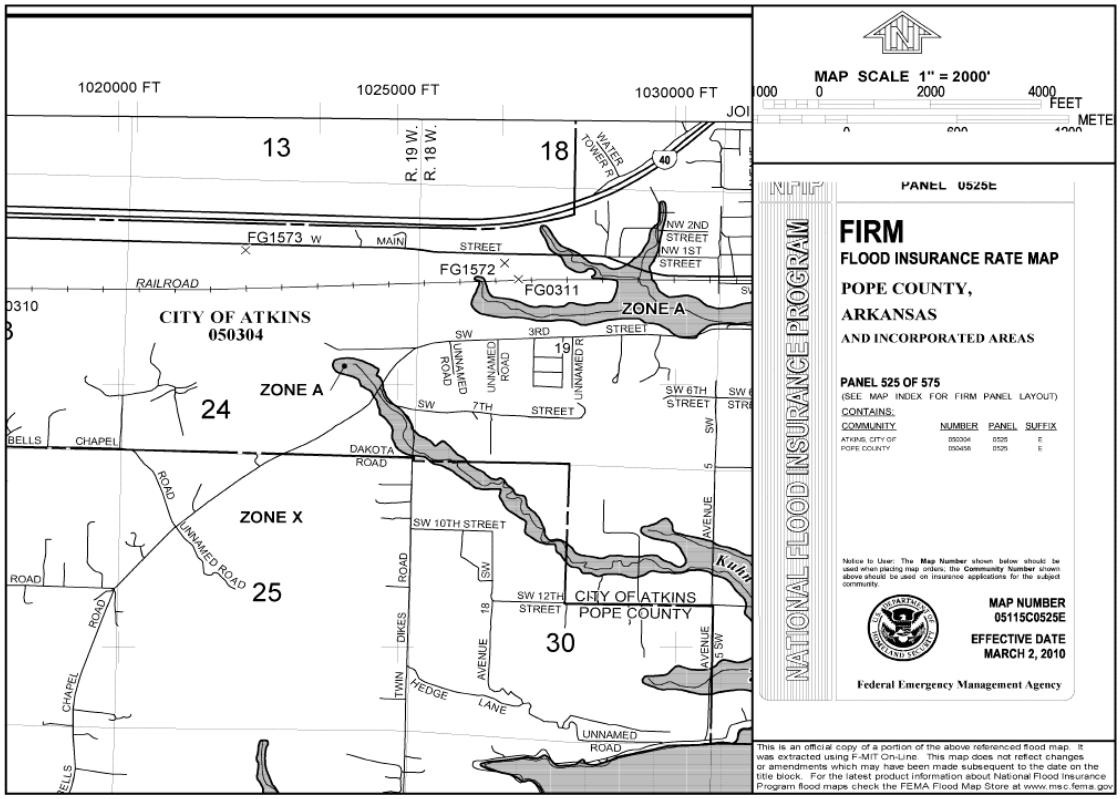
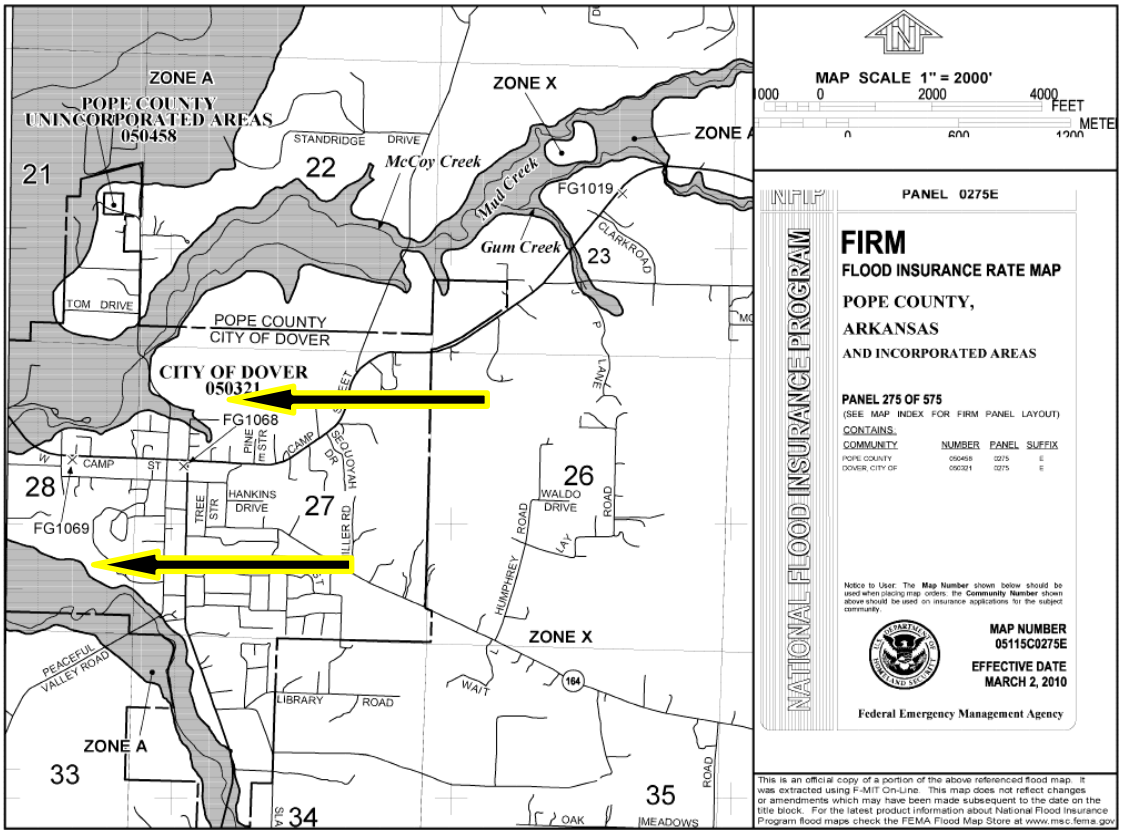


Figure 5.15 Floodplain Map City of Dover



Arrow shows area of where facilities in the Dover School District are.

Figure 5.16 Floodplain Map City of London A

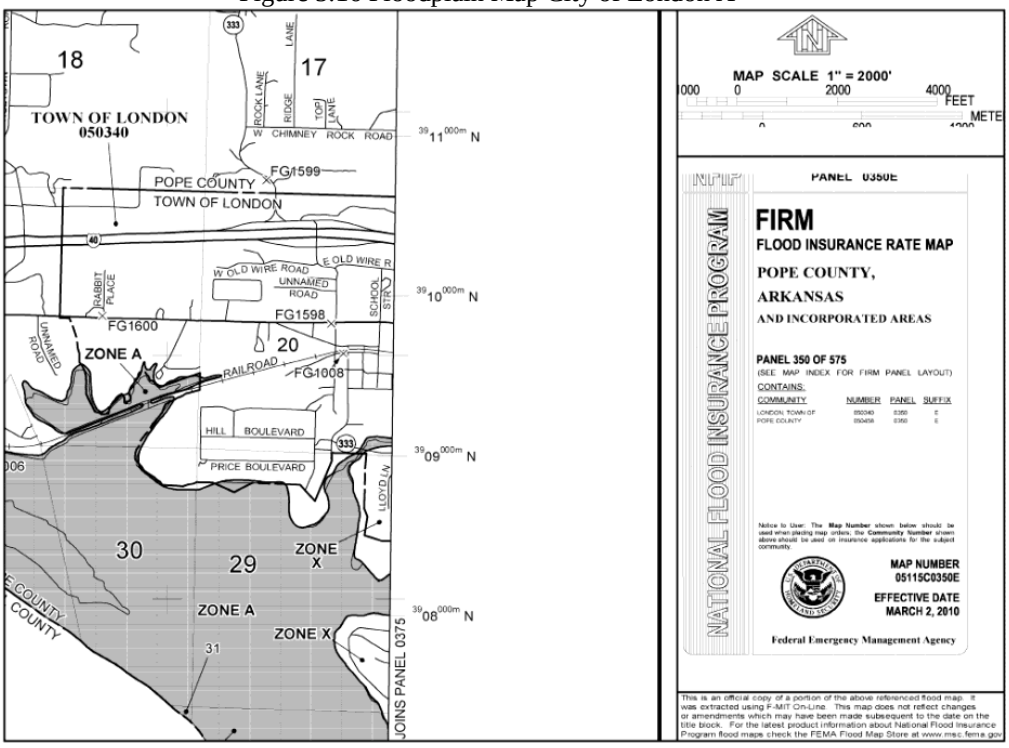


Figure 5.17 Floodplain Map City of London B

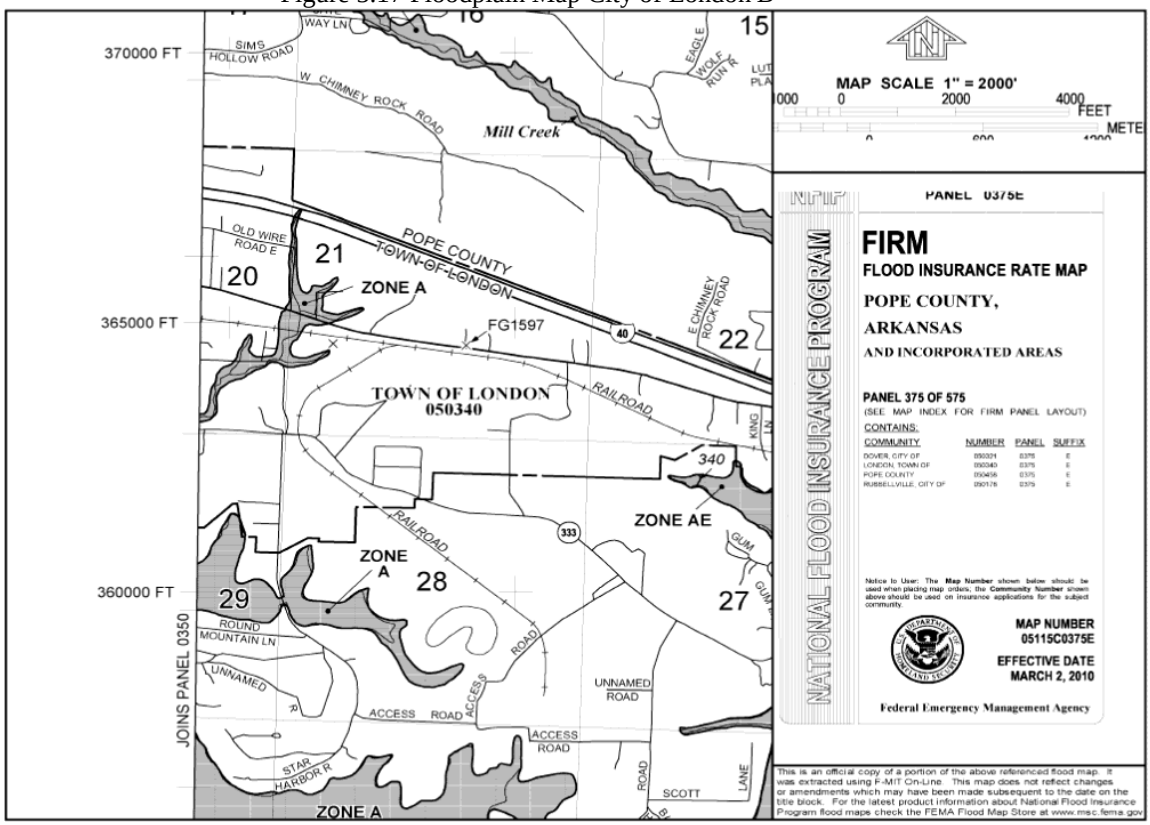


Figure 5.18 Floodplain Map City of Russellville A

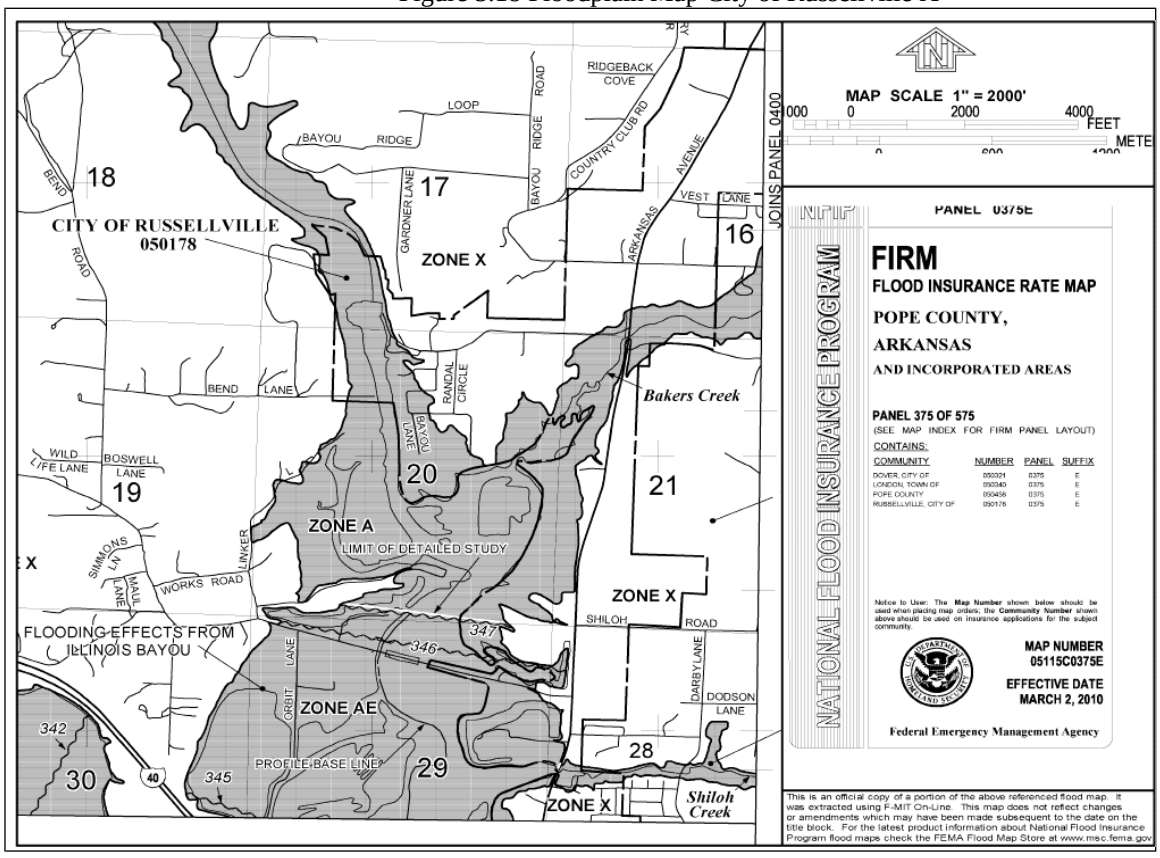


Figure 5.19 Floodplain Map City of Russellville B

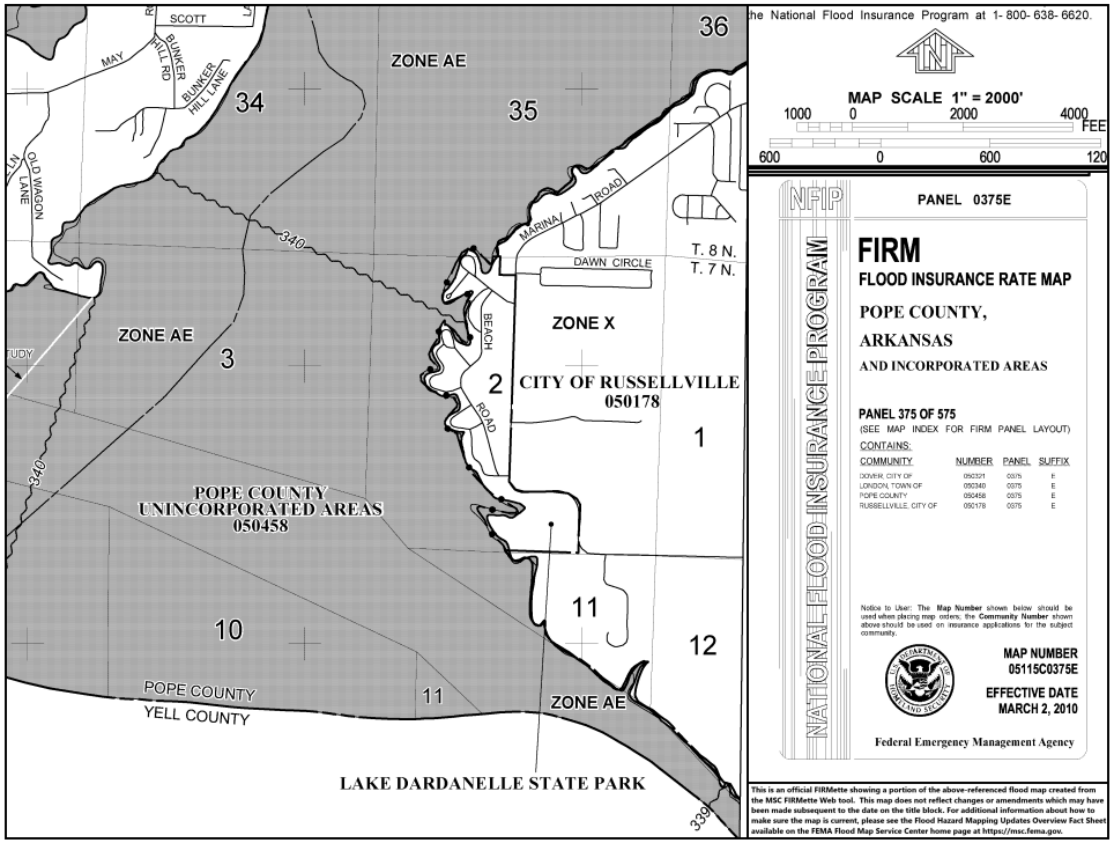


Figure 5.20 Floodplain Map City of Russellville C

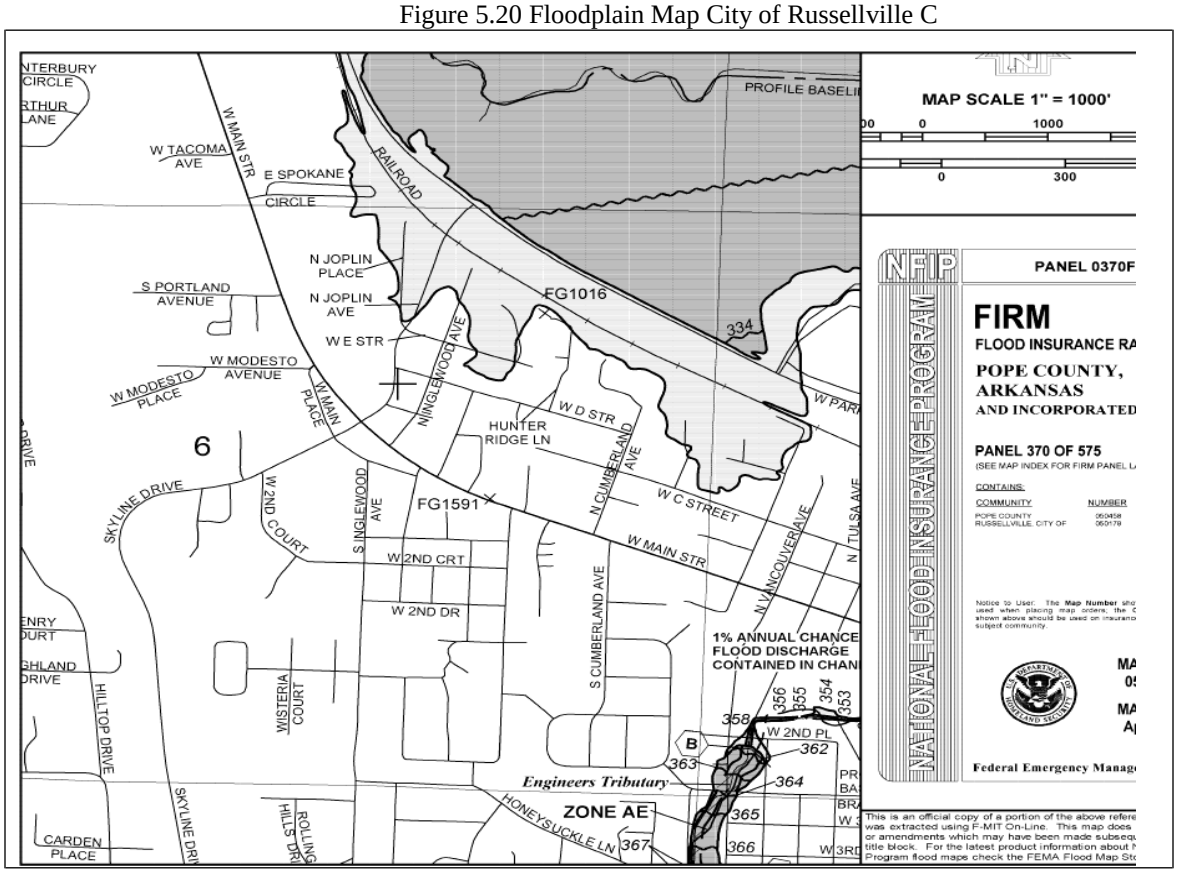
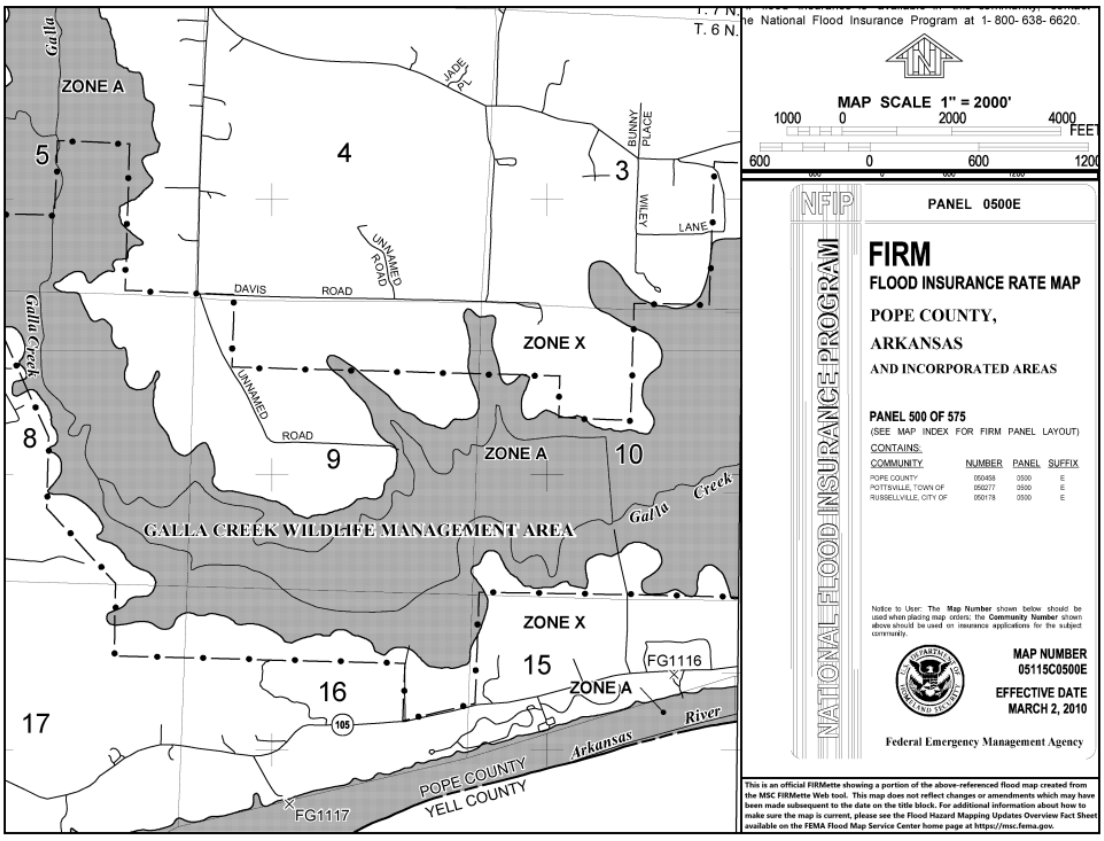


Figure 5.21 Floodplain Map City of Russellville D



The unincorporated area of Pope County located at the Galla Creek Game Management Area.

Figure 5.22 Floodplain Map City of Pottsville

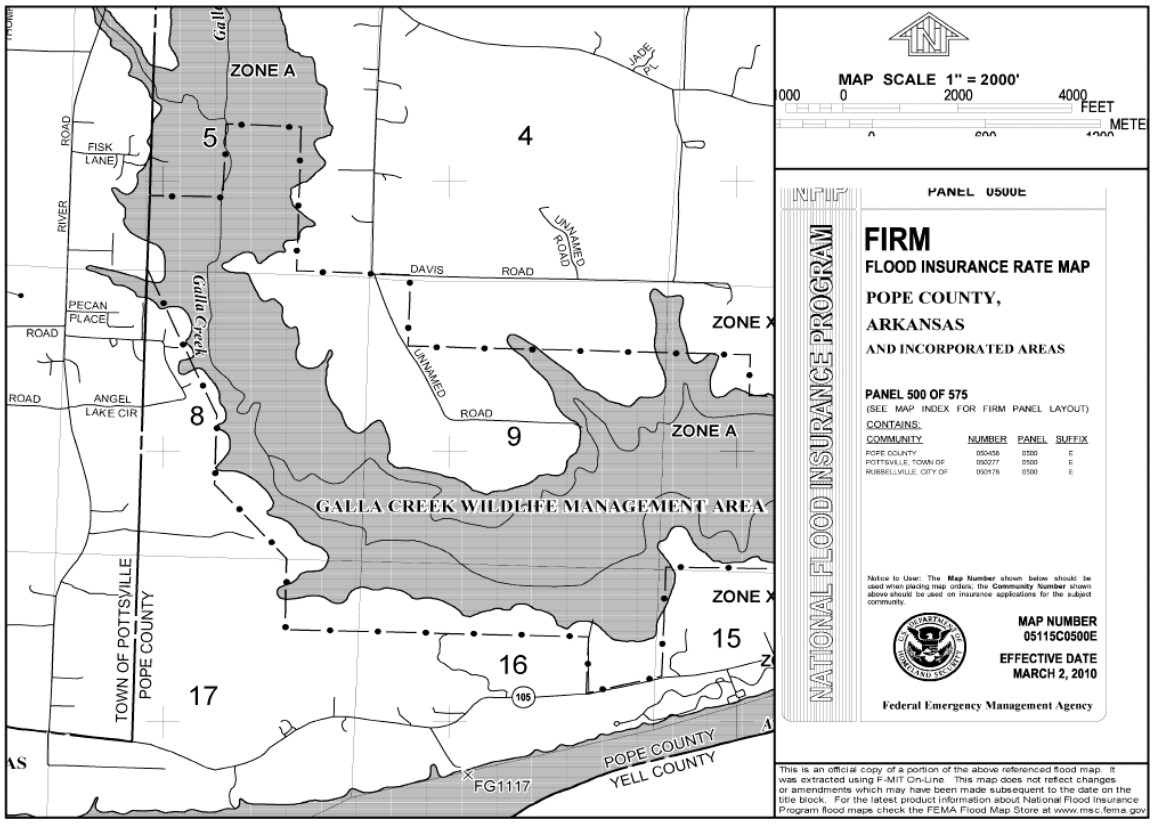


Figure 5.23 Floodplain Map Unincorporated Pope County A

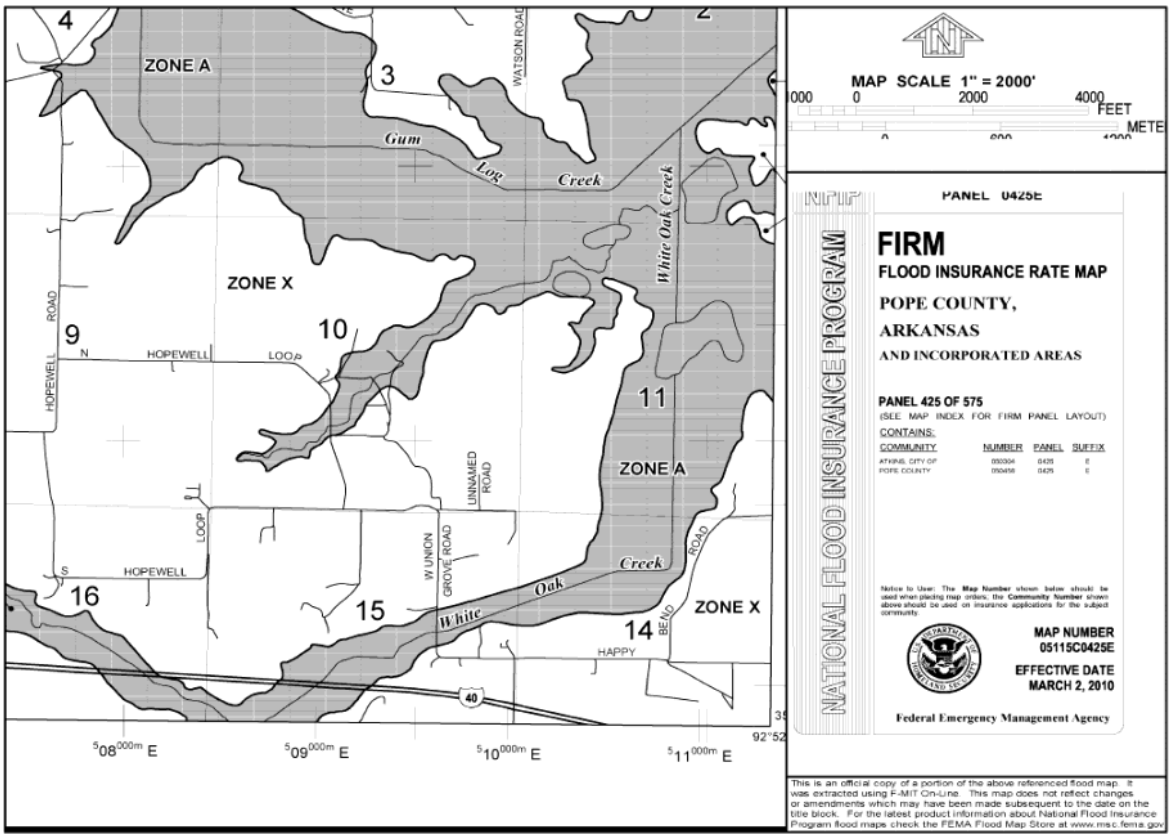


Figure 5.24 Floodplain Map Unincorporated Pope County B

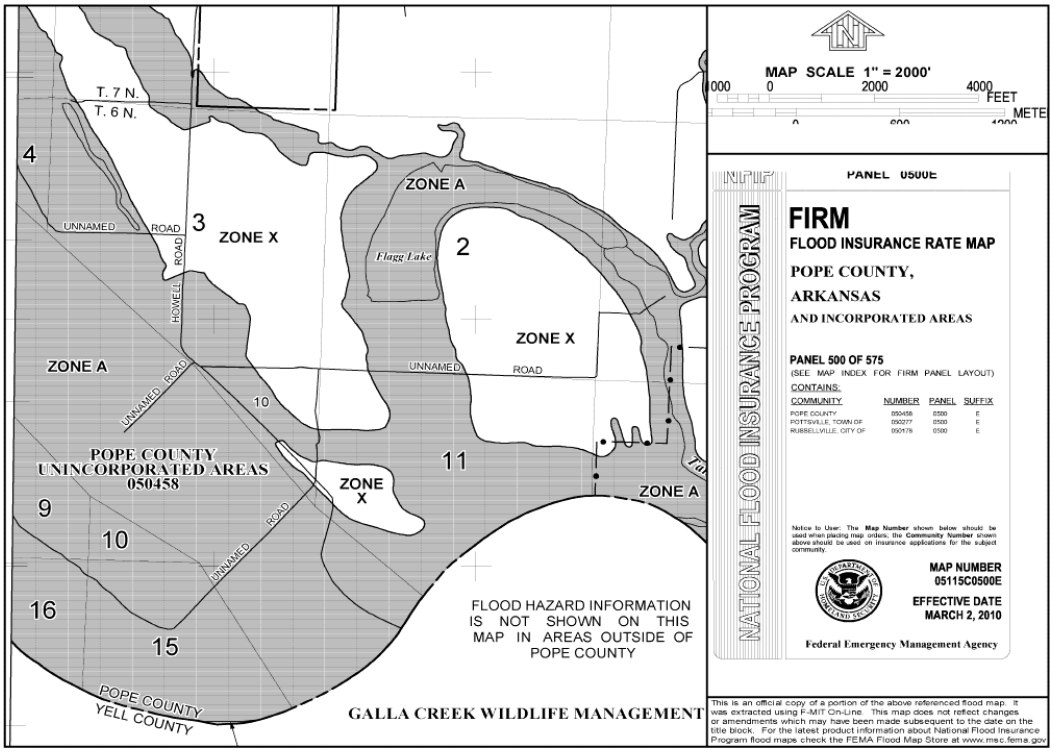


Figure 5.25 Floodplain Map Unincorporated Pope County C

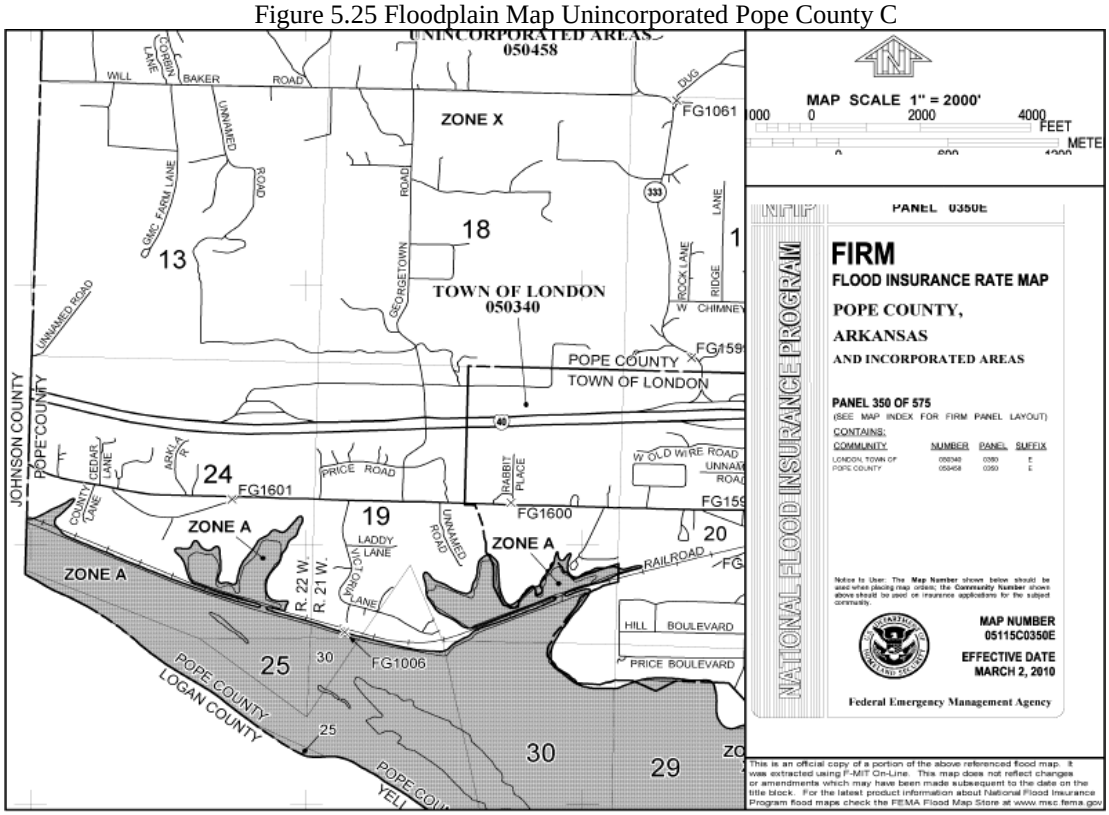
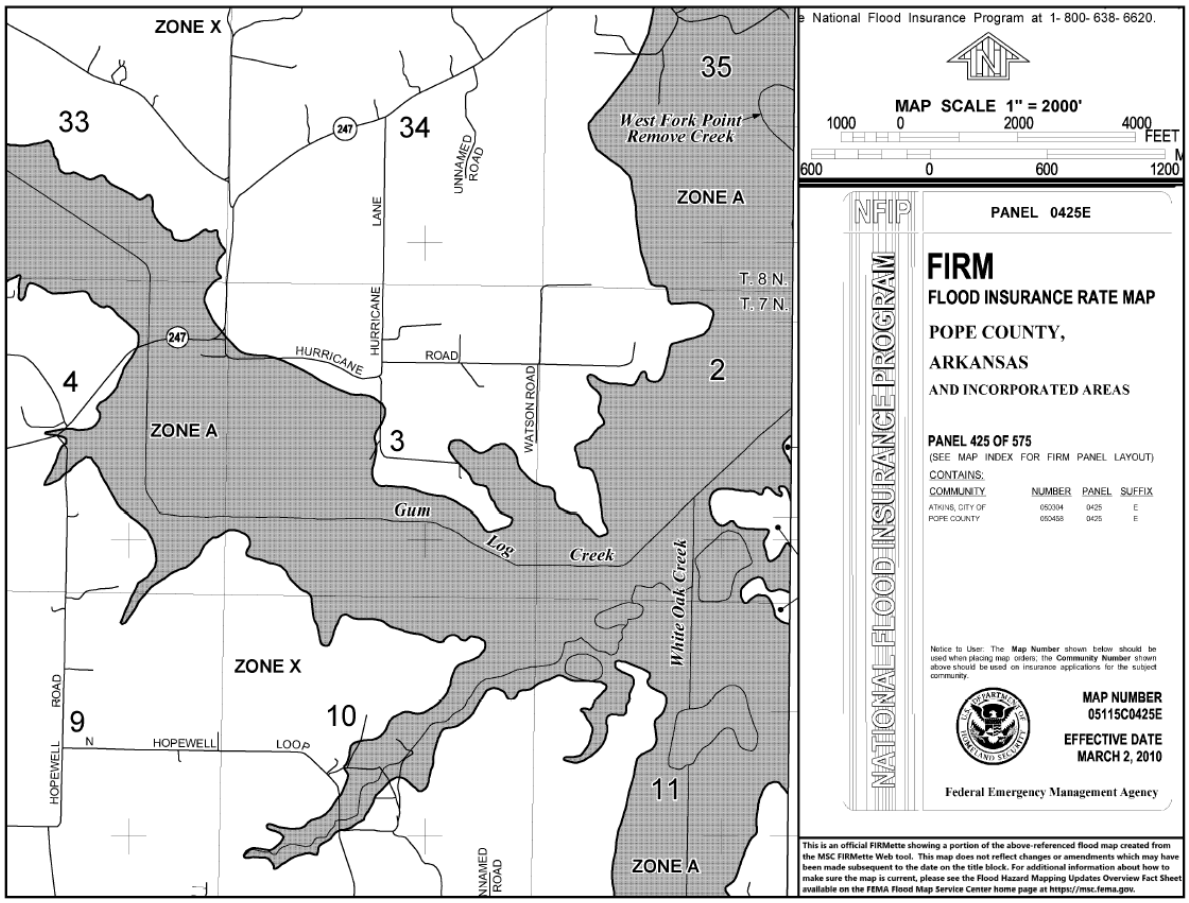


Figure 5.26 Floodplain Map Unincorporated Pope County D



National Flood Hazard Layer FIRMette

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- **SPECIAL FLOOD HAZARD AREAS**
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- **OTHER AREAS OF FLOOD HAZARD**
  - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone D*
- **OTHER AREAS**
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- **GENERAL STRUCTURES**
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- **OTHER FEATURES**
  - 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
  - Coastal Transect
  - Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
- **MAP PANELS**
  - Digital Data Available
  - No Digital Data Available
  - Unmapped

N

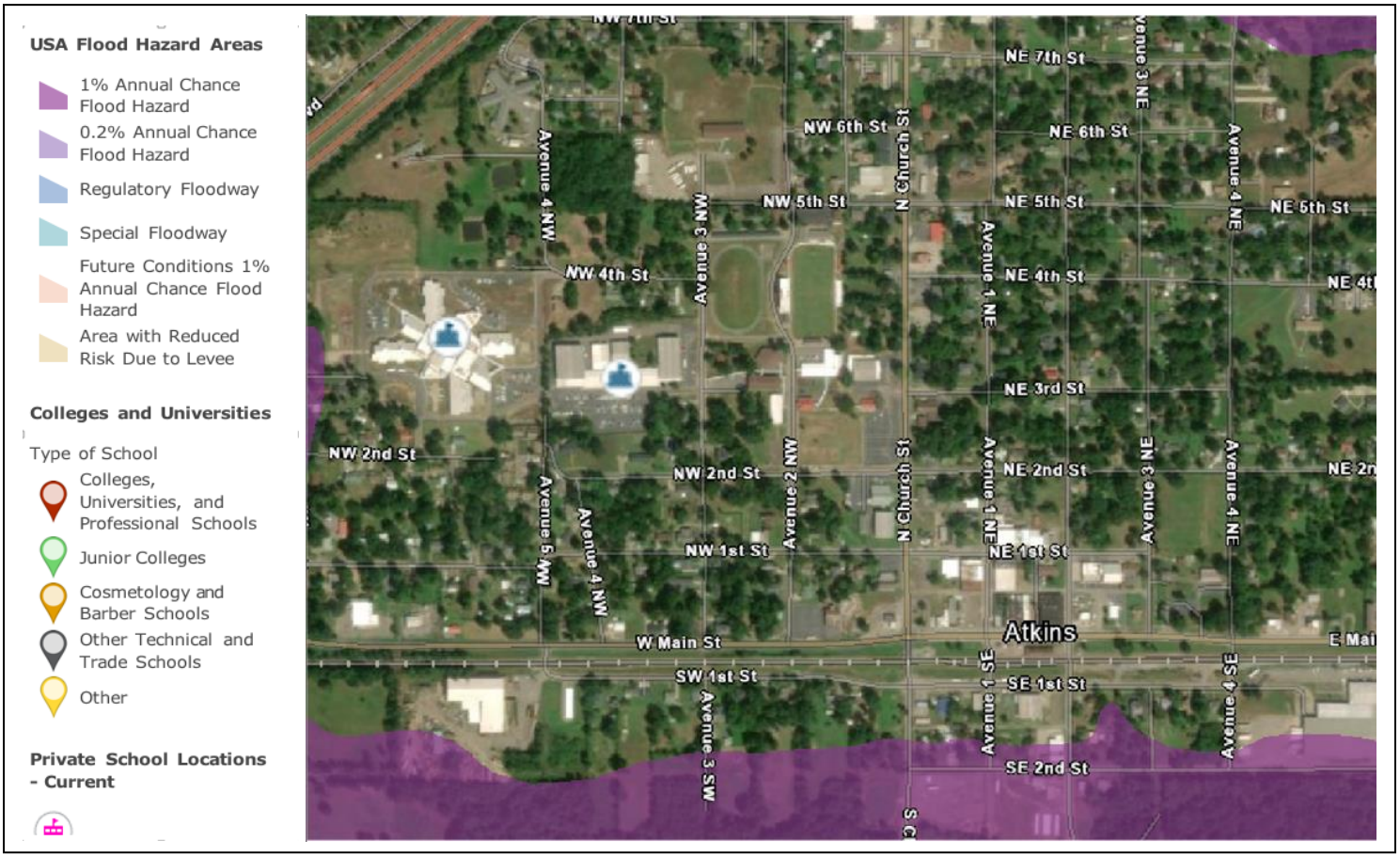
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/17/2023 at 12:22 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

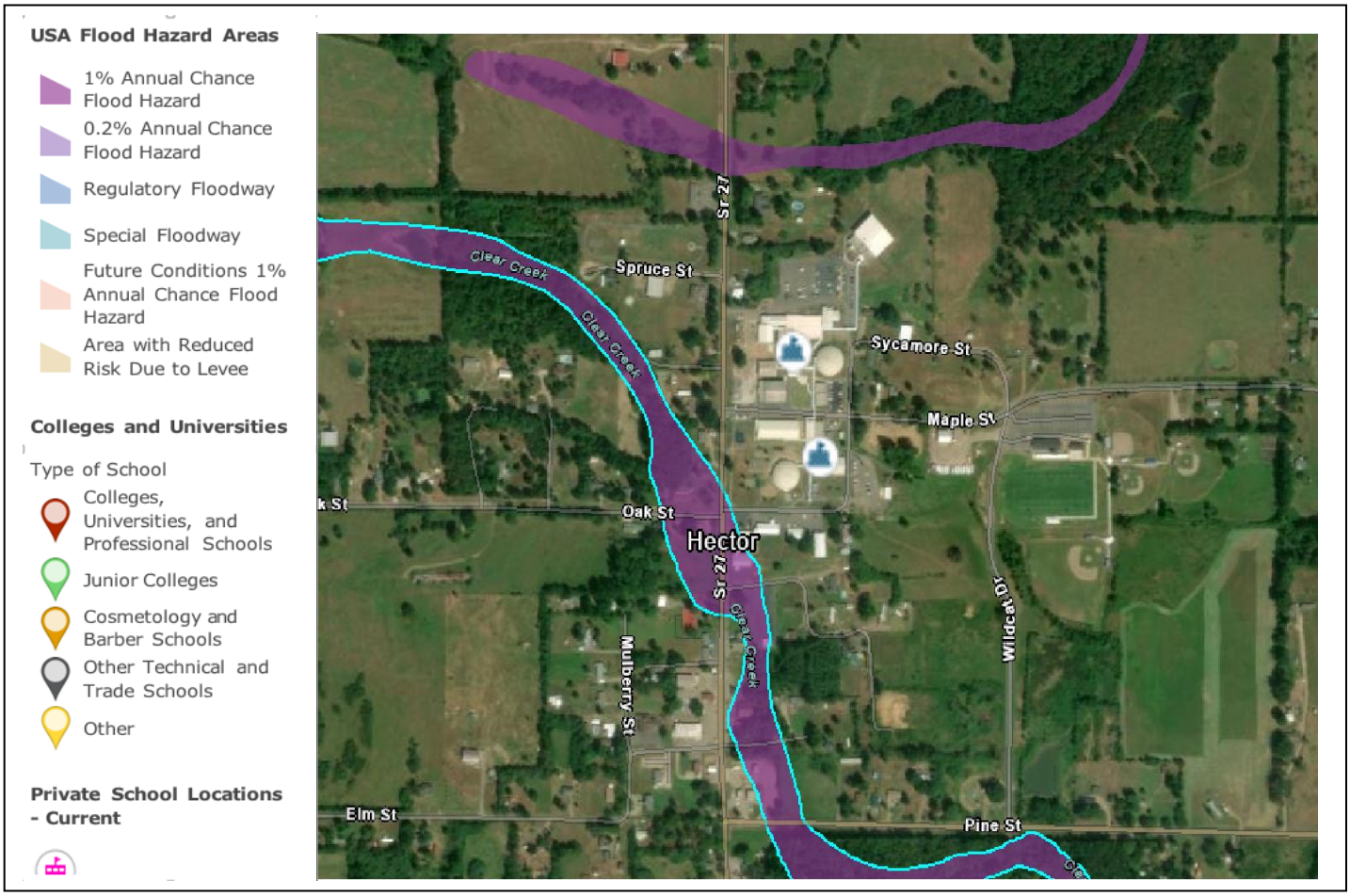
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Pope County, AR



Pope County

Pope County, AR



Pope County

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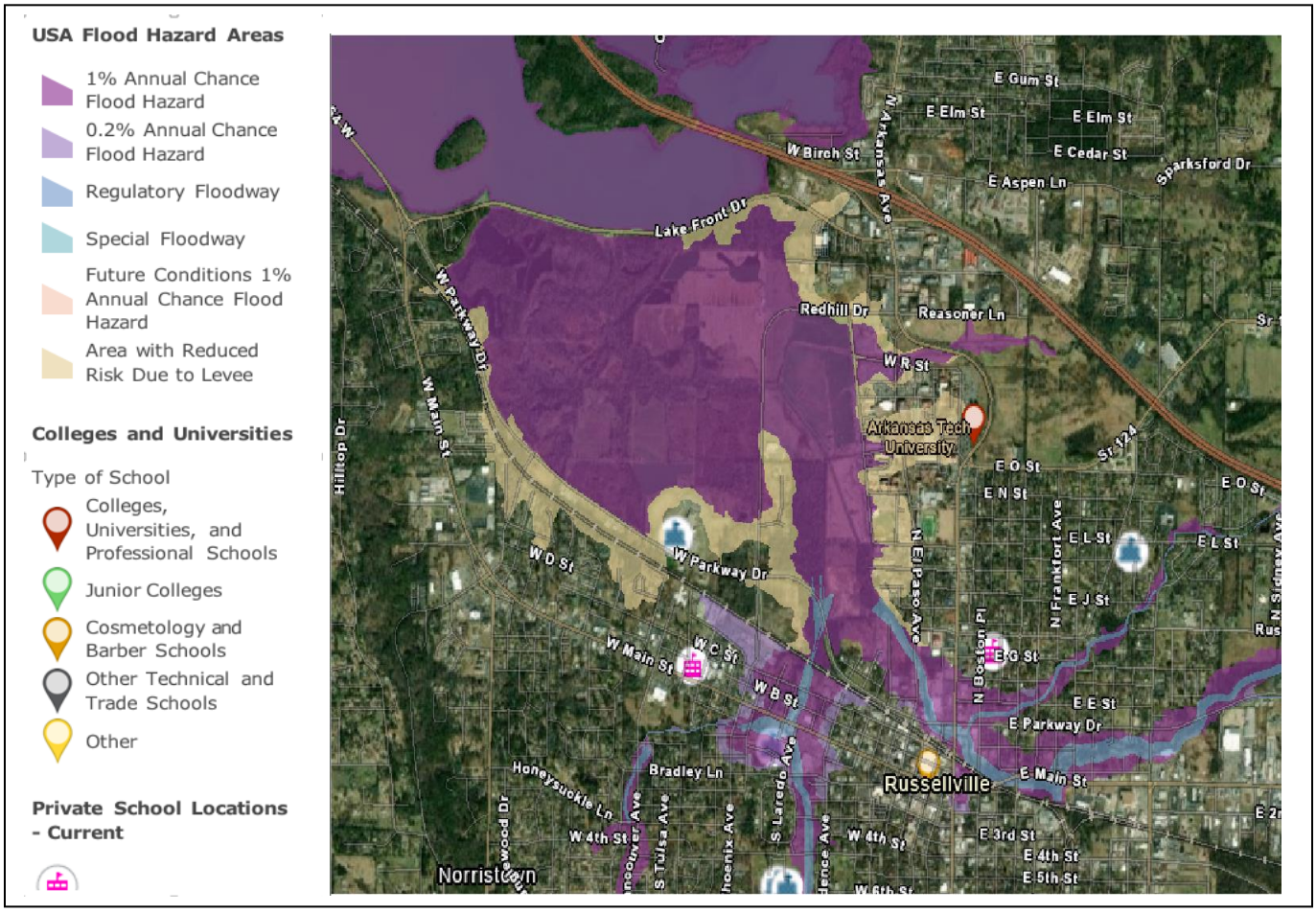
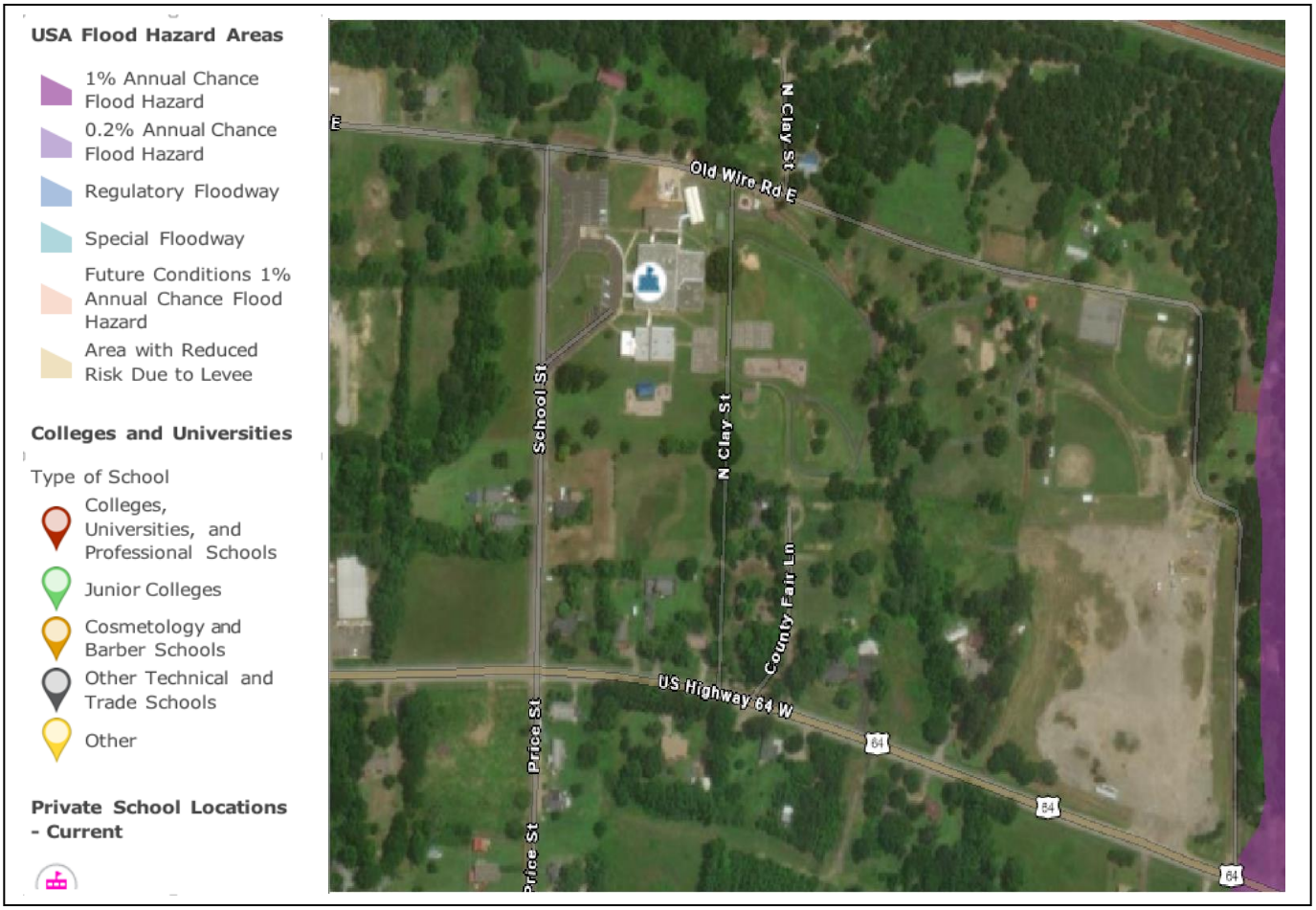
Pope County, AR



Pope County

NCES EDGE | PSS products are not copyrighted. These products are free to use in a product or publication, however acknowledgement must be given to the National Center for Education Statistics as the source. The point information in the PSS school shapefile is for statistical research purposes only. Coordinates in the shapefile have six implied decimal places, but the positional accuracy of these coordinates may not be as great as the six decimal places suggest. | Maxar | Esri Community Maps Contributors, Arkansas GIS Office, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

Pope County, AR



Pope County

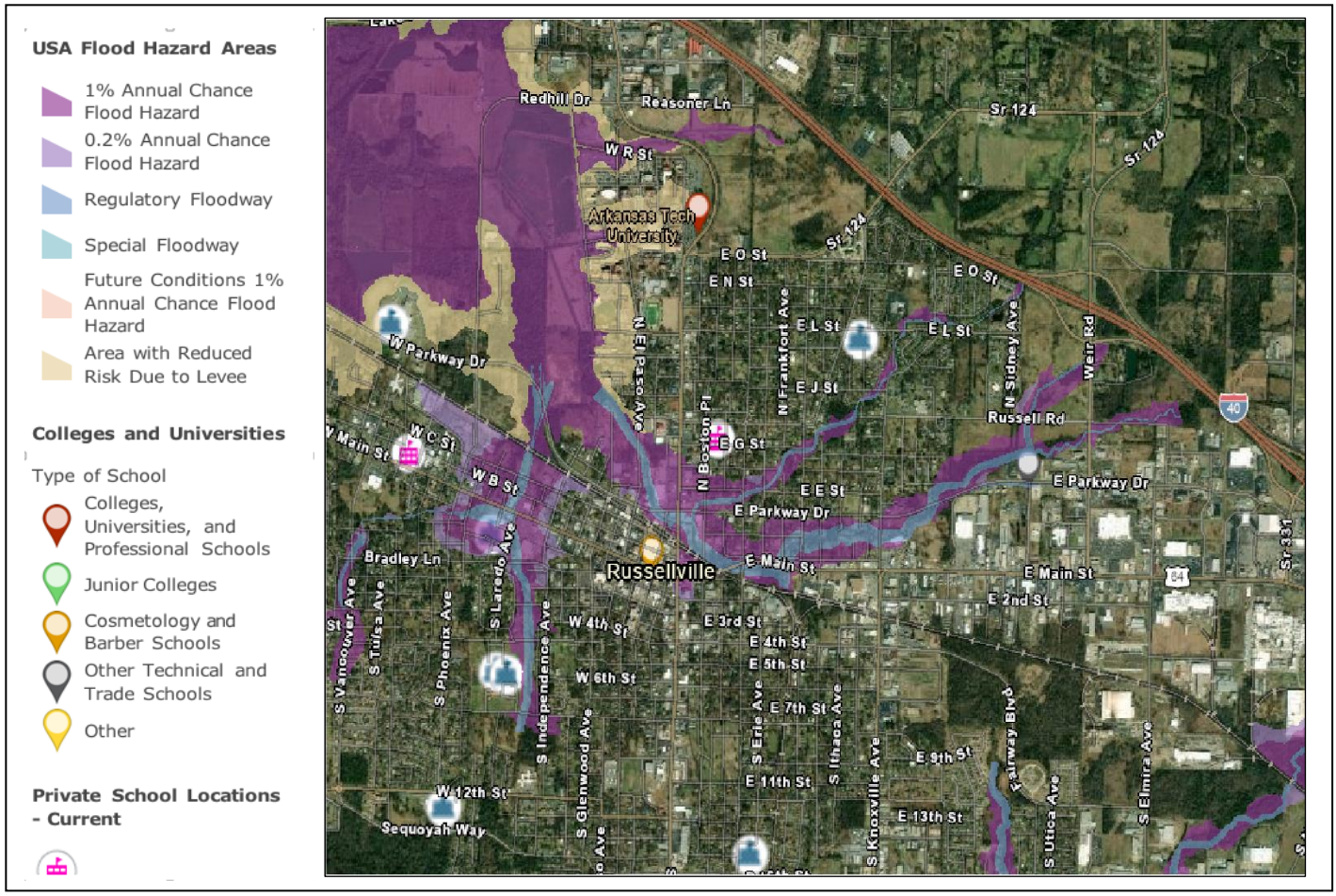
100m

Pope County, AR

Pope County

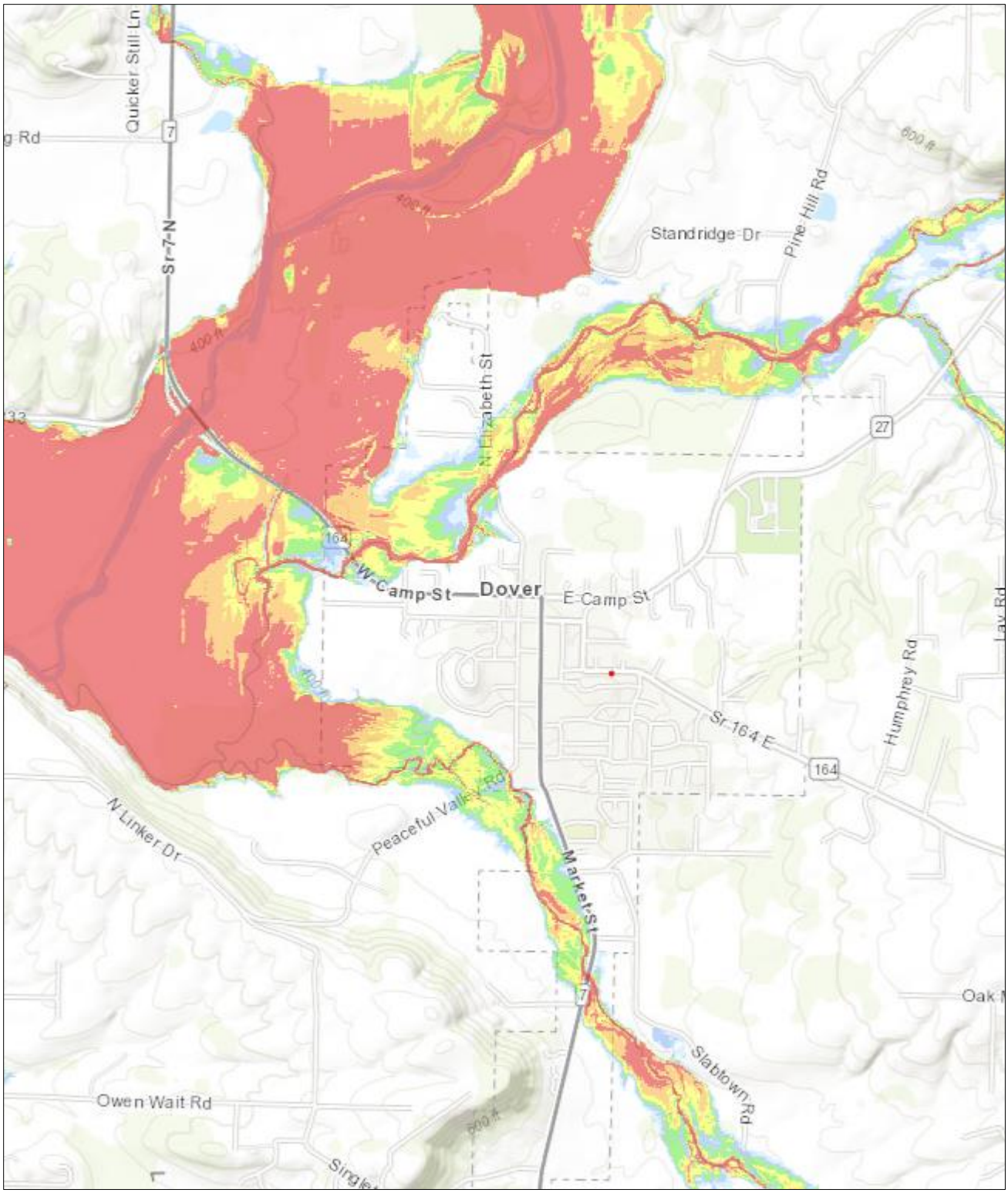
0.4km

Pope County, AR

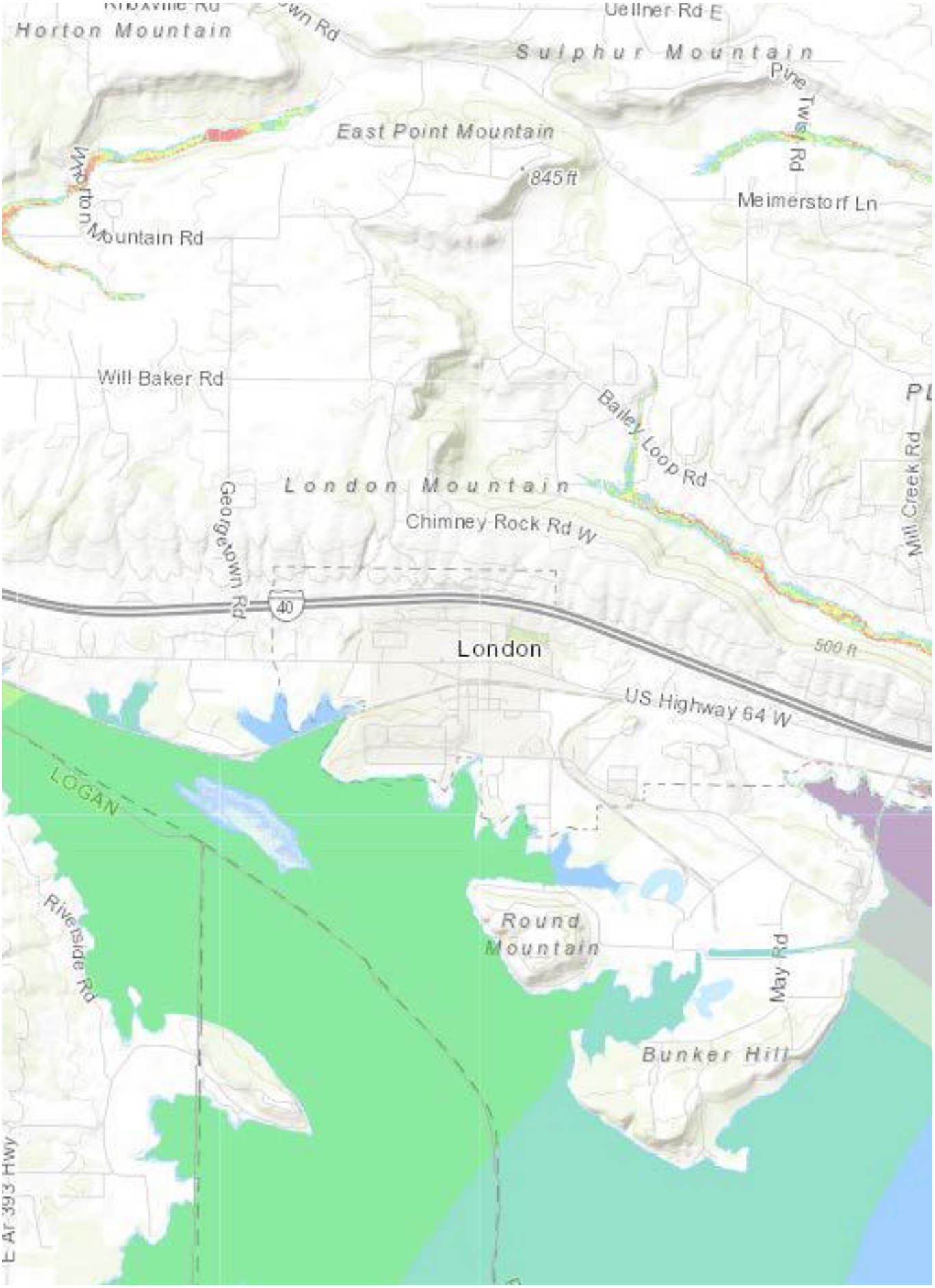


Pope County


Hurricane Rd
Alpine Meadow
Hopewell Rd
N Hopewell Loop
N Church St
Hudson Rd
Union Grove Loop
W Main St
Atkins
US Highway
SW 3rd St
SE 4th St
Avenue J SE
Black Land Rd
Fronsberger Rd
Lake Rd
Twin Dikes Rd
N Shore Rd
Reed Loop
Stella Chapel Rd E
Lake Atkins
Gold Hill Rd
Loop

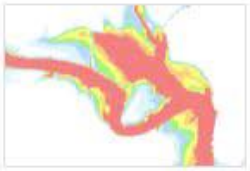

Quicker Still Ln
g Rd
7
Sr-7-N
400 ft
Standridge Dr
Pine Hill Rd
600 ft
N Elizabeth St
27
164
W Camp St
Dover
E Camp St
Humphrey Rd
Sr-164 E
164
N Linker Dr
Peaceful Valley Rd
Market St
7
Slabtown Rd
Owen Wait Rd
800 ft


27
843 ft
609
Oak St
SR 27
Maple St
Hector
Clear Creek
Walnut Rd
27
Sr 27
Laundromat Rd


Horton Mountain
Sulphur Mountain
Uellner Rd E
East Point Mountain
845 ft
Pine Twist Rd
Meimerstorf Ln
Mountain Rd
Will Baker Rd
Bailey Loop Rd
London Mountain
Chimney Rock Rd W
Georgetown Rd
Mill Creek Rd
40
London
500 ft
US Highway 64 W
LOGAN
Riverside Rd
Round Mountain
May Rd
Bunker Hill

Report | Legend 5 | Map Layers 3

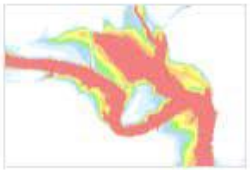
Flood Depth (1%)



- ≤ 1 foot
- > 1 to 2 feet
- > 2 to 3 feet
- > 3 to 4 feet
- > 4 to 5 feet
- > 5 feet

Comments: Depicts estimated water depths above land surface during a 1% annual chance storm event (a storm that has a 1/100 chance of occurring in any calendar year). Glossary of Terms...

Flood Depth (0.2%)



- ≤ 1 foot
- > 1 to 2 feet
- > 2 to 3 feet
- > 3 to 4 feet
- > 4 to 5 feet
- > 5 feet

Comments: Depicts estimated water depths above land surface during a 0.2% annual chance storm event (a storm that has a 1/500 chance of occurring in any calendar year). Glossary of Terms...

Counties

Glossary | Quick Start

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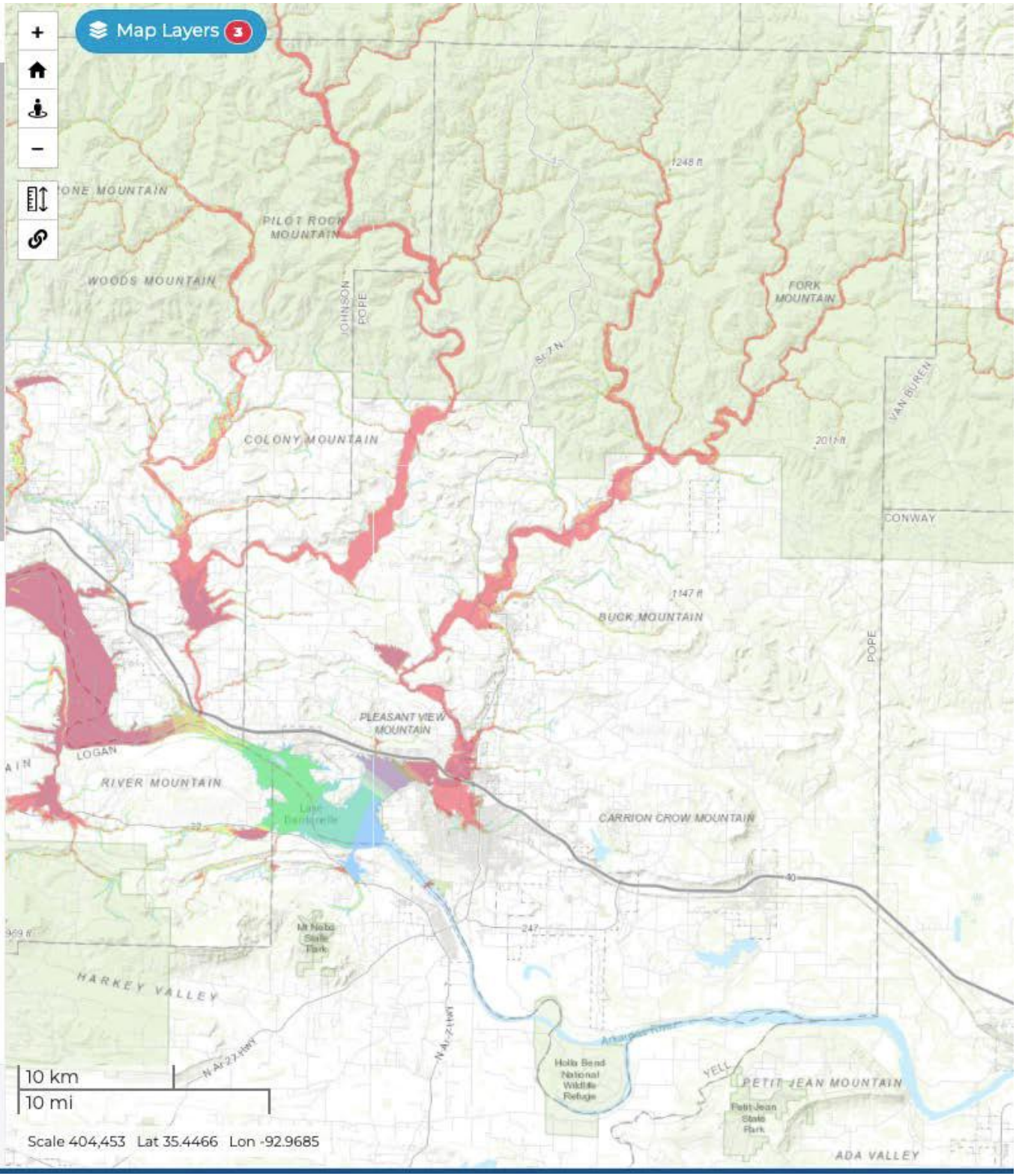

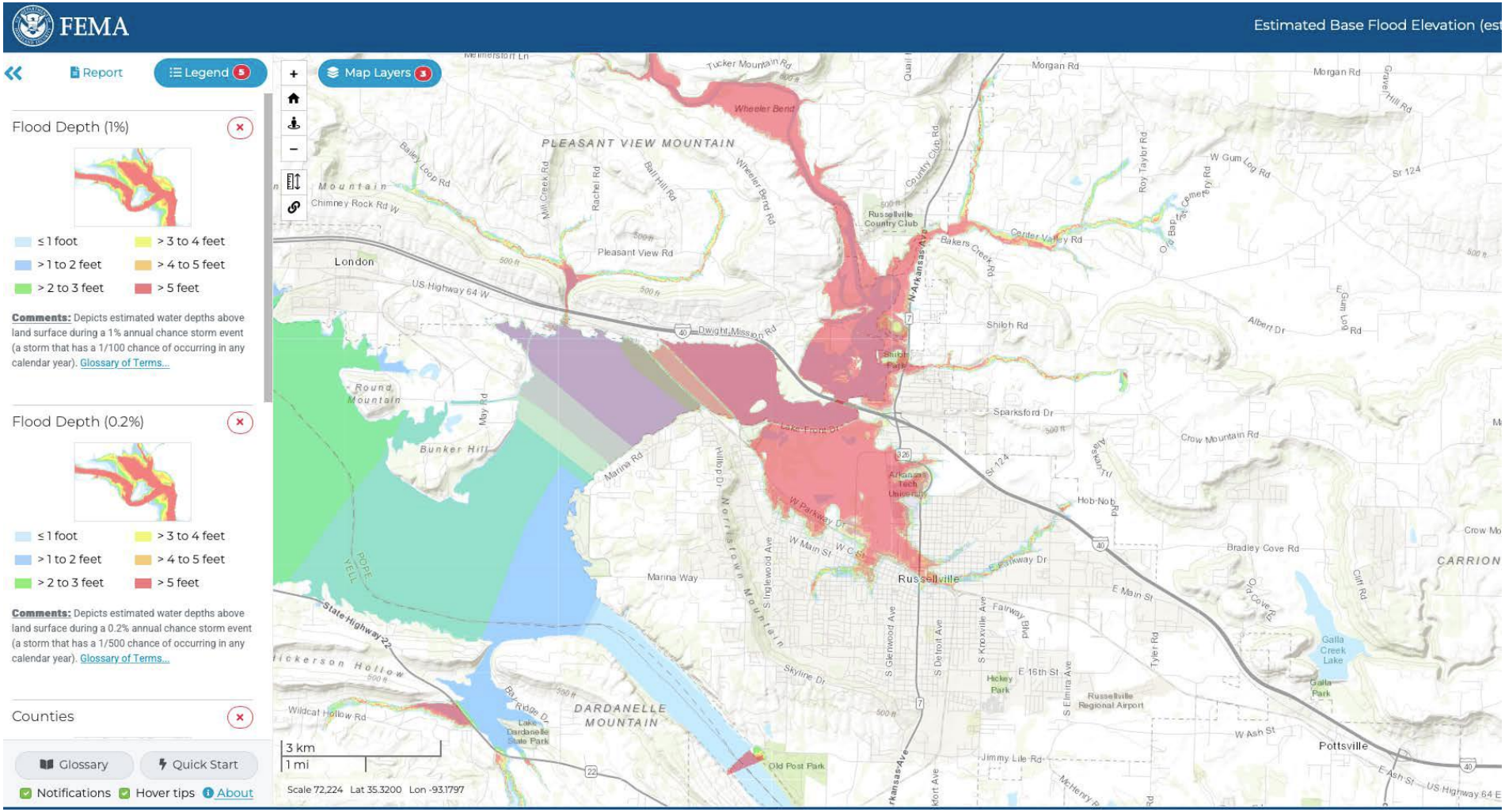
FEMA
Estimated Base Flood Elevation (est
Report
Legend 5
Map Layers 3
Flood Depth (1%)
≤ 1 foot
> 1 to 2 feet
> 2 to 3 feet
> 3 to 4 feet
> 4 to 5 feet
> 5 feet
Comments: Depicts estimated water depths above land surface during a 1% annual chance storm event (a storm that has a 1/100 chance of occurring in any calendar year). Glossary of Terms...
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≤ 1 foot
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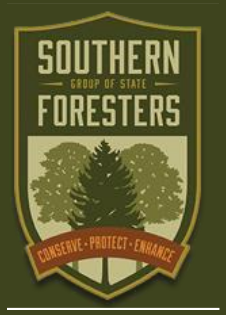
Counties
Glossary
Quick Start
Notifications
Hover tips
About
PLEASANT VIEW MOUNTAIN
DARDANELLE MOUNTAIN
Round Mountain
Bunker Hill
London
Russellville
Pottsville
Dwight Mission Rd
Pleasant View Rd
Shiloh Rd
Sparksford Dr
Crow Mountain Rd
Bradley Cove Rd
Marina Way
Skyline Dr
Wildcat Hollow Rd
Jimmy Lile Rd
Morgan Rd
Wheeler Bend
Bakers Creek Rd
Albert Dr
W Main St
E Main St
W Ash St
E Ash St
US Highway 64 W
US Highway 64 E
State Highway 22
Chimney Rock Rd W
Bailey Loop Rd
Wheeler Bend Rd
Ball Hill Rd
Rachel Rd
Mill Creek Rd
Country Club Rd
Roy Taylor Rd
W Gum Log Rd
E Gum Log Rd
Cedar Valley Rd
N Arkansas Ave
S Arkansas Ave
Lake Front Dr
W Parkway Dr
E Parkway Dr
Hillbrook Dr
Norristown Mountain
S Inglewood Ave
S Glenwood Ave
S Detroit Ave
S Knoxville Ave
Fairway Blvd
E 16th St
S Elmira Ave
Tyler Rd
Cliff Rd
Old Cove Rd
Hob-Nob Rd
Marina Rd
May Rd
Tucker Mountain Rd
Old Post Park
Galla Creek Lake
Galla Park
Hickey Park
Russellville Regional Airport
Russellville Country Club
Arkansas Tech University
Lake Dardanelle State Park
Bar Ridge Dr
Pope Vell
Tickerson Hollow
CARRION
3 km
1 mi
Scale 72,224 Lat 35.3200 Lon -93.1797

SOUTHERN WILDFIRE RISK ASSESSMENT SUMMARY REPORT



Report was generated using
www.southernwildfirerisk.com

Report version: 4.0

Report generated: 5/3/2022

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Hold Control and Click to navigate to the section of your interest.

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Users should also note that property boundaries included in any product do not represent an on-the-ground survey suitable for legal, engineering, or surveying purposes. They represent only the approximate relative locations.

Introduction

Welcome to the Southern Wildfire Risk Assessment Summary Report.

This tool allows users of the Professional Viewer application of the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP) to define a specific project area and summarize wildfire related information for this area. A detailed risk summary report is generated using a set of predefined map products developed by the Southern Wildfire Risk Assessment project which have been summarized explicitly for the user defined project area. The report is generated in MS WORD format.

The report has been designed so that information from the report can easily be copied and pasted into other specific plans, reports, or documents depending on user needs. Examples include, but are not limited to, Community Wildfire Protection Plans, Local Fire Plans, Fuels Mitigation Plans, Hazard Mitigation Plans, Homeowner Association Risk Assessments, and Forest Management or Stewardship Plans. Formats and standards for these types of reports vary from state to state across the South, and accordingly SouthWRAP provides the SWRA information in a generic risk report format to facilitate use in any type of external document. The SouthWRAP Risk Summary Report also stands alone as a viable depiction of current wildfire risk conditions for the user defined project area.

SouthWRAP provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in the South.

Results of the assessment can be used to help prioritize areas in the state where mitigation treatments, community interaction and education, or tactical analyses might be necessary to reduce risk from wildfires.

The SouthWRAP products included in this report are designed to provide the information needed to support the following key priorities:

- Identify areas that are most prone to wildfire
- Identify areas that may require additional tactical planning, specifically related to mitigation projects and Community Wildfire Protection Planning
- Provide the information necessary to justify resource, budget and funding requests
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries
- Define wildland communities and identify the risk to those communities
- Increase communication and outreach with local residents and the public to create awareness and address community priorities and needs
- Plan for response and suppression resource needs
- Plan and prioritize hazardous fuel treatment programs

To learn more about the SWRA project or to create a custom summary report, go to www.southernwildfirerisk.com.

Products

Each product in this report is accompanied by a general description, table, chart and/or map. A list of available SouthWRAP products in this report is provided in the following table.

SouthWRAP Product	Description
Wildland Urban Interface (WUI)	Depicts where humans and their structures meet or intermix with wildland fuel
WUI Risk Index	Represents a rating of the potential impact of a wildfire on people and their homes
Community Protection Zones	Represents those areas designated as primary and secondary priorities for community protection planning
Burn Probability	Probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts
Characteristic Rate of Spread	Represents the speed with which a fire moves in a horizontal direction across the landscape
Characteristic Flame Length	Represents the distance between the tip and base of the flame
Characteristic Fire Intensity Scale	Quantifies the potential fire intensity for an area by orders of magnitude
Fire Type - Extreme	Represents the potential fire type (surface or canopy) under extreme percentile weather conditions
Surface Fuels	Contains the parameters needed to compute surface fire behavior characteristics
Dozer Operability Rating	Level of difficulty to operate a dozer in an area based on limitations associated with slope and vegetation type

Wildland Urban Interface

Description

The South is one of the fastest growing regions in the nation, with an estimated population growth of 1.5 million people per year. The South also consistently has the highest number of wildfires per year. Population growth is pushing housing developments further into natural and forested areas where most of these wildfires occur. This situation puts many lives and communities at risk each year.

In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI).

The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the **Pope County AR** project area, it is estimated that **56,404** people or **91.3 % percent** of the total project area population (**61,749)** live within the WUI.

The Wildland Urban Interface (WUI) layer reflects housing density depicting where humans and their structures meet or intermix with wildland fuels.

WUI housing density is categorized based on the standard Federal Register and U.S. Forest Service SILVIS data set categories, long considered a de facto standard for depicting WUI. However, in the SWRA WUI data the number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements for fire protection planning activities. While units of the actual data set are in *houses per sq. km*., the data is presented as the *number of houses per acre* to aid with interpretation and use by fire planners in the South.

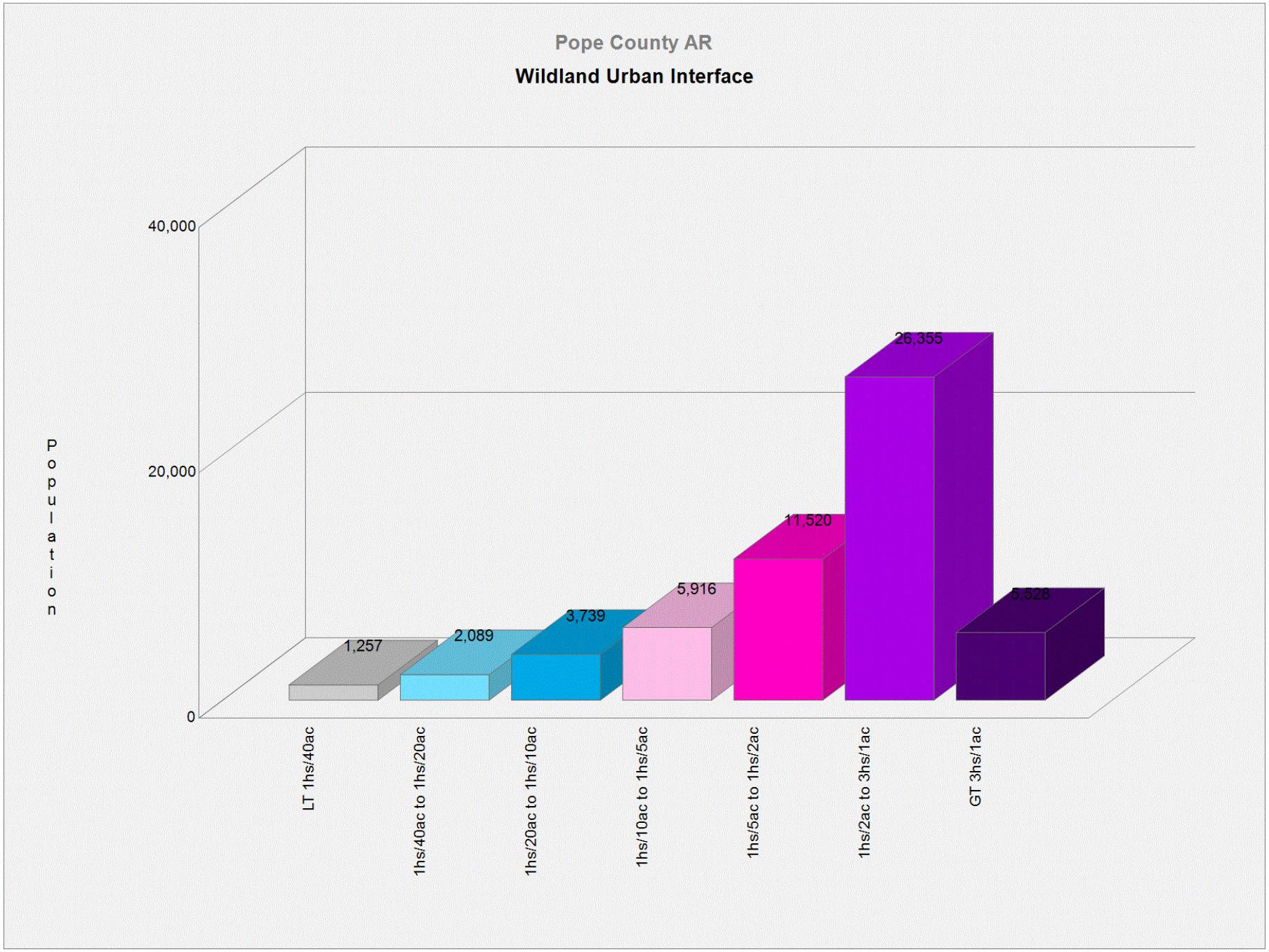
In the past, conventional wildland urban interface data sets, such as USFS SILVIS, have been used to reflect these concerns. However, USFS SILVIS and other existing data sources do not provide the level of detail for defining population living in the wildland as needed by Southern state WUI specialists and local fire protection agencies.

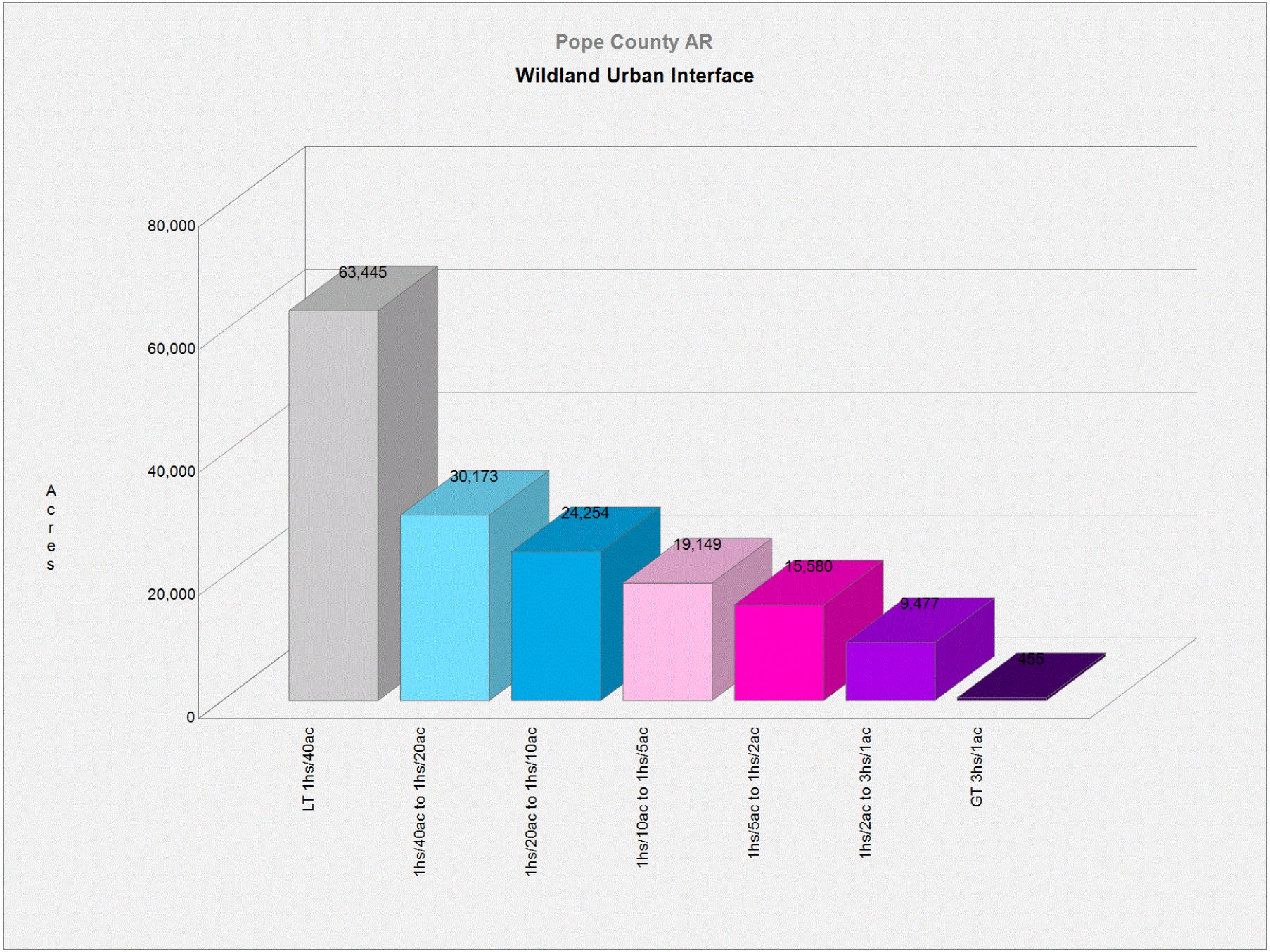
The new SWRA WUI 2012 dataset is derived using advanced modeling techniques based on the SWRA Where People Live (housing density) dataset and 2012 LandScan population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The primary difference between the WPL and WUI is that populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by a wildfire. Simply put, the SWRA WUI is the SWRA WPL data with the urban core areas removed.

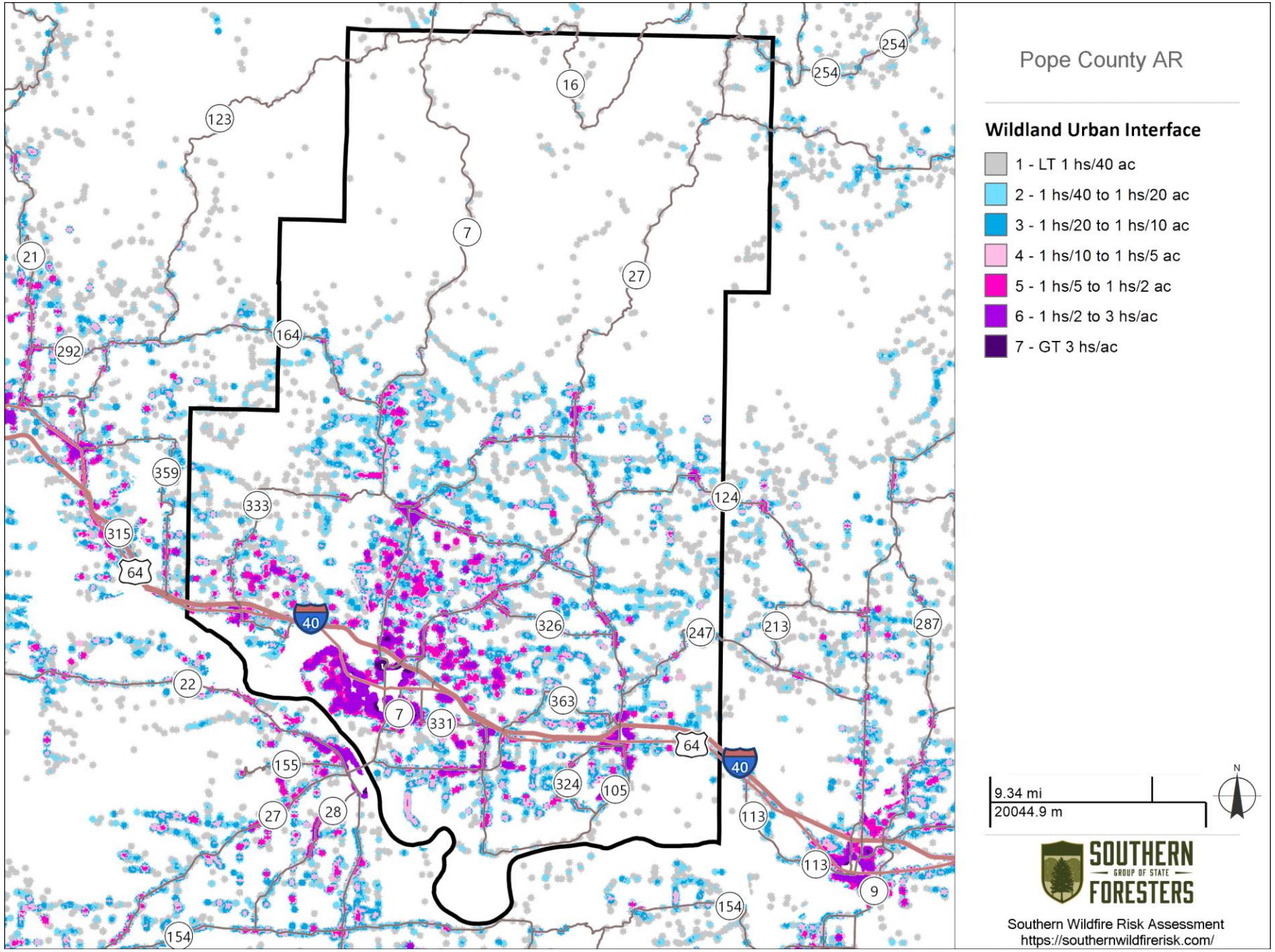
Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers. The following table shows the total population for each WUI area within the project area.

WUI – Population and Acres

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	1,257	2.2 %	63,445	39.0 %
1hs/40ac to 1hs/20ac	2,089	3.7 %	30,173	18.6 %
1hs/20ac to 1hs/10ac	3,739	6.6 %	24,254	14.9 %
1hs/10ac to 1hs/5ac	5,916	10.5 %	19,149	11.8 %
1hs/5ac to 1hs/2ac	11,520	20.4 %	15,580	9.6 %
1hs/2ac to 3hs/1ac	26,355	46.7 %	9,477	5.8 %
GT 3hs/1ac	5,528	9.8 %	455	0.3 %
Total	**56,404**	**100.0 %**	162,533	100.0 %


Pope County AR
Wildland Urban Interface
Population
40,000
20,000
0
1,257
2,089
3,739
5,916
11,520
26,355
5,528
LT 1hs/40ac
1hs/40ac to 1hs/20ac
1hs/20ac to 1hs/10ac
1hs/10ac to 1hs/5ac
1hs/5ac to 1hs/2ac
1hs/2ac to 3hs/1ac
GT 3hs/1ac


Pope County AR
Wildland Urban Interface
Acres
80,000
60,000
40,000
20,000
0
63,445
30,173
24,254
19,149
15,580
9,477
455
LT 1hs/40ac
1hs/40ac to 1hs/20ac
1hs/20ac to 1hs/10ac
1hs/10ac to 1hs/5ac
1hs/5ac to 1hs/2ac
1hs/2ac to 3hs/1ac
GT 3hs/1ac


Pope County AR
Wildland Urban Interface
1 - LT 1 hs/40 ac
2 - 1 hs/40 to 1 hs/20 ac
3 - 1 hs/20 to 1 hs/10 ac
4 - 1 hs/10 to 1 hs/5 ac
5 - 1 hs/5 to 1 hs/2 ac
6 - 1 hs/2 to 3 hs/ac
7 - GT 3 hs/ac
9.34 mi
20044.9 m
N
SOUTHERN GROUP OF STATE FORESTERS
Southern Wildfire Risk Assessment
https://southernwildfirerisk.com/

WUI Risk Index

Description

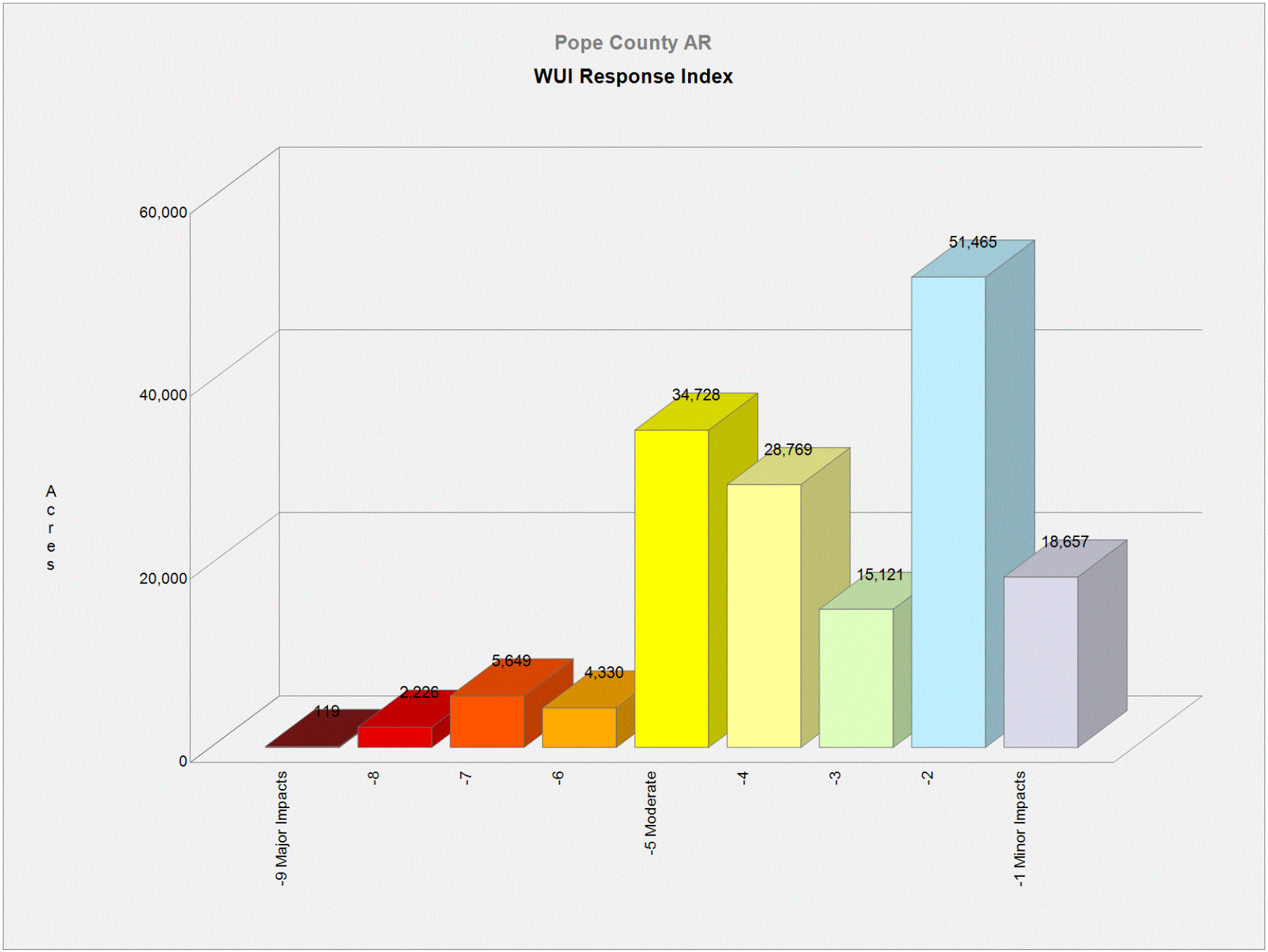
The Wildland Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface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

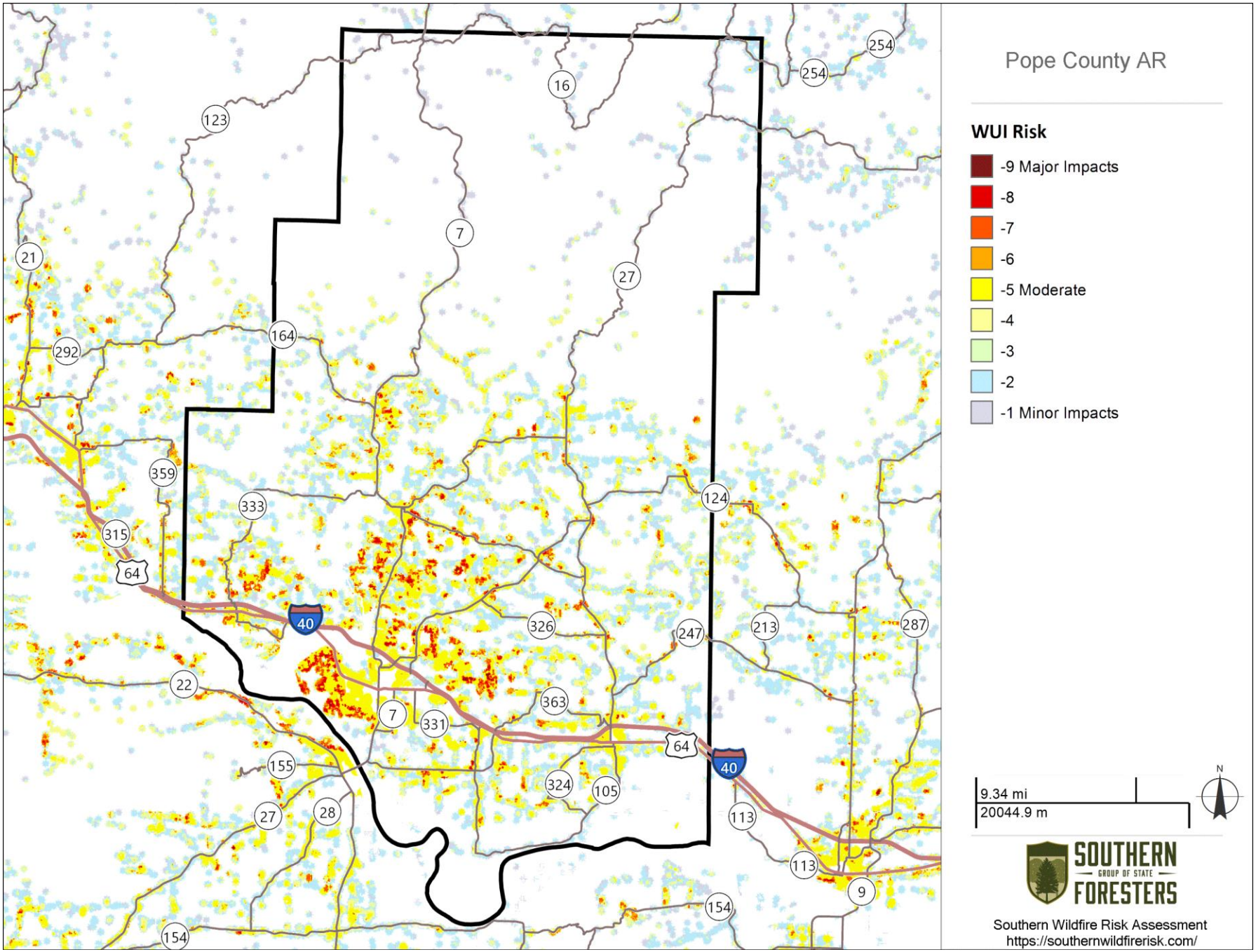
The WUI Risk Rating is derived using a Response Function modeling approach. Response functions are a method of assigning a net change in the value to a *resource* or *asset* based on susceptibility to fire at different intensity levels, such as flame length. The range of values is from -1 to -9, with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

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

Fire intensity data is modeled to incorporate penetration into urban fringe areas so that outputs better reflect real world conditions for fire spread and impact in fringe urban interface areas. With this enhancement, houses in urban areas adjacent to wildland fuels are incorporated into the WUI risk modeling. All areas in the South have the WUI Risk Index calculated consistently, which allows for comparison and ordination of areas across the entire region. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers.

Class	Acres	Percent
-9 Major Impacts	119	0.1 %
-8	2,226	1.4 %
-7	5,649	3.5 %
-6	4,330	2.7 %
-5 Moderate	34,728	21.6 %
-4	28,769	17.9 %
-3	15,121	9.4 %
-2	51,465	32.0 %
-1 Minor Impacts	18,657	11.6 %
Total	**161,064**	**100.0 %**


Pope County AR
WUI Response Index
Acres
60,000
40,000
20,000
0
119
2,226
5,649
4,330
34,728
28,769
15,121
51,465
18,657
-9 Major Impacts
-8
-7
-6
-5 Moderate
-4
-3
-2
-1 Minor Impacts


Pope County AR
WUI Risk
-9 Major Impacts
-8
-7
-6
-5 Moderate
-4
-3
-2
-1 Minor Impacts
9.34 mi
20044.9 m
N
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Community Protection Zones

Description

Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.

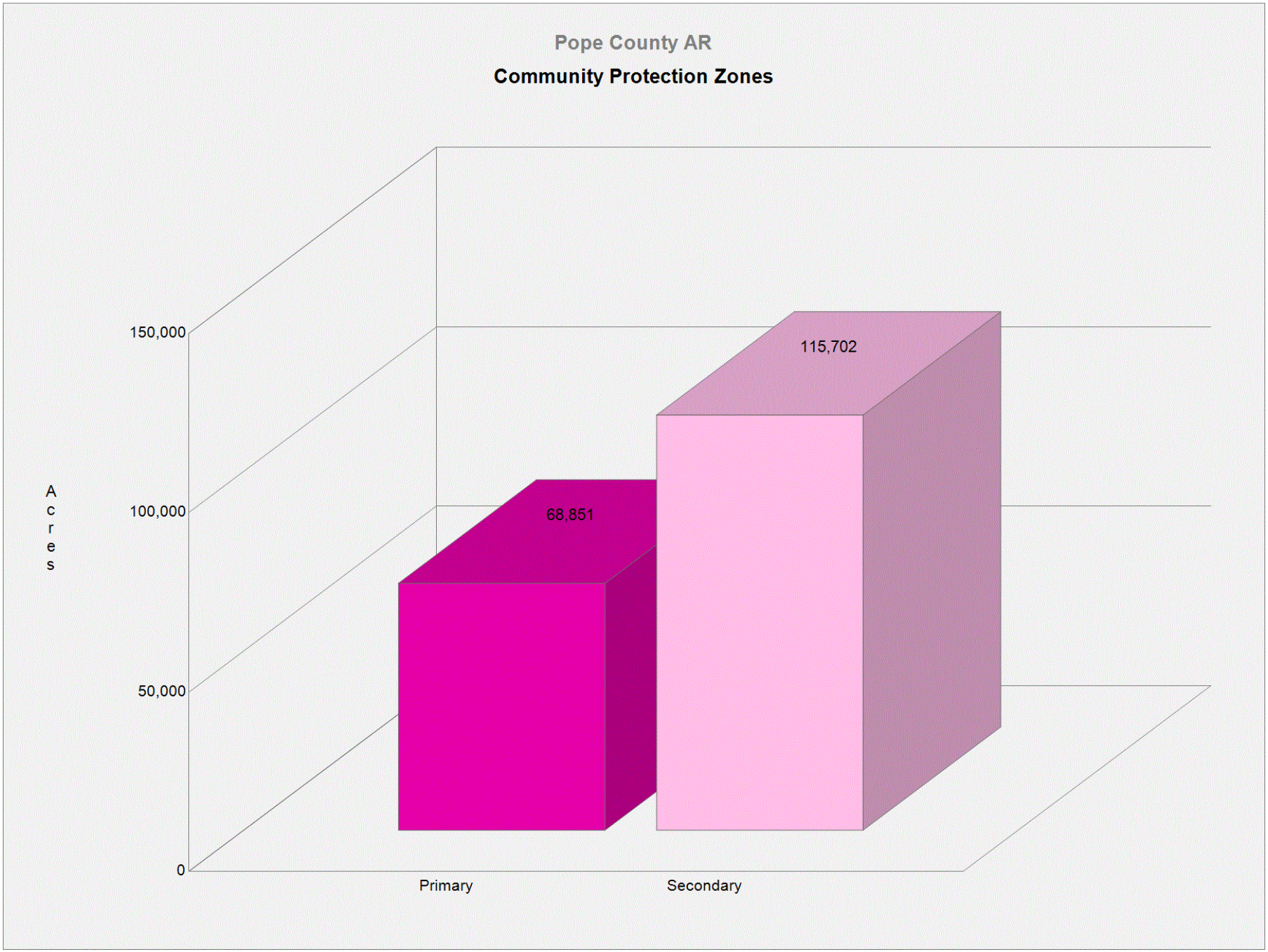
General consensus among fire planners is that for fuel mitigation treatments to be effective in reducing wildfire hazard, they must be conducted within a close distance of a community. In the South, the WUI housing density has been used to reflect populated areas in place of community boundaries (Primary CPZ). This ensures that CPZs reflect where people are living in the wildland, not jurisdictional boundaries.

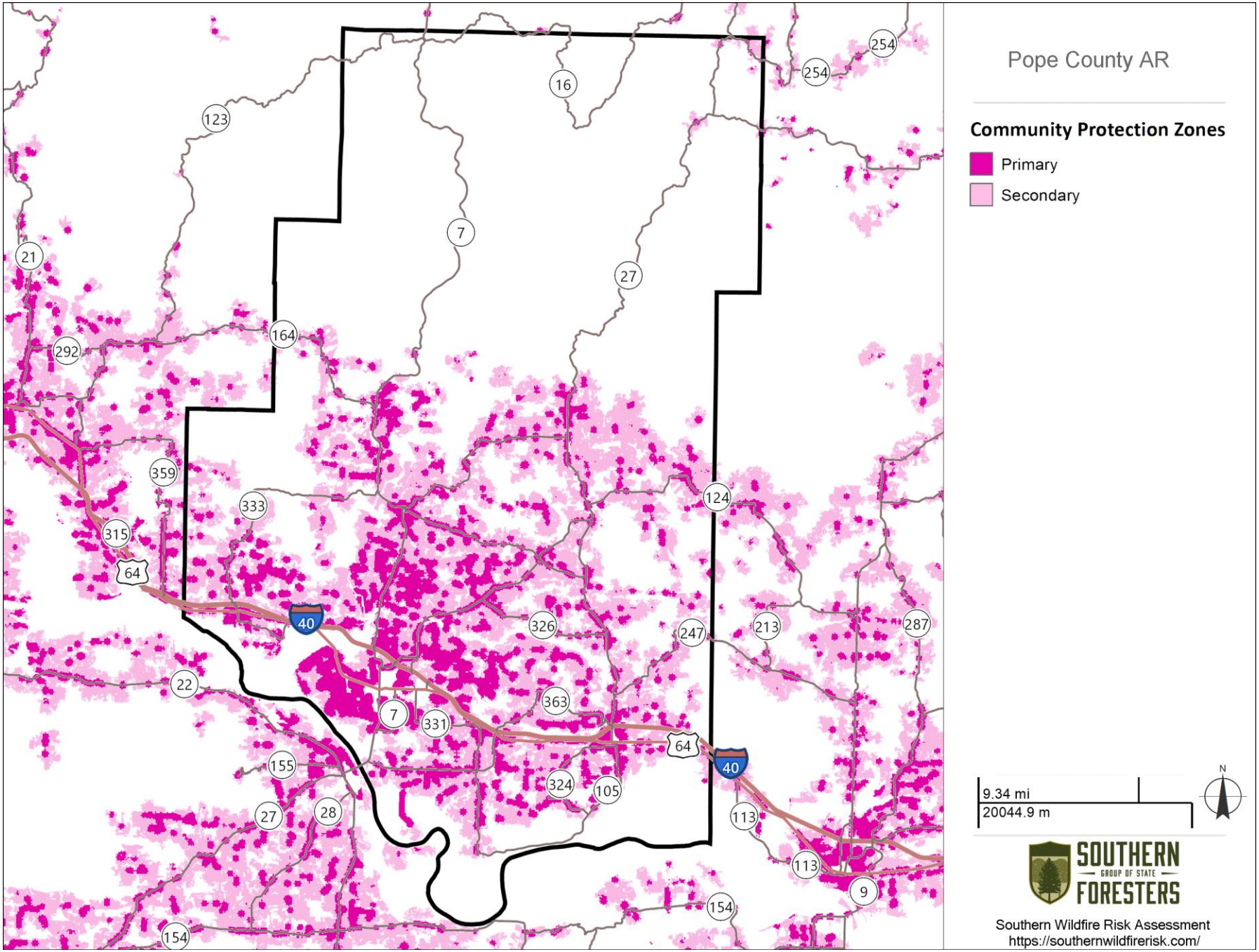
Secondary CPZs represent a variable width buffer around populated areas that are within a 2-hour fire spread distance. Accordingly, CPZs will extend farther in areas where rates of spread are greater and less in areas where minimal rate of spread potential exists. Secondary CPZ boundaries inherently incorporate fire behavior conditions.

Primary CPZs reflect areas with a predefined housing density, such as greater than 1 house per 20 acres. Secondary CPZs are the areas around Primary CPZs within a 2 hour fire spread distance.

All areas in the South have the CPZs calculated consistently, which allows for comparison and ordination of areas across the entire region. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers.

Class	Acres	Percent
Primary	68,851	37.3 %
Secondary	115,702	62.7 %
Total	**184,553**	**100.0 %**


Pope County AR
Community Protection Zones
Acres
150,000
100,000
50,000
0
68,851
115,702
Primary
Secondary


Pope County AR
Community Protection Zones
Primary
Secondary
9.34 mi
20044.9 m
N
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Burn Probability

Description

The Burn Probability (BP) layer depicts the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts.

Describe in more detail, it is the tendency of any given pixel to burn, given the static landscape conditions depicted by the LANDFIRE Refresh 2008 dataset (as resampled by FPA), contemporary weather and ignition patterns, as well as contemporary fire management policies (entailing considerable fire prevention and suppression efforts).

The BP data does not, and is not intended to, depict fire-return intervals of any vintage, nor do they indicate likely fire footprints or routes of travel. Nothing about the expected shape or size of any actual fire incident can be interpreted from the burn probabilities. Instead, the BP data, in conjunction with the Fire Program Analysts FIL layers, are intended to support an actuarial approach to quantitative wildfire risk analysis (e.g., see Thompson et al. 2011).

Values in the Burn Probability (BP) data layer indicate, for each pixel, the number of times that cell was burned by an FSim-modeled fire, divided by the total number of annual weather scenarios simulated. Burn probability raster data was generated using the large fire simulator - FSim - developed for use in the Fire Program Analysis (FPA) project. FSim uses historical weather data and current landcover data for discrete geographical areas (Fire Planning Units - FPUs) and simulates fires in these FPUs. Using these simulated fires, an overall burn probability and marginal burn probabilities at four fire intensities (flame lengths) are returned by FSim for each 270m pixel in the FPU.

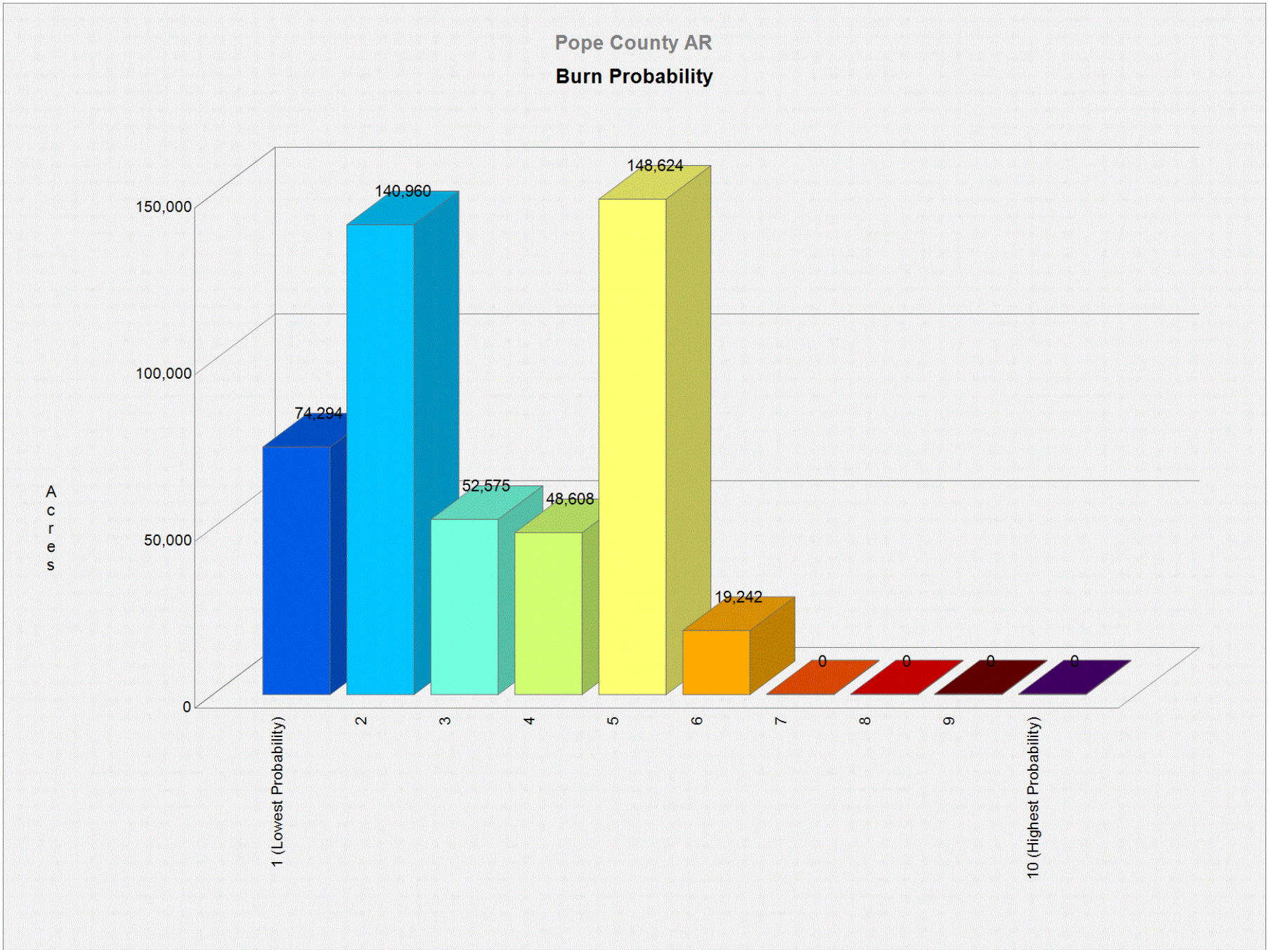
The fire growth simulations, when run repeatedly with different ignition locations and weather streams, generate burn probabilities and fire behavior distributions at each landscape location (i.e., cell or pixel). Results are objectively evaluated through comparison with historical fire patterns and statistics, including the mean annual burn probability and fire size distribution, for each FPU. This evaluation is part of the FSim calibration process for each FPU, whereby simulation inputs are adjusted until the slopes of the historical and modeled fire size distributions are similar and the modeled average burn probability falls within an acceptable range of the historical reference value (i.e., the 95% confidence interval for the mean).

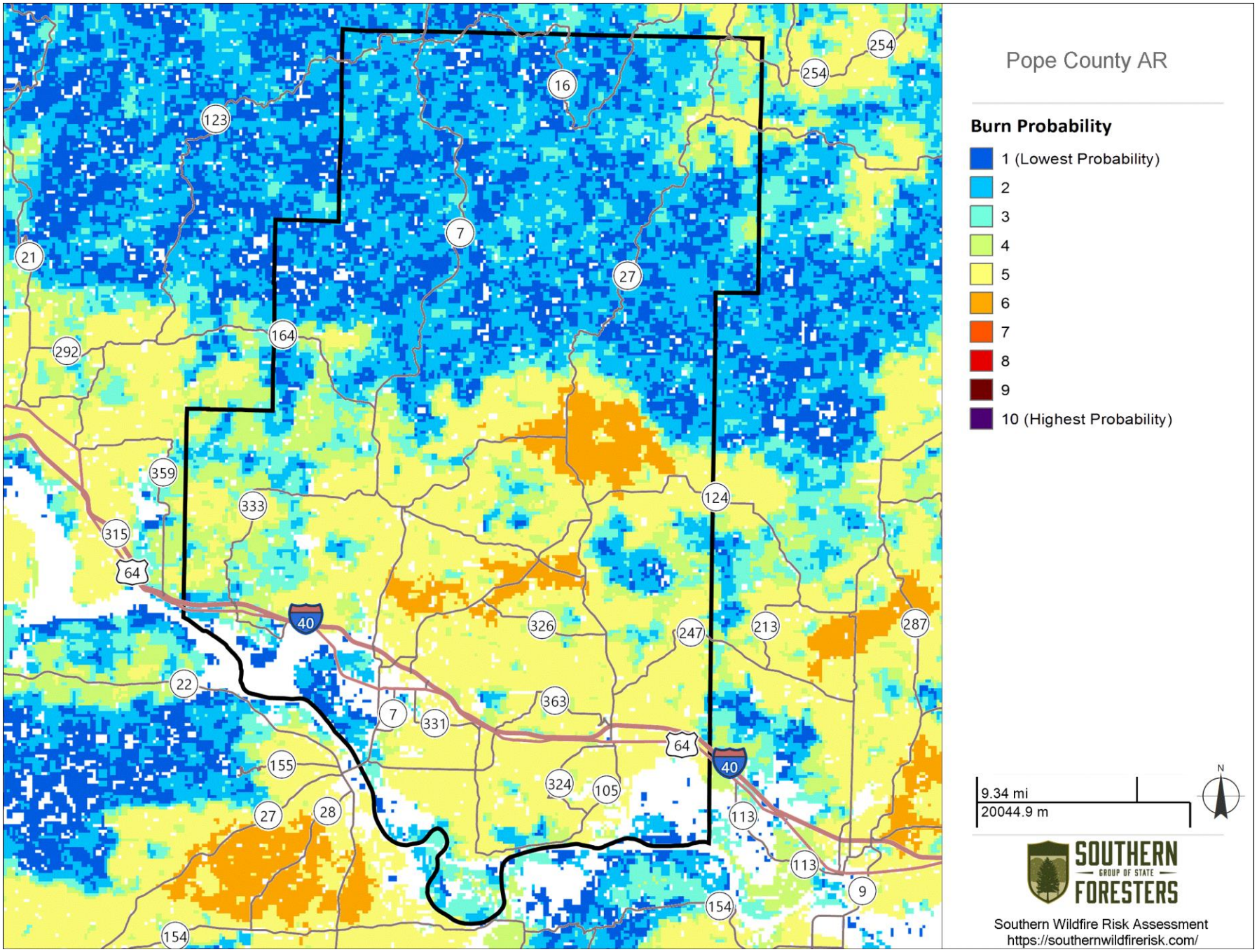
Please refer to the metadata available for this dataset for a detailed description of the data processing methods, assumptions and references that pertain to the development of this data. This information is available from the USFS Missoula Fire Sciences Laboratory.

Please refer to the web site link in the report References to obtain more detailed descriptions of FPA and the related data products such as Burn Probability.

Burn Probability replaces the Wildland Fire Susceptibility Index (WFSI) layer developed in the original SWRA project completed in 2005.

Class	Acres	Percent
1	74,294	15.3 %
2	140,960	29.1 %
3	52,575	10.9 %
4	48,608	10.0 %
5	148,624	30.7 %
6	19,242	4.0 %
7	0	0.0 %
8	0	0.0 %
9	0	0.0 %
10	0	0.0 %
Total	**484,303**	**100.0 %**


Pope County AR
Burn Probability
Acres
150,000
100,000
50,000
0
74,294
140,960
52,575
48,608
148,624
19,242
0
0
0
0
1 (Lowest Probability)
2
3
4
5
6
7
8
9
10 (Highest Probability)


Pope County AR
Burn Probability
1 (Lowest Probability)
2
3
4
5
6
7
8
9
10 (Highest Probability)
9.34 mi
20044.9 m
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Fire Behavior

Description

Fire behavior is the manner in which a fire reacts to the following environmental influences:

1. **Fuels**
2. **Weather**
3. **Topography**

Fire behavior characteristics are attributes of wildland fire that pertain to its spread, intensity, and growth. Fire behavior characteristics utilized in the Southern Wildfire Risk Assessment (SWRA) include fire type, rate of spread, flame length and fire intensity scale. These metrics are used to determine the potential fire behavior under different weather scenarios. Areas that exhibit moderate to high fire behavior potential can be identified for mitigation treatments, especially if these areas are in close proximity to homes, business, or other assets.

Fuels

The SWRA includes composition and characteristics for both surface fuels and canopy fuels. Significant increases in fire behavior will be captured if the fire has the potential to transition from a surface fire to a canopy fire.

Fuel datasets required to compute both surface and canopy fire potential include:

- **Surface Fuels**, generally referred to as fire behavior fuel models, provide the input parameters needed to compute surface fire behavior.
- **Canopy Cover** is the horizontal percentage of the ground surface that is covered by tree crowns. It is used to compute wind reduction factors and shading.
- **Canopy Ceiling Height/Stand Height** is the height above the ground of the highest canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. A good estimate of canopy ceiling height would be the average height of the dominant and co-dominant trees in a stand. It is used for computing wind reduction to midflame height and spotting distances from torching trees (Fire Program Solutions, L.L.C, 2005).
- **Canopy Base Height** is the lowest height above the ground above which here is sufficient canopy fuel to propagate fire vertically (Scott & Reinhardt, 2001). Canopy base height is a property of a plot, stand, or group of trees, not of an individual tree. For fire modeling, canopy base height is an effective value that incorporates ladder fuel, such as tall shrubs and small trees. Canopy base height is used to determine if a surface fire will transition to a canopy fire.
- **Canopy Bulk Density** is the mass of available canopy fuel per unit canopy volume (Scott & Reinhardt, 2001). Canopy bulk density is a bulk property of a stand, plot, or group of trees, not of an individual tree. Canopy bulk density is used to predict whether an active crown fire is possible.

Weather

Environmental weather parameters needed to compute fire behavior characteristics include 1-hour, 10-hour, and 100-hour timelag fuel moistures, herbaceous fuel moisture, woody fuel moisture, and the 20-foot 10 minute average wind speed. To collect this information, weather influence zones were established across the region. A weather influence zone is an area where for analysis purposes the weather on any given day is considered uniform. Within each weather influence zone, historical daily weather is gathered to compile a weather dataset from which four percentile weather categories are created. The percentile weather categories are intended to represent low, moderate, high, and extreme fire weather days. Fire behavior outputs are computed for each percentile weather category to determine fire potential under different weather scenarios.

The four percentile weather categories include:

- Low Weather Percentile (0 – 15%)
- Moderate Weather Percentile (16 – 90%)
- High Weather Percentile (91 – 97%)
- Extreme Weather Percentile (98 – 100%)

Topography

Topography datasets required to compute fire behavior characteristics are elevation, slope and aspect.

FIRE BEHAVIOR CHARACTERISTICS

Fire behavior characteristics provided in this report include:

- **Characteristic Rate of Spread**
- **Characteristic Flame Length**
- **Characteristic Fire Intensity Scale**
- **Fire Type - Extreme**

Characteristic Rate of Spread

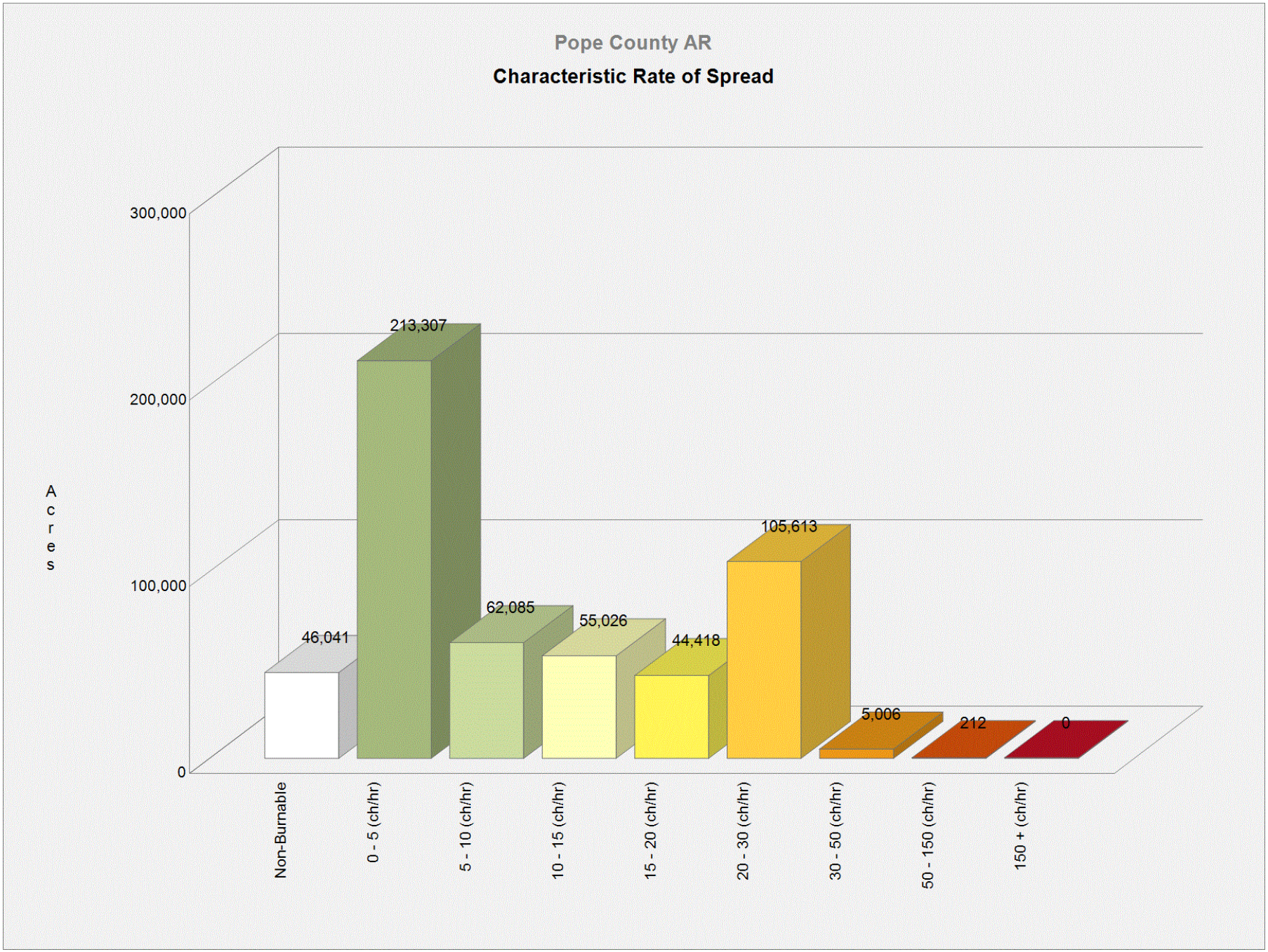
Description

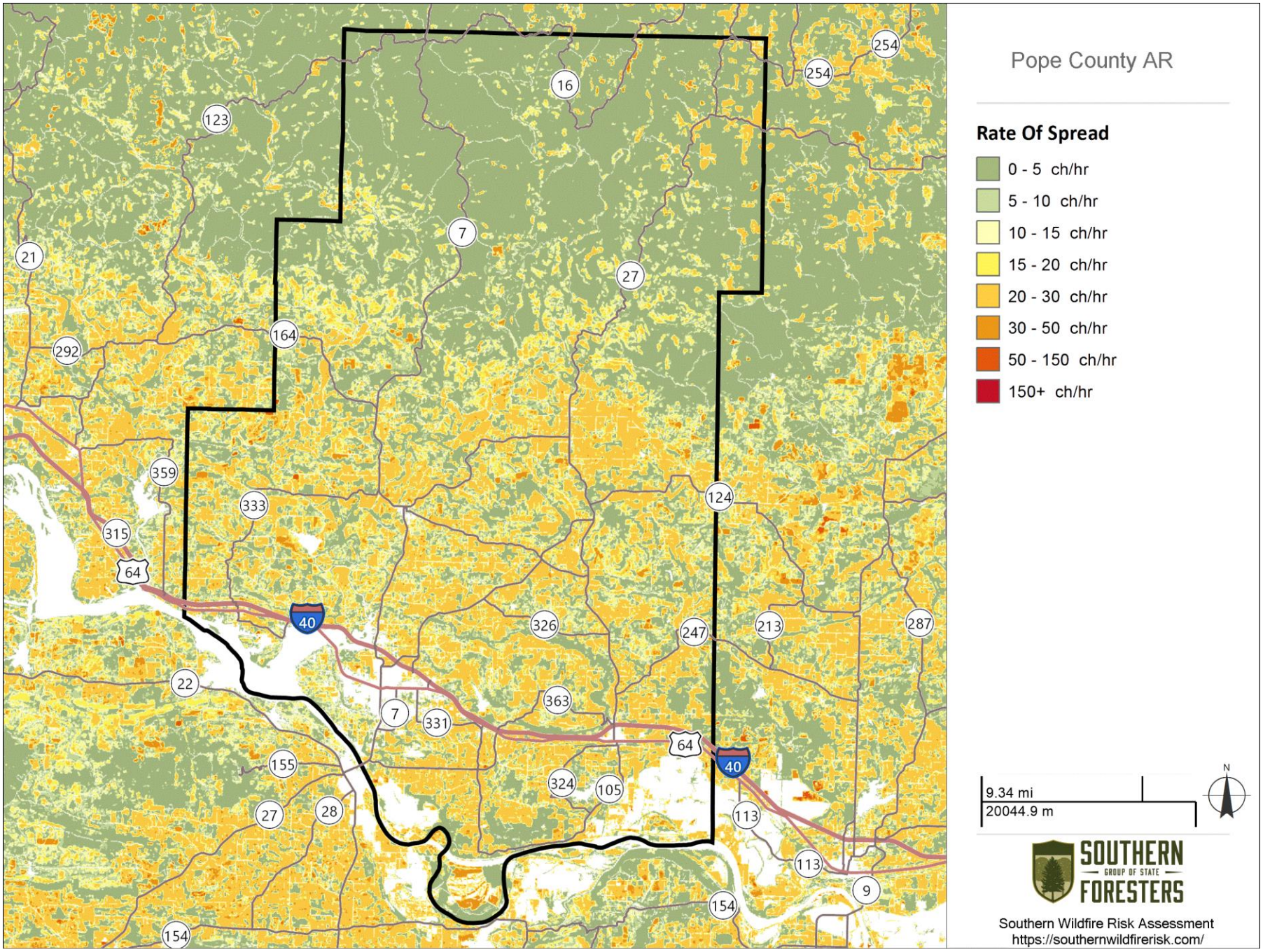
Characteristic Rate of Spread is the typical or representative rate of spread of a potential fire based on a weighted average of four percentile weather categories. Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains per hour (ch/hr) or feet per minute (ft/min). For purposes of the Southern Wildfire Risk Assessment, this measurement represents the maximum rate of spread of the fire front. Rate of Spread is the metric used to derive the Community Protection Zones.

Rate of spread is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

Rate of Spread	Acres	Percent
Non-Burnable	46,041	8.7 %
0 - 5 (ch/hr)	213,307	40.1 %
5 - 10 (ch/hr)	62,085	11.7 %
10 – 15 (ch/hr)	55,026	10.3 %
15 - 20 (ch/hr)	44,418	8.4 %
20 - 30 (ch/hr)	105,613	19.9 %
30 - 50 (ch/hr)	5,006	0.9 %
50 - 150 (ch/hr)	212	0.0 %
150 + (ch/hr)	0	0.0 %
Total	**531,708**	**100.0 %**


Pope County AR
Characteristic Rate of Spread
Acres
300,000
200,000
100,000
0
46,041
213,307
62,085
55,026
44,418
105,613
5,006
212
0
Non-Burnable
0 - 5 (ch/hr)
5 - 10 (ch/hr)
10 - 15 (ch/hr)
15 - 20 (ch/hr)
20 - 30 (ch/hr)
30 - 50 (ch/hr)
50 - 150 (ch/hr)
150 + (ch/hr)


Pope County AR
Rate Of Spread
0 - 5 ch/hr
5 - 10 ch/hr
10 - 15 ch/hr
15 - 20 ch/hr
20 - 30 ch/hr
30 - 50 ch/hr
50 - 150 ch/hr
150+ ch/hr
9.34 mi
20044.9 m
N
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Characteristic Flame Length

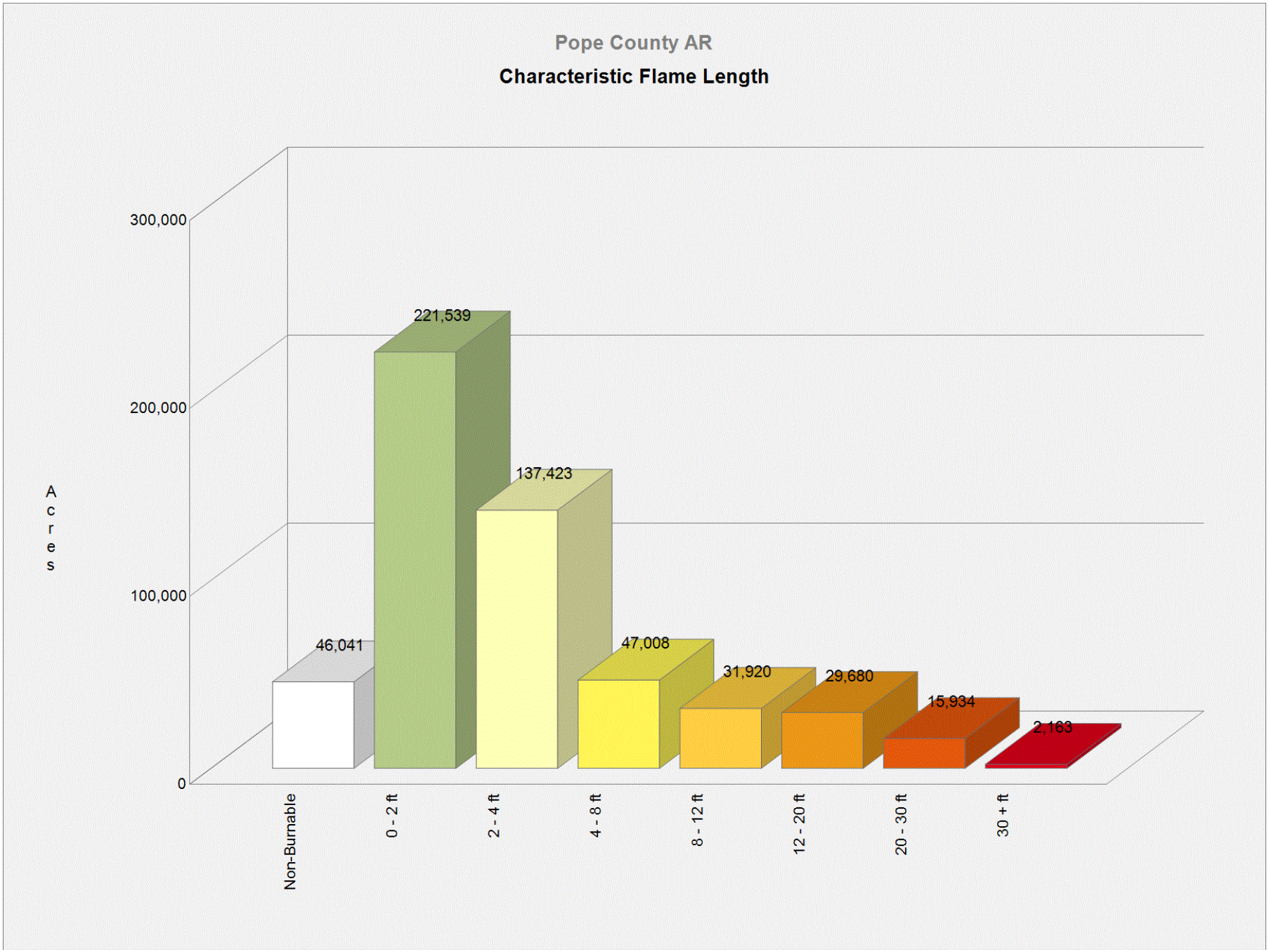
Description

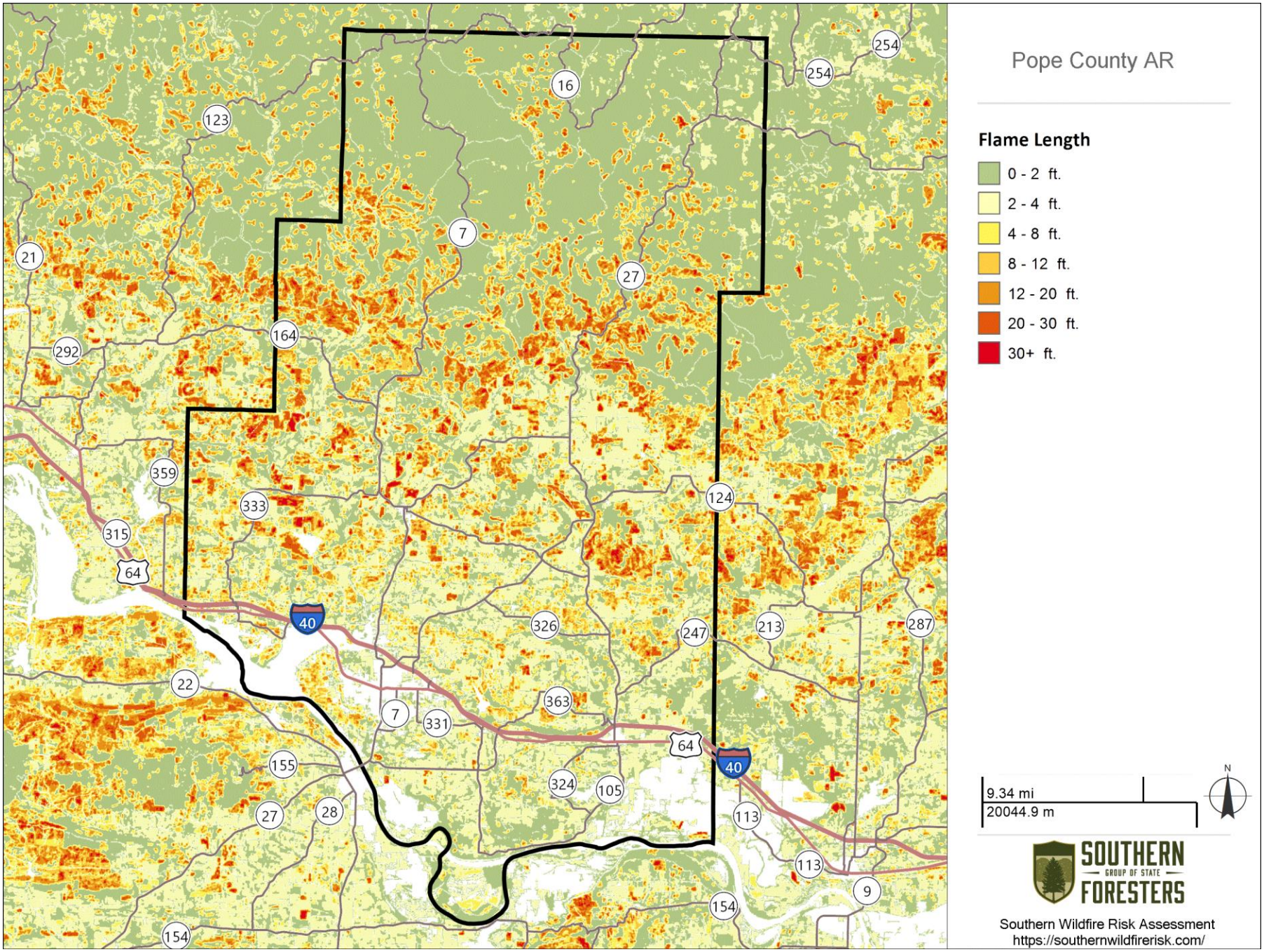
Characteristic Flame Length is the typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories. Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating. Flame length is typically measured in feet (ft). Flame length is the measure of fire intensity used to generate the response index outputs for the SWRA.

Flame length is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

Flame Length	Acres	Percent
Non-Burnable	46,041	8.7 %
0 - 2 ft	221,539	41.7 %
2 - 4 ft	137,423	25.8 %
4 - 8 ft	47,008	8.8 %
8 - 12 ft	31,920	6.0 %
12 - 20 ft	29,680	5.6 %
20 - 30 ft	15,934	3.0 %
30 + ft	2,163	0.4 %
Total	**531,708**	**100.0 %**


Pope County AR
Characteristic Flame Length
Acres
300,000
200,000
100,000
0
46,041
221,539
137,423
47,008
31,920
29,680
15,934
2,163
Non-Burnable
0 - 2 ft
2 - 4 ft
4 - 8 ft
8 - 12 ft
12 - 20 ft
20 - 30 ft
30 + ft


Pope County AR
Flame Length
0 - 2 ft.
2 - 4 ft.
4 - 8 ft.
8 - 12 ft.
12 - 20 ft.
20 - 30 ft.
30+ ft.
9.34 mi
20044.9 m
N
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Characteristic Fire Intensity Scale

Description

Characteristic Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

- **Class 1, Very Low:**
  Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

- **Class 2, Low:**
  Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

- **Class 3, Moderate:**
  Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

- **Class 4, High:**
  Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

- **Class 5, Very High:**
  Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

For all Southern states, except Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed.

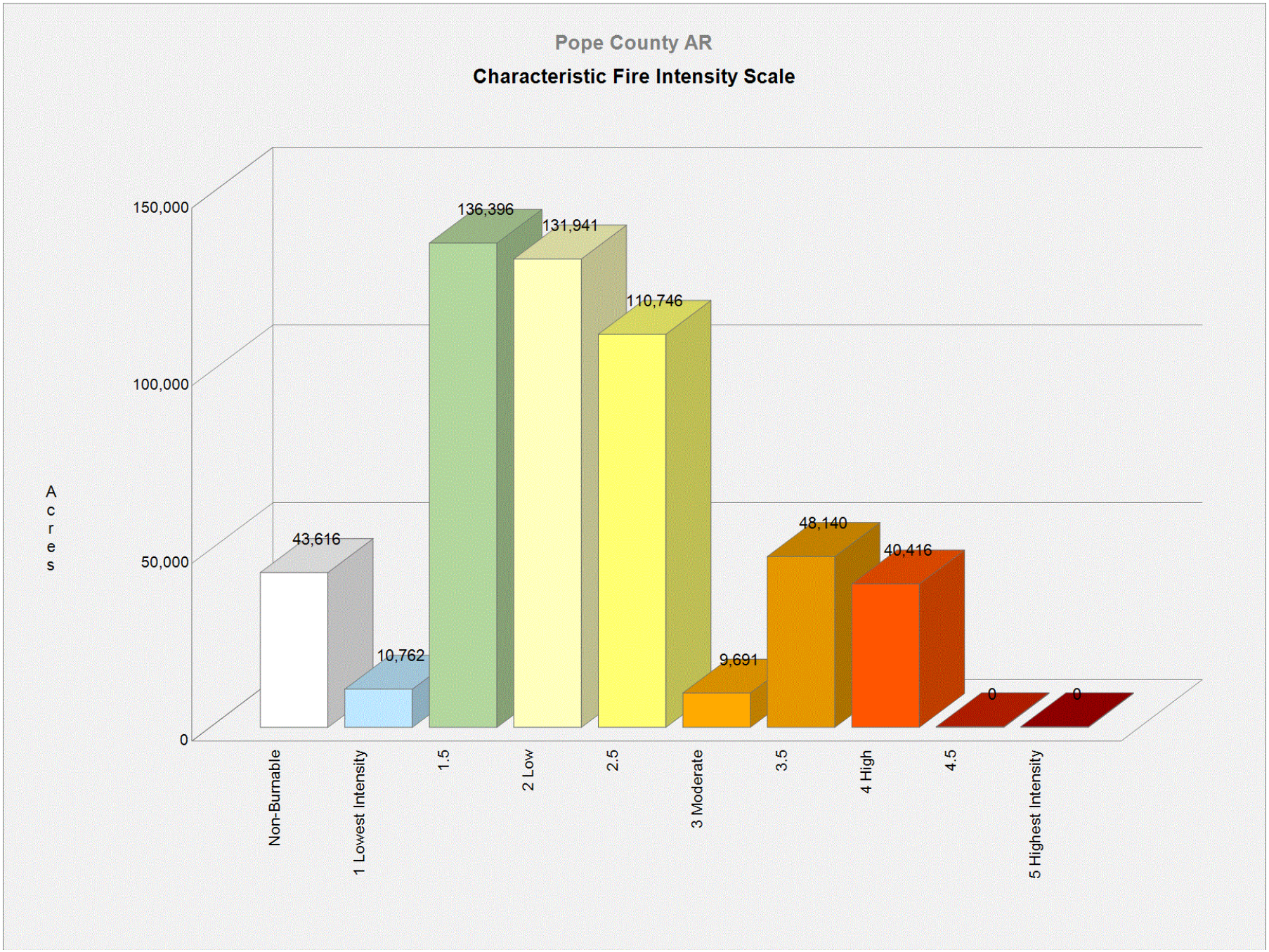
To aid in viewing on the map, FIS is presented in 1/2 class increments. Please consult the SouthWRAP User Manual for a more detailed description of the FIS class descriptions.

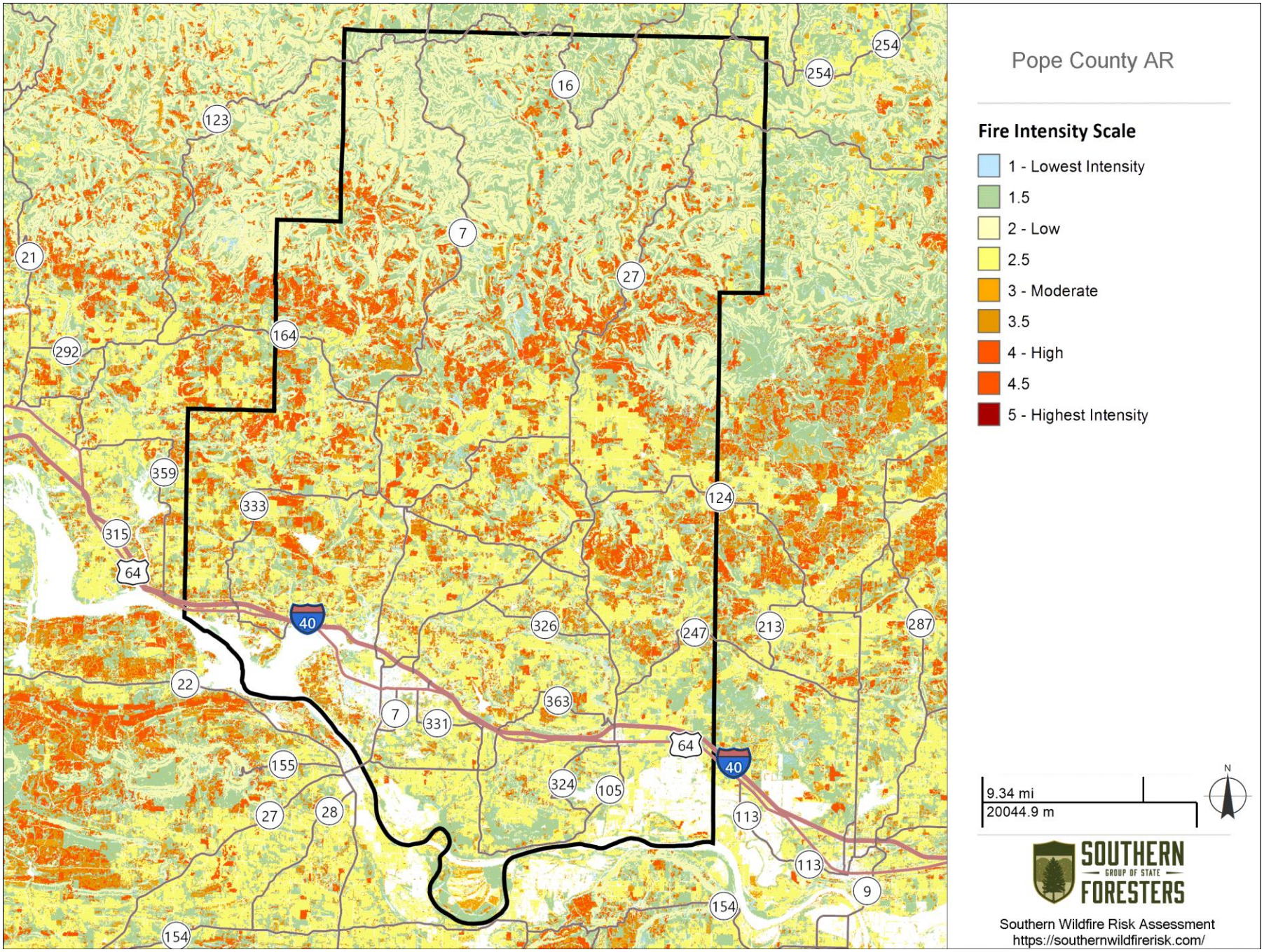
Since all areas in the South have fire intensity scale calculated consistently, it allows for comparison and ordination of areas across the entire region.

Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

The fire intensity scale map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

Class	Acres	Percent
Non-Burnable	43,616	8.2 %
1 Lowest Intensity	10,762	2.0 %
1.5	136,396	25.7 %
2 Low	131,941	24.8 %
2.5	110,746	20.8 %
3 Moderate	9,691	1.8 %
3.5	48,140	9.1 %
4 High	40,416	7.6 %
4.5	0	0.0 %
5 Highest Intensity	0	0.0 %
Total	**531,708**	**100.0 %**


Pope County AR
Characteristic Fire Intensity Scale
Acres
150,000
100,000
50,000
0
43,616
10,762
136,396
131,941
110,746
9,691
48,140
40,416
0
0
Non-Burnable
1 Lowest Intensity
1.5
2 Low
2.5
3 Moderate
3.5
4 High
4.5
5 Highest Intensity


Pope County AR
Fire Intensity Scale
1 - Lowest Intensity
1.5
2 - Low
2.5
3 - Moderate
3.5
4 - High
4.5
5 - Highest Intensity
9.34 mi
20044.9 m
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Fire Type – Extreme

Description

There are two primary fire types – surface fire and canopy fire. Canopy fire can be further subdivided into passive canopy fire and active canopy fire. A short description of each of these is provided below.

Surface Fire
A fire that spreads through surface fuel without consuming any overlying canopy fuel. Surface fuels include grass, timber litter, shrub/brush, slash and other dead or live vegetation within about 6 feet of the ground.

Passive Canopy Fire
A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods (Scott & Reinhardt, 2001).

Active Canopy Fire
A crown fire in which the entire fuel complex (canopy) is involved in flame, but the crowning phase remains dependent on heat released from surface fuel for continued spread (Scott & Reinhardt, 2001).





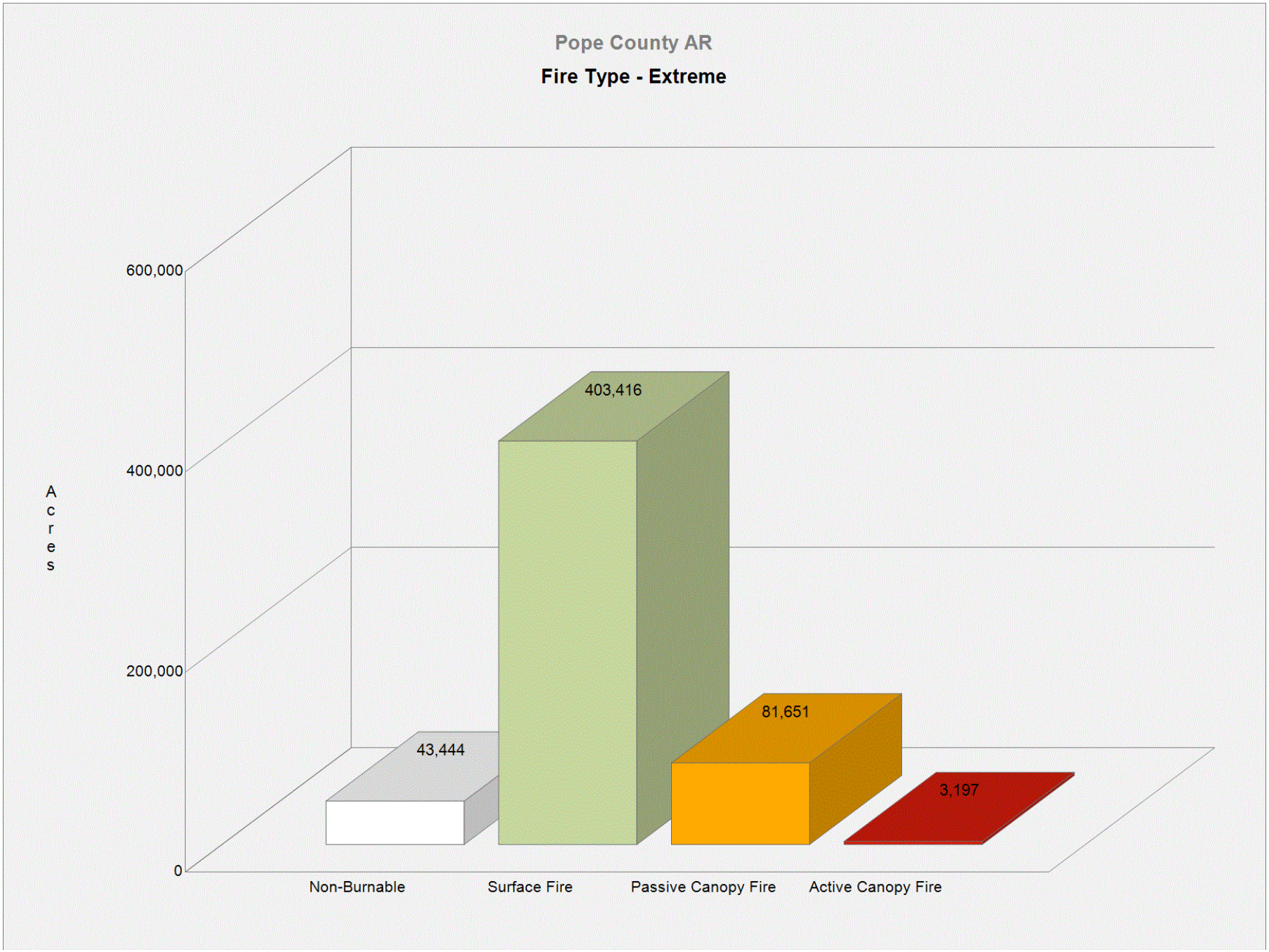

Fire Type – Extreme represents the potential fire type under the extreme percentile weather category. The extreme percentile weather category represents the average weather based on the top three percent fire weather days in the analysis period. It is not intended to represent a worst case scenario weather event. Accordingly, the potential fire type is based on fuel conditions, extreme percentile weather, and topography.

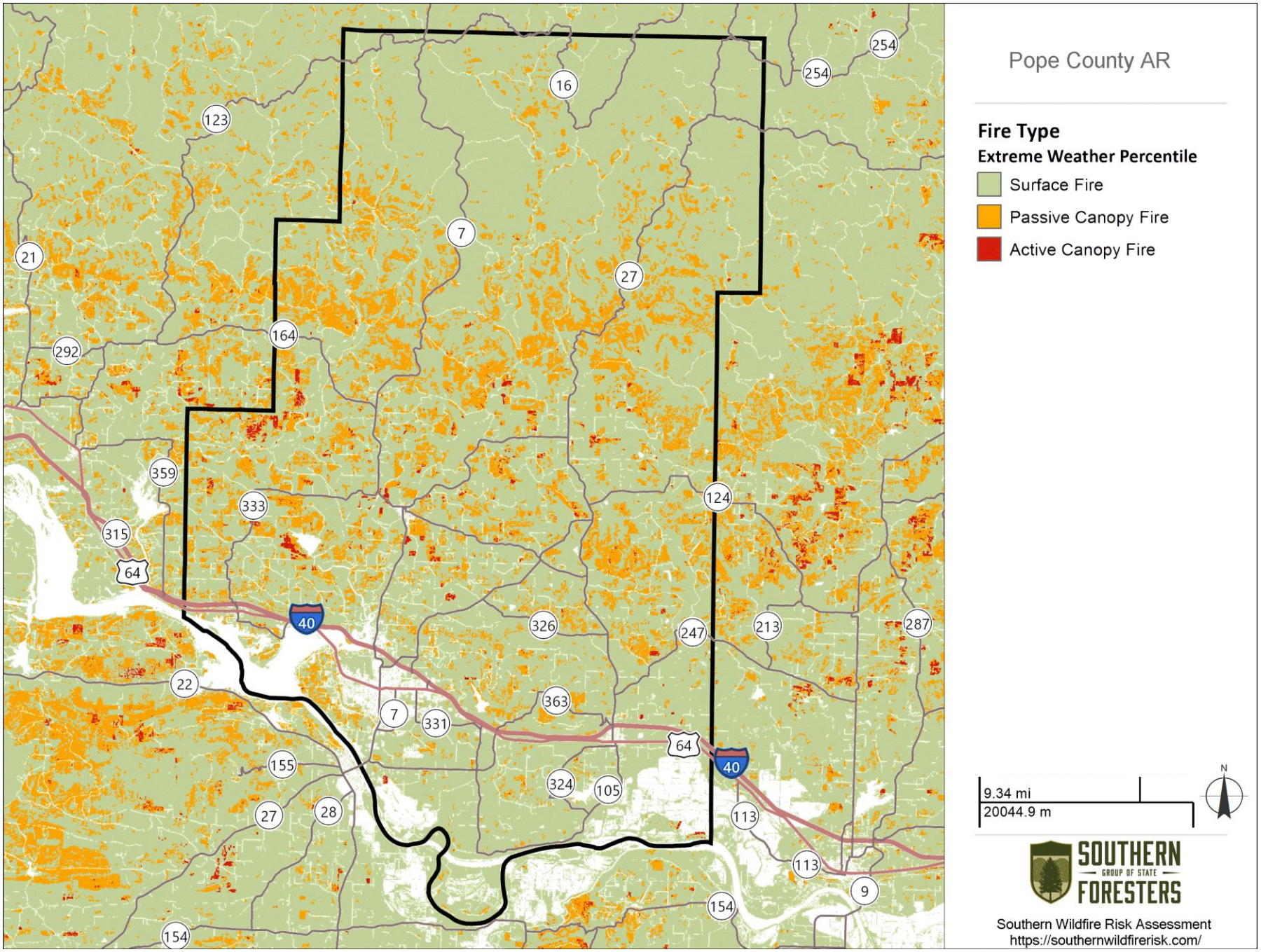
Canopy fires are very dangerous, destructive and difficult to control due to their increased fire intensity. From a planning perspective, it is important to identify where these conditions are likely to occur on the landscape so that special preparedness measure can be taken if necessary. The Fire Type – Extreme layer shows the footprint of where these areas are most likely to occur. However, it is important to note that canopy fires are not restricted to these areas. Under the right conditions, it can occur in other canopied areas.

For all Southern states, except Florida and Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed. For Florida, the 2010 Florida risk assessment update data is shown.

The fire type - extreme map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

Fire Type	Acres	Percent
Non-Burnable	43,444	8.2 %
Surface Fire	403,416	75.9 %
Passive Canopy	81,651	15.4 %
Active Canopy	3,197	0.6 %
Total	**531,708**	**100.0 %**


Pope County AR
Fire Type - Extreme
600,000
400,000
200,000
0
Acres
403,416
43,444
81,651
3,197
Non-Burnable
Surface Fire
Passive Canopy Fire
Active Canopy Fire


Pope County AR
Fire Type
Extreme Weather Percentile
Surface Fire
Passive Canopy Fire
Active Canopy Fire
9.34 mi
20044.9 m
N
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Surface Fuels

Description

Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, such as rate of spread, flame length, fireline intensity, and other fire behavior metrics. As the name might suggest, surface fuels only account for the surface fire potential. Canopy fire potential is computed through a separate but linked process. The Southern Wildfire Risk Assessment accounts for both surface and canopy fire potential in the fire behavior outputs.

Surface fuels are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire: 1) grass, 2) shrub/brush, 3) timber litter and 4) slash. There are two standard fire behavior fuel model sets published for use. The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson, 1982) contains 13 fuel models and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott & Burgan 2005) contains 40 fuel models.

The SWRA Surface Fuels have been updated to use the FBPS 2005 40 fuel model set from the LANDFIRE 2010 products, supplemented with additional enhancements obtained through calibration workshops with the Southern states. Florida uses FBPS 1982 fuel models derived based on spectral classification of Landsat Thematic Mapper (TM) satellite imagery derived as part of the Florida Forest Service fuels mapping and risk assessment projects. Texas fuels represent 2010 updates conducted as part of a statewide fuels and canopy mapping effort.

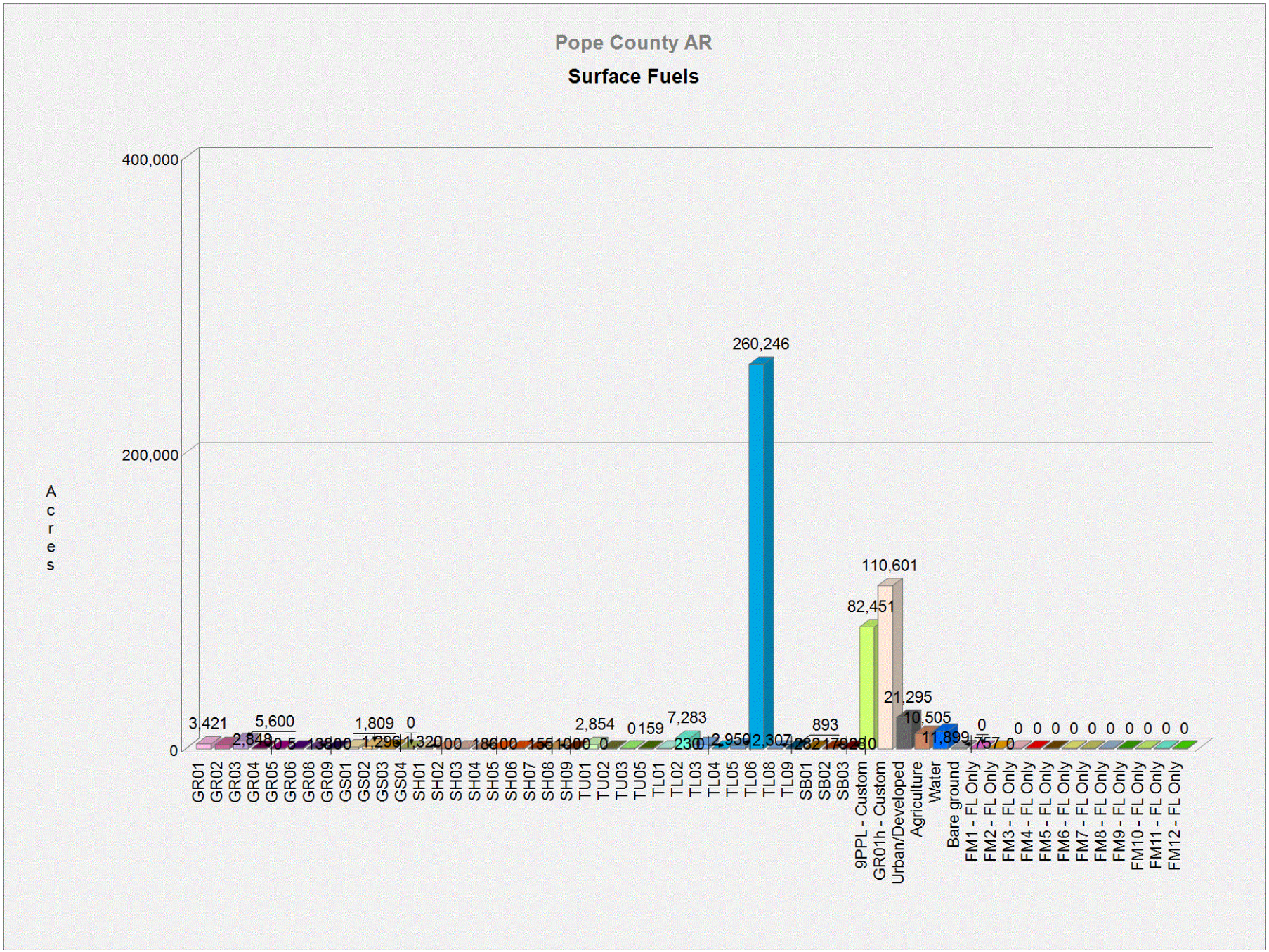
For the remaining 11 Southern states, the recently completed SWRA Update project produced a new surface fuels dataset based on 2010 LANDFIRE products. A detailed fuels calibration process was undertaken that involved collaboration with Southern state fuels and fire behavior specialists supported by federal partner involvement. Workshops were held to review the LANDFIRE fuels product and calibrate the data by modifying specific fuels classes to better reflect local knowledge and input. A key component of this calibration task involved using image processing techniques to better delineate conifer areas, and in particular pine areas (plantations and natural stands). The fuels layer represents 2010 conditions.

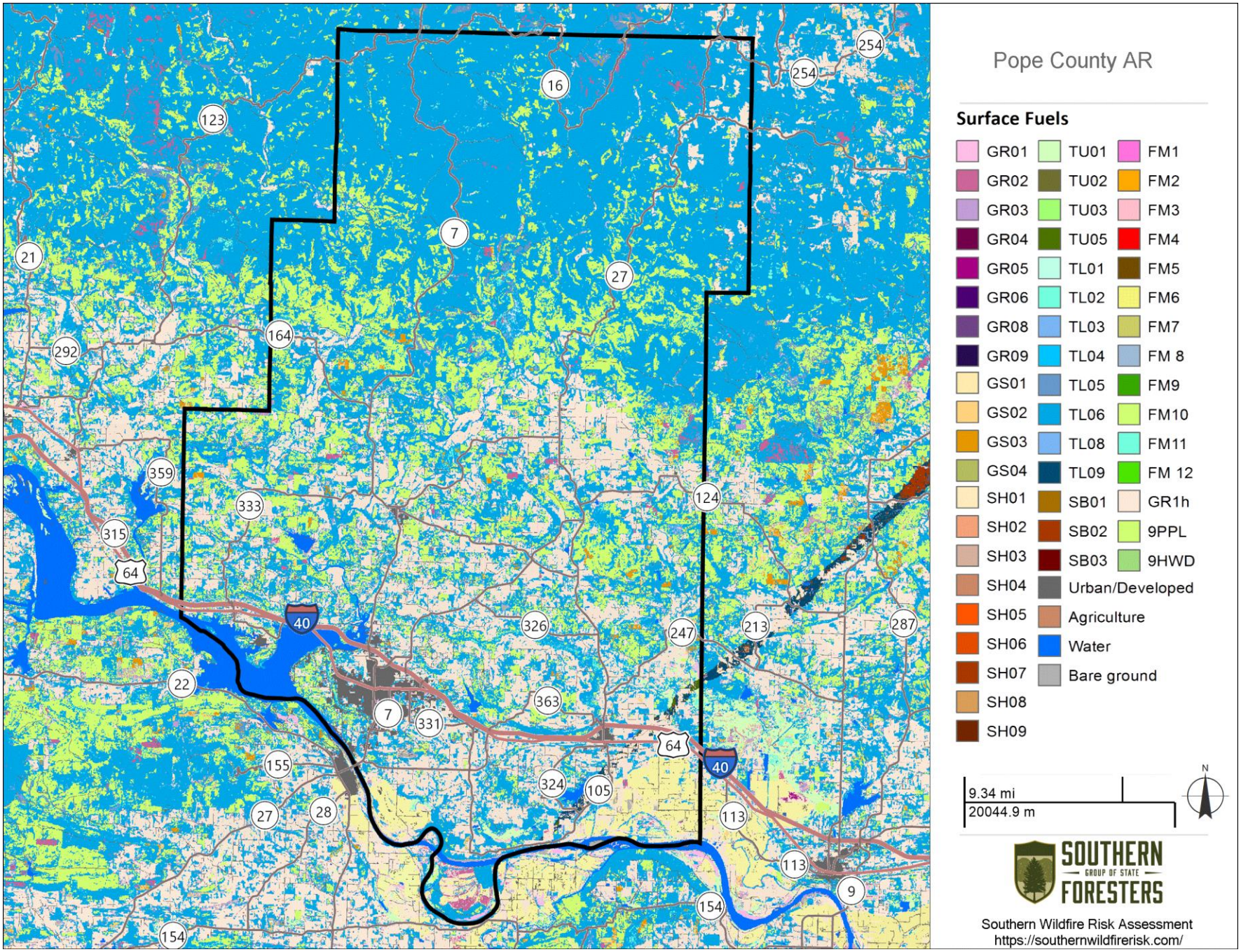
Surface Fuel	FBPS Fuel Model Set	Description	Acres	Percent
Grass Fuels Type Models (nearly pure grass and/or forb type)				
GR01	2005	Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.	3,421	0.6 %
GR02	2005	Moderately coarse continuous grass, average depth about 1 foot. Spread rate high; flame length moderate.	2,848	0.5 %
GR03	2005	Very coarse grass, average depth about 2 feet. Spread rate high; flame length moderate.	5,600	1.1 %
GR04	2005	Moderately coarse continuous grass, average depth about 2 feet. Spread rate very high; flame length high.	0	0.0 %
GR05	2005	Dense, coarse grass, average depth about 1 to 2 feet. Spread rate very high; flame length high.	5	0.0 %
GR06	2005	Dryland grass about 1 to 2 feet tall. Spread rate very high; flame length very high.	138	0.0 %
GR08	2005	Heavy, coarse, continuous grass 3 to 5 feet tall. Spread rate very high; flame length very high.	0	0.0 %
GR09	2005	Very heavy, coarse, continuous grass 5 to 8 feet tall. Spread rate extreme; flame length extreme.	0	0.0 %
Grass-Shrub Fuels Type Models (mixture of grass and shrub, up to 50 percent shrub coverage)				
GS01	2005	Shrubs are about 1 foot high, low grass load. Spread rate moderate; flame length low.	1,296	0.2 %
GS02	2005	Shrubs are 1 to 3 feet high, moderate grass load. Spread rate high; flame length moderate.	1,809	0.3 %
GS03	2005	Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate high; flame length moderate.	1,320	0.2 %
GS04	2005	Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high.	0	0.0 %
Shrub Fuel Type Models (Shrubs cover at least 50 percent of the site, grass sparse to nonexistent)				
SH01	2005	Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low; flame length very low.	0	0.0 %
SH02	2005	Moderate fuel load (higher than SH01), depth about 1 foot, no grass fuel present. Spread rate low; flame length low.	0	0.0 %
SH03	2005	Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate low; flame length low.	186	0.0 %
SH04	2005	Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate high; flame length moderate.	0	0.0 %

Surface Fuel	FBPS Fuel Model Set	Description	Acres	Percent
SH05	2005	Heavy shrub load, depth 4 to 6 feet. Spread rate very high; flame length very high.	0	0.0 %
SH06	2005	Dense shrubs, little or no herb fuel, depth about 2 feet. Spread rate high; flame length high.	155	0.0 %
SH07	2005	Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than SH05, but flame length similar. Spread rate high; flame length very high.	10	0.0 %
SH08	2005	Dense shrubs, little or no herb fuel, depth about 3 feet. Spread rates high; flame length high.	0	0.0 %
SH09	2005	Dense, finely branched shrubs with significant fine dead fuel, about 4 to 6 feet tall; some herbaceous fuel may be present. Spread rate high, flame length very high.	0	0.0 %
Timber-Understory Fuel Type Models (Grass or shrubs mixed with litter from forest canopy)				
TU01	2005	Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low.	2,854	0.5 %
TU02	2005	Fuelbed is moderate litter load with shrub component. Spread rate moderate; flame length low.	0	0.0 %
TU03	2005	Fuelbed is moderate litter load with grass and shrub components. Spread rate high; flame length moderate.	0	0.0 %
TU05	2005	Fuelbed is high load conifer litter with shrub understory. Spread rate moderate; flame length moderate.	159	0.0 %
Timber Litter Fuel Type Models (dead and down woody fuel litter beneath a forest canopy)				
TL01	2005	Light to moderate load, fuels 1 to 2 inches deep. Spread rate very low; flame length very low.	230	0.0 %
TL02	2005	Low load, compact. Spread rate very low; flame length very low.	7,283	1.4 %
TL03	2005	Moderate load conifer litter. Spread rate very low; flame length low.	2,950	0.6 %
TL04	2005	Moderate load, includes small diameter downed logs. Spread rate low; flame length low.	0	0.0 %
TL05	2005	High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low.	2,307	0.4 %
TL06	2005	Moderate load, less compact. Spread rate moderate; flame length low.	260,246	48.9 %
TL08	2005	Moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low.	282	0.1 %

Surface Fuel	FBPS Fuel Model Set	Description	Acres	Percent
TL09	2005	Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate.	893	0.2 %
Slash-Blowdown Fuel Type Models (activity fuel/slash or debris from wind damage)				
SB01	2005	Low load activity fuel. Spread rate moderate; flame length low.	179	0.0 %
SB02	2005	Moderate load activity or low load blowdown. Spread rate moderate; flame length moderate.	28	0.0 %
SB03	2005	High load activity fuel or moderate load blowdown. Spread rate high; flame length high.	0	0.0 %
Custom Fuel Type Models (all states except Florida)				
9PPL	Custom	Long-needle (pine litter, plantations) with a high load	82,451	15.5 %
GR01h	Custom	Pasture and hayland	110,601	20.8 %
Non-burnable Fuel Type Models (insufficient wildland fuel to carry a wildland fire under any condition)				
NB01	2005	Urban or suburban development; insufficient wildland fuel to carry wildland fire. Includes roads.	21,295	4.0 %
NB03	2005	Agricultural field, maintained in nonburnable condition.	10,505	2.0 %
NB08	2005	Open water	11,899	2.2 %
NB09	2005	Bare ground	757	0.1 %
1982 Fire Behavior Prediction System – ONLY USED FOR FLORIDA ASSESSMENT				
FM 1	1982	Short grass	0	0.0 %
FM 2	1982	Timber grass and understory	0	0.0 %
FM 3	1982	Tall grass	0	0.0 %
FM 4	1982	Chaparral	0	0.0 %

Surface Fuel	FBPS Fuel Model Set	Description	Acres	Percent
FM 5	1982	Brush	0	0.0 %
FM 6	1982	Dormant brush	0	0.0 %
FM 7	1982	Southern rough	0	0.0 %
FM 8	1982	Compact timber litter	0	0.0 %
FM 9	1982	Hardwood litter	0	0.0 %
FM 10	1982	Timber (understory)	0	0.0 %
FM 11	1982	Light logging slash	0	0.0 %
FM 12	1982	Medium logging slash	0	0.0 %
			531,707	**100.0 %**


Pope County AR
Surface Fuels
400,000
200,000
0
Acres
260,246
110,601
82,451
21,295
10,505
11,899
7,283
5,600
3,421
2,854
1,809
893
GR01
GR02
GR03
GR04
GR05
GR06
GR08
GR09
GS01
GS02
GS03
GS04
SH01
SH02
SH03
SH04
SH05
SH06
SH07
SH08
SH09
TU01
TU02
TU03
TU05
TL01
TL02
TL03
TL04
TL05
TL06
TL08
TL09
SB01
SB02
SB03
9PPL - Custom
GR01h - Custom
Urban/Developed
Agriculture
Water
Bare ground
FM1 - FL Only
FM2 - FL Only
FM3 - FL Only
FM4 - FL Only
FM5 - FL Only
FM6 - FL Only
FM7 - FL Only
FM8 - FL Only
FM9 - FL Only
FM10 - FL Only
FM11 - FL Only
FM12 - FL Only


Pope County AR
Surface Fuels
GR01
GR02
GR03
GR04
GR05
GR06
GR08
GR09
GS01
GS02
GS03
GS04
SH01
SH02
SH03
SH04
SH05
SH06
SH07
SH08
SH09
TU01
TU02
TU03
TU05
TL01
TL02
TL03
TL04
TL05
TL06
TL08
TL09
SB01
SB02
SB03
Urban/Developed
Agriculture
Water
Bare ground
FM1
FM2
FM3
FM4
FM5
FM6
FM7
FM 8
FM9
FM10
FM11
FM 12
GR1h
9PPL
9HWD
9.34 mi
20044.9 m
N
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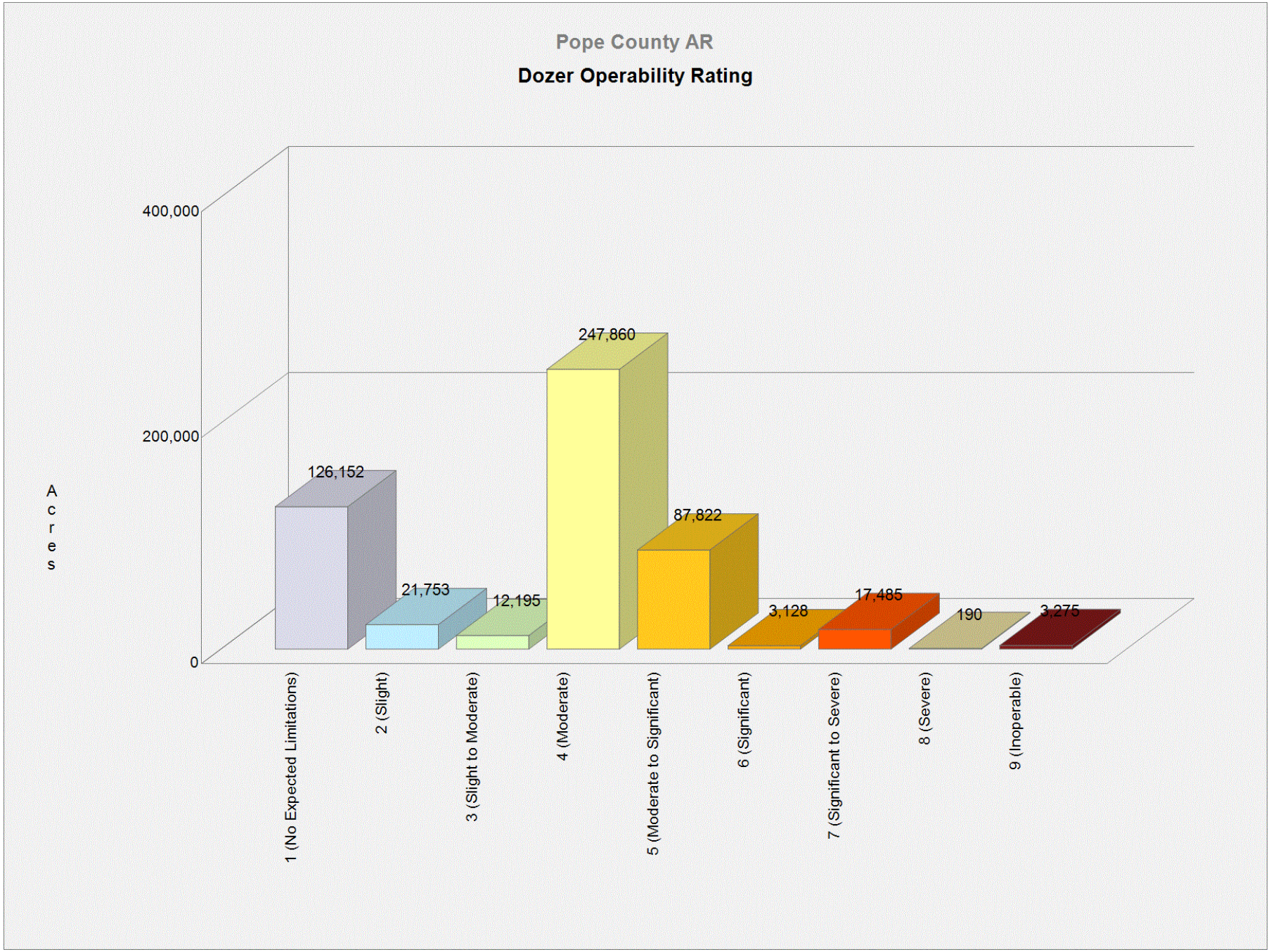
Southern Wildfire Risk Assessment
https://southernwildfirerisk.com/

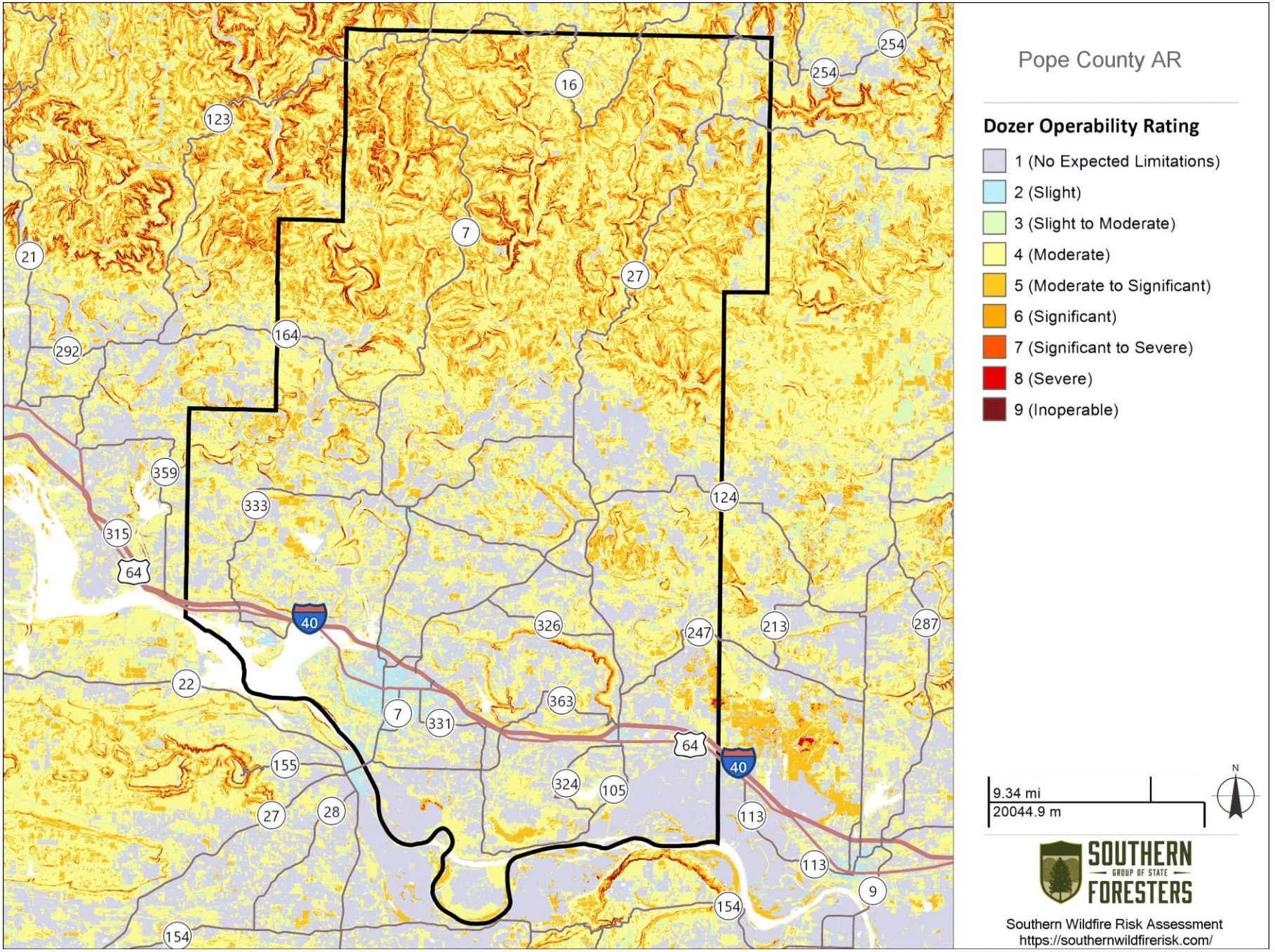
Dozer Operability Rating

Description

The Dozer Operability Rating (DOR) expresses how difficult it is to operate a dozer in an area based on limitations associated with slope and vegetation/fuel type. Using the fireline production rates published in the NWCG Fireline Handbook 3 (PMS 410-1) as a guide, operability values were assigned to a matrix based on 6 slope classes and 10 vegetation/fuels classes. The possible values range from 1 to 9, with 1 representing no limitations and 9 being inoperable.

Class	Acres	Percent
1 (No Expected Limitations)	126,152	24.3 %
2 (Slight)	21,753	4.2 %
3 (Slight to Moderate)	12,195	2.3 %
4 (Moderate)	247,860	47.7 %
5 (Moderate to Significant)	87,822	16.9 %
6 (Significant)	3,128	0.6 %
7 (Significant to Severe)	17,485	3.4 %
8 (Severe)	190	0.0 %
9 (Inoperable)	3,275	0.6 %
Total	**519,860**	**100.0 %**


Pope County AR
Dozer Operability Rating
400,000
200,000
0
Acres
126,152
21,753
12,195
247,860
87,822
3,128
17,485
190
3,275
1 (No Expected Limitations)
2 (Slight)
3 (Slight to Moderate)
4 (Moderate)
5 (Moderate to Significant)
6 (Significant)
7 (Significant to Severe)
8 (Severe)
9 (Inoperable)


Pope County AR
Dozer Operability Rating
1 (No Expected Limitations)
2 (Slight)
3 (Slight to Moderate)
4 (Moderate)
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6 (Significant)
7 (Significant to Severe)
8 (Severe)
9 (Inoperable)
9.34 mi
20044.9 m
N
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Southern Wildfire Risk Assessment
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More information about the Fire Program Analysis project is available from http://www.forestsandrangelands.gov/WFIT/applications/FPA/index.shtml

More information about the Oak Ridge National Laboratory LandScan data is available from http://web.ornl.gov/sci/landscan/landscan_documentation.shtml

More information about the U.S. Forest Service SILVIS data is available from http://silvis.forest.wisc.edu/maps/wui_main

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