Central Arkansas Water

Essential & Exceptional

Valuing our Natural Capital Assets

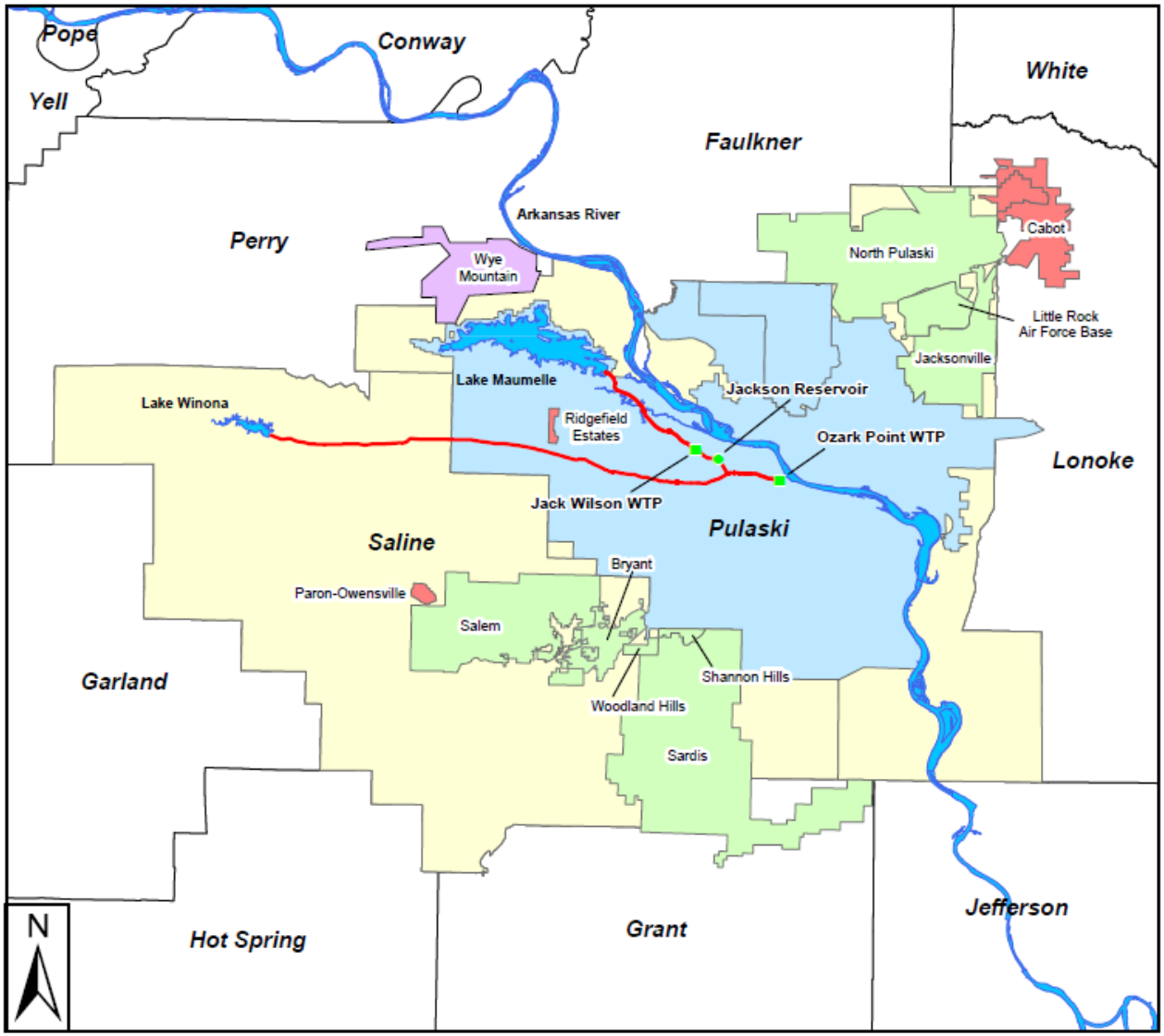
Oklahoma Clean Lakes & Watersheds Association

March 30, 2016

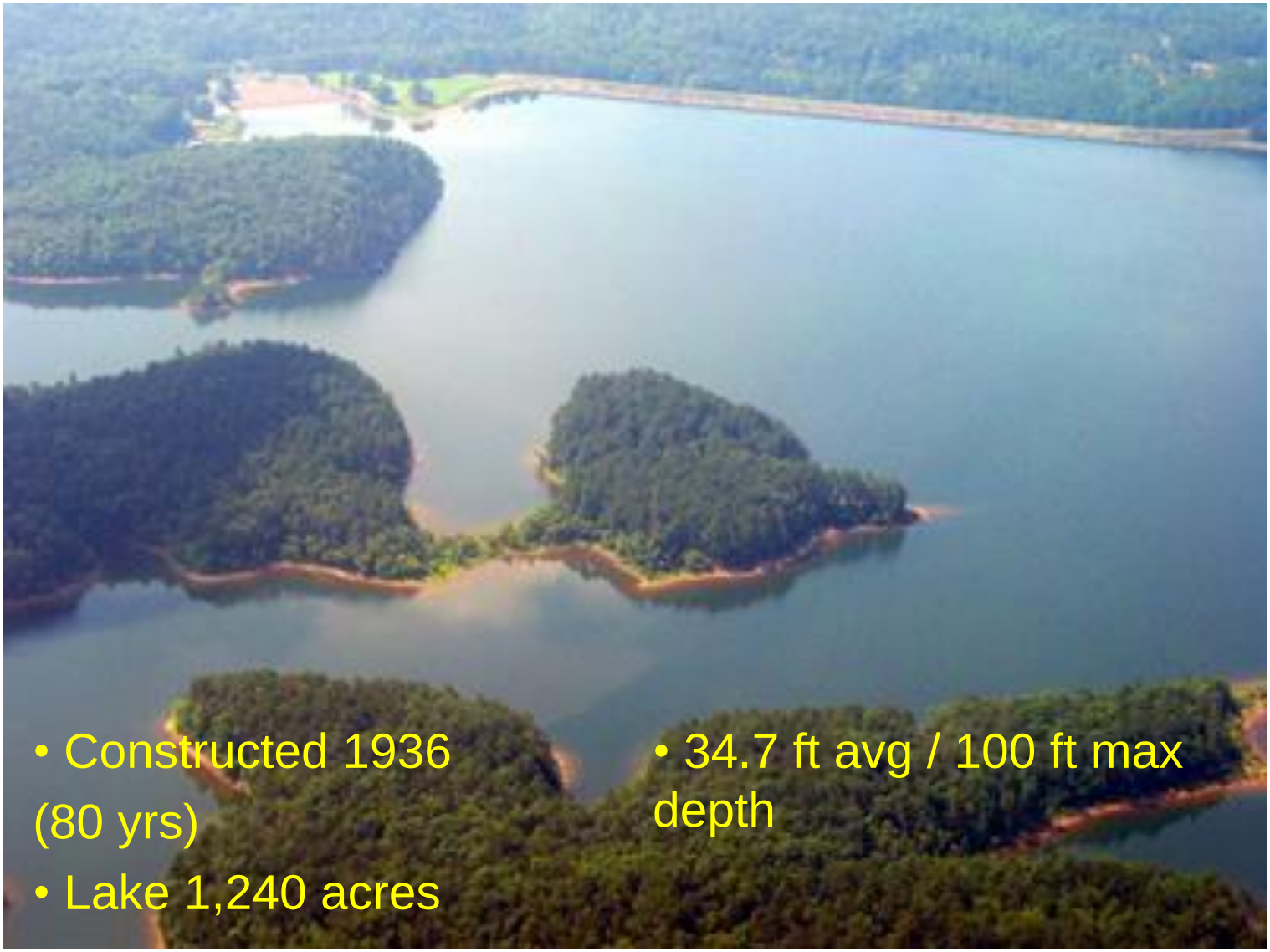
Central Arkansas Water

- Formed in 2001 with the merger of LR & NLR water utilities
- 400,000+ population service area in four counties
- Average day demand - 63 MGD
- Peak day demand - 125 MGD
- Two treatment plants
  - Wilson plant: 133 MGD
  - Ozark Point plant: 24 MGD
- Two sources
  - Lake Maumelle: 93 MGD
  - Lake Winona: 27 MGD

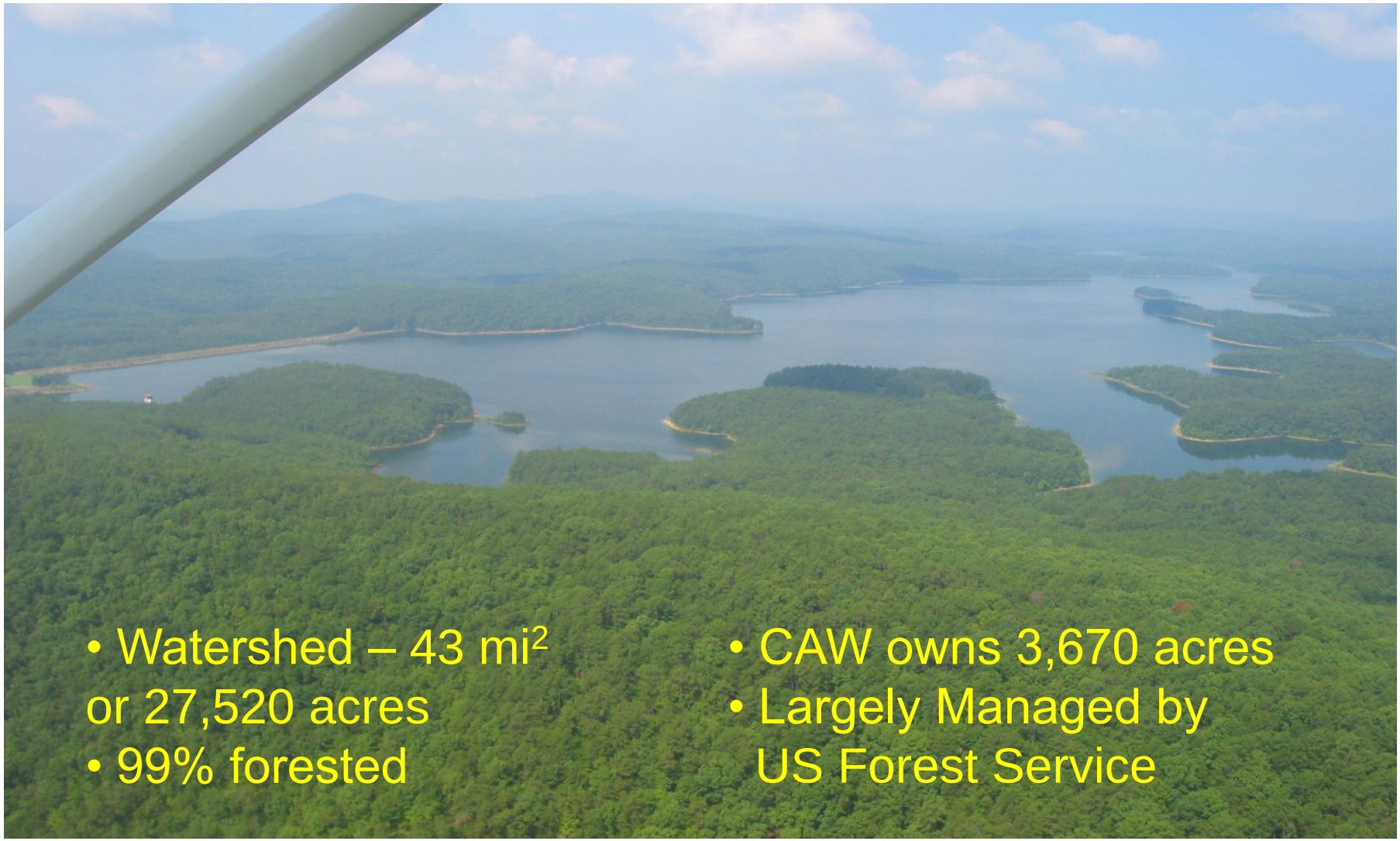
CAW Service Area



Lake Winona


• Constructed 1936 (80 yrs)
• Lake 1,240 acres
• 34.7 ft avg / 100 ft max depth

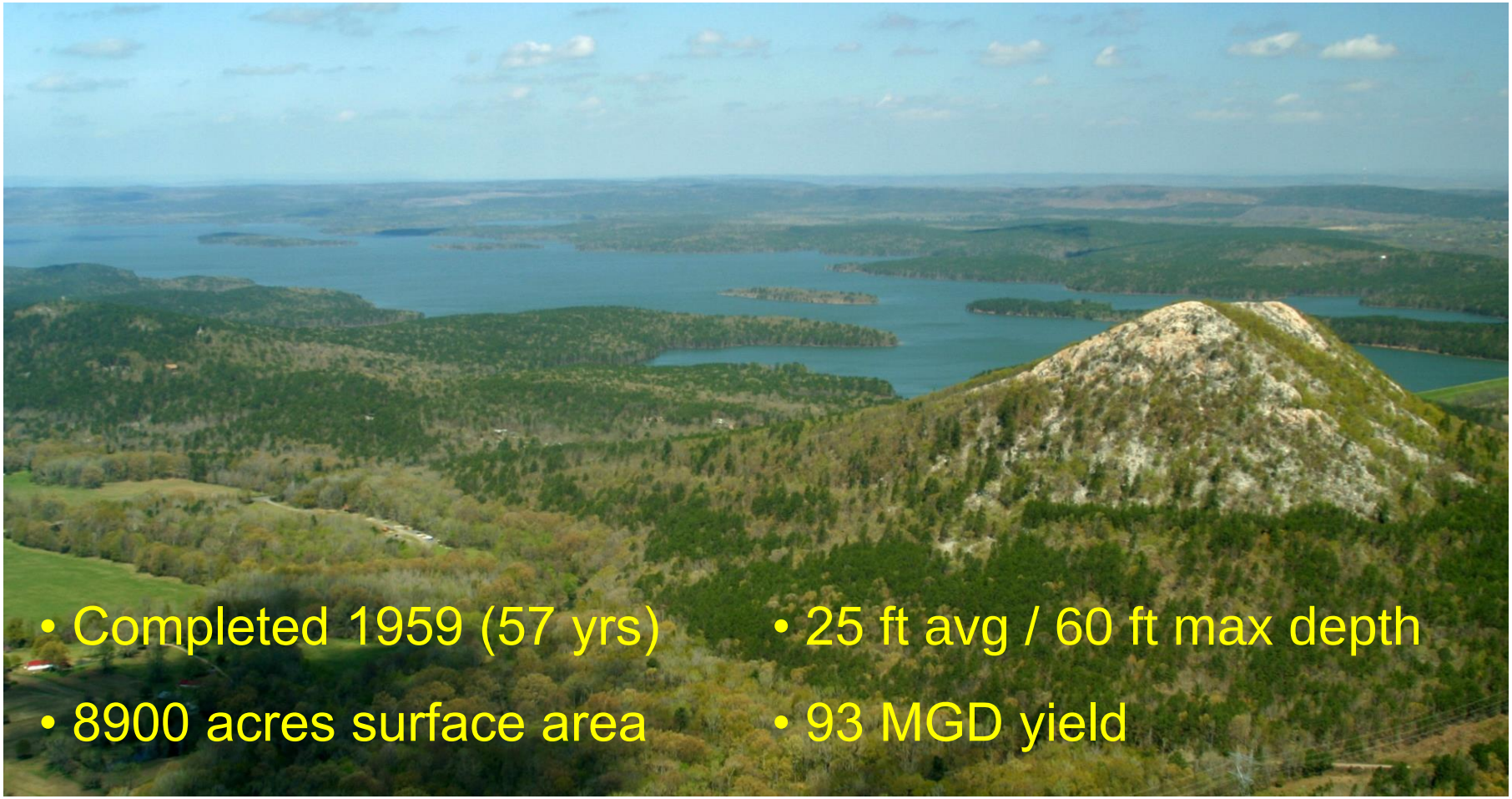
Lake Winona Watershed



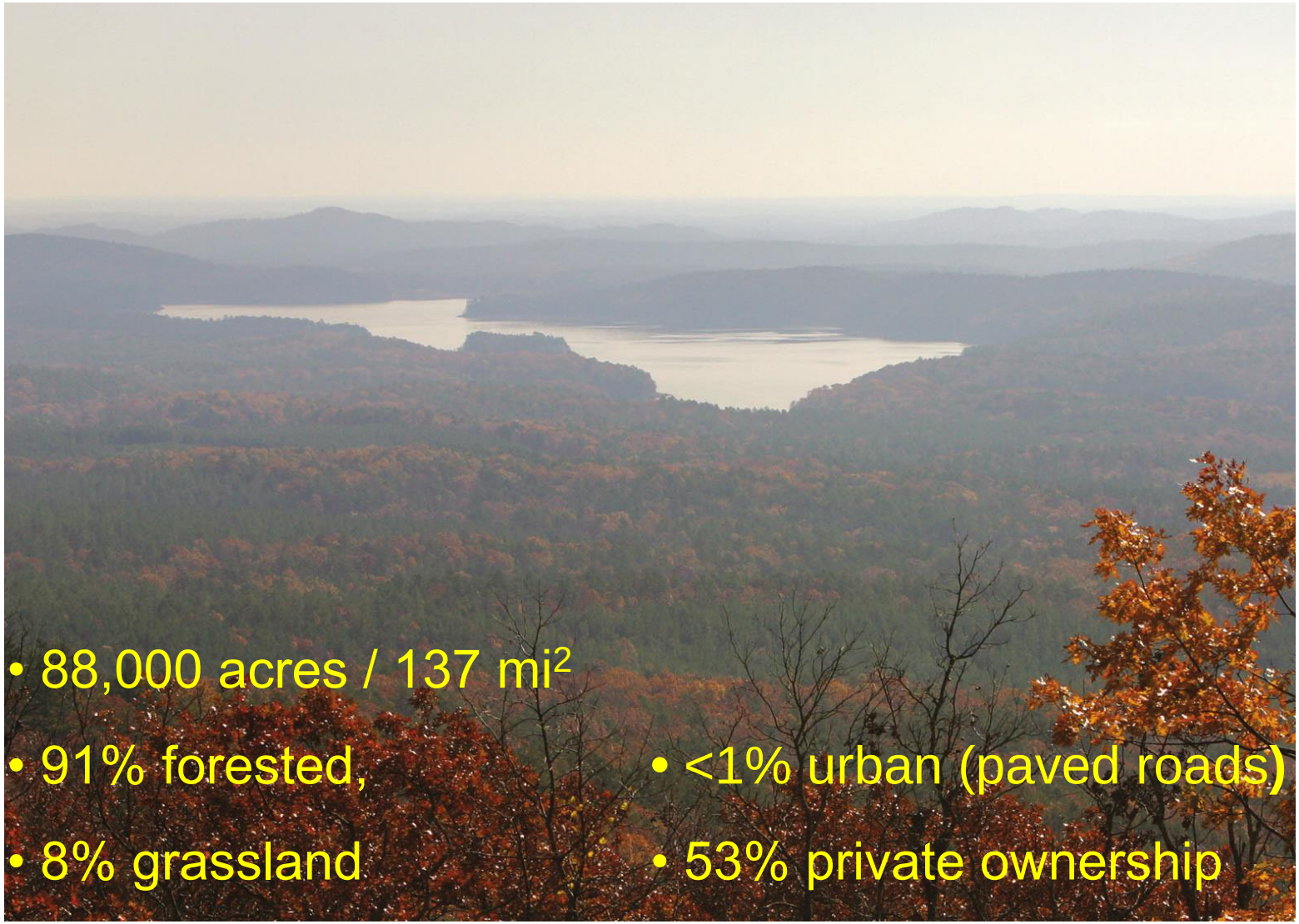
- Watershed – 43 mi^2 or 27,520 acres
- 99% forested

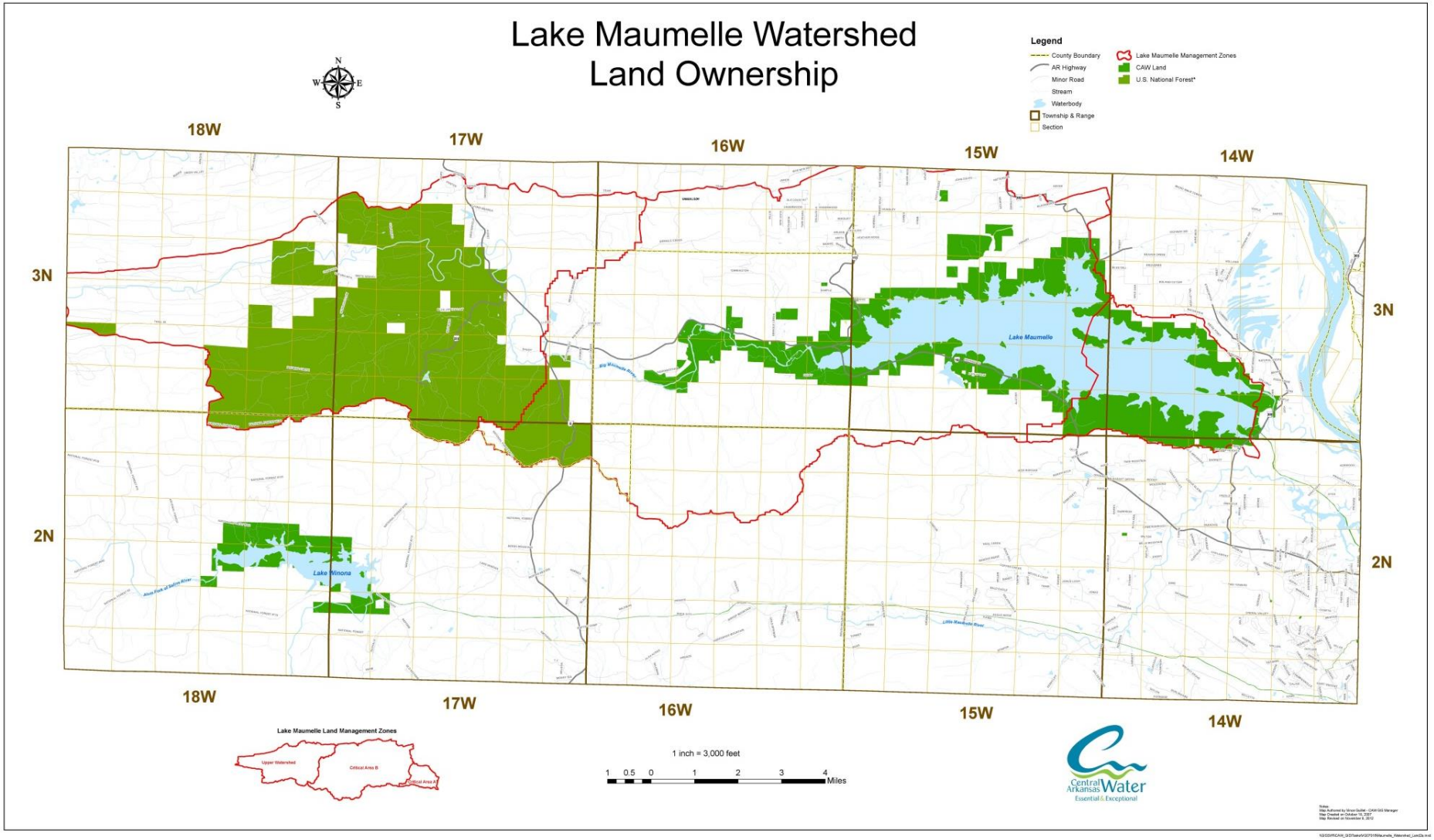
- CAW owns 3,670 acres
- Largely Managed by US Forest Service

Lake Maumelle



Lake Maumelle Watershed




Lake Maumelle Watershed
Land Ownership
Legend
County Boundary
AR Highway
Minor Road
Stream
Waterbody
Township & Range
Section
Lake Maumelle Management Zones
CAW Land
U.S. National Forest*
18W
17W
16W
15W
14W
3N
2N
Lake Maumelle
Lake Winona
Big Maumelle River
Little Maumelle River
North Fork of Saline River
Lake Maumelle Land Management Zones
Upper Watershed
Critical Area B
Critical Area A
1 inch = 3,000 feet
1 0.5 0 1 2 3 4
Miles
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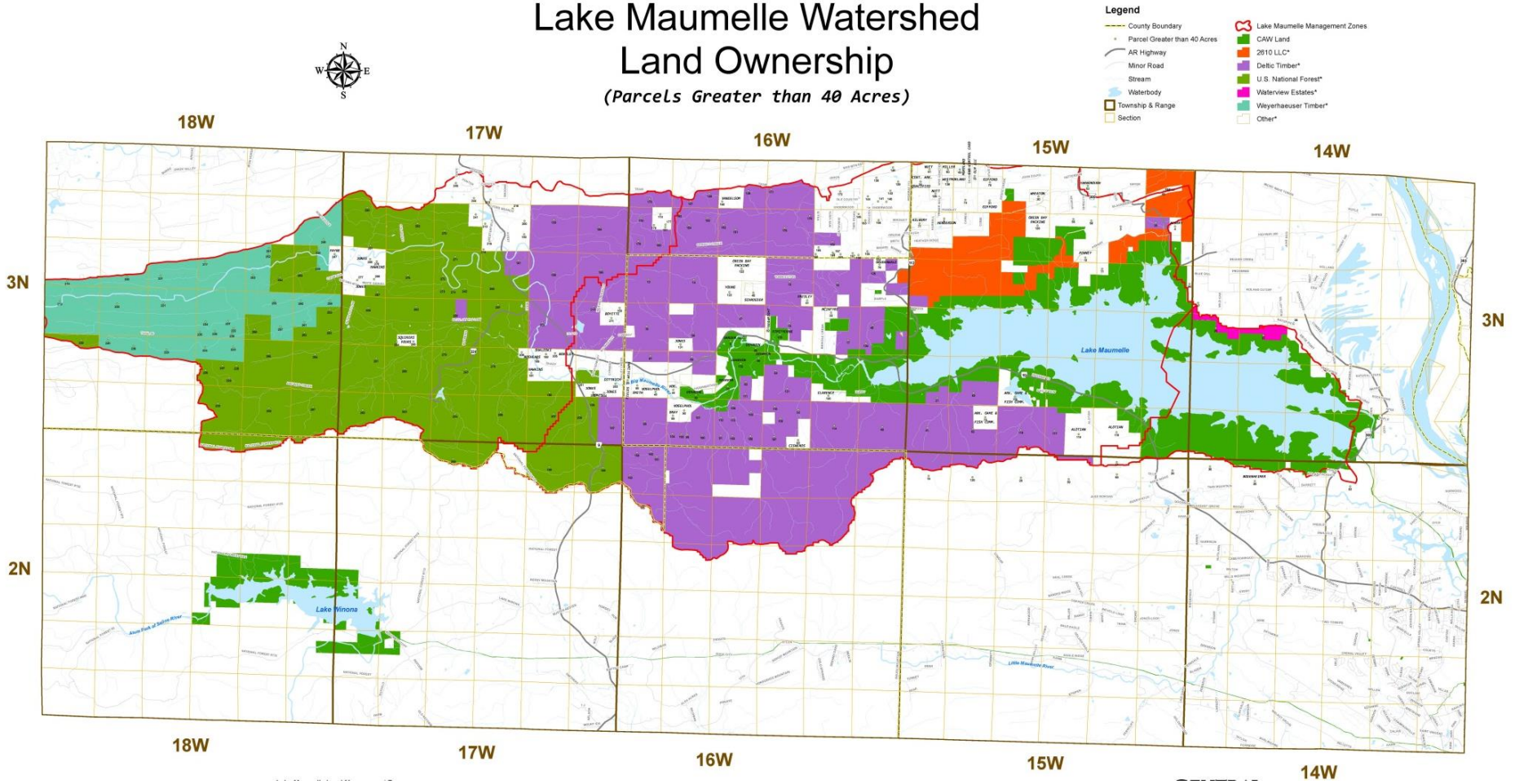
Lake Maumelle Watershed Land Ownership

(Parcels Greater than 40 Acres)



2007 Watershed Management Plan

- Goals - Policy Advisory Council

1. Maintain Maumelle as a long term, abundant supply of high quality water
2. Provide equitable sharing of costs and benefits

- Objectives

1. Minimize public health risks
2. Minimize impact to existing residents
3. Minimize impact on existing operations
4. Minimize rate increases
5. Minimize sedimentation & loss of storage
6. Protect tributary streams
7. Allow limited recreation
8. Meet community values

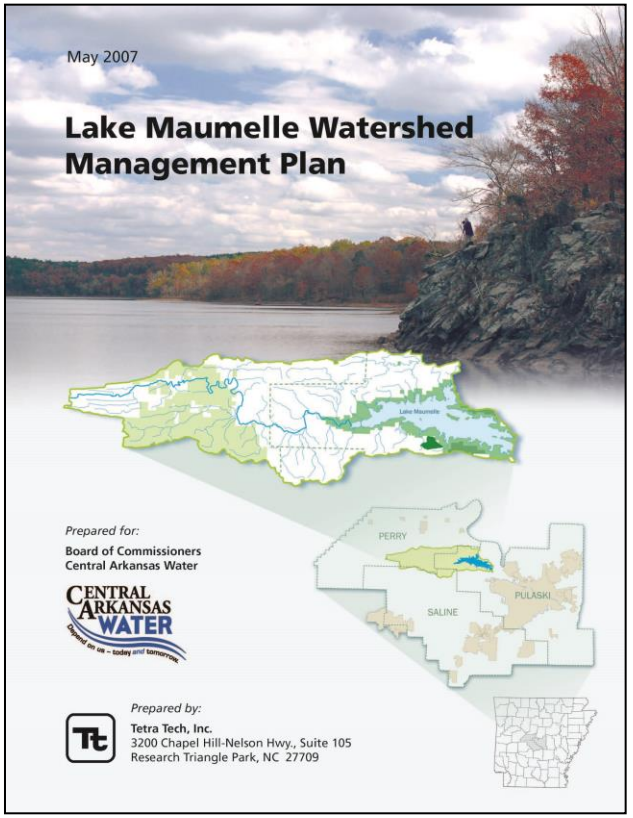
2007 Watershed Management Plan

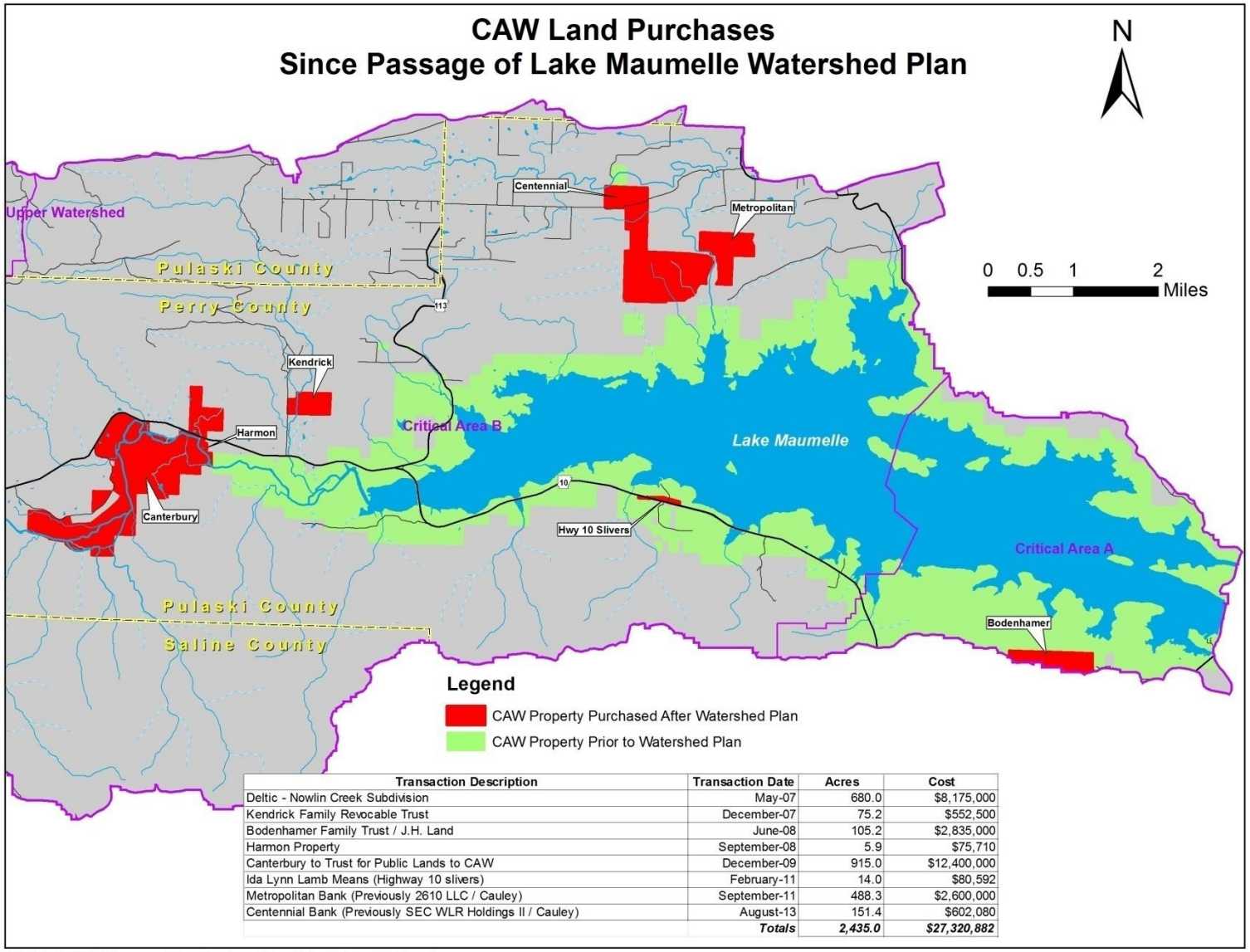
Findings:

- Existing water quality is very good
- Future water quality will not meet goals under build-out scenarios

Recommendations:

- Regulatory management initiatives
  - New development design
  - Wastewater discharges
  - Sedimentation controls
  - Legacy exemptions
  - Watershed protection ordinance
- Nonregulatory management initiatives
  - Hazardous spill mitigation
  - Unpaved road management
  - Improved lake management
  - Improved CAW land management
- Voluntary stewardship practices
- Adaptive management approach





Transaction Description	Transaction Date	Acres	Cost
Deltic - Nowlin Creek Subdivision	May-07	680.0	$8,175,000
Kendrick Family Revocable Trust	December-07	75.2	$552,500
Bodenhamer Family Trust / J.H. Land	June-08	105.2	$2,835,000
Harmon Property	September-08	5.9	$75,710
Canterbury to Trust for Public Lands to CAW	December-09	915.0	$12,400,000
Ida Lynn Lamb Means (Highway 10 slivers)	February-11	14.0	$80,592
Metropolitan Bank (Previously 2610 LLC / Cauley)	September-11	488.3	$2,600,000
Centennial Bank (Previously SEC WLR Holdings II / Cauley)	August-13	151.4	$602,080
	Totals	***2,435.0***	***$27,320,882***

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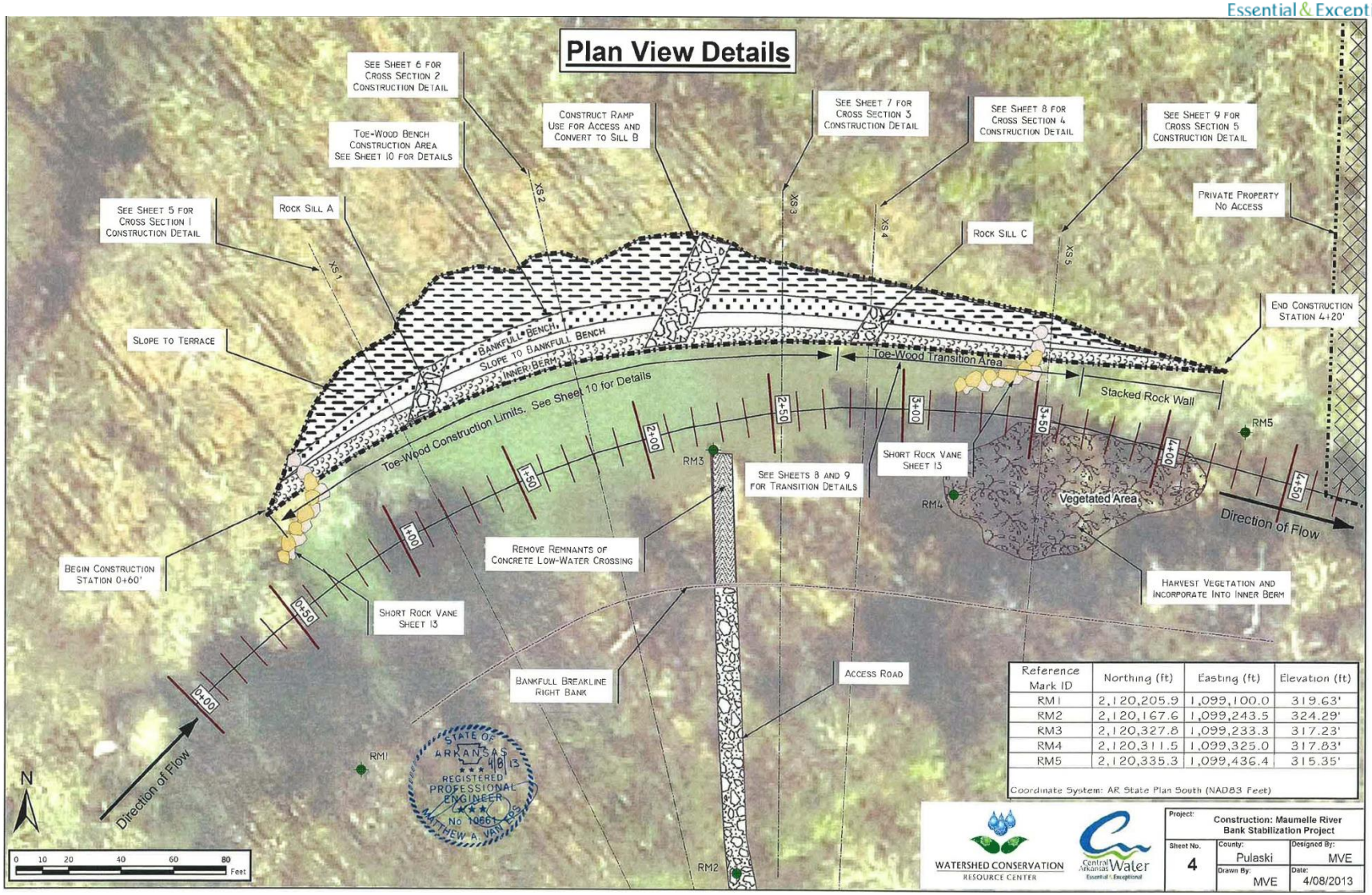
$0.45/meter
Generates
~$1m/yr

Funded 2,600 acres & conservation easements

Purchase price:
$4000 - $22000
Per acre

Streambank Restoration



Reference Mark ID	Northing (ft)	Easting (ft)	Elevation (ft)
RM1	2,120,205.9	1,099,100.0	319.63'
RM2	2,120,167.6	1,099,243.5	324.29'
RM3	2,120,327.8	1,099,233.3	317.23'
RM4	2,120,311.5	1,099,325.0	317.83'
RM5	2,120,335.3	1,099,436.4	315.35'

Coordinate System: AR State Plan South (NAD83 Feet)

WATERSHED CONSERVATION RESOURCE CENTER

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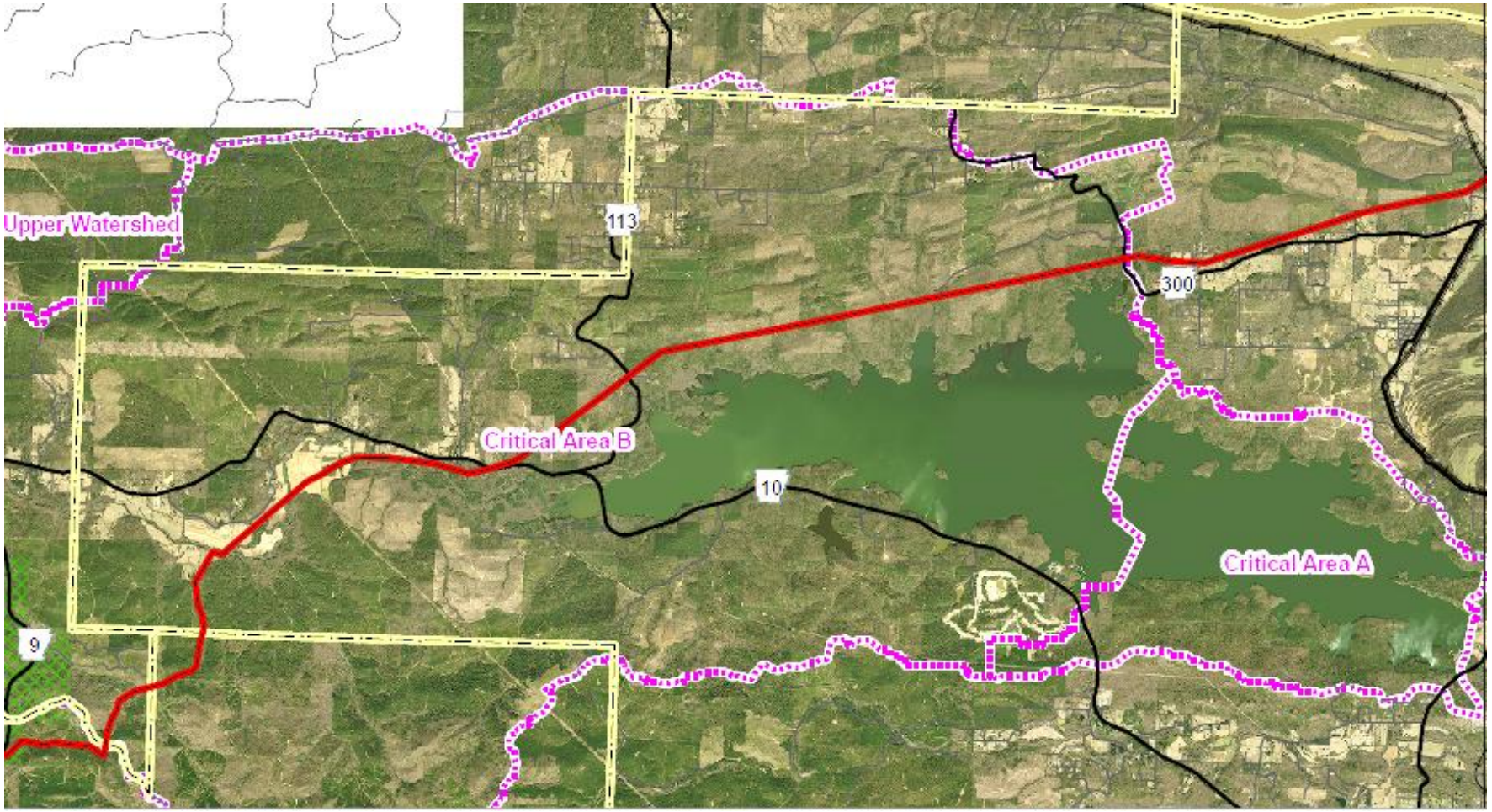
Project: Construction: Maumelle River Bank Stabilization Project		
Sheet No. 4	County: Pulaski	Designed By: MVE
	Drawn By: MVE	Date: 4/08/2013

Oil Pipeline in Watershed



March 29, 2013 - 210,000 gallons of Canadian diluted bitumen (dilbit)

Tornado April 2014

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Horizontal Asset Management Program

The Business of Water: Public Perception

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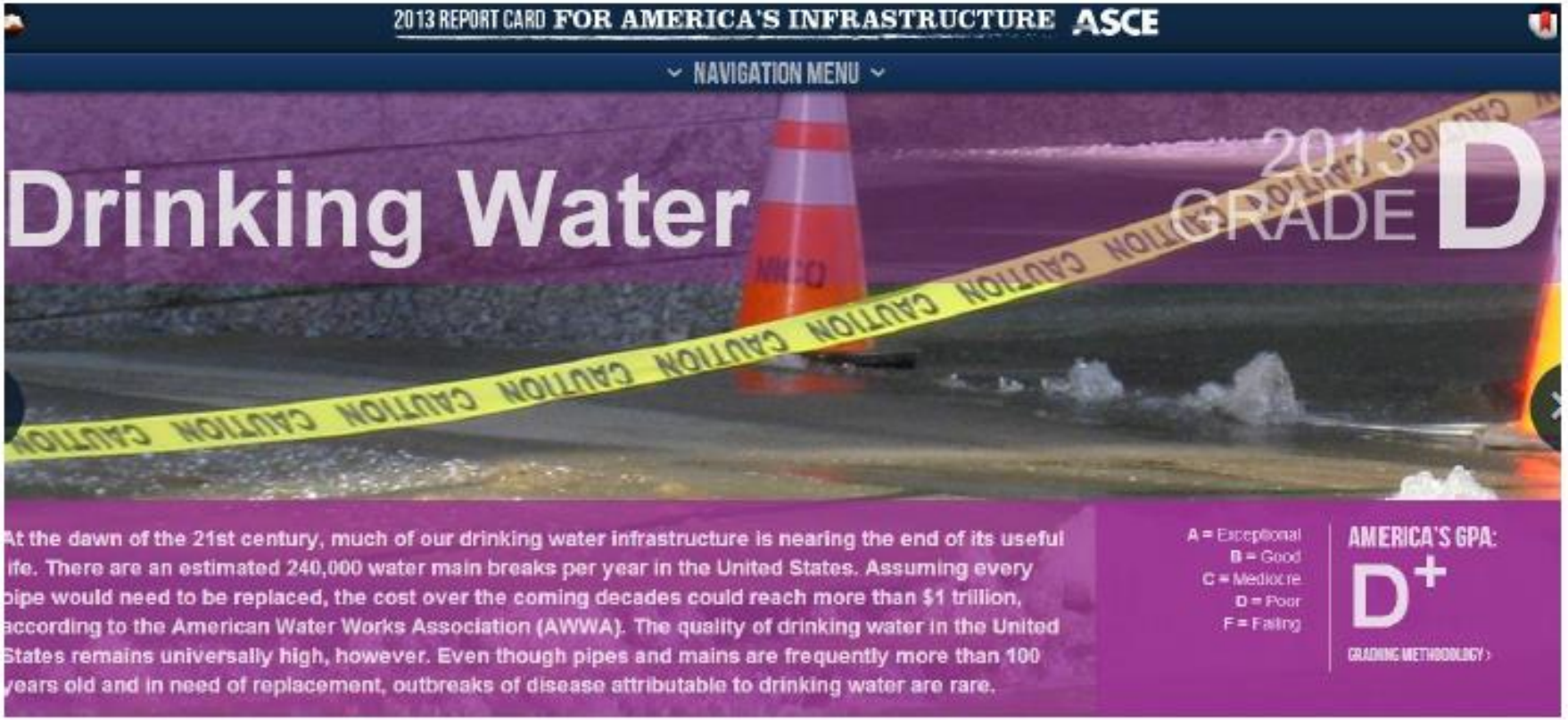
American Society of Civil Engineers

Infrastructure Report Card

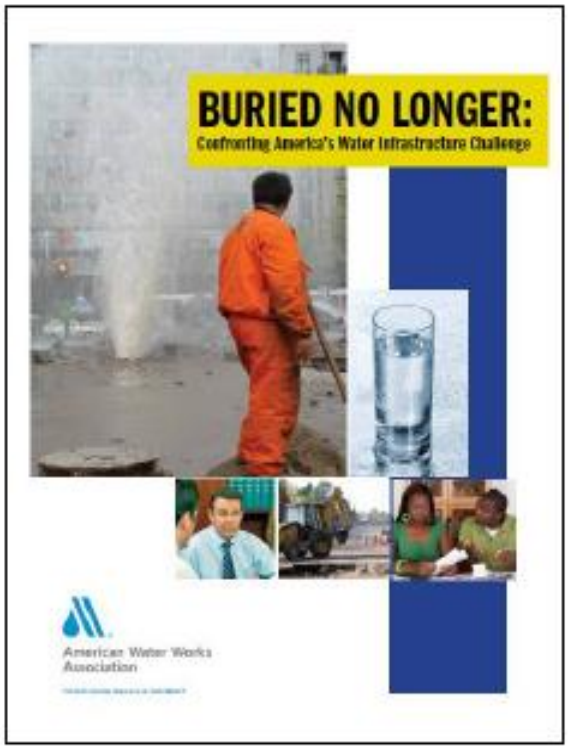


Drinking Water Infrastructure Funding Needs

AWWA 2012 Report

25 yr need = $1 trillion

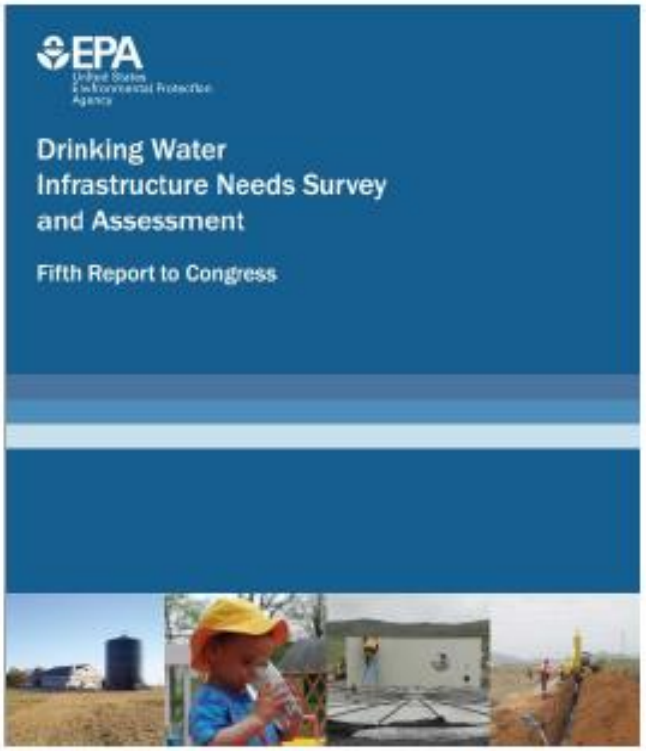
(Pipeline assets only)



EPA 2011 Survey

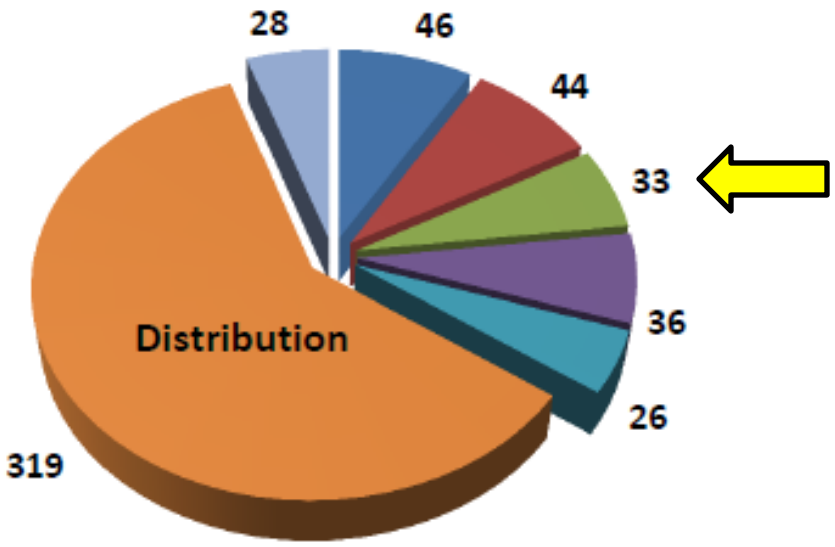
20 yr need = $384 billion

(All assets, no population growth)



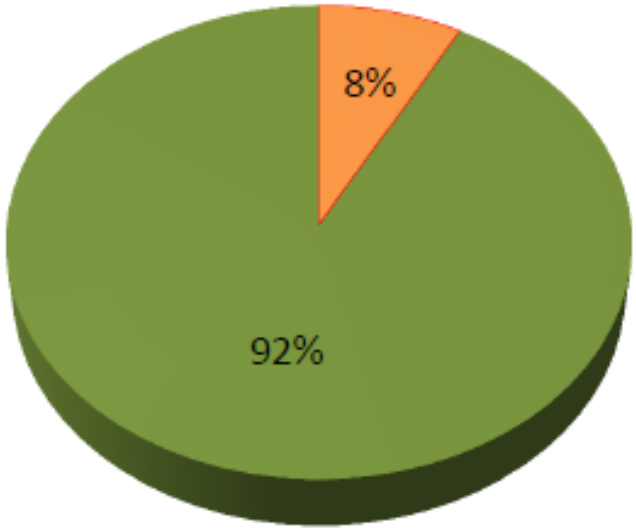
Assets vs. Capital Expenditures

CAW Capital Assets Total = $544 Million



- Land
- Building, fixtures and grounds
- Water source
- Purification
- Pumping
- Distribution
- Other equipment

Capital Expenditures - 2014



- Main Replacements
- All Other Capital Expenditures

Source: 2013 CAFR

Potential Watershed Land Value

Land Ownership	Acres	$4,000/Acre	$22,000/Acre
Reservoir	8,900	$35,600,000	$195,800,000
CAW Land <2007	8,500	$34,000,000	$187,000,000
CAW Land >2007	2,600	$10,400,000	$57,200,000
Total	**20,000**	**$80,000,000**	**$440,000,000**
53% Watershed	**46,640**	**$186,560,000**	**$1,026,080,000**

Top Targets

Black bass are the most popular sport fish species in Arkansas, and Lake Maumelle holds true to that trend. Forty-five percent of anglers surveyed during spring 2014 were pursuing black bass. Crappie anglers made up 25 percent, and anglers specifically targeting white bass made up 9 percent of those surveyed. It is important to note that this survey does not include anglers who bank fished, which make up a large percentage of panfish, catfish and white bass anglers.

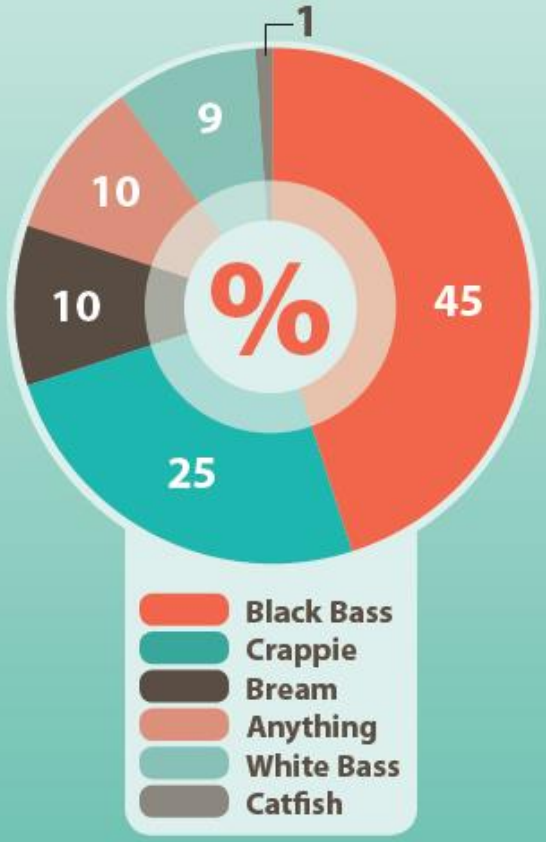


Table Fare

Anglers enjoy keeping a mess of fish from Maumelle's cool, clear water. About 29 percent of black bass caught were harvested. Crappie, a fish typically sought for food, were retained 73 percent of the time, while white bass and bream had harvest rates of 40 percent and 53 percent, respectively.

Estimated totals for March-May 2014

Black Bass
25,722..... Caught
18,245..... Released
7,478..... Harvested
29% Harvested

White Bass
9,582..... Caught
5,749..... Released
3,833..... Harvested
40% Harvested

Bream
6,598..... Caught
3,086..... Released
3,482..... Harvested
53% Harvested

Crappie
3,997..... Caught
1,095..... Released
2,901..... Harvested
73% Harvested

Arkansas Game & Fish Commission

Lake Maumelle

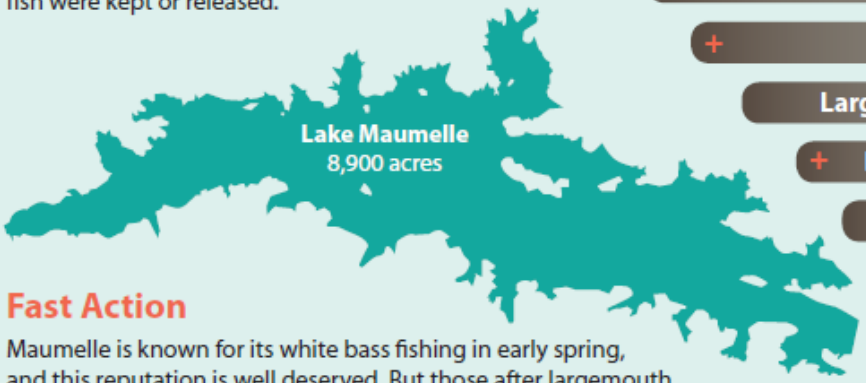
2014 Creel Survey

ARKANSAS GAME AND FISH COMMISSION

Maumelle Measures Up 2014 creel survey results

At 8,900 acres and only minutes from the largest city in Arkansas, Lake Maumelle should be one of the most popular destinations for anglers looking to wet a line without a huge investment in time or gas money. This water-supply reservoir, however, has suffered a harsh reputation with some anglers as a difficult place to catch fish.

Fisheries biologists with the Arkansas Game and Fish Commission conducted random creel surveys in spring 2014 to determine actual catch rates for many species and compare them to similar reservoirs. They spoke to 614 anglers at Jolly Roger's Marina and Sleepy Hollow Access after their fishing day to determine size and number of each species anglers caught, what species they were targeting and whether the fish were kept or released.



Size Matters

Largemouth bass and spotted bass in Maumelle do tend to run on the small side, but most other sport fish from the lake are larger on average than fish from similar waters in Arkansas and Tennessee. Again, white bass tend to stand out in the fishery, but channel catfish run much larger than average and are often disregarded in Lake Maumelle. Bluegill also tend to put on a few extra ounces, and anglers who target bream in a little deeper water tend to be rewarded with some nice dinner-sized fish.

Average fish weight on Lake Maumelle

- \+ Channel Catfish - 5.7 lbs.
- \+ White Bass - 1.4 lbs.
- Largemouth Bass - 1.2 lbs.
- \+ Black Crappie - 1.0 lbs.
- Spotted Bass - 0.8 lbs.
- \+ Bluegill - 0.5 lbs.

\+ Above Average

Fast Action

Maumelle is known for its white bass fishing in early spring, and this reputation is well deserved. But those after largemouth and spotted bass tend to complain about low catch rates. The creel survey shows catch rates for these two species are actually very high. Anglers averaged 1.2 fish per hour, as opposed to 0.7 fish per hour on several Arkansas and Tennessee reservoirs.

Change With the Seasons

During the creel survey, biologists observed trends in angler success for each species they were after. These "prime times" usually occurred during spawning season for these species, with the only exception being catfish biting best a bit earlier than their typical spawning season.

Best Month to Target

March	April	May
White Bass	Catfish Crappie	Bream Black Bass

Value Added

Aside from good fishing, Lake Maumelle helps recirculate local funds through boat launches and sales of gasoline, food and fishing equipment. Nearly all anglers surveyed (99 percent) were Arkansas residents, with 64 percent being from Pulaski County and 21 percent being from Saline County. Anglers in boats spent an average of **$40 per fishing trip** to the lake, contributing an estimated **$389,055 to the local economy** during March, April and May of 2014.

Catch Rates Per Hour

\+ Above Average

2.1	1.5	1.2	0.3	0.3
\+ White Bass	Bream	\+ Black Bass	Crappie	Catfish

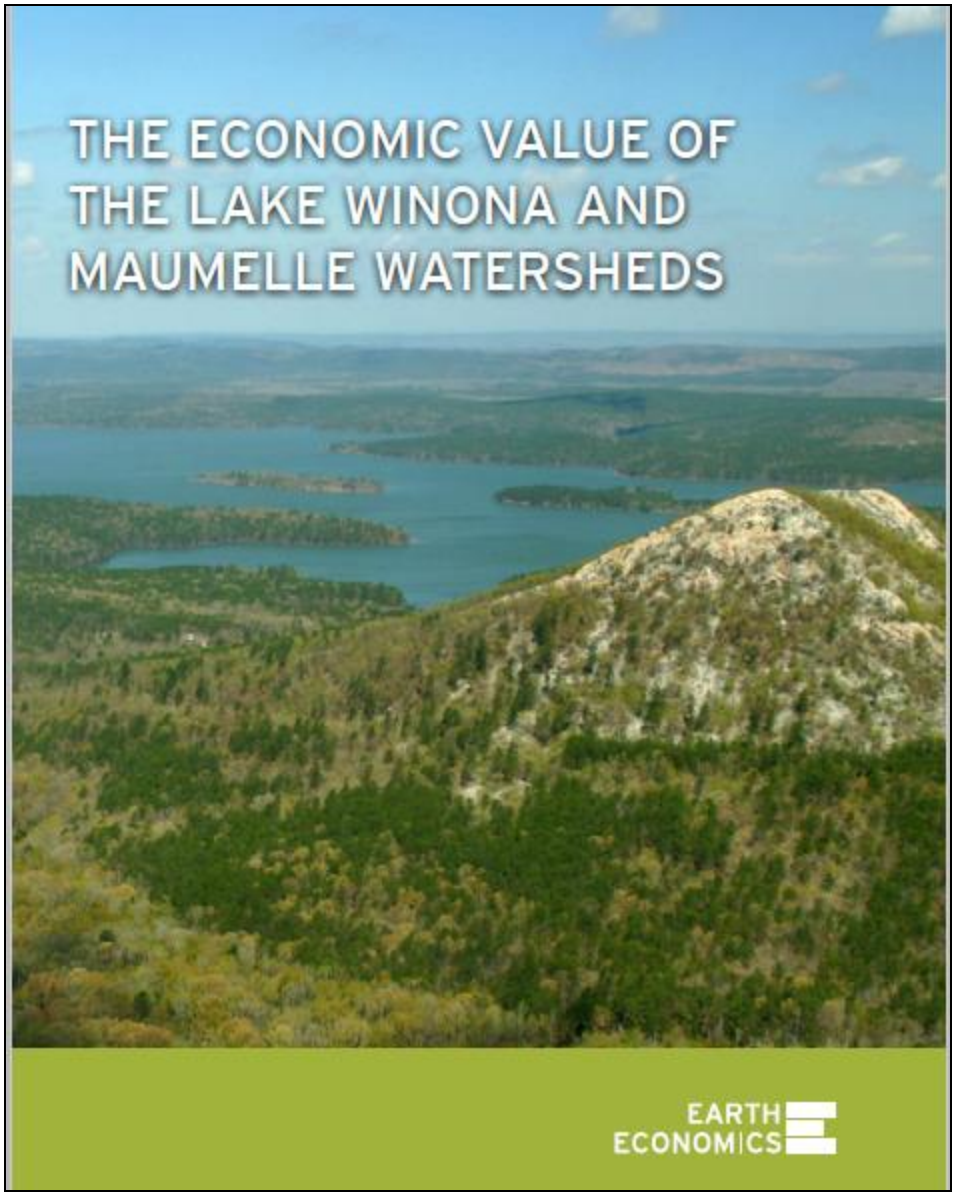
Location	March	April	May	Total
Jolly Rogers	2,263.00	3,146.00	2,521.00	7,930.00
Sleepy Hollow	680	899	595	2,174.00
Total	2,943.00	4,045.00	3,116.00	10,104.0 (± 1,613)

Average trip length (hrs)				
Jolly Rogers	3.8	4.2	5.2	4.4 (0.43)
Sleepy Hollow	3.4	2.4	2.5	2.8 (0.31)

Average spent ($)/trip				
Jolly Rogers	39.7	39.2	40.6	39.9 (1.6)
Sleepy Hollow	31.3	30	42.5	33.3 (4.4)

Value fishery ($)				
Jolly Rogers	89,827.00	123,339.00	102,353.00	315,520.00
Sleepy Hollow	21,261.00	26,970.00	25,303.00	73,534.00
Total value of fishery ($)	111,088.00	150,309.00	127,656.00	**389,055.0 (± 61, 577)**

The total and monthly number of fishing trips, value of the fishery (US$), average amount spent per fishing trip ($), and average trip length (hours) for anglers launching boats from the Jolly Rogers and Sleepy Hollow accesses of Lake Maumelle during March, April, and May of 2014. Standard error values are in parenthesis. 99% Confidence Intervals are in parentheses and are denoted by ±.



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Wahlund, N., Cooley, C., and Wood, P. 2015. The Economic Value of the Lake Winona and Maumelle Watersheds. Earth Economics, Tacoma, WA.

Acknowledgements:

This report was generously supported by the Walton Family Foundation.

Earth Economics' research team for this project included Rowan Schmidt, Angela Fletcher, Tedi Dickinson, and TaNeashia Sudds. Cover and layout design by Paula Wood. This report was edited by Jessica Hanson.

Gaps Analysis Table

	Cultivated	Forests	Grasslands	Pasture	Water	Wetlands
Aesthetic Information	X				X	X
Air Quality		X				X
Biological Control	X	X	X	X		
Climate Stability						
Cultural Value	X	X		X	X	X
Disaster Risk Reduction					X	X
Energy & Raw Materials	X	X				X
Food	X			X		X
Habitat		X				X
Medicinal Resources						
Ornamental Resources						
Pollination & Seed Dispersal		X	X	X		
Recreation & Tourism		X			X	X
Soil Formation	X	X	X	X		
Soil Retention	X	X				
Soil Quality						
Water Capture, Conveyance, & Supply		X	X			X
Water Quality		X	X		X	X
Water Storage		X			X	

KEY		
	X	Ecosystem services present and valued in this study
		Ecosystem services present but not valued in this study
		Ecosystem services not produced by this land cover type

Lake Maumelle Watershed

Primary Ecosystem Services

	Acres	Low ($/acre/year)	High ($/acre/year)	Total Low ($/year)	Total High ($/year)
Cultivated	15	$129	$129	$1,935	$1,937
Forests	67,918	$69	$915	$4,655,779	$62,123,915
Grasslands	7,002	$57	$63	$399,865	$442,365
Pasture	464	$7	$7	$3,374	$3,374
Water	9,012	$1,425	$2,258	$12,846,298	$20,347,519
Wetlands	467	$3,723	$18,828	$1,739,400	$8,796,287
Totals	**84,878**			**$19,646,650**	**$91,715,398**

Secondary Ecosystem Services

	Acres	Low ($/acre/year)	High ($/acre/year)	Total Low ($/year)	Total High ($/year)
Cultivated	15	$175	$489	$2,620	$7,330
Forests	67,918	$369	$5,041	$25,067,855	$342,388,901
Grasslands	7,002	$30	$30	$212,711	$212,711
Pasture	464	$160	$329	$74,185	$152,848
Water	9,012	$2,104	$3,378	$18,961,098	$30,439,089
Wetlands	467	$864	$15,954	$403,862	$7,453,718
Totals	**84,878**			**$44,722,330**	**$380,654,596**

Lake Winona Watershed

Primary Ecosystem Services

	Acres	Low ($/acre/year)	High ($/acre/year)	Total Low ($/year)	Total High ($/year)
Forests	24,705	$69	$915	$1,693,548	$22,597,691
Grasslands	728	$57	$63	$41,593	$46,014
Water	1,126	$1,425	$2,258	$1,605,627	$2,543,186
Wetlands	64	$3,723	$18,828	$239,019	$1,208,736
Totals	**26,624**			**$3,579,787**	**$26,395,627**

Secondary Ecosystem Services

	Acres	Low ($/acre/year)	High ($/acre/year)	Total Low ($/year)	Total High ($/year)
Forests	24,705	$69	$915	$1,693,548	$22,597,691
Grasslands	728	$57	$63	$41,593	$46,014
Water	1,126	$1,425	$2,258	$1,605,627	$2,543,186
Wetlands	64	$3,723	$18,828	$239,019	$1,208,736
Totals	**26,624**			**$3,579,787**	**$26,395,627**

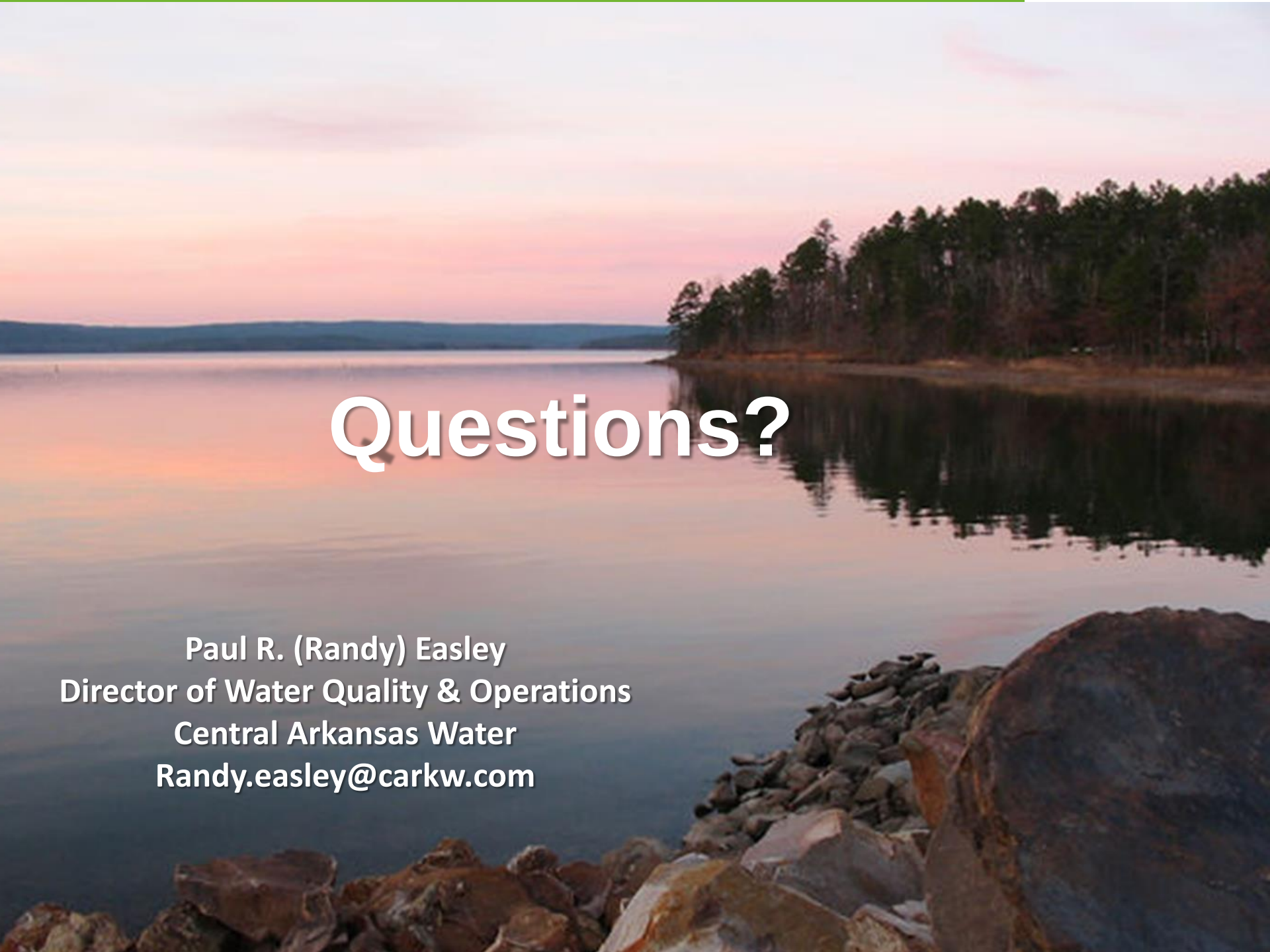
Water Sales Revenue

2010	2011	2012
$44,734,656	$47,899,601	$49,448,601

2013	2014	2015
$45,998,541	$45,070,592	$45,998,541

5 Year Average Revenue - $46,525,089

Water Source Asset Value - $33,000,000



Paul R. (Randy) Easley
Director of Water Quality & Operations
Central Arkansas Water
Randy.easley@carkw.com