

# The Buffalo River Watershed Management Plan

Prepared for

**The Beautiful Buffalo River Action Committee**

June 19, 2019



# The Buffalo River Watershed Management Plan

## Overview:

- The Buffalo River Watershed Management Plan is a **voluntary, non-regulatory, nonpoint source watershed management plan** consisting of nine elements. It does not include regulated facilities or encompass any management practices for regulated facilities.
- **Only one tributary (Bear Creek) is listed as impaired** (2016 ADEQ 303d list) for Total Dissolved Solids (TDS) due to the influence of a regulated (point source) municipal wastewater treatment plant (Marshall).
- Recommended subwatersheds for initial Best Management Practice (BMP) implementation include:
  - Mill Creek (upper)
  - Calf Creek
  - Bear Creek
  - Brush Creek
  - Tomahawk Creek
  - Big Creek (lower)

# The Buffalo River Watershed Management Plan

## Overview continued:

Recommended BMPs for 3 land uses; pasture, forest and ecotone (transition from land use type to another)

- **Pasture**

- Nutrient Management plans
- Livestock exclusion / controlled access
- Forest / non-forest riparian buffers
- Pasture planting / management
- Prescribed / rotational grazing
- Silvopasture establishment
- Ponds / sediment basins

- **Forest**

- Pre-harvest planning – skid trails, landings, seeding, revegetation and etc.
- Streamside management zones (SMZs)
- Roads – water bars, diversion ditches, grade control
- Prescribed burns
- Trail management

# The Buffalo River Watershed Management Plan

## Overview continued:

Recommended Management Practices for ecotone (transition from land use type to another)

- **Ecotones**
  - Streambank stabilization / restoration
  - Filter strips / native plants
  - Gamebird habitat restoration

## Additional needs:

- Karst sinkholes identification, debris clean-out and minimized surrounding pollutant sources
- Invasive or destructive species control
- Identification of failing individual sewage disposal systems

# The Buffalo River Watershed Management Plan

## Overview continued:

### WMP Benefits

- Implementing the practices in the BWMP can provide monetary and non-monetary **benefits to landowners, communities and society** at large through improved environmental services.
- There are a variety of government and non-government **programs** that can **provide technical and financial assistance** to stakeholders interested in implementing practices recommended in this plan
- Additional funding will increase the likelihood the **recommendations** in this plan will be **implemented**.

The BRWMP is a **living** and **adaptable tool** that is **stakeholder driven**

# **The Buffalo River Watershed Management Plan**

## **Nine Element Watershed Management Plan Development and the Process**

# **The Buffalo River Watershed Management Plan**

## **EPA's Nine Elements to be addressed in Watershed Management Plans (WMPs)**

1. Identification of the Water Quality Problem if applicable
2. Determine pollutant load reductions if applicable
3. Identify controls
4. Estimate cost of WMP implementation
5. Education and outreach components
6. Schedule of implementation to address non-point sources
7. Measurable milestones
8. Criteria to determine success, improvement or change
9. Water quality monitoring and WMP progress component

# **The Buffalo River Watershed Management Plan**

## **The Watershed Management Plan Development Process**

Focus:

- A. Build Partnerships
- B. Characterizing the watershed
- C. Finalizing management goals and identifying solutions
- D. Designing an implementation program
- E. Implementing the watershed based management plan
- F. Measuring progress

Items A – D are accomplished. Items E & F are dependent upon the stakeholders in the watershed.



# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

Meetings:

Meeting Date	Location	# in Attendance
December 08, 2016	Marshall, AR	130
March 30, 2017	Jasper, AR	65
June 08, 2017	Marshall, AR	40
October 12, 2017	Jasper, AR	30

# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

### A. Build Partnerships:

Stakeholders Participating in	the development of the WMP
Farmers	Environmental Interest groups
Ranchers	Landowners
NGO's	Business owners / operators
Conservation Districts	ADEQ
NRCS	ADH
USCOE	AFC
USFWS	AGFC
BRNPS	ADPT
	UACES

# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

### B. Characterizing the watershed:

- Population density
- Watershed uses (agriculture, urban, forest and recreation)
- Landownership (private, federal and state)
- Land use/land cover
  - Forest, pasture, urban and water
- Soil types and slopes
- **Water quality**
  - **Data, reports and studies 1985 – 2015** (sources NPS – BRNP, USGS and ADEQ)

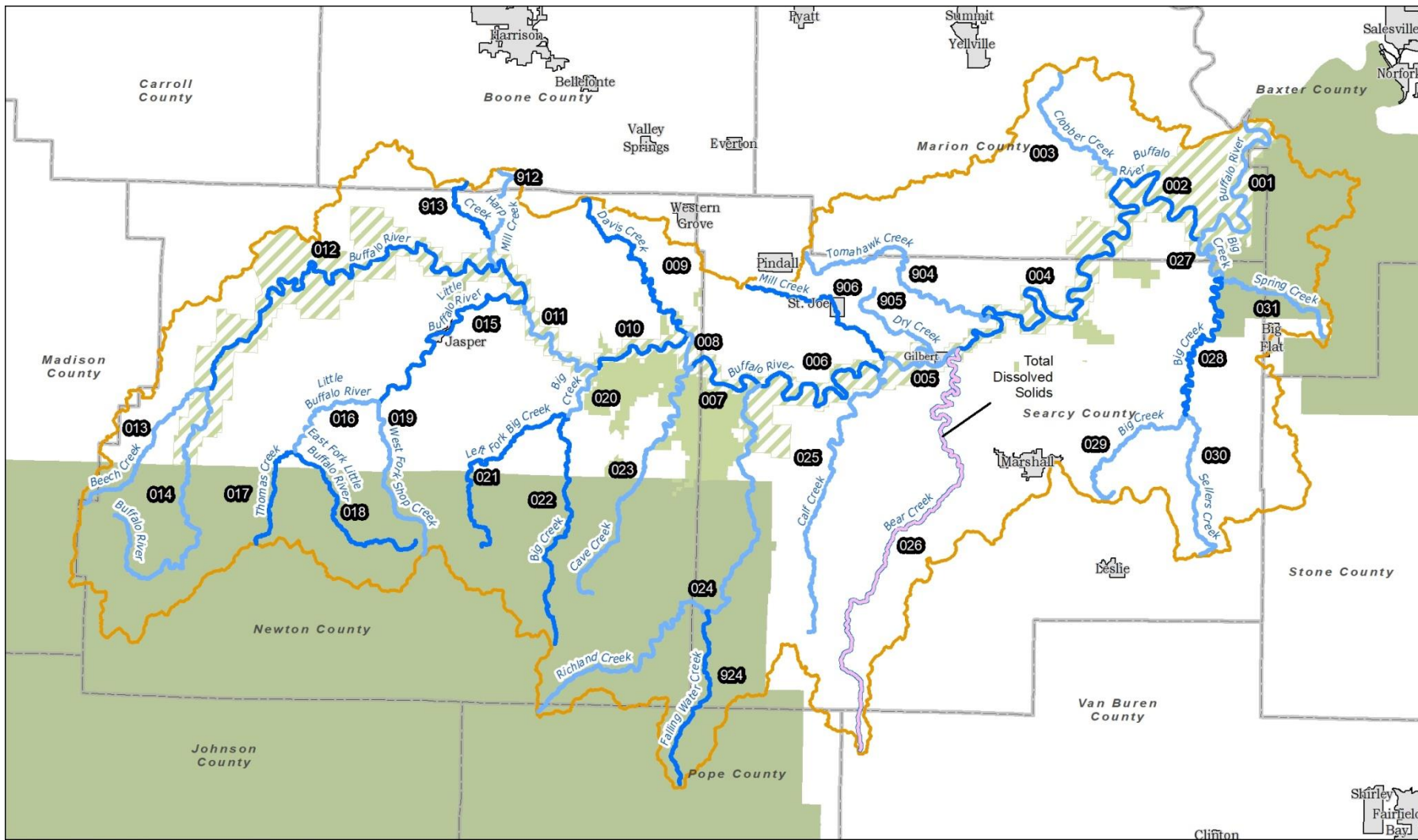
# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

### C. Finalizing Goals and identifying solutions:

- Through 2016 no stream or stream segments were impaired by nonpoint sources
- Historically and currently the water quality in the Buffalo River watershed and its tributaries are considered high quality water resources. The water quality as a whole of the Buffalo River watershed is of higher quality than any other watershed in Arkansas.
- Primary focus is to **maintain and enhance water quality** when applicable. Constituents to address include:
  - Inorganic Nitrogen
  - Bacteria
  - Phosphorus
  - Turbidity/sediment

# 2016 303(d) List of Impaired Waters



## Buffalo Watershed

5  
Miles

-  Buffalo HUC8
-  Counties
-  City Limits
-  AGFC Areas
-  Buffalo National River
-  Ozark National Forest Area
-  ADEQ Reach Number
-  Impaired Streams
-  Nonimpaired Streams



# The Buffalo River Watershed Management Plan

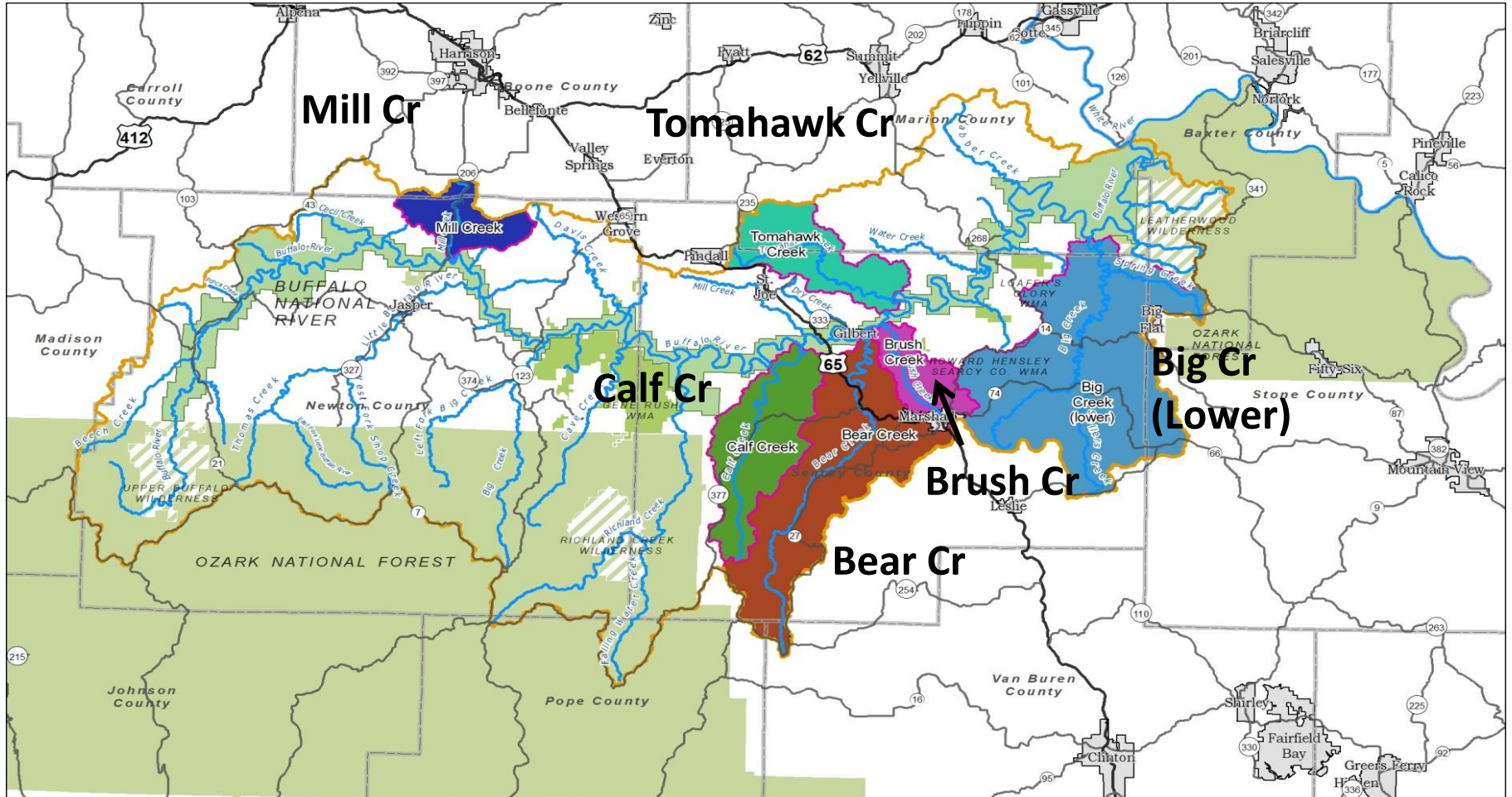
## The Watershed Management Plan Development Process

- Recommended subwatersheds for initial Best Management Practice implementation include:
  - Mill Creek (upper)
  - Calf Creek
  - Bear Creek
  - Brush Creek
  - Tomahawk Creek
  - Big Creek (lower)

**Subwatershed recommendations based on selected water quality concentrations, loads, and long term trends; biological condition indices; NRCS natural resources concerns; and the presence of karst/carbonate bedrock**

(data sources – ADEQ, USGS and National Park Service)

# Recommended Subwatersheds for Implementation



## Buffalo Watershed

5

Miles

### Recommended Watersheds

Varied Colors

- US Highway
- State Highway
- Major Reaches
- Buffalo HUC8
- Counties

- City Limits
- Buffalo National River
- AGFC Areas
- Ozark National Forest Wilderness Area
- Ozark National Forest Area



# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

D. Designing an Implementation Plan to address the following:

Strategy	Inorganic Nitrogen	Bacteria	Phosphorus	Turbidity / Sediment
<b>Pasture and hay land Management Practices</b>				
Nutrient Management Plans	X	X	X	
Riparian Buffers	X	X	X	X
Pond / sediment basins	X	X	X	X
Livestock access control	X	X	X	X
Prescribed / rotational grazing	X	X	X	X
Silvopasture establishment	X	X	X	X
Pasture planting and management	X	X	X	X



# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

D. Designing an Implementation Plan to address the following:

Strategy	Inorganic Nitrogen	Bacteria	Phosphorus	Turbidity / Sediment
<b>Forest Management Practices</b>				
Prescribed Burns				
Forestry BMP			X	X
Pond / sediment basins			X	X
Trail Management practices			X	X
<b>Ecotone Management Practices</b>				
Streambank stabilization / restoration	X	X	X	X
Filter strips / native plants	X	X	X	X
Game bird habitat restoration	X	X	X	X

# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

D. Designing an Implementation Plan to address the following:

Strategy	Inorganic Nitrogen	Bacteria	Phosphorus	Turbidity / Sediment
<b>Management Practices for Multiple Land Uses</b>				
Unpaved Road environmentally sensitive maintenance			X	X
On-site wastewater system management	X	X	X	X
Control of invasive and destructive species (e.g. feral hogs)	X	X	X	X
Karst protection practices	X	X	X	X

# The Buffalo River Watershed Management Plan

## The Watershed Management Plan Development Process

D. Designing an Implementation Plan to address the following:

### NO<sub>3</sub> Estimated Reduction/Cost (\$K)\*

Practice	Mill Cr (40%**)	Calf Cr (32%)	Bear Cr (68%)	Tomahawk (41%)	Brush Cr (33%)	Big Cr (L) (70%)
Stream exclusion	40%***/ \$150****	32%/ \$810	42%/ \$1,700	41%/ \$520	33%/ \$200	53%/ \$1,800
Forested buffer	40%/ \$90	32%/ \$490	49%/ \$1,200	41%/ \$320	33%/ \$120	49%/ \$1,300
Non-forest buffer	34%/ \$22	32%/ \$140	34%/ \$240	36%/ \$75	33%/ \$35	49%/ \$250
Pasture planting/Mgt	40%/ \$820	32%/ \$1,600	46%/ \$2,000	41%/ \$1,600	33%/ \$550	41%/ \$5,000
Prescribed grazing	14%/ \$260	14%/ \$640	14%/ \$550	14%/ \$500	14%/ \$210	14%/ \$1,400

\* Independent BMP implementation (not suites of practices)

\*\* Estimated reduction needed

\*\*\* Potential reduction that could be achieved

\*\*\*\* Cost based on 2016 EQIP cost allocations and can cover approximately 75% of total cost

# The Buffalo River Watershed Management Plan

Other recommendations in the BRWMP:

- Additional WQ monitoring (two are currently being implemented)
  - National Park Service is doing continuous DO at selected sites
  - ADEQ has added TSS to their sample analysis
  - Implementation of a Trash Index
- Formation of watershed and subwatershed “teams”
  - AGFC Stream teams
  - Implementation teams capturing activities relative to the WMP
- Continued outreach and education to stakeholders with the watershed
  - Landowner to landowner interaction
  - NRCS programs and initiatives
  - Watershed groups and NGO’s

# The Buffalo River Watershed Management Plan

## Conclusion:

- The BRWMP is a **living** and **adaptable tool** that is **stakeholder driven**
- Implementing the practices in this plan can provide monetary and non-monetary **benefits to landowners, communities and society** at large through improved environmental services.
- There are a variety of government and non-government **programs** that can **provide technical and financial assistance** to stakeholders interested in implementing practices recommended in this plan
- Additional funding will increase the likelihood the **recommendations** in this plan will be **implemented**.
- BRWMP was fully **accepted by EPA** June 05, 2018 meeting all the required nine-elements

# The Buffalo River Watershed Management Plan

## ???? Questions ????



Tony Ramick  
Fiscal/Program Manager  
Nonpoint Source Management Program  
Arkansas Natural Resources Commission  
101 East Capitol, Suite 350  
Little Rock, AR 72201

(501) 682-3914  
[Tony.ramick@arkansas.gov](mailto:Tony.ramick@arkansas.gov)