



# Central Arkansas Water: Why We **Burn, Prescribed Fire** as a Water Quality Management Tool

**2017 Oklahoma Clean Lakes & Watersheds**

Randy Easley, Director of Water Quality



# 2007 Watershed Management Plan

## Driven by Development Pressures

### Findings:

- Existing water quality is very good
- Future water quality will not meet goals under build-out scenarios
- Set targets for Total Organic Carbon (TOC), Turbidity, and Phosphorous

**“No single management option can meet all of the objectives [of this plan]; therefore a combination of methods and actions are needed.”**



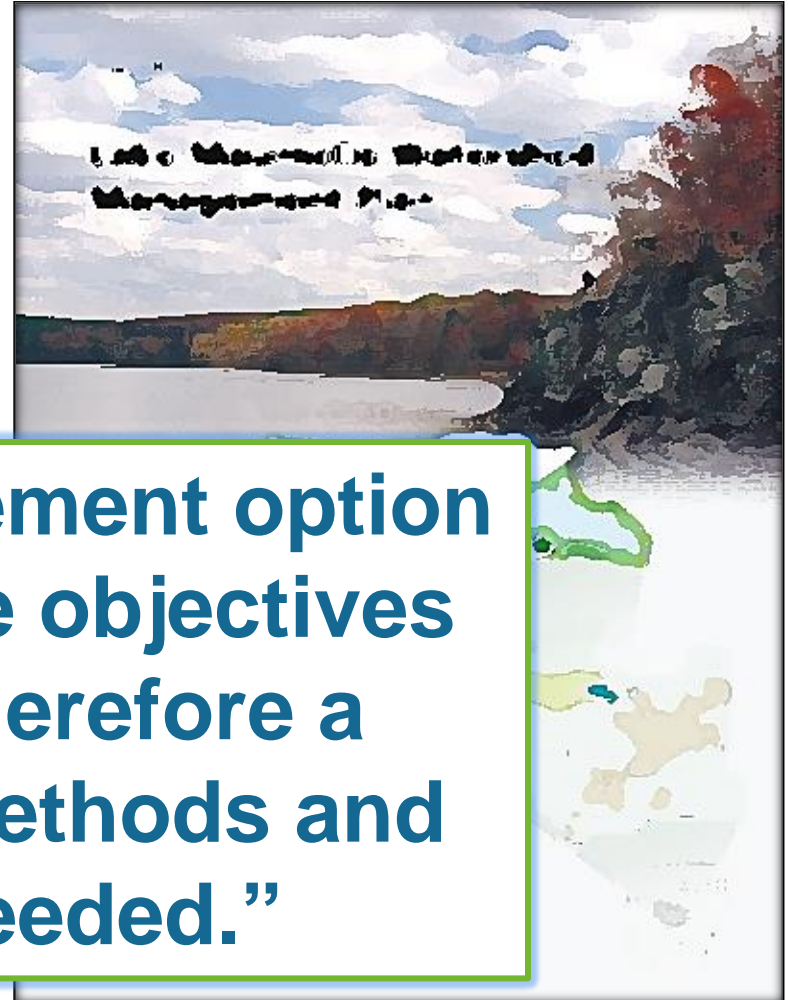
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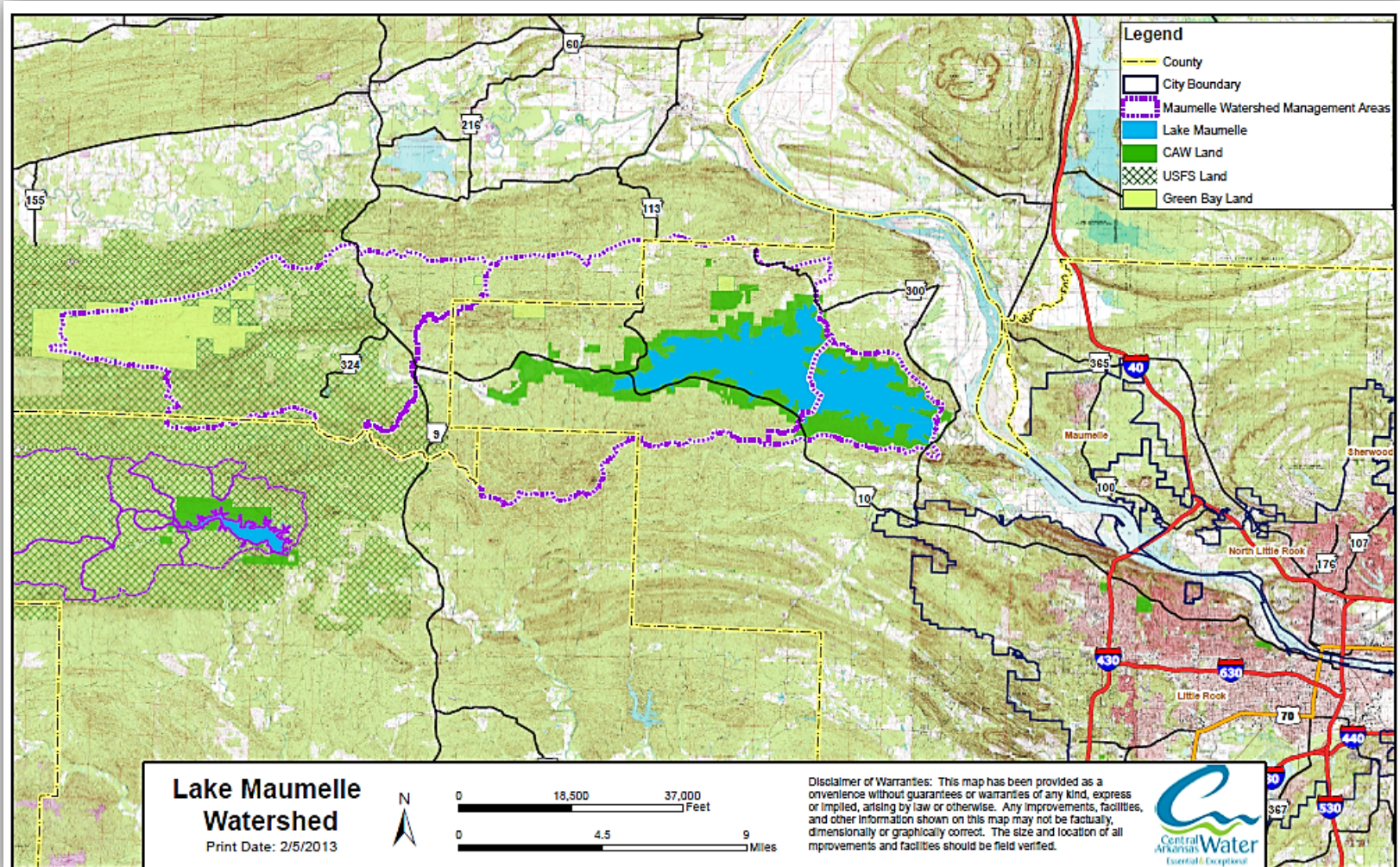




# CAW Watersheds

Winona= 27,500 acres  
(43 mi<sup>2</sup>)

Maumelle= 88,000 acres  
(137 mi<sup>2</sup>)

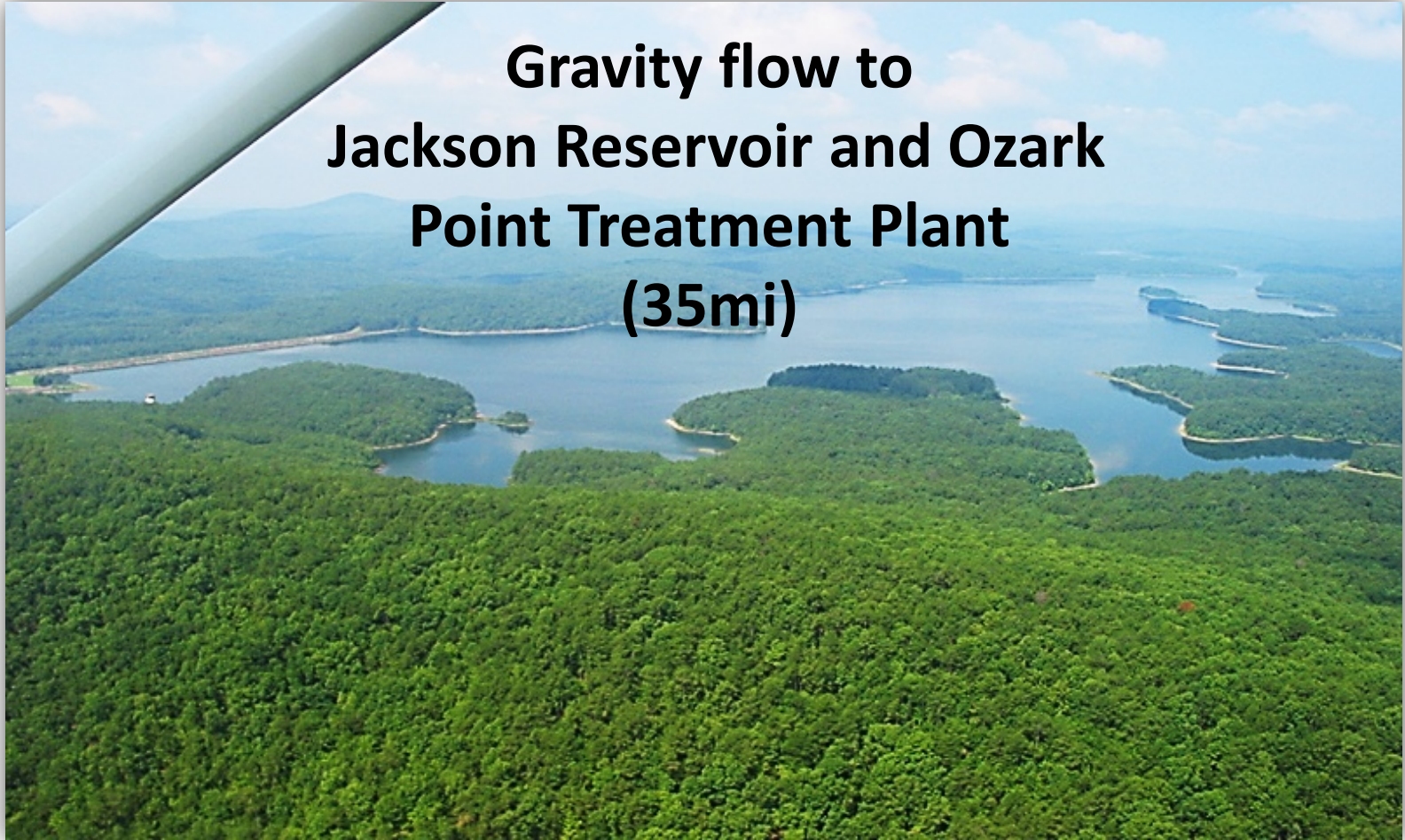




# Lake Winona

# 1936

**Gravity flow to  
Jackson Reservoir and Ozark  
Point Treatment Plant  
(35mi)**



- 1,240 surface acres
- 35 feet Average Depth
- Surrounded by Natl Forest
- 100 feet Maximum Depth

# Lake Maumelle

1956

**USGS: “...more pristine than most other reservoirs...”**

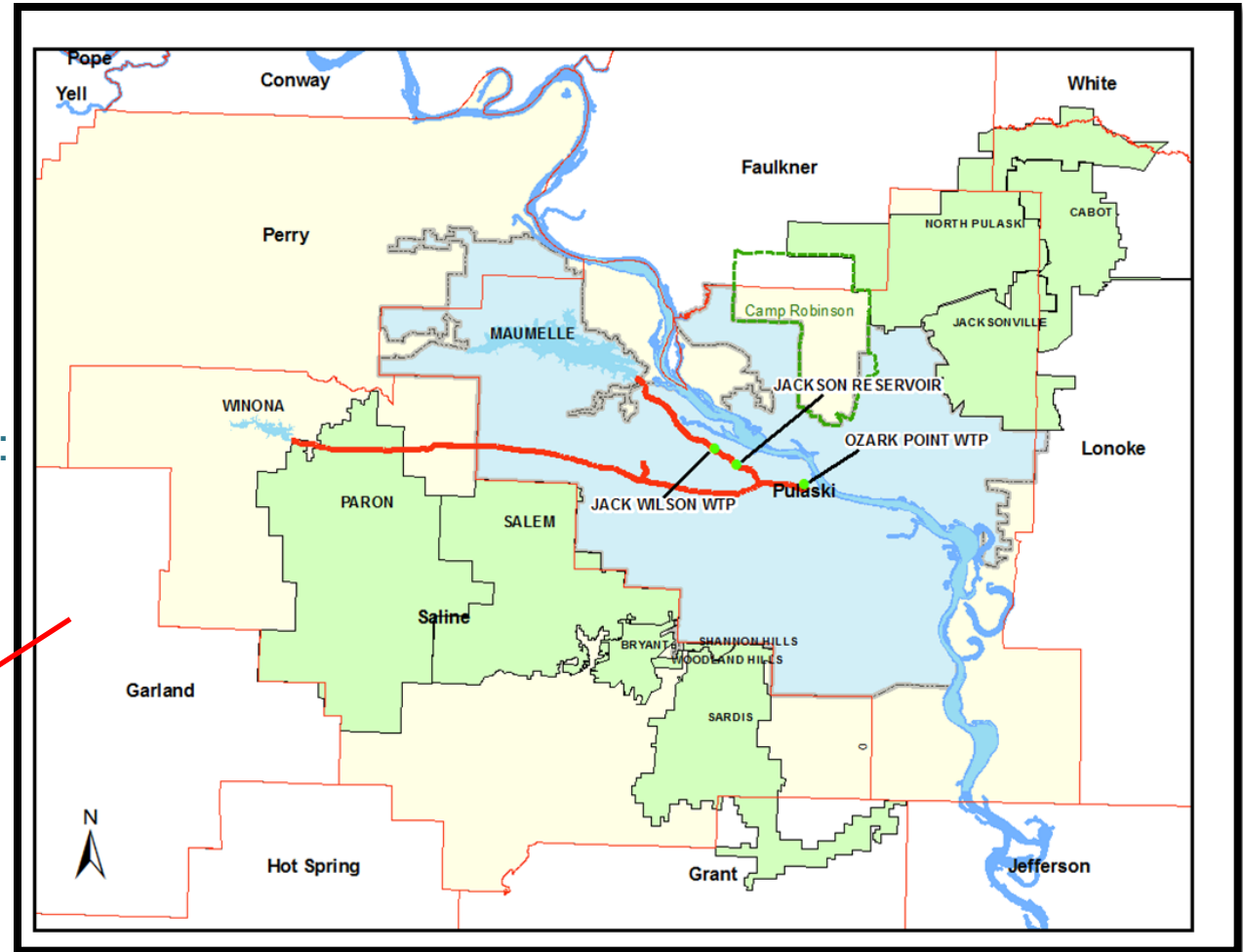


- 8,900 acre lake surface
- 91% Forested Watershed
- 25 feet Average Depth
- 60 feet Maximum Depth



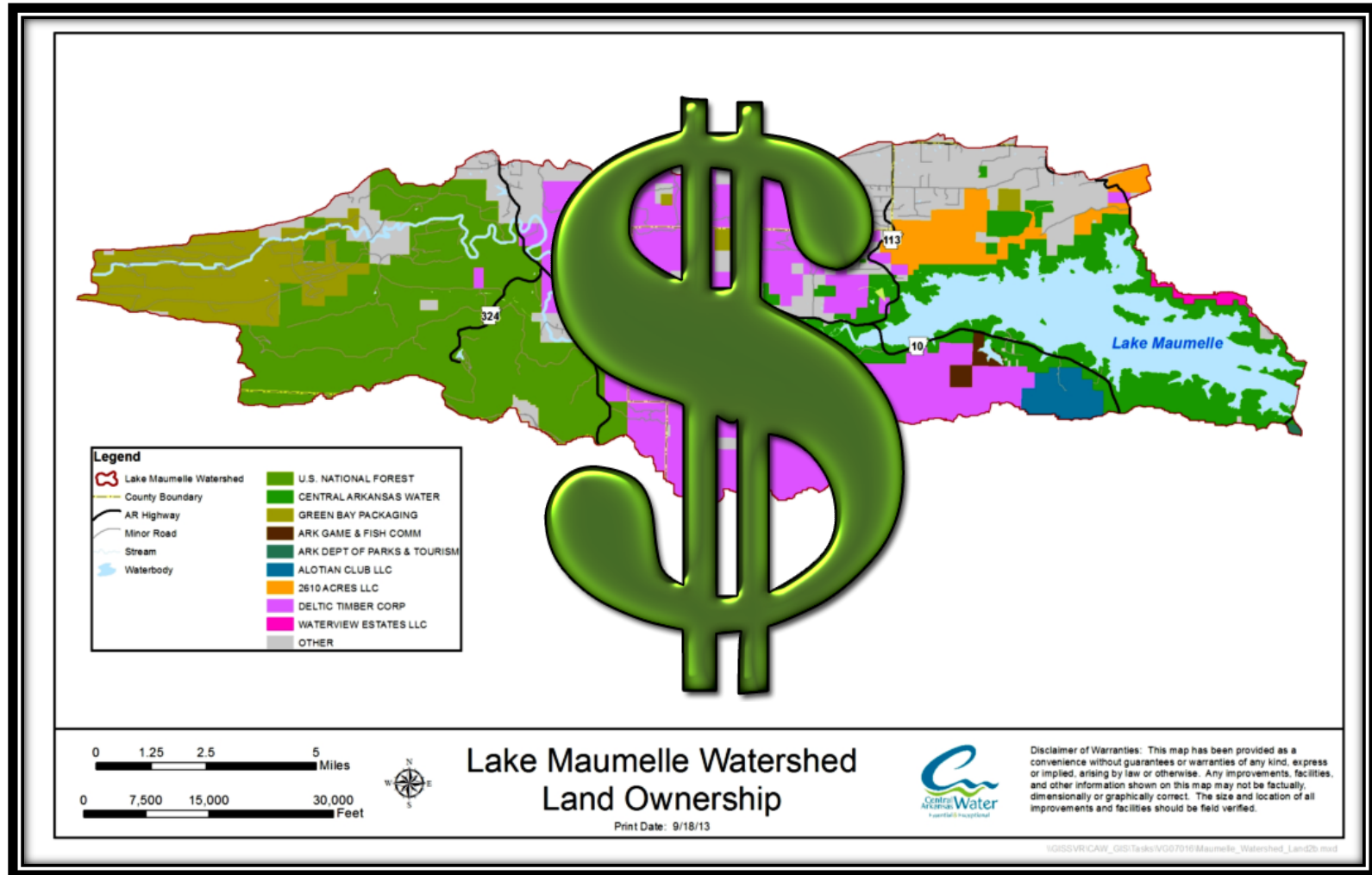
# Central Arkansas Water

- Serves over 450,000 Arkansans with safe, high quality water
- One in every 7 Arkansans benefit from CAW's service
- Supply from 2 reservoirs: Lake Maumelle & Lake Winona



# Why Manage Land for Drinking Water?

- Healthy Forests = Healthy Water!
- Healthy Tributaries = Healthy Source Water!





**How do we protect  
our resource?.....**

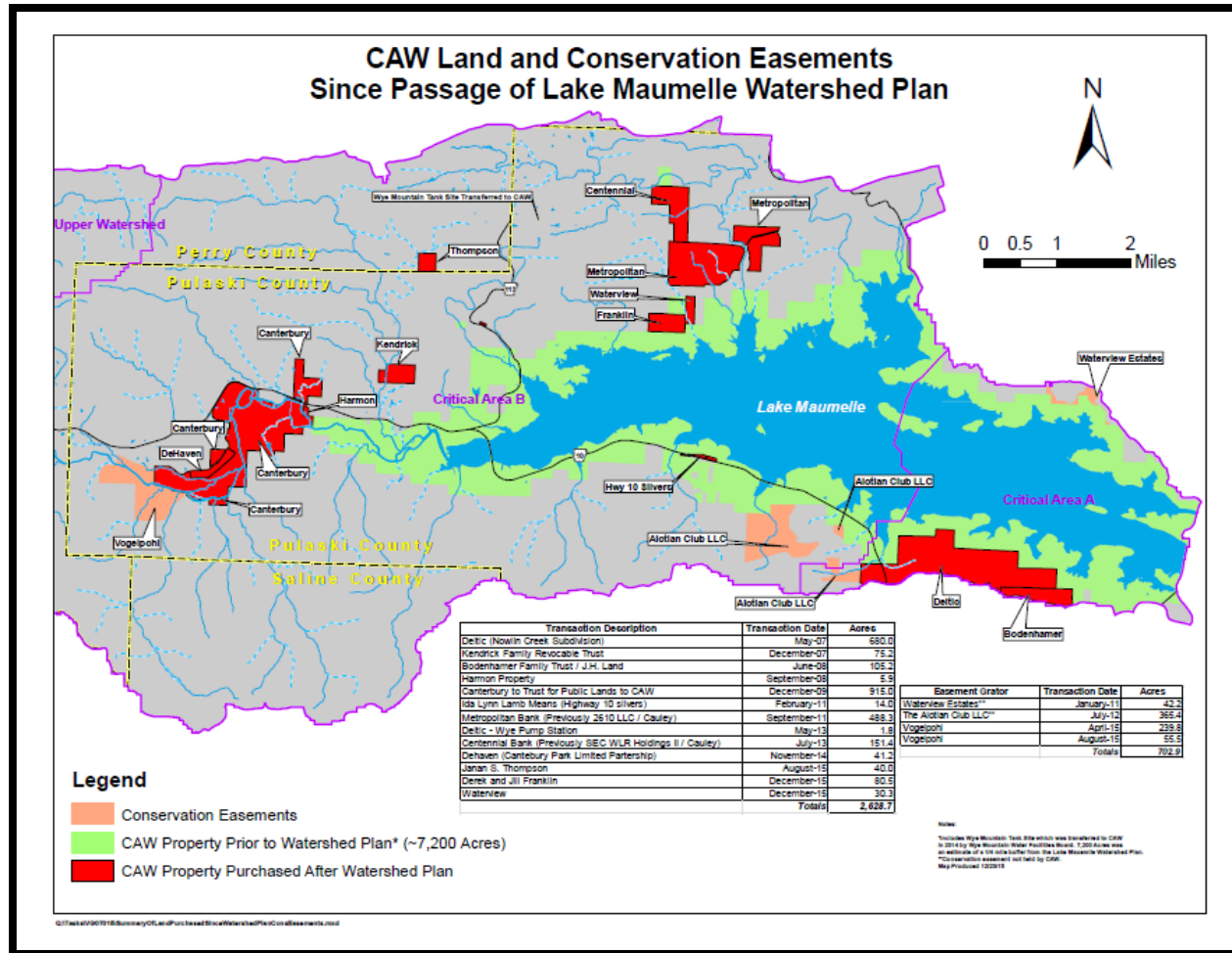
# Managing the Land

*...And setting the standard*

- 1) Land Acquisitions and Conservation
- 2) Forest Management: Fire, Thinning, Roads
- 3) Restoration & Reforestation
- 4) Monitoring
- 5) Wildlife and Recreation
- 6) Education and Outreach
- 7) Risk Mitigation and Emergency Response

# Land Acquisitions and Conservation

- Purchased more than **2,600 acres** of property since plan adoption
- Placed **295 acres** under a Conservation Easement





# Land Acquisitions and Conservation

- Through a **\$0.45** watershed protection fee per meter.
- Generates approximately **\$1 million per year**.

UTILITY BILLING SERVICES				ACCT. NO.		SERVICE ADDRESS		CITY		CLASS		NAME ON ACCOUNT	
P.O. Box 8100 Little Rock, AR 72203-8100								LITTLE ROCK		RESIDENTIAL			
CUSTOMER SERVICE 501-372-5161 FOR CUSTOMER SERVICE INFORMATION, PLEASE, SEE REVERSE SIDE.				BILLING DATE		2/04/15							
				DUE DATE		2/25/15							
METER NUMBER(S)		BILLING PERIOD			METER READINGS				CONSUMPTION 100 CUBIC FEET		DESCRIPTION		
		FROM	TO	DAYS	PREVIOUS	READ CODE	PRESENT	READ CODE					
274095		12/19/14	1/23/15	35	1052		1056		4		WATER		
YOUR AVERAGE WINTER CONSUMPTION FOR SEWER IS:												4	
CURRENT ACTIVITY													
Monthly Charges				9.07	24.57				22.02		55.66		
Watershed Protection				.45							.45		
Franchise Fee				.95	2.46						3.41		
Sales Tax				.94					1.98		2.92		
Fed. Safe Drinking Water Act				.30							.30		
Service Line Replacement Fee					1.00						1.00		
TOTAL CURRENT CHARGES				\$11.71	\$28.03				\$24.00		\$63.74		
TOTAL AMOUNT NOW DUE				\$32.63CR	\$28.03				\$24.00		\$19.40		

# Prescribed Fire & Ecological Thinning

- Reduce TOC (DBP)
- Provide Water Quality Filtration
- Produce Healthier & More Resilient Forests
- Reduces the Risk of Wildfire
- Improve Wildlife Habitat, Plant and Animal Diversity, and Recreational Opportunities





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***I AM THE GOD OF ALL HELLFIRE!***

# What is Prescribed Fire?



**Prescribed fire or prescribed burning** is strategically planned, carefully managed, low-intensity fire used to accomplish a forest management goal or multiple goals. For CAW, our goal for using prescribed fires is to protect water quality and improve forest health.

**Central Arkansas Water** periodically conducts prescribed burns around Lake Maumelle and Lake Winona in order to improve the health of the watersheds and improve the quality of our drinking water.

**Prescribed fire** is used to enhance, maintain, and restore forest communities and the plants and animals that are associated with them, while also improving public safety and increasing recreational opportunities. Nearly 225,000 acres across Arkansas are managed with prescribed fire each year.





# CAW General Fire Management Goals

LAKE MAUMELLE  
CENTRAL ARKANSAS WATER  
FIRE MANAGEMENT PLAN



August 2013

The Nature Conservancy  
Arkansas Field Office  
601 North University Avenue  
Little Rock, AR 72205

- 1. Reduction of organic carbon** entering the lake through reduction of the duff and litter layer through frequent, low intensity prescribed burns.
- 2. Maintain and increase biodiversity** through the reintroduction of a natural ecological process.
- 3. Reduction** in mid-story and understory woody vegetation.
- 4. Maintenance of Basal Area/acre** open shortleaf pine and oak woodlands.
- 5. Consume logging slash and debris** (10, 100, 1000 hour fuels).
- 6. Restoration and maintenance** of inherent structure and species composition of pine-oak woodland community.
- 7. Invigoration of the herbaceous understory** through frequent, low-intensity burns.



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**8. Demonstrate applicability** of prescribed fire in conjunction with timber management.

**9. Mitigation** of stand-replacement wildfire.

**10. Maintain wildlife habitat.** Native game and non-game species utilize open edge habitat for cover (Gee et al. 1994). A variety of plants are used as food sources for white-tailed deer, wild turkey, northern bobwhite quail, and other game species (Rosene 1988).

**11. Reduce non-native species.** Many non-native species have not evolved in an environment of regular fire and are consequently not adapted to fire. (Most invasive species are susceptible to fire at some or all times of the year.)

# CAW Specific Fire Management Objectives

**Objective a:** Conduct prescribed burns on an average of 800-1,600 acres per year over a five-year period.

**Objective b:** Maintain a 3-5-year fire return interval on all proposed burn units.

**Objective c:** Conduct at least one (1) first-entry prescribed burn on previously unburned tracts each fiscal year.

**Objective d:** Conduct at least one (1) hazardous fuels reduction burn each fiscal year.

**Objective e:** Retain at least 90% of pine-hardwood overstory for future timber harvest and conservation forestry.

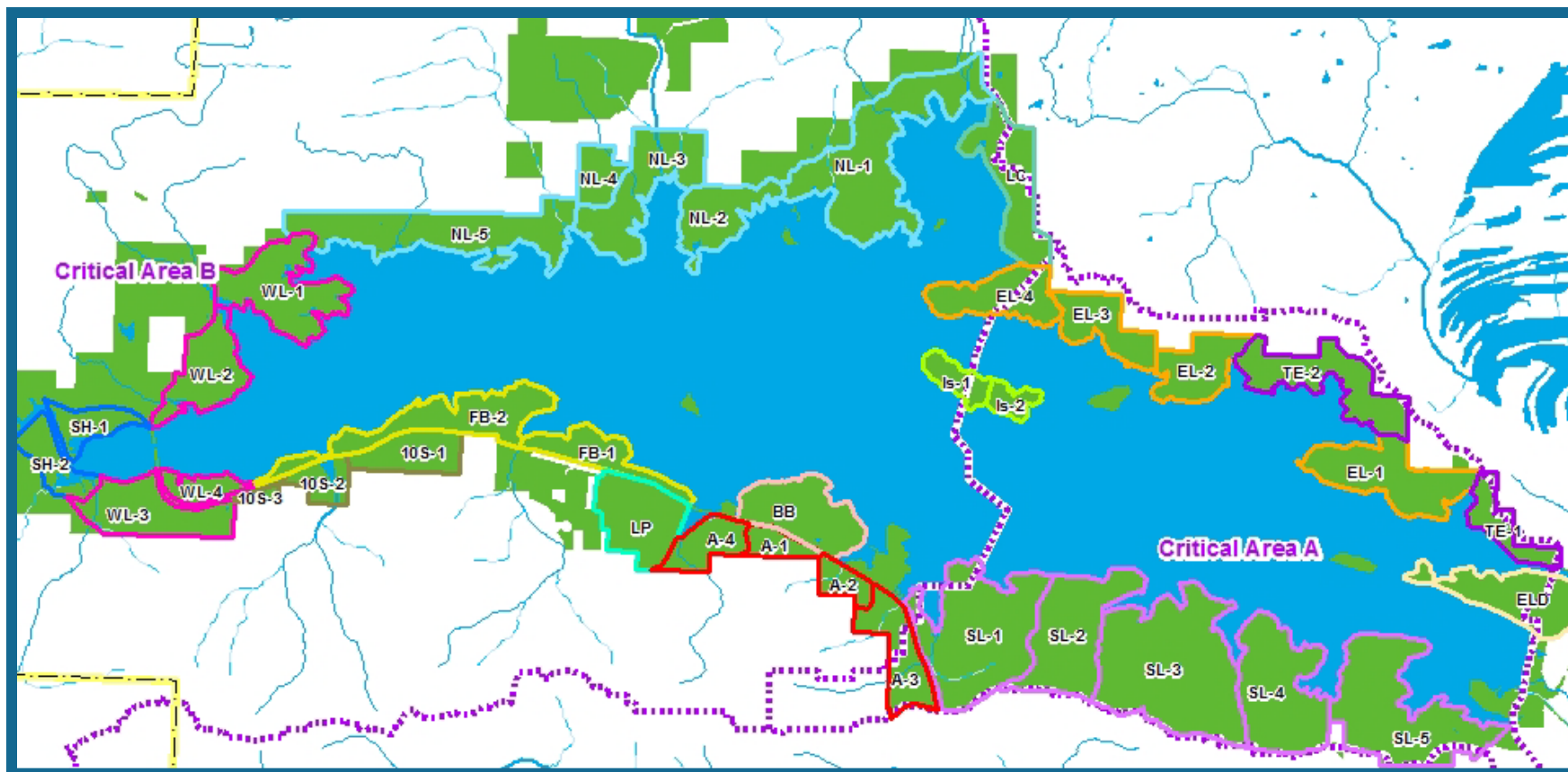
**Objective f:** Conduct photopoint monitoring to track changes in vegetation structure every three (3) years.

**Objective g:** Conduct first order fire effects monitoring (FOFEM) to track specific burn unit objectives (char, scorch, topkill, etc.) after each prescribed burn.

# Forest Management: Rx Fire & Ecological Thinning

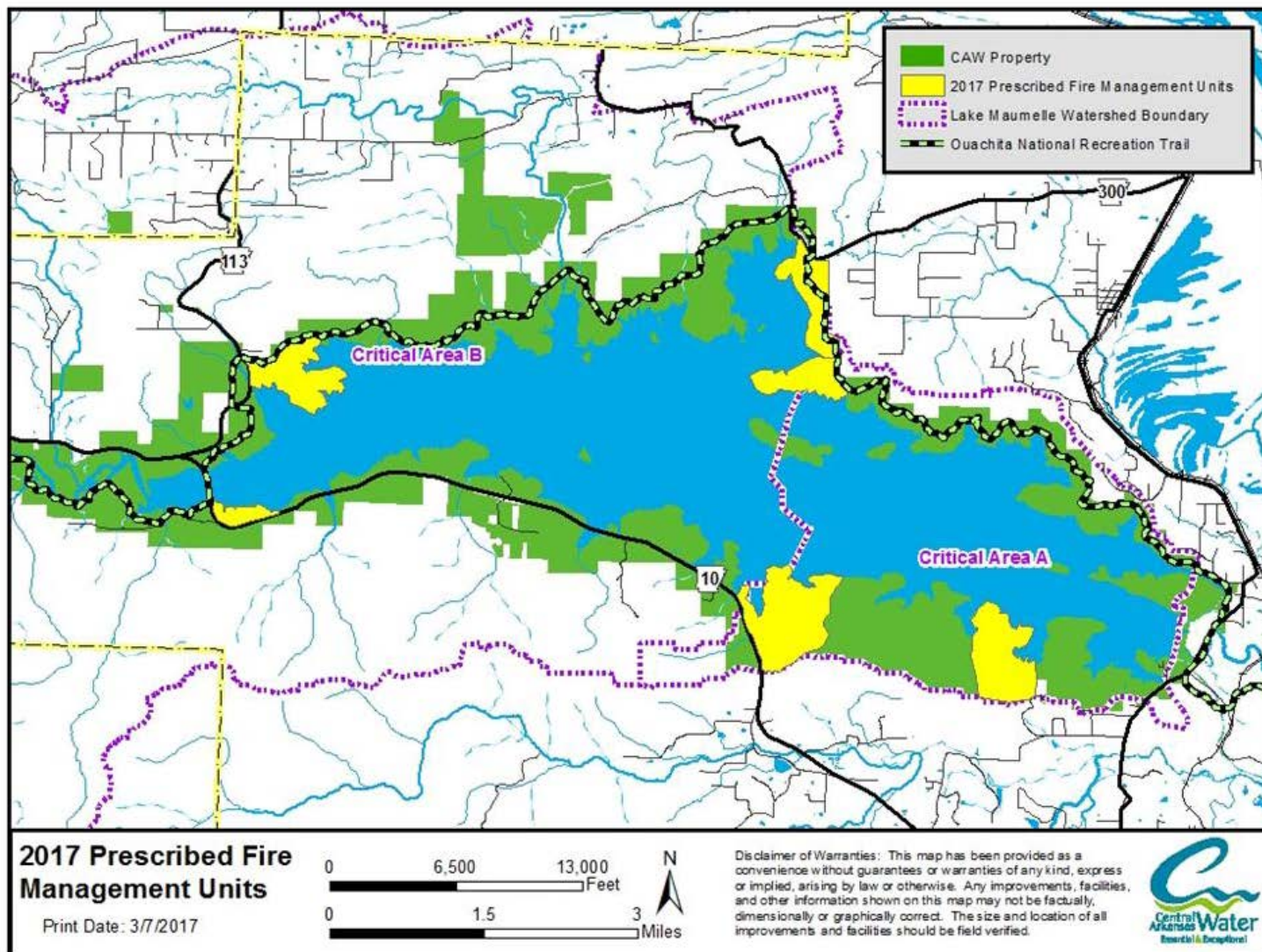
**Burned:** To-Date ~1,630 acres– 8 units; 9 burns

**Thinned:** To-Date 270 acres- 3 units      **Current (2017):** 478 acres





# 2017 Management Units



# Benefits of Prescribed Fire for Water Quality

1. Total Organic Carbon Reduction
2. Water Quality Filtration
3. Healthier and More Resilient Forests
4. Reduction of Wildfire Risks
5. Increases Wildlife Habitat, Plant and Animal Diversity, Recreation

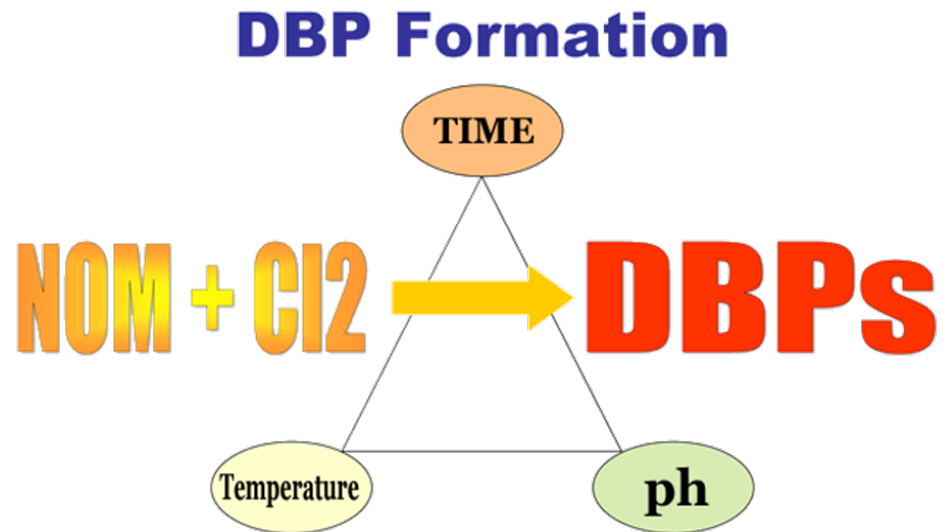


# Total Organic Carbon Reduction

Prescribed fire breaks down leaf litter and downed timber from forests. This, in turn, decreases the amount of **Total Organic Carbon (TOC)** that would travel into our lakes if the timber was left to naturally decay.

TOC in raw water supplies can lead to the formation of **Disinfection Byproducts (DBPs)**, a federally-regulated contaminant in drinking water that CAW and other water utilities are required to control.

The **best control** for DBP formation is to **limit** the input of **TOC** to raw water sources used for drinking water.





# Healthier and More Resilient Forests

In **dense and crowded forests**, more trees and vegetation compete for the same amount of nutrients and water. This increased competition makes the vegetation more **susceptible to droughts, disease, and pests**.

By controlling certain types of vegetation, prescribed fires reduce competition for water and nutrients, resulting in a **healthier forest**. In addition, prescribed burns **enrich the soil** through the resulting ash, thereby improving conditions for **new plant growth**.



**HEALTHY FORESTS = CLEAN WATER**

Use Best Management Practices

# Reduction of Wildfire Risks

Much of CAW's forestland has not been managed in over **50 years**, resulting in dense and overcrowded forests. These conditions result in an abundance of leaf litter, downed woody debris, and the potential for diseased/damaged vegetation that burns easily and at high intensity.

**Heavy fuel loads** can be responsible for **intense fires** that move into adjacent forests and cause serious damage to standing timber or buildings. Completion of prescribed burns removes heavy fuel loads and, at the same time, provides an opportunity to install firebreaks that will aid in wildfire containment and response should a wildfire occur.



# Enhanced Wildlife Habitat

## Plant and Animal Diversity, and Recreation

By **stimulating growth of seeds** in the soil that are buried beneath leaves and debris, prescribed fire causes **native grasses** and **wildflowers** to grow and, in turn, provide food and habitat for wildlife, pollinators, and migrating bird species.

Many forests in Arkansas depend on fire to provide food and habitat for a diversity of plants and animals, including game species like quail, turkey and deer.

In addition, approximately 46% of the state's terrestrial rare plants and animals depend on fire at some part of their lifecycle.







### **Prescribed Burn Notice**

Central Arkansas Water and The Nature Conservancy will be conducting a prescribed burn in your area in the next few months. All nearby landowners are being informed of the prescribed burn that will be conducted by a specially trained crew. Safety is our top priority during all phases of the prescribed burn. The burn will occur when there are very specific weather conditions and smoke will likely be visible in your area during the burn.

For more information contact:  
Raven Lawson

Watershed Protection Manager  
501.210.1857 or [Raven.Lawson@carkw.com](mailto:Raven.Lawson@carkw.com)  
[www.carkw.com/prescribedburn](http://www.carkw.com/prescribedburn)





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### BENEFITS OF PRESCRIBED FIRE FOR WATER QUALITY

#### Total Organic Carbon Reduction.

Prescribed fire breaks down leaf litter and downed timber from forests. This, in turn, decreases the amount of Total Organic Carbon (TOC) that would travel into our lakes if the timber was left to naturally decay. TOC in raw water supplies can lead to the formation of Disinfection Byproducts (DBPs), a federally-regulated contaminant in drinking water that CAW and other water utilities are required to control. The best control for DBP formation is to limit the input of TOC to raw water sources used for drinking water.



#### Water Quality Filtration.

By controlling certain types of vegetation, a prescribed burn can allow more sunlight to reach the forest floor and can also reduce competition for water and nutrients by invasive species. These changes promote an abundant and diverse grassy understory and more resilient vegetation because burning stimulates growth of seeds in the soil that are often dormant and buried beneath leaves and debris. The robust root complexes and new vegetation growth help slow and absorb runoff, turning the forest into a first-line of defense water filter for pollutants that could enter the lake through runoff from rain events.



#### Healthier and More Resilient Forests.

In dense and crowded forests, more trees and vegetation compete for the same amount of nutrients and water. Increased competition makes the vegetation more susceptible to droughts, disease, and pests. By controlling certain types of vegetation, prescribed fires reduce competition for water and nutrients, resulting in a healthier forest. In addition, prescribed burns enrich the soil through the resulting ash, thereby improving conditions for new plant growth.



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### OTHER BENEFITS OF PRESCRIBED FIRE



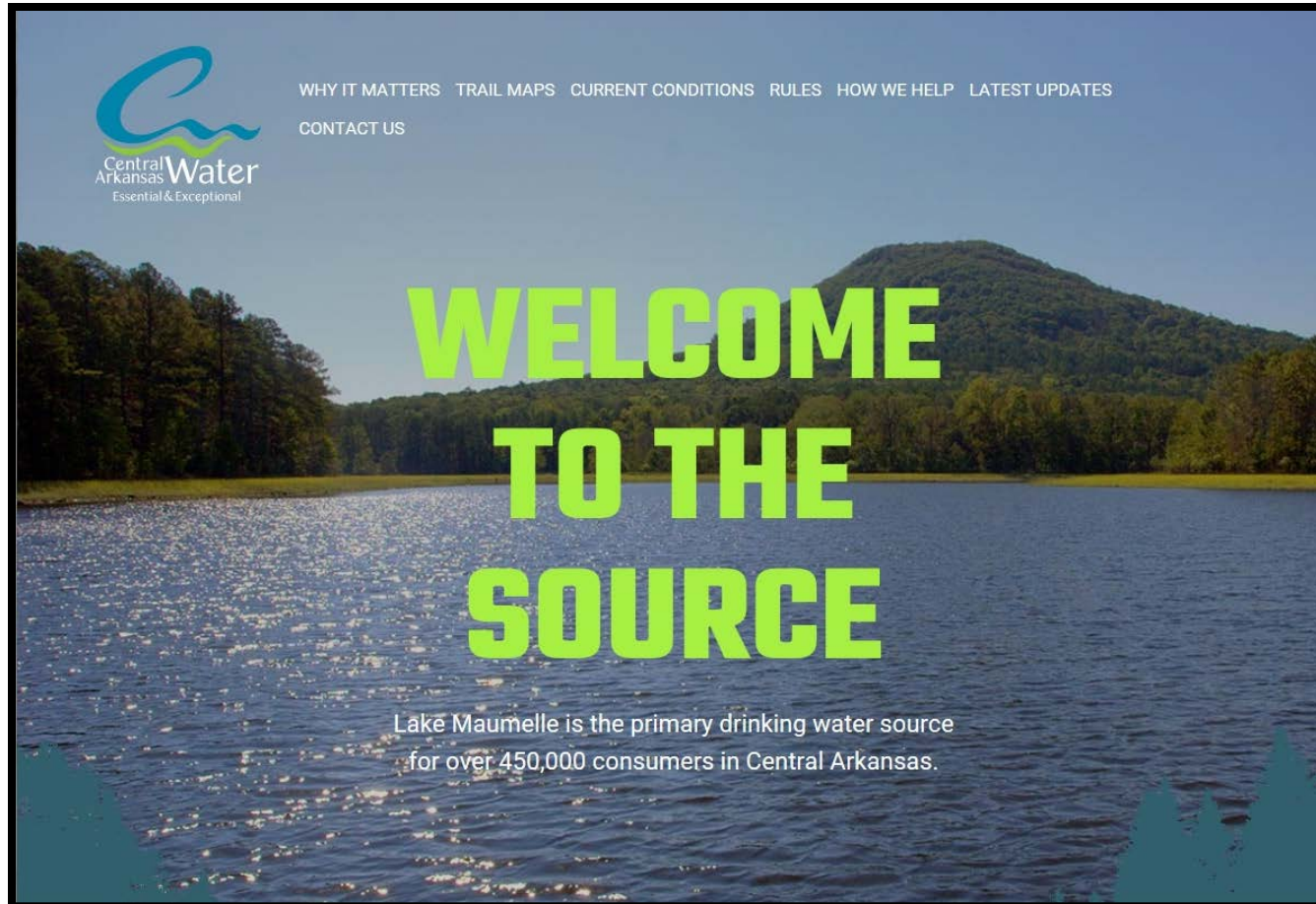
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## Prescribed Fire For Water Quality Protection



# Want more information?



Sign up for our email lists @ **[WWW.LAKEMAUMELLE.ORG](http://WWW.LAKEMAUMELLE.ORG)**



# Questions?



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