Arkansas Water Plan 2014 Update

Appendix H
Issues and Recommendations
Technical Memo

TECHNICAL MEMORANDUM

TO: Issues and Recommendations Workgroup
FROM: Arkansas Water Plan Planning Team
DATE: November 11, 2014
SUBJECT: Final Issues and Recommendations Workgroup Process and Outputs

1.0. PURPOSE

The purpose of this Technical Memorandum is to describe the process used to develop and prioritize water issues and associated recommendations for incorporation into the Arkansas Water Plan Executive Summary. This process included:

1. Nomination of members for the Issues and Recommendations Workgroup and selection of spokespersons.
2. Issue identification and their prioritization.
3. Recommendation identification and their prioritization.
4. Summarization of priority water issues and recommendations resulting from the Workgroup process.

Each of these steps is discussed below.

2.0 BACKGROUND

The 1990 Arkansas Water Plan is in the process of being updated under the direction of the Arkansas Natural Resources Commission (ANRC). Reports have been completed on projected water demands, water availability through 2050, and gap analyses to identify areas or sectors where available water is projected to be insufficient to meet demand. These reports are available on the Arkansas Water Plan website (http://www.arwaterplan.arkansas.gov/) and served as background for identifying water issues and associated recommendations to resolve these issues. The process of identifying and prioritizing these issues was conducted through the Issues and Recommendations Workgroup.

3.0 ISSUES AND RECOMMENDATIONS WORKGROUP

The function of the Issues and Recommendations (I&R) Workgroup was to identify and prioritize water issues and recommendations for resolving the water issues within 5 Planning Regions in Arkansas (Attachment 1) and statewide. The I&R Workgroup was composed of representatives from the 11 major water use sectors within each of the 5 Planning Regions throughout the State:

1. Agricultural Irrigation,
2. Agricultural Livestock/Poultry/Aquaculture,

3. Fish and Wildlife,
4. Recreation,
5. Thermoelectric Utilities,
6. Industry,
7. Public Water/Wastewater Providers,
8. Municipal Governments,
9. County Governments,
10. Navigation, and
11. Conservation Districts.

A public nomination process was used to identify regional Workgroup members with backgrounds and interests in each of the 11 water use sectors. Nomination forms were distributed to public, professional, and nongovernmental organizations, and governmental agencies, in addition to being available on the arwaterplan.arkansas.gov website. Any individual who submitted a nomination form was included in one of the sectors and became a member of the Workgroup. In addition, any individuals who attended the public meetings and were interested in participating in the process were added to the Workgroup. The final Workgroup included approximately 150 members. (See Attachment 2 for a list of Workgroup members and their sector representation).

As part of the process, a spokesperson was selected for each sector within each region. Each sector spokesperson served as a liaison to his or her respective sector and planning region for the purpose of eliciting additional water issues, recommendations, and comments and providing these to the I&R Workgroup for consideration. Each sector spokesperson had an equal voice in each of the 5 planning regions regardless of the number of representatives within that sector to ensure that all water users' issues and recommendations received equitable consideration. The spokesperson served to focus, not filter, issues and recommendations raised for that sector.

Responsibilities of each I&R Workgroup member were to:

1. Agree to attend all meetings and conference calls and represent that sector in the region in identifying and prioritizing water issues and recommendations for resolving these issues. If the representative could not attend or participate, they agreed to contact the spokesperson for their sector and provide comments. If a spokesperson could not attend, they agreed to find an alternate to represent that sector in the region.
2. Serve as a liaison for that sector within that region, solicit comments from others within their region that have an interest or stake in that sector, and provide these comments to the sector spokesperson.
3. Read information forwarded prior to each meeting, synthesize the comments received, and be prepared to summarize these comments for the sector spokesperson and/or other sector representatives.

4.0 WATER ISSUES AND RECOMMENDATIONS IDENTIFICATION AND PRIORITIZATION

4.1 Water Issue Identification

The first I&R Workgroup meeting was held in January 2014 at the Arkansas Rural Water Association Headquarters in Lonoke, to explain both the process for identifying and prioritizing water issues and recommendations in each planning region and the ground rules for the process. Approximately 175 individuals participated in the January meeting.

A preliminary set of water issues were identified from:

1. 1990 Arkansas Water Plan,
2. 2013 Arkansas Water Plan public meetings,
3. ANRC Commissioners and staff,
4. Conservation District assessments, and
5. Winthrop Rockefeller Foundation Water Issues in Arkansas Report.

These issues were assigned to one of 10 different issue categories:

1. Groundwater Quantity,
2. Surface Water Quantity,
3. Water Conservation and Shortage,
4. Water Quality,
5. Infrastructure,
6. Funding and Incentives,
7. Water Law and Regulations,
8. Measurement and Assessment,
9. Planning, and
10. Public Awareness of Water Resources Issues.

This preliminary list of water issues was distributed to each of the I&R Workgroup members prior to the January 2014 meeting for review and consideration. This first meeting initiated the process.

The Workgroup members representing the 11 sectors were combined as follows to facilitate discussion:

1. Agriculture – Irrigation + Livestock/Poultry/Aquaculture,
2. Fish and Wildlife + Recreation,
3. Thermoelectric Utilities + Industry,
4. Public Water/Wastewater Providers,
5. Municipal + County Governments,
6. Navigation, and
7. Conservation Districts.

The Workgroup members met in these combined sector subgroups to discuss the preliminary list of water issues and identify additional issues. Additional issues identified at the meeting were integrated with the preliminary list and this combined issues list was provided to each member following the meeting (Attachment 3).

4.2 Water Issue Prioritization

Meetings were held in each of the 5 planning regions in February to review and discuss the revised list of issues resulting from the first meeting, as well as incorporate additional issues suggested by others within that sector and region since the January meeting. A total of about 300 individuals participated in these meetings. These discussions occurred within the 7 combined sector groups listed in Section 4.1 above. Following discussion within each of the sector groups, the regional spokesperson for each of the 11 sectors listed the 5 highest priority issues within their sector on flip charts.

Following a review of each of the 5 highest priority issues identified by each sector, the spokesperson for each of the 11 sectors was given 10 votes to cast for the issues that sector considered to be the highest priority issue(s) in the region. The distribution of these votes could range from all the votes cast for one issue considered by that sector to far outweigh all other issues, to one vote for an issue in each category. The spokesperson caucused with her or his respective sector representatives at the meeting to identify and vote for the highest priority regional issues. The purpose of prioritization was to identify and focus on those water issues that were considered highest priority by workgroup members statewide and within each region. Resources will always be limited, so not all issues can be addressed simultaneously. This exercise helped identify those issues that were of highest priority. All the issues are retained (See Attachment 3). In general, as priority issues are addressed, other issues will also be addressed because many of these issues are subsets of the priority issues. A summary of the priority issues and votes from all of the February regional meetings can be found in Attachment 4.

4.3 Priority Water Issue Recommendation Identification

Meetings were also held in each of the 5 planning regions in March to brainstorm recommendations to resolve the priority issues within the regions or statewide. A preliminary set of recommendations was prepared from the same information sources as those used to develop the preliminary set of water issues (See 4.1 Water Issue Identification above) and sent to each of the I&R Workgroup members prior to the regional meetings. A list of the priority issues that was generated within each of the planning regions and statewide during the February regional meetings was also included. A total of about 240 individuals participated in these meetings. During these meetings, each sector spokesperson for that region, or a designated reporter, compiled a list of recommendations addressing the priority issues for his or her respective sectors on recommendation forms provided to each of the sector subgroups. These recommendations were synthesized to develop a consolidated list of recommendations. This list of recommendations was provided to I&R Workgroup members for review and comment prior to the prioritization of these recommendations within their regions and statewide. Additional recommendations were received after the regional March Workgroup

meetings concluded. An open process guided the Workgroup deliberations so these additional recommendations were incorporated into this consolidated recommendation list. This consolidated list was distributed to all Workgroup members (Attachment 5)

4.4 Priority Water Issue Recommendation Prioritization

A statewide meeting was held in April in North Little Rock to prioritize recommendations for resolving priority regional and statewide water issues. About 130 members attended this meeting. At this statewide meeting, the regional representatives for each of the sectors met in their respective combined sector groups to discuss the consolidated list of recommendations and identify the highest priority recommendations within each region as well as statewide. Additional recommendations were proposed by some of these groups, listed on flipcharts for consideration by other sectors, and described to the Workgroup. As with the prioritization of the water issues, each sector spokesperson received 10 votes to cast for the highest priority recommendations within their region and an additional 10 votes to cast for the highest priority recommendations addressing statewide issues.

The purpose of prioritization was to identify and focus on those recommendations that were considered highest priority by workgroup members statewide and within each region. Resources will always be limited, so not all recommendations can be implemented simultaneously. This exercise helped identify those recommendations that were considered the highest priority by the Workgroup. All the recommendations are retained (See Attachment 5). In general, as priority recommendations are implemented, other recommendations will also be implemented because many of same actions or activities needed to implement the priority recommendations are needed to implement the non-priority recommendations. The highest priority water issue recommendations, statewide and by region, are listed in Table 1. The full set of prioritized recommendations, listed in descending order of priority, can be found in Attachment 6.

In general, priority recommendations were raised for issues related to:

- Use and decline of groundwater
- Greater use of and quantification of excess surface water
- Considerations of water quality as well as water quantity
- Water conservation and drought contingency planning
- Repair, replacement, and maintenance of infrastructure, including navigation
- Funding and incentives for all water projects
- Drinking water priority and availability
- Increased public awareness, outreach and education on water and water resources issues and management.

The next steps were to review the high priority recommendations, evaluate the technical, socioeconomic, and statutorily/regulatory feasibility of these recommendations, and reframe or reformulate the recommendations, if necessary, so they reflect the underlying intent of the I&R Workgroup, and can also be implemented. Some of the recommendations will require

legislative action. The proposed recommendations, and the proposed legislative action, were identified and included in the Draft Executive Summary of the Arkansas Water Plan.

4.5 Final Issues and Recommendations

A final list of statewide issues and recommendations was prepared, discussed with, and revised by the ANRC Commission, and is incorporated in the final Arkansas Water Plan. Many of the regional issues raised during the I&R meetings were also statewide issues. Attachment 7 lists the final set of both statewide and regional priority issues and recommendations that resulted from the I&R process. Statewide and regional implementation, following the ANRC Commission review and adoption, will be initiated based on this final set of recommendations.

5.0 ARKANSAS WATER PLAN EXECUTIVE SUMMARY

5.1 Draft Arkansas Water Plan Executive Summary

A Draft Executive Summary was prepared by the end of June. This Draft Executive Summary included a list of the high priority water issues and associated recommendations for resolving these issues statewide and for each of the 5 planning regions, as well as proposed legislative actions for implementing these recommendations.

A subsequent series of public meetings were held around the State for additional comment on the Draft Executive Summary. This information was 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.

5.2 Final Arkansas Water Plan

The ANRC will begin the process of rule-making to implement the Arkansas Water Plan following final submission in November 2014. This updated Plan will serve as the vehicle for moving toward sustainable water resources management throughout the State, including the five Planning Regions.

Arkansas Water Plan Update

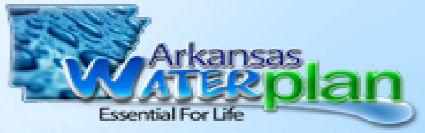


Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

STATEWIDE	
Category	**Recommendation**
Groundwater Quantity	• Establish a statewide groundwater monitoring network to determine the rate of decline and provide the basis for management recommendations to eliminate the decline, particularly in planning regions without groundwater models.
Surface Water Quantity	• Recommendations for establishing excess surface water ranged from below 25% to as high as 75%. Because of these differences, it is recommended that the proportion of stream flow designated as excess surface water be determined by an independent entity for all perennial streams in Arkansas using a risk-based, flow-fisheries framework as the scientific approach for estimating the fish and wildlife component of instream flow uses through a stakeholder-driven process. Basins with estimated water gaps should receive higher priority for application of this approach. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. The study should be conducted through an open and transparent process. ANRC and other state and federal grant monies should be sought to fund this scientific study.
Water Conservation and Shortage	• ANRC Rule 14 should be amended to reduce the required storage volume to 1-2 ac-ft so additional entities are eligible for cost share of on-farm storage systems.
	• ANRC should create a state drought and shortage response team that develops drought and shortage contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages. The prioritization should include established inter and intra basin transfers. Allocation during drought should be tied to nearby stream gages.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

STATEWIDE	
Category	**Recommendation**
Water Quality	• Water quality authority is shared by ADEQ and ANRC. The Arkansas Water Plan should reflect and integrate the water quality policies of ADEQ as the state's primary planning document regarding water quality policy. Both ADEQ and ANRC should collaborate to monitor, plan, and fund water quality improvement programs to reduce sediment and nutrient loading into state streams, lakes, rivers and wetlands with particular emphasis on maintaining the integrity of relatively unaltered, high quality streams. Increased water quality monitoring shall be implemented at a segment level to assess program implementation success.
	• ANRC should work closely with state and federal agencies, conservation districts, and non-governmental organizations to remove streams from ADEQ's 303(d) list through education, and state and federal conservation programs.
Infrastructure	• The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Arkansas, Mississippi, Ouachita, Red, and White Rivers for navigation and the other benefits is receives.
	• Provide local/state funding support for repair, rehabilitation of PL566 dams and ongoing maintenance. These funds shall also be used to support technical assistance and equipment.
Measurement and Assessment	• Critical streamflow gages should be identified and maintained through time in every planning region. Critical gages would be defined as those necessary for basin yield analysis, upstream flow requirements, drought allocation, and compact compliance.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

STATEWIDE	
Category	**Recommendation**
Public Awareness	• Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

EAST	
Category	**Recommendation**
Groundwater Quantity	• Surface and groundwater should be managed conjunctively to address water needs for agriculture, drinking water, industry, recreation, and fish and wildlife. ANRC should develop and implement conjunctive management strategies in critical groundwater areas with specific goals to recover the aquifers in those areas.
	• Reserve deep aquifers for use as municipal drinking water sources.
Surface Water Quantity	• Recommendations for establishing excess surface water ranged from below 25% to as high as 75%. Because of these differences, it is recommended that the proportion of stream flow designated as excess surface water be determined by an independent entity for all perennial streams in Arkansas using a risk-based, flow-fisheries framework as the scientific approach for estimating the fish and wildlife component of instream flow uses through a stakeholder-driven process. Basins with estimated water gaps should receive higher priority for application of this approach. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. The study should be conducted through an open and transparent process. ANRC and other state and federal grant monies should be sought to fund this scientific study.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

EAST	
Category	**Recommendation**
Water Conservation and Shortage	• Shortage and drought contingency plans should be developed for the Bayou Bartholomew, Bayou Macon, Bayou DeView, St. Francis, Cache, and Beouf River basins. The Fish and Wildlife Flow Framework should serve as the stakeholder process for scientifically determining appropriate **minimum** flow levels for different classes of streams statewide. Priorities of use during a drought or shortage should be regionally determined by local landowners, recreationists, industry and fish/wildlife scientists before those shortages occur to reflect regional priorities.
	• ANRC must develop water conservation plans to encourage more efficient use of water resources. Water Conservation plans must be based on scientific research and include user interaction to determine practical Best Management Practices (BMP) in water use and water conservation. ANRC must provide detailed user (profile based) action plans that water users can modify and implement in their respective daily operations. Water Conservation plans should be developed for the full water user profile including Domestic, Agricultural, Irrigation, Industrial, and Commercial, Mining, and Irrigation District water supply, power supply, municipal and county. ARNC should periodically survey a sampling of water users (by profile) to assess what BMPs are practical, successful and what is impractical. Surveys should ask users for new BMPs that might need research to determine viability or they have found useful The ANRC website should encourage users to submit new ideas and critique present BMPs.
Water Quality	• 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.
Infrastructure	• The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Arkansas, Mississippi, and White Rivers for navigation and the other benefits it receives.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

EAST	
Category	**Recommendation**
Funding and Incentives	• Propose legislation to increase allowable percentages of ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow.
	• Propose legislation to increase the bond funding authority under the existing Arkansas General Obligations Bond programs so monies can be utilized to cost share with federal or state programs for water projects.
Planning	• Recommendations **should not** include restrictions, mandates, taxes or assessments applicable to groundwater use without sound data and contemporaneously providing viable, timely and economical solutions in lieu such restrictions or added costs.
	• Designate Conservation Districts as the repository for various records, including but not limited to utility system records, and make that information accessible to those that may need to use it.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

NORTH	
Category	**Recommendation**
Groundwater Quantity	• ANRC should improve groundwater well reporting to include ground elevation, GPS coordinates, yield, as well as depth to groundwater. • Surface and groundwater should be managed together to address water needs of all sectors.
Surface Water Quantity	• Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
	• Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies.
	• ANRC should re-evaluate the non-riparian water permitting process associated with the shale industry assuring the consideration of seasonal flows and cumulative impacts.
	• Reallocation of storage in Corps of Engineer reservoirs needs to occur
Water Conservation and Shortage	• Water in the form of rainfall must be slowed in its travel from the time it hits the ground until it reaches the Gulf. ANRC should promote public education in the wise use and conservation of water. More funding would be needed for conservation organizations and conservation districts.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

NORTH	
Category	**Recommendation**
Water Quality	• Arkansas Water Plan should include a Healthy Streams policy statement for flow alterations and non-point source pollution, similar to, and complimentary of, ADEQ's Regulation 2 anti-degradation policy for point source discharges. ANRC will develop the Healthy Streams policy statement in collaboration with ADEQ and sector stakeholders. Encourage ANRC to work with private landowners to remove barriers to the implementation of Best Management Practices.
	• ANRC should develop solutions to the "impaired water" designation for the water below Bull Shoals and Norfork Dams caused by low dissolved oxygen water passed through the dams.
	• BMP economics and effectiveness are important to adoption across the state. The Discovery Farm Program at the U of A is an excellent way to truly determine potential impacts and to realize actual benefits of BMP implementation. Funding for this program should continue and be expanded to address potential impacts from agriculture, to educate farmers on BMP effectiveness, and to educate the general public on the importance of agriculture to the state's economy and feeding the world.
Funding and Incentives	• Propose legislation to establish a sustainable funding source dedicated to maintain, repair, and upgrade infrastructure for public water and sewerage treatment, and addressing MS4 by implementing green infrastructure as defined by the EPA and the US Forest Service to manage rainwater where it falls.
Water Law and Regulations	• ANRC should streamline permitting requirements (more user friendly) for efforts to improve stream stability, e.g., allow short term deviations, with specific stipulations and requirements. Long term benefits can be achieved through cooperative efforts with regulatory agencies.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

NORTH	
Category	**Recommendation**
Public Awareness	• Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, Ag Council, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

WEST-CENTRAL	
Category	**Recommendation**
Groundwater Quantity	• The sandy alluvial aquifer along the Arkansas River Valley should be evaluated for quantity and quality as a source of water supply. Locate funding to study and evaluate this aquifer. This would alleviate the need for building new surface water impoundments on flowing waters in the highlands.
	• Public outreach and education is needed to improve groundwater well reporting/monitoring to get a greater understanding of the sustainability and condition of our aquifers in the West-central Region of the state.
Surface Water Quantity	• Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
	• ANRC should support development and construction of new water supply projects in areas of critical need, or where projected demand exceeds projected water availability.
	• ANRC shall pursue reallocation of storage in federal impoundments in areas where there is a critical need, or projected increased demand, for additional water supply.
Water Conservation and Shortage	• Excess surface water should be captured during times of abundance, stored in on-farm reservoir, and used during low flow/shortage situations for livestock watering, irrigation, and other uses.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

WEST-CENTRAL	
Category	**Recommendation**
Water Quality	• The water authorities of our State are shared by ANRC and ADEQ. Both ANRC and ADEQ should collaborate to monitor, plan, and fund water quality improvement programs to reduce sediment and nutrient loading into our state streams, rivers, wetlands, and lakes with particular emphasis on maintaining the integrity of relatively unaltered, high quality streams. In importance of water quality and quantity, the Arkansas State Water Plan revision and ANRC should support the existing ADEQ regulations.
Infrastructure	• A federal match of 65% is available for rehabilitation of PL566, but is not being accessed because local entities cannot generate the 35% match. Propose legislation for dedicated State funds to offset a portion of the 35% so local entities can upgrade and maintain these structures. PL566 funding needs to be appropriate for development of new sources for drinking water, agriculture, flood control, etc. Watershed assessments should be updated.
Funding and Incentives	• Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050.
Public Awareness	• Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

SOUTH-CENTRAL	
Category	**Recommendation**
Surface Water Quantity	• Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream water use. Intermittent streams should be evaluated through a different process to allow removal/diversion during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
	• ANRC should encourage industry, agriculture, others to use surface water in Critical Groundwater Areas by proposing legislation to amend Act 341 of 1995 as amended (ACA 26-51-1001 et seq.) to apply the tax credit to industries and agriculture that choose to construct surface use infrastructure rather than use groundwater.
Water Conservation and Shortage	• ANRC should create a state drought and shortage response team with representatives from all pertinent state agencies that develops adaptive drought and shortage contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages.
	• Propose legislation to make state and federal tax incentives and cost-share funds even more available to farmers and landowners so that water conservation measures are economically feasible and desirable in all regions of the state. Partner state and federal agencies should also aggressively promote increased use of effective management techniques already available. This could include funding for outreach and education and technical assistance to reduce impediments to management.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

SOUTH-CENTRAL	
Category	**Recommendation**
Water Quality	• Responsibility and authority for maintaining and improving water quality is shared by ADEQ and ANRC. The Arkansas Water Plan should reflect and integrate the water quality policies of ADEQ as the state's primary planning document regarding water quality policy. ADEQ and ANRC should collaborate to develop policies and regulations that improve water quality by reducing sediment and nutrient loading into streams, lakes, and rivers with particular emphasis on maintaining the integrity of unaltered, high quality streams. Removing streams from ADEQ's 303(d) list should be a major goal of the Arkansas Water Plan.
Infrastructure	• The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Ouachita River for navigation and the other benefits it receives.
Funding and Incentives	• Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050.
	• Propose legislation to increase Federal and State funding for on-farm storage. Projects should include normal practices such as ponds for livestock water but funds should also be available for rainwater harvesting and storage for use in poultry houses.
	• Propose legislation to sustain and increase tax incentives & cost sharing options for constructing more on-farm storage systems.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

SOUTH-CENTRAL	
Category	**Recommendation**
Planning	• Retain the Planning Region Work Groups for implementation of the Arkansas Water Plan, particularly related to subregional issues and considerations.
Public Awareness	• Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.
	• Educate the public in water issues pertaining to Sparta & Alluvial Aquifers.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

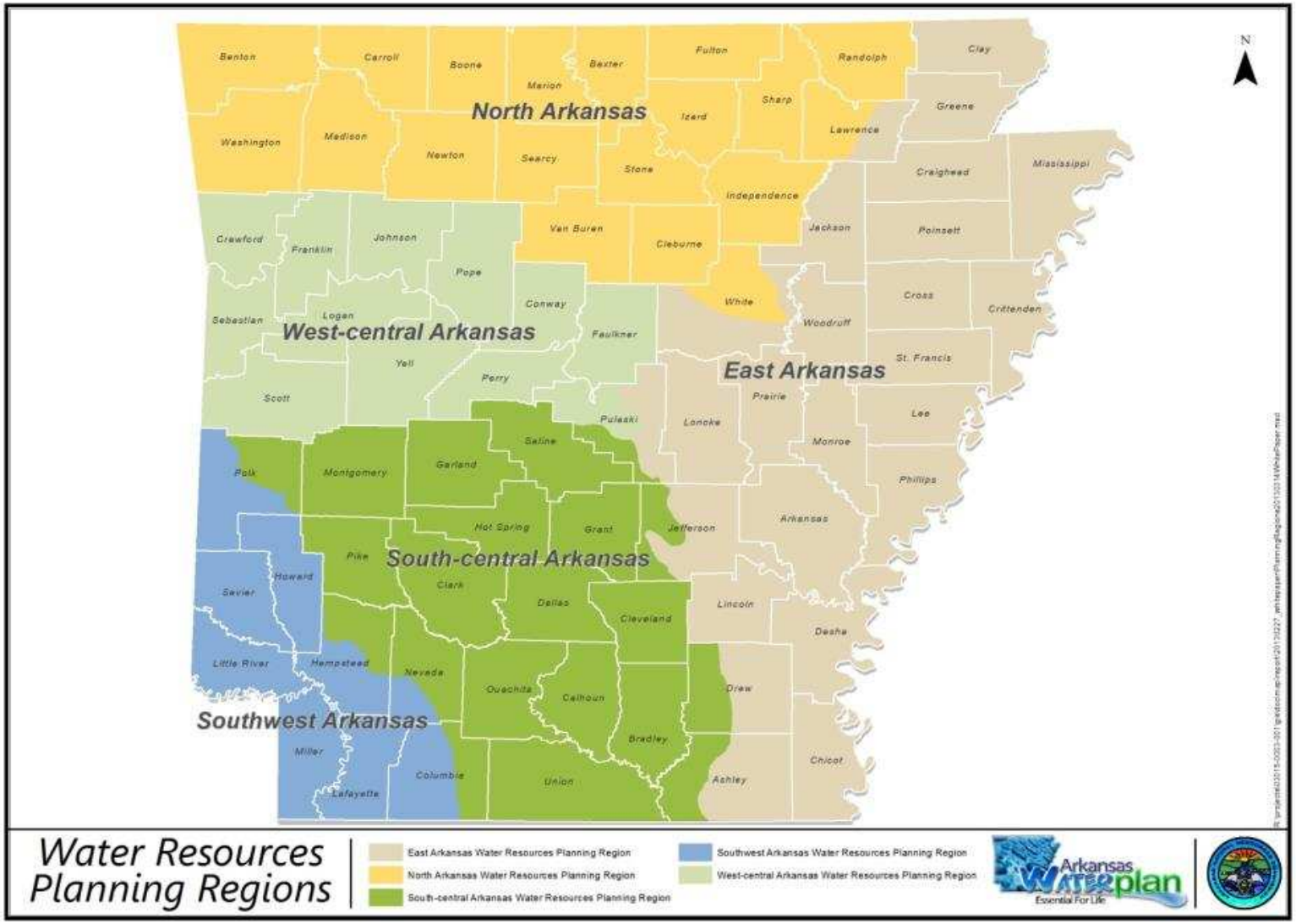
SOUTHWEST	
Category	**Recommendation**
Surface Water Quantity	• Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
	• Increase water storage capacity of the Red River upstream from Shreveport, LA through construction of locks and dams for river navigation funded by usage fees on bulk transport, recreation usage, water sales to urban areas, and outside funding.
Water Conservation and Shortage	• During drought, water needs to be allocated based on a state prioritization basis. For instance, the highest priority always must be municipal and domestic uses, but beyond that a prioritization is needed for industrial, agriculture, and instream uses. The prioritization should include established inter and intra basin transfers which may be affected by local circumstances • Allocation during drought should be tied to nearby stream gages.
Infrastructure	• The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Red River for navigation and the other benefits it receives.

Table 1-High priority Statewide and Planning Region Recommendations for the Arkansas Water Plan

SOUTHWEST	
Category	**Recommendation**
Funding and Incentives	• Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050.
	• On surface water: ANRC Title 10 should be adequately funded by the state as well as continue funding of federal 319 program. The funding should be equally distributed to all regions of the state. ANRC Title 14 should be modified to make it more applicable to livestock – 1 acre-foot storage.
Water Law and Regulations	• ANRC Title 3 should be amended to state that surface water needs to be first priority for use, and Arkansas should be given first priority in using Arkansas water. • Streamline regulations dealing with construction of dams and impoundments to provide additional surface water sources.
Public Awareness	• Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices. • Incorporate education/awareness programs into the public schools K-12. Existing Aquatic Wild (educational frameworks) program has lesson plans already prepared. Statewide approach to the emphatic importance of the next generation understanding water conservation, issues, and problem solving. Focus on long term sustainability of water as a natural resource.

ATTACHMENT 1

Planning Region Figure



Attachment 1. Arkansas Water Plan Water Resources Planning Regions

ATTACHMENT 2

Workgroup Participants

EAST REGION
Public Water/WW Providers
Diana Woodle **
Dennis Sternberg
EAST REGION
Industrial Water Users
Wayne Turney **
Kimberly Rhodes (Alt)
EAST REGION
Ag - Crop Irrigation
Alec Farmer **
Trav Baxter
Davis Bell
Hank Bueker
Rick Bransford
Dow Brantley
Chuck Capps
Dennis Carman
David Carruth
Terry Dabbs
Cynthia Edwards
Frank Elder
Park Eldridge
Jaysson Funkhouser
David Gairhan
Robert "Bobby" Gammill
Nathan Gregory
Andrew Grobmyer
Clark Hall
Michael Hamilton
Chris Henry, DHD, PE
Craig Hilburn
Steven Hoskins
Mark Isbell
Dusty Kennemore
John King III
Wes Kirkpatrick
Leigh Kreimer
Scott Matthews
Mike McDermott
Dr. Curtis Merrell
Ben Noble
Gene Sullivan

** indicates spokesperson

EAST REGION
Ag - Crop Irrigation cont.
Mike Sullivan
Elvis Vaughn
Ray Vester
Andrew Wargo III
William "Bill" Weaver
Danny Wilson
Steve Wilson
Mark Wimpy
Tom S. Wimpy
Brandon Finch
EAST REGION
Ag - Livestock
Dusty Kennemore **
EAST REGION
Thermoelectric
Kellee Fletcher **
EAST REGION
Fish & Wildlife
Steve Filipek **
David Carruth
Craig Hilburn
Dr. Curtis Merrell
Luke Naylor
Ricky O'Neill
Jason W. Phillips
Brett Timmons, AGFC
Diana Andrews AGFC
EAST REGION
Recreation
Jody Pagan **
David Carruth
Dr. Curtis Merrell
Jason Milks
Ricky O'Neill
Kathryn Hazelette

** indicates spokesperson

EAST REGION
Navigation
William "Bill" Weaver **
Harvey Joe Sanner
EAST REGION
County Governments
Judge Glen "Sonny" Cox **
Robert D. Hendrix, PE
EAST REGION
Municipal Governments
Mayor Larry Bryant **
Mayor Frank Fogleman
EAST REGION
Conservation Districts
Andrew Wargo, III **
Alec Farmer
Dusty Kennemore
Woody Ray
Elvis Vaughn
Danny C. Wilson
Tom S. Wimpy
NORTH REGION
Public Water/WW Providers
Alan D. Fortenberry, P.E. **
Clint Bell
Larry Lloyd, P.E.
Judge Terry C. Ott
Rob Smith
Heath Ward
NORTH REGION
Industrial Water Users
Lynn Cornelius **
Rob Smith

** indicates spokesperson

NORTH REGION
Ag - Crop Irrigation
Greg Baltz **
Judge Terry C. Ott
NORTH REGION
Ag - Livestock
Gene Pharr **
Jamie Burr
Angela Danovi
Judge Terry C. Ott
NORTH REGION
Thermoelectric
Tracy Johnson
NORTH REGION
Fish & Wildlife
Jeff Quinn **
Jack Abrahamson
Sam D. Cooke
Angela Danovi
Tim Kibe
Judge Terry C. Ott
George Peters
Tim Snell
Jerry Weber
NORTH REGION
Recreation
Jane Darr **
Sam D. Cooke
Angela Danovi
Delia Haak
Tim Kibe
Judge Terry C. Ott
George Peters
NORTH REGION
Navigation
Gene Higginbotham**

** indicates spokesperson

NORTH REGION
County Governments
Judge Terry C. Ott**
Charles Bennett
Judge Marilyn Edwards
NORTH REGION
Municipal Governments
Mayor David Morris **
Katie Teague
NORTH REGION
Conservation Districts
James Widner **
WEST-CENTRAL REGION
Public Water/WW Providers
Dale Kimbrow **
Kate Althoff
Stan Berry
Greg Cross
Paul "Randy" Easley
Barry Haas
Lance McAvoy
Mayor Daniel Rogers
Kent Walker
Steve Wear
Alice Andrews
WEST-CENTRAL REGION
Industrial Water Users
Stan Berry **
WEST-CENTRAL REGION
Ag - Crop Irrigation
Robert Carruthers **
Debbie Moreland
Dina C. Nash
Phillip Sims
Robert Stobaugh

** indicates spokesperson

WEST-CENTRAL REGION
Ag - Livestock
Dan Wright **
WEST-CENTRAL REGION
Thermoelectric
Stephen Cain **
WEST-CENTRAL REGION
Fish & Wildlife
Matthew Irvin **
Stan Berry
Tim Kibe
Dina C. Nash
Frank Leone
Rob Parkes
Ward Gardner
Brett Hobbs
WEST-CENTRAL REGION
Recreation
Debbie Doss **
Bob Allen
Stan Berry
Glen Bishop
Barry Haas
Tim Kibe
Dina C. Nash
Alice Andrews
WEST-CENTRAL REGION
Navigation
Gene Higginbotham **
Stan Berry
WEST-CENTRAL REGION
County Governments
Judge Gus Young **
Stan Berry
Judge David Hudson

** indicates spokesperson

WEST-CENTRAL REGION
Municipal Governments
Mayor Daniel Rogers **
Stan Berry
Mayor Tab Townsell
Jim von Tungeln
WEST-CENTRAL REGION
Conservation Districts
Debbie Moreland **
Stan Berry
Robert Carruthers
Nina Prather
SOUTHWEST REGION
Public Water/WW Providers
Robert Baxley **
SOUTHWEST REGION
Industrial Water Users
Paula J. Szczerba **
SOUTHWEST REGION
Ag - Crop Irrigation
Brendon Burrell **
SOUTHWEST REGION
Ag - Livestock
Dennis Ritchie **
Ray Rogers
Carla Vaught
SOUTHWEST REGION
Thermoelectric
Greg Carter **
Tim Gross
SOUTHWEST REGION
Fish & Wildlife
Eric Brinkman **
Brad Dreyer (Forestry)
Ray Rogers

** indicates spokesperson

SOUTHWEST REGION
Recreation
Stan Speight**
Ray Rogers
SOUTHWEST REGION
Navigation
Gene Higginbotham **
SOUTHWEST REGION
County Governments
Judge Kevin Smith **
SOUTHWEST REGION
Municipal Governments
Mayor Billy Ray Jones **
SOUTHWEST REGION
Conservation Districts
Amy A. Cowling**
SOUTH-CENTRAL REGION
Public Water/WW Providers
James C. Scott **
Don P. Chaney
David Brian Hendrix
Dale Kimbrow
Roger Moren
SOUTH-CENTRAL REGION
Industrial Water Users
Scott Milburn **
SOUTH-CENTRAL REGION
Ag - Crop Irrigation
Darwin Hendrix **
Derek Helms
David Brian Hendrix
Grant Pace (Forestry)

** indicates spokesperson

SOUTH-CENTRAL REGION
Ag - Livestock
Jason Green**
SOUTH-CENTRAL REGION
Thermoelectric
Brent Parker **
SOUTH-CENTRAL REGION
Fish & Wildlife
Jason Olive **
Mark Karnes
Ricky O'Neill
Jaret Rushing
Richard Stich
Jason Throneberry
Brett Hobbs
SOUTH-CENTRAL REGION
Recreation
Dr. Bill Layher **
Byron Eubanks
David Brian Hendrix
Tim Kibe
Ricky O'Neill**
SOUTH-CENTRAL REGION
Navigation
Gene Higginbotham **
SOUTH-CENTRAL REGION
County Governments
Judge Floyd W. Nutt **
SOUTH-CENTRAL REGION
Municipal Governments
SOUTH-CENTRAL REGION
Conservation Districts
Thomas M. Frazer **
David Brian Hendrix

** indicates spokesperson

ATTACHMENT 3

Revised and Consolidated Set of AWP Issues

Attachment 3. Consolidated List of Water Issues In Arkansas

A preliminary set of water issues were identified from:

1. 1990 Arkansas Water Plan
2. 2013 Arkansas Water Plan public meetings
3. ANRC Commissioners and staff
4. Conservation District assessments, and
5. Winthrop Rockefeller Foundation Water Issues in Arkansas Report

This preliminary set of issues is listed below, by general categories, with a designation of its regional applicability:

1. St – Statewide
2. E – East Arkansas Planning Region
3. N – North Arkansas Planning Region
4. WC – West Central Arkansas Planning Region
5. SC – South Central Arkansas Planning Region
6. SW – Southwest Arkansas Planning Region

An asterisk (*) means this issue was identified in the 1990 Water Plan and is still an issue.

This preliminary list was supplemented with issues identified at the Statewide Issues and Recommendations Workgroup meeting in January. The issues identified at the Statewide January meeting were synthesized and integrated into the consolidated list of issues included below. The consolidated workgroup issues are listed below under the subheading of Workgroup Issues. The sector(s) raising these issues at the Statewide meeting were:

Ag = Agriculture Irrigation and Livestock/Poultry/Aquaculture
FWR = Fish and Wildlife and Recreation
TI = Thermoelectric and Industry
PWWP = Public Water/Wastewater Providers
MC = Municipal and County Governments
N = Navigation
CD = Conservation Districts

The sector(s) designations are noted with each Workgroup issue listed below. The list of issues on the following pages will serve as the starting point for discussion at the February Regional Workgroup meetings.

SURFACE WATER QUANTITY

1. Site specific and seasonally available stream flows may effect the amount of water reliably available for direct diversion from surface sources to satisfy beneficial out of stream uses (e.g. agriculture, livestock, industry, recreation) while sustaining the fish and wildlife resources. (St).*
2. New impoundments are needed to provide adequate surface water supply (SC).
3. Surface water resource development may be in conflict with efforts dedicated to the preservation and conservation of outstanding water resource waters streams (St).*
4. Quantification of in-stream water needs for navigation, current and forecasted riparian use, interstate compacts, fish and wildlife, and aquifer recharge based on sound science is needed for all Arkansas streams (St).
5. Authorization of excess water use should not result in adverse impacts to instream needs (St).*
6. Reallocation of storage for water supply is needed in federal projects (e.g., reservoirs) (St).

Additional Workgroup Issues

1. More surface water storage, particularly on-farm/off-channel storage is needed to off-set groundwater use (Ag, FWR).
2. Surface water use should be a priority over groundwater withdrawals (Ag, MC).
3. Water from areas with surplus water should not be distributed to deficit areas without considering the economic and development implications (Ag).
4. The 25% value for estimating excess surface water should be re-evaluated (Ag), with explicit fish and wildlife considerations (FWR).
5. Water supply storage in Corps reservoirs is not fully committed (TI).
6. High quality water is being depleted for uses that do not require that quality of water (PWWP).
7. Transfers of water out of state should not be considered above that needed to satisfy interstate compacts (PWWP).
8. Economic costs and benefits need to be considered with every water alternative, including restrictions/regulations (Ag).

GROUNDWATER QUANTITY

1. Ground water levels are declining severely in the alluvial aquifer in the Grand Prairie Region and the area west of Crowleys Ridge (E).*
2. Ground water levels are declining in parts of the Sparta Sand aquifer of the Gulf Coastal Plain (SC).*
3. The most extensive ground water problem in the Interior Highlands of Arkansas is the naturally occurring low yield of water and poor quality in shallow formations. Individuals cannot afford deep wells (N).*
4. More accurate water measurements are needed to estimate agricultural irrigation water use (E).*
5. Overdrafting of groundwater aquifers can lead to permanent loss of storage because the aquifers collapse. (St)
6. Reporting groundwater use is inconsistent, which adds uncertainty to estimating supply and demand (St).
7. Surface water and groundwater are not being managed conjunctively (St).

Additional Workgroup Issues

1. Groundwater depletion is critical and affecting surface water resources (FWR, N).
2. Important groundwater sources of drinking water (e.g., Sparta) are being depleted for other uses, and there is competition among sectors for high quality water (PWWP, MC).
3. Greater emphasis is needed on the interstate aquifers among AR, TN, MS (CD).

WATER CONSERVATION & SHORTAGES

1. 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 (St).*
2. Coordination between state agencies (ANRC, ADEQ, AGFC, AHD, ANHC) during times of drought, shortages (formal or informal declarations) and when permitting non-riparian uses needs explicit incorporation into the water plan.
3. Water supply sources (both groundwater and surface water) need to be identified to support economic expansion across the state (St).*
4. Water conservation practices are not being aggressively pursued as an alternative to development to meet future needs (St).*
5. There is inadequate water supply during summer months for watering livestock (N, E).

Additional Workgroup Issues

1. Water reuse and recycling needs greater emphasis (MC).
2. Water conservation practices need to be emphasized (Ag, FWR).

WATER QUALITY

1. There are a significant number of stream miles that have impaired uses throughout the State (St).
2. Erosion (sheet, rill, gully, streambank, unpaved roads) is a major contributor to water quality problems statewide (St).
3. Much of the problem in water-quality degradation is from nonpoint source pollution (St).*
4. Municipal and industrial point sources are sources of impairment (St).
5. Saltwater intrusion is a significant problem in several aquifers of Arkansas (E, SC).*
6. Poorly constructed and abandoned oil, gas, and water wells threaten the water quality of our ground water throughout the State (St).*
7. There is insufficient water quality data to manage water resources and identify possible problem areas (St).*
8. Inadequate nutrient management is contributing to water quality problems (N, E).*

Additional Workgroup Issues

1. Nutrient management areas should be considered in the plan (Ag).
2. Outstanding natural resource waters need protection (FWR).
3. Water quality, in its broadest context, is as important as water quantity and should be considered in the Water Plan (Ag, FWR).
4. Increased development and changing land use are impacting water quality and quantity (PWWP, CD).
5. Water supplies are vulnerable to unsewered sources of wastewater (PWWP).
6. Salt water intrusion is impacting groundwater quality (PWWP).
7. Greater attention needs to be given to contaminants of emerging concern (PWWP).
8. Incremental costs and benefits associated with water quality improvements should be estimated (TI).

INFRASTRUCTURE ISSUES

1. The Arkansas Natural Resources Commission lacks the authority to require conformance with the Plan (St).*
2. A process is needed for statewide prioritization of infrastructure projects (St).*
3. Impaired drainage and floodwater damages are continuing to affect agricultural production in Arkansas (E).*
4. There is insufficient infrastructure to deliver and distribute water from areas of surplus to areas in need (St).
5. Growth without adequate planningcontributes to both flooding and water quality problems (St).

Additional Workgroup Issues

1. Rural utilities are resource-limited – trained people and funds (PWWP).
2. Maintaining and replacing aging infrastructure, including dams, drainage, and levees, is an issue across the state (MC, PWWP, CD).

FUNDING AND INCENTIVE ISSUES

1. Arkansas communities need additional funding sources for construction of water and sewer projects to supplement FHA and other federal funding sources. (St).*
2. Funding sources will be required for infrastructure to redirect water to areas of need (St).*
3. Current state financial assistance programs contain restrictions on type of assistance available to local sponsor and type of water resources projects which may be funded (St).*
4. Sufficient funding to repair, replace, and maintain dams, levees, PL566 structures, and aging infrastructure is not available (St).

Additional Work Group Issues

1. Funding of under construction and on-going water projects should be a priority (Ag).
2. Incentives for stream restoration need to be developed (FWR).
3. Funds are limited for maintenance and replacement of aging infrastructure (PWWP).
4. Utility rates are not based on the actual value of water (PWWP).
5. Federal fund restrictions limit their use for utilities, municipalities, and counties (MC).
6. Incentives are needed to encourage implementation of additional voluntary conservation and management practices (CD), including water enterprise zones (FWR).

WATER LAW & REGULATIONS

1. Conflicts are occurring between meeting in-state water needs with those needs of other states as agreed to through Arkansas's interstate compacts (St).*
2. Some levee and drainage districts fail to perform routine maintenance after debt service is retired (St).*
3. Federal regulatory procedures related to endangered species are an impediment to implementing water resources projects (St).
4. A modernized structure is needed for statewide water management in Arkansas (St).
5. Other states are trying to buy or take Arkansas's water (St).

Additional Workgroup Issues

1. Voluntary practices should be favored over regulated practices (Ag).
2. Greater enforcement of environmental regulations, particularly permitted activities/discharges, is needed (FWR).
3. Outstanding natural resource waters need special protection (FWR).

4. Interagency inconsistencies need to be addressed (TI).
5. Drinking water uses are being removed from streams (PWWP).
6. Smaller wastewater treatment facilities are not being maintained (PWWP).
7. There is no expedient process for approving and constructing additional storage reservoirs (PWWP).
8. There is no protection of groundwater sources for drinking water (PWWP).
9. Federal and state regulations can impede regional utility projects (MC).
10. Endangered Species Act regulatory complexity is difficult for municipalities and counties to address (MC).
11. Consistent, enforceable building standards and codes are needed to ensure compatibility among utilities (MC).
12. Jurisdictional silos limit opportunities for cooperation and coordination (MC).

WORKGROUP MEASUREMENT AND ASSESSMENT ISSUES

1. More frequent updates of the Water Plan should be considered (Ag).
2. A more comprehensive groundwater/surface water monitoring network across the state is needed for both supply and demand estimates (Ag, FWR).
3. Quantitative estimates of the value of water (both quantity and quality) need to be developed for various sectors (FWR).
4. The 25% estimate used to calculate excess water needs to be evaluated and the appropriate number, if it is not 25%, documented (FWR).
5. Demand estimates should consider only the water consumed, not withdrawn (TI).
6. There is no one source for information on water (TI).
7. Greater accuracy and consistency is needed for water use measurements of both surface and groundwater use (Ag, CD).

WORKGROUP PLANNING ISSUES

1. A comprehensive, continuous planning process is needed, but not conducted, so it is difficult to practice adaptive management (PWWP).
2. Additional planning, restoration, and state money is needed to remove streams from the impaired category (303(d) list) (CD).
3. Drought contingency plans are needed (Ag).
4. Joint water management planning is needed among agencies within planning regions (CD).
5. Better methods must be developed to allow the best available technical, social, and economic sciences to inform and influence water management decision-making and policy development for water resources (St).

PUBLIC AWARENESS OF RESOURCE ISSUES

1. Lack of understanding and knowledge about water resources is the greatest statewide issue (St).
2. Currently there is no methodology to quantify economic impact or a monetary value to water quality. If a methodology was developed/available, the "value" of water quality would be better understood by the general public (St).
3. Sound stewardship of water and water resources is needed to ensure there is adequate water to meet desired uses (St).

Additional Workgroup Issues

1. Greater awareness, outreach, and education on water are needed (FWR).
2. Outreach and education training is needed across all sectors, particularly on water and water resources (CD).
3. There is no single source with links or access to information related to water and water resources anywhere in the State. Information is scattered across agencies, organizations, universities, and the web (St).

ATTACHMENT 4

Final Tech Memo-Region Priority Issues

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 50th St.
1:00 p.m. – 4:30 Issues and Recommendations Workgroup Meeting

East Region: Stuttgart, March 17th
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 18th
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 20th
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: • Existing, on-going projects; • Future projects; • Conservation/water management practices; • Research; • Outreach and education; and • Synthesis of existing, available tools, practices, and funding incentives.	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

Category	Issue	Votes
(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

Category	Issue	Votes
	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

Category	Issue	Votes
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

Category	Issue	Votes
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

Category	Issue	Votes
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

Category	Issue	Votes
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

Category	Issue	Votes
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

Category	Issue	Votes
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

Category	Issue	Votes
	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

ATTACHMENT 5

Consolidated Recommendations List for April 29th Meeting

Statewide

Statewide Summary Recommendations

Issues	Recommendations
GROUNDWATER AR-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.	AR-1a: Arkansas should commit to the efficient use and management of both of surface water and groundwater resources through conjunctive management, intentionally recharging the basin when excess water supply is available. AR-1b: Existing and on-going water projects (e.g., Grand Prairie and Bayou Meto irrigation projects) should be funded and completed. Funding recommendations are included with Issue AR-9. AR-1c: Establish a statewide groundwater monitoring network to determine the rate of decline and provide the basis for management recommendations to eliminate the decline, particularly in planning regions without groundwater models. AR-1d: Continued emphasis, tax incentives, and funding shall be given to converting from groundwater to surface water, implementing water management and conservation practices, particularly for agricultural irrigation. AR-1e: Compile a list of available tools; conservation practices, funding incentives, and tax credits; and local, state, and federal funding sources for groundwater and surface water management and maintain on the ANRC website for public use. AR-1f: Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies.

Statewide Summary Recommendations (continued).

Issues	Recommendations
SURFACE WATER AR-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. 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) needs to be determined.	AR-2a. Recommendations for establishing excess surface water ranged from below 25% to as high as 75%. Because of these differences, it is recommended that the proportion of stream flow designated as excess surface water be determined by an independent entity for all perennial streams in Arkansas using a risk-based, flow-fisheries framework as the scientific approach for estimating the fish and wildlife component of instream flow uses through a stakeholder-driven process. Basins with estimated water gaps should receive higher priority for application of this approach. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. The study should be conducted through an open and transparent process. ANRC and other state and federal grant monies should be sought to fund this scientific study. AR-2b. Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies.
WATER STORAGE AR-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.	AR-3a: Dedicated state funding should be provided to support ANRC Title 10 to help off-set a portion of the cost share to increase adopting on-farm storage systems. AR-3b: ANRC Rule 14 should be amended to reduce the required storage volume to 1-2 ac-ft so additional entities are eligible for cost share of on-farm storage systems. AR-3c: ANRC, in conjunction with other state and federal agencies, should identify projects and determine how to transfer/store water to meet demand on a regional, watershed basis for conjunctive water management. AR-3d: Propose legislation to increase the tax credits for landowners constructing on-farm reservoirs.

Statewide Summary Recommendations (continued).

ISSUES	Recommendations
WATER QUALITY AR-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.	AR-4a: Request increased State funding for stream bank stabilization and riparian enhancement, for forestry education and stewardship plans, training for county road crews for road and ditch maintenance, and for paving critical areas of county gravel road systems that are high contributors of sediment. Incentives shall be implemented that encourage private (non-industrial) landowners to retain streamside management zones and use erosion control practices. AR-4b: ANRC should continue to administer, fund, and implement the nonpoint source program leveraging EPA 319 funds in priority and nutrient sensitive watersheds. Request additional funding appropriations to increase available cost share funds for leveraging federal grants. AR-4c: Designate additional areas of the State as nutrient surplus areas because of increased animal production. Nutrient management plans should be required in these nutrient surplus areas. AR-4d: Propose legislation to increase, or at least maintain, funding for nonpoint source controls (streambank restoration, erosion control, and forest management), prioritizing projects in "priority watersheds," and "nutrient sensitive" watersheds. AR-4e: ANRC should work closely with state and federal agencies, conservation districts, and non-governmental organizations to remove streams from ADEQ's 303(d) list through education, and state and federal conservation programs. AR-4f: Water quality authority is shared by ADEQ and ANRC. The AWP should reflect and integrate the water quality policies of ADEQ as the state's primary planning document regarding water quality policy. Both ADEQ and ANRC should collaborate to monitor, plan, and fund water quality improvement programs to reduce sediment and nutrient loading into state streams, lakes, rivers and wetlands with particular emphasis on maintaining the integrity of relatively unaltered, high quality streams. Increased water quality monitoring shall be implemented at a segment level to assess program implementation success.

Statewide Summary Recommendations (continued).

ISSUES	Recommendations
FEDERAL REALLOCATION OF STORAGE AR-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.	AR-5a: ANRC should pursue reallocation of storage in federal impoundments for additional water supply in areas where there is a critical need or increased projected demand is estimated to exceed supply.
WATER SHORTAGE AR-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.	AR-6a: ANRC should create a state drought and shortage response team that develops drought and shortage contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages. The prioritization should include established inter and intra basin transfers. Allocation during drought should be tied to nearby stream gages.
INFRASTRUCTURE AR-7: Infrastructure, from municipal and rural water/wastewater distribution systems to dams, levees, and PL566 structures, are aging and failing.	AR-7a: Provide local/state funding support for repair, rehabilitation of PL566 dams and ongoing maintenance. These funds shall also be used to support technical assistance and equipment. AR-7b: Continue to provide and sustain state tax exempt bonds for the maintenance of the aging infrastructure. Propose legislation for a sustainable sales tax for repairing, maintaining, and replacing infrastructure. Establish a higher ranking for cities/counties/regions/water districts that invest in themselves, as an incentive for those who generate some of their own funding.
REGULATIONS AR-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.	AR-8a: ANRC should review state and federal laws and regulations collaboratively with ADEQ, ADH, and AGFC and appropriate federal agencies and take appropriate steps to streamline and coordinate water development project procedures and information sources while maintaining comprehensive review criteria. AR-8b: Establish a “mediator” as an advocate for cities/utilities with federal/state regulators to facilitate the permitting process.

Statewide Summary Recommendations (continued).

ISSUES	Recommendations
FUNDING AR-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.	AR-9a: Propose legislation to create a water check-off program for all water users. These funds should be used to complete existing projects, fund new projects, and develop outreach and education programs. The program will emphasize surface water projects that reduce ground water withdrawals, integrated irrigation water conservation and management practices, and repair/replacement of water infrastructure. AR-9b: Propose legislative funding mechanisms and incentives for consolidating small municipal systems to create or expand regional water/wastewater utilities. AR-9c: Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow. AR-9d: Propose legislation to increase the bond funding authority under the existing Arkansas General Obligations Bond programs so monies can be utilized to cost share with federal or state programs for water projects. AR-9e: Propose legislation to authorize a water resources reconstruction and repair funding program under the authority and management of ANRC, specifically to assist local and county entities in repairing, replacing, and maintaining infrastructure.

Statewide Summary Recommendations (continued).

ISSUES	Recommendations
	AR-9f: Propose an 1/8 cent sales tax to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices. AR-9g: Propose legislation to increase the duration of tax credits for projects that transfer groundwater to surface water use to encourage adoption, and extend this credit for early adopters of surface water projects. AR-9h: Propose legislation to modify the existing tax incentives available under the Water Resources Conservation and Development Incentives Act to account for increased water use efficiency or reduction in groundwater withdrawal. Create a graded tax credit with up to a 25% tax credit outside a critical groundwater area, and up to 80% tax credit within a critical groundwater area, with the maximum tax credits based on documented water use efficiencies of greater than 90% or complete transfer from ground water to surface water. AR-9i: Support legislation to increase or at least maintain funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices. AR-9j: Propose legislation to support conservation districts in addressing urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment.

Statewide Summary Recommendations (continued).

ISSUES	Recommendations
REGIONAL PERSPECTIVE AR-10: Regional issues are not currently reflected in the Arkansas Water Plan	AR-10a: ANRC has committed to including regional uses and recommendations in the Arkansas Water Plan update.
Public Awareness AR-11: There is a lack of public awareness about the importance of water for all sectors	AR-11a: Encourage state natural resource agencies/entities to expand existing educational programs (Project WILD, Project WET, Arkansas Stream Team Program, plus others) to increase the level of awareness of the importance of water to the state for all 11 sectors and the need for water conservation measures and best management practices in order to sustain the Natural State's economy, environment, and society into the future. AR-11b: The Arkansas Water Foundation should formulate a holistic and integrated framework for developing and promoting statewide awareness, outreach, and educational programs, and coordinate similar efforts among state agencies, universities, and nongovernmental organizations. This integrated framework should include training modules on water and water related issues and the broad implications of water for sustainable communities for community leaders, local authorities, and business leaders. There shall be a focus on prevention of water related problems as well as water conservation and the economic benefits of both prevention and conservation. AR-11c: Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.

Statewide Summary Recommendations (continued).

ISSUES	Recommendations
	AR-11d: Prepare a proclamation for the Governor of the State of Arkansas to declare a Decade of Sustainable Water to encourage better understanding of the importance of water, water conservation and management in every facet of Arkansans' lives – environmental, social, and economic. AR-11e: A coordinated educational effort among K through 12 schools, universities, nonprofit organizations, and state agencies should be administered through the Water Foundation over the next decade. AR-11f: Propose the Governor appoint a taskforce of state agency personnel to develop a single source of the state's water data and information from all agencies and entities. AR-11g: Establish a common website where all water oriented education and conservation information and data can be centralized (i.e., Arkansaswater.org).

Statewide Summary Recommendations (continued).

ADDITIONAL RECOMMENDATIONS

MEASUREMENT AND ASSESSMENT

AR-12 A consistent, standardized approach should be developed for estimating and reporting water use for different crops for a more precise accounting of water use across counties.

AR-13 Critical streamflow gages should be identified and maintained through time in every planning region. Critical gages would be defined as those necessary for basin yield analysis, upstream flow requirements, drought allocation, and compact compliance.

AR-14 Conduct an assessment of progress in implementing the Arkansas Water Plan every 5 years and revise as needed to ensure it is moving toward its goals and objectives.

AR-15 Propose comprehensive statewide study to determine capabilities for building new reservoir systems (large scale and small scale) to supply surface water and reduce ground water demand.

Additional Surface Water (AR-3)

AR-16 Regional Projects.

a. Significant regional projects have been approved (Bayou Meto and White River) and should be completed and evaluated before alternative solutions are pursued.
b. Publicly endorse a plan and schedule for completing these approved projects.
c. Address funding challenges and develop a plan to obtain necessary funding for completion.
d. Identify other viable regional projects, prioritize by need and likelihood of success, and initiate the new projects.

AR-17 On-farm water storage facilities.

a. Aggressively promote benefits of on-farm water storage.
b. Enhance technical support from NRCS and state technicians.
c. Streamline application process for approved on-farm projects.
d. Increase incentives designed to encourage voluntary implementation (aggressive tax credits at multiple of construction cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits).

Statewide Summary Recommendations (continued).

AR-18 Available Surface Water. Expand the statutory definition of excess surface water to raise the percentage of available water, thus providing access to more water for diversion purposes.

Insufficient Funding (AR-9).

AR-19 Identify the various types of potential funding and match with the most applicable type of project. For instance, 1) public bonds and property owner assessments for regional projects, 2) public funds for state and federal agency support and 3) tax incentives for individual on-farm activities. Develop credible budget and plan for each funding type.

Regional Planning Areas (AR-10)

AR-20 East Arkansas has areas with distinct water resource characteristics. County lines are not always the proper boundaries for identifying such characteristics or adopting a water conservation plan suitable for a given area. Develop regions or areas for water conservation planning based on identifiable and similarly aligned characteristics.

Other Conservation Measures (AR -11).

AR-21 Aggressively educate and promote the need for irrigation conservation measures and identify best management practices and technology.

AR-22 Increase incentives designed to encourage voluntary deployment of irrigation conservation measures and purchase of systems/equipment (aggressive tax credits at multiple of cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits). Develop and promote best management practices ("BMP"), which include, but are not limited to, tail water recovery, PHAUCET/Pipe Planner, water monitoring devices, land leveling, surge valves, remote controls, soil moisture monitors, satellite monitoring of crops and soils, cooperative agreements with energy providers, and cellular links to weather stations.

AR-23 Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.

Statewide Summary Recommendations (continued).

Use of the Water Plan

AR-24 Refine the data for measuring current irrigation usage and trends. (Current data is widely criticized and is not sufficient for policy matters that affect property rights.)

AR-25 Establish milestones throughout the scheduled term of the Water Plan.

AR-26 Establish goals and aggressive incentives for increasing the use of water monitoring devices.

AR-27 Establish goals and aggressive incentives for deploying best management practices and water conservation technologies.

AR-28 Establish goals and aggressive incentives for achieving measurable water savings.

AR-29 Adjust irrigation usage trends/projections/goals as better data are gathered and measurable water savings are achieved.

AR-30 Recommendations **should not** include restrictions, mandates, taxes or assessments applicable to groundwater use without sound data and contemporaneously providing viable, timely and economical solutions in lieu such restrictions or added costs.

Note: Reference to "aggressive incentives" or "aggressive tax credits" means something along the lines of tax credits equal to 2-3 times the cost of the conservation measure and much higher annual limits for use of the tax credit. These aggressive incentives would be available for years 1-4 (set a known expiration date) so as to attract more immediate and measurable participation in water monitoring and conservation.

MODIFICATIONS TO WORKGROUP RECOMMENDATIONS

AR-1c Establish a statewide groundwater monitoring network to determine the rate of decline or increase and provide the basis for management recommendations to reduce the declines, particularly in planning regions without groundwater models.

AR-1d. Continued emphasis, tax incentives, and funding shall be given to converting from groundwater to surface water, adoption of best water management and conservation practices, particularly for agricultural irrigation.

Statewide Summary Recommendations (continued).

AR-1e. Compile a list of available tools; conservation practices, funding incentives, and tax credits; and local, state, and federal funding sources for groundwater and surface water management and maintain on the ANRC website for public use. Water plan should build upon existing incentives by expanding and increasing available incentives.

AR-3c. ANRC, in conjunction with other state and federal agencies, should identify projects and determine how to transfer/collect/store water to meet demand on a regional, watershed basis for conjunctive water management.

AR-3d. Propose legislation to increase the tax credits and other incentives for landowners constructing on-farm reservoirs.

AR-9a. Propose legislation to create designated revenue streams from all water users to help finance water needs. These funds should be used to complete existing infrastructure development projects, fund new projects, and develop outreach and education programs. The program will emphasize surface water projects that reduce ground water withdrawals, integrated irrigation water conservation and management practices, and repair/replacement of water infrastructure.

AR-9f. Propose a state-wide funding mechanism (potentially a sales tax) to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices.

AR-9g. Propose legislation to increase the duration of tax credits for projects that transfer use from groundwater to surface water to encourage adoption, and extend this credit for early adopters of surface water utilization systems.

AR-11c. Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, Ag Council, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.

AR-12. A consistent, standardized approach should be developed for estimating and reporting water use for different crops for a more precise accounting of water use across counties. Such an approach would be best if it was voluntary and incentivized if there are additional reporting requirements or data transmitted. In addition, such information should ensure appropriate measures to protect privacy of landowners.

Statewide Summary Recommendations (continued).

AR-13. Critical streamflow gages should be identified and maintained through time in every planning region. Critical gages would be defined as those necessary for basin yield analysis, upstream flow requirements, drought allocation, and compact compliance.

AR-14. Conduct an assessment of progress in implementing the Arkansas Water Plan every 5 years and revise as needed to ensure it is moving toward its goals and objectives. Assessments should provide an accurate estimation of where we are today and provide an understanding of what the state's goals are for water savings, storage capacity development, and adoption of technologies and BMPs.

- Blue indicates the recommendations were submitted separately and not during the Regional Workgroup meetings.

East Region Summary Recommendations (continued)

East Region Summary Recommendations

Issues	Recommendations
SURFACE WATER E-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).	E-1a. Recommendations for establishing excess surface water ranged from below 25% to as high as 75%. Because of these differences, it is recommended that the proportion of stream flow designated as excess surface water be determined by an independent entity for all perennial streams in Arkansas using a risk-based, flow-fisheries framework as the scientific approach for estimating the fish and wildlife component of instream flow uses through a stakeholder-driven process. Basins with estimated water gaps should receive higher priority for application of this approach. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. The study should be conducted through an open and transparent process. ANRC and other state and federal grant monies should be sought to fund this scientific study. E-1b. Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife, with a stakeholder process to determine basin specific priorities of the in stream and out of stream of water uses. Intermittent streams should be evaluated through a different process to allow use during periods of high flow.
GROUNDWATER E-2: Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	E-2a: Surface and groundwater should be managed conjunctively to address water needs for agriculture, drinking water, industry, recreation, and fish and wildlife. ANRC should develop and implement conjunctive management strategies in critical groundwater areas with specific goals to recover the aquifers in those areas.

East Region Summary Recommendations (continued)

Issues	Recommendations
	E-2b: Integrate surface water use, groundwater conservation and on farm conservation measures (tailwater recovery, land leveling, strategic water delivery practices) into an integrated and continuous planning process for the delta of Arkansas. Aquifers should be evaluated for quantity and quality as a source for domestic water needs and other uses. E-2c: Propose legislation to fund and complete the Grand Prairie and Bayou Meto projects. E-2d: Reserve deep aquifers for use as municipal drinking water sources. E-2e: Institute and enforce a penalty for wasteful use of groundwater in agriculture.
WATER SHORTAGE E-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.	E-3a: Shortage and drought contingency plans should be developed for the Bayou Bartholomew, Bayou Macon, Bayou DeView, St. Francis, Cache, and Beouf River basins. The Fish and Wildlife Flow Framework should serve as the stakeholder process for scientifically determining appropriate **minimum** flow levels for different classes of streams statewide. Priorities of use during a drought or shortage should be regionally determined by local landowners, recreationists, industry and fish/wildlife scientists before those shortages occur to reflect regional priorities.
FUNDING E-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.	E-4a:Propose a voluntary water check-off program for municipal, industrial, and agricultural users that can be used to fund projects converting groundwater to surface water use, water conservation practices, education and outreach, and repair/replacement of infrastructure. E-4b: Propose legislation to increase allowable percentages of ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow.

East Region Summary Recommendations (continued)

Issues	Recommendations
	E-4c: ANRC rules such as Title 10 & Title 14 should be amended so they are more accessible to livestock producers. Dedicated state funding is needed for Title 10 to help offset a portion of the cost share. This will increase adopting of on-farm storage. The AC-FT threshold required for eligibility under Title 14 should be lowered to 1-2 AC-FT. E-4d: Propose legislation to increase the bond funding authority under the existing Arkansas General Obligations Bond programs so monies can be utilized to cost share with federal or state programs for water projects. E-4e: Propose legislation for a 1/8 cent sales tax to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices. E-4f: Propose legislation to increase the duration of tax credits for projects that transfer groundwater to surface water use to encourage adoption, and extend this credit to early adopters of surface water projects. E-4g: Modify the existing tax incentives available under the Water Resources Conservation and Development Incentives Act to account for increased water use efficiency or reduction in groundwater withdrawal. Create a graded tax credit with up to a 25% tax credit outside a critical groundwater area, and up to 80% tax credit within a critical groundwater area, with the maximum tax credits based on documented water use efficiencies of greater than 90% or complete transfer from groundwater to surface water. E-4h: Encourage the legislature to increase or at least maintain funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices.

East Region Summary Recommendations (continued)

Issues	Recommendations
	E-4i: Propose legislation to support conservation districts in addressing urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment. Maintain, at a minimum, current funding for extension and research staff. E-4j: Propose legislation to increase State funding for stream bank stabilization and riparian enchancement, for forestry education and stewardship plans, training for county road crews for road maintenance, and for paving critical areas of county gravel road systems that are high contributors of sediment. E-4k: Prepare a synthesis of existing, available tools, practices, and funding incentives, tax credits, local, state, and federal funding sources for groundwater and surface water conservation, and maintain this on the ANRC website for public use. E-4l: Propose legislation to fund additional research needed to improve water use efficiency, reuse of gray water for irrigation, genetic research on drought tolerant species, and aquifer storage and recovery. E-4m: Propose legislation to target tax credits: o For flow metering, o For livestock watering, and o For more efficient suites of irrigation water management practices. Encourage a streamlined EQIP process for flow meters.

East Region Summary Recommendations (continued)

Issues	Recommendations
INFORMATION MANAGEMENT E-5: There is no single source of water data or information across agencies.	E-5a: Propose the Governor of the State of Arkansas appoint a task force to develop a single source of the state's water data or information across agencies and Arkansans. E-5b: Designate Conservation Districts as the repository for various records, including but not limited to utility system records, and make that information accessible to those that may need to use it.
ADMINISTRATION E-6: A modernized administrative structure is needed for statewide water management (one authority) rather than having it distributed across multiple agencies	E-6a. ANRC should formulate and propose an administrative structure for statewide water management within one agency.
REGIONAL PLANNING E-7: Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	E-7a: Retain the Planning Region Work Groups for implementation of the Arkansas Water Plan, particularly related to subregional issues and considerations. E-7b: ANRC has committed to including regional uses and recommendations in the Arkansas Water Plan update.
WATER CONSERVATION E-8: Continue to pursue water conservation practices as an alternative to development for future needs.	E-8a: Propose legislation to make state and federal tax incentives and cost-share funds even more available to farmers and landowners so that water conservation measures are economically feasible and desirable in all regions of the state. Partner state and federal agencies should also aggressively promote increased use of effective management techniques already available. This could include funding for outreach and education and technical assistance to reduce impediments to management. E-8b: ANRC should promote quantifying water usage and incorporation of this information into integrated irrigation water conservation and management practices through tax incentives, cost-share programs, and outreach and education.

East Region Summary Recommendations (continued)

Issues	Recommendations
	E-8c: ANRC should quantify economic costs of irrigation and economic savings through implementing water conservation practices. E-8d: ANRC should emphasize soil health, cover crops, soil management, etc. as part of water conservation practices.
INFRASTRUCTURE E-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.	E-9a: Propose legislation to establish funding mechanisms and incentives for consolidating small municipal systems to create or expand regional water/wastewater utilities. E-9b: Propose legislation to authorize a water resources reconstruction and repair funding program under the authority and management of ANRC, specifically to assist local and county entities in repairing, replacing, and maintaining infrastructure.
PUBLIC AWARENESS AND EDUCATION E-10: Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	E-10a: Propose a proclamation for the Governor of the State of Arkansas to declare a "Decade of Sustainable Water" to encourage better understanding of the importance of water, water conservation, and management in every facet of Arkansan's lives – environment, social, and economic. E-10b: Arkansas Conservation Districts should develop and implement, in conjunction with UA Cooperative Extension Service and ANRC, an education program about agricultural water uses, needs, and the importance of agriculture to the Arkansas economy. E-10c: ANRC should document the economic benefit of these water projects through jobs and food security, and the contributions to Arkansas GDP from agriculture. Include this information in education programs.

East Region Summary Recommendations (continued)

ADDITIONAL RECOMMENDATIONS:

E-11 Prioritize the Water Plan activities on a time line from planning to implementation to measures of progress to outcomes

E-12 Require detailed, comprehensive economic analyses before any endangered species critical habitat designations are made to support the designation.

E-13 RECOMMENDATION: ANRC must develop water conservation plans to encourage more efficient use of water resources. Water Conservation plans must be based on scientific research and include user interaction to determine practical Best Management Practices (BMP) in water use and water conservation. ANRC must provide detailed user (profile based) action plans that water users can modify and implement in their respective daily operations. Water Conservation plans should be developed for the full water user profile including Domestic, Agricultural, Irrigation, Industrial, and Commercial, Mining, and Irrigation District water supply, power supply, municipal and county. ARNC should periodically survey a sampling of water users (by profile) to assess what BMPs are practical, successful and what is impractical. Surveys should ask users for new BMPs that might need research to determine viability or they have found useful The ANRC website should encourage users to submit new ideas and critique present BMPs.*

E-14 RECOMMENDATION: ANRC and appropriate agencies should seek legislative authority to require all water users to comply with and implement water conservation measures in all affected areas during drought conditions, water shortage situations or in areas of critical water shortage.

E-15 RECOMMENDATION: Agriculture Irrigation is the major user of groundwater in Arkansas. New irrigation technologies and improved techniques in irrigation Best Management Practices (BMP) need to be developed and demonstrated to Arkansas Agriculture Irrigators. ANRC must partner with the Arkansas Department of Agriculture, the University of Arkansas, the University of Arkansas Cooperative Extension Service, Conservation Districts and the Natural Resources Conservation Service to develop better, practical BMPs, irrigation techniques, and technology to conserve our water resources. Arkansas Irrigators should implement these practical BMPs in their irrigation operations and provide feedback on their success to ANRC on a seasonal timeframe.

E-16 RECOMMENDATION: Implementing improved irrigation technologies and improved techniques in irrigation Best Management Practices (BMPs) may require a significant investment in material and labor costs by Arkansas Agricultural Irrigators. ANRC should encourage Arkansas Agricultural Irrigators to invest in this operational cost by offering state tax incentives similar to irrigation project tax credits for Impoundments (of at least 20 acre – feet), Conversions (from ground to surface water irrigation) and land leveling.

East Region Summary Recommendations (continued)

E-17 RECOMMENDATION: ANRC should continue to work closely with the Arkansas Department of Environmental Quality (ADEQ) and the Arkansas Department of Health (ADH) in protecting our State's precious water supply. New issues regarding potential and existing problems with our water resources have to be identified, addressed and reassessed by these agencies on a continual, periodic basis. Joint agency reports on these problem areas and potential solutions should be reported to the Governor, the State legislature and made available to the Public. ANRC, ADEQ and ADH must encourage other state agencies, water users and the general public to help identify potential water resource quality/quantity problems and solutions.

E-18 RECOMMENDATION: Currently, ANRC offers irrigation project tax credits for Impoundments (of at least 20 acre – feet), Conversions (from ground to surface water irrigation) and land leveling. There are no similar tax credits available for ranchers who use livestock ponds (surface water) to water their livestock operations. Livestock waterway barrier fences are the key measure protecting Arkansas streams, ditches, and other waterways from pollution by unrestricted livestock access. Heavy rains or flooding situations often require ranchers to repair or replace these livestock waterway barrier fencing. Ranchers should be offered tax credits for installing livestock ponds and installing livestock waterway barrier fencing or for the repair/replacement of livestock waterway barrier fencing damaged by heavy rains, flooding conditions or some other natural disaster.

E-19 RECOMMENDATION: Buffer zones reduce or prevent suspended solids (soil) and associated contaminants from being deposited into lakes, rivers, streams, wetlands and/or sources of drinking water as rainfall or snowmelt moves over the ground. ANRC should offer state Tax credits (similar to those Tax credits available under the existing irrigation tax credits system) to Landowners, operators and producers who expand or create buffer zones (filter strips) around crop, pasture, forest and urban areas.

E-20 RECOMMENDATION: The water plan should focus on the following items: conservation, development of surface water supply, generating new funding opportunities to develop water infrastructure, education of public on water utilization/conservation, and incentives to increase adoption of conservation systems and best management practices, and research to develop new methods and technologies to reduce water use. Plan should also look to lower regulatory burdens that hamper implementation of the strategies listed above. The plan should avoid regulation, unnecessary taxes and fees, arbitrary limits on consumption, and mandatory adoption of irrigation systems or methods.

Insufficient Funding (E-4).

E-21 RECOMMENDATION Identify the various types of potential funding and match with the most applicable type of project. For instance, 1) public bonds and property owner assessments for regional projects, 2) public funds for state and federal agency support and 3) tax incentives for individual on-farm activities. Develop credible budget and plan for each funding type.

East Region Summary Recommendations (continued)

Regional Planning Areas (E-7)

E-22 RECOMMENDATION East Arkansas has areas with distinct water resource characteristics. County lines are not always the proper boundaries for identifying such characteristics or adopting a water conservation plan suitable for a given area. Develop regions or areas for water conservation planning based on identifiable and similarly aligned characteristics.

Other Conservation Measures (E-8, 10).

E-23 Aggressively educate and promote the need for irrigation conservation measures and identify best management practices and technology.

E-24 Increase incentives designed to encourage voluntary deployment of irrigation conservation measures and purchase of systems/equipment (aggressive tax credits at multiple of cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits). Develop and promote best management practices ("BMP"), which include, but are not limited to, tail water recovery, PHAUCET/Pipe Planner, water monitoring devices, land leveling, surge valves, remote controls, soil moisture monitors, satellite monitoring of crops and soils, cooperative agreements with energy providers, and cellular links to weather stations.

E-25 Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.

Infrastructure (E-9)

E-26 Regional Projects.

a. Significant regional projects have been approved (Bayou Meto and White River) and should be completed and evaluated before alternative solutions are pursued.
b. Publicly endorse a plan and schedule for completing these approved projects.
c. Address funding challenges and develop a plan to obtain necessary funding for completion.
d. Identify other viable regional projects, prioritize by need and likelihood of success, and initiate the new projects.

E-27 On-farm water storage facilities.

a. Aggressively promote benefits of on-farm water storage.
b. Enhance technical support from NRCS and state technicians.
c. Streamline application process for approved on-farm projects.

East Region Summary Recommendations (continued)

d. Increase incentives designed to encourage voluntary implementation (aggressive tax credits at multiple of construction cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits).

E-28 Available Surface Water. Expand the statutory definition of excess surface water to raise the percentage of available water, thus providing access to more water for diversion purposes.

Use of the Water Plan

AR-24 Refine the data for measuring current irrigation usage and trends. (Current data is widely criticized and is not sufficient for policy matters that affect property rights.)

E-29 Establish milestones throughout the scheduled term of the Water Plan.

E-30 Establish goals and aggressive incentives for increasing the use of water monitoring devices.

E-31 Establish goals and aggressive incentives for deploying best management practices and water conservation technologies.

E-32 Establish goals and aggressive incentives for achieving measurable water savings.

E-34 Adjust irrigation usage trends/projections/goals as better data are gathered and measurable water savings are achieved.

E-35 Recommendations **should not** include restrictions, mandates, taxes or assessments applicable to groundwater use without sound data and contemporaneously providing viable, timely and economical solutions in lieu such restrictions or added costs.

Note: Reference to “aggressive incentives” or “aggressive tax credits” means something along the lines of tax credits equal to 2-3 times the cost of the conservation measure and much higher annual limits for use of the tax credit. These aggressive incentives would be available for years 1-4 (set a known expiration date) so as to attract more immediate and measurable participation in water monitoring and conservation.

East Region Summary Recommendations (continued)

MODIFICATIONS TO WORKGROUP RECOMMENDATIONS

E-4a. Propose a designated revenue stream from water users to help finance water use needs, including projects converting groundwater to surface water use, water conservation practices, education and outreach, research to improve water utilization, and repair/replacement/build new infrastructure.

E-4e. Propose legislation for a state wide funding mechanism (perhaps a sales tax) to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices.

E-4g. Modify the existing tax incentives available under the Water Resources Conservation and Development Incentives Act to account for increased water use efficiency or reduction in groundwater withdrawal. Create a graded tax credit with up to a 25% tax credit outside a critical groundwater area, and up to 80% tax credit within a critical groundwater area, with the maximum tax credits based on documented water use efficiencies of greater than 50% or complete transfer from groundwater to surface water.

E-4h. Encourage the legislature to increase funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices.

E-4i. Propose legislation to provide more support for conservation districts in addressing urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment. Maintain, at a minimum, current funding for extension and research staff.

E-4k. Prepare a synthesis of existing, available tools, practices, and funding incentives, tax credits, local, state, and federal funding sources for groundwater and surface water conservation, and maintain this on the ANRC website for public use and distribute through the UofA Extension Service and Conservation Districts.

E-4m. Propose legislation to target tax credits:

- For flow metering, surge valves, multiple inlet irrigation systems, planned polypipe furrow irrigation systems, land improvements such as land leveling, surface water collection, storage and distribution systems, tail water recovery, and other irrigation BMPs known to reduce water usage.

E-7a. Retain the Planning Region Work Groups for implementation of the Arkansas Water Plan, particularly related to subregional issues and considerations by conservation district.

- Blue indicates the recommendations were submitted separately and not during the Regional Workgroup meetings.

North Region Summary Recommendations

Issues	Recommendations
SURFACE WATER N-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.	N-1a: Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
WATER QUALITY N-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.	N-2a: The Issue is the Recommendation.
SURFACE WATER N-3: The 25% restriction used to estimate "excess surface water" should be increased so additional water is available for non-riparian use.	N-3a: ANRC should re-evaluate the non-riparian water permitting process associated with the shale industry assuring the consideration of seasonal flows and cumulative impacts. N-3b: Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies. N-3c: See N-1a Recommendation above.

North Region Summary Recommendations (continued).

Issues	Recommendations
MEASUREMENT AND ASSESSMENT N-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	N-4a: ANRC should modify permit and reporting forms to explicitly account for return flow.
REGULATIONS N-5: Regulatory restrictions make it difficult to restore streams and need to be changed.	N-5a: ANRC should encourage public outreach concerning the problems caused by instream gravel mining to protect and preserve the integrity of Ozark Streams. N-5b: ANRC should streamline permitting requirements (more user friendly) for efforts to improve stream stability, e.g., allow short term deviations, with specific stipulations and requirements. Long term benefits can be achieved through cooperative efforts with regulatory agencies.
SURFACE WATER N-6: "Excess available water" might be based on the lowest historical gap year rather than 25% of average annual (more conservative approach).	N-6a: See N-3 Recommendation

North Region Summary Recommendations (continued).

Issues	Recommendations
WATER CONSERVATION N-7: Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	N-7a: ANRC should encourage outreach and education on water conservation to reduce the need to build impoundments. Emphasize outreach to small communities. N-7b: Conservation issues can be offset by additional storage on farms that will be filled during the night while uses for homes and businesses would be at the lowest. N-7c: Surface and groundwater should be managed together to address water needs of all sectors. N-7d: Water in the form of rainfall must be slowed in its travel from the time it hits the ground until it reaches the Gulf. ANRC should promote public education in the wise use and conservation of water. More funding would be needed for conservation organizations and conservation districts. N-7e: ANRC should provide a model for "Best Site Selection" for new impoundments built for public or agriculture water supply. It should specifically include consideration for proximity to areas of deficit and cost of infrastructure for allocation, and preference of non perennial streams and streams that do not have significant ecological sensitivity.
REALLOCATION IN FEDERAL PROJECTS N-8: Reallocation of storage in Corps of Engineer reservoirs needs to occur	N-8a: The Issue is the Recommendation.
FUNDING N-9: Additional funding sources are needed for water/sewer projects.	N-9a: Propose legislation to establish a sustainable funding source dedicated to maintain, repair, and upgrade infrastructure for public water and sewerage treatment, and addressing MS4 by implementing green infrastructure as defined by the EPA and the US Forest Service to manage rainwater where it falls. N-9b: Propose legislation for a sustainable sales tax for repairing, maintaining, and replacing infrastructure.

North Region Summary Recommendations (continued).

Issues	Recommendations
WATER QUALITY N-10a: Water quality is as important as water quantity, and should be considered in the water plan.	N-10a.a: AWP should include a Healthy Streams policy statement for flow alterations and non-point source pollution, similar to, and complimentary of, ADEQ's Regulation 2 anti-degradation policy for point source discharges. ANRC will develop the Healthy Streams policy statement in collaboration with ADEQ and sector stakeholders. Encourage ANRC to work with private landowners to remove barriers to the implementation of Best Management Practices. N-10a.b: ANRC should develop solutions to the "impaired water" designation for the water below Bull Shoals and Norfork Dams caused by low dissolved oxygen water passed through the dams. N-10a.c: BMP economics and effectiveness are important to adoption across the state. The Discovery Farm Program at the U of A is an excellent way to truly determine potential impacts and to realize actual benefits of BMP implementation. Funding for this program should continue and be expanded to address potential impacts from agriculture, to educate farmers on BMP effectiveness, and to educate the general public on the importance of agriculture to the state's economy and feeding the world.
GROUNDWATER N-10b: There is insufficient information on the volume and yield of groundwater aquifers in the North Region.	N-10b.a: ANRC should improve groundwater well reporting to include ground elevation, GPS coordinates, yield, as well as depth to groundwater.
WATER CONSERVATION N-10c: Greater emphasis is needed on reuse, recycling, and water conservation education.	N-10c.a: Regional planning teams should become regional implementation teams for implementation and adaptive management of the Arkansas Water Plan. N-10c.b: Propose legislation for additional funding to support and sustain the educational efforts of nonprofit entities.

West-central Region Summary Recommendations

Issues	Recommendations
SURFACE WATER WC-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).	WC-1a: Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study. WC-1b: Solutions should include reasonable surface water use, groundwater conservation, and on farm conservation (i.e., on farm storage reservoirs, land leveling, and tailwater recovery systems). WC-1c: ANRC should re-evaluate and establish meaningful minimum flow for Arkansas River projects.
INFRASTRUCTURE WC-2: Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	WC-2a: Propose legislation to establish a sustainable funding source dedicated to maintain, repair, and upgrade infrastructure and dams for public drinking water reservoirs, water treatment, and sewage facilities. By doing this, it would discourage building new impoundments on flowing streams which takes away from in-stream flows. WC-2b: Propose legislation to fund critical maintenance of locks and dams on MKARNS as navigation pools provide benefits to agriculture, recreation, municipal and industrial water supply, habitat for fish and wildlife, hydropower, and navigation.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
	WC-2c: A federal match of 65% is available for rehabilitation of PL566, but is not being accessed because local entities cannot generate the 35% match. Propose legislation for dedicated State funds to offset a portion of the 35% so local entities can upgrade and maintain these structures. PL566 funding needs to be appropriate for development of new sources for drinking water, agriculture, flood control, etc. Watershed assessments should be updated. WC-2d: Propose legislation to establish funding mechanisms and incentives for consolidating small municipal systems into regional water and wastewater systems. WC-2e: Compile a list of existing available tools; conservation practices, funding incentives, and tax credits; and local, state, and federal funding sources and maintain on the ANRC website for public use. WC-2f: Encourage funding for localized programs be directed by locally led workgroup. WC-2g: Encourage local/state funding for support of repair, rehabilitation of PL566 dams and ongoing maintenance.
GROUNDWATER WC-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.	WC-3a: Public outreach and education is needed to improve groundwater well reporting/monitoring to get a greater understanding of the sustainability and condition of our aquifers in the West-central Region of the state. WC-3b: The sandy alluvial aquifer along the Arkansas River Valley should be evaluated for quantity and quality as a source of water supply. Locate funding to study and evaluate this aquifer. This would alleviate the need for building new surface water impoundments on flowing waters in the highlands.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
WATER QUALITY WC-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).[1]	WC-4a: The water authorities of our State are shared by ANRC and ADEQ. Both ANRC and ADEQ should collaborate to monitor, plan, and fund water quality improvement programs to reduce sediment and nutrient loading into our state streams, rivers, wetlands, and lakes with particular emphasis on maintaining the integrity of relatively unaltered, high quality streams. In importance of water quality and quantity, the Arkansas State Water Plan revision and ANRC should support the existing ADEQ regulations. WC-4b: Propose legislation to increase state funding for stream bank stabilization, riparian enhancement, and forestry education and stewardship plans. WC-4c: Continue support of voluntary locally led conservation programs.
WATER SHORTAGE WC-5: There is inadequate water supply for livestock watering during summer months.	WC-5a: Excess surface water should be captured during times of abundance, stored in on-farm reservoir, and used during low flow/shortage situations for livestock watering, irrigation, and other uses. WC-5b: Propose legislation to increase state funding for surface water infrastructure to capture, store, and distribute available supply for agriculture, navigation, drinking water, flood control, fish and wildlife habitat, and recreation.

[1] The agriculture stakeholders disagree with the overly broad and generalized statement that nutrient management is inadequate "on all Arkansas streams as well as Extraordinary Resource Waters." ERWs already receive additional protections in some cases. Any additional protections provided must include a comprehensive cost benefit analysis and must account for recreational impacts to water quality.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
WATER SUPPLY WC-6: New surface water impoundments are needed to provide adequate water supply.	WC-6a. ANRC should maintain existing and ongoing water supply projects. WC-6b. Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies. WC-6c.ANRC should support development and construction of new water supply projects in areas of critical need, or where projected demand exceeds projected water availability.
REALLOCATION IN FEDERAL PROJECTS WC-7: Reallocation of storage for water supply in Corps lakes needs to occur.	WC-7a: ANRC shall pursue reallocation of storage in federal impoundments in areas where there is a critical need, or projected increased demand, for additional water supply.
REGULATIONS WC-8: Federal and state regulations impede implementing and effectively managing water utility projects.	WC-8a: ANRC should revisit regulations that may be impeding the implementation and effective management of water utility projects. Integrate continuous adaptive management as resources and technology changes. Regional workgroup planning teams should continue as currently structured to determine how best to meet the needs of water users in the future. WC-8b: ANRC should establish "mediator" between federal/state regulators to facilitate permitting process as an advocate for cities/utilities.
REGIONAL PLANNING WC-9: Any legislation needs to be tailored to regions. One statewide size does not fit all regions.	WC-9a: ANRC has committed to including regional uses and recommendations in the Arkansas Water Plan update.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
MEASUREMENT AND ASSESSMENT WC-10: Returned water should be included in the calculations of available water. "Withdrawn" does not necessarily always mean "consumed."	WC-10a: Available water estimates for the Arkansas Water Plan update did incorporate return flow.

ADDITIONAL ISSUE:

Due to extremely limited groundwater and poor water quality, additional emphasis should be on surface water storage in the West-central Region to meet its livestock needs.

ADDITIONAL RECOMMENDATIONS:

WC-11 Propose legislation to fund research on water conservation practices.

WC-12 Provide multiple support levels for conservation districts to address urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment.

South-central Region Summary Recommendations

Issues	Recommendations
NAVIGATION SC-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.	SC-1a: Propose a legislative resolution that funding be maintained for the Ouachita River navigation system. Document the economic benefits of water transport of goods and delivery of heavy equipment compared to other forms of transportation to the region, as well as benefits from municipal/industrial water supply, fish & wildlife recreation, flood risk reduction, and agricultural, thermoelectric & industrial water supply. SC-1b: Encourage congressional representatives to pass legislation to fund the dredging and maintenance of the navigation system.
FUNDING SC-2: There is a Lack of funding to construct additional surface water impoundments in critical groundwater areas.	SC-2a: Educate the public in water issues pertaining to Sparta & Alluvial Aquifers. SC-2b: Propose legislation to increase Federal and State funding for on farm storage. Projects should include normal practices such as ponds for livestock water but should also be available for rainwater harvesting and storage for use in poultry houses. SC-2c: Existing ANRC rules such as Title 10 & Title 14 should be amended so they are more accessible to livestock producers. Propose legislation for dedicated state funding for Title 10 to help offset a portion of the cost share. This will increase adopting of on farm storage. Modify the eligibility requirement under Title 14 to lower the storage threshold to 1-2 ac-ft.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
SURFACE WATER SC-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.	SC-3a: Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream water use. Intermittent streams should be evaluated through a different process to allow removal/diversion during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
WATER QUALITY SC-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.	SC-4a: ANRC should encourage implementation of reuse and recycling practices for irrigation water that are being used in other states (LA). SC-4b: Responsibility and authority for maintaining and improving water quality is shared by ADEQ and ANRC. The AWP should reflect and integrate the water quality policies of ADEQ as the state's primary planning document regarding water quality policy. ADEQ and ANRC should collaborate to develop policies and regulations that improve water quality by reducing sediment and nutrient loading into streams, lakes, and rivers with particular emphasis on maintaining the integrity of unaltered, high quality streams. Removing streams from ADEQ's 303d list should be a major goal of the AWP.
REGULATIONS SC-5: Outstanding Resource Waters need special protection for both water quantity and quality.	SC-5a: In a unified effort to protect the water resources of the State of Arkansas, and in recognition of the connected importance of water quality and water quantity, the updated Arkansas State Water Plan shall support the existing Arkansas Pollution Control and Ecology Commission Regulation #2.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
WATER SHORTAGE SC-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.	SC-6a: ANRC should create a state drought and shortage response team with representatives from all pertinent state agencies that develops adaptive drought and shortage contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages. SC-6b: ANRC should encourage cooperation between multiple government agencies & public officials and representatives to put plans in place before there is a crisis. SC-6c: ANRC should encourage cooperation, collaboration, and communication among states' and federal agencies, local governments, private business/industry, municipalities and individuals who rely on a shared water resource for withdrawal, discharge, recreation (including refuges, wildlife areas, etc.), and/or livelihood in anticipation of and prior to drought and/or possible low flow restrictions.
REALLOCATION IN FEDERAL PROJECTS SC-7: Reallocation of storage for water supply is needed in federal Corps lakes to make those sources more readily available for drinking water.	SC-7a: Propose the reallocations of storage in Corps Lakes with the Corps of Engineers and Congressional representatives to make it more available for drinking water.
SURFACE WATER SC-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.	SC-8a: See SC-3 Recommendation.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
FUNDING SC-9a: Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	SC-9a.a: Propose legislation to sustain and increase tax incentives & cost sharing options for constructing more on-farm storage systems. SC-9a.b: See SC-2c recommendation.
WATER SUPPLY SC-9b: 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).	SC-9b.a: Drinking water should be designated as the highest and best use, and should have the highest priority for allocation during times of shortage.
NAVIGATION SC-9c: A threat of change in federal laws for navigation threatens the maintenance of Ouachita River pool elevations.	SC-9c.a: Propose a legislative resolution that federal funding be maintained for the Ouachita River navigation system. Document the economic benefits of water transport of goods and delivery of heavy equipment compared to other forms of transportation to the region, as well as benefits from municipal/industrial water supply, fish & wildlife recreation, flood risk reduction, and agricultural, thermoelectric & industrial water supply. SC-9c.b: Encourage congressional representatives to pass legislation to fund the dredging and maintenance of the navigation system.
SURFACE WATER SC-9d: Industry should be encouraged to use surface water.	SC-9d.a: Help new Industries to area, as well as existing industries stay informed through Chamber of Commerce or other local agencies on the benefits of using surface water. SC-9d.b: Propose legislation for tax incentives for replacing of water systems to accommodate surface water use.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
	SC-9d.c: ANRC should require industry to use surface water when available. SC-9d.d: ANRC should encourage industry, agriculture, others to use surface water in Critical Groundwater Areas by proposing legislation to amend Act 341 of 1995 as amended (ACA 26-51-1001 et seq.) to apply the tax credit to industries and agriculture that choose to construct surface use infrastructure rather than use groundwater. SC-9d.e: Propose legislation to extend tax credits/incentives to 20 years for entities who have constructed surface water incentives so early adopters can receive credit.
WATER STORAGE SC-9e: More surface water impoundments are needed in critical groundwater areas.	See SC-9d recommendations.

Southwest Region Summary Recommendations

Issues	Recommendations
SURFACE WATER SW-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.	SW-1a: Increase water storage capacity upstream from Shreveport, LA through construction of locks and dams for river navigation funded by usage fees on bulk transport, recreation usage, water sales to urban areas, and outside funding.
REGULATIONS SW-2: There is concern that the first priority for Arkansas water may not be for Arkansas residents.	SW-2a: ANRC Title 3 should be amended to state that surface water needs to be first priority for use, and Arkansas should be given first priority in using Arkansas water.
FUNDING SW-3: Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.	SW-3a: Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050. SW-3b: On surface water: ANRC Title 10- should be adequately funded by the state as well as continue funding of federal 319 program. The funding should be equally distributed to all regions of the state. ANRC Title 14 should be modified to make it more applicable to livestock – 1 acre-foot storage.
REGULATIONS SW-4: Surface water should be the first priority source for all water uses.	SW-4a: See SW-2 Recommendation
WATER SHORTAGE SW-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.	SW-5a: Allocation during shortage should be tied to nearby stream gages.

Southwest Region Summary Recommendations (continued).

Issues	Recommendations
WATER CONSERVATION SW-6: Water conservation practices are not being aggressively pursued as an alternative to development to meet future needs.	SW-6a: Incorporate education/awareness programs into the public schools K-12. Existing Aquatic Wild (educational frameworks) program has lesson plans already prepared. Statewide approach to the emphatic importance of the next generation understanding water conservation, issues, and problem solving. Focus on long term sustainability of water as a natural resource. SW-6b: Develop incentive programs to encourage the public to practice water conservation, and thus reduce wasteful practices.
WATER STORAGE SW-7: Additional surface water impoundments are needed for better utilization of water to meet human needs.	SW-7a: Streamline regulations dealing with construction of dams and impoundments to provide additional surface water sources. SW-7b: On surface water: ANRC Title 1- should be adequately funded by the state as well as continue funding of the federal 319 program. The funding should be equally distributed to all regions of the state. ANRC Title 14 should be modified to make it more applicable to livestock – 1 ac-ft storage. SW-7c: Increase funding to agricultural and urban areas specifically tied to water storage facilities.
MEASUREMENT AND ASSESSMENT SW-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.	SW-8a: Conduct an assessment of the existing stream gage network and identify critical gaps in the network. A critical gage would be defined as necessary for basin yield analysis, upstream flow requirements, drought allocation, and compact compliance. Fund the implementation of these gages and sustain funding through a check-off program of water users, or sustainable water resources tax.

Southwest Region Summary Recommendations (continued).

Issues	Recommendations
SURFACE WATER SW-9: Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.	SW-9a: During drought, water needs to be allocated based on a state prioritization basis. For instance, the highest priority always must be municipal and domestic uses, but beyond that a prioritization is needed for industrial, agriculture, and instream uses. The prioritization should include established inter and intra basin transfers which may be affected by local circumstances. SW-9b: Allocation during drought should be tied to nearby stream gages. SW-9c: Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
WATER SHORTAGE SW-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?	SW-10a: Formulate an allocation process for water in time of shortage/drought to make sure that all of Arkansas' needs – consumers, navigation, agricultural, industrial, and commercial – are met before any water leaves the state.

ADDITIONAL RECOMMENDATIONS:

SW-11 Utilize media and news articles to increase public awareness of the importance of water and its quality.

SW-12 Utilize all state resource agencies in programs to increase public awareness of water importance.

SW-13 Increase federal and state funding through ANRC to promote conservation education statewide.

ATTACHMENT 6

Final I & R Workgroup Priority Recommendations for the AWP

Statewide Summary Recommendations

Issues	Recommendations
SURFACE WATER 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. 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) needs to be determined.	Recommendations for establishing excess surface water ranged from below 25% to as high as 75%. Because of these differences, it is recommended that the proportion of stream flow designated as excess surface water be determined by an independent entity for all perennial streams in Arkansas using a risk-based, flow-fisheries framework as the scientific approach for estimating the fish and wildlife component of instream flow uses through a stakeholder-driven process. Basins with estimated water gaps should receive higher priority for application of this approach. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. The study should be conducted through an open and transparent process. ANRC and other state and federal grant monies should be sought to fund this scientific study.
INFRASTRUCTURE	The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Arkansas, Mississippi, Ouachita, Red, and White Rivers for navigation and the other benefits is receives.
WATER QUALITY 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.	Water quality authority is shared by ADEQ and ANRC. The AWP should reflect and integrate the water quality policies of ADEQ as the state's primary planning document regarding water quality policy. Both ADEQ and ANRC should collaborate to monitor, plan, and fund water quality improvement programs to reduce sediment and nutrient loading into state streams, lakes, rivers and wetlands with particular emphasis on maintaining the integrity of relatively unaltered, high quality streams. Increased water quality monitoring shall be implemented at a segment level to assess program implementation success.
WATER SHORTAGE A pre-shortage allocation process does	ANRC should create a state drought and shortage response team that develops drought and shortage

Statewide Summary Recommendations (continued)

Issues	Recommendations
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.	contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages. The prioritization should include established inter and intra basin transfers. Allocation during drought should be tied to nearby stream gages.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.
Water Law and Regulation	Recommendations should NOT include restrictions, mandates, taxes, or assessments applicable to groundwater or surface water use without sound data and contemporaneously providing viable, timely, and economical solutions in lieu such restrictions or added costs.
WATER QUALITY 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.	ANRC should work closely with state and federal agencies, conservation districts, and non-governmental organizations to remove streams from ADEQ's 303(d) list through education, and state and federal conservation programs.
INFRASTRUCTURE Infrastructure, from municipal and rural water/wastewater distribution systems to dams, levees, and PL566 structures, are aging and failing.	Provide local/state funding support for repair, rehabilitation of PL566 dams and ongoing maintenance. These funds shall also be used to support technical assistance and equipment.

Statewide Summary Recommendations (continued)

Issues	Recommendations
GROUNDWATER 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.	Establish a statewide groundwater monitoring network to determine the rate of decline and provide the basis for management recommendations to eliminate the decline, particularly in planning regions without groundwater models.
WATER STORAGE 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.	ANRC Rule 14 should be amended to reduce the required storage volume to 1-2 ac-ft so additional entities are eligible for cost share of on-farm storage systems.
Measurement and Assessment	Critical streamflow gages should be identified and maintained through time in every planning region. Critical gages would be defined as those necessary for basin yield analysis, upstream flow requirements, drought allocation, and compact compliance.

Statewide Summary Recommendations (continued)

Issues	Recommendations
SURFACE WATER 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. 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) needs to be determined.	Available Surface Water. Expand the statutory definition of excess surface water to raise the percentage of available water, thus providing access to more water for diversion purposes.
FUNDING	Identify the various types of potential funding and match with the most applicable type of project. 1) Public bonds and property owner assessments for regional projects, 2)public funds for local conservation districts, state, and federal agency support, 3) tax incentives for individual on-farm activities. Develop credible budget and plan for each funding type.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.
GROUNDWATER 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.	Arkansas should commit to the efficient use and management of both of surface water and groundwater resources through conjunctive management, intentionally recharging the basin when excess water supply is available.
GROUNDWATER Groundwater table declines are an on-going issue and are expected to increase	Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of

Statewide Summary Recommendations (continued)

Issues	Recommendations
in the future. In some regions, there are no groundwater models for estimating existing aquifer volumes and yields.	decision on the availability, quantity or quality of existing drinking water supplies.
SURFACE WATER 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. 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) needs to be determined.	The proportion of stream flow designated as excess water be determined by an independent entity using a scientific approach through an open and transparent process. Intermittent streams should be evaluated through a separate process. ANRC and other state agencies should fund or seek funds for this study.
WATER STORAGE 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.	ANRC, in conjunction with other state and federal agencies, should identify projects and determine how to transfer/store water to meet demand on a regional, watershed basis for conjunctive water management.
WATER STORAGE Additional surface water storage is needed, ranging from on-farm/off-channel storage, in-stream weirs, to new	On-farm water storage facilities. a. Aggressively promote benefits of on-farm water storage. b. Enhance technical support from NRCS and state technicians. c. Streamline application process for approved on-farm projects. d. Increase incentives designed to encourage voluntary implementation (aggressive tax credits at

Statewide Summary Recommendations (continued)

Issues	Recommendations
reservoirs, to locks and dams on navigable rivers to ensure there is adequate water to satisfy riparian and non-riparian uses, and instream needs.	multiple of construction cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits).
FUNDING	Propose an 1/8 cent sales tax to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Encourage state natural resource agencies/entities to expand existing educational programs (Project WILD, Project WET, Arkansas Stream Team Program, plus others) to increase the level of awareness of the importance of water to the state for all 11 sectors and the need for water conservation measures and best management practices in order to sustain the Natural State's economy, environment, and society into the future.
INFRASTRUCTURE Infrastructure, from municipal and rural water/wastewater distribution systems to dams, levees, and PL566 structures, are aging and failing.	Continue to provide and sustain state tax exempt bonds for the maintenance of the aging infrastructure. Propose legislation for a sustainable sales tax for repairing, maintaining, and replacing infrastructure. Establish a higher ranking for cities/counties/regions/water districts that invest in themselves, as an incentive for those who generate some of their own funding.
FUNDING	Propose legislation to support conservation districts in addressing urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment.
WATER STORAGE 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	Regional Projects. a. Significant regional projects have been approved (Bayou Meto and White River) and should be completed and evaluated before alternative solutions are pursued. b. Publicly endorse a plan and schedule for completing these approved projects. c. Address funding challenges and develop a plan to obtain necessary funding for completion. d. Identify other viable regional projects, prioritize by need and likelihood of success, and initiate the new projects.

Statewide Summary Recommendations (continued)

Issues	Recommendations
non-riparian uses, and instream needs.	
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Propose the Governor appoint a taskforce of state agency personnel to develop a single source of the state's water data and information from all agencies and entities.
WATER QUALITY 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.	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.
Measurement and Assessment	Conduct an assessment of progress in implementing the Arkansas Water Plan every 5 years and revise as needed to ensure it is moving toward its goals and objectives.
GROUNDWATER 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.	Continued emphasis, tax incentives, and funding shall be given to converting from groundwater to surface water, implementing water management and conservation practices, particularly for agricultural irrigation.

Statewide Summary Recommendations (continued)

Issues	Recommendations
SURFACE WATER 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. 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) needs to be determined.	Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies.
WATER STORAGE 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.	Dedicated state funding should be provided to support ANRC Title 10 to help off-set a portion of the cost share to increase adopting on-farm storage systems.
FEDERAL REALLOCATION OF STORAGE Reallocation of water storage is needed for all Corps of Engineer impoundments. Storage in these reservoirs was originally allocated 50 to 60 years ago.	ANRC should pursue reallocation of storage in federal impoundments for additional water supply in areas where there is a critical need or increased projected demand is estimated to exceed supply.
REGULATIONS Federal and State regulations and	ANRC should review state and federal laws and regulations collaboratively with ADEQ, ADH, and AGFC and appropriate federal agencies and take appropriate steps to streamline and coordinate water development

Statewide Summary Recommendations (continued)

Issues	Recommendations
policies conflict among agencies and impede development of new water projects, effective management of existing water projects, and restoration of impaired streams.	project procedures and information sources while maintaining comprehensive review criteria.
FUNDING 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.	Propose legislative funding mechanisms and incentives for consolidating small municipal systems to create or expand regional water/wastewater utilities.
FUNDING	Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow.
FUNDING	Support legislation to increase or at least maintain funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	A coordinated educational effort among K through 12 schools, universities, nonprofit organizations, and state agencies should be administered through the Water Foundation over the next decade.

Statewide Summary Recommendations (continued)

Issues	Recommendations
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Increase incentives designed to encourage voluntary deployment of irrigation conservation measures and purchase of systems/equipment (aggressive tax credits at multiple of cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits). Develop and promote best management practices ("BMP"), which include, but are not limited to, tail water recovery, PHAUCET/Pipe Planner, water monitoring devices, land leveling, surge valves, remote controls, soil moisture monitors, satellite monitoring of crops and soils, cooperative agreements with energy providers, and cellular links to weather stations.
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	ANRC should modify permit and reporting forms to explicitly account for return flow.
WATER STORAGE 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.	Propose legislation to increase the tax credits for landowners constructing on-farm reservoirs.
SURFACE WATER 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.	Increase water storage capacity upstream from Shreveport, LA through construction of locks and dams for river navigation funded by usage fees on bulk transport, recreation usage, water sales to urban areas, and outside funding.
Surface Water	Propose comprehensive statewide study to determine capabilities for building new reservoir systems (large

Statewide Summary Recommendations (continued)

Issues	Recommendations
	scale and small scale) to supply surface water and reduce ground water demand.
GROUNDWATER 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.	Establish a statewide groundwater monitoring network to determine the rate of decline or increase and provide the basis for management recommendations to reduce the declines, particularly in planning regions without groundwater models.
FUNDING	Propose legislation to modify the existing tax incentives available under the Water Resources Conservation and Development Incentives Act to account for increased water use efficiency or reduction in groundwater withdrawal. Create a graded tax credit with up to a 25% tax credit outside a critical groundwater area, and up to 80% tax credit within a critical groundwater area, with the maximum tax credits based on documented water use efficiencies of greater than 90% or complete transfer from ground water to surface water.
REGIONAL PERSPECTIVE Regional issues are not currently reflected in the Arkansas Water Plan	East Arkansas has areas with distinct water resource characteristics. County lines are not always the proper boundaries for identifying such characteristics or adopting a water conservation plan suitable for a given area. Develop regions or areas for water conservation planning based on identifiable and similarly aligned characteristics.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, Ag Council, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.

Statewide Summary Recommendations (continued)

Issues	Recommendations
GROUNDWATER Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	Surface and groundwater should be managed conjunctively to address water needs for agriculture, drinking water, industry, recreation, and fish and wildlife. ANRC should develop and implement conjunctive management strategies in critical groundwater areas with specific goals to recover the aquifers in those areas.
WATER CONSERVATION Greater emphasis is needed on reuse, recycling, and water conservation education.	Propose legislation for additional funding to support and sustain the educational efforts of nonprofit entities.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Encourage funding for localized programs be directed by locally led workgroup.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Encourage local/state funding for support of repair, rehabilitation of PL566 dams and ongoing maintenance.

Statewide Summary Recommendations (continued)

Issues	Recommendations
MEASUREMENT AND ASSESSMENT Returned water should be included in the calculations of available water. "Withdrawn" does not necessarily always mean "consumed."	Available water estimates for the Arkansas Water Plan update did incorporate return flow.
WATER SHORTAGE 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.	ANRC should encourage cooperation, collaboration, and communication among states' and federal agencies, local governments, private business/industry, municipalities and individuals who rely on a shared water resource for withdrawal, discharge, recreation (including refuges, wildlife areas, etc.), and/or livelihood in anticipation of and prior to drought and/or possible low flow restrictions.
Water Conservation and Shortage	ANRC must develop water conservation plans to encourage more efficient use of water resources. Water Conservation plans must be based on scientific research and include user interaction to determine practical Best Management Practices (BMP) in water use and water conservation. ANRC must provide detailed user (profile based) action plans that water users can modify and implement in their respective daily operations. Water Conservation plans should be developed for the full water user profile including Domestic, Agricultural, Irrigation, Industrial, and Commercial, Mining, and Irrigation District water supply, power supply, municipal and county. ARNC should periodically survey a sampling of water users (by profile) to assess what BMPs are practical, successful and what is impractical. Surveys should ask users for new BMPs that might need research to determine viability or they have found useful The ANRC website should encourage users to submit new ideas and critique present BMPs.*
Measurement and Assessment	Refine the data for measuring current irrigation usage and trends. (Current data is widely criticized and is not sufficient for policy matters that affect property rights.)
GROUNDWATER	Existing and on-going water projects (e.g., Grand Prairie and Bayou Meto irrigation projects) should be

Statewide Summary Recommendations (continued)

Issues	Recommendations
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.	funded and completed. Funding recommendations are included with Issue AR-9.
GROUNDWATER 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.	Continued emphasis, tax incentives, and funding shall be given to converting from groundwater to surface water, adoption of best water management and conservation practices, particularly for agricultural irrigation.
GROUNDWATER 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.	Compile a list of available tools; conservation practices, funding incentives, and tax credits; and local, state, and federal funding sources for groundwater and surface water management and maintain on the ANRC website for public use.
GROUNDWATER 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.	Compile a list of available tools; conservation practices, funding incentives, and tax credits; and local, state, and federal funding sources for groundwater and surface water management and maintain on the ANRC website for public use. Water plan should build upon existing incentives by expanding and increasing available incentives.
WATER STORAGE Additional surface water storage is needed, ranging from on-farm/off-	ANRC, in conjunction with other state and federal agencies, should identify projects and determine how to transfer/collect/store water to meet demand on a regional, watershed basis for conjunctive water management.

Statewide Summary Recommendations (continued)

Issues	Recommendations
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.	
WATER STORAGE 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.	Propose legislation to increase the tax credits and other incentives for landowners constructing on-farm reservoirs.

Statewide Summary Recommendations (continued)

Issues	Recommendations
WATER QUALITY 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.	Request increased State funding for stream bank stabilization and riparian enhancement, for forestry education and stewardship plans, training for county road crews for road and ditch maintenance, and for paving critical areas of county gravel road systems that are high contributors of sediment. Incentives shall be implemented that encourage private (non-industrial) landowners to retain streamside management zones and use erosion control practices.
WATER QUALITY 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.	ANRC should continue to administer, fund, and implement the nonpoint source program leveraging EPA 319 funds in priority and nutrient sensitive watersheds. Request additional funding appropriations to increase available cost share funds for leveraging federal grants.
WATER QUALITY 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.	Designate additional areas of the State as nutrient surplus areas because of increased animal production. Nutrient management plans should be required in these nutrient surplus areas.

Statewide Summary Recommendations (continued)

Issues	Recommendations
WATER QUALITY 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.	Propose legislation to increase, or at least maintain, funding for nonpoint source controls (streambank restoration, erosion control, and forest management), prioritizing projects in "priority watersheds," and "nutrient sensitive" watersheds.
WATER SHORTAGE 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.	ANRC should create a state drought and shortage response team that develops drought and shortage contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages. The prioritization should include established inter and intra basin transfers. Allocation during drought should be tied to nearby stream gages and groundwater aquifer monitoring.
REGULATIONS 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.	Establish a “mediator” as an advocate for cities/utilities with federal/state regulators to facilitate the permitting process.

Statewide Summary Recommendations (continued)

Issues	Recommendations
FUNDING 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.	Propose legislation to create a water check-off program for all water users. These funds should be used to complete existing projects, fund new projects, and develop outreach and education programs. The program will emphasize surface water projects that reduce ground water withdrawals, integrated irrigation water conservation and management practices, and repair/replacement of water infrastructure.
FUNDING 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	Propose legislation to create designated revenue streams from all water users to help finance water needs. These funds should be used to complete existing infrastructure development projects, fund new projects, and develop outreach and education programs. The program will emphasize surface water projects that reduce ground water withdrawals, integrated irrigation water conservation and management practices, and repair/replacement of water infrastructure.

Statewide Summary Recommendations (continued)

Issues	Recommendations
incentives.	
FUNDING	Propose legislation to increase the bond funding authority under the existing Arkansas General Obligations Bond programs so monies can be utilized to cost share with federal or state programs for water projects.
FUNDING	Propose legislation to authorize a water resources reconstruction and repair funding program under the authority and management of ANRC, specifically to assist local and county entities in repairing, replacing, and maintaining infrastructure.
FUNDING	Propose a state-wide funding mechanism (potentially a sales tax) to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices.
FUNDING	Propose legislation to increase the duration of tax credits for projects that transfer groundwater to surface water use to encourage adoption, and extend this credit for early adopters of surface water projects.
FUNDING	Propose legislation to increase the duration of tax credits for projects that transfer use from groundwater to surface water to encourage adoption, and extend this credit for early adopters of surface water utilization systems.
FUNDING	Identify the various types of potential funding and match with the most applicable type of project. For instance, 1) public bonds and property owner assessments for regional projects, 2) public funds for state and federal agency support and 3) tax incentives for individual on-farm activities. Develop credible budget and plan for each funding type.
REGIONAL PERSPECTIVE Regional issues are not currently reflected in the Arkansas Water Plan	ANRC has committed to including regional uses and recommendations in the Arkansas Water Plan update.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	The Arkansas Water Foundation should formulate a holistic and integrated framework for developing and promoting statewide awareness, outreach, and educational programs, and coordinate similar efforts among state agencies, universities, and nongovernmental organizations. This integrated framework should include training modules on water and water related issues and the broad implications of water for sustainable communities for community leaders, local authorities, and business leaders. There shall be a focus on

Statewide Summary Recommendations (continued)

Issues	Recommendations
	prevention of water related problems as well as water conservation and the economic benefits of both prevention and conservation.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Prepare a proclamation for the Governor of the State of Arkansas to declare a Decade of Sustainable Water to encourage better understanding of the importance of water, water conservation and management in every facet of Arkansans' lives – environmental, social, and economic.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Establish a common website where all water oriented education and conservation information and data can be centralized (i.e., Arkansaswater.org).
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Aggressively educate and promote the need for irrigation conservation measures and identify best management practices and technology.
Measurement and Assessment	Adjust irrigation usage trends/projections/goals as better data are gathered and measurable water savings are achieved.
Measurement and Assessment	Establish goals and aggressive incentives for achieving measurable water savings.
Water Conservation and Shortage	Establish goals and aggressive incentives for deploying best management practices and water conservation technologies.
Measurement and Assessment	Establish goals and aggressive incentives for increasing the use of water monitoring devices.
Measurement and Assessment	Establish milestones throughout the scheduled term of the Water Plan.
Measurement and Assessment	Conduct an assessment of progress in implementing the Arkansas Water Plan every 5 years and revise as needed to ensure it is moving toward its goals and objectives. Assessments should provide an accurate estimation of where we are today and provide an understanding of what the state's goals are for water savings, storage capacity development, and adoption of technologies and BMPs.
Measurement and Assessment	Critical streamflow gages should be identified and maintained through time in every planning region. Critical gages would be defined as those necessary for basin yield analysis, upstream flow requirements, drought allocation, and compact compliance.

Statewide Summary Recommendations (continued)

Issues	Recommendations
Measurement and Assessment	A consistent, standardized approach should be developed for estimating and reporting water use for different crops for a more precise accounting of water use across counties. Such an approach would be best if it was voluntary and incentivized if there are additional reporting requirements or data transmitted. In addition, such information should ensure appropriate measures to protect privacy of landowners.
Measurement and Assessment	A consistent, standardized approach should be developed for estimating and reporting water use for different crops for a more precise accounting of water use across counties.

Note: Reference to “aggressive incentives” or “aggressive tax credits” means something along the lines of tax credits equal to 2-3 times the cost of the conservation measure and much higher annual limits for use of the tax credit. These aggressive incentives would be available for years 1-4 (set a known expiration date) so as to attract more immediate and measurable participation in water monitoring and conservation.

East Region Summary Recommendations (continued)

East Region Summary Recommendations

Issues	Recommendations
SURFACE WATER 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).	Recommendations for establishing excess surface water ranged from below 25% to as high as 75%. Because of these differences, it is recommended that the proportion of stream flow designated as excess surface water be determined by an independent entity for all perennial streams in Arkansas using a risk-based, flow-fisheries framework as the scientific approach for estimating the fish and wildlife component of instream flow uses through a stakeholder-driven process. Basins with estimated water gaps should receive higher priority for application of this approach. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. The study should be conducted through an open and transparent process. ANRC and other state and federal grant monies should be sought to fund this scientific study.
Infrastructure	The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Arkansas, Mississippi, Ouachita, Red, and White Rivers for navigation and the other benefits is receives.
GROUNDWATER Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	Surface and groundwater should be managed conjunctively to address water needs for agriculture, drinking water, industry, recreation, and fish and wildlife. ANRC should develop and implement conjunctive management strategies in critical groundwater areas with specific goals to recover the aquifers in those areas.
WATER QUALITY Incremental costs and benefits associated with water quality improvements should be understood and quantified. A cost/benefit analysis should be required for any water	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.

East Region Summary Recommendations (continued)

Issues	Recommendations
quality changes.	
WATER SHORTAGE 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.	Shortage and drought contingency plans should be developed for the Bayou Bartholomew, Bayou Macon, Bayou DeView, St. Francis, Cache, and Beouf River basins. The Fish and Wildlife Flow Framework should serve as the stakeholder process for scientifically determining appropriate **minimum** flow levels for different classes of streams statewide. Priorities of use during a drought or shortage should be regionally determined by local landowners, recreationists, industry and fish/wildlife scientists before those shortages occur to reflect regional priorities.
Water Law and Regulation	Recommendations **should not** include restrictions, mandates, taxes or assessments applicable to groundwater use without sound data and contemporaneously providing viable, timely and economical solutions in lieu such restrictions or added costs.
GROUNDWATER Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	Reserve deep aquifers for use as municipal drinking water sources.
FUNDING 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.	Propose legislation to increase allowable percentages of ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow.
FUNDING There is insufficient funding for:	Propose legislation to increase the bond funding authority under the existing Arkansas General Obligations Bond programs so monies can be utilized to cost share with federal or state programs for

East Region Summary Recommendations (continued)

Issues	Recommendations
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.	water projects.
INFORMATION MANAGEMENT There is no single source of water data or information across agencies.	Designate Conservation Districts as the repository for various records, including but not limited to utility system records, and make that information accessible to those that may need to use it.
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.	Available Surface Water. Expand the statutory definition of excess surface water to raise the percentage of available water, thus providing access to more water for diversion purposes.
Water Conservation and Shortage	ANRC must develop water conservation plans to encourage more efficient use of water resources. Water Conservation plans must be based on scientific research and include user interaction to determine practical Best Management Practices (BMP) in water use and water conservation. ANRC must provide detailed user (profile based) action plans that water users can modify and implement in their respective daily operations. Water Conservation plans should be developed for the full water user profile including Domestic, Agricultural, Irrigation, Industrial, and Commercial, Mining, and Irrigation District water supply, power supply, municipal and county. ARNC should periodically survey a sampling of water users (by profile) to assess what BMPs are practical, successful and what is impractical. Surveys should ask users for new BMPs that might need research to determine viability or they have found useful The ANRC website should encourage users to submit new ideas and critique present

East Region Summary Recommendations (continued)

Issues	Recommendations
	BMPs.*
GROUNDWATER Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	Integrate surface water use, groundwater conservation and on farm conservation measures (tailwater recovery, land leveling, strategic water delivery practices) into an integrated and continuous planning process for the delta of Arkansas. Aquifers should be evaluated for quantity and quality as a source for domestic water needs and other uses.
FUNDING 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.	Propose legislation to increase State funding for stream bank stabilization and riparian enchancement, for forestry education and stewardship plans, training for county road crews for road maintenance, and for paving critical areas of county gravel road systems that are high contributors of sediment.
WATER STORAGE 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.	Regional Projects. a. Significant regional projects have been approved (Bayou Meto and White River) and should be completed and evaluated before alternative solutions are pursued. b. Publicly endorse a plan and schedule for completing these approved projects. c. Address funding challenges and develop a plan to obtain necessary funding for completion. d. Identify other viable regional projects, prioritize by need and likelihood of success, and initiate the new projects.

East Region Summary Recommendations (continued)

Issues	Recommendations
FUNDING 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.	Propose legislation to support conservation districts in addressing urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment. Maintain, at a minimum, current funding for extension and research staff.
REGIONAL PLANNING Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	Retain the Planning Region Work Groups for implementation of the Arkansas Water Plan, particularly related to subregional issues and considerations.
Measurement and Assessment	Refine the data for measuring current irrigation usage and trends. (Current data is widely criticized and is not sufficient for policy matters that affect property rights.)
SURFACE WATER 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).	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife, with a stakeholder process to determine basin specific priorities of the in stream and out of stream of water uses. Intermittent streams should be evaluated through a different process to allow use during periods of high flow.
FUNDING There is insufficient funding for: a. Existing and on-going water projects	Propose a voluntary water check-off program for municipal, industrial, and agricultural users that can be used to fund projects converting groundwater to surface water use, water conservation practices,

East Region Summary Recommendations (continued)

Issues	Recommendations
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.	education and outreach, and repair/replacement of infrastructure.
FUNDING 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.	ANRC rules such as Title 10 & Title 14 should be amended so they are more accessible to livestock producers. Dedicated state funding is needed for Title 10 to help offset a portion of the cost share. This will increase adopting of on-farm storage. The AC-FT threshold required for eligibility under Title 14 should be lowered to 1-2 AC-FT.
FUNDING 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.	Propose legislation for a 1/8 cent sales tax to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices.
FUNDING There is insufficient funding for: a. Existing and on-going water projects	Propose legislation to increase the duration of tax credits for projects that transfer groundwater to surface water use to encourage adoption, and extend this credit to early adopters of surface water projects.

East Region Summary Recommendations (continued)

Issues	Recommendations
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.	
FUNDING 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.	Propose legislation to target tax credits: o For flow metering, surge valves, multiple inlet irrigation systems, planned polypipe furrow irrigation systems, land improvements such as land leveling, surface water collection, storage and distribution systems, tail water recovery, and other irrigation BMPs known to reduce water usage.
INFORMATION MANAGEMENT There is no single source of water data or information across agencies.	Propose the Governor of the State of Arkansas appoint a task force to develop a single source of the state's water data or information across agencies and Arkansans.
ADMINISTRATION A modernized administrative structure is needed for statewide water management (one authority) rather than having it distributed across multiple agencies	ANRC should formulate and propose an administrative structure for statewide water management within one agency.

East Region Summary Recommendations (continued)

Issues	Recommendations
REGIONAL PLANNING Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	East Arkansas has areas with distinct water resource characteristics. County lines are not always the proper boundaries for identifying such characteristics or adopting a water conservation plan suitable for a given area. Develop regions or areas for water conservation planning based on identifiable and similarly aligned characteristics.
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	ANRC should promote quantifying water usage and incorporation of this information into integrated irrigation water conservation and management practices through tax incentives, cost-share programs, and outreach and education.
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	Increase incentives designed to encourage voluntary deployment of irrigation conservation measures and purchase of systems/equipment (aggressive tax credits at multiple of cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits). Develop and promote best management practices ("BMP"), which include, but are not limited to, tail water recovery, PHAUCET/Pipe Planner, water monitoring devices, land leveling, surge valves, remote controls, soil moisture monitors, satellite monitoring of crops and soils, cooperative agreements with energy providers, and cellular links to weather stations.

East Region Summary Recommendations (continued)

Issues	Recommendations
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.	Regional Projects. a. Significant regional projects have been approved (Bayou Meto and White River) and should be completed and evaluated before alternative solutions are pursued. b. Publicly endorse a plan and schedule for completing these approved projects. c. Address funding challenges and develop a plan to obtain necessary funding for completion. d. Identify other viable regional projects, prioritize by need and likelihood of success, and initiate the new projects.
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.	On-farm water storage facilities. a. Aggressively promote benefits of on-farm water storage. b. Enhance technical support from NRCS and state technicians. c. Streamline application process for approved on-farm projects. d. Increase incentives designed to encourage voluntary implementation (aggressive tax credits at multiple of construction cost; higher multiple in critical ground water areas; expand annual limits for use of tax credits).
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Arkansas Conservation Districts should develop and implement, in conjunction with UA Cooperative Extension Service and ANRC, an education program about agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.

East Region Summary Recommendations (continued)

Issues	Recommendations
SURFACE WATER 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. 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) needs to be determined.	The proportion of stream flow designated as excess water be determined by an independent entity using a scientific approach through an open and transparent process. Intermittent streams should be evaluated through a separate process. ANRC and other state agencies should fund or seek funds for this study.
SURFACE WATER 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. 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) needs to be determined.	Available Surface Water. Expand the statutory definition of excess surface water to raise the percentage of available water, thus providing access to more water for diversion purposes.
FUNDING There is insufficient funding for: a. Existing and on-going water projects b. Future projects c. Conservation/water management practices	Encourage the legislature to increase or at least maintain funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices.

East Region Summary Recommendations (continued)

Issues	Recommendations
d. Research e. Outreach and education, and f. Synthesis of existing, available tools, practices, and funding incentives.	
FUNDING 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.	Propose legislation to target tax credits: o For flow metering, o For livestock watering, and o For more efficient suites of irrigation water management practices. Encourage a streamlined EQIP process for flow meters.
Water Quality	Buffer zones reduce or prevent suspended solids (soil) and associated contaminants from being deposited into lakes, rivers, streams, wetlands and/or sources of drinking water as rainfall or snowmelt moves over the ground. ANRC should offer state Tax credits (similar to those Tax credits available under the existing irrigation tax credits system) to Landowners, operators and producers who expand or create buffer zones (filter strips) around crop, pasture, forest and urban areas.
Planning	The water plan should focus on the following items: conservation, development of surface water supply, generating new funding opportunities to develop water infrastructure, education of public on water utilization/conservation, and incentives to increase adoption of conservation systems and best management practices, and research to develop new methods and technologies to reduce water use. Plan should also look to lower regulatory burdens that hamper implementation of the strategies listed above. The plan should avoid regulation, unnecessary taxes and fees, arbitrary limits on consumption, and mandatory adoption of irrigation systems or methods.
Measurement and Assessment	Conduct an assessment of progress in implementing the Arkansas Water Plan every 5 years and revise as needed to ensure it is moving toward its goals and objectives.
GROUNDWATER Overing of groundwater aquifers can lead to	Propose legislation to fund and complete the Grand Prairie and Bayou Meto projects.

East Region Summary Recommendations (continued)

Issues	Recommendations
permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	
GROUNDWATER Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	Institute and enforce a penalty for wasteful use of groundwater in agriculture.
FUNDING 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.	Propose a designated revenue stream from water users to help finance water use needs, including projects converting groundwater to surface water use, water conservation practices, education and outreach, research to improve water utilization, and repair/replacement/build new infrastructure.
FUNDING 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	Propose legislation for a state wide funding mechanism (perhaps a sales tax) to provide sustained funding for water quantity and quality projects, with an emphasis on projects that promote surface water use to reduce groundwater withdrawals. Surface water projects shall incorporate both water conservation and best management practices.

East Region Summary Recommendations (continued)

Issues	Recommendations
f. Synthesis of existing, available tools, practices, and funding incentives.	
FUNDING 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.	Modify the existing tax incentives available under the Water Resources Conservation and Development Incentives Act to account for increased water use efficiency or reduction in groundwater withdrawal. Create a graded tax credit with up to a 25% tax credit outside a critical groundwater area, and up to 80% tax credit within a critical groundwater area, with the maximum tax credits based on documented water use efficiencies of greater than 90% or complete transfer from groundwater to surface water.
FUNDING 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.	Modify the existing tax incentives available under the Water Resources Conservation and Development Incentives Act to account for increased water use efficiency or reduction in groundwater withdrawal. Create a graded tax credit with up to a 25% tax credit outside a critical groundwater area, and up to 80% tax credit within a critical groundwater area, with the maximum tax credits based on documented water use efficiencies of greater than 50% or complete transfer from groundwater to surface water.
FUNDING 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	Propose legislation to provide more support for conservation districts in addressing urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment. Maintain, at a minimum, current funding for extension and research staff.

East Region Summary Recommendations (continued)

Issues	Recommendations
f. Synthesis of existing, available tools, practices, and funding incentives.	
FUNDING 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.	Prepare a synthesis of existing, available tools, practices, and funding incentives, tax credits, local, state, and federal funding sources for groundwater and surface water conservation, and maintain this on the ANRC website for public use.
FUNDING 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.	Prepare a synthesis of existing, available tools, practices, and funding incentives, tax credits, local, state, and federal funding sources for groundwater and surface water conservation, and maintain this on the ANRC website for public use and distribute through the UofA Extension Service and Conservation Districts.
FUNDING 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	Propose legislation to fund additional research needed to improve water use efficiency, reuse of gray water for irrigation, genetic research on drought tolerant species, and aquifer storage and recovery.

East Region Summary Recommendations (continued)

Issues	Recommendations
f. Synthesis of existing, available tools, practices, and funding incentives.	
FUNDING 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.	Identify the various types of potential funding and match with the most applicable type of project. For instance, 1) public bonds and property owner assessments for regional projects, 2) public funds for state and federal agency support and 3) tax incentives for individual on-farm activities. Develop credible budget and plan for each funding type.
REGIONAL PLANNING Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	Retain the Planning Region Work Groups for implementation of the Arkansas Water Plan, particularly related to subregional issues and considerations by conservation district.
REGIONAL PLANNING Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	ANRC has committed to including regional uses and recommendations in the Arkansas Water Plan update.
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	ANRC should quantify economic costs of irrigation and economic savings through implementing water conservation practices.
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	ANRC should emphasize soil health, cover crops, soil management, etc. as part of water conservation practices.

East Region Summary Recommendations (continued)

Issues	Recommendations
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	Aggressively educate and promote the need for irrigation conservation measures and identify best management practices and technology.
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.
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.	Propose legislation to establish funding mechanisms and incentives for consolidating small municipal systems to create or expand regional water/wastewater utilities.
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.	Propose legislation to authorize a water resources reconstruction and repair funding program under the authority and management of ANRC, specifically to assist local and county entities in repairing, replacing, and maintaining infrastructure.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to	Propose a proclamation for the Governor of the State of Arkansas to declare a “Decade of Sustainable Water” to encourage better understanding of the importance of water, water conservation, and management in every facet of Arkansan’s lives – environment, social, and economic.

East Region Summary Recommendations (continued)

Issues	Recommendations
the Arkansas economy.	
FUNDING 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.	Encourage the legislature to increase funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices.
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	Propose legislation to make state and federal tax incentives and cost-share funds even more available to farmers and landowners so that water conservation measures are economically feasible and desirable in all regions of the state. Partner state and federal agencies should also aggressively promote increased use of effective management techniques already available. This could include funding for outreach and education and technical assistance to reduce impediments to management.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	ANRC should document the economic benefit of these water projects through jobs and food security, and the contributions to Arkansas GDP from agriculture. Include this information in education programs.
Measurement and Assessment	Prioritize the Water Plan activities on a time line from planning to implementation to measures of progress to outcomes
Water Law and Regulation	Require detailed, comprehensive economic analyses before any endangered species critical habitat designations are made to support the designation.
Water Conservation	ANRC and appropriate agencies should seek legislative authority to require all water users to comply with and implement water conservation measures in all affected areas during drought conditions, water shortage situations or in areas of critical water shortage.

East Region Summary Recommendations (continued)

Issues	Recommendations
Water Conservation	Agriculture Irrigation is the major user of groundwater in Arkansas. New irrigation technologies and improved techniques in irrigation Best Management Practices (BMP) need to be developed and demonstrated to Arkansas Agriculture Irrigators. ANRC must partner with the Arkansas Department of Agriculture, the University of Arkansas, the University of Arkansas Cooperative Extension Service, Conservation Districts and the Natural Resources Conservation Service to develop better, practical BMPs, irrigation techniques, and technology to conserve our water resources. Arkansas Irrigators should implement these practical BMPs in their irrigation operations and provide feedback on their success to ANRC on a seasonal timeframe.
Funding and Incentives	Implementing improved irrigation technologies and improved techniques in irrigation Best Management Practices (BMPs) may require a significant investment in material and labor costs by Arkansas Agricultural Irrigators. ANRC should encourage Arkansas Agricultural Irrigators to invest in this operational cost by offering state tax incentives similar to irrigation project tax credits for Impoundments (of at least 20 acre – feet), Conversions (from ground to surface water irrigation) and land leveling.
Water Quality	ANRC should continue to work closely with the Arkansas Department of Environmental Quality (ADEQ) and the Arkansas Department of Health (ADH) in protecting our State's precious water supply. New issues regarding potential and existing problems with our water resources have to be identified, addressed and reassessed by these agencies on a continual, periodic basis. Joint agency reports on these problem areas and potential solutions should be reported to the Governor, the State legislature and made available to the Public. ANRC, ADEQ and ADH must encourage other state agencies, water users and the general public to help identify potential water resource quality/quantity problems and solutions.

East Region Summary Recommendations (continued)

Issues	Recommendations
Funding and Incentives	Currently, ANRC offers irrigation project tax credits for Impoundments (of at least 20 acre – feet), Conversions (from ground to surface water irrigation) and land leveling. There are no similar tax credits available for ranchers who use livestock ponds (surface water) to water their livestock operations. Livestock waterway barrier fences are the key measure protecting Arkansas streams, ditches, and other waterways from pollution by unrestricted livestock access. Heavy rains or flooding situations often require ranchers to repair or replace these livestock waterway barrier fencing. Ranchers should be offered tax credits for installing livestock ponds and installing livestock waterway barrier fencing or for the repair/replacement of livestock waterway barrier fencing damaged by heavy rains, flooding conditions or some other natural disaster.
Measurement and Assessment	Establish milestones throughout the scheduled term of the Water Plan.
Measurement and Assessment	Establish goals and aggressive incentives for increasing the use of water monitoring devices.
Water Conservation and Shortage	Establish goals and aggressive incentives for deploying best management practices and water conservation technologies.
Measurement and Assessment	Establish goals and aggressive incentives for achieving measurable water savings.
Measurement and Assessment	Adjust irrigation usage trends/projections/goals as better data are gathered and measurable water savings are achieved.

Note: Reference to “aggressive incentives” or “aggressive tax credits” means something along the lines of tax credits equal to 2-3 times the cost of the conservation measure and much higher annual limits for use of the tax credit. These aggressive incentives would be available for years 1-4 (set a known expiration date) so as to attract more immediate and measurable participation in water monitoring and conservation.

North Region Summary Recommendations

Issues	Recommendations
SURFACE WATER 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.	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
GROUNDWATER There is insufficient information on the volume and yield of groundwater aquifers in the North Region.	ANRC should improve groundwater well reporting to include ground elevation, GPS coordinates, yield, as well as depth to groundwater.
SURFACE WATER The 25% restriction used to estimate "excess surface water" should be increased so additional water is available for non-riparian use.	Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies.
SURFACE WATER The 25% restriction used to estimate "excess surface water" should be increased so additional water is available for non-riparian use.	ANRC should re-evaluate the non-riparian water permitting process associated with the shale industry assuring the consideration of seasonal flows and cumulative impacts.

North Region Summary Recommendations (continued).

Issues	Recommendations
WATER QUALITY Water quality is as important as water quantity, and should be considered in the water plan.	AWP should include a Healthy Streams policy statement for flow alterations and non-point source pollution, similar to, and complimentary of, ADEQ's Regulation 2 anti-degradation policy for point source discharges. ANRC will develop the Healthy Streams policy statement in collaboration with ADEQ and sector stakeholders. Encourage ANRC to work with private landowners to remove barriers to the implementation of Best Management Practices.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, Ag Council, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.

North Region Summary Recommendations (continued).

Issues	Recommendations
WATER CONSERVATION Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	Water in the form of rainfall must be slowed in its travel from the time it hits the ground until it reaches the Gulf. ANRC should promote public education in the wise use and conservation of water. More funding would be needed for conservation organizations and conservation districts.
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.	Available Surface Water. Expand the statutory definition of excess surface water to raise the percentage of available water, thus providing access to more water for diversion purposes.
REGULATIONS Regulatory restrictions make it difficult to restore streams and need to be changed.	ANRC should streamline permitting requirements (more user friendly) for efforts to improve stream stability, e.g., allow short term deviations, with specific stipulations and requirements. Long term benefits can be achieved through cooperative efforts with regulatory agencies.
WATER CONSERVATION Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	Surface and groundwater should be managed together to address water needs of all sectors.
REALLOCATION IN FEDERAL PROJECTS Reallocation of storage in Corps of Engineer reservoirs needs to occur	The Issue is the Recommendation.
FUNDING Additional funding sources are needed for water/sewer projects.	Propose legislation to establish a sustainable funding source dedicated to maintain, repair, and upgrade infrastructure for public water and sewerage treatment, and addressing MS4 by implementing green infrastructure as defined by the EPA and the US Forest Service to manage rainwater where it falls.

North Region Summary Recommendations (continued).

Issues	Recommendations
WATER QUALITY Water quality is as important as water quantity, and should be considered in the water plan.	ANRC should develop solutions to the "impaired water" designation for the water below Bull Shoals and Norfork Dams caused by low dissolved oxygen water passed through the dams.
WATER QUALITY Water quality is as important as water quantity, and should be considered in the water plan.	BMP economics and effectiveness are important to adoption across the state. The Discovery Farm Program at the U of A is an excellent way to truly determine potential impacts and to realize actual benefits of BMP implementation. Funding for this program should continue and be expanded to address potential impacts from agriculture, to educate farmers on BMP effectiveness, and to educate the general public on the importance of agriculture to the state's economy and feeding the world.
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	ANRC should modify permit and reporting forms to explicitly account for return flow.
WATER CONSERVATION Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	ANRC should provide a model for "Best Site Selection" for new impoundments built for public or agriculture water supply. It should specifically include consideration for proximity to areas of deficit and cost of infrastructure for allocation, and preference of non perennial streams and streams that do not have significant ecological sensitivity.
WATER CONSERVATION Greater emphasis is needed on reuse, recycling, and water conservation education.	Propose legislation for additional funding to support and sustain the educational efforts of nonprofit entities.

North Region Summary Recommendations (continued).

Issues	Recommendations
WATER QUALITY 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.	Water quality authority is shared by ADEQ and ANRC. The AWP should reflect and integrate the water quality policies of ADEQ as the state's primary planning document regarding water quality policy. Both ADEQ and ANRC should collaborate to monitor, plan, and fund water quality improvement programs to reduce sediment and nutrient loading into state streams, lakes, rivers and wetlands with particular emphasis on maintaining the integrity of relatively unaltered, high quality streams. Increased water quality monitoring shall be implemented at a segment level to assess program implementation success.
INFRASTRUCTURE Infrastructure, from municipal and rural water/wastewater distribution systems to dams, levees, and PL566 structures, are aging and failing.	Provide local/state funding support for repair, rehabilitation of PL566 dams and ongoing maintenance. These funds shall also be used to support technical assistance and equipment.
GROUNDWATER Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	Integrate surface water use, groundwater conservation and on farm conservation measures (tailwater recovery, land leveling, strategic water delivery practices) into an integrated and continuous planning process for the delta of Arkansas. Aquifers should be evaluated for quantity and quality as a source for domestic water needs and other uses.

North Region Summary Recommendations (continued).

Issues	Recommendations
FUNDING 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.	Encourage the legislature to increase funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Arkansas Conservation Districts should develop and implement, in conjunction with UA Cooperative Extension Service and ANRC, an education program about agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	ANRC should document the economic benefit of these water projects through jobs and food security, and the contributions to Arkansas GDP from agriculture. Include this information in education programs.

North Region Summary Recommendations (continued).

Issues	Recommendations
MEASUREMENT AND ASSESSMENT Returned water should be included in the calculations of available water. "Withdrawn" does not necessarily always mean "consumed."	Available water estimates for the Arkansas Water Plan update did incorporate return flow.
WATER SHORTAGE 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.	ANRC should encourage cooperation, collaboration, and communication among states' and federal agencies, local governments, private business/industry, municipalities and individuals who rely on a shared water resource for withdrawal, discharge, recreation (including refuges, wildlife areas, etc.), and/or livelihood in anticipation of and prior to drought and/or possible low flow restrictions.
SURFACE WATER Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.

North Region Summary Recommendations (continued).

Issues	Recommendations
SURFACE WATER 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. 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) needs to be determined.	Recommendations for establishing excess surface water ranged from below 25% to as high as 75%. Because of these differences, it is recommended that the proportion of stream flow designated as excess surface water be determined by an independent entity for all perennial streams in Arkansas using a risk-based, flow-fisheries framework as the scientific approach for estimating the fish and wildlife component of instream flow uses through a stakeholder-driven process. Basins with estimated water gaps should receive higher priority for application of this approach. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. The study should be conducted through an open and transparent process. ANRC and other state and federal grant monies should be sought to fund this scientific study.
WATER SHORTAGE 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.	ANRC should create a state drought and shortage response team that develops drought and shortage contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages. The prioritization should include established inter and intra basin transfers. Allocation during drought should be tied to nearby stream gages.
SURFACE WATER The 25% restriction used to estimate "excess surface water" should be increased so additional water is available for non-riparian use.	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow.

North Region Summary Recommendations (continued).

Issues	Recommendations
	ANRC and other state and federal grant monies should be sought to fund this scientific study.
REGULATIONS Regulatory restrictions make it difficult to restore streams and need to be changed.	ANRC should encourage public outreach concerning the problems caused by instream gravel mining to protect and preserve the integrity of Ozark Streams.
WATER CONSERVATION Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	ANRC should encourage outreach and education on water conservation to reduce the need to build impoundments. Emphasize outreach to small communities.
WATER CONSERVATION Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	Conservation issues can be offset by additional storage on farms that will be filled during the night while uses for homes and businesses would be at the lowest.
FUNDING Additional funding sources are needed for water/sewer projects.	Propose legislation for a sustainable sales tax for repairing, maintaining, and replacing infrastructure.
WATER CONSERVATION Greater emphasis is needed on reuse, recycling, and water conservation education.	Regional planning teams should become regional implementation teams for implementation and adaptive management of the Arkansas Water Plan.
WATER QUALITY 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.	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.

West-central Region Summary Recommendations

Issues	Recommendations
SURFACE WATER 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).	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
FUNDING Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.	Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050.
GROUNDWATER 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.	The sandy alluvial aquifer along the Arkansas River Valley should be evaluated for quantity and quality as a source of water supply. Locate funding to study and evaluate this aquifer. This would alleviate the need for building new surface water impoundments on flowing waters in the highlands.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
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).[1]	The water authorities of our State are shared by ANRC and ADEQ. Both ANRC and ADEQ should collaborate to monitor, plan, and fund water quality improvement programs to reduce sediment and nutrient loading into our state streams, rivers, wetlands, and lakes with particular emphasis on maintaining the integrity of relatively unaltered, high quality streams. In importance of water quality and quantity, the Arkansas State Water Plan revision and ANRC should support the existing ADEQ regulations.
WATER SUPPLY New surface water impoundments are needed to provide adequate water supply.	ANRC should support development and construction of new water supply projects in areas of critical need, or where projected demand exceeds projected water availability.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	A federal match of 65% is available for rehabilitation of PL566, but is not being accessed because local entities cannot generate the 35% match. Propose legislation for dedicated State funds to offset a portion of the 35% so local entities can upgrade and maintain these structures. PL566 funding needs to be appropriate for development of new sources for drinking water, agriculture, flood control, etc. Watershed assessments should be updated.
WATER SHORTAGE There is inadequate water supply for livestock watering during summer months.	Excess surface water should be captured during times of abundance, stored in on-farm reservoir, and used during low flow/shortage situations for livestock watering, irrigation, and other uses.
GROUNDWATER Groundwater monitoring and modeling need to be included (for West-central region) in the state water plan to help us	Public outreach and education is needed to improve groundwater well reporting/monitoring to get a greater understanding of the sustainability and condition of our aquifers in the West-central Region of the state.

[1] The agriculture stakeholders disagree with the overly broad and generalized statement that nutrient management is inadequate "on all Arkansas streams as well as Extraordinary Resource Waters." ERWs already receive additional protections in some cases. Any additional protections provided must include a comprehensive cost benefit analysis and must account for recreational impacts to water quality.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
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.	
REALLOCATION IN FEDERAL PROJECTS Reallocation of storage for water supply in Corps lakes needs to occur.	ANRC shall pursue reallocation of storage in federal impoundments in areas where there is a critical need, or projected increased demand, for additional water supply.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.
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).[2]	Continue support of voluntary locally led conservation programs.
WATER SHORTAGE	Propose legislation to increase state funding for surface water infrastructure to capture, store, and

[2] The agriculture stakeholders disagree with the overly broad and generalized statement that nutrient management is inadequate "on all Arkansas streams as well as Extraordinary Resource Waters." ERWs already receive additional protections in some cases. Any additional protections provided must include a comprehensive cost benefit analysis and must account for recreational impacts to water quality.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
There is inadequate water supply for livestock watering during summer months.	distribute available supply for agriculture, navigation, drinking water, flood control, fish and wildlife habitat, and recreation.
WATER SUPPLY New surface water impoundments are needed to provide adequate water supply.	Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies.
REGULATIONS Federal and state regulations impede implementing and effectively managing water utility projects.	ANRC should establish "mediator" between federal/state regulators to facilitate permitting process as an advocate for cities/utilities.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Propose legislation to establish a sustainable funding source dedicated to maintain, repair, and upgrade infrastructure and dams for public drinking water reservoirs, water treatment, and sewage facilities. By doing this, it would discourage building new impoundments on flowing streams which takes away from in-stream flows.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Encourage funding for localized programs be directed by locally led workgroup.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
MEASUREMENT AND ASSESSMENT Returned water should be included in the calculations of available water. "Withdrawn" does not necessarily always mean "consumed."	Available water estimates for the Arkansas Water Plan update did incorporate return flow.
GROUNDWATER Overing of groundwater aquifers can lead to permanent loss of storage because the aquifers consolidate or subside. Overing contributes to reduced streamflow because of reduced groundwater discharge to streams.	Integrate surface water use, groundwater conservation and on farm conservation measures (tailwater recovery, land leveling, strategic water delivery practices) into an integrated and continuous planning process for the delta of Arkansas. Aquifers should be evaluated for quantity and quality as a source for domestic water needs and other uses.
FUNDING 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.	Encourage the legislature to increase or at least maintain funding for University of Arkansas Research and Cooperative Extension Service education and outreach, including the University of Arkansas Discovery Farm Program. Increased funding could assist faster adoption of water conservation practices.
FUNDING There is insufficient funding for: a. Existing and on-going water projects	Propose legislation to support conservation districts in addressing urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment. Maintain, at a minimum, current funding for extension and research staff.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
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.	
FUNDING 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.	Propose legislation to target tax credits: o For flow metering, o For livestock watering, and o For more efficient suites of irrigation water management practices. Encourage a streamlined EQIP process for flow meters.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
INFORMATION MANAGEMENT There is no single source of water data or information across agencies.	Designate Conservation Districts as the repository for various records, including but not limited to utility system records, and make that information accessible to those that may need to use it.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Arkansas Conservation Districts should develop and implement, in conjunction with UA Cooperative Extension Service and ANRC, an education program about agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.
FUNDING Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	Propose legislation to sustain and increase tax incentives & cost sharing options for constructing more on-farm storage systems.
FUNDING Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	Due to extremely limited groundwater and poor water quality, additional emphasis should be on surface water storage in the West-central Region to meet its livestock needs.
FUNDING Increased state level funding incentives	Propose legislation to fund research on water conservation practices.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	
FUNDING Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	Provide multiple support levels for conservation districts to address urban, suburban, and rural natural resources issues, such as technical assistance, staffing, and equipment.
SURFACE WATER 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).	Solutions should include reasonable surface water use, groundwater conservation, and on farm conservation (i.e., on farm storage reservoirs, land leveling, and tailwater recovery systems).
SURFACE WATER 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).	ANRC should re-evaluate and establish meaningful minimum flow for Arkansas River projects.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Propose legislation to fund critical maintenance of locks and dams on MKARNS as navigation pools provide benefits to agriculture, recreation, municipal and industrial water supply, habitat for fish and wildlife, hydropower, and navigation.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Propose legislation to establish funding mechanisms and incentives for consolidating small municipal systems into regional water and wastewater systems.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Compile a list of existing available tools; conservation practices, funding incentives, and tax credits; and local, state, and federal funding sources and maintain on the ANRC website for public use.
INFRASTRUCTURE Funding is needed to repair, replace, maintain, and build infrastructure, including dams, levees, and PL566 structures.	Encourage local/state funding for support of repair, rehabilitation of PL566 dams and ongoing maintenance.

West-central Region Summary Recommendations (continued).

Issues	Recommendations
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).[3]	Propose legislation to increase state funding for stream bank stabilization, riparian enhancement, and forestry education and stewardship plans.
WATER SUPPLY New surface water impoundments are needed to provide adequate water supply.	ANRC should maintain existing and ongoing water supply projects.
REGULATIONS Federal and state regulations impede implementing and effectively managing water utility projects.	ANRC should revisit regulations that may be impeding the implementation and effective management of water utility projects. Integrate continuous adaptive management as resources and technology changes. Regional workgroup planning teams should continue as currently structured to determine how best to meet the needs of water users in the future.
REGIONAL PLANNING Any legislation needs to be tailored to regions. One statewide size does not fit all regions.	ANRC has committed to including regional uses and recommendations in the Arkansas Water Plan update.

[3] The agriculture stakeholders disagree with the overly broad and generalized statement that nutrient management is inadequate "on all Arkansas streams as well as Extraordinary Resource Waters." ERWs already receive additional protections in some cases. Any additional protections provided must include a comprehensive cost benefit analysis and must account for recreational impacts to water quality.

South-central Region Summary Recommendations

Issues	Recommendations
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.	Responsibility and authority for maintaining and improving water quality is shared by ADEQ and ANRC. The AWP should reflect and integrate the water quality policies of ADEQ as the state's primary planning document regarding water quality policy. ADEQ and ANRC should collaborate to develop policies and regulations that improve water quality by reducing sediment and nutrient loading into streams, lakes, and rivers with particular emphasis on maintaining the integrity of unaltered, high quality streams. Removing streams from ADEQ's 303d list should be a major goal of the AWP.
FUNDING Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.	Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050.
SURFACE WATER 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.	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream water use. Intermittent streams should be evaluated through a different process to allow removal/diversion during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
FUNDING There is a Lack of funding to construct additional surface water impoundments in critical groundwater areas.	Propose legislation to increase Federal and State funding for on farm storage. Projects should include normal practices such as ponds for livestock water but should also be available for rainwater harvesting and storage for use in poultry houses.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.
FUNDING There is a Lack of funding to construct additional surface water impoundments in critical groundwater areas.	Educate the public in water issues pertaining to Sparta & Alluvial Aquifers.
WATER SHORTAGE 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.	ANRC should create a state drought and shortage response team with representatives from all pertinent state agencies that develops adaptive drought and shortage contingency plans for each planning region. The team should establish regional priorities for water use during droughts and shortages.
FUNDING Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	Propose legislation to sustain and increase tax incentives & cost sharing options for constructing more on-farm storage systems.
SURFACE WATER Industry should be encouraged to	ANRC should encourage industry, agriculture, others to use surface water in Critical Groundwater Areas by proposing legislation to amend Act 341 of 1995 as amended (ACA 26-51-1001 et seq.) to apply the tax credit

South-central Region Summary Recommendations (continued).

Issues	Recommendations
use surface water.	to industries and agriculture that choose to construct surface use infrastructure rather than use groundwater.
WATER STORAGE More surface water impoundments are needed in critical groundwater areas.	ANRC should encourage industry, agriculture, others to use surface water in Critical Groundwater Areas by proposing legislation to amend Act 341 of 1995 as amended (ACA 26-51-1001 et seq.) to apply the tax credit to industries and agriculture that choose to construct surface use infrastructure rather than use groundwater.
WATER STORAGE More surface water impoundments are needed in critical groundwater areas.	Help new Industries to area, as well as existing industries stay informed through Chamber of Commerce or other local agencies on the benefits of using surface water.
WATER STORAGE More surface water impoundments are needed in critical groundwater areas.	Propose legislation for tax incentives for replacing of water systems to accommodate surface water use.
WATER STORAGE More surface water impoundments are needed in critical groundwater areas.	ANRC should require industry to use surface water when available.
WATER STORAGE More surface water impoundments are needed in critical groundwater areas.	Propose legislation to extend tax credits/incentives to 20 years for entities who have constructed surface water incentives so early adopters can receive credit.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
REGIONAL PLANNING Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	Retain the Planning Region Work Groups for implementation of the Arkansas Water Plan, particularly related to subregional issues and considerations.
WATER CONSERVATION Continue to pursue water conservation practices as an alternative to development for future needs.	Propose legislation to make state and federal tax incentives and cost-share funds even more available to farmers and landowners so that water conservation measures are economically feasible and desirable in all regions of the state. Partner state and federal agencies should also aggressively promote increased use of effective management techniques already available. This could include funding for outreach and education and technical assistance to reduce impediments to management.
SURFACE WATER Industry should be encouraged to use surface water.	Help new Industries to area, as well as existing industries stay informed through Chamber of Commerce or other local agencies on the benefits of using surface water.
NAVIGATION 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.	Propose a legislative resolution that funding be maintained for the Ouachita River navigation system. Document the economic benefits of water transport of goods and delivery of heavy equipment compared to other forms of transportation to the region, as well as benefits from municipal/industrial water supply, fish & wildlife recreation, flood risk reduction, and agricultural, thermoelectric & industrial water supply.
NAVIGATION Lock and dam maintenance on the Ouachita River is needed to ensure navigation pools continue to provide	Encourage congressional representatives to pass legislation to fund the dredging and maintenance of the navigation system.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
for municipal/industrial water supply, recreation, and flood damage protection.	
FUNDING There is a Lack of funding to construct additional surface water impoundments in critical groundwater areas.	Existing ANRC rules such as Title 10 & Title 14 should be amended so they are more accessible to livestock producers. Propose legislation for dedicated state funding for Title 10 to help offset a portion of the cost share. This will increase adopting of on farm storage. Modify the eligibility requirement under Title 14 to lower the storage threshold to 1-2 ac-ft.
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.	ANRC should encourage implementation of reuse and recycling practices for irrigation water that are being used in other states (LA).
REGULATIONS Outstanding Resource Waters need special protection for both water quantity and quality.	In a unified effort to protect the water resources of the State of Arkansas, and in recognition of the connected importance of water quality and water quantity, the updated Arkansas State Water Plan shall support the existing Arkansas Pollution Control and Ecology Commission Regulation #2.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
WATER SHORTAGE 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.	ANRC should encourage cooperation between multiple government agencies & public officials and representatives to put plans in place before there is a crisis.
WATER SHORTAGE 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.	ANRC should encourage cooperation, collaboration, and communication among states' and federal agencies, local governments, private business/industry, municipalities and individuals who rely on a shared water resource for withdrawal, discharge, recreation (including refuges, wildlife areas, etc.), and/or livelihood in anticipation of and prior to drought and/or possible low flow restrictions.
REALLOCATION IN FEDERAL PROJECTS Reallocation of storage for water supply is needed in federal Corps lakes to make those sources more readily available for drinking water.	Propose the reallocations of storage in Corps Lakes with the Corps of Engineers and Congressional representatives to make it more available for drinking water.
WATER SUPPLY The highest and best use of water (surface or ground) is as drinking water. This should be reflected in	Drinking water should be designated as the highest and best use, and should have the highest priority for allocation during times of shortage.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
state policy (state water plan) and in state regulations (higher priority in ADEQ regulations No. 2 and No. 6).	
NAVIGATION A threat of change in federal laws for navigation threatens the maintenance of Ouachita River pool elevations.	Propose a legislative resolution that federal funding be maintained for the Ouachita River navigation system. Document the economic benefits of water transport of goods and delivery of heavy equipment compared to other forms of transportation to the region, as well as benefits from municipal/industrial water supply, fish & wildlife recreation, flood risk reduction, and agricultural, thermoelectric & industrial water supply.
NAVIGATION A threat of change in federal laws for navigation threatens the maintenance of Ouachita River pool elevations.	Encourage congressional representatives to pass legislation to fund the dredging and maintenance of the navigation system.
NAVIGATION A threat of change in federal laws for navigation threatens the maintenance of Ouachita River pool elevations.	The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Arkansas, Mississippi, Ouachita, Red, and White Rivers for navigation and the other benefits is receives.
SURFACE WATER Industry should be encouraged to use surface water.	Propose legislation for tax incentives for replacing of water systems to accommodate surface water use.
SURFACE WATER Industry should be encouraged to use surface water.	ANRC should require industry to use surface water when available.
SURFACE WATER Industry should be encouraged to use surface water.	Propose legislation to extend tax credits/incentives to 20 years for entities who have constructed surface water incentives so early adopters can receive credit.

South-central Region Summary Recommendations (continued).

Issues	Recommendations
SURFACE WATER 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.	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream water use. Intermittent streams should be evaluated through a different process to allow removal/diversion during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
FUNDING Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	Educate the public in water issues pertaining to Sparta & Alluvial Aquifers.

Southwest Region Summary Recommendations

Issues	Recommendations
SURFACE WATER Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.	Reasonable use of excess surface water should be determined by an independent entity in basins containing surface water gaps using the Fish and Wildlife Flow Framework as the scientific process to improve information about stream flow needs of fish and wildlife with a stakeholder process to determine basin specific priorities on the in stream and out of stream of water use. Intermittent streams should be evaluated through a different process to allow use during periods of high flow. ANRC and other state and federal grant monies should be sought to fund this scientific study.
WATER CONSERVATION Water conservation practices are not being aggressively pursued as an alternative to development to meet future needs.	Incorporate education/awareness programs into the public schools K-12. Existing Aquatic Wild (educational frameworks) program has lesson plans already prepared. Statewide approach to the emphatic importance of the next generation understanding water conservation, issues, and problem solving. Focus on long term sustainability of water as a natural resource.
FUNDING Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.	Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050.
WATER STORAGE Additional surface water impoundments are needed for better utilization of water to meet human needs.	Streamline regulations dealing with construction of dams and impoundments to provide additional surface water sources.
SURFACE WATER 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.	Increase water storage capacity upstream from Shreveport, LA through construction of locks and dams for river navigation funded by usage fees on bulk transport, recreation usage, water sales to urban areas, and outside funding.
INFRASTRJUCTURE	The State of Arkansas benefits greatly from navigation as a water resource. Municipal and industrial water supply, irrigation and other agricultural uses, fish and wildlife habitat, recreation, flood risk reduction, and thermoelectric/hydropower are all benefits received in part from navigation. The state should work to maximize the full development of the Arkansas, Mississippi, Ouachita, Red, and

Southwest Region Summary Recommendations (continued).

Issues	Recommendations
	White Rivers for navigation and the other benefits is receives.
REGULATIONS There is concern that the first priority for Arkansas water may not be for Arkansas residents.	ANRC Title 3 should be amended to state that surface water needs to be first priority for use, and Arkansas should be given first priority in using Arkansas water.
FUNDING Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.	On surface water: ANRC Title 10- should be adequately funded by the state as well as continue funding of federal 319 program. The funding should be equally distributed to all regions of the state. ANRC Title 14 should be modified to make it more applicable to livestock – 1 acre-foot storage.
SURFACE WATER Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.	During drought, water needs to be allocated based on a state prioritization basis. For instance, the highest priority always must be municipal and domestic uses, but beyond that a prioritization is needed for industrial, agriculture, and instream uses. The prioritization should include established inter and intra basin transfers which may be affected by local circumstances.
SURFACE WATER Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.	Allocation during drought should be tied to nearby stream gages.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Support expanded research and hiring of researchers by U of A Extension and Conservation Districts for discovery of new conservation practices.

Southwest Region Summary Recommendations (continued).

Issues	Recommendations
WATER SHORTAGE 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.	Shortage and drought contingency plans should be developed for the Bayou Bartholomew, Bayou Macon, Bayou DeView, St. Francis, Cache, and Beouf River basins. The Fish and Wildlife Flow Framework should serve as the stakeholder process for scientifically determining appropriate **minimum** flow levels for different classes of streams statewide. Priorities of use during a drought or shortage should be regionally determined by local landowners, recreationists, industry and fish/wildlife scientists before those shortages occur to reflect regional priorities.
MEASUREMENT AND ASSESSMENT Returned water should be included in the calculations of available water. "Withdrawn" does not necessarily always mean "consumed."	Available water estimates for the Arkansas Water Plan update did incorporate return flow.
SURFACE WATER Industry should be encouraged to use surface water.	Help new Industries to area, as well as existing industries stay informed through Chamber of Commerce or other local agencies on the benefits of using surface water.
REGULATIONS Surface water should be the first priority source for all water uses.	ANRC Title 3 should be amended to state that surface water needs to be first priority for use, and Arkansas should be given first priority in using Arkansas water.
WATER CONSERVATION Water conservation practices are not being aggressively pursued as an alternative to development to meet future needs.	Develop incentive programs to encourage the public to practice water conservation, and thus reduce wasteful practices.
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.	Conduct an assessment of the existing stream gage network and identify critical gaps in the network. A critical gage would be defined as necessary for basin yield analysis, upstream flow requirements, drought allocation, and compact compliance. Fund the implementation of these gages and sustain funding through a check-off program of water users, or sustainable water resources tax.

Southwest Region Summary Recommendations (continued).

Issues	Recommendations
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	ANRC should modify permit and reporting forms to explicitly account for return flow.
WATER CONSERVATION Conservation, particularly on-farm and off-channel storage, needs to be emphasized as the way to offset groundwater use.	Water in the form of rainfall must be slowed in its travel from the time it hits the ground until it reaches the Gulf. ANRC should promote public education in the wise use and conservation of water. More funding would be needed for conservation organizations and conservation districts.
SURFACE WATER 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. 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) needs to be determined.	The proportion of stream flow designated as excess water be determined by an independent entity using a scientific approach through an open and transparent process. Intermittent streams should be evaluated through a separate process. ANRC and other state agencies should fund or seek funds for this study.
Public Awareness There is a lack of public awareness about the importance of water for all sectors	Public awareness should be elevated through public education seminars about agricultural water uses, needs, importance for food security, and the importance of agriculture to the Arkansas economy. These seminars should be provided by and promoted by University of Arkansas Division of Agriculture field agents working in cooperation with local NRCS, Farm Bureau, Ag Council, County Conservation Districts, and local governing bodies, and should include information on both water quantity and quality.

Southwest Region Summary Recommendations (continued).

Issues	Recommendations
INFORMATION MANAGEMENT There is no single source of water data or information across agencies.	Designate Conservation Districts as the repository for various records, including but not limited to utility system records, and make that information accessible to those that may need to use it.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Arkansas Conservation Districts should develop and implement, in conjunction with UA Cooperative Extension Service and ANRC, an education program about agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.
WATER QUALITY 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.	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.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Increase federal and state funding through ANRC to promote conservation education statewide.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Utilize all state resource agencies in programs to increase public awareness of water importance.
PUBLIC AWARENESS AND EDUCATION Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Utilize media and news articles to increase public awareness of the importance of water and its quality.

Southwest Region Summary Recommendations (continued).

Issues	Recommendations
WATER SHORTAGE Coordination between state agencies during times of drought, shortages, and when permitting non-riparian uses needs to be explicitly incorporated into the water plan.	Allocation during shortage should be tied to nearby stream gages.
WATER STORAGE Additional surface water impoundments are needed for better utilization of water to meet human needs.	On surface water: ANRC Title 1- should be adequately funded by the state as well as continue funding of the federal 319 program. The funding should be equally distributed to all regions of the state. ANRC Title 14 should be modified to make it more applicable to livestock – 1 ac-ft storage.
WATER STORAGE Additional surface water impoundments are needed for better utilization of water to meet human needs.	Increase funding to agricultural and urban areas specifically tied to water storage facilities.
WATER SHORTAGE 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?	Formulate an allocation process for water in time of shortage/drought to make sure that all of Arkansas' needs – consumers, navigation, agricultural, industrial, and commercial – are met before any water leaves the state.

ATTACHMENT 7

Regional Priority Issues and Recommendations

Tables 7-1 through 7-5 list regional priority issues and recommendations for ANRC to consider for implementation. Regional priority issues and recommendations that are not within the authority of ANRC were excluded from these tables. The complete list of regional priority issues and recommendations is included in the Issues and Recommendations technical memorandum Attachments 3 and 5, respectively.

Table 7-1 Highest Ranked Issues and Recommendations in the East Arkansas Planning Region

Priority Issues	Priority Recommendations
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).	Region priority recommendations similar/same as state recommendations included in implementation plan, see Section 3.3
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.	1. ANRC should develop and implement conjunctive management strategies to address water needs for agriculture, drinking water, industry, recreation, and fish and wildlife in critical groundwater areas with specific goals to recover the aquifers in those areas. 2. Reserve deep aquifers for use as municipal drinking water sources.
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.	1. ANRC will develop shortage and drought contingency plans for Bayou Bartholomew, Bayou Macon, Bayou DeView, St. Francis, Cache, and Beouf River basins. 2. ANRC will adopt the Fish and Wildlife Flow Framework to serve as the stakeholder process for scientifically determining appropriate **minimum** flow levels for different classes of streams state
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.	Recommendation to increase bond funding authority included in state-wide implementation plan, see Section 3.4
Geographic subareas in the Delta must be considered in planning and implementing water projects. One size does not fit all areas.	Recommendations for this issue were not identified as region priority. However, ANRC, through the Critical Groundwater Areas program, recognizes and considers differences in groundwater issues in different areas of the Delta.
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.	The region priority recommendation relates to navigation, over which ANRC has no authority. ANRC does have authority to address flood control and drainage therefore, recommend ANRC expand work with Conservation Districts and other state and federal agencies to identify priority flood control and drainage projects and possible funding sources.
The 25% excess surface water definition needs scientific justification.	Recommendations for this issue were not identified as region priority. However, the issue is addressed in implementation of state-wide recommendations, see Section 3.3
Education/training is needed to help urban users understand agricultural water uses, needs, and the importance of agriculture to the Arkansas economy.	Recommendations for this issue were not identified as region priority. However, the issue is addressed in implementation of state-wide recommendations, see Section 3.6

Table 7-2 Highest Ranked Issues and Recommendations in the North Arkansas Planning Region	
Priority Issues	**Priority Recommendations**
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.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.3
The 25% restriction used to estimate "excess surface water" should be increased so additional water is available for non-riparian use.	1. Region priority recommendation same as state recommendation included in implementation plan, see Section 3.3 2. Propose legislation that designates the highest and best use of any Arkansas water be for human consumption and that any Arkansas agency's permitting or program decisions first consider the effects of decision on the availability, quantity or quality of existing drinking water supplies.
Excess available water" might be based on the lowest historical gap year rather than 25% of average annual (more conservative approach).	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.3
Reallocation of storage in Corps of Engineer reservoirs needs to occur.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.8
Water conservation practices are not being aggressively pursued as an alternative to development for future needs.	1. ANRC should promote public education in the wise use and conservation of water. 2. More funding should be provided to conservation organizations and conservation districts for educational outreach on water conservation.
Additional funding sources are needed for water/sewer projects.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.4
Water quality is as important as water quantity, and should be considered in the water plan.	1. AWP should include a Healthy Streams policy statement for flow alterations and non-point source pollution, similar to, and complimentary of, ADEQ's Regulation 2 anti-degradation policy for point source discharges. ANRC shoulddevelop the Healthy Streams policy statement in collaboration with ADEQ and sector stakeholders. 2. Encourage ANRC to work with private landowners to remove barriers to the implementation of Best Management Practices, including the Discovery Farm Program.
There is insufficient information on the volume and yield of groundwater aquifers in the North Region.	Region priority recommendations same as state recommendation included in implementation plan, see Section 3.1
Greater emphasis is needed on reuse, recycling, and water conservation education.	Region priority recommendations similar to state recommendations included in implementation plan, see Section 3.6

Table 7-3 Highest Ranked Issues and Recommendations in the West-central Arkansas Planning Region	
Priority Issues	**Priority Recommendations**
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).	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.3
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).	ANRC should place particular emphasis on maintaining the integrity of relatively unaltered, high quality streams through its water permitting and nonpoint source programs.
There is inadequate water supply for livestock watering during summer months.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.1
Reallocation of storage for water supply in Corps lakes needs to occur.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.8
Any legislation needs to be tailored to regions. One state size does not fit all regions.	Recommendation for this issue was not region priority

Table 7-4 Highest Ranked Issues and Recommendations in the South-central Arkansas Planning Region	
Priority Issues	**Priority Recommendations**
There is a lack of funding to construct additional surface water impoundments in critical groundwater areas.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.4
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.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.3
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.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.5
Outstanding Resource Waters need special protection for both water quantity and quality.	ANRC should place particular emphasis on maintaining the integrity of relatively unaltered, high quality streams.
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.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.2
Reallocation of storage for water supply is needed in federal Corps lakes to make those sources more readily available for drinking water.	Recommendation was not a region priority, however, issue is addressed by state recommendation included in implementation plan, see Section 3.8
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.	Recommendation for this issue was not region priority
Increased state level funding incentives and cost share are needed to encourage more on-farm storage for crop irrigation and livestock watering.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.9
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).	Recommendation for this issue was not region priority
Industry should be encouraged to use surface water.	ANRC should encourage industry, agriculture, others to use surface water in Critical Groundwater Areas by proposing legislation to amend Act 341 of 1995 as amended (ACA 26-51-1001 et seq.) to apply the tax credit to industries and agriculture that choose to construct surface use infrastructure rather than use groundwater.
More surface water impoundments are needed in critical groundwater areas.	Region priority recommendation same as state recommendation included in implementation plan, see Section 3.9

Table 7-5 Highest Ranked Issues and Recommendations in the Southwest Arkansas Planning Region	
Priority Issues	**Priority Recommendations**
There is concern that the first priority for Arkansas water may not be for Arkansas residents.	ANRC Title 3 should be amended to state that surface water needs to be first priority for use, and Arkansas should be given first priority in using Arkansas water.
Increased state funding in the form of cost-share programs should be provided for agriculture in developing on-farm surface storage facilities.	1. Propose legislation to increase allowable percentages via ANRC's tax credit program to landowners to encourage construction of on-farm reservoirs thereby reducing the dependence on groundwater and surface stream flow, from 2015 through 2050. 2. On surface water: ANRC Title 10 should be adequately funded by the state as well as continue funding of federal 319 program. The funding should be equally distributed to all regions of the state. ANRC Title 14 should be modified to make it more applicable to livestock – 1 acre-foot storage.
Surface water should be the first priority source for all water uses.	1. ANRC Title 3 should be amended to state that surface water needs to be first priority for use. 2. Arkansas should be given first priority in using Arkansas water.
Coordination between state agencies during times of drought, shortages, and when permitting non-riparian uses needs to be explicitly incorporated into the water plan.	Region priority recommendation already implemented through Title 3.
Water conservation practices are not being aggressively pursued as an alternative to development to meet future needs.	Region priority recommendations are not ANRC purview, however, issue is addressed in state-wide implementation plan
Additional surface water impoundments are needed for better utilization of water to meet human needs.	ANRC does not have authority to implement region priority recommendation
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.	Recommendation was not a region priority, however, issue is addressed by state recommendation included in implementation plan, see Section 3.2
Excess water is estimated using average annual values. Using the drought of record instead for estimating excess water should be considered.	Recommendations for this issue were not high priority for region.
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?	Recommendations for this issue were not high priority for region. Issue is addressed in Title 3.