



# Arkansas Water Plan Update



## Attachment 4. Memorandum on Priority Water Issues in Arkansas

*To: Issues and Recommendations Workgroup Members*

*From: Kent Thornton, FTN Associates*

*Date: February 28, 2014*

*Subject: Regional Priority Water Issues*

### 1.0. Background

The first Issues and Recommendations Workgroup meeting was held on January 14, 2014. This statewide meeting initiated the process of identifying water issues by 11 water use sectors:

- Agriculture – Irrigation
- Agriculture – Livestock/Poultry/Aquaculture
- Fish and Wildlife
- Recreation
- Thermoelectric Power
- Industry
- Public Water/Wastewater Providers
- County Governments
- Municipal Governments
- Navigation
- Conservation Districts

Each of the sectors contributed additional issues to a preliminary list of water issues that was provided to each Workgroup member prior to the meeting. This combined list of issues was synthesized and consolidated and distributed to each Workgroup member for their review and use in eliciting additional issues from members of their community and sector peer group.

A series of regional Workgroup meetings were held in February to identify the highest priority water issues in each region. The regions and meeting location were:

- East Region – Jonesboro
- North Region – Mountain View
- West-central Region – Russellville
- South-central Region – Hot Springs
- Southwest Region – Texarkana

The same format was used for each region meeting. The water use sectors met to discuss, integrate, and identify the 5 highest priority issues in their sector. These 5 priority issues were sorted into one of 10 categories:

- Surface Water Quantity
- Groundwater Quantity
- Water Conservation and Shortages
- Water Quality
- Infrastructure
- Funding and Incentives
- Water Law and Regulations
- Measurement and Assessment
- Planning
- Public Awareness of Water Resource Issues.

The Workgroup then discussed a maximum of 55 water issues and identified the highest priority regional water issue in each category. Each Sector Spokesperson was given 10 votes to cast for the issues that that sector considered to be the highest priority in the region. This voting could range from one vote for the highest priority issue in each category to all 10 votes for one issue considered to be the highest priority in the region. The combined sector votes were tallied to determine the highest priority regional water issues.

## **2.0 Regional Priority Issues**

The 10 highest priority water issues in each region based on the voting are shown in the following sections. The 5 appendices list all the priority water issues and associated votes within each of the 5 Planning Regions.

### **2.1 East Region**

About 60 individuals participated in discussions at the East Region meeting. The 10 highest priority water issues in the East Region were:\*

1. Quantification of instream water needs for navigation, current and future riparian use, interstate compacts, fish and wildlife, and aquifer recharge based on sound science is needed for all Arkansas streams to determine the amount of water available for diversion from surface water to satisfy beneficial out of stream uses (i.e., agriculture, livestock, industrial, recreation).

\*Declining groundwater levels were acknowledged by nearly every participant as the predominant issue in the East Region. As such, it was not ranked because it was the obvious issue.

2. Overdrafting of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overdrafting contributes to reduced streamflow because of reduced groundwater discharge to streams.
3. The state needs to be more proactive in addressing potential shortages before the need for allocation is required, and establish a pre-shortage allocation process through coordination of all stakeholders.
4. There is insufficient funding for:
  - a. Existing and on-going water projects
  - b. Future projects
  - c. Conservation/water management practices
  - d. Research
  - e. Outreach and education, and
  - f. Synthesis of existing, available tools, practices, and funding incentives.
5. There is no single source of water data or information across agencies.
6. A modernized administrative structure is needed for statewide water management (one authority), rather than having it distributed across multiple agencies.
7. Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.
8. Water conservation practices are not being aggressively pursued as an alternative to development for future needs.
9. Infrastructure for existing, on-going, and future projects is inadequate, including moving water from where it is, to where it is needed. This includes infrastructure for reducing flood flow and addressing drainage issues. In addition, the 25% excess surface water definition needs scientific justification.
10. Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.

## **2.2 North Region**

Approximately 40 individuals participated in discussions in the North Region. The 10 highest priority water issues in the North Region were:

1. The Fish and Wildlife Framework for Documenting Alternative Approaches for Estimating Fish and Wildlife Flows in Arkansas and Implementing the State Water Plan needs to be incorporated into the water plan to provide for alternative measure of “excess surface water” and process for determining minimum low flows during times of shortages.

2. Incremental costs and benefits associated with water quality improvements should be understood and quantified. A cost/benefit analysis should be required for any water quality changes.
3. The 25% restriction used to estimate “excess surface water” should be increased so additional water is available for non-riparian use.
4. All water that is withdrawn from a stream should not be assumed to be consumed. Demand estimates should include the return flow from these withdrawals.
5. Regulatory restrictions make it difficult to restore streams and need to be changed.
6. “Excess available water” might be based on the lowest historical gap year rather than 25% of average annual (more conservative approach).
7. Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.
8. Reallocation of storage in Corps of Engineer reservoirs needs to occur.
9. Additional funding sources are needed for water/sewer projects.
10. (three-way tie)
  - a. Water quality is as important as water quantity, and should be considered in the water plan.
  - b. There is insufficient information on the volume and yield of groundwater aquifers in the North Region.
  - c. Greater emphasis is needed on reuse, recycling, and water conservation education.

### **2.3 West-central Region**

Approximately 60 individuals participated in discussions in the West-central Region. The 10 highest priority water issues in the West-central Region were:

1. Quantification of instream water needs for navigation, current and future riparian use, interstate compacts, fish and wildlife resources, and aquifer recharge based on sound science is needed for all Arkansas streams to determine the amount of water available for diversion from surface water to satisfy beneficial out of stream uses (i.e., agriculture, livestock, industrial, and recreation).
2. Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.
3. Groundwater monitoring and modeling need to be included (for West-central region) in the state water plan to help us determine if radial wells in the sandy alluvial aquifer along the Arkansas River could be considered to provide water supply for

communities, understanding that overdrafting of groundwater aquifers can lead to permanent loss of storage because the aquifers collapse.

4. Erosion, inadequate nutrient management, and other impairments exist on all Arkansas streams as well as Extraordinary Resource Waters. Streams and Extraordinary Resource Waters need more protection (i.e., conservation programs).
5. There is inadequate water supply for livestock watering during summer months.
6. New surface water impoundments are needed to provide adequate water supply.
7. Reallocation of storage for water supply in Corps lakes needs to occur.
8. Federal and state regulations impede implementing and effectively managing water utility projects.
9. Any legislation needs to be tailored to regions. One statewide size does not fit all regions.
10. Returned water should be included in the calculations of available water. "Withdrawn" does not necessarily always mean "consumed."

## **2.4 South-central Region**

Approximately 40 individuals participated in discussions in the South-central Region. The 10 highest priority water issues in the South-central Region were:

1. Lock and dam maintenance on the Ouachita River is needed to ensure navigation pools continue to provide for municipal/industrial water supply, recreation, and flood damage protection.
2. There is a Lack of funding to construct additional surface water impoundments in critical groundwater areas.
3. Quantification of in-stream water needs for navigation, riparian use, interstate compacts, fish and wildlife, and aquifer recharge based on sound science is needed for ALL Arkansas streams.
4. Degradation of surface water from nonpoint sources is a problem throughout the state. Degradation of groundwater due to over-withdrawal is a problem in specific regions in the state. Erosion and sedimentation (nonpoint source pollution) is a significant problem contributing to water quality problems and should be considered as high of a priority as water quantity.
5. Outstanding Resource Waters need special protection for both water quantity and quality.
6. Coordination between state agencies, as well as adaptive management, is needed prior to drought conditions so that plans are made ahead of time. One way this could happen would be through more frequent revisions of the state water plan.

7. Reallocation of storage for water supply is needed in federal Corps lakes to make those sources more readily available for drinking water.
8. It has been over 20 years since the last water plan update. We have more data and more sophisticated models; therefore, greater accuracy. These increased accuracies should allow a greater percentage of the excess surface water to be used.
9. (Five-way tie)
  - a. Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.
  - b. The highest and best use of water (surface or ground) is as drinking water. This should be reflected in state policy (state water plan) and in state regulations (higher priority in ADEQ regulations No. 2 and No. 6).
  - c. A threat of change in federal laws for navigation threatens the maintenance of Ouachita River pool elevations.
  - d. Industry should be encouraged to use surface water.
  - e. More surface water impoundments are needed in critical groundwater areas.

## **2.5 Southwest Region**

Approximately 30 individuals participated in discussions in the Southwest Region. The 10 highest priority water issues in the Southwest Region were:

1. Surface water impoundments are needed on the Red River so southwest Arkansas can benefit: water supply – industrial and municipal, recreation, fish and wildlife, irrigation, flood risk reduction, and navigation.
2. There is concern that the first priority for Arkansas water may not be for Arkansas residents.
3. Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.
4. Surface water should be the first priority source for all water uses.
5. Coordination between state agencies during times of drought, shortages, and when permitting non-riparian uses needs to be explicitly incorporated into the water plan.
6. Water conservation practices are not being aggressively pursued as an alternative to development to meet future needs.
7. Additional surface water impoundments are needed for better utilization of water to meet human needs.
8. The number of stream gages throughout the state is declining. Stream gaging networks need to be maintained so changes in water supply can be assessed.

9. Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.
10. The process of allocating water is unclear. Our concern is, how will water be set aside to meet demand of future industrial plants – timber or food related?

## **2.6 Statewide Issues**

There were similar issues raised across many of the regions. While the wording was slightly different within regions, the following were raised as priority water issues across multiple regions:

1. Groundwater table declines are an on-going issue and are expected to increase in the future. In some regions, there are no groundwater models for estimating existing aquifer volumes and yields.
2. Quantification of instream water needs for navigation, current and future riparian use, interstate compacts, fish and wildlife, and aquifer recharge based on sound science is needed for all Arkansas streams to determine the amount of water available (i.e., 25%) for diversion from surface water to satisfy beneficial out of stream uses (i.e., agriculture, livestock, industrial, recreation).
3. Additional surface water storage is needed, ranging from on-farm/off-channel storage, in-stream weirs, to new reservoirs, to locks and dams on navigable rivers to ensure there is adequate water to satisfy riparian and non-riparian uses, and instream needs.
4. Degradation of surface water quality from nonpoint sources is a problem throughout the state. Erosion and sedimentation (nonpoint source pollution) is a significant problem contributing to water quality problems and should be considered as high of a priority as water quantity.
5. Reallocation of water storage is needed for all Corps of Engineer impoundments. Storage in these reservoirs was originally allocated 50 to 60 years ago.
6. A pre-shortage allocation process does not exist so the amount of water needed to satisfy instream needs and the priority assigned to different water uses during times of shortage is unclear.
7. Infrastructure, from municipal and rural water/wastewater distribution systems to dams, levees, and PL566 structures, are aging and failing.
8. Federal and State regulations and policies conflict among agencies and impede development of new water projects, effective management of existing water projects, and restoration of impaired streams.

9. There is insufficient funding for:
  - a. Maintaining existing and on-going water projects
  - b. Development and construction of future projects
  - c. Conservation/water management practices
  - d. Research
  - e. Outreach and education, and
  - f. Synthesis of existing, available tools, practices, and funding incentives.
10. Regional issues are not currently reflected in the Arkansas Water Plan, which can lead to a “one size fits all” approach to water management. Regional approaches, considering the differences not only among regions, but also within regions are critically needed.
11. There is a lack of public awareness about the importance of water for all sectors, and water’s importance to sustaining the natural State, its economy, and our society.

### **3.0 March Regional Meetings**

A series of regional meetings are scheduled for March. The purpose of the March meetings will be to propose recommendations, funding options, and incentives for addressing each of the Regional priority water issues. Regional meetings are scheduled for the following dates and locations:

**Southwest Region: Texarkana, AR March 13th**

Four States Fairgrounds, Agri Learning Center: 3700 East 50<sup>th</sup> St.  
1:00 p.m. – 4:30 Issues and Recommendations Workgroup Meeting

**East Region: Stuttgart, March 17<sup>th</sup>**

Grand Prairie Center, Phillips Community College of the U of A: 2709  
Highway 165 South  
10:00-11:30 optional session on water management and conservation  
practices, funding, and enrollment process  
Lunch will be provided  
1:00 p.m. – 4:30 Issues and Recommendations Workgroup Meeting

**North Region: Fayetteville, March 18<sup>th</sup>**

Fayetteville Town Center: 15 West Mountain St.  
1:00 p.m. – 4:30 Issues and Recommendations Workgroup Meeting

**West-central Region: Russellville, March 19th**

Lake Point Conference Center: 171 Lake Point Lane  
1:00 p.m. – 4:30 Issues and Recommendations Workgroup Meeting



**South-central Region: El Dorado, March 20<sup>th</sup>**

El Dorado Conference Center, South Arkansas Community College: 311

South West Ave.

10 a.m. - 11:30, optional session on local water issues

Lunch on your own.

1:00 p.m. – 4:30 Issues and Recommendations Workgroup Meeting

**4.0 April Statewide Meeting**

The final Issues and Recommendations Workgroup meeting will be held in North Little Rock on April 29, 2014. This meeting will prioritize the recommendations, funding options, and incentives for the regional priority water issues. A final Issues and Recommendations Technical Memorandum with the priority issues and recommendations, including funding options and incentives, will be prepared by the end of May and distributed to all Workgroup members.

**5.0 Arkansas Water Plan Executive Summary**

A Draft Executive Summary will be prepared by the end of June. A subsequent series of public meetings will be held around the State for additional comment on the Draft Executive Summary. This information will be integrated into the Executive Summary during October and the Final Executive Summary, and associated technical supporting documents, will be provided to the ANRC in November 2014 as the Arkansas Water Plan Update for rule-making consideration.

## Appendix 1 East Region

Category	Issue	Votes
Surface Water Quantity	Quantification of instream water needs for navigation, current and future riparian use, interstate compacts, fish and wildlife, and aquifer recharge based on sound science is needed for all Arkansas streams to determine the amount of water available for diversion from surface water to satisfy beneficial out of stream uses (i.e., agriculture, livestock, industrial, recreation).	8
Groundwater Quantity	Overdrafting of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overdrafting contributes to reduced streamflow because of reduced groundwater discharge to streams.	8
Water Conservation and Shortages	The state needs to be more proactive in addressing potential shortages before the need for allocation is required, and establish a pre-shortage allocation process through coordination of all stakeholders.	8
Funding and Incentives	There is insufficient funding for: <ul style="list-style-type: none"> <li>• Existing, on-going projects;</li> <li>• Future projects;</li> <li>• Conservation/water management practices;</li> <li>• Research;</li> <li>• Outreach and education; and</li> <li>• Synthesis of existing, available tools, practices, and funding incentives.</li> </ul>	8
Public Awareness of Water Resource Issues	There is no single source of water data or information across agencies. (Workgroup agreed to combine this issue with a similar issue listed under Measure and Assess)	8
Water Law and Regulations	A modernized administrative structure is needed for statewide water management (one authority), rather than having it distributed across multiple agencies.	7
Planning	Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	7

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
(Water Quantity)	Water conservation practices are not being aggressively pursued as an alternative to development for future needs.	6
Infrastructure	Infrastructure for existing, on-going, and future projects is inadequate, including moving water from where it is, to where it is needed. This includes infrastructure for reducing flood flow and addressing drainage issues. In addition, the 25% excess surface water definition needs scientific justification.	6
Public Awareness of Water Resource Issues	Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	6
Water Law and Regulations	Interagency inconsistencies need to be addressed.	5
Groundwater Quantity	Groundwater levels needed for drinking water are declining.	4
Water Quality	Incremental costs and benefits associated with water quality have not been quantified and should be estimated.	4
Infrastructure	Complete COE study of White River to implement navigation improvements.	4
Measurement and Assessment	There is no one source for information on water. (Workgroup recommendation to combine with Public Awareness Issue on no single source of information).	4
Public Awareness of Water Resource Issues	As the Plan is implemented, a statewide sales tax to fund water projects is needed.	4
Water Conservation and Shortages	More incentives for water reuse are needed.	3
Infrastructure	Address Arkansas and White River Cutoff to Mississippi River hazard to navigation.	3
Public Awareness of Water Resource Issues	Utility rates are not based on actual value of water.	3
Groundwater Quantity	Reporting groundwater use is inconsistent.	2
Water Conservation and Shortages	Industry is not being encouraged to reuse wastewater or grey water.	2
Water Quality	Outstanding natural resource waters (ORW) need	2

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
	protection.	
Groundwater Quantity	High quality groundwater needed for drinking water is being depleted for other uses.	1
Funding and Incentives	There is insufficient infrastructure to deliver and distribute water from areas of surplus to areas of need.	1
Groundwater Quantity	There are significant declines in groundwater now and into the future.	0
Water Conservation and Shortages	Water conservation practices are not being aggressively pursued (i.e., CRP, WRP, EQIP) by government agencies.	0
Water Quality	Nonpoint source pollution, including erosion (sheet rill, gully, streambanks, unpaved roads), is degrading water quality.	0
Water Law and Regulations	Well data, as currently provided and reported, is unreliable.	0
Measurement and Assessment	Greater accuracy and consistency is needed for water use measurements of both surface and groundwater.	0
Planning	Additional planning, restoration State/Federal dollars needed to remove streams from the impaired category (303(d) list).	0
Public Awareness of Water Resource Issues	Greater awareness, outreach, and education efforts on water are needed.	

## Appendix 2 North Region

Category	Issue	Votes
Surface Water Quantity	The Fish and Wildlife Framework for Documenting Alternative Approaches for Estimating Fish and Wildlife Flows in Arkansas and Implementing the State Water Plan needs to be incorporated into the water plan to provide for alternative measure of “excess surface water” and process for determining minimum low flows during times of shortages.	13
Planning	Incremental costs and benefits associated with water quality improvements should be understood and quantified. A cost/benefit analysis should be required for any water quality changes.	10
Water Law and Regulations	The 25% restriction used to estimate “excess surface water” should be increased so additional water is available for non-riparian use.	8
Measurement and Assessment	All water that is withdrawn from a stream should not be assumed to be consumed. Demand estimates should include the return flow from these withdrawals.	7
Water Quality	Regulatory restrictions make it difficult to restore streams and need to be changed.	6
Surface Water Quantity	“Excess available water” might be based on the lowest historical gap year rather than 25% of average annual (more conservative approach).	5
Surface Water Quantity	Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	5
Surface Water Quantity	Reallocation of storage in Corps of Engineer reservoirs needs to occur.	5
Funding and Incentives	Additional funding sources are needed for water/sewer projects.	5
Water Quality	Water quality is as important as water quantity, and should be considered in the water plan.	4
Groundwater Quantity	There is insufficient information on the volume and yield of groundwater aquifers in the North Region.	4

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
Public Awareness of Water Resource Issues	Greater emphasis is needed on reuse, recycling, and water conservation education.	4
Measurement and Assessment	The Arkansas Water Plan needs to include an interagency and stakeholder process/structure to monitor implementation of the plan, assess periodic outcomes, and perform continuous planning.	3
Water Quality	Greater protection of water quality from point and nonpoint pollution is needed for water supply sources.	3
Surface Water Quantity	Weirs or small dams should be constructed on streams to slow the flow, store floodwaters, contribute to groundwater recharge, and reduce sediment transport in streams.	3
Planning	There currently is no single source for information on water.	2
Planning	Economic impacts of use restrictions must be considered as the water plan moves forward.	2
Surface Water Quantity	Outstanding natural resource waters (ORW) need protection.	2
Infrastructure	Smaller municipalities have limited resources, and aging infrastructure and personnel. Greater emphasis and promotion should be given to regionalization of facilities.	2
Public Awareness of Water Resource Issues	Water is undervalued. Water rates should reflect the true value of water.	2
Funding and Incentives	Increased funding/incentives are needed for switching from use of groundwater to use of surface water.	2
Surface Water Quantity	Use of high quality sources for uses other than drinking water should be discouraged.	1
Groundwater Quantity	Quantitative measures for determining groundwater volumes and yields in North Region aquifers are needed.	1
Groundwater Quantity	Water plan needs to commit to more groundwater modeling data collection to manage surface water and groundwater conjunctively.	1
Groundwater Quantity	Better records of well drilling are required. Currently records are unreliable.	0

### Appendix 3 West-central Region

Category	Issue	Votes
Surface Water Quantity	Quantification of instream water needs for navigation, current and future riparian use, interstate compacts, fish and wildlife resources, and aquifer recharge based on sound science is needed for all Arkansas streams to determine the amount of water available for diversion from surface water to satisfy beneficial out of stream uses (i.e., agriculture, livestock, industrial, and recreation).	10
Funding and Incentives	Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	9
Groundwater Quantity	Groundwater monitoring and modeling need to be included (for West-central region) in the state water plan to help us determine if radial wells in the sandy alluvial aquifer along the Arkansas River could be considered to provide water supply for communities, understanding that overdrafting of groundwater aquifers can lead to permanent loss of storage because the aquifers collapse.	8
Water Quality	Erosion, inadequate nutrient management, and other impairments exist on all Arkansas streams as well as Extraordinary Resource Waters. Streams and Extraordinary Resource Waters need more protection (i.e., conservation programs).	8
Water Conservation and Shortages	There is inadequate water supply for livestock watering during summer months.	6
Surface Water Quantity	New surface water impoundments are needed to provide adequate water supply.	5
Surface Water Quantity	Reallocation of storage for water supply in Corps lakes needs to occur.	5
Water Law and Regulations	Federal and state regulations can impede development and maintenance of utility projects.	5
Water Law and Regulations	Any legislation needs to be tailored to regions. One statewide size does not fit all regions.	5

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
Measurement and Assessment	Returned water should be included in the calculations of available water. "Withdrawn" does not necessarily always mean "consumed."	5
Funding and Incentives	Restrictions associated with Federal funds limit their usefulness for utilities, municipalities and counties.	4
Water Law and Regulations	Jurisdictional silos limit opportunities for cooperation and coordination among agencies and organizations.	4
Measurement and Assessment	For some sectors the water reported should be water consumed and not water withdrawn. One generic report should not cover all sectors.	4
Water Conservation and Shortages	Water conservation practices need to be aggressively pursued as an alternative to development to meet future needs.	3
Infrastructure	There currently is no process to address the situation when a water supply project is not paid off in time and the provider goes into default because the supply is not completely sold or spoken for.	3
Infrastructure	Rural system infrastructure is declining and failing due to loss of population and the age of the infrastructure.	3
Infrastructure	A process is needed for statewide prioritization of infrastructure projects.	3
Public Awareness of Water Resource Issues	People don't understand the ancillary benefits of navigation projects, such as recreation, fish and wildlife enhancement, water supply, and flood risk reduction.	3
Public Awareness of Water Resource Issues	Outreach and education training across all sectors including landowner, local, state, and federal elected officials is needed.	3
Water Law and Regulations	High quality water sources should have drinking water as the highest priority use.	3
Planning	Drought contingency planning is insufficient.	2
Water Law and Regulations	The amount of "excess surface water" available for use needs to be increased above the 25% restriction.	2
Water Law and Regulations	Voluntary practices should be favored over regulations that require practices.	2



<b>Category</b>	<b>Issue</b>	<b>Votes</b>
Infrastructure	The maintenance of locks and dams is declining because of lack of funding and federal support.	1
Funding and Incentives	Increased funding/incentives/cost share for more surface water and on-farm storage is needed.	1
Planning	Groundwater modeling in the West-central region is inadequate, but critical.	1
Surface Water Quantity	Site specific and seasonally available stream flows may affect the reliability/quantity/quality of drinking water sources.	0
Groundwater Quantity	Groundwater decline is resulting in lower pool elevations in the Arkansas River because of stream recharge of the aquifer and these lower pool elevations are affecting navigation.	0
Groundwater Quantity	Groundwater use reporting is inadequate, inconsistent, and unreliable.	0
Water Conservation and Shortages	Potential conflicts between water users are increasing and will be a major issue in future years.	0
Water Conservation and Shortages	The state needs to be more proactive in addressing potential shortages before the need for allocation is required and establish a pre-shortage allocation process through adaptive management.	0
Water Quality	More regulatory flexibility is needed for stream restoration, particularly in sediment removal and clearing natural blockages from creeks/streams.	0
Infrastructure	Lack of funding for locks and dams will reduce pool levels and affect available water downstream.	0
Funding and Incentives	Funding is needed to address local natural resource issues and concerns, not just regional or statewide issues.	0
Planning	Additional resources are needed to address removing streams from impaired category (303(d) list).	0
Planning	A disaster contingency plan for natural resources is needed.	0
Water Law and Regulations	Interagency inconsistencies and conflicting rules and regulations need to be addressed.	0

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
Water Law and Regulations	Liability, taxing, and reporting issues related to levee and drainage districts need to be addressed.	0
Measurement and Assessment	Assessments, future forecasts, and demand analyses should include local landowners needs and future uses.	0

### Appendix 4 South-central Region

Category	Issue	Votes
Infrastructure	Lock and dam maintenance on the Ouachita River is needed to ensure navigation pools continue to provide for municipal/industrial water supply, recreation, and flood damage protection.	8
Funding and Incentives	There is a lack of funding to construct additional surface water impoundments in critical groundwater areas.	8
Surface Water Quantity	Quantification of in-stream water needs for navigation, riparian use, interstate compacts, fish and wildlife, and aquifer recharge based on sound science is needed for ALL Arkansas streams.	7
Water Quality	Degradation of surface water from nonpoint sources is a problem throughout the state. Degradation of groundwater due to over-withdrawal is a problem in specific regions in the state. Erosion and sedimentation (nonpoint source pollution) is a significant problem contributing to water quality problems and should be considered as high of a priority as water quantity.	7
Water Quality	Outstanding Resource Waters need special protection for both water quantity and quality.	7
Water Conservation and Shortages	Coordination between state agencies, as well as adaptive management, is needed prior to drought conditions so that plans area made ahead of time. One way this could happen would be through more frequent revisions of the state water plan.	7
Surface Water Quantity	Reallocation of storage for water supply is needed in federal Corps lakes to make those sources more readily available for drinking water.	5
Water Law and Regulations	It has been over 20 years since the last water plan update. We have more data and more sophisticated models; therefore, greater accuracy. These increased accuracies should allow a greater percentage of the excess surface water to be used.	5
Surface Water Quantity	Industry should be encouraged to use surface water.	4

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
Funding and Incentives	Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	4
Water Law and Regulations	The highest and best use of water (surface or ground) is as drinking water. This should be reflected in state policy (state water plan) and in state regulations (higher priority in ADEQ regulations No. 2 and No. 6).	4
Water Law and Regulations	A threat of change in federal laws for navigation threatens the maintenance of Ouachita River pool elevations.	4
Surface Water Quantity	More surface water impoundments are needed in critical groundwater areas.	3/4
Water Law and Regulations	ADEQ dissolved mineral discharge limits prohibit reasonable use and discharge into streams.	2
Water Law and Regulations	Any changes to the methodologies used to calculate minimum stream flows and excess surface water must be transparent and include input from all sectors and comprehensive cost benefit analysis.	2
Planning	Gap analysis for surface water and groundwater does not consider the importance of water quality for source selection and treatment cost.	2
Infrastructure	Surface water impoundments are needed in critical groundwater areas. (Workgroup recommendation to combine with Surface Water Quantity issue on need for more impoundments in critical groundwater areas).	1
Water Conservation and Shortages	Conservation education is needed on groundwater shortage in critical groundwater areas.	0
Measurement and Assessment	Aquifer recovery has to be monitored for another 30 years at a cost of \$140,000 per year (Union County example). Need continued monitoring to assess the effectiveness of management practices.	0
Groundwater Quantity	Depletion of Sparta and Alluvial aquifers is occurring.	0
Public Awareness of Water Resource Issues	People don't understand ancillary benefits of navigation for municipal/industrial water supply, recreation, flood risk reduction, and fish and wildlife.	0
Public Awareness of Water Resource Issues	Continuous education on water and water issues is necessary.	0

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
Public Awareness of Water Resource Issues	The monetary value of water quality needs to be quantified for use in cost/benefit analyses.	0

## Appendix 5 Southwest Region

Category	Issue	Votes
Infrastructure	Surface water impoundments are needed on the Red River so southwest Arkansas can benefit: water supply – industrial and municipal, recreation, fish and wildlife, irrigation, flood risk reduction, and navigation.	17
Water Law and Regulations	There is concern that the first priority for Arkansas water may not be for Arkansas residents.	12
Funding and Incentives	Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.	9
Surface Water Quantity	Surface water should be the first priority source for all water uses.	8
Water Conservation and Shortages	Coordination between state agencies during times of drought, shortages, and when permitting non-riparian uses needs to be explicitly incorporated into the water plan.	7
Water Conservation and Shortages	Water conservation practices are not being aggressively pursued as an alternative to development to meet future needs.	7
Water Conservation and Shortages	Additional surface water impoundments are needed for better utilization of water to meet human needs.	7
Measurement and Assessment	The number of stream gages throughout the state is declining. Stream gaging networks need to be maintained so changes in water supply can be assessed.	6
Planning	Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.	4
Planning	The process of allocating water is unclear. Our concern is, how will water be set aside to meet demand of future industrial plants – timber or food related?	4
Public Awareness of Water Resource Issues	Improve education as it relates to sound stewardship of water resources to ensure there is adequate water to meet desired uses into the future.	3
Groundwater Quantity	Groundwater tables are declining, and recharge appears to	3

Category	Issue	Votes
	be reduced. This needs better quantification.	
Water Quality	There is insufficient water quality data to manage water resources and identify possible problem areas, including major sources of siltation/erosion.	3
Water Law and Regulations	Better technology and more sophisticated data collection techniques than 20 years ago is reason enough to revisit the 25% restriction mandated by Arkansas statute. This law should be revisited and the percentage adjusted if research warrants.	3
Public Awareness of Water Resource Issues	Outreach and education is needed for all sectors, particularly in water and water resources.	2
Funding and Incentives	Refinancing is needed for existing infrastructure, particularly in smaller communities.	2
Funding and Incentives	Conservation rebates are insufficient to promote more efficient water management.	2
Public Awareness of Water Resource Issues	Greater emphasis needs to be given to educating K-12 and government agencies on water and water issues.	1
Planning	A water allocation process is needed to assign priorities for water use across all water use sectors.	1
Water Quality?	Lack of surface impoundments is contributing to poorer quality water.	1
Surface Water Quantity	Change water to a commodity so all benefit through appropriate pricing structures.	1
Funding and Incentives	More funding is needed, "period."	1
Water Quality	Regulations are being proposed for "emerging contaminants", when effects, if any, associated with these contaminants are unknown.	0
Surface Water Quantity	Groundwater users need to convert to surface water use in the future.	0
Surface Water Quantity	Reservoir siltation is contributing to loss of water storage.	0
Surface Water Quantity	Quantification of in-stream water needs for navigation, current and forecasted riparian use, interstate compacts, fish and wildlife, and aquifer recharge based on sound	0

<b>Category</b>	<b>Issue</b>	<b>Votes</b>
	science is needed for all Arkansas streams.	
Water Law and Regulations	Water withdrawal is not the same as water consumption. Return flows need to be considered in the water demand and water supply analyses.	0
Water Law and Regulations	Regulations are too strict for future construction of impoundments to be feasible.	0