



# Watershed Protection – How it is Being Approached by the Beaver Watershed Alliance

Clell Ford, Executive Director

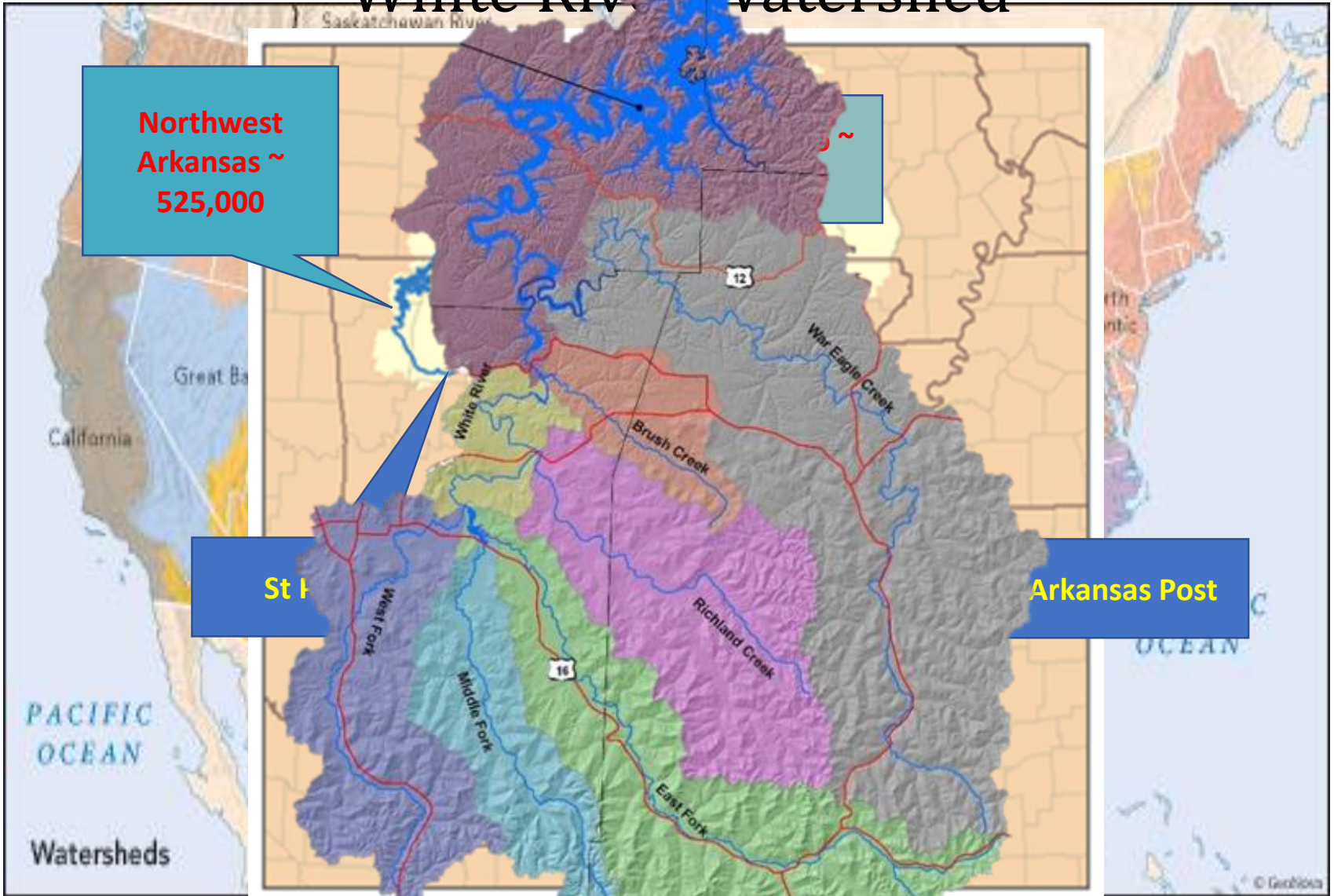
October 6, 2019

[www.beaverwatershedalliance.org](http://www.beaverwatershedalliance.org)



**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

# White River Watershed



Northwest  
Arkansas ~  
525,000

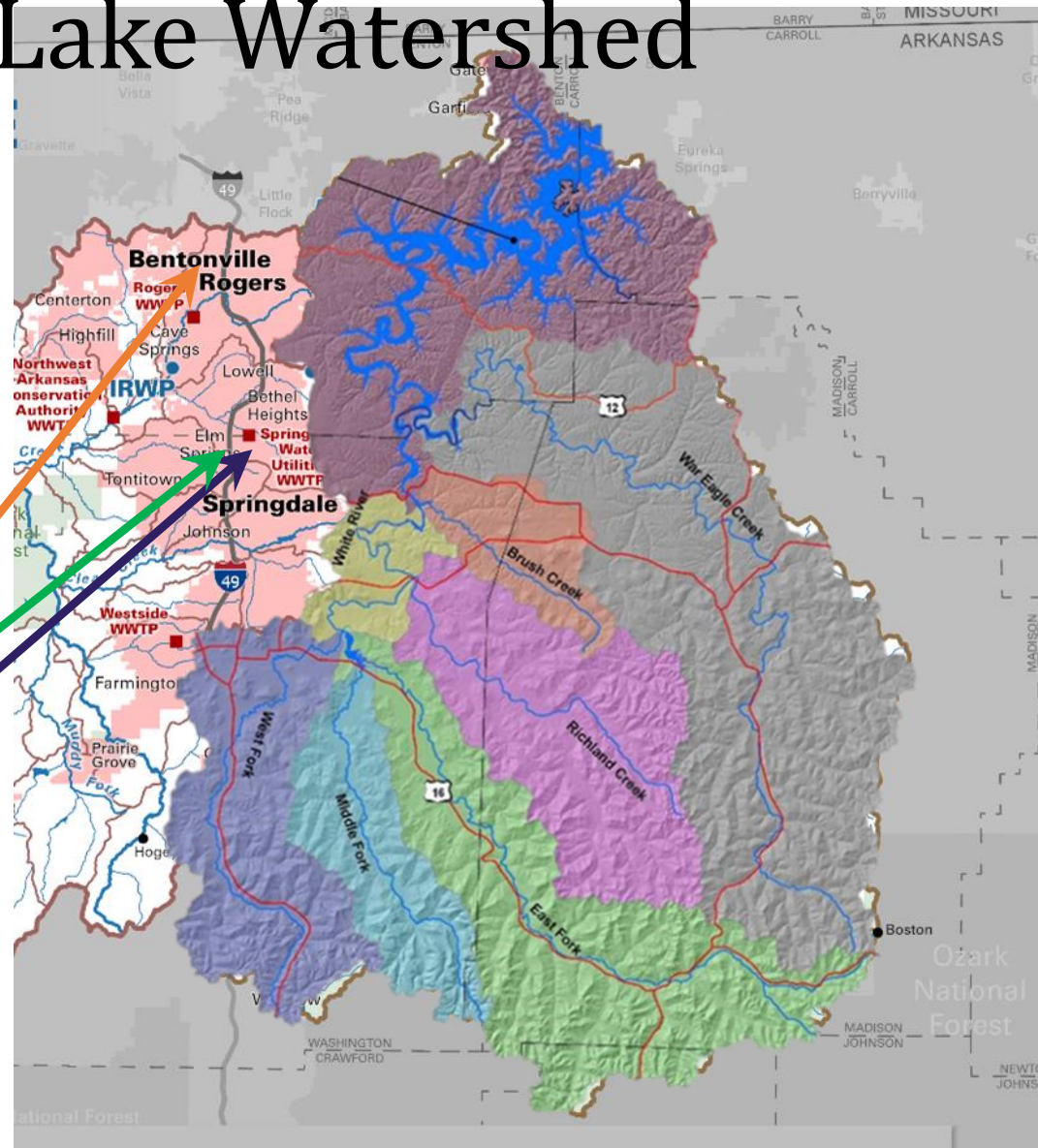
St I

Arkansas Post

**MISSION:** Proactively protect, enhance and improve water quality in Beaver Lake and the integrity of its watershed

# Beaver Lake Watershed

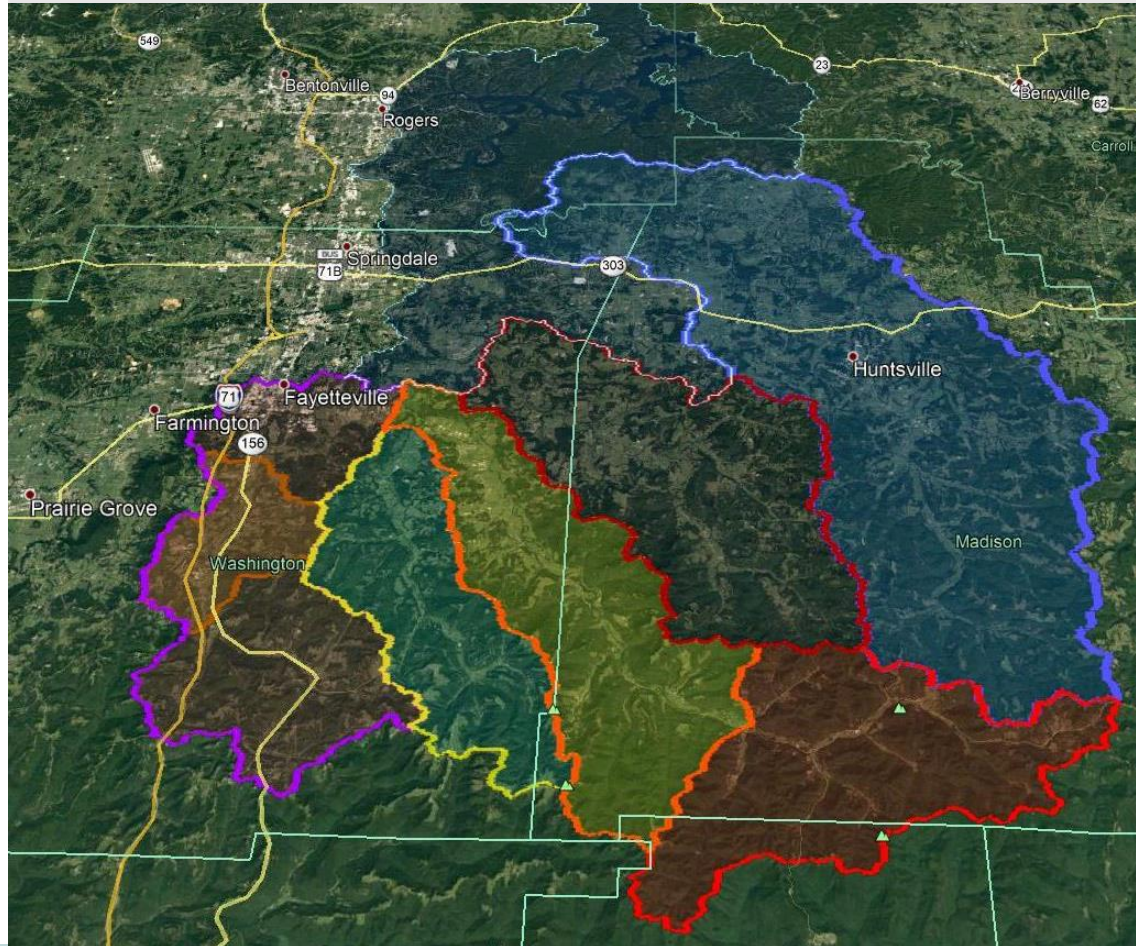
- Boston Mountain and Ozark Highlands
- 1195 square miles
- 31,700 acre Corps Lake impounded in 1965
- Authorized for
  - Flood Control
  - Power Generation
  - Water Supply
- Water supply:
  - 1 in 6 Arkansans
  - Most industries in Northwest Arkansas rely on the lake
  - Mossback
  - WalMart
  - Tyson



*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

# Beaver Watershed Alliance – 501(c)3 non-profit:

**MISSION: Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed**



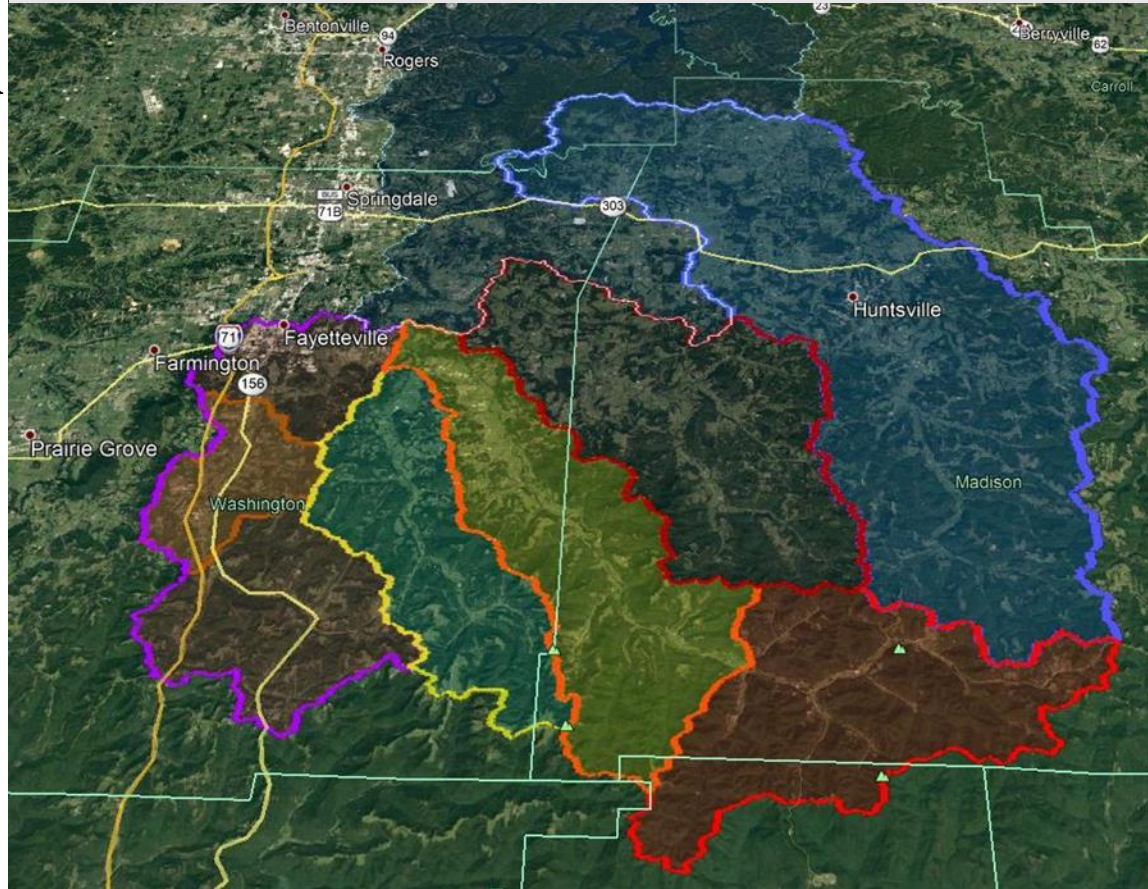
**MISSION: Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed**

# Beaver Watershed Alliance – 501(c)3 non-profit:

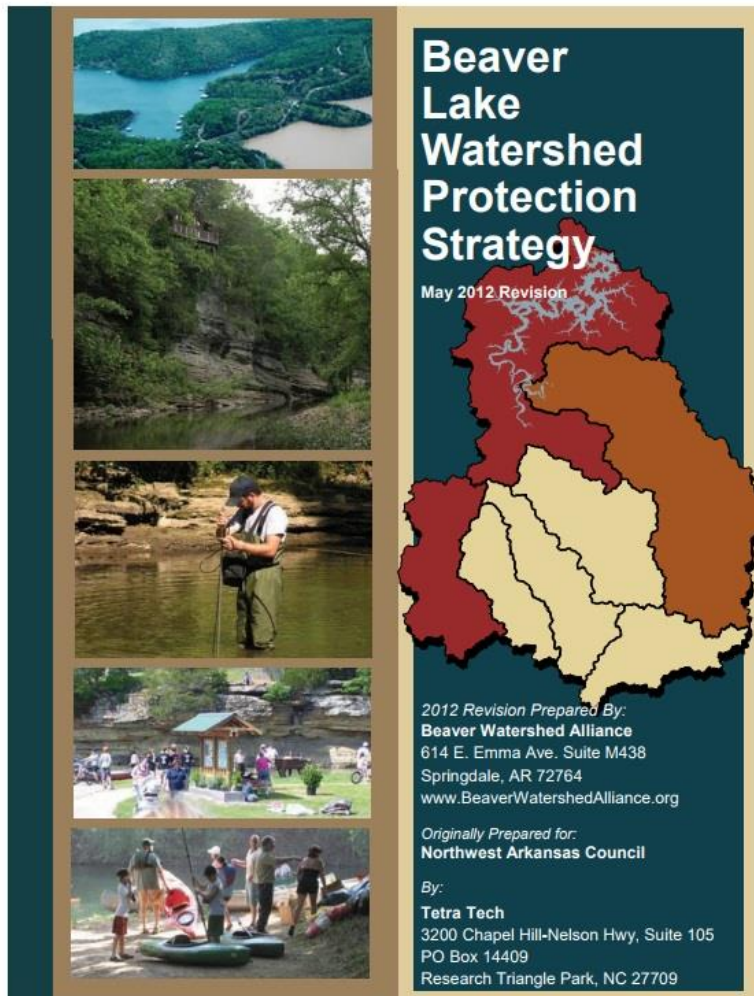
Principal Focus: Reduce pollutant transport to Beaver Lake – Source Water Protection

- Work with cooperative partners using grants and agreements for services:
- Unpaved roads
- Green infrastructure
- Stream bank restoration
- Expansion of native plant material for restoration projects
- Healthy forest management
- Habitat restoration

**MISSION: Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed**



**MISSION: Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed**



2009: Effort initiated by the Northwest Arkansas Council to proactively address the potential for problems and protect water quality

### Three overarching goals:

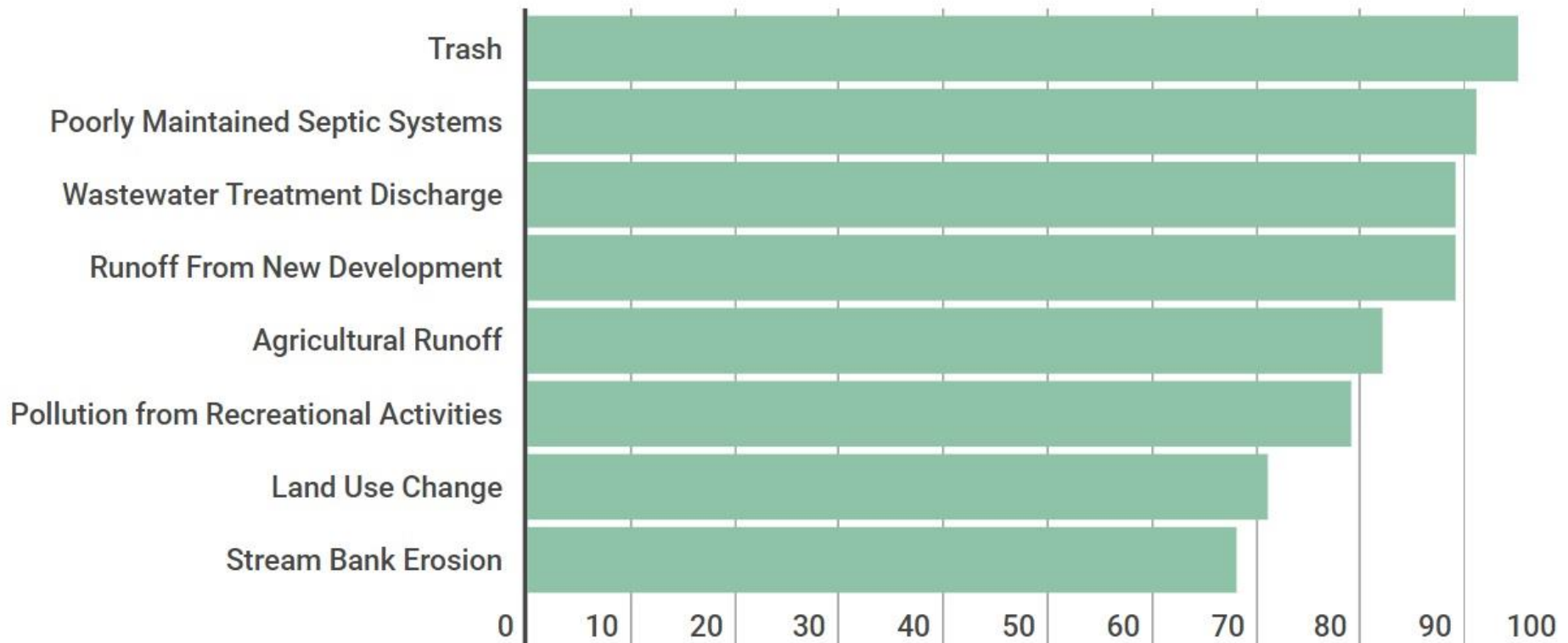
1. Maintain a long-term, high-quality drinking water supply for present and future needs
2. Restore water quality of impaired stream and lake areas
3. Minimize additional costs and regulations for people living and working in the watershed.

**2020 Update In Progress**

**The Beaver Lake Watershed Protection Strategy is the first modern, 9-element management plan accepted by the U.S. EPA in Arkansas.**

*MISSION: Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed*

# November 2017 Survey of Benton, Madison and Washington Counties



\*400 residents polled in the Beaver Lake watershed area.

**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

# Beaver Lake Impairments



## Southern Appalachians

**Siltation/Turbidity**

**Excessive Nutrients  
(algae blooms)**

**Excessive  
mudflats/shalowness  
(little deep water  
refuge)**

**Limited littoral  
structure (lack of woody  
structure and  
vegetation, shoreline  
erosion)**

*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed



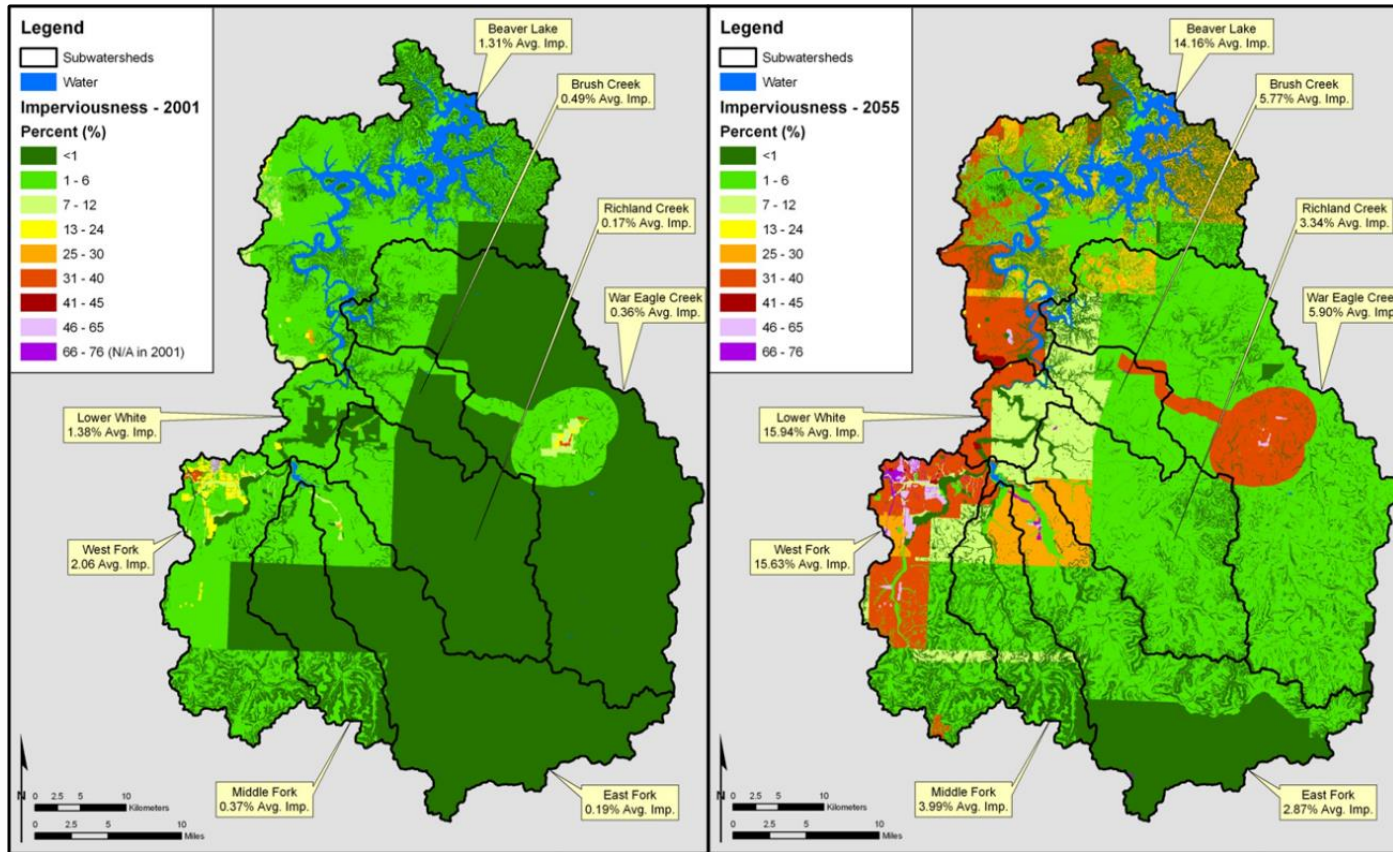
This is what gets removed from lake water by  
Beaver Water District – and the other water  
providers on the lake.

Every Day -  
1 ton of sediment  
= ~ 1 pound Phosphorus



*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake  
and the integrity of its watershed

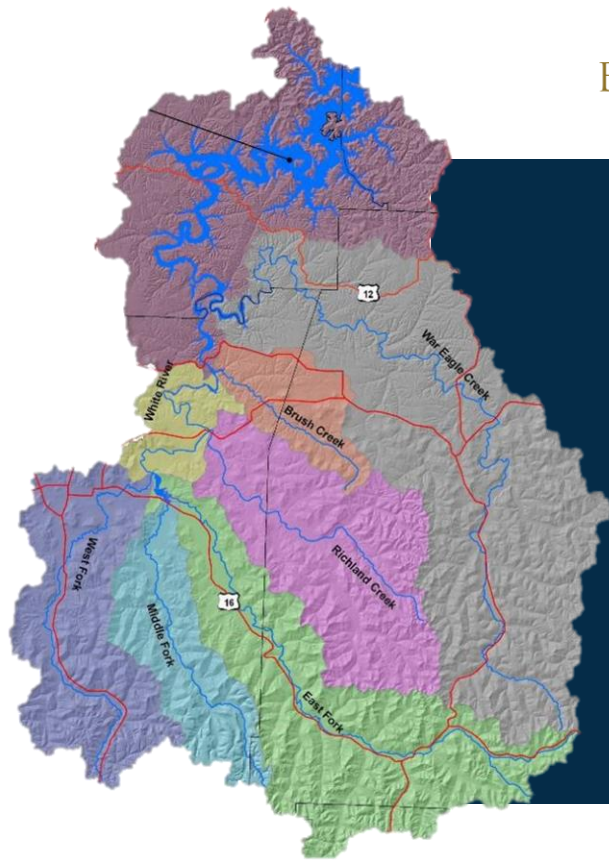
# Current (2006) vs Future (2055) Imperviousness



Watershed wide:

- Forest decreases from 70% to 60%
- Pasture decreases from 21% to 15%
- Low density development (<35% impervious) increases from 2% to 18%

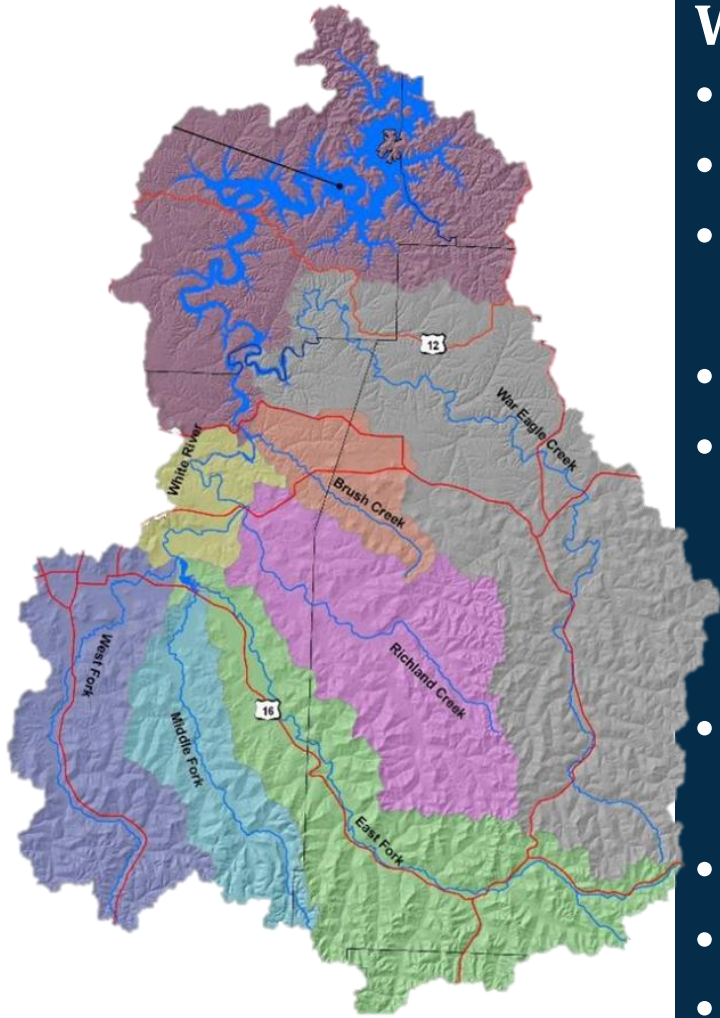
**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed



**Watershed Approach**  
**Voluntary Participation**  
**Best Management Practices (BMP)**  
**Scientific Investigation**  
**Adaptive Management**

*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

# Watershed Challenges and Opportunities



## Watershed Approach

- Source Water Protection:
- Streambank restoration
- Install Low Impact Development Features
- Headwater Pond Optimization Project
- Native Plant Material to support environmental restoration projects
- SRF to grants to Source Water Protection projects for small communities
- Habitat Restoration for Endangered Species
- Low Water Crossing Removal
- Lakeshore restoration
- Pasture Renovation / Aeration

*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

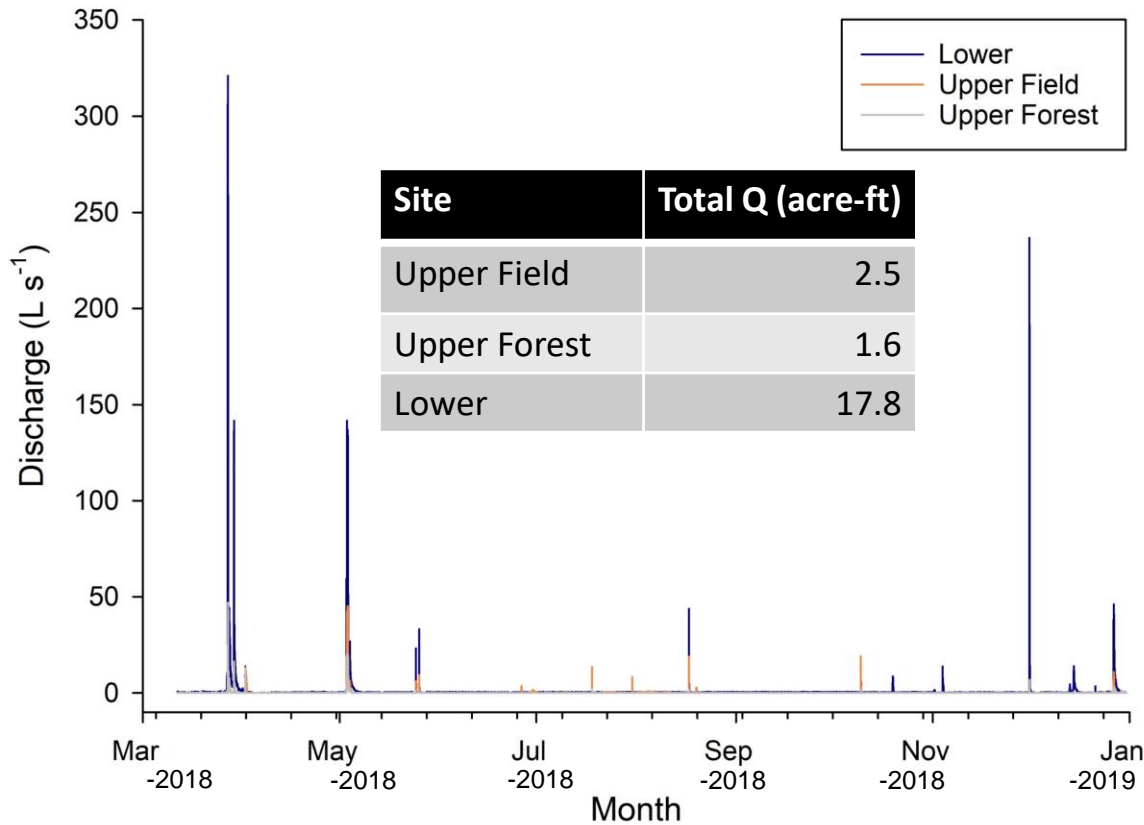


*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed



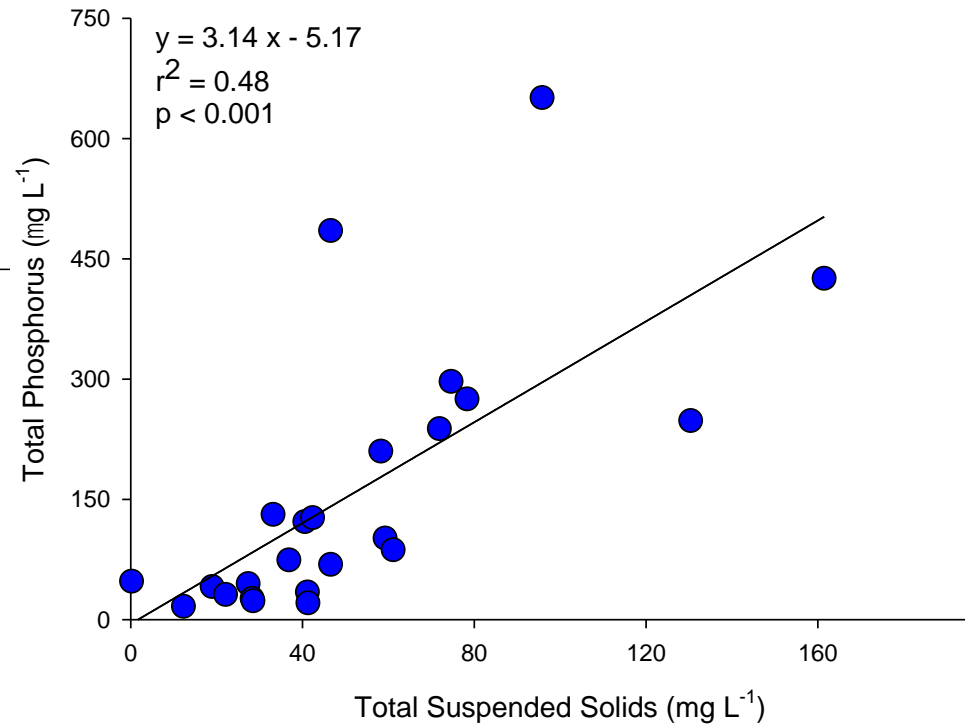
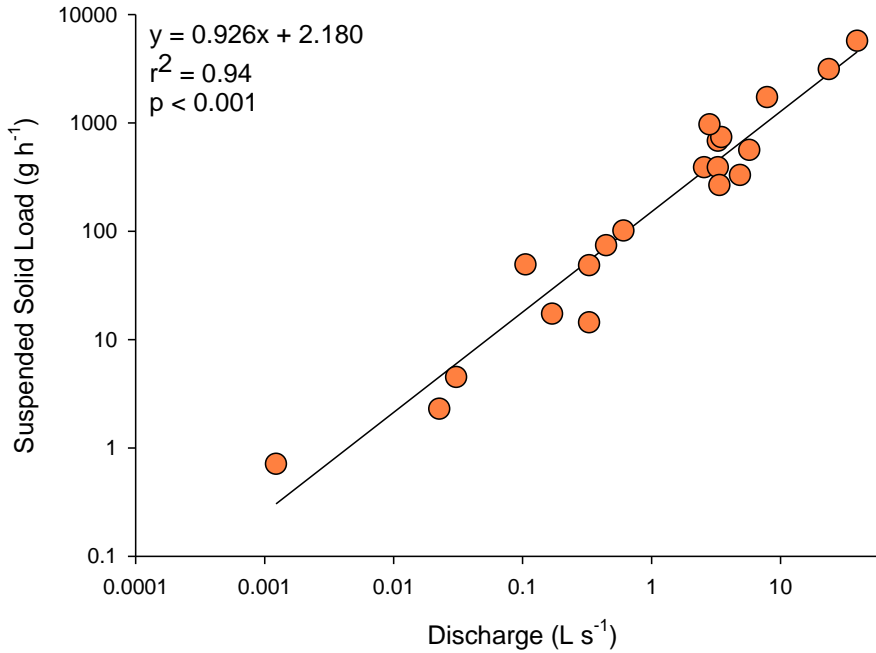
*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

# Pond Site Discharge data March 2018- Jan 2019



**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

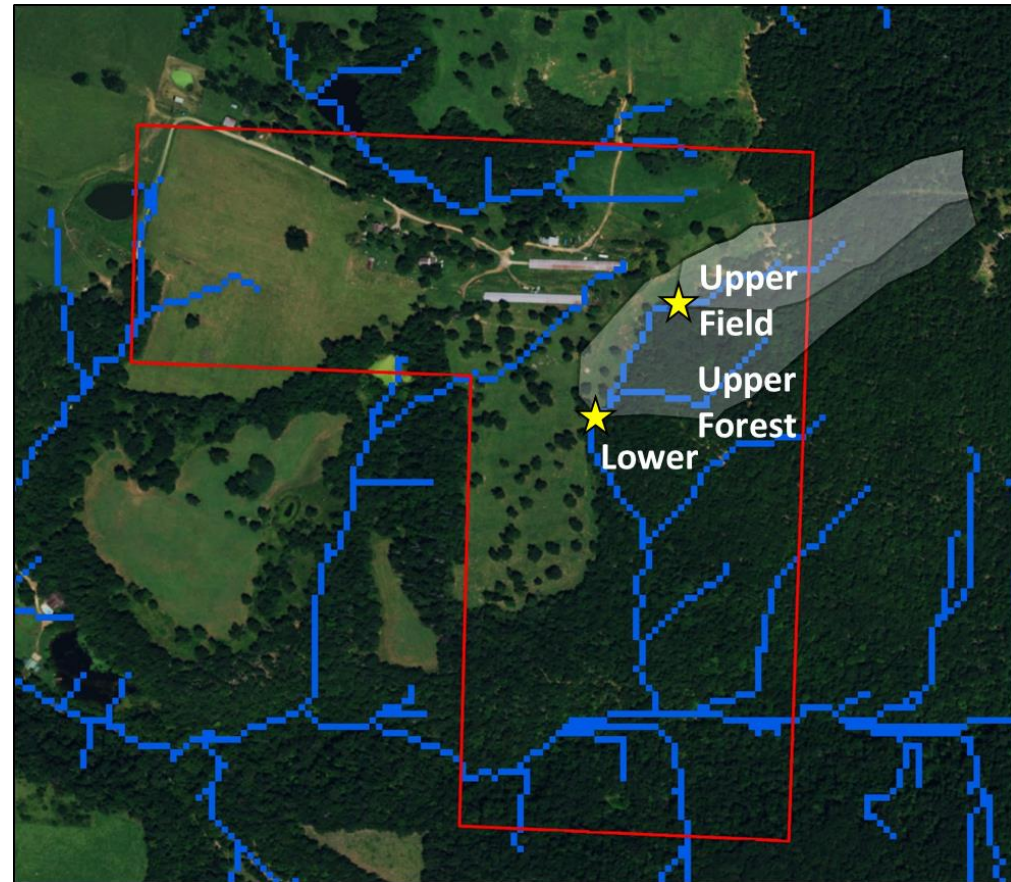
# Suspended solid load and relationship to total phosphorus - storm events

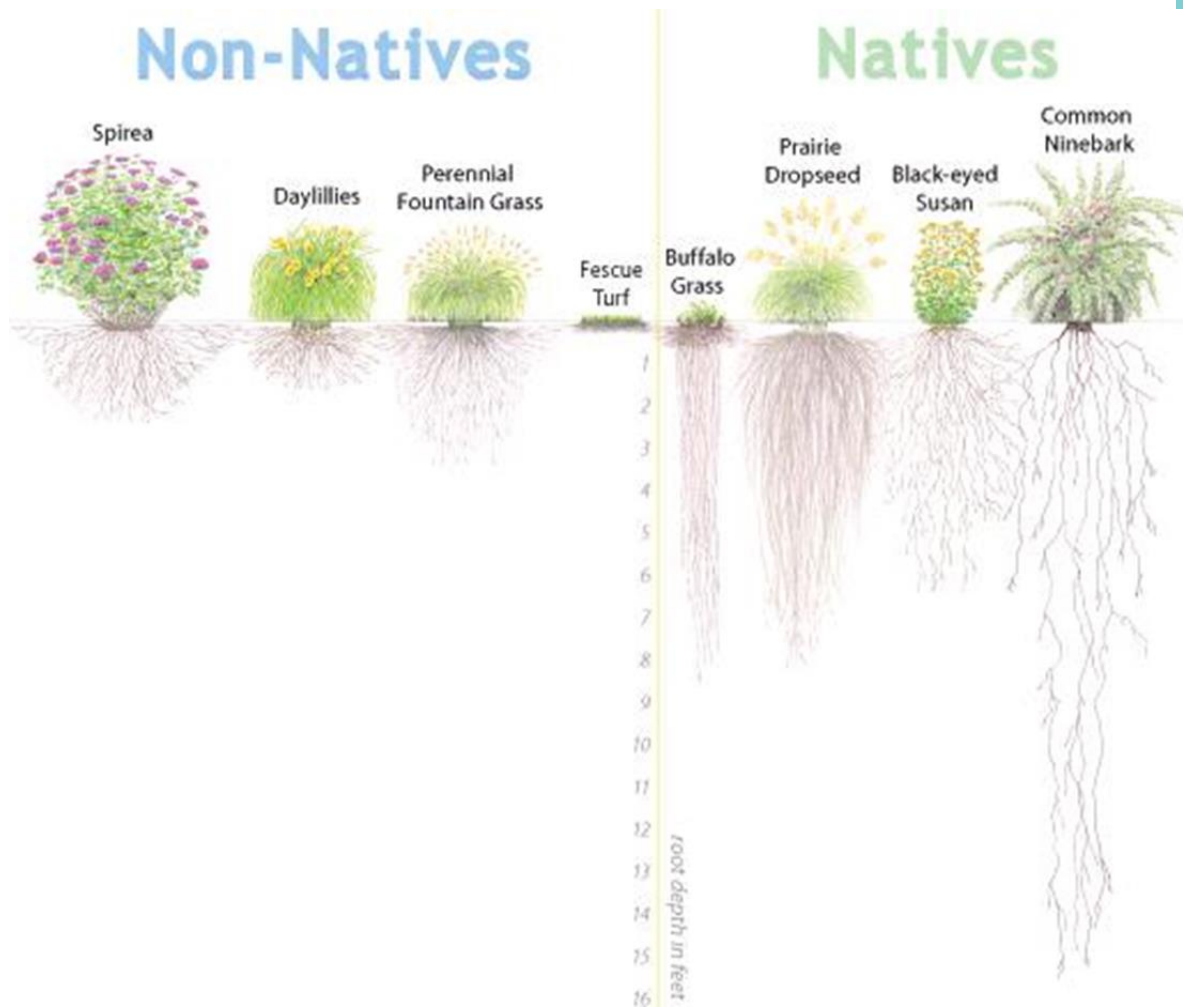




# Small ponds at the top of watersheds

- Forest areas:
  - Statistically lower flows
  - Lower sediment loads
  - Lower nutrient loads
- Compared with adjacent pasture
- Nutrient values increased faster with increasing sediment at the pasture site
- Next: Built the pond – lets see what happens

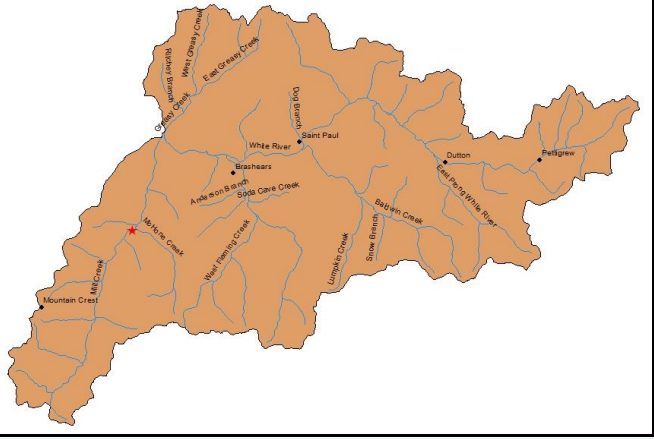
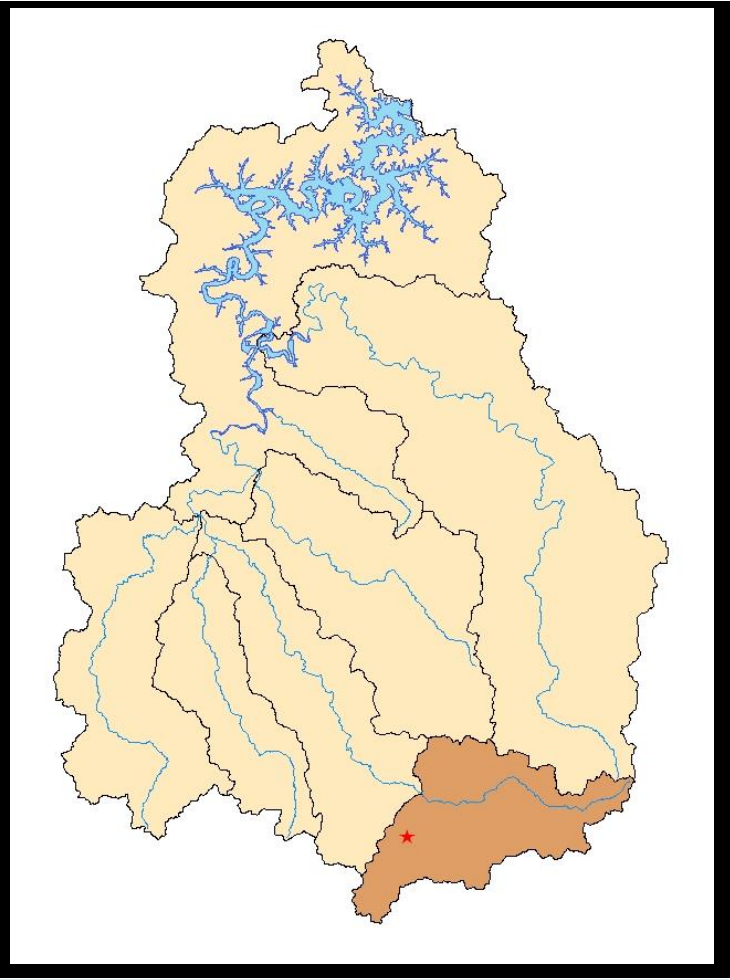




## BMPs:

- Green Infrastructure /LID Mini Grant Program
- Support for Farmers
- Produce local genotype native plant material for restoration projects

*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed



**Mill Creek LWC Location**



**Natural State  
Streams LLC**



**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed





Mill Creek LWC Removal



*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed





## Mill Creek LWC Removal



**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

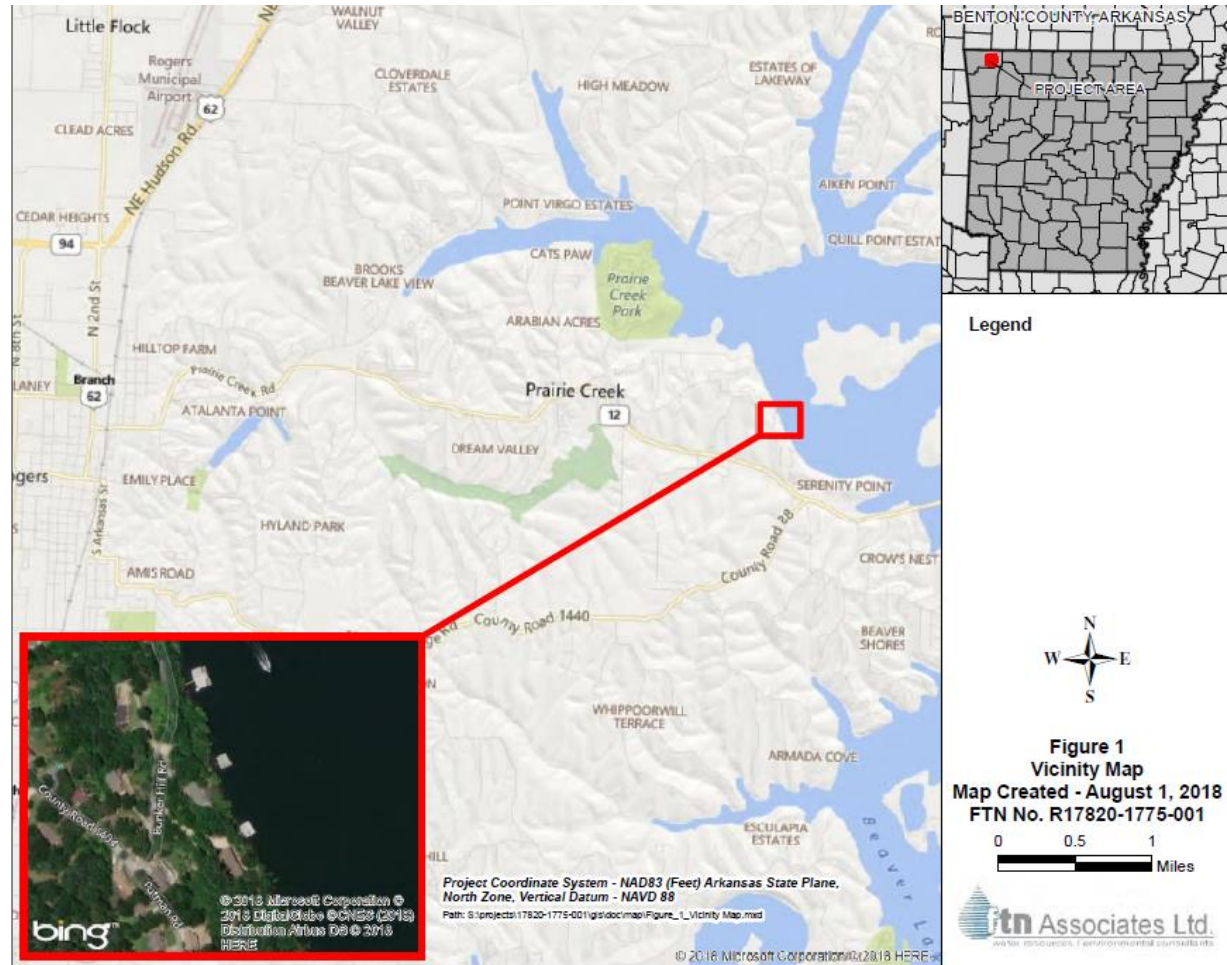


# Fish Habitat Restoration Projects



**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

# Lakeside Shoreline Restoration Project



*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed

# Lakeside – Project permitting began Oct 2018 – received Oct 2019



- Restore 250 linear feet of shoreline
- Anticipate 195 yd<sup>3</sup> of fill
- Use concrete block mat and vegetative plantings
- Materials not used before on Beaver Lake
- USACE sees this as proof of concept project – look for more of these in the future
- Work to begin at lower lake levels during dry season

*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed





## Opportunities abound for Source Water Protection Services:

**Watershed Approach**

**Voluntary Participation**

**Best Management Practices (BMP)**

**Scientific Investigation**

**Adaptive Management**

*MISSION:* Proactively protect, enhance and sustain water quality in Beaver Lake  
and the integrity of its watershed

# Great Partners = Clean Water 2019

The  
WALTON FAMILY  
FOUNDATION



**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed





## Thank you from all of us:

Clell Ford [clell@beaverwatershedalliance.org](mailto:clell@beaverwatershedalliance.org)

Becky Roark [becky@beaverwatershedalliance.org](mailto:becky@beaverwatershedalliance.org)

Melissa McCarver [melissa@beaverwatershedalliance.org](mailto:melissa@beaverwatershedalliance.org)

Nate Weston [nate@beaverwatershedalliance.org](mailto:nate@beaverwatershedalliance.org)

Carrie Byron [carrie@beaverwatershedalliance.org](mailto:carrie@beaverwatershedalliance.org)

Barbara Fraleigh [barbara@beaverwatershedalliance.org](mailto:barbara@beaverwatershedalliance.org)

Kayla Sayre [kayla@beaverwatershedalliance.org](mailto:kayla@beaverwatershedalliance.org)

or

[info@beaverwatershedalliance.org](mailto:info@beaverwatershedalliance.org)

479-750-8007

[www.beaverwatershedalliance.org](http://www.beaverwatershedalliance.org)



**MISSION:** Proactively protect, enhance and sustain water quality in Beaver Lake and the integrity of its watershed