



BUFFALO RIVER WATERSHED

Resource Information

BUFFALO RIVER WATERSHED

Buffalo River Counties
(1,342.7 Square Miles)

Baxter

Boone

Madison

Marion

Newton

Pope

Searcy

Stone

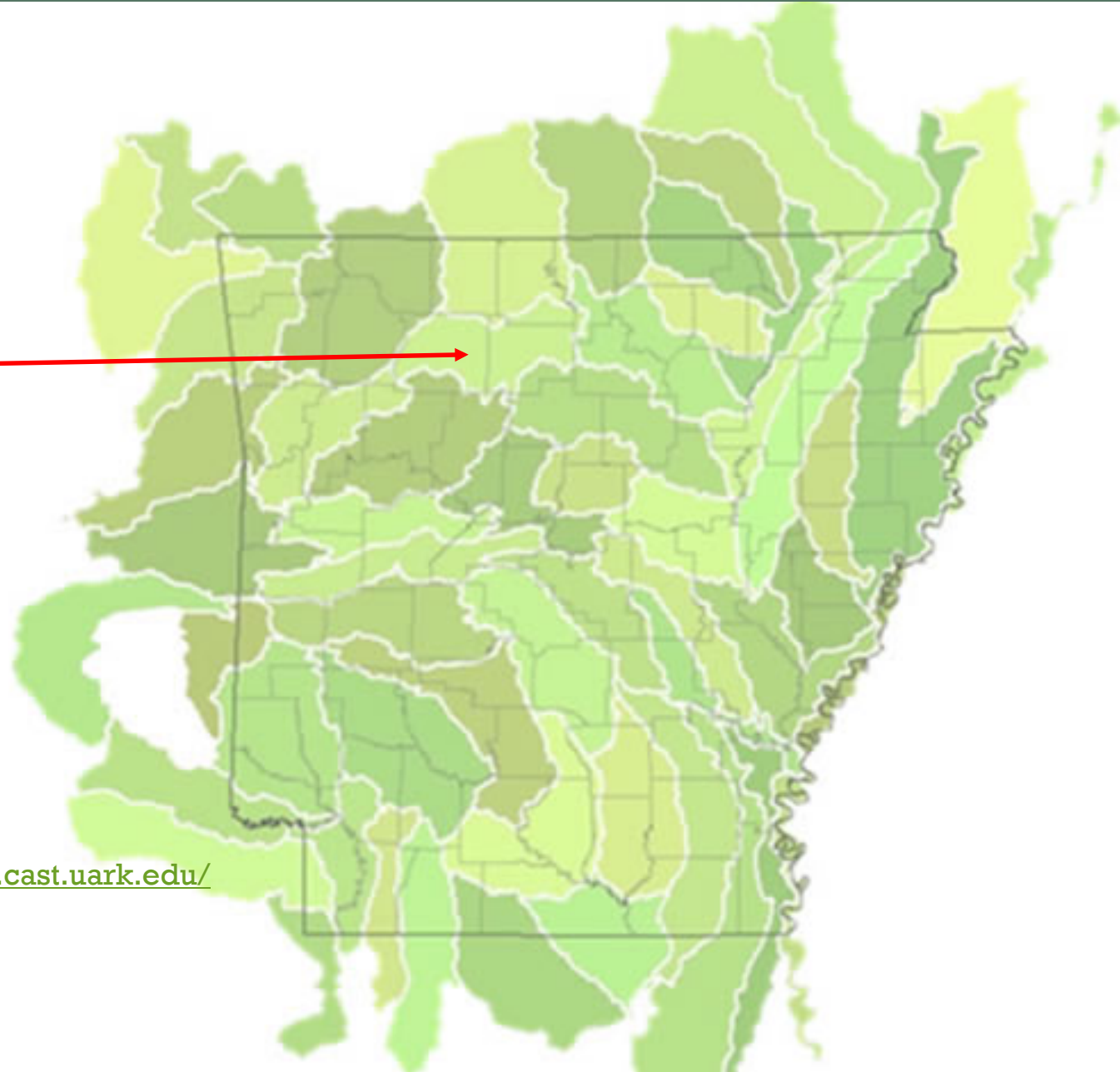
Van Buren



Arkansas Watersheds

8-Digit Watersheds

Bayou Bartholomew
Bayou D'Arbonne
Bayou Macon
Bayou Meto
Beaver Reservoir
Big
Bodcau Bayou
Boeuf
Buffalo
Bull Shoals Lake
Cache
Cadron
Cross Bayou
Current
Dardanelle Reservoir
Eleven Point
Elk
Fourche La Fave
Frog-Mulberry
Illinois
Kiamichi
L'Anguille
Lake Conway-Point Remove
Lake O' The Cherokees
Little Missouri <http://watersheds.cast.uark.edu/>
Little Red
Little River Ditches
Loggy Bayou



8-Digit Watersheds

Lower Arkansas
Lower Arkansas-Maumelle
Lower Black
Lower Little
Lower Mississippi-Greenville
Lower Mississippi-Helena
Lower Mississippi-Memphis
Lower Neosho
Lower Ouachita-Bayou De Loutre
Lower Ouachita-Smackover
Lower Saline
Lower St. Francis
Lower Sulphur
Lower White
Lower White-Bayou Des Arc
McKinney-Posten Bayous
Middle White
Mountain Fork
North Fork White
Ouachita Headwaters
Pecan-Waterhole
Petit Jean
Poteau
Robert S. Kerr Reservoir
Spring
Strawberry
Upper Black
Upper Ouachita
Upper Saline
Upper White-Village

BUFFALO RIVER WATERSHED

The Buffalo River is a tributary of the White River in north central Arkansas.

- Approximately 150 miles long, the river flows easterly across Newton and Searcy counties before crossing the southeastern corner of Marion County to meet the White River.

The majority of the Buffalo River watershed is located in Newton (46%) and Searcy (37%) counties, followed by Marion County (11%) and Baxter County (2.5%).

- The remainder of the watershed (less than 3%) includes portions of Boone, Madison, Pope, Stone, and Van Buren counties at the fringes of the watershed.

BUFFALO RIVER WATERSHED

There are just five incorporated areas within the watershed:

- Gilbert, Marshall, and Saint Joe in Searcy County, Jasper in Newton County, and Big Flat in Baxter County.

The Buffalo River watershed covers 1,342.7 square miles, drained by over 2,000 miles of streams (Center for Advanced Spatial Technologies 2006).

- It is a sub-basin of the Upper White River basin and is identified by the U.S. Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC) 11010005.
- There are 37 12-digit HUC sub-watersheds within the Buffalo River watershed.

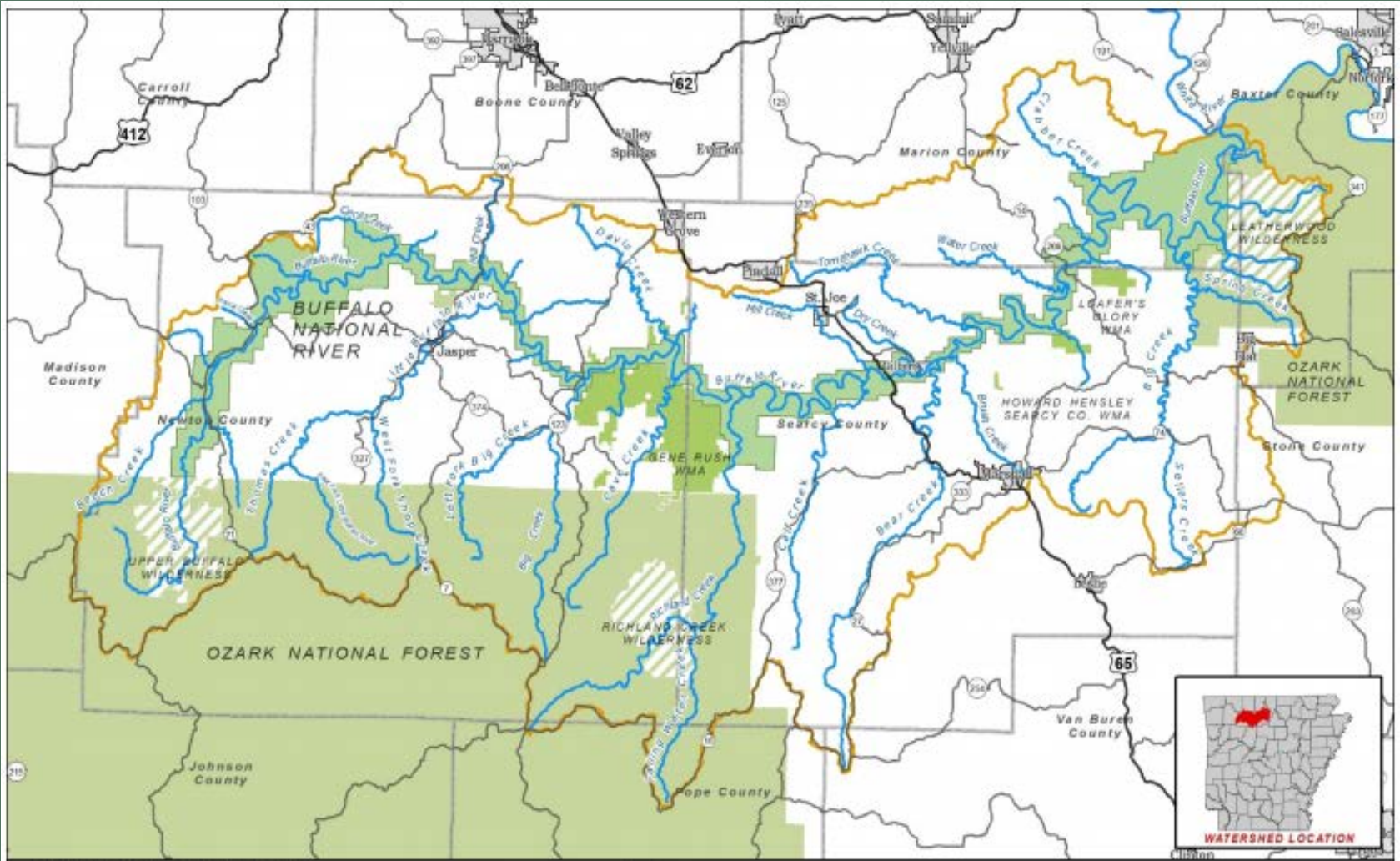
BUFFALO RIVER WATERSHED

Major tributaries to the Buffalo River include Bear Creek, two Big Creeks (one in Newton County and another in Searcy and Marion counties), Calf Creek, Cave Creek, Cecil Creek, Clabber Creek, Davis Creek, Little Buffalo River, two Mill Creeks (one in Newton County and one in Searcy County), Richland Creek, Tomahawk Creek, and Water Creek.

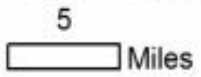
- Other major streams in the watershed include Thomas Creek, a tributary of the Little Buffalo River, and Spring and Sellers Creeks, tributaries of the eastern Big Creek.

Approximately 40% of the Buffalo River watershed is within one or more publicly owned areas: the Ozark-St. Francis National Forest, eight Arkansas Game and Fish Commission Wildlife Management Areas, and the Buffalo National River (a unit of the US National Park Service).

BUFFALO RIVER WATERSHED



Buffalo Watershed



- US Highway
- State Highway
- Major Reaches
- Buffalo HUC8
- Counties
- City Limits
- Buffalo National River
- AGFC Areas
- Ozark National Forest Area
- Ozark National Forest Wilderness Area



BUFFALO RIVER WATERSHED POPULATION

Numbers of people in the counties of the Buffalo River watershed are presented in the next table.

- The watershed is rural, with no urbanized areas and no urban clusters as defined by the US Census Bureau.
- The population change in the counties of the watershed has been small, with 0.2% decrease from 2000 to 2010 followed by a 1.8% decrease to 2015.
- Between 2000 and 2010, population increased in most of the surrounding counties (by an average of 8.3%, $\pm 5.1\%$) but decreased slightly in Newton and Searcy counties (by 3.2% and 0.8% respectively).
- Since then, from 2010 to 2015, the populations in the surrounding counties have had slight changes – decreases of 3.0% or less in Baxter, Marion, and Van Buren counties; and increases of 2.6% or less in Boone, Madison, Pope, and Stone counties.

BUFFALO RIVER WATERSHED POPULATION

- In the same period, the populations in Newton and Searcy counties decreased by 5.0% and 4.0% respectively.
- The populations in Baxter, Marion, Searcy, and Van Buren counties are projected to continue to decline (by 0.2% to 4.2%) through 2020 while the Boone, Madison, and Newton County populations are projected to increase slightly (1.3% or 1.9%) and the Pope and Stone County populations are projected to increase by 4.2% and 7.5%.

BUFFALO RIVER WATERSHED POPULATION

County	2000^a Total population	Population Density^b (avg/sq mi)	2010^a Total Population	Population Density^a (avg/sq mi)	2015 population estimate^c	2020 projection^d
Buffalo River Watershed [†]	15,874	11.8	15,837	11.8	15,545	n/a
Baxter	38,386	69.2	41,513	74.9	41,040	36,791 – 44,135
Boone	33,948	57.4	36,903	62.5	37,222	35,277 – 40,782
Madison	14,243	17.0	15,717	18.8	15,767	14,328 – 17,819
Marion	16,140	27.0	16,653	27.9	16,458	14,003 – 17,396
Newton	8,608	10.5	8,330	10.1	8,052	7,533 – 8,630
Pope	54,469	67.1	61,754	76.0	63,390	62,693 – 69,564
Searcy	8,261	12.4	8,195	12.3	7,965	7,151 – 8,621
Stone	11,499	19.0	12,394	20.4	12,456	12,683 – 14,115
Van Buren	16,192	22.8	17,295	24.4	16,771	15,154 – 17,069
State of Arkansas	2,673,400	51.4	2,915,918	56.0	2,958,208	3,034,437 – 3,110,424

[†] Values for the watershed aggregated from US Census Bureau data for block groups intersecting the watershed. The counts for block groups partially within the watershed were proportioned by area.

^a (US Census Bureau 2012)

^b (US Census Bureau 2003)

^c (US Census Bureau 2015)

^d (UALR Institute for Economic Advancement 2015)

BUFFALO RIVER WATERSHED POPULATION

Additional demographic information for the Buffalo River watershed and surrounding counties is located in the next table.

- This includes percentages of the population for characteristics of commuting, household structure, age, gender, race, median income, poverty, fields of employment, and education level.
- Within the watershed, the majority of commuters drive alone, though a higher percentage carpool than across the state as a whole. About two-thirds of households are families, and most of these include two parents. The population of the watershed is older than the state-wide profile.
- There are lower percentages of persons under age 18, 18 to 34 years, and 35 to 49 years; while there are higher percentages of persons aged 50 to 64 years and 65 and older.
- The majority (>94%) of persons in the watershed consider themselves White (non-Hispanic).

BUFFALO RIVER WATERSHED POPULATION

Household and per-capita incomes in the counties of the Buffalo River watershed are below those state-wide.

- However, there is a slightly lower percentage of families below the poverty level, and a slightly higher percentage of people below the poverty level than for the state as a whole.
- The unemployment rate is two percentage points lower than the state-wide rate.
- The percentages of high school graduates, bachelor's, and graduate degree holders are all lower than the state-wide values.

BUFFALO RIVER WATERSHED POPULATION

	Buffalo River Watershed ¹	Baxter County	Boone County	Madison County	Marion County	Newton County	Pope County	Searcy County	Stone County	Van Buren County	State of Arkansas
Commuting (number of persons)											
Drove alone	77.4%	84.6%	85.2%	77.8%	76.1%	75.2%	84.0%	77.9%	76.9%	83.4%	82.6%
Carpooled	14.2%	8.9%	9.2%	13.3%	17.8%	13.7%	9.9%	14.2%	12.8%	10.3%	10.8%
Public Transportation	0.5%	0.4%	0.0%	0.7%	0.3%	0.7%	0.1%	0.4%	0.0%	0.2%	0.4%
Walk or other	4.1%	2.1%	3.1%	2.3%	2.3%	4.6%	3.7%	4.3%	4.1%	2.9%	3.1%
Mean travel time (minutes)	32.42	17.1	20.3	31.7	23.1	36.2	18.8	31.3	25.2	27.4	21.6
Worked at home	3.8%	4.0%	2.5%	6.0%	3.5%	5.8%	2.3%	3.4%	6.2%	3.3%	3.2%
Household structure											
Family households	66.5%	65.8%	69.3%	73.4%	68.5%	67.3%	68.2%	64.4%	62.7%	66.1%	66.8%
Two parent families	57.2%	52.9%	55.0%	60.9%	57.4%	56.6%	53.1%	56.9%	53.0%	50.7%	49.1%
Single parent families	9.3%	12.9%	14.3%	12.6%	11.1%	10.7%	15.1%	7.6%	9.7%	15.4%	17.7%
Single person household	29.8%	30.0%	26.7%	23.9%	26.8%	30.1%	26.9%	31.2%	34.2%	29.6%	28.2%
Other non-family household	3.8%	4.2%	4.0%	2.7%	4.6%	2.7%	5.0%	4.4%	3.1%	4.3%	5.0%
Age (number of persons)											
Median age	NA	51.5	41.4	41.8	51.3	47.7	35.2	47.0	48.5	47.1	37.7
Under 18	20.0%	17.6%	22.7%	23.7%	17.4%	20.0%	22.8%	20.6%	21.0%	20.0%	23.9%
18 to 34 years	16.4%	15.1%	19.2%	18.4%	14.8%	15.8%	27.1%	17.1%	15.8%	16.9%	22.7%
35 to 49 years	17.5%	15.3%	18.5%	19.2%	15.5%	17.2%	17.7%	16.3%	15.7%	17.1%	18.8%
50 to 64 years	23.3%	22.4%	20.2%	21.7%	26.3%	24.3%	18.4%	22.8%	23.1%	21.9%	19.2%
65 and older	22.8%	29.6%	19.4%	17.0%	26.0%	22.7%	14.0%	23.2%	24.5%	24.2%	15.3%
Gender (number of persons)											
Female	50.2%	51.7%	51.3%	49.9%	50.3%	49.9%	50.5%	50.0%	49.3%	50.6%	50.9%
Male	49.8%	48.3%	48.7%	50.1%	49.7%	50.1%	49.5%	50.0%	50.7%	49.4%	49.1%
Race (number of persons)											
White non-Hispanic	94.2%	95.3%	94.5%	90.9%	94.8%	94.4%	85.5%	94.1%	95.3%	93.6%	73.6%
Hispanic	1.7%	1.9%	2.2%	5.2%	2.2%	1.1%	7.8%	1.9%	1.7%	2.9%	6.9%
Black non-Hispanic	0.1%	0.3%	0.4%	0.0%	0.3%	0.0%	2.9%	0.3%	0.0%	0.5%	15.4%
Native American	1.2%	0.6%	0.7%	0.5%	0.7%	1.4%	0.6%	1.1%	0.2%	0.4%	0.8%
Asian	0.8%	0.5%	0.5%	0.6%	0.7%	0.5%	0.7%	1.1%	0.2%	0.2%	1.4%
Other race	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
>1 race, non-Hispanic	1.9%	1.3%	1.7%	2.7%	1.3%	2.7%	2.5%	1.6%	2.6%	2.3%	1.9%
Income											
Per capita income	\$18,285	\$22,475	\$21,946	\$20,693	\$17,779	\$18,038	\$20,047	\$18,533	\$18,944	\$19,047	\$22,798
Families below poverty level	13.8%	10.7%	13.9%	16.6%	12.7%	13.7%	14.8%	17.1%	16.5%	15.8%	14.2%
People below poverty level	20.0%	15.9%	17.7%	20.5%	18.8%	20.5%	20.0%	23.6%	24.6%	21.4%	19.3%

BUFFALO RIVER WATERSHED POPULATION

	Buffalo River Watershed ¹	Baxter County	Boone County	Madison County	Marion County	Newton County	Pope County	Searcy County	Stone County	Van Buren County	State of Arkansas
Employment											
Unemployed	5.7%	7.6%	8.4%	7.3%	10.9%	4.4%	7.6%	5.9%	7.0%	11.2%	7.7%
Mgmt, business, science, arts	25.1%	29.2%	30.7%	27.1%	19.4%	23.5%	28.8%	27.7%	31.4%	25.3%	32.0%
Service	18.0%	19.7%	18.9%	14.7%	25.8%	20.0%	17.6%	11.9%	21.6%	16.7%	17.1%
Sales, office	22.0%	23.3%	25.4%	19.3%	20.1%	18.8%	23.4%	26.0%	14.1%	22.1%	23.9%
Natural resources, construction, maintenance	13.8%	8.5%	10.9%	15.6%	11.7%	14.1%	11.1%	16.0%	21.0%	19.6%	10.7%
Production, transportation, material moving	21.1%	19.3%	14.1%	23.2%	23.0%	23.5%	19.1%	18.4%	11.9%	16.3%	16.4%
Self-employed	18.8%	12.1%	12.4%	16.8%	12.4%	20.2%	9.4%	21.7%	21.9%	15.2%	9.4%
Education (population 25 or older)											
High School graduate (or higher)	82.1%	87.4%	85.8%	78.4%	85.4%	81.9%	82.7%	81.9%	79.1%	81.9%	84.8%
Bachelor's degree (or higher)	13.5%	17.9%	14.7%	10.7%	13.2%	14.6%	20.9%	13.9%	15.9%	12.3%	21.1%
Graduate degree	4.7%	4.8%	5.4%	3.6%	4.1%	4.9%	7.4%	5.1%	6.3%	4.0%	7.5%

¹ Values for the watershed aggregated from US Census Bureau data for Block Groups intersecting the watershed. The counts for Block Groups partially within the watershed were proportioned by area.

² Calculated from US Census Bureau statistics. Result may not be as accurate as original census statistics.

BUFFALO RIVER WATERSHED ECONOMICS

The largest drivers of the economy in the Buffalo River watershed are tourism and outdoor recreation (such as hiking, canoeing, hunting, and fishing).

- Livestock farming and timber production also contribute to the economy in the area.
- The value of sales and receipts reported in \$1,000 for selected economic sectors in the counties within the Buffalo River watershed in the 2012 economic census is summarized in the following table.

Economic Sector	Baxter County	Boone County	Madison County	Marion County	Newton County	Pope County	Searcy County	Stone County	Van Buren County	Total
Portion of county within watershed	5.8%	1.7%	0.3%	23.3%	75.3%	1.4%	74.7%	1.7%	0.3%	–
Manufacturing	\$574,423	\$493,651	D*	\$244,842	\$5,301	\$1,506,729	D*	\$10,458	D*	\$2,835,404
Wholesale Trade	D*	D*	D*	\$16,497	D*	\$322,369	D*	\$34,139	\$35,553	\$408,558
Retail Trade	\$476,645	\$493,268	\$130,207	\$94,779	\$17,001	\$869,392	\$49,780	\$107,472	\$168,365	\$2,406,909
Transportation† & Warehousing	D*	\$102,697	D*	D*	\$2,352	\$113,198	n/a	\$2,008	\$45,416	\$265,671
Accommodation & Food Service	\$61,602	D*	\$7,445	\$8,462	D*	D*	D*	\$14,776	\$15,795	\$108,080
Total	\$1,112,670	\$1,089,616	\$137,652	\$364,580	\$24,654	\$2,811,688	\$49,780	\$168,853	\$265,129	\$6,024,622

* data withheld by US Census Bureau to avoid disclosure of data for individual businesses

†Does not include railroad transportation or U.S. Postal Service as these are out of scope for the census.

BUFFALO RIVER WATERSHED ECONOMICS

Agriculture and timber are not economic sectors reported in the economic census.

- However, they contribute value to manufacturing, real estate, wholesale trade, and transportation and warehousing economic sectors.
- The following table lists the value of sales in \$1,000 of agricultural products reported for the counties within the Buffalo River watershed in the 2012 census of agriculture.

Commodity	Baxter	Boone	Madison	Marion	Newton	Pope	Searcy	Stone	Van Buren	Total
Portion of county within watershed	5.8%	1.7%	0.3%	23.3%	75.3%	1.4%	74.7%	1.7%	0.3%	–
All agricultural products	\$20,367	\$124,065	\$208,163	\$39,667	\$28,655	\$150,102	\$13,038	\$53,664	\$19,947	\$657,668
Crops (incl. nursery & greenhouse)	\$601	\$1,329	\$3,145	\$560	\$1,004	\$10,396	\$1,012	\$841	\$1,067	\$19,955
Hay	\$489	\$1,075	\$2,134	D*	\$797	\$1,615	\$976	\$764	\$976	\$8,826
Livestock	\$19,766	\$122,736	\$205,018	\$39,107	\$27,651	\$139,706	\$12,026	\$52,823	\$18,880	\$637,713
Cattle & calves	\$12,238	\$33,941	\$21,995	\$11,873	\$6,284	\$15,680	\$9,438	\$21,965	\$9,248	\$142,662
Milk from cows	–	\$971	\$1,547	–	–	–	\$684	D*	\$568	\$3,770
Hogs & Pigs	D*	D*	\$15	D*	\$821	\$4,456	D*	D*	D*	\$5,292
Poultry & eggs	\$6,381	\$87,438	\$180,788	\$26,680	\$20,360	\$119,028	D*	\$30,666	\$6,862	\$478,203

* data withheld by USDA NASS to avoid disclosure of data for individual farms

BUFFALO RIVER WATERSHED ECONOMICS

The following table summarizes economic inputs to the counties within the Buffalo River Watershed from tourism.

	Baxter	Boone	Madison	Marion	Newton	Pope	Searcy	Stone	Van Buren
Portion of county within watershed	5.8%	1.7%	0.3%	23.3%	75.3%	1.4%	74.7%	1.7%	0.3%
Total travel expenditures	\$248,024,325	\$78,129,815	\$11,099,282	\$52,831,277	\$14,559,881	\$168,950,409	\$10,958,306	\$85,942,510	\$61,279,737
Travel-generated payroll	\$45,523,290	\$14,377,943	\$1,602,500	\$10,323,012	\$2,687,943	\$25,754,794	\$1,731,754	\$16,353,240	\$9,983,222
Travel-generated employment	2,328 jobs	819 jobs	68 jobs	543 jobs	154 jobs	1,371 jobs	85 jobs	841 jobs	537 jobs
Travel-generated state tax	\$14,526,524	\$4,642,607	\$673,248	\$3,124,452	\$864,269	\$7,211,447	\$661,242	\$4,969,321	\$3,782,691
Travel-generated local tax	\$4,562,107	\$1,503,591	\$290,724	\$1,194,722	\$339,283	\$2,375,141	\$256,001	\$1,822,192	\$1,767,119
Visitors (person-trips)	1,041,452	331,808	43,502	214,450	57,822	677,208	53,781	352,509	229,343

BUFFALO RIVER WATERSHED ECONOMICS

Contributions and Impacts of Buffalo National River visitor spending to local economy in 2015 in \$1,000s

	Recreation Visits	Visitor Spending	Contributions ^a & Impacts ^b due to Buffalo NR			
			Jobs	Labor Income	Value Added	Economic Output
Total visitors (importance to regional economy)	1,463,304	\$62,243.2	969	\$24,528.1	\$40,151.7	\$72,009.0
Non-local visitors (inflow to regional economy)	1,014,290	\$55,289.2	878	\$22,367.5	\$36,715.4	\$65,876.4

^a Defined by NPS as gross economic activity in region that is associated with National Park visits. Indicator of relative magnitude and importance to regional economies.

^b Defined by NPS as net changes to the regional economy due to non-local visitors to National Parks. Spending by local visitors excluded because would still likely be spent in local economy. Indicator of economic activity that would be lost if park was not there.

BUFFALO RIVER WATERSHED GEOLOGY

The Buffalo River watershed is situated in the northern Boston Mountains and the southern Springfield Plateau and Salem Plateau physiographic regions of the Ozark Plateaus.

- The geology of the Ozark Plateaus consists of sedimentary rock that was deposited in shallow marine seas during the Ordovician through Pennsylvanian periods.
- The geology of the Boston Mountains is dominated by sandstones, while the Springfield Plateau is predominantly limestone.
- A surface geology map of the Buffalo River watershed shows approximately 64% of the surface geology is limestone and dolomite formations, including most of the Buffalo Riverbed.

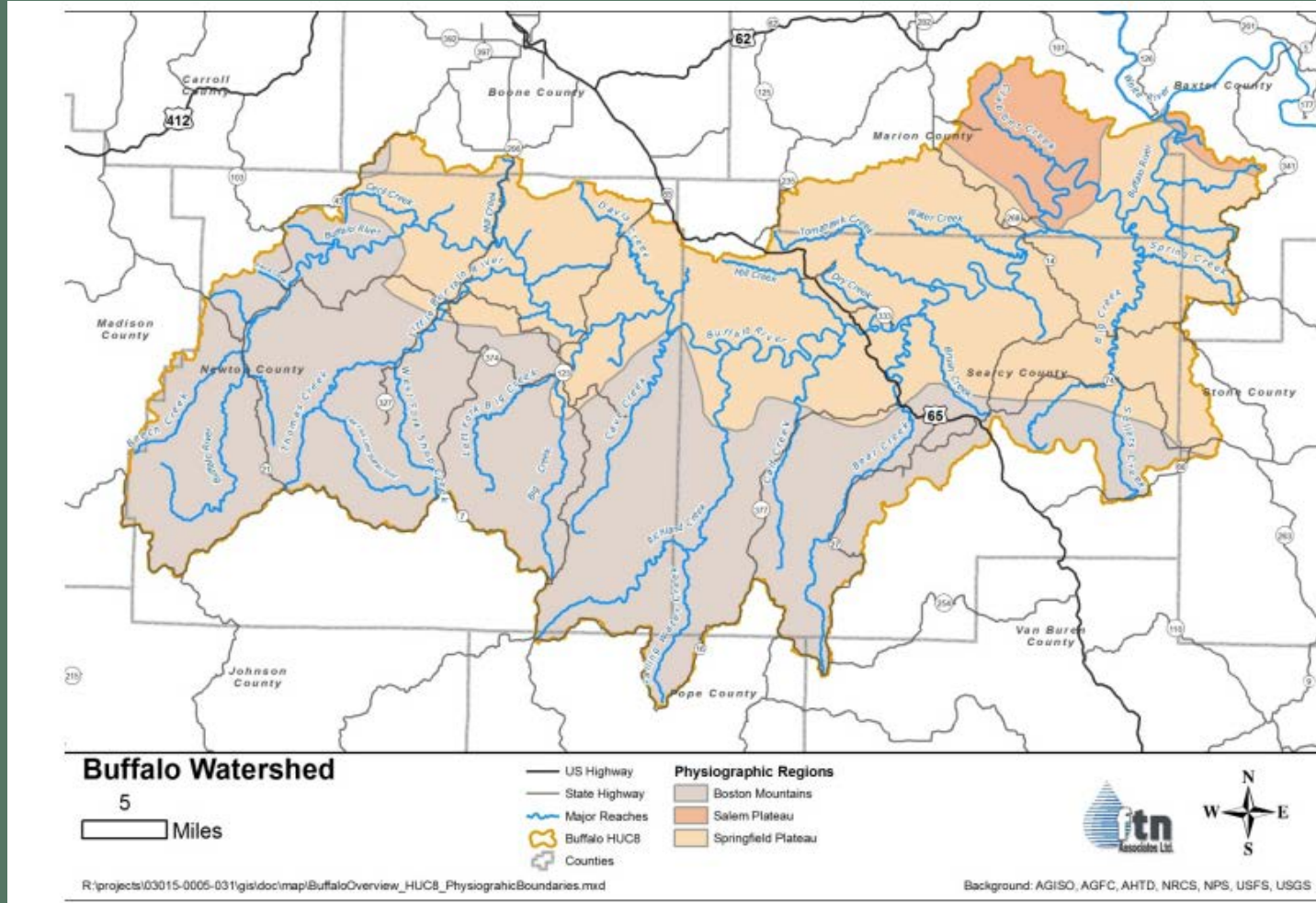
BUFFALO RIVER WATERSHED GEOLOGY

The Buffalo River watershed is underlain by a series of gently folded sandstone, shale, cherty dolomite, and limestone formations.

- The rocks underlying the watershed have been affected by tectonic forces and erosion, resulting in widespread presence of faults and solution/karst features.
- Karst features in the Buffalo River watershed are associated primarily with the Boone Formation.
- Within the boundaries of the National River parklands, there are over 300 cave systems.

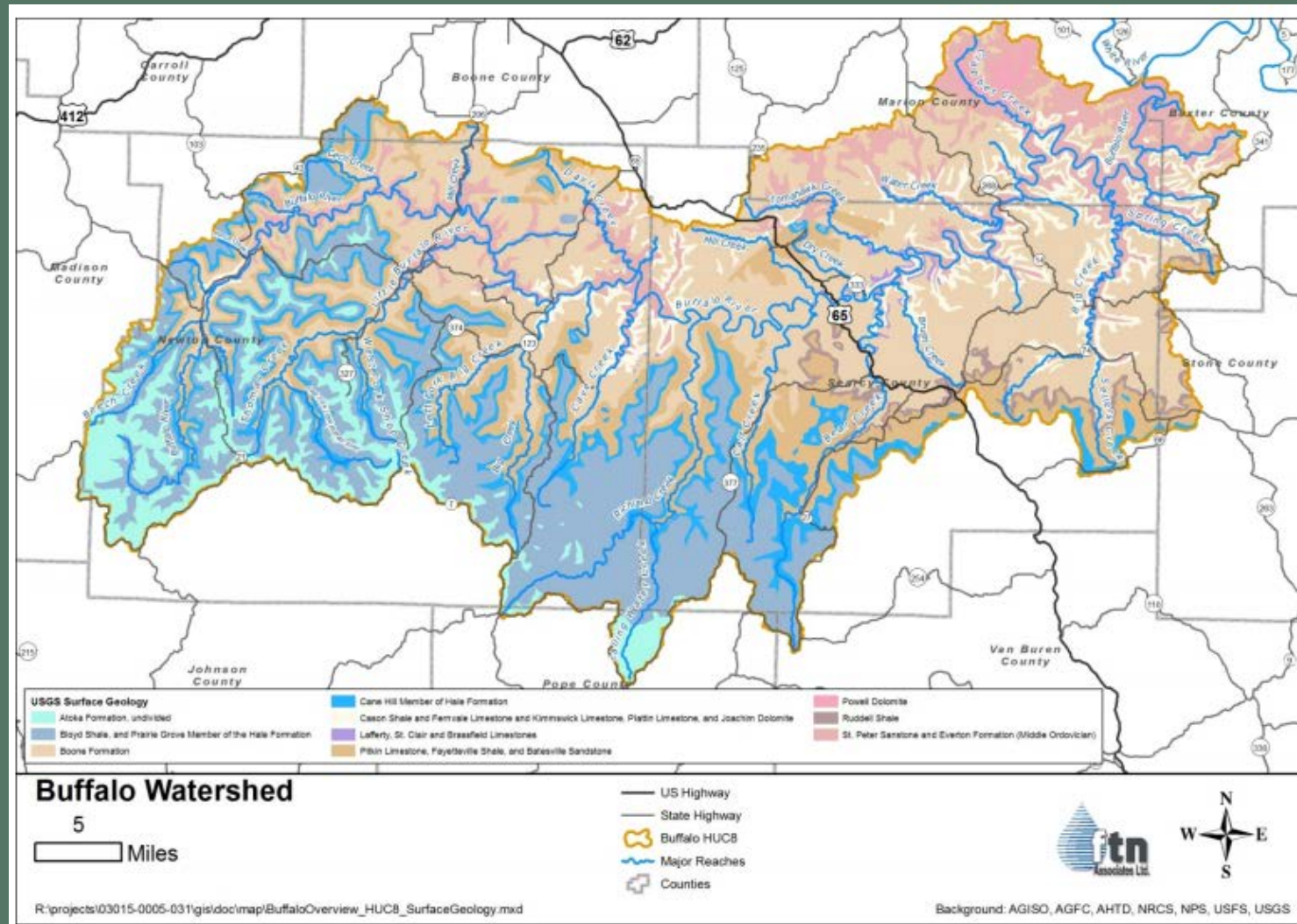
BUFFALO RIVER WATERSHED GEOLOGY

Physiographic regions within the Buffalo River Watershed



BUFFALO RIVER WATERSHED GEOLOGY

Surface geology map of the Buffalo River Watershed



BUFFALO RIVER WATERSHED GEOLOGY

Stratigraphic column listing with descriptions of lithology for geologic formations underlying the Buffalo River Watershed

Era	Period	Geologic Unit	Lithology	Percent of watershed surface^a	Thickness, feet
Paleozoic	Pennsylvanian	Atoka Formation	Sandstone, shale, limestone	6.1%	100-500
		Bloyd Formation	Limestone, Sandstone, shale	28.1%	175-200
		Hale Formation	Silty shale		100-180
	Mississippian	Pitkin Limestone	Limestone	13.4%	50-100
		Fayetteville Shale	Shale	Not exposed at surface	10-400
		Batesville Sandstone	Sandstone		0-200
		Moorefield Formation and Ruddell Shale	Shale and limestone	1.9%	0-300
		Boone Formation	Cherty limestone	31.8%	300-350
		St. Joe Limestone	Limestone	Not exposed at surface	0-100
	Silurian	Laferty Limestone	limestone	0.2%	5-20
		St. Clair Limestone	Limestone		0-100
		Brassfield Limestone	Limestone		0-38
	Ordovician	Cason Shale	Shale	5.9%	<23
		Fernvale Limestone	Limestone		0-100
		Kimmswick Limestone	Limestone	12.3%	0-55
		Plattin Limestone	Limestone		0-160
		Joachim Dolomite	Dolostone		0-50
		St. Peter Sandstone	Sandstone	0-175	12.3%
		Everton Formation	Limestone, sandy dolostone		
		Powell Dolomite	Shaly dolostone	0.7%	<200
Cotter Dolomite		Cherty limestone	Not exposed at surface	250-500	
Roubidoux Formation		Sandstone and sandy dolomite		100 – 250	
Gasconade Formation		Dolomite, cherty and sandy dolomite, and sandstone.		350 – 360	

BUFFALO RIVER WATERSHED GEOLOGY

The Buffalo River watershed is located in the lead and zinc fields of northern Arkansas. The Buffalo River watershed had the largest zinc deposits in northern Arkansas.

- Zinc and lead ores occurred in the Cotter, Powell, Smithville, and Everton formations of the Ordovician period, and the Boone Formation and Batesville Sandstone of the Mississippian period.
- The most productive zinc and lead ore deposits occurred in the Boone and Everton formations.
- Copper ore was also present in mineable quantities in at least one location in the Buffalo River watershed.
- The Arkansas Geological Survey indicates the presence of at least one historical coal mine in the watershed.

BUFFALO RIVER WATERSHED TOPOGRAPHY

Elevations within the Buffalo River watershed range from 384 feet above sea level where the Buffalo River joins the White River, to 2,562 feet above sea level in the Boston Mountains of the upper watershed.

- The Buffalo River has cut deeply into the bedrock, resulting in tall vertical bluffs at river bends.
- From Ponca to Pruitt, the river gradient is an average of 13 feet per mile. Between Pruitt and Highway 65, the river gradient averages 5 foot per mile, and downstream of Highway 65, the average river gradient is 3 feet per mile.

BUFFALO RIVER WATERSHED TOPOGRAPHY

Land slopes in the Buffalo River watershed range from less than 1% in valley bottoms and on upland flats, to 60% on hill sides.

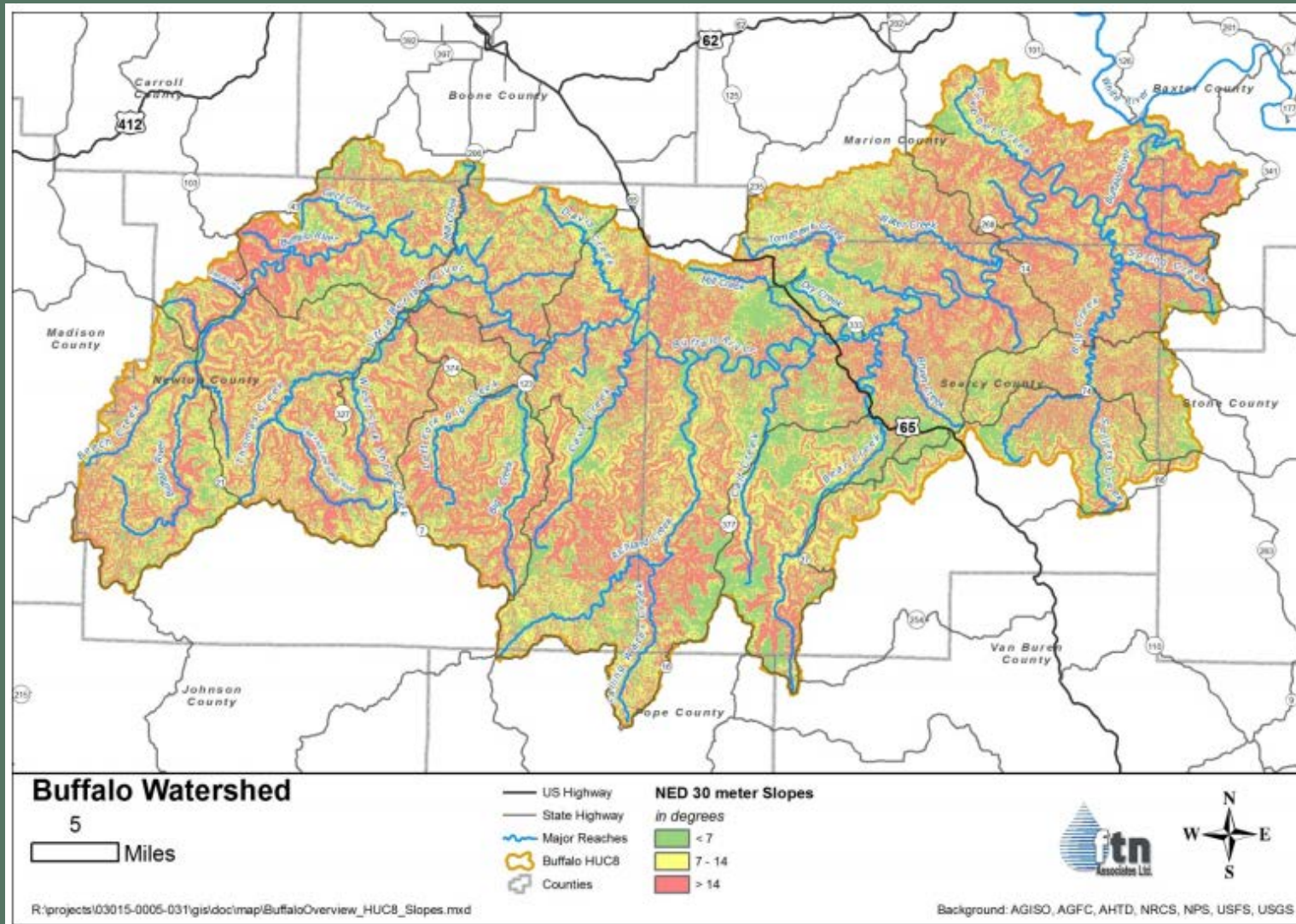
- Slopes of 14% or more are considered steep, while areas with slopes of 7% or less are considered flat lands.
- GIS analysis indicates that approximately 40% of the watershed has slopes steeper than 14%. The following table lists the proportion of the Buffalo River watershed considered flat lands, steep, and in between.
- The following figure shows a map of the locations of areas within the three slope ranges.

Slope areas in the Buffalo River Watershed

Slope ranges, degrees	Area within the watershed, Acres	Percent of watershed
<7%	220,509	25.7%
7-14%	289,259	33.8%
>14%	347,209	40.5%

BUFFALO RIVER WATERSHED TOPOGRAPHY

Map of slope ranges in the Buffalo River Watershed



BUFFALO RIVER WATERSHED TOPOGRAPHY

Each of the three physiographic regions in the watershed is characterized by differences in topography.

- Nineteen percent of the watershed is in the Salem Plateau physiographic region, where the characteristic terrain is gently rolling hills with local relief ranging from 50 to 100 feet.
- Forty-seven percent of the watershed is in the Springfield Plateau physiographic region. In this area of the watershed, elevations range from 1,000 to 1,700 feet above sea level and local relief is less than 200 to 300 feet.
- Thirty-four percent of the watershed is in the Boston Mountains physiographic region.
- This area of the watershed is characterized by rugged terrain with local relief of up to 1,000 feet.
- Elevations in this region of the watershed range from 1,200 to 2,576 feet above sea level.

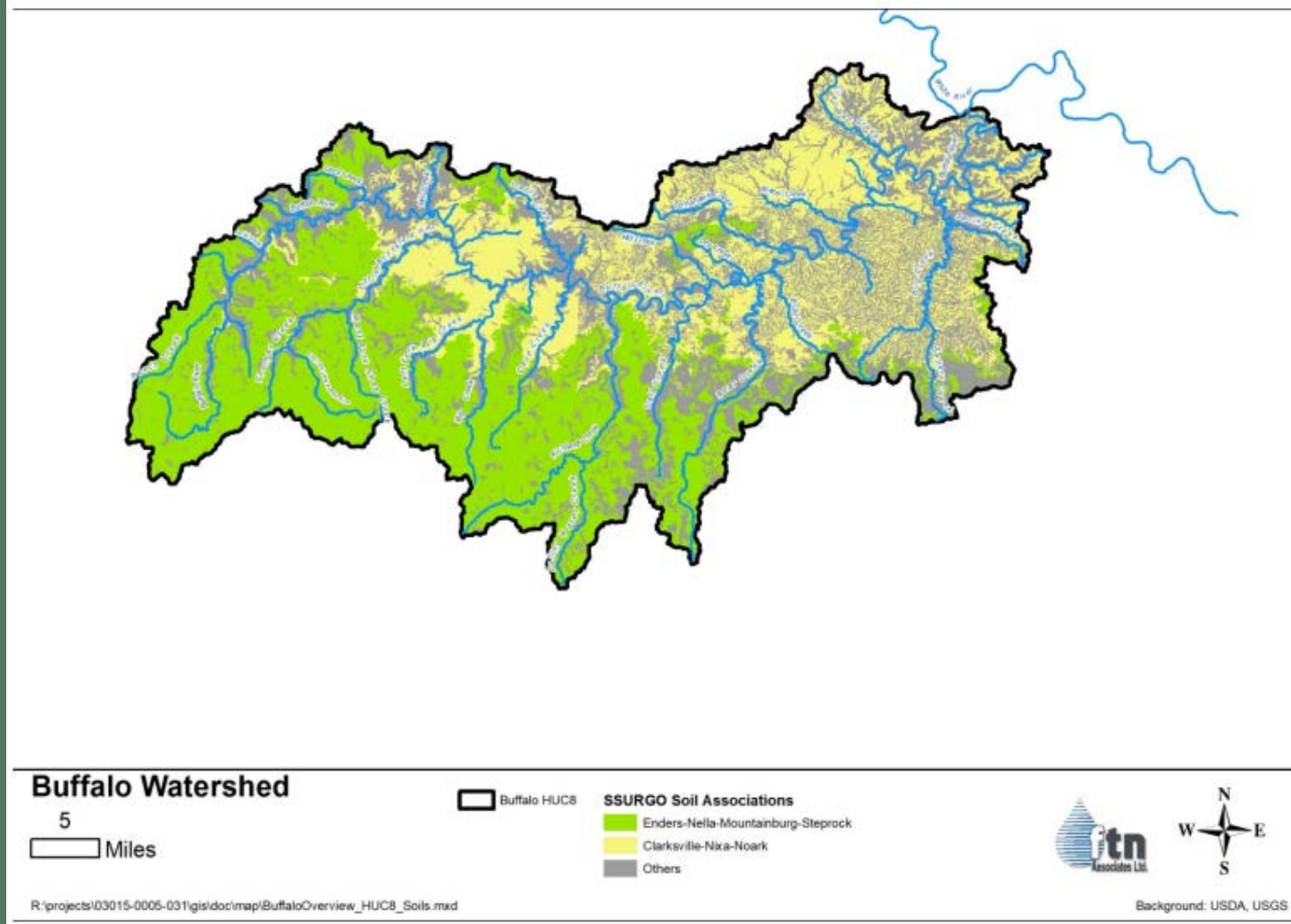
BUFFALO RIVER WATERSHED SOILS

Two soil associations account for 76% of the watershed soils; Enders-Nella-Mountainburg-Steprock in the Boston Mountains, and Clarksville-Nixa-Noark in the Springfield Plateau.

- However, the soil characteristics in the watershed are complex and diverse.
- Sixty-four dominant soil taxonomic units are present in the Buffalo River watershed, that include a total of 167 soil mapping units (Scott and Smith 1994).
- Most soils in the watershed include significant amounts of coarse fragments, primarily of chert.

BUFFALO RIVER WATERSHED SOILS

Over three-quarters of the soils in the Buffalo River Watershed are in two soil associations



BUFFALO RIVER WATERSHED LAND USE/LAND COVER

The majority of the land in the Buffalo River watershed, 80%, is forested.

- Pasture and haylands is the next most common land use in the watershed.
- The majority of the pasture and haylands in the watershed are located in the portion of the watershed downstream of the Searcy County line.

Approximately 60% of the pasture and haylands in the Buffalo River watershed is located on relatively flat land in river valleys and ridge tops.

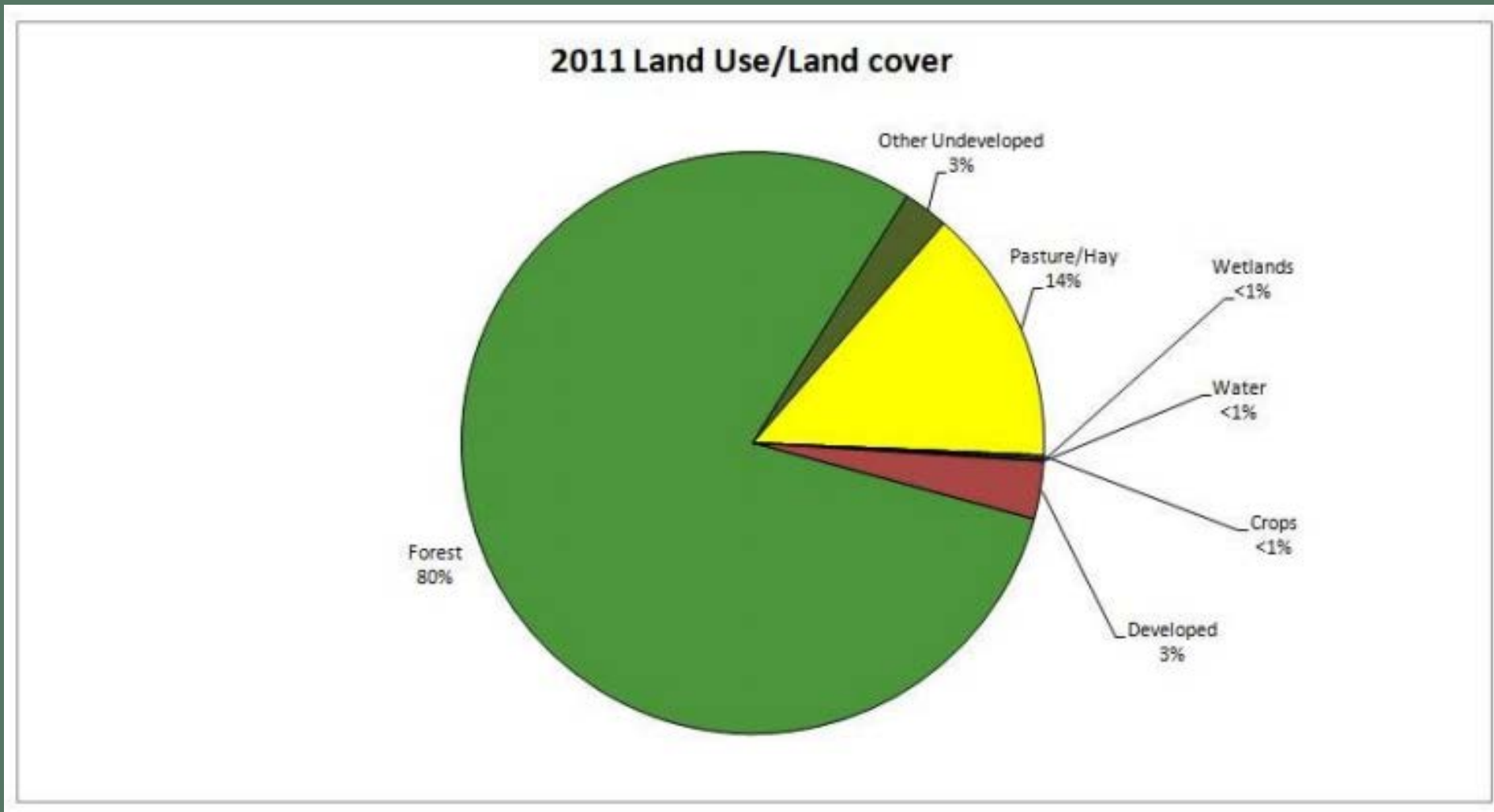
Approximately one-third of the Buffalo River watershed is public land, i.e., National Park, Wildlife Management Areas, or National Forest.

- The majority of the public land in the watershed is forested; however, the National Park also includes pasture and haylands.

There are also pasture and haylands on privately held lands within the boundaries of the Ozark National Forest.

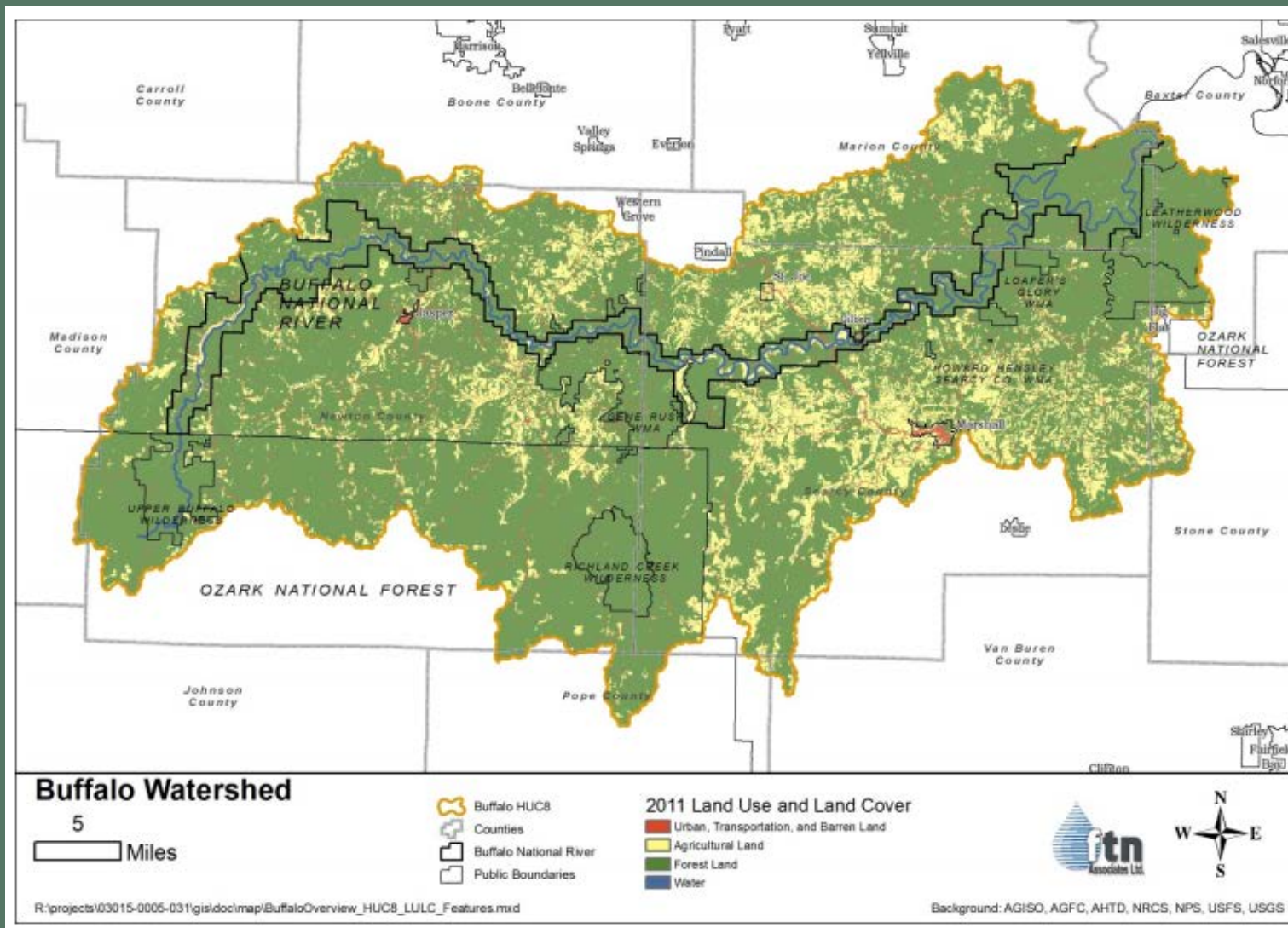
BUFFALO RIVER WATERSHED LAND USE/LAND COVER

Land use/land cover percentages for the Buffalo River Watershed



BUFFALO RIVER WATERSHED LAND USE/LAND COVER

Land use map of the Buffalo River Watershed



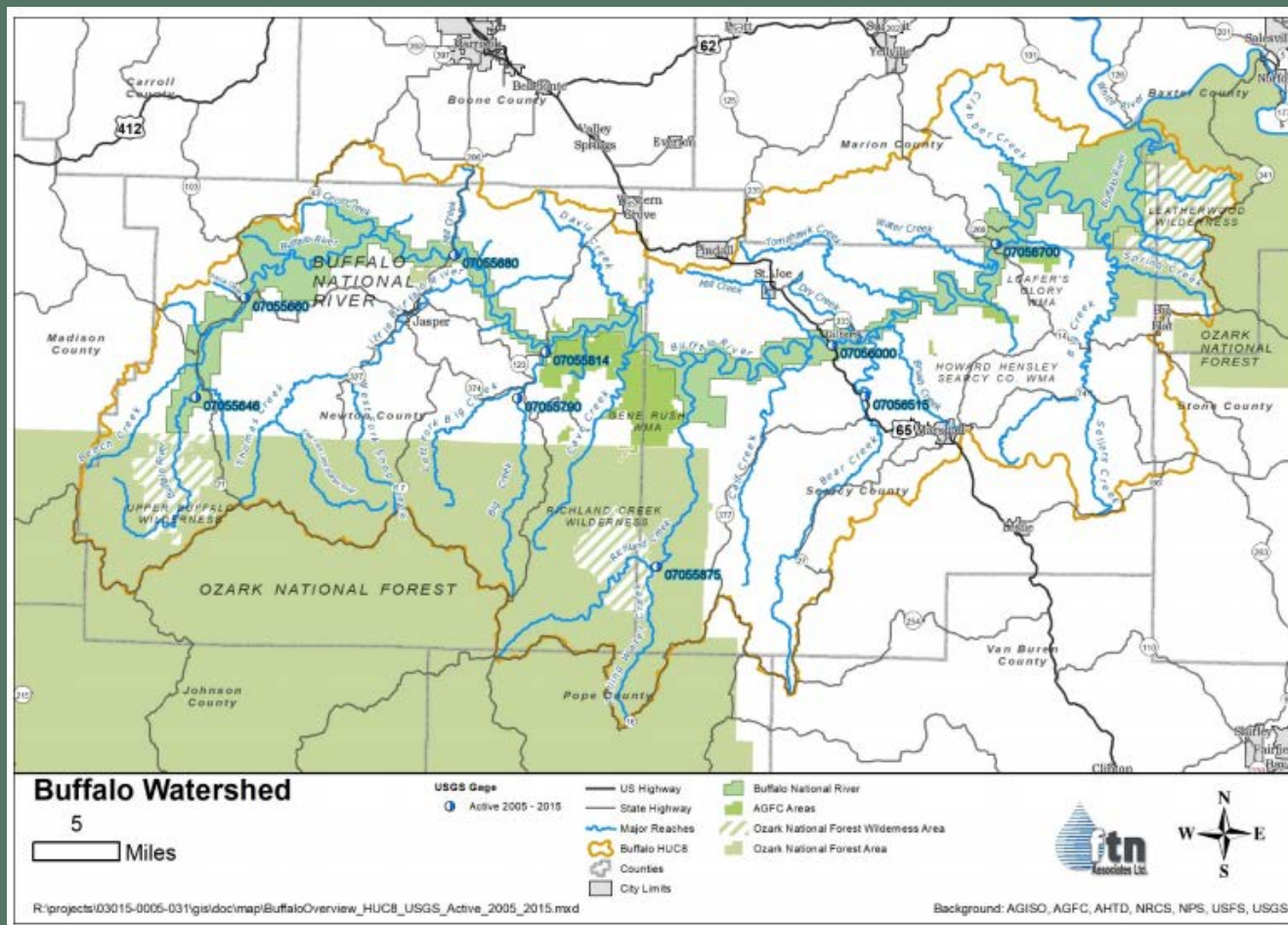
BUFFALO RIVER WATERSHED LAND USE/LAND COVER

Public lands in the Buffalo River Watershed

Land Holder	Percent of Watershed Held	Percent of Held Land Forested	Percent of Held Land in Pasture/Hay	Percent of Held Land in Other Undeveloped
National Park Service	11%	88%	5%	3%
National Forest Service	26%	92%	4%	1%
Arkansas Game and Fish Commission	3%	96%	<1%	1%

BUFFALO RIVER WATERSHED SURFACE WATER

There are over 2,000 miles of streams in the Buffalo River watershed.
There were nine active USGS flow gages in the Buffalo River Watershed in 2016.



BUFFALO RIVER WATERSHED SURFACE WATER

The following table lists summary statistics for flow measurements from these gages during the period January 2006 through December 2015.

- The farthest downstream USGS flow gage on the Buffalo River is at Harriet.
- Average annual flow at that gage over the period 2003-2015 (the period of record for which complete calendar years of approved data are available as of January 2016) ranges from 753.6 cubic feet per second (cfs) to 2,678 cfs (USGS 2017a).
- The largest tributary subbasin is the Little Buffalo River, which accounts for over 10% of the watershed.
- The downstream, or lower, Big Creek, and Richland Creek tributary subbasins each also account for approximately 10% of the Buffalo River watershed.

BUFFALO RIVER WATERSHED SURFACE WATER

Statistics for discharge data from USGS gages from 2006-2015

Site Number	Year Established	Site Name	Annual Average Discharge, cfs	Lowest Monthly Discharge, cfs	Highest Monthly Discharge, cfs	7Q10 Flow, cfs+	90% Exceeds Flow+	Peak Flow, cfs
07055646*	1993	Buffalo R near Boxley	108.1	0.116	1,166	0.0	0.879	27,700
07055660	2008	Buffalo R at Ponca	193.5	0.198	1,196	0.011	2.50	39,000
07055680	2008	Buffalo R at Pruitt	284.2	0.797	1,856	0.613	6.60	26,900
07055790	2014	Big Cr near Mt. Judea	Period of record too short	1.51	365.1	1.83	3.00	14,600
07055814	2015	Big Cr at Carver	Data prior to March 2016 not approved by USGS for statistics					
07055875*	1995	Richland Cr near Witts Spring	135.3	0.03	1,102	0.0	0.790	32,900
07056000*	1939	Buffalo R near St. Joe	1,217	16.4	9,115	7.43	43.0	134,000
07056515*	1999	Bear Cr near Silver Hill	124.6	0.887	1,037	0.479	5.50	33,700
07056700*	2002	Buffalo R near Harriet	1,512	44.7	12,010	28.3	66.0	161,000

*Daily flows available for entire period of 1/1/2006 – 12/31/2015

+These statistics are based on data from the entire period of record for each gage.

Previous Slides Source:

Buffalo River Watershed Management Plan

The final draft Buffalo River Watershed Management Plan (Plan) has been uploaded to the following website:

<https://www.adeq.state.ar.us/water/planning/integrated/303d/pdfs/2018/2018-05-22-final-buffalo-river-wmp.pdf>

The draft Plan will be available for stakeholder review until January 15, 2018, and subsequently submitted to EPA for acceptance. EPA “accepts” the plan as opposed to “approving” it because there are no proposed mandatory regulations in this plan. Following EPA acceptance, the watershed management plan will be available to guide implementation of management practices and activities within the Buffalo River watershed.

Please keep in mind that this is not a “formal regulatory comment process” because the Watershed Plan is not a “regulatory” document. The recommendations it contains are strictly voluntary.

The Arkansas Natural Resources Commission sincerely appreciates the citizens who attended the four meetings in Marshall and Jasper during the past 12 months and all the organizations and individuals who provided comments to help with the Plan’s development.

For more information, contact:

ANRC, (501) 682 3914; Tony Ramick, Tony.Ramick@arkansas.gov or
FTN Associates, (501) 225 7779; Terry Horton, twh@ftn-assoc.com

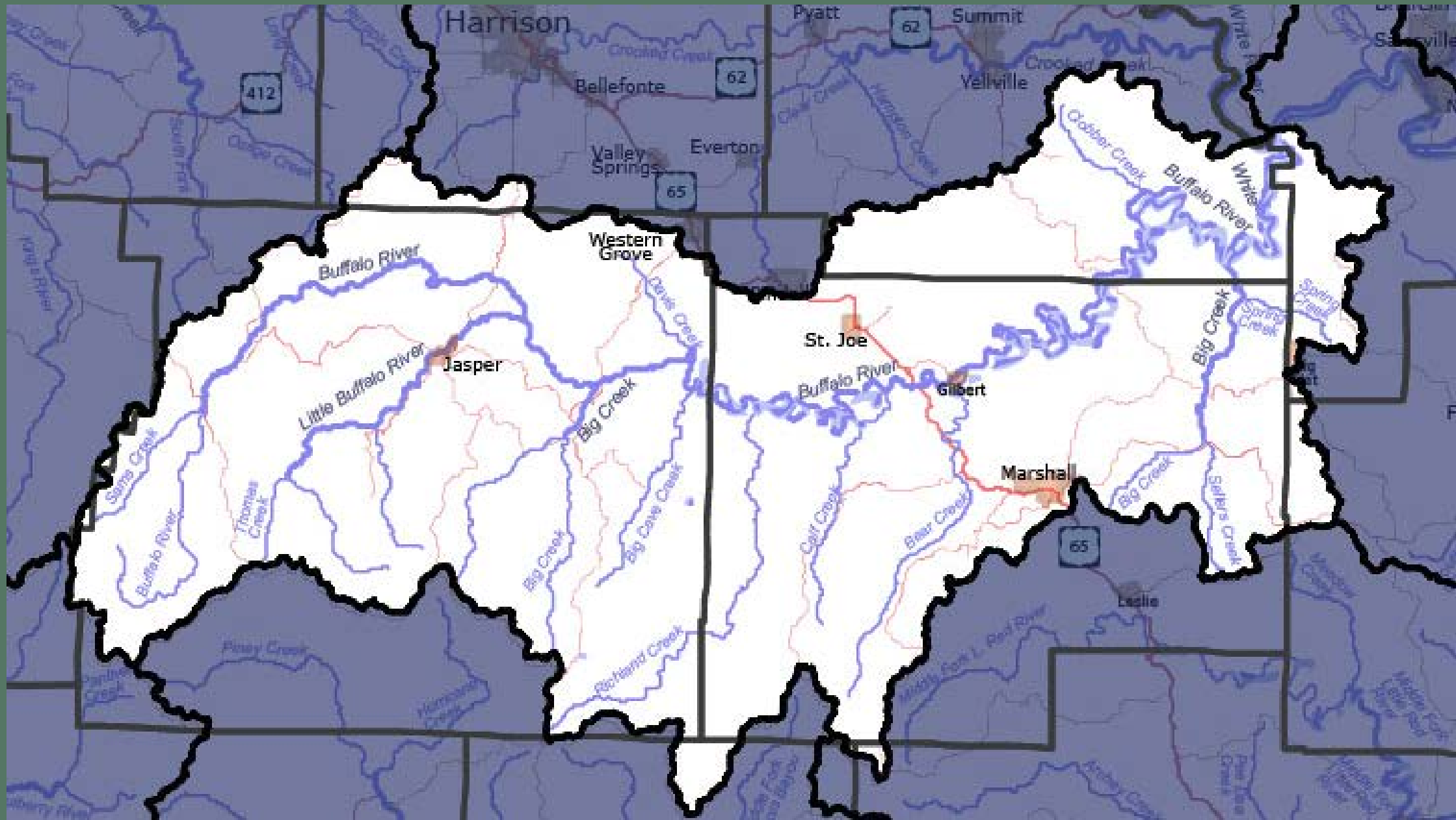
BUFFALO RIVER WATERSHED

Buffalo River Counties
(1,342.7 Square Miles)

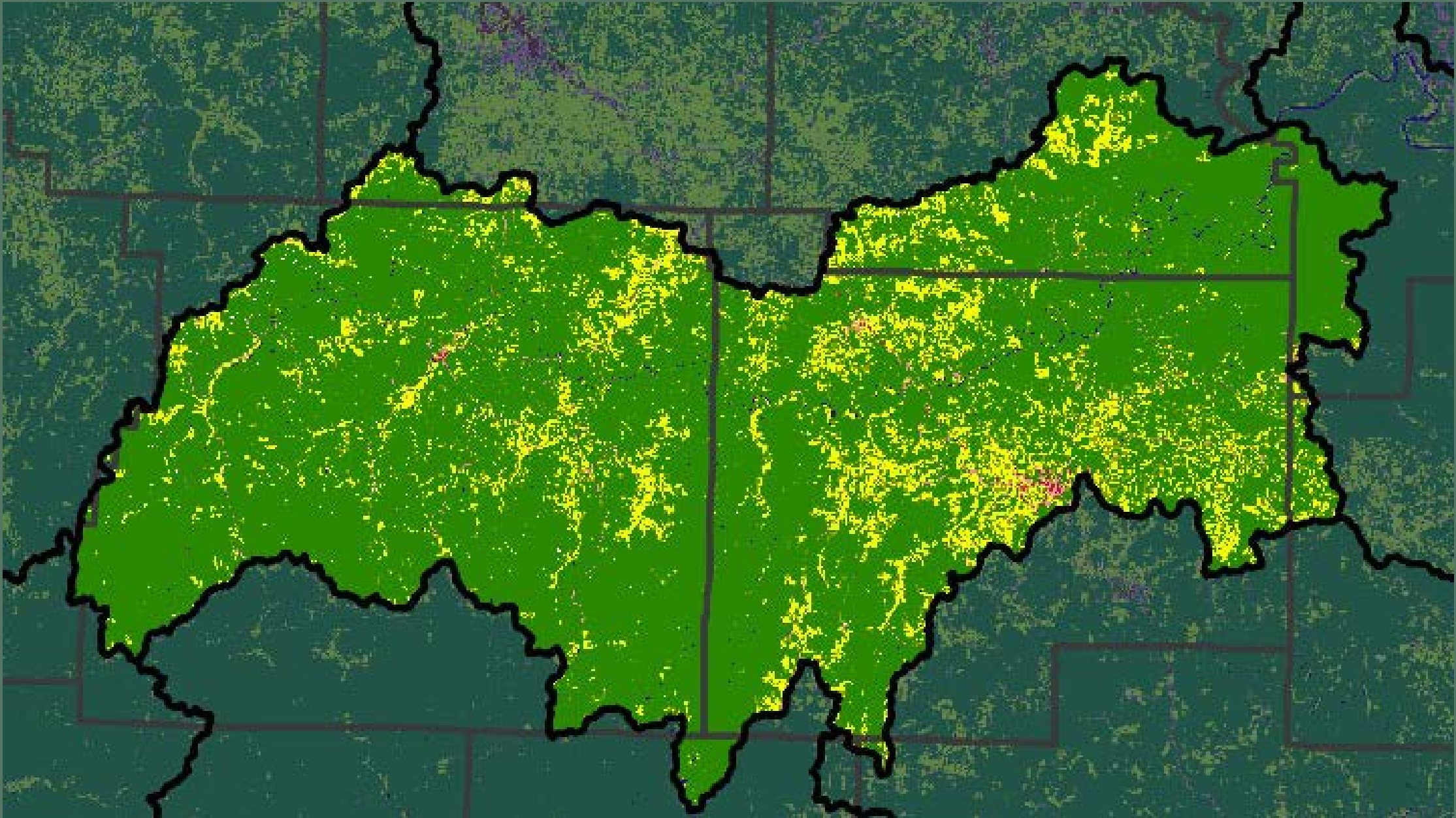
Baxter
Boone
Madison
Marion
Newton
Pope
Searcy
Stone
Van Buren



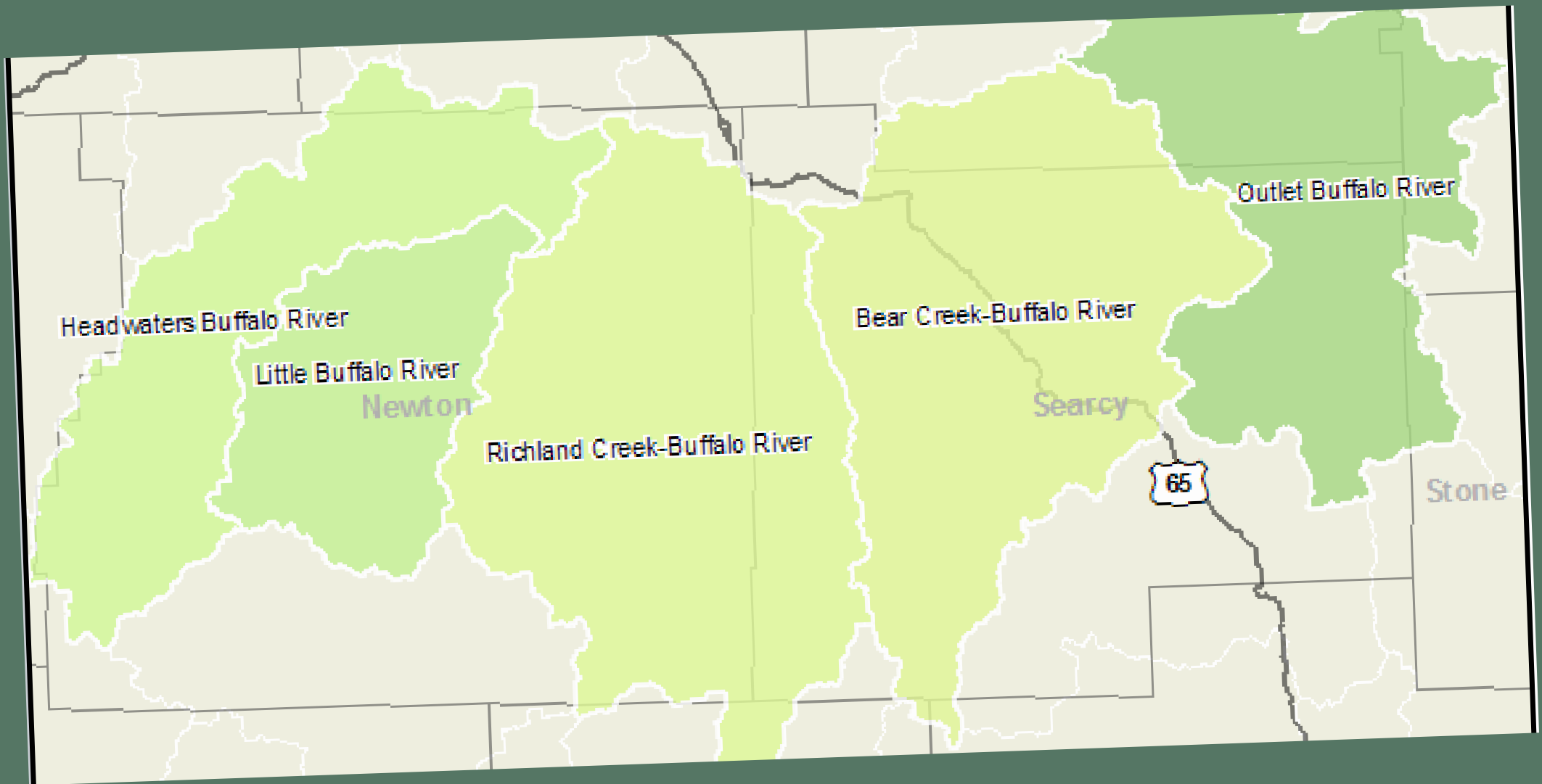
BUFFALO RIVER WATERSHED



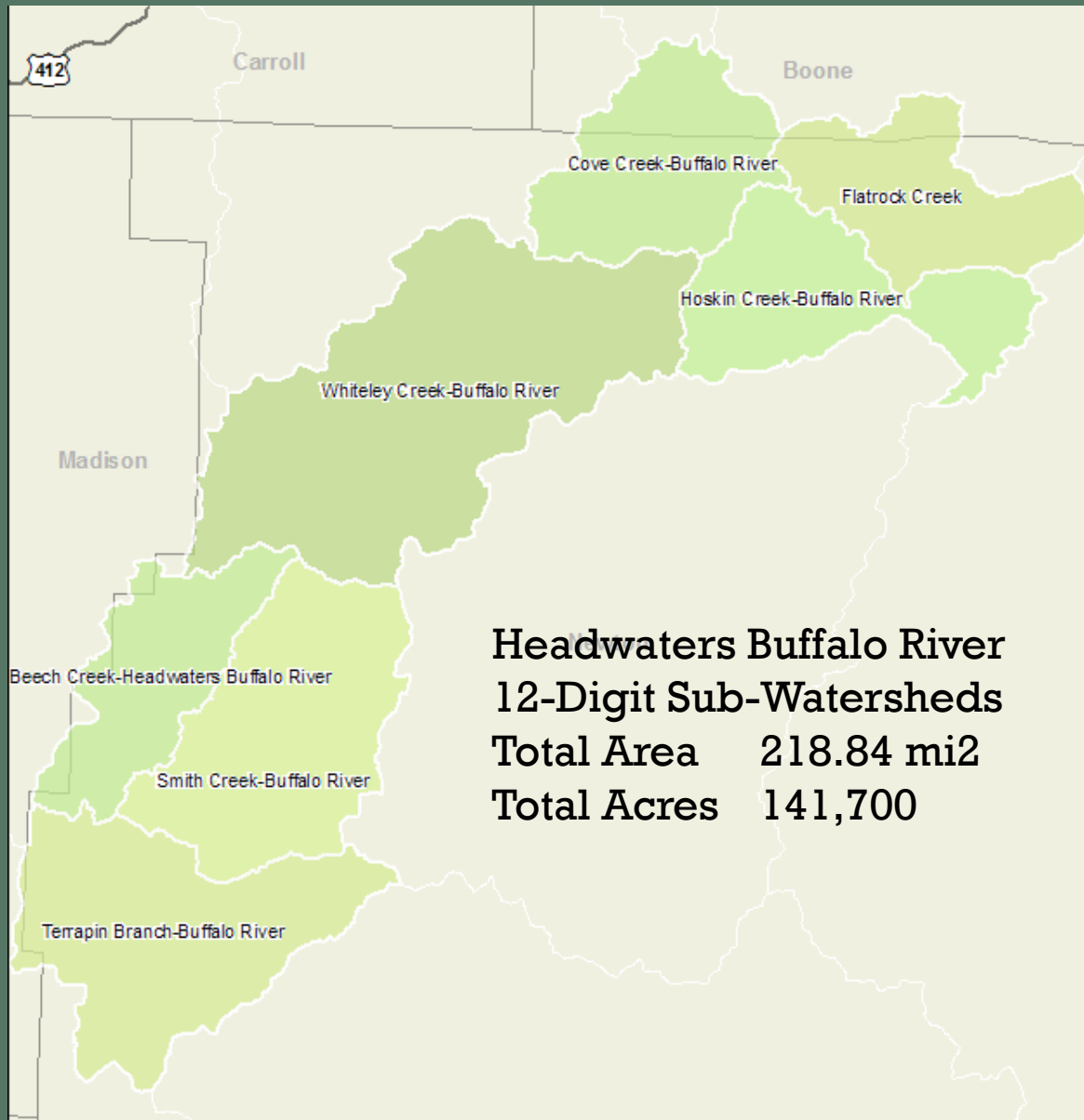
BUFFALO RIVER WATERSHED



BUFFALO RIVER WATERSHED 10-DIGIT SUB-WATERSHEDS



BUFFALO RIVER WATERSHED HEADWATERS BUFFALO RIVER, 10-DIGIT



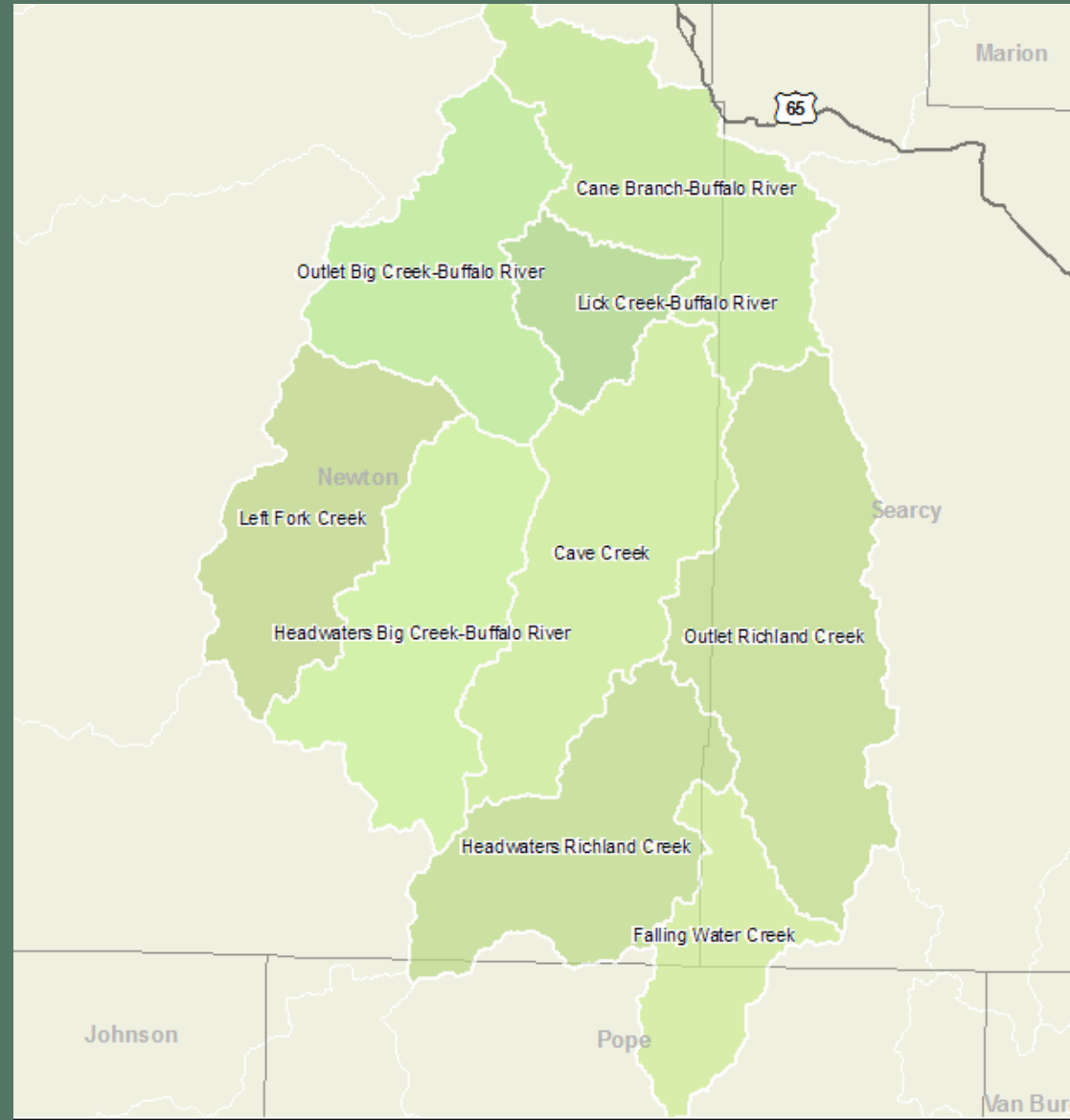
BUFFALO RIVER WATERSHED LITTLE BUFFALO RIVER, 10-DIGIT



Little Buffalo River
12-Digit Sub-Watersheds
Total Area 144.43 mi²
Total Acres 93,518

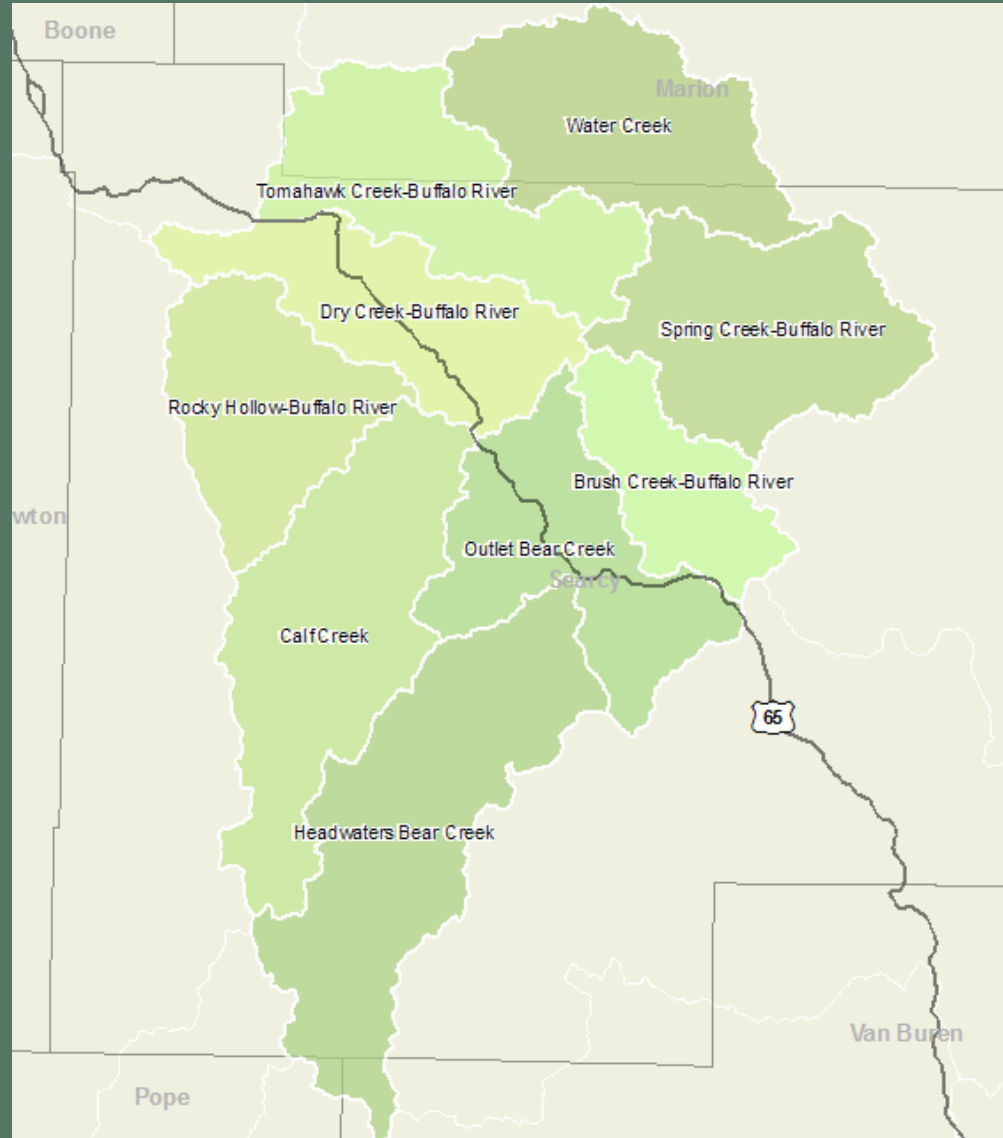
BUFFALO RIVER WATERSHED

RICHLAND CREEK-BUFFALO RIVER, 10-DIGIT



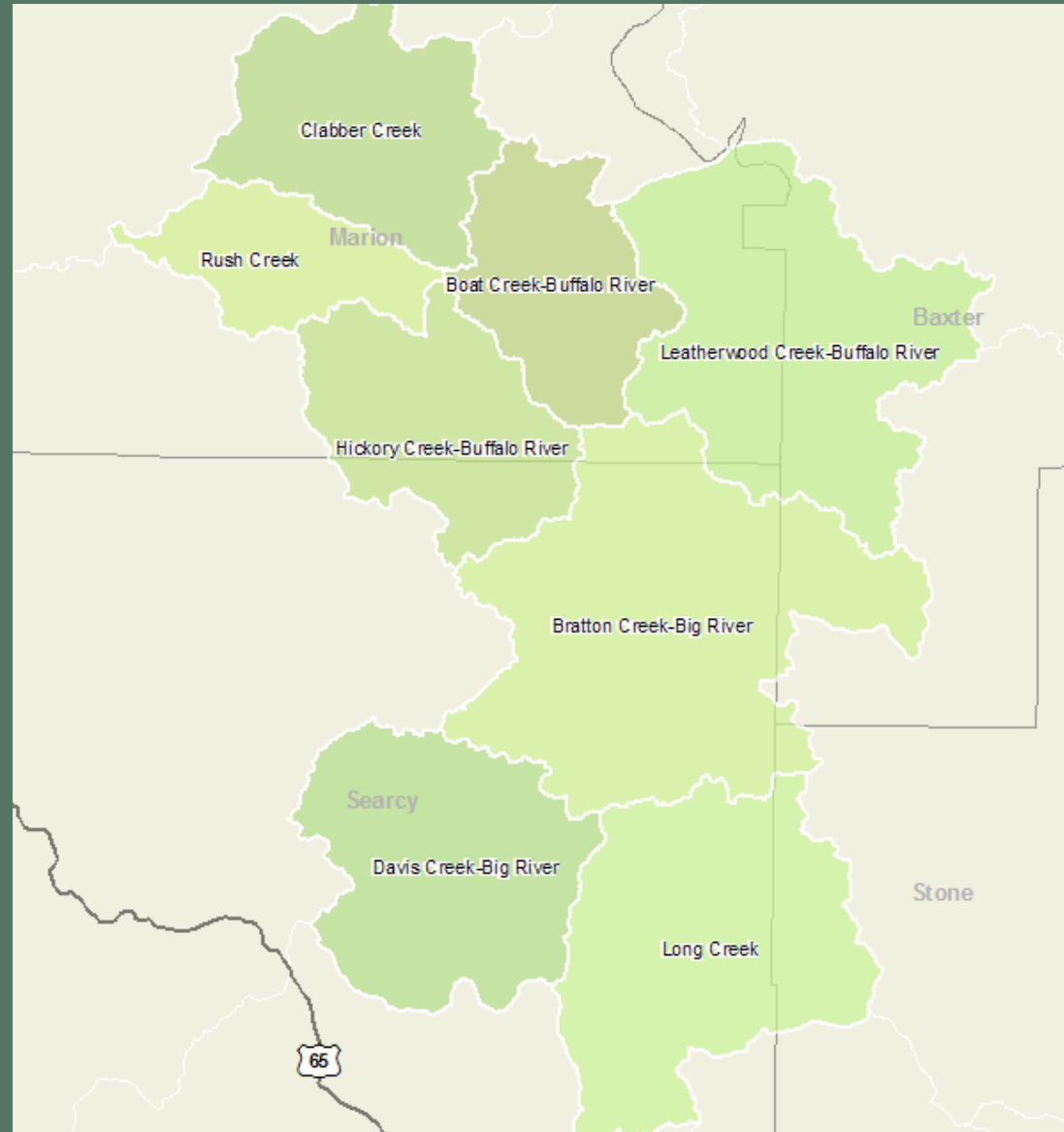
Richland Creek-Buffalo River
12-Digit Sub-Watersheds
Total Area 370.47 mi²
Total Acres 239,875

BUFFALO RIVER WATERSHED BEAR CREEK-BUFFALO RIVER, 10-DIGIT



Bear Creek-Buffalo River
12-Digit Sub-Watersheds
Total Area 338.75 mi²
Total Acres 219,337

BUFFALO RIVER WATERSHED BEAR CREEK-BUFFALO RIVER, 10-DIGIT



Outlet Buffalo River
12-Digit Sub-Watersheds
Total Area 270.23 mi²
Total Acres 174,969

***BUFFALO RIVER WATERSHED
BAXTER, BOONE, MADISON, MARION, NEWTON,
POPE, SEARCY, STONE, VAN BUREN***

Quick Facts from the Division of Agriculture

Approximate Land Area	3,962,297 acres
Average Size of Farms	acres
Number of Farms	6,832
Land in Farms	1,606,536 acres
Cropland Harvested	235,838 acres
Market Value Ag Products	\$815.5 Million

***BUFFALO RIVER WATERSHED
BAXTER, BOONE, MADISON, MARION, NEWTON,
POPE, SEARCY, STONE, VAN BUREN***

Agricultural Employment

Jobs

Farm, Forestry & Fish Production.....	5,540
Agricultural Services.....	1,306
Processing of Agriculture, Forestry & Fish Products.....	5,472
Agriculture – Direct (Total).....	12,319
All Industries (Total).....	112,350

Source: Computed from the Arkansas 2017 IMPLAN Database, IMPL^N.

***BUFFALO RIVER WATERSHED
BAXTER, BOONE, MADISON, MARION, NEWTON,
POPE, SEARCY, STONE, VAN BUREN***

Farm Revenue

In millions of dollars

All crops.....	\$	18.1
All livestock.....		720.5
Other farm income.....		40.9
Total farm revenue.....		779.5

Source: Information from 2017 REIS database, Bureau of Economic Analysis.

BUFFALO RIVER WATERSHED
BAXTER, BOONE, MADISON, MARION, NEWTON,
POPE, SEARCY, STONE, VAN BUREN

Agricultural Value Added

In millions of dollars

Farm, Forestry & Fish Production.....	\$	198.4
Agricultural Services.....		52.6
Processing of Agriculture, Forestry & Fish Products.....		387.8
Agriculture – Direct (Total).....		638.8
All industries (Total).....		7,326.2

Source: Computed from the Arkansas 2017 IMPLAN Database, IMPL^N.

Contribution to Gross State Product in green



BUFFALO RIVER WATERSHED

