

8-Digit HUC Watershed Prioritization in Arkansas - Risk Assessment Matrix Approach

**2014 Update
Threatened and Endangered (T&E) Species**

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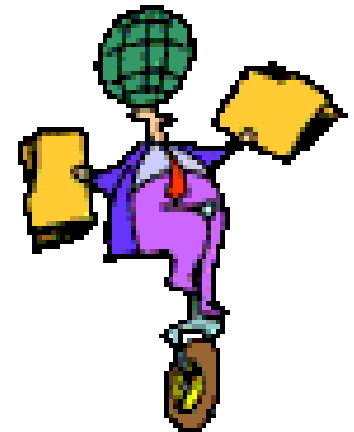


What is Arkansas Watershed Prioritization Approach?



Pro-active stakeholder participation

A comparative risk assessment based collaborative process that integrate scientific analysis and stakeholder deliberation



For further details please refer:

Fact sheet #FSPPC 116- Watershed prioritization for managing nonpoint source pollution in Arkansas.

Available at <http://www.uaex.edu/publications/pdf/FSPPC116.pdf>



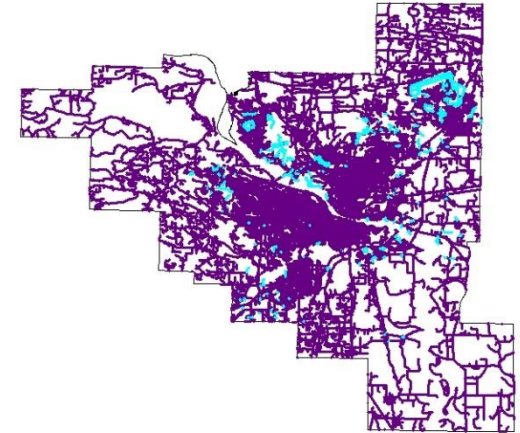
What Data Sources are considered?



Federal



State




NASS Data, Census Data, 303(d) list, Land Use Land Cover, and Road network



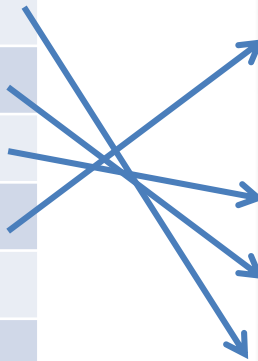
Continuous Stakeholder Engagement

2005-2009 Plan

2008 Revision

Sl#	Approved category
1	Water Body impairment
2	Human Health Impact
3	Biotic Impacts
4	Potential Human Exposure
5	Construction 
6	Rural Roads
7	Non-row Crop Agriculture
8	Row Crop Agriculture
9	Urban
10	Forestry
11	Priority of a Bordering State

1. Water Body Impairment
2. Designated Use Impact
3. Biotic Impacts
4. Potential Human Exposure
5. Urban and Suburban Population 
6. Impervious Surface
7. Economic Activity 
8. Cropland
9. Livestock and Pasture
10. Unpaved Roads
11. Forestry
12. Priority of Neighboring State



Scoring Approach

Assign Score for Each Category

3	4	8	10
2	6	8	6
3	10	5	1
3	7	9	10

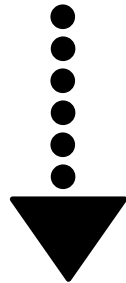
3	4	8	10
2	6	8	6
3	10	5	1
3	7	9	10

0	10	0	10
10	0	0	0
0	0	0	0
0	0	0	10

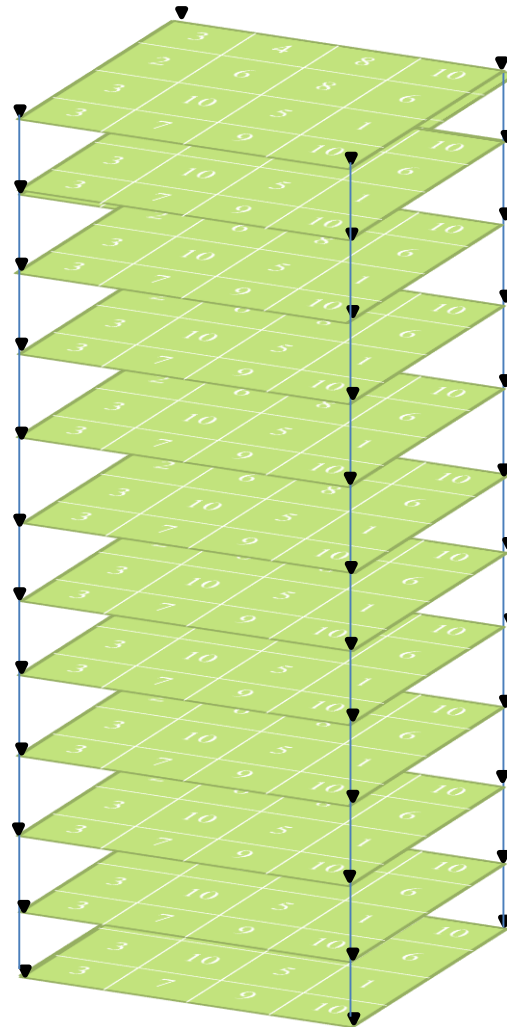
1. Water Impairment

2. Use Impact

12. Neighboring State Priority



Overlay



Final Score

$$\begin{aligned}
 &= \\
 &1. \text{ Water Impairment } \boxed{X} \\
 &2. \text{ Use Impact } + \\
 &3. \text{ Biotic Impact } + \\
 &4. \text{ Human Exposure } + \\
 &5. \text{ Urban/Suburban Population } + \\
 &6. \text{ Impervious Surface } + \\
 &7. \text{ Economic Activity } + \\
 &8. \text{ Cropland } + \\
 &9. \text{ Livestock \& Pasture } + \\
 &10. \text{ Unpaved Roads } + \\
 &11. \text{ Forestry } + \\
 &12. \text{ Neighbor's Priority } \boxed{) }
 \end{aligned}$$



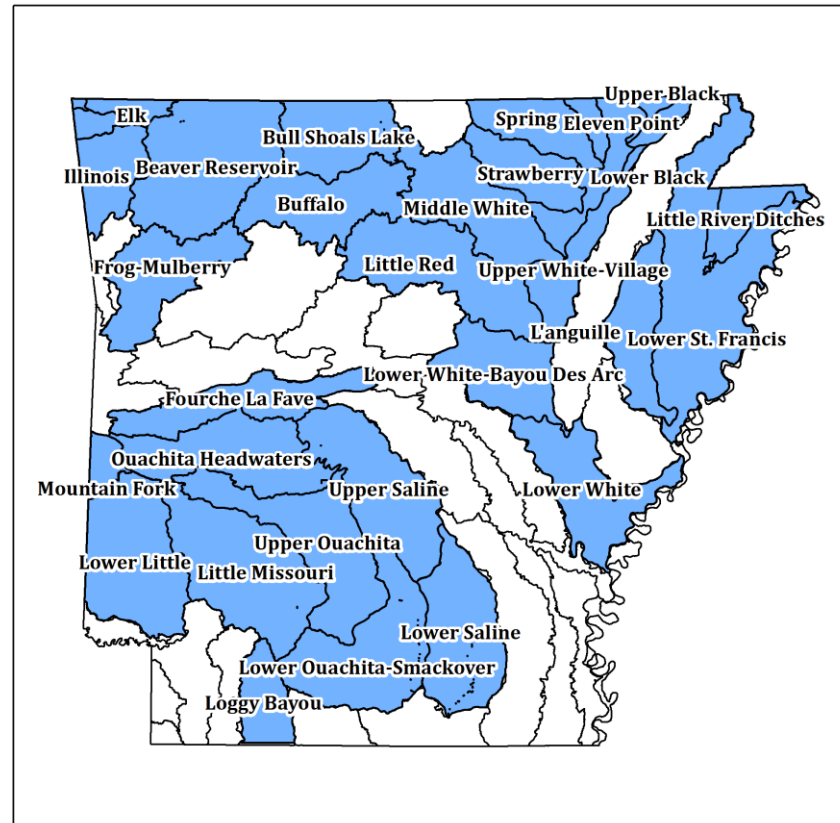
Proposed Revision- Time line

1. During 2013 ANRC NPS Annual Stakeholder meeting, a proposal to include Threatened and Endangered (T&E) species in the matrix was considered
2. A workgroup was formed to discuss adding T & E species as matrix variable
3. The group met on November 6, 2013 and May 28, 2014 and came up with an approach for consideration by the stakeholders group



T&E Species in AR Watersheds

Threatened & Endangered Species



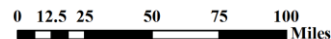
**Present in 32
(out of 58)
8-digit HUC
watersheds**



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Department of Biological and Agricultural Engineering



Data Source:
Geostor (www.geostor.arkansas.gov),
NRCS (datagateway.nrcs.usda.gov)
Map Created: September 16, 2014



UTM NAD 83
ZONE 15N

Source: Chris Davidson,
US Fish and Wildlife
Service



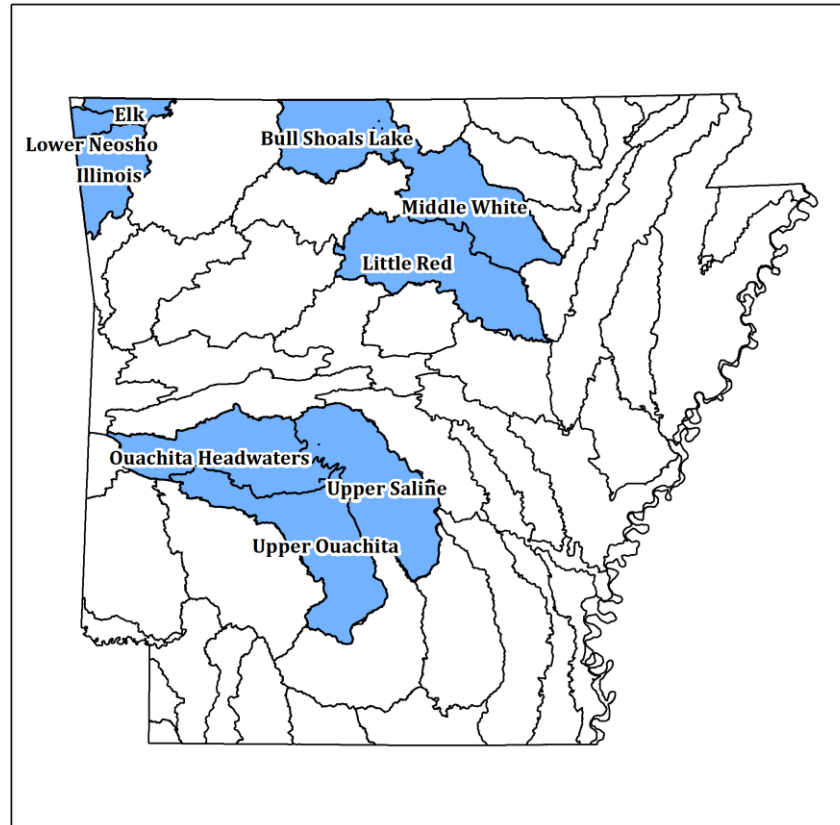
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ANRC NPS Annual Stakeholder Meeting, September 17, 2014

T&E Species Endemic to Arkansas

Threatened & Endangered Species Endemic to Arkansas



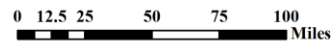
**Present in 9
(out of 58)
8-digit HUC
watersheds**



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Data Source:
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Map Created: September 16, 2014



UTM NAD 83
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Source: Chris Davidson,
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Service



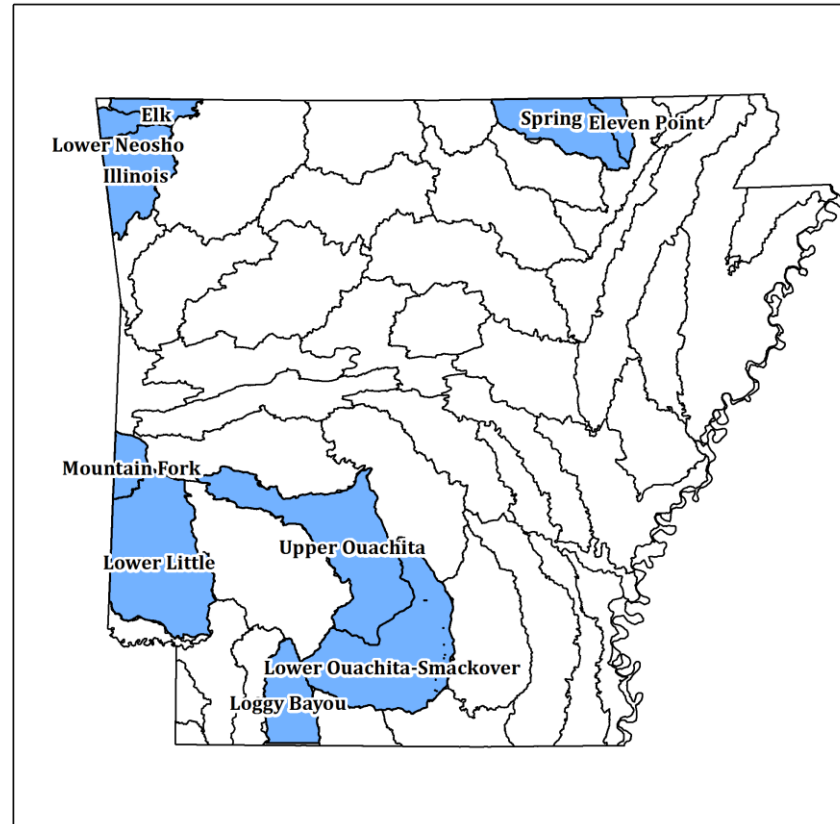
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T&E Species Endemic to Region

Threatened & Endangered Species Endemic to Region



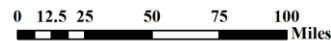
**Present in 10
(out of 58)
8-digit HUC
watersheds**



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Data Source:
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Map Created: September 16, 2014



UTM NAD 83
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Source: Chris Davidson,
US Fish and Wildlife
Service



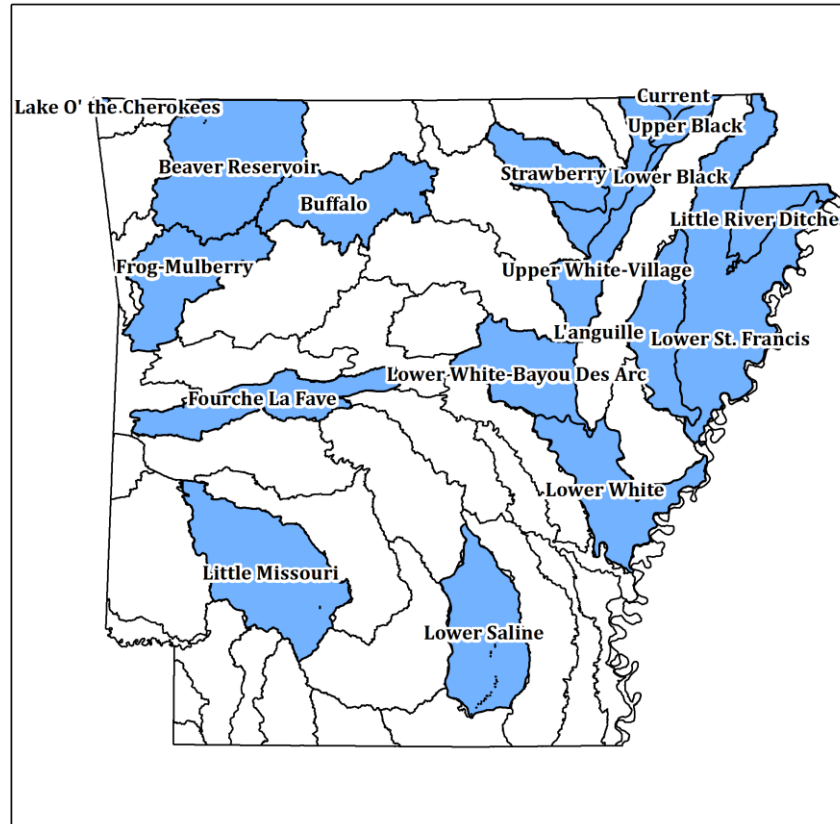
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ANRC NPS Annual Stakeholder Meeting, September 17, 2014

T&E Species Neither Endemic to Arkansas or Region

Threatened & Endangered Species Not Endemic to Arkansas or Region



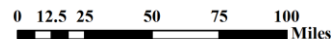
**Present in 17
(out of 58)
8-digit HUC
watersheds**



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Data Source:
Geostor (www.geostor.arkansas.gov),
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Map Created: September 16, 2014



UTM NAD 83
ZONE 15N

Source: Chris Davidson,
US Fish and Wildlife
Service



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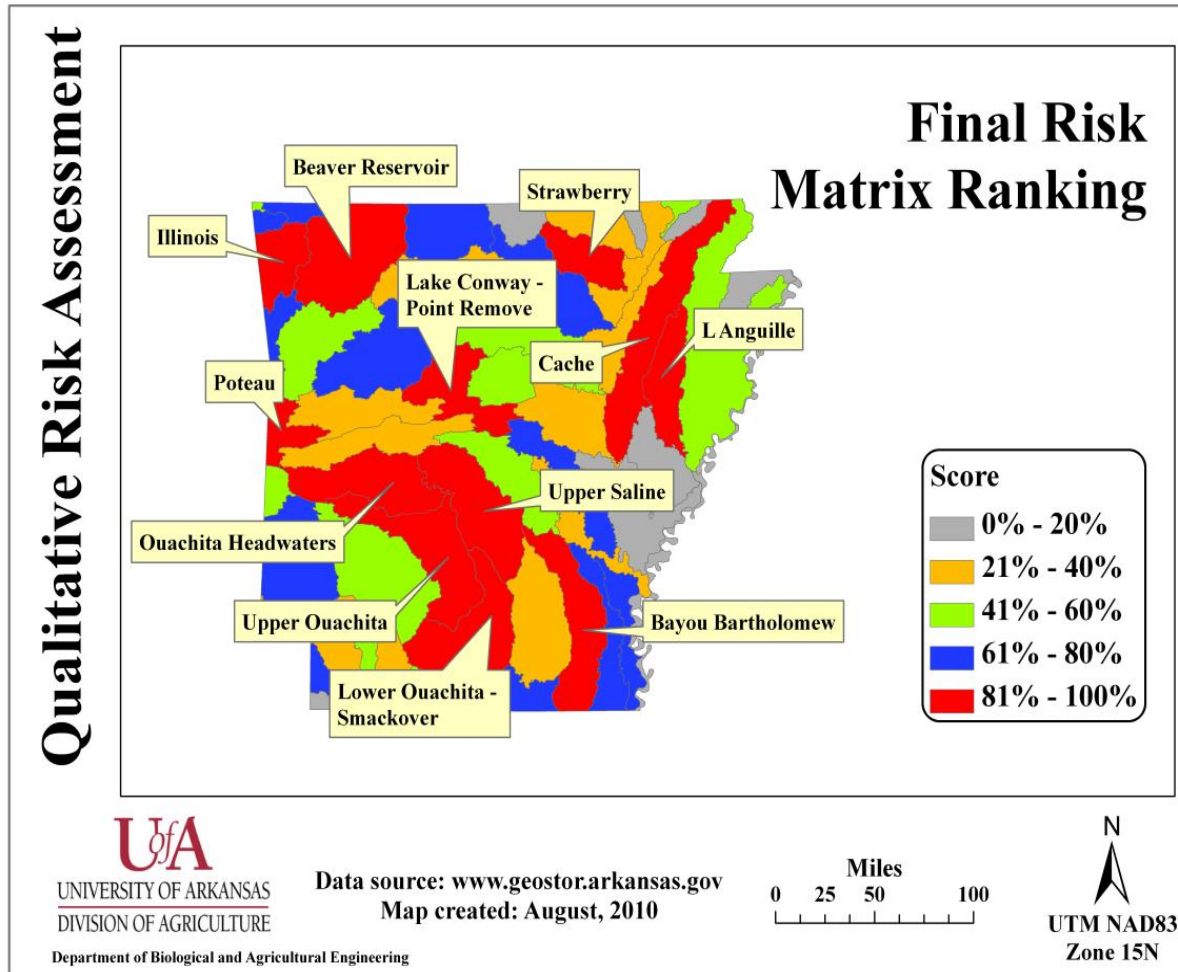
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ANRC NPS Annual Stakeholder Meeting, September 17, 2014

Demo



Priority Map (excluding T&E)



Acknowledgments

Mr. Tom Riley, Retired Director, Public Policy Center,
University of Arkansas Division of Agriculture Cooperative
Extension Service

Ben Hancock, Staff Member at Biological and Agricultural
Engineering Department



Questions/Discussions



Priority Watersheds

Subwatershed Name	HUC (8-digit)	Drainage Area (km ²)	Majority Land Use	Final Risk Matrix Percentile
Beaver Reservoir	11010001	5625.71	Forest (64%)	100
Poteau	11110105	1442.52	Forest (61%)	98
Bayou Bartholomew	08040205	3976.38	Forest (59%)	97
Illinois	11110103	1962.51	Pasture (45%)	95
Ouachita Headwaters	08040101	4007.36	Forest (77%)	93
Lake Conway-Point Remove	11110203	2961.08	Forest (54%)	91
Upper Ouachita	08040102	4542.74	Forest (79%)	90
Upper Saline	08040203	4442.43	Forest (78%)	88
L Anguille	08020205	2473.54	Crops (71%)	85
Cache	08020302	5067.21	Crops (67%)	85
Strawberry	11010012	1971.50	Forest (58%)	83
Lower Ouachita-Smackover	08040201	4662.94	Forest (82%)	81



Risk Matrix Summary

Watershed	HUC 8 digit	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	Total
Beaver Reservoir	11010001	10	10	10	10	8.28	5.69	7.93	4.14	8.79	2.76	6.31	10	838.97
Poteau	11110105	10	0	10	10	8.62	8.62	9.22	2.41	4.31	5.86	3.45	10	725.00
Bayou Bartholomew	8040205	10	10	10	8	4.14	3.62	2.47	6.72	4.05	4.31	7.41	10	707.24
Illinois	11110103	8	5	0	10	9.31	9.66	9.91	5.34	8.10	8.45	5.52	10	650.34
Ouachita Headwaters	8040101	10	5	10	10	7.24	8.28	5.14	0.86	3.19	8.79	5.57	0	640.69
Lake Conway-Point Remove	11110203	8	10	10	10	7.93	9.14	9.48	5.17	6.55	3.62	5.69	0	620.69
Upper Ouachita	8040102	10	10	10	10	3.97	6.03	4.53	0.69	1.72	7.93	6.78	0	616.55
Upper Saline	8040203	8	10	10	10	8.10	8.45	5.31	1.72	1.90	9.31	5.97	0	566.07
Cache	8020302	10	4	10	2	5.86	3.79	6.90	8.97	2.16	7.59	5.17	0	564.31
L. Anguille	8020205	10	10	10	2	4.83	5.00	3.07	9.14	1.38	7.41	3.60	0	564.31
Strawberry	11010012	10	10	10	2	3.28	5.17	3.45	5.00	3.45	8.28	4.91	0	555.34
Lower Ouachita-Smackover	8040201	10	10	10	8	2.07	3.28	6.29	0.34	1.90	5.69	7.12	0	546.90

*C1 = Water body impairment, C2 = Designated usage, C3 = Biotic impact, C4 = Potential human impact, C5 = Urban suburban population, C6 = Impervious surface, C7 = Economic activity, C8 = Cropland, C9 = Livestock and pasture, C10 = Unpaved roads, C11 = Forestry, C12 = Adjacent state priority



Selected Priority Watersheds

Name	HUC 8 Digit	Name of impaired streams/segments	Causes for impairment*	Source
Ouachita Headwaters	8040101	Marzam Creek	pH	NO T SPECIFIED
		Little Marzam Creek	pH	UN
		Prairie Creek	DO, Cu, Tb	SE
Upper Ouachita	8040102	Cove Creek	pH, SO4, TDS	RE, UN
		Chamberlain Creek	pH, SO4, TDS, Cu, Zn, Cd	RE
		Lucinda Creek	pH, SO4, Zn	RE
		D.C. Creek	Zn	RE
		Caddo River	Tb, Zn	RE
		Ouachita River	Zn	UN
		Deceiper Creek	pH	UN
		Freeo Creek	pH	UN
		White Oak Creek	pH	UN
		Tulip Creek	pH	UN
Cypress Creek	pH	UN		
S. Fork Caddo		Cu, Zn	RE	



Selected Priority Watersheds

Name	HUC 8 Digit	Name of impaired streams/segments	Causes for impairment*	Source
Cache	8020302	Cache River	TDS, Pb, Tb	AG
		Frierson Lake	Sl, Cu	UN
		Old Town	NU	UN
		Bayou DeView	Cl, TDS, Pb	IP, MP, AG
		Lost Creek Ditch	Cl	UN
Strawberry	11010012	Strawberry River	Tb, PA	SE
Lower Ouachita-Smackover	8040201	Moro Creek	Cu, Pb, Tb, Hg	UN, SE
		Ouachita River	Cu, Zn, Hg	UN
		L. Champagnolle Cr.	Hg	UN
		Champagnolle	Hg	UN
		Elcc Tributary	Cu, Zn, NO3, Cl, SO4, TDS, AM	IP
		Flat Creek	Cu, Zn, Cl, SO4, TDS	RE , IP
		Salt Creek	pH, Cu, Cl, TDS	RE , IP
		Prairie Creek	Tb	SE
		Smackover Creek	DO, Zn	UN
Jug Creek	Cu	MP		

