



**US Army Corps  
of Engineers®**  
Little Rock District

# **Bull Shoals Lake, Arkansas**

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## **ENVIRONMENTAL ASSESSMENT**

Reallocation of Water Storage at Bull Shoals Lake, Arkansas,  
for the Ozark Mountain Regional Public Water Authority and  
Marion County Regional Water District



**FINAL July 2010**



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**ENVIRONMENTAL ASSESSMENT  
FINAL**

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Regional Public Water Authority**



**July 2010**

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**FINDING OF NO  
SIGNIFICANT IMPACT**

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## FINDING OF NO SIGNIFICANT IMPACT

**NAME OF PROPOSED ACTION:** Ozark Mountain Regional Public Water Authority (OMRPWA) and Marion County Regional Water District (MCRWD), Water Supply Storage Reallocation, Bull Shoals Lake, Arkansas.

**PURPOSE AND NEED FOR THE PROPOSED ACTION:** The Little Rock District, U.S. Army Corps of Engineers proposes that 11,886.541 acre-feet of conservation pool storage in Bull Shoals Lake be reallocated from hydropower purpose to water supply storage to satisfy the Municipal and Industrial water supply needs of OMRPWA and MCRWD (**Alternative 2**). The top of conservation pool is 659.00 NGVD29, with seasonal differences. The total water supply storage would be 13,584.617 acre-feet (1,698.077 acre-feet previously reallocated from the conservation pool and an additional 11,886.541 acre-feet reallocated from the conservation pool).

**ALTERNATIVES:** In addition to the Proposed Action (reallocation from the conservation pool), reallocation of storage from the flood and inactive pools were considered, as well as the No-Action alternative, were considered in the preparation of an Environmental Assessment (EA) for this Proposed Action:

**No Action (Alternative 1):** The existing condition represents the current 1,698.077 acre-feet of water supply storage within the conservation pool. The top of pool is at elevation 659.00 feet. The seasonal pool plan is also part of this condition that raises the top of conservation pool, with the White River Minimum Flows (WRMF) Project implemented, to elevation 662.0 feet from 15 May to 15 June and then to 661.00 feet from 15 July to 30 September.

**Reallocation from the flood pool (Alternative 3):** This alternative would reallocate 11,948.151 acre-feet from the flood control pool for water supply storage. The top of the conservation pool, with the WRMF Project implemented, would be raised to elevation 659.25 with seasonal pool raises. The total water supply storage would be 13,646.229 acre-feet, including the existing allocation. Dependable yield mitigation storage is included (13.221 acre-feet) to keep existing water supply users' yield whole to compensate for the reduction in the dependable yield which occurs when the conservation pool is expanded.

**Reallocation from the inactive pool (Alternative 4):** This alternative would reallocate 11,943.284 acre-feet from the inactive pool for water supply storage. The top of the conservation pool, with WRMF implemented, would remain at 659.0 feet with seasonal pool raises and the bottom of the conservation pool would be lowered to 628.14 feet. The total water supply storage would be 13,461 acre-feet, including the existing allocation. Dependable yield mitigation storage is included (12.975 acre-feet) to keep existing water supply users' yield whole to compensate for the reduction in the dependable yield which occurs when the conservation pool is expanded.

## ANTICIPATED ENVIRONMENTAL IMPACTS:

Consideration of the environmental effects of the proposed action have been disclosed in the *Environmental Assessment, Reallocation of Water Storage at Bull Shoals Lake, Arkansas, for the Ozark Mountain Regional Public Water Authority and Marion County Regional Water District, July, 2010*, prepared by the U.S. Army Corps of Engineers, Little Rock District, and which is hereby incorporated by reference into this document. It has been determined that there will be no significant environmental impacts as a result of the implementation of this action; and, it is therefore necessary in order to prepare this Finding Of No Significant Impact (FONSI). This determination of significance is required by 40 CFR 1508.13. Additionally, 40 CFR 1508.27 defines significance as it relates to consideration of environmental effects of a direct, indirect or cumulative nature.

Criteria that must be considered in making this finding are addressed below, in terms of both context and intensity. The significance of both short and long term effects must be viewed in several contexts: society as a whole (human, national); the affected region; the affected interests; and the locality. The context for this determination is primarily local, as shown in Figures 1.1 and 2.1 of the EA. The context for this action is not highly significant geographically, nor is it controversial in any significant way. Consideration of intensity refers to the magnitude and intensity of impact, where impacts may be both beneficial and adverse. Within this context, the magnitude and intensity of impacts resulting from this decision are not significant. The determination for each impact topic is listed below:


1. **The degree to which the action results in both beneficial and adverse effects. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.** The EA indicates that there will be beneficial effects such as the availability of increased water supply to meet Municipal and Industrial needs of the region served by OMRPWA and MCRWD until the year 2025 by implementation of Alternative 2 (Proposed Action). Perhaps more importantly, the proposed action alternative provides a source of safe drinking water to a region with long-standing health issues associated with the current water supply. The EA also indicates that any negative effects, such as a small loss of hydropower benefits, will be minimal.
2. **The degree to which the action affects public health or safety.** No adverse effects to public health or safety will result from the Proposed Action. Under existing conditions, no significant amounts of hazardous materials are identified in the immediate area of the Proposed Action. Implementing the Proposed Action would not create hazardous conditions affecting public health or safety.
3. **The degree to which the action affects unique characteristics of the potentially affected area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.** No such unique characteristics or resources have been identified in the project area.

4. **The degree to which effects on the quality of the human environment are likely to be highly controversial.** The project will benefit the public, therefore the Little Rock District, Corps of Engineers does not regard this activity as controversial. Eight comments were received from agencies or organizations and two comments were received from individuals during the public review period from May 11, 2010 to June 11, 2010. Two of the groups responding, Southwestern Power Administrations (SWPA) and Southwestern Power Resources Association (SPRA), disagreed with the manner in which hydropower losses were calculated and the two individuals expressed concern about issues unrelated to the proposed action. Other comments received were either supportive or minimal in nature. In synopsis, the public comments do not reflect a high degree of controversy.
5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** Reallocation of water supply storage from Bull Shoals Lake has occurred once in the past. Although this reallocation is larger, there is no uncertainty involving the impacts or risks of this action.
6. **The degree to which the action may establish a precedent for future actions with significant impacts.** The reallocation of water supply storage at Bull Shoals Lake is situation specific and will not establish any precedent for future action that has significant impacts.
7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** Cumulative effects analyses for the physical and biological resources that would potentially be affected are presented in the EA. The Proposed Action would not result in any significant cumulative impacts in regard to any reasonably foreseeable action in the project area.
8. **The degree to which the action may adversely affect items listed or eligible for listing in the National Register of Historic Places, or other significant scientific, cultural or historic resources.** As previously stated in Item 3 above, no known historic structures or archaeological sites would be affected by the Proposed Action.
9. **The degree to which the action may adversely affect an endangered or threatened species or its critical habitat.** As disclosed in the EA, Section 4.4.3, coordination with the USFWS indicates that no T&E species are anticipated to be impacted by the Proposed Action.
10. **Whether the action threatens a violation of Federal, State or local law or requirements imposed for the protection of the environment.** No such violations will occur. Continued coordination with regulatory agencies will be ongoing to ensure compliance with all federal, state, regional, and local regulations and guidelines

**CONCLUSIONS:**

The impacts identified in the prepared EA have been thoroughly discussed and assessed. No impacts identified in the EA would cause any significant adverse effects to the human environment. Therefore, due to the analysis presented in the EA and comments received from a 30-day public review period that began on May 11, 2010, and ended on June 11, 2010, it is my decision that the preparation of an Environmental Impact Statement (EIS) as required by the National Environmental Policy Act (NEPA) is unwarranted and a "Finding of No Significant Impact" (FONSI) is appropriate. The signing of this document indicates the Corps' final decision of the proposed action as it relates to NEPA. The EA and FONSI will be held on file in the Planning and Environmental Division for future reference. Consultation with regulatory agencies will be ongoing to ensure compliance with all federal, state, regional, and local regulations and guidelines.

17 Aug 10  
Date

  
Glen A. Masset  
Colonel, US Army  
District Engineer

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# **Section 1.0**

# **Introduction**

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## 1.0 INTRODUCTION

### 1.1 Purpose and Need

The purpose of this environmental assessment (EA) is to evaluate the impacts of the proposed reallocation of water storage at Bull Shoals Lake, Arkansas, to meet the Municipal and Industrial (M&I) needs of the North Central Arkansas region.

The proponent of this action, the Ozark Mountain Regional Public Water Authority (OMRPWA) is a coalition of 20 water systems that was formed in 2004 to pursue a future water supply for the north central Arkansas region. OMRPWA serves a population of about 22,000 in Newton, Searcy, and parts of Boone, Marion, Johnson, and Pope Counties (see Figure 1.1 for the location of the counties involved). Raw water sources include shallow wells, deep wells, springs, or ground water purchased from neighboring water systems (see Figure 1.2 for a general layout map of OMRPWA member areas with color coding for water supply sources in the areas).

Following is a list of OMRPWA members:

#### Newton County

City of Jasper  
Mt. Sherman Water Association  
Nail-Swain Water Association  
East Newton County Water Association  
Mockingbird Hill Water Association  
Deer Community Water Association  
Lurton-Pelsor Water Association  
Town of Western Grove  
Parthenon Water Association

#### Searcy County

SP&G Water Association  
(St. Joe, Pindall & Gilbert)  
City of Marshall  
South Mountain Water Association  
SDM Water Association  
(Snowball, Dongola & Marsena)  
Town of Leslie  
Morning Star Water Association

#### Boone County

Town of Valley Springs  
Town of Diamond City  
Town of Lead Hill  
Lake Bull Shoals Estates

#### Members At Large

National Park Service  
(Buffalo National River)

Several member water systems have elevated levels of radium and fluoride that exceed the national primary drinking water standards. EPA has certified that many of the sources used by members of OMRPWA are unsafe for human consumption and the Arkansas Department of Health (ADH) has issued Administrative Orders to some members for continuing to supply unsafe water (ESI 2009a). As a result, ADH has identified the need for an alternative supply for these communities as their highest priority (ADH, 2010).

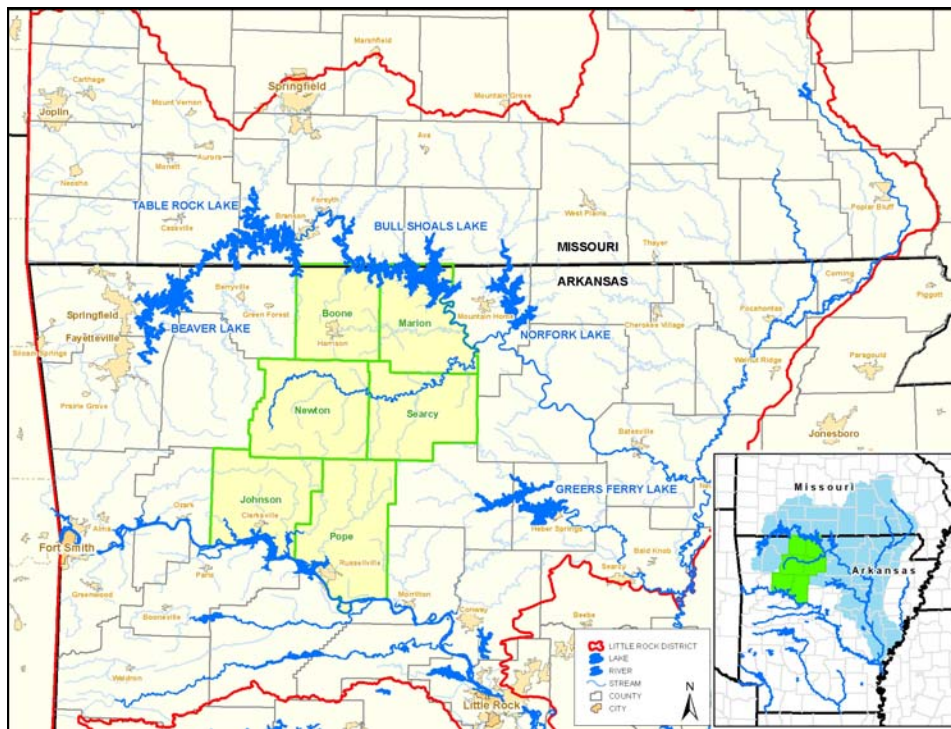


Figure 1.1 Arkansas Counties Served by OMRPWA Members

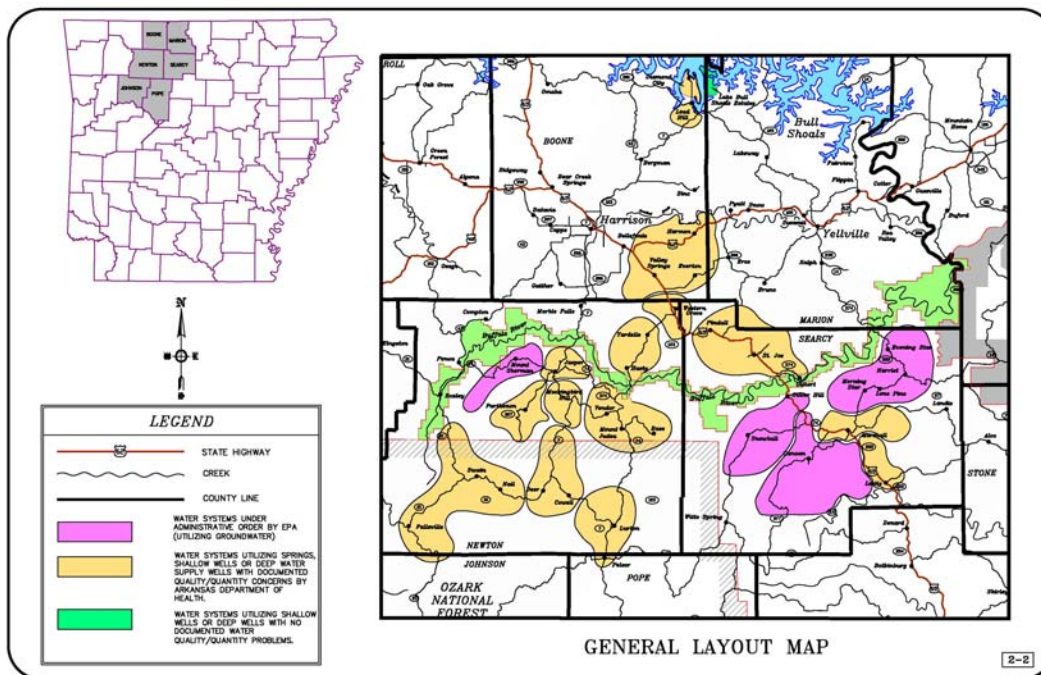


Figure 1.2 OMRPWA Area General Layout Map

Source: Ozark Mountain Regional Public Water Authority, Preliminary Engineering Report North Central Arkansas, April 2009, prepared by Engineering Services, Inc.

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For more than 30 years the region has struggled to find clean and reliable sources of water. A regional water supplier has worked without success to develop a water supply from the Buffalo River watershed. The plan was under environmental review for about 10 years where it received permitting challenges and a legal challenge by the National Park service because of the designation of the Buffalo River as the nation's first national river. Ultimately, progress on the project was stopped because of the environmental hurdles.

Bull Shoals and Norfolk Lakes remain as the only local clean, reliable, and readily available sources of water for OMRPWA.

OMRPWA commissioned a preliminary engineering report to evaluate the demand for water and water supply alternatives. That report (Ozark Mountain Regional Public Water Authority, Preliminary Engineering Report Amendment No. 1 – North Central Arkansas, August 2009, prepared by Engineering Services, Inc. (ESI) and Ozark Mountain Regional Public Water Authority, Preliminary Engineering Report North Central Arkansas, April 2009, prepared by ESI), evaluated twelve alternatives that included purchasing water from neighboring water systems, new supplies from U.S. Army Corps of Engineers' (USACE) reservoirs, and construction of new facilities to treat and convey the supplies to member systems. This report concluded that a 6 MGD supply from Bull Shoals Lake is the most cost-effective alternative and sufficient to meet the future demands of the member water systems. Therefore, OMRPWA requested, in a letter dated October 8, 2009, that the Corps reallocate storage sufficient to supply 6 million gallons per day (MGD) from Bull Shoals Lake.

Marion County Regional Water District (MCRWD) - Only one water provider currently utilizes Bull Shoals Lake as a municipal water source. MCRWD has a water supply allocation of 880 acre-feet from Bull Shoals Lake intended to provide a 1 MGD yield (ESI 1982). In 2007 and 2008, MCRWD sold an average 0.89 MGD and 0.84 MGD respectively. Peak summer usage is 1.2 MGD and their treatment plant capacity is 2.0 MGD (ESI 2009b). In a letter dated October 6, 2009, MCRWD requested that Little Rock District reallocate storage sufficient to supply an additional 1 MGD (for a total yield of 2 MGD) to allow for additional growth. Therefore, the MCRWD request for an additional 1 MGD allocation has been incorporated into this EA.

The following is a list of MCRWD members:

Marion County

City of Bull Shoals  
City of Flippin  
City of Summit  
City of Yellville

MCRWD also serves rural Marion County and the cities of Bruno and Pyatt plan to connect to the system.

Most of the member entities pump the water from their well(s) adding only chlorine for disinfection before distributing it to their customers. Only five of the 20 systems provide some method of filtration prior to customers drinking. Also, due to a fluctuation in ground water levels many systems experience serious water shortages during the late summer months leaving some families without water.

Short Term Interim Action (Critical Needs Phase) versus Long Term Solution: The short term interim action, the Critical Needs Phase, already funded by USDA, Rural Utilities Service, will

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provide safe water to some OMRPWA customers until the long-term new overall water system is constructed. The Critical Needs Phase includes a pipeline between the city of Marshall and the water systems under Administrative Orders from the ADH to not consume water (these are Mt. Sherman Water Association, South Mountain Water Association, Snowball, Dongola & Marsena Water Association, and Morning Star Water Association). This pipeline will allow clean water from Marshall to be blended with contaminated water to reduce the overall contaminant levels. While the blended water is a short-term solution, Marshall cannot sustain the flow to these water systems during dry periods. This water supply system is being put into place now and the associated costs are included in the without project conditions.

See Figure 1.3 for a depiction of the Critical Needs Phase improvements.

In October 2009, it was announced OMRPWA will receive \$56 million in grant and loan funding from the U.S. Department of Agriculture (USDA) through the American Recovery and Reinvestment Act (ARRA) of 2009. These funds will be used for constructing the water intake structure and treatment plant adjacent to Bull Shoals Lake, transmission lines, and booster pumping stations to transport the water across the rugged terrain in the Ozarks. However, these funds must be obligated by September 2010; and in order to obligate the funds, OMRPWA must first have a water supply storage agreement executed with USACE by August 2010.

As a result of the study conducted by ESI, OMRPWA has formulated a plan to develop a new source of water supply by constructing a water intake, treatment, and distribution system for water from Bull Shoals Lake that would provide needed additional water supply for its members.

The proposed OMRPWA project includes the construction of a new water transmission system for OMRPWA members designed to provide approximately at least 4.5 MGD (but have capacity to deliver up to 6.0 MGD) to the region in order to meet current water consumption needs. The project currently includes the following features:

- Construct a water intake structure on Bull Shoals Lake;
- Construct a water treatment facility to be located near Diamond City, AR;
- Install 115 miles of ductile iron transmission lines connecting the intake structure and treatment facility to OMRPWA member systems;
- Construct water storage tanks, which will supply water by gravity flow to each bulk customer; and,
- Construct booster pumping stations and install pressure reducing valves in order to serve the mountainous regions.



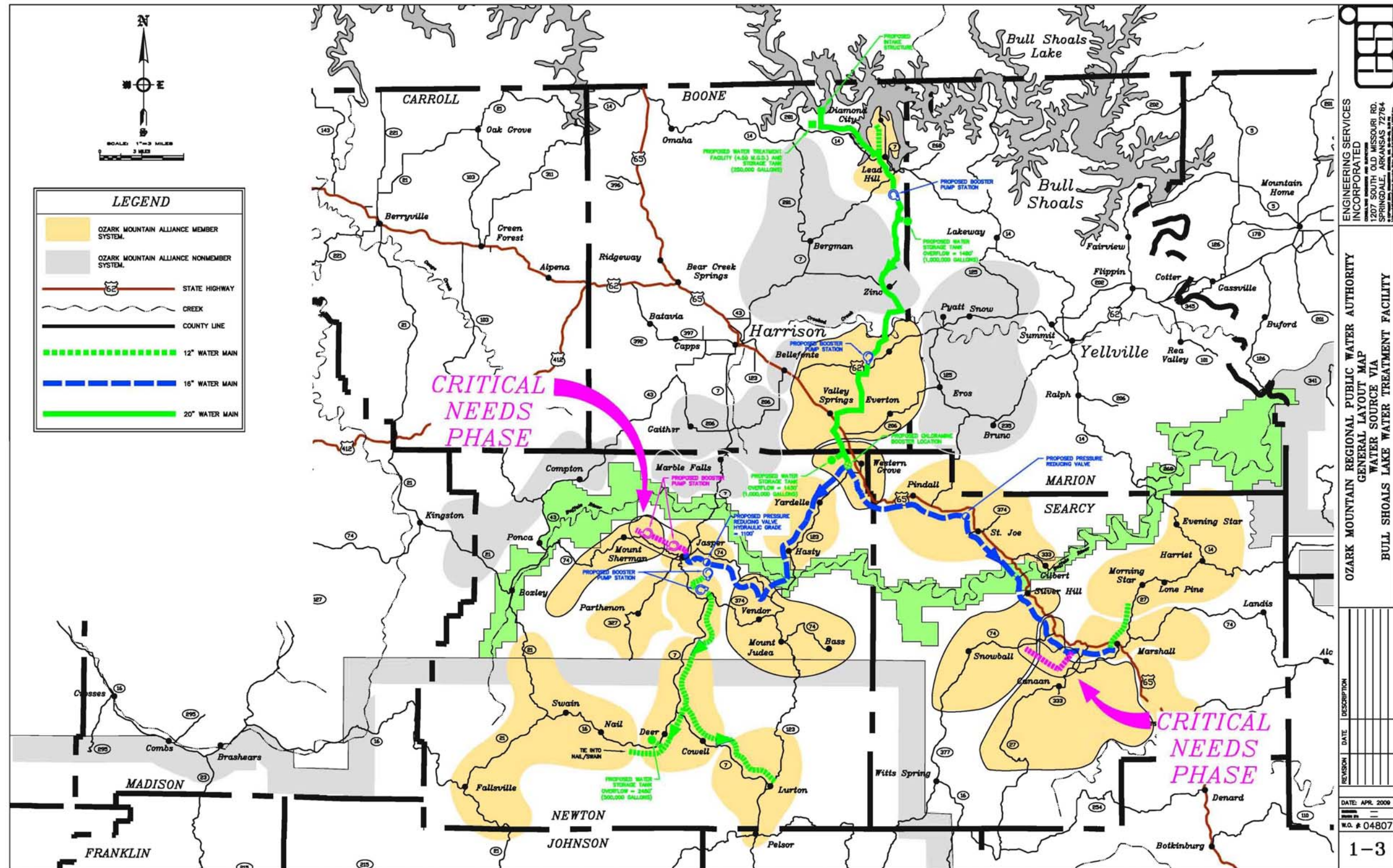


Figure 1.3 OMRPA - Schematic of Critical Needs Phase





An environmental assessment was prepared on this proposed project under NEPA guidelines and a Finding of No Significant Impact (FONSI) was signed on 24 August 2009 by the USDA Rural Utilities Service (RUS). A copy of that FONSI is provided in Attachment 5. Therefore, this EA does not address the construction of that new water transmission system, rather only the reallocation of water storage at Bull Shoals Lake. Because this proposed action is currently planned and evaluated, it is considered part of the baseline conditions for the conduct of this EA, and the EA for that proposed action (*Environmental Report for Ozark Mountain Regional Public Water Authority to serve North Central Arkansas*, January 2008 [Revised May 2009] and *Environmental Report, Amendment No. 1, for Ozark Mountain Regional Public Water Authority to serve North Central Arkansas*, August 2009) is hereby incorporated by reference into this EA (40 CFR 1502.21) (see Attachment 5 for a copy of the EA and FONSI). See Figure 1.4 for an illustration of the proposed new OMRPWA water intake and distribution system.

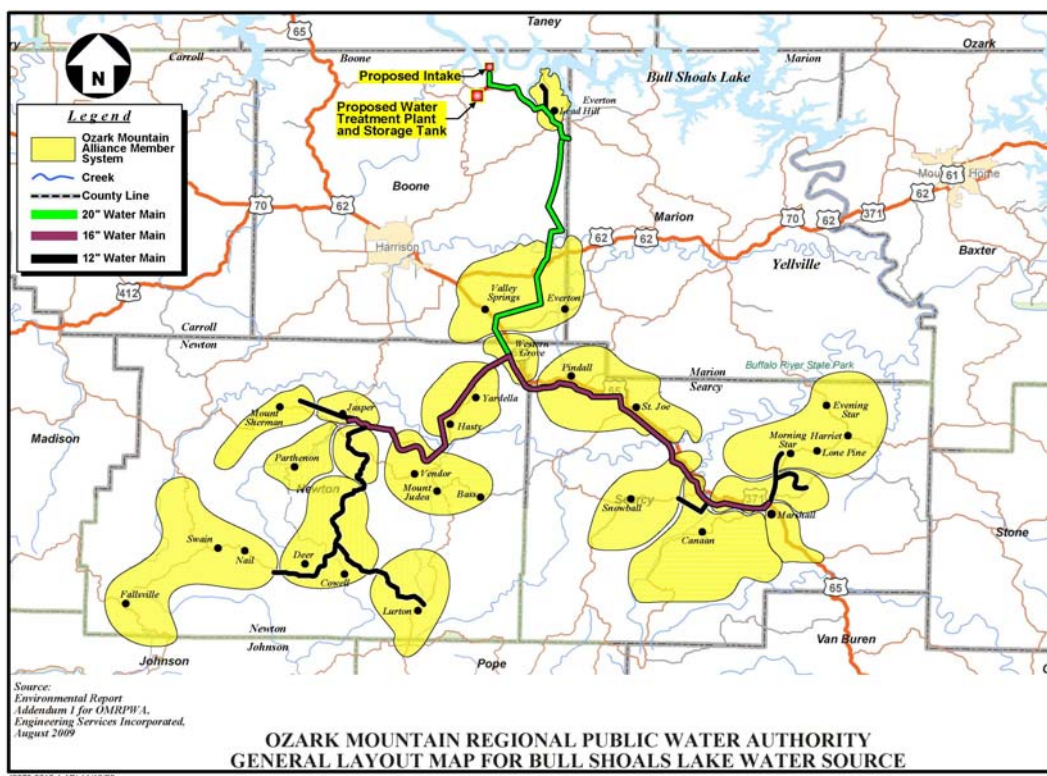


Figure 1.4 Proposed New OMRPWA Water Transmission System

As part of the system of the five multipurpose White River Basin lakes Bull Shoals Dam and Lake is managed primarily for flood control, hydro-power generation, and to a lesser extent recreation, fish and wildlife, and water supply. Additionally, reallocation of storage to provide tail water minimum flows will be implemented in the near future under the White River Minimum Flow Project. Because all of the storage space in the lakes is already allocated to existing purposes and no unused storage or surplus storage is available, there would need to be a reallocation of storage to fulfill the request of OPRPWA and MCRWD for an increase in water supply usage.

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This environmental assessment (EA) is being prepared under the guidelines of the National Environmental Policy Act (NEPA) of 1970 (42 USC 4321 *et seq.*, as amended, per regulations set forth by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508) (ER 200-2-2).

## **1.2 Background**

### White River System

The White River Lake System is made up of five multipurpose storage reservoirs (Beaver, Table Rock, Bull Shoals, Norfolk, and Greers Ferry Lakes) and also a small flood control reservoir (Clearwater) on the Black River. System operation includes six control points on the White River, four control points on the Black River and one control point on the Little Red River. The White River Basin has changed dramatically over the last 50 years and to accommodate the many changes, the regulating plan for the system has been updated many times as well. Also due to these changes, the data recorded at gage locations is not uniform. In order to represent a uniform condition in the basin for the purposes of frequency and duration analyses, the White River System model was developed using the USACE Southwestern Division Regulation Simulation Computer Model (SUPER) to simulate the operations of the many reservoirs in the basin and produce a modified period of record for each control point.

The White River Basin Water Management Plan (1998 update) provides a comprehensive system of water control regulation which encompasses the entire White River Basin, incorporates all the basin projects and their many purposes, and provides seasonal flood control and hydropower releases based on the agricultural practices of the lower basin and other land uses downstream of the projects. The plan also addresses the needs of the downstream trout fishery by providing a mechanism to maintain cool water temperatures based on monitored and forecasted ambient air temperatures. It also provides a deviation procedure to respond to unforeseen and emergency conditions which are not included in the plan or for which the plan is singularly inadequate.

In January 2009, the White River Minimum Flows (WRMF) Project Report was completed and a Record of Decision (ROD) was signed which would reallocate 233,000 acre-feet of flood control storage to the conservation pool for minimum flow releases. The target minimum flow of 800 cubic feet per second (cfs) release includes 160 cfs from normal leakage through the closed wicket gates, 590 cfs release through one of the main hydropower turbines, and 50 cfs existing release through the house hydropower Station Service Unit. With this change, the storage capacity is 2.127 million acre-feet of flood control storage, 1.236 million acre-feet in the conservation pool, and 2.045 million acre-feet of storage in the inactive pool, for a total storage of 5.408 million acre-feet.

The WRMF Project Report and the Record of Decision were approved by the Assistant Secretary of the Army (Civil Works) in January 2009. Alternative BS-3, the recommended plan specific to Bull Shoals Lake, was authorized by the 2006 Energy and Water Development Appropriations Act Section 132(a). Alternative BS-3 will reallocate five feet of flood control storage, totaling 233,000 ac-ft for a target minimum flow release of 800 cfs. The top of the conservation pool will be raised five feet from elevation 654 to 659 ft. In anticipation of this change, the storage capacity in the lake will be 2.127 million ac-ft of flood control storage, 1.236 million ac-ft of conservation storage, and 2.045 million ac-ft of inactive storage, for a total storage of 5.408

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million ac-ft. The project is currently at the end of the engineering and design phase and is expected to be implemented, so the base condition and without project condition assumes the WRMF reallocation is in place, however, reallocation of storage for WRMF will occur after the OMRPWA and MCRWD reallocation.

### Bull Shoals Lake

The Bull Shoals Reservoir was authorized for flood control and future hydroelectric power by the Flood Control Act of 1938 (P.L. 75-761) and was modified by the Flood Control Act of 1941 (P.L. 77-228) to include hydroelectric power and other beneficial uses (fish/wildlife and recreation). The Water Supply Act of 1958 (P.L. 85-500) authorized water supply uses for the lake, and the Chief of Engineers has discretion to reallocate up to 15-percent of total storage capacity or 50,000 acre-feet (whichever is less) if there is no significant impact to other authorized project purposes. Section 304 of the Water Resources Development Act (WRDA) of 1996 (P.L. 104-303) authorized recreation and fish and wildlife mitigation as purposes of the project. Minimum flows to be implemented at Bull Shoals Lake (Alternative BS-3) as a result of the WRMF Project were authorized in Section 132 of the 2006 Energy and Water Development Appropriations Act (P.L. 109-103). This legislation also repealed previous WRDA 1999 and 2000 authorities for minimum flows. In summary, Bull Shoals Lake has authorized purposes of flood control and hydroelectric power and authorized uses of recreation, fish and wildlife mitigation, and water supply.

Dam construction was started in 1947 and completed in 1951. The powerhouse and switchyard were completed in 1952. Bull Shoals Lake ‘construction’ was considered complete with the installation in December 1963 of the final two generating units for a total eight turbines at a cost of about \$86 million ([www.swl.usace.mil/parks/bullshoals/damandlake.html](http://www.swl.usace.mil/parks/bullshoals/damandlake.html)). Recreation began in 1948 with the stocking of rainbow trout in the tailwater. A small water supply reallocation was implemented in 1988 for the MCRWD.

Bull Shoals Dam and Lake are operated by the U. S. Army Corps of Engineers, Little Rock District. Bulls Shoals tail water provides important trout habitat within the White River Lake System of the Ozark Mountains in north central Arkansas. In January 2009, the WRMF Report and ROD were approved and signed, as a result 233,000 acre-feet of flood control storage is planned to be reallocated to the conservation pool to provide minimum flow releases to the lower White River. With this anticipated change, the storage capacity will be 2.127 million acre-feet of flood control storage, 1.236 million acre-feet in the conservation pool, and 2.045 million acre-feet of storage in the inactive pool, for a total storage of 5.408 million acre-feet.

Table 1.1 summarizes the current physical features of Bull Shoals Lake.

**Table 1.1 Bull Shoals Lake Physical Features (After Reallocation for White River Minimum Flows)**

<b>Feature</b>	<b>Elevation(1)</b>	<b>Area (acres)</b>	<b>Storage Volume (acre-feet)</b>	<b>Equivalent Runoff(2) (inches)</b>
Top of dam (3)	708			
Design pool	703	79,730	6,013,000	18.7
Top of flood control pool	695	71,240	5,408,000	16.8
Spillway crest (17 tainter gates 40' wide by 28' high)	667	52,510	3,682,500	11.4
Top of conservation pool (4)	659	48,005	3,281,000	10.2
Top of conservation pool (5)	654	45,440	3,048,000	9.5
Top of inactive pool	628.5	33,795	2,045,000	6.4
Probable maximum drawdown	588	20,260	964,400	3.0
Sluice invert (16 sluices 4' wide by 9' high)	477.06	829	8,380	-
Streambed	450	0	0	
Flood control storage	695-659		2,127,000	
Conservation storage	659-628.5		1,236,000	
Inactive storage (hydropower, fish, recreation, sediment)	628.5-450		2,045,000	
(1) Feet, NGVD29				
(2) 6036 square miles of drainage area upstream of dam				
(3) Top of dam has a 3-foot concrete parapet				
(4) White River Minimum Flow Reallocation (Alt. BS-3)				
(5) Current operation				

The base condition is with the WRMF authorized reallocation from the flood pool which will raise the elevation from 654.00 ft to elevation 659.0 ft. This reduces the flood pool storage by 233,000 ac-ft. Thus the flood pool will have 2,127,000 ac-ft of storage for flood reduction purposes between elevation 659.00 ft and 695.00 ft. The conservation pool was increased by the 233,000 ac-ft for a total of 1,236,000 ac-ft between elevation 628.50 ft and 659.00 ft to provide storage for WRMF, water supply and hydroelectric power. The inactive pool has storage of 2,045,000 ac-ft between elevation 628.50 ft and 450.00 ft. The elevation of the lowest invert (sluice) is 477.06 ft, leaving a "dead" storage of about 8,380 ac-ft. The inactive pool provides storage for additional head for hydroelectric power, recreation and fish habitat, and sediment. Also, this storage is available for emergency uses during drought conditions that include hydroelectric power operations and M&I water supply. The maximum probable drawdown is elevation 588.00 ft which has been estimated as the lowest elevation that the turbines could operate in a safe mode. The storage remaining below 588.00 ft is 964,400 ac-ft.

Current project outputs for Bull Shoals Lake through Fiscal Year (FY) 2008 include:

- \$190 million estimated for cumulative flood damages prevented;
- 3 million visitors annually for recreational use of the lake and land resources;
- 753,700 megawatt hours for annual hydropower generation; and
- 0.85 MGD average daily demand for water supply by MCRWA.

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There is currently one Municipal and Industrial (M&I) water supply reallocation from Bull Shoals Lake. It is for MCRWD for 880 acre-feet, intended to yield 1 MGD. As part of this study, the volume required to yield 1 MGD will be updated based on the current reallocation request as well as the reallocation for the WRMF Project, previously summarized in this section.

### Overall Water System Project verses Corps Action

In the fall of 2009, the United States Department of Agriculture (USDA) secured \$56M in America Reinvestment and Recovery Act (ARRA) funds to construct a water intake structure and treatment system adjacent to Bull Shoals Lake. The ARRA funds must be obligated by September 2010; therefore, OMRPWA must first have a signed water storage agreement executed with the Corps for storage of the water by August 2010. OMRPWA's letter dated February 1, 2007, originally requested 12 MGD; however, since the ESI report showed that 6 MGD would be sufficient, OMRPWA resubmitted a letter on October 8, 2009, requesting the Corps reallocate storage sufficient to supply 6 MGD.

The Corps reallocation action is to determine if there is a Federal interest, and if so, from which pool of Bull Shoals Lake to reallocate storage to provide a total yield of 7 MGD. This reallocation request is a precursor to the larger overall Ozark Mountain water system project. In addition to the water supply agreement with the Corps, OMRPWA is constructing a water treatment plant, intake structure, and distribution lines funded with USDA's Rural Development funds. With the addition of one filter and one pump, the capacity of this water treatment facility is 6 MGD and it has a storage tank of 1,000,000 gallons. The water treatment facility will be located adjacent to the south side of Bull Shoals Lake near Diamond City, Arkansas. The environmental impacts of that project, including the intake, pumping, and treatment facilities, as well as the pipeline distribution system, have been previously addressed in a separate EA and FONSI, previously cited in Section 1.1, and are therefore not addressed in this EA. This EA addresses the reallocation of water supply storage in Bull Shoals Lake only.

Figure 1.5 is a schematic of the dam, with lake and pool elevations and current allocation volumes.

### **1.3 Project Location**

Bull Shoals Lake is a reservoir created by Bull Shoals Dam on the White River, which is located approximately seven miles northwest of Mountain Home, Arkansas. The lake extends from North Central Arkansas in Marion, Boone, and Baxter counties into South Central Missouri in Taney and Ozark counties, as shown in Figure 1.6. A more detailed description of the project location and area can be found in Section 4.0 Affected Environment of this EA.

# Bull Shoals Lake

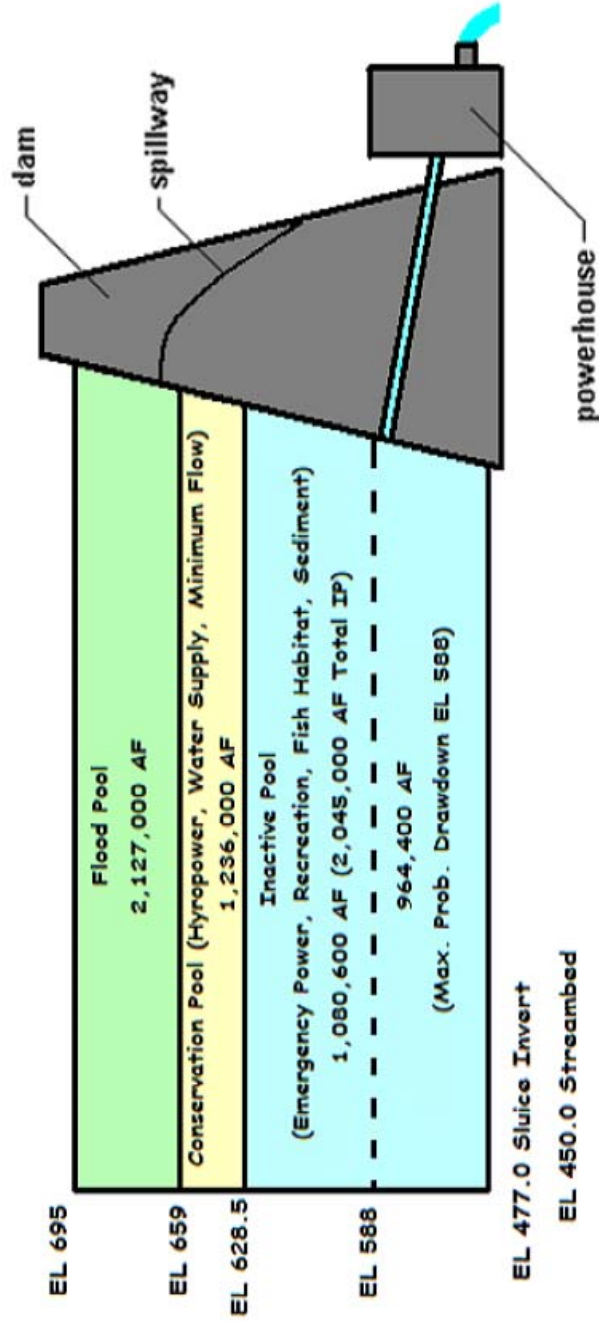


Figure 1.5 Bull Shoals Lake Pool Elevations and Volumes



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## **1.4 Project Authority**

### **1.4.1 Water Supply Act of 1958, as Amended**

General authority for the Corps to reallocate existing storage space at Corps reservoirs to M&I water supply is contained in the Water Supply Act of 1958 (Title III of Public Law 85-500), as amended, 33 U.S.C. 390b. Reallocation of storage that would seriously affect other project purposes, or that involve major structural or operational changes to the project, require Congressional authorization. Reallocations not seriously affecting other project purposes, and that do not involve major structural or operational changes, may be approved by the Secretary or the Army. The Chief of Engineers has delegated authority to approve reallocations consisting of the lesser of: a) 15 percent of total storage capacity allocated to all authorized project purposes; or b) 50,000 acre-feet. Nevertheless, even such a reallocation may require Secretarial approval due to other aspects of the proposal, including reduced pricing for non-Federal cost of storage payments for low income communities under Section 322 of the Water Resources Development Act of 1990. The non-Federal interest requesting a reallocation must agree to pay 100 percent of the first costs (investment costs) of the reallocation. Such payment may be amortized over a period of up to thirty years, with interest as specified in the Water Supply Act, as amended.





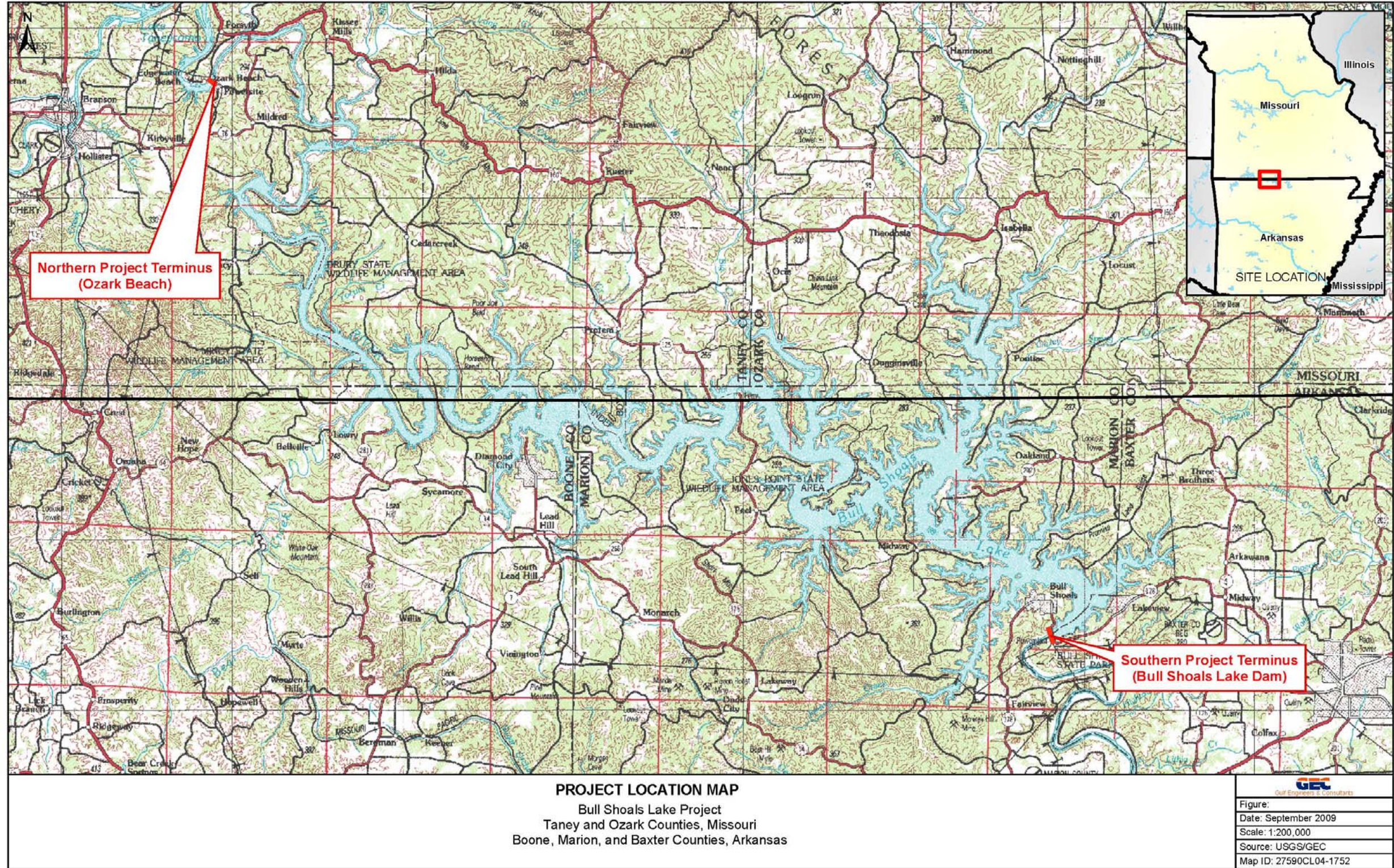


Figure 1.6 Project Location Map





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## 1.4.2 Public Law 88-140, Recognizing Permanent Rights to Storage

The non-Federal interest may acquire a permanent right to the use of storage under the authority of Public Law 88-140 (October 16, 1963), 43 U.S.C. 390c.-f. Such right is obtained by the non-Federal interest upon completion of payment of the first costs (investment costs) of the reallocation, and may be utilized as long as the project is operated by the Government. The non-Federal interest remains responsible for its proportionate share of annual operation and maintenance costs, and of reconstruction, rehabilitation, and replacement costs for project features, allocated to its water supply storage. Such storage also remains subject to equitable reallocation among project purposes due to sedimentation.

## 1.4.3 Section 322 of the Water Resources Development Act (WRDA) of 1990

Provision of reduced pricing of storage space for low income communities is contained in Section 322 of WRDA 1990 (33 U.S.C. 2324). Section 322 defines the term “low income community” as a community with a population of less 20,000 which is located in a county with per capita income less than the per capita income of two-thirds of the counties in the United States. If a low income community requests water supply storage space in a Corps project and such space is available or may be made available through reallocation, the Secretary may provide such space to the community up to an amount sufficient to yield 2,000,000 gallons per day at the following price.

The price shall be the greater of:

- 1) the updated construction cost of the project allocated to provide such amount of water supply storage space or \$100 per acre-foot of storage space, whichever is less, or
- 2) the value of the benefits which are lost as a result of providing such water supply storage space.

## 1.4.4 Previous Water Storage Projects

### Marion County Regional Water District Water Supply Agreement

MCRWD was reallocated storage for 880 ac-ft, intended to yield 1 MGD. As part of this study, the volume required to yield 1 MGD will be updated based on the current reallocation request and the reallocation for the WRMF Project, which reallocated storage from the flood control pool. When reallocation of storage from the flood control pool would impact existing water supply users and hydropower users, Dependable Yield Mitigation Storage (DYMS) to compensate the existing water supply users must be considered in the analysis (ER-1105-2-100).

Dependable (Firm) yield is based on the available inflow, the available storage, and the critical low flow period at a specific location in the watershed, i.e., Bull Shoals Lake. Increasing the conservation storage increases yield but reduces the dependable yield of the users because the dependable yield per unit of storage is reduced. This occurs because inflow into the lake remains the same. Since more users are sharing the same inflow, the yield per unit of storage decreases even though the total yield of the project increases. Therefore to compensate the existing water supply users the new user would contract for their needed storage plus the additional storage to maintain the existing users’ dependable yield. This additional storage required to keep existing users whole is termed DYMS.

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The Base condition (No Action), Alternative 1, has the existing user, MCRWD, being made whole because of WRMF. Although OMRPWA/MCRWD will contract for storage prior to WRMF, they will not make the existing Marion County yield whole, but only provide DYMS under the assumption that Marion County is already whole at 1 MGD. This means that if for some reason WRMF is not implemented then the existing Marion County supply will not have the dependable yield of 1 MGD but will maintain the yield that they currently have for their 880 ac-ft of storage. Also the new users (OMRPWA/MCRWD) will have contracted storage that will provide more dependable yield than requested. The reallocation analysis for OMRPWA/MCRWD is for Ozark Mountain to provide DYMS for existing Marion County supply, then Marion County to provide DYMS for Ozark Mountain and existing Marion County supply. Under this “NO” WRMF scenario the existing Marion County supply would have to obtain additional storage in order to have a dependable yield of 2 MGD, because their current storage does not provide 1 MGD yield.

### White River Minimum Flows Project

Section 132(a) of the FY2006 Energy and Water Development Appropriations Act (EWDA, Public Law 109-103) authorized implementation of plans BS-3 at Bull Shoals and NF-7 at Norfolk Lakes in the White River basin to provide minimum flow releases to enhancements that provide national benefit and shall be a Federal expense in accordance with section 906 (e) of 1986, of WRDA as described in the WRMF Report, Arkansas and Missouri dated July 2004. Also, Section 132 repealed Section 374 of the WRDA 1999 and Section 304 of WRDA 2000, rescinding authorization to reallocate storage at Table Rock Lake, Greers Ferry Lake, and Beaver Lake for minimum flows. The repeal does not eliminate further consideration of alternative plans. WRMF is at the end of the engineering and design phase and has been fully funded by Construction General and ARRA funds.

## **1.5 Project Scoping**

The Little Rock District, USACE conducted two workshops in the project area near Mountain Home, Arkansas. The first workshop was held on June 30, 2009 at the Bull Shoals Lake Visitor Center and the second was held in Diamond City, AR, on July 1, 2009. Approximately 100 people attended and there were no negative comments on the study. This positive response at the public meetings indicated that public controversy is not a factor in determining the significance of the effects of the proposed action. Therefore, after assessing that the proposed action will not be controversial, along with the other factors for determining significance, the decision was made to proceed with an Environmental Assessment in lieu of an Environmental Impact Statement. Copies of public workshop press releases can be found in Attachment 1, Public Scoping Materials.

## **1.6 Public Review/Comments**

The draft environmental assessment (Draft EA) and reallocation report for this action were released concurrently for public review and comment on May 11, 2010. The comment period ran for 30 days from May 11, 2010, to June 11, 2010. All information pertaining to the public comment period, copies of comments received, summary of major issues identified in comments, and Little Rock District’s summary conclusions regarding relevant issues are contained in Attachment 3.

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# **Section 2.0**

# **Description of**

# **Proposed Action**

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## 2.0 DESCRIPTION OF PROPOSED ACTION

The preferred alternative for the Proposed Action is reallocation from the Conservation Pool (Alternative 2). This alternative would reallocate an additional 11,886.541 acre-feet of storage from the conservation pool for water supply. The total water supply storage would be 13,584.617 acre-feet including the current allocation. The top of pool elevation, with White River Minimum Flows implemented, would be at elevation 659.0 feet. Alternative 2 is further described in Section 3.0 of this EA and Section 7.1 of the Reallocation Report.

The main dam has a maximum height above the river bed of 258 feet and extends approximately 2,256 feet in length. The Bull Shoals Dam supports 17 spillway crest gates and is the fifth largest concrete dam in the United States. Bull Shoals Lake encompasses 45,440 surface acres and a shoreline of 740 miles at the top of the design conservation pool (654 feet). The lake's upstream drainage basin is 6,036 square miles. The existing project storage allocations will change with implementation of WRMF.

The WRMF Project Report and the Record of Decision were approved by the Assistant Secretary of the Army (Civil Works) in January 2009. Alternative BS-3, the recommended plan specific to Bull Shoals Lake, was authorized by the 2006 Energy and Water Development Appropriations Act Section 132(a). Alternative BS-3 will reallocate five feet of flood control storage, totaling 233,000 ac-ft for a target minimum flow release of 800 cfs. The top of the conservation pool will be raised five feet from elevation 654 to 659 ft. In anticipation of this change, the storage capacity in the lake will be 2.127 million ac-ft of flood control storage, 1.236 million ac-ft of conservation storage, and 2.045 million ac-ft of inactive storage, for a total storage of 5.408 million ac-ft. The project is currently in engineering and design phase and is expected to be implemented, so the base condition and without project condition assumes the WRMF reallocation is in place, however, reallocation of storage for WRMF will occur after the OMRPWA and MCRWD reallocation.

The proposed action also includes the construction and implementation of the new OMRPWA water transmission system including a new water intake facility at Bull Shoals Lake, and water treatment/pumping plant nearby on existing USACE property, as well as a pipeline transportation/distribution system to deliver the increased water supply to customers. This action has been previously evaluated under NEPA guidelines for environmental impacts and was determined to result in no significant impact to the natural or human environments. The EA and FONSI for that action are hereby incorporated into this EA by reference and the NEPA documents are included in Attachment 5 to this EA.

Table 2.1 summarizes the physical features of Bull Shoals Lake with the proposed alternative BS-3 implemented. Figure 3 is a schematic of Bull Shoals dam and lake with pool elevations and volumes.

The base condition is with the WRMF authorized reallocation from the flood pool which will raise the elevation from 654.00 ft to elevation 659.0 ft. This reduces the flood pool storage by 233,000 ac-ft. Thus the flood pool will have 2,127,000 ac-ft of storage for flood reduction purposes between elevation 659.00 ft and 695.00 ft. The conservation pool was increased by the 233,000 ac-ft for a total of 1,236,000 ac-ft between elevation 628.50 ft and 659.00 ft to provide storage for WRMF, water supply and hydroelectric power. The inactive pool has storage of 2,045,000 ac-ft between elevation 628.50 ft and 450.00 ft. The elevation of the lowest invert (sluice) is 477.06 ft, leaving a "dead" storage of about 8,380 ac-ft. The inactive pool provides

storage for additional head for hydroelectric power, recreation and fish habitat, and sediment. Also, this storage is available for emergency uses during drought conditions that include hydroelectric power operations and M&I water supply. The maximum probable drawdown is elevation 588.00 ft which has been estimated as the lowest elevation that the turbines could operate in a safe mode. The storage remaining below 588.00 ft is 964,400 ac-ft.

**Table 2.1 Bull Shoals Lake Physical Features (After Reallocation for White River Minimum Flows)**

<b>Feature</b>	<b>Elevation(1)</b>	<b>Area (acres)</b>	<b>Storage Volume (ac-ft)</b>	<b>Equivalent Runoff (2) (inches)</b>
Top of dam (3)	708			
Design pool	703	79,730	6,013,000	18.7
Top of flood control pool	695	71,240	5,408,000	16.8
Spillway crest (17 tainter gates 40' wide by 28' high)	667	52,510	3,682,500	11.4
Top of conservation pool (4)	659	48,005	3,281,000	10.2
Top of conservation pool (5)	654	45,440	3,048,000	9.5
Top of inactive pool	628.5	33,795	2,045,000	6.4
Probable maximum drawdown	588	20,260	964,400	3.0
Sluice invert (16 sluices 4' wide by 9' high)	477.06	829	8,380	-
Streambed	450	0	0	
Usable storage				
Flood control storage	695-659		2,127,000	
Conservation storage	659-628.5		1,236,000	
Inactive storage	628.5-450		2,045,000	
(1) Feet, mean sea level (msl)				
(2) 6036 square miles of drainage area upstream of dam				
(3) Top of dam has a 3-foot concrete parapet				
(4) White River Minimum Flow Reallocation (Alt. BS-3)				
(5) Current operation				

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# **Section 3.0 Alternatives**

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## 3.0 ALTERNATIVES

### 3.1 Plan Formulation

During plan formulation the goal is to identify and perform an initial evaluation of preliminary measures and alternatives for water supply. Consideration of all reasonable alternatives is required under the Economic and Environmental Principles for Water and Related Land Resources Implementation Studies. The National Environmental Policy Act (NEPA) requires Federal agencies to incorporate environmental considerations in their planning and decision-making process. The Planning Guidance Notebook, Engineering Regulation (ER 1105-2-100), Appendix E and Appendix H, of the Water Resources Report, requires the formulation and evaluation of a full range of reasonable alternative plans.

Alternatives are formulated to take into account the overall problems, needs, and opportunities afforded by the proposed action. Those alternatives are assessed consistent with the national objective of contributing to National Economic Development (NED) and protecting the Nation's Environment, and consistent with Federal laws and regulations. The NED objective for water supply is to provide the most cost-effective water supply source to meet the region's future Municipal and Industrial requirements. The identification of measures and the evaluation of measures and alternatives were guided by the Corps Environmental Operating Principles (EOP) and compliance with the Campaign Plan. An assessment of how those Administration goals were applied and further details on the plan formulation and alternative selection process are presented in the Water Supply Storage Reallocation Report (sections 6.0 and 3.0, respectively).

Urgency and Need for Water - Current water sources include shallow wells, deep wells, or springs. The majority of the member water systems struggle to meet customer demands from their existing sources. In addition, the ADH has stated the well water has excessive and dangerous levels of radium, fluoride, and hydrogen sulfide, and they have declared the need for an alternative water supply for these communities as their top priority. The Environmental Protection Agency has certified that many of these water sources are not safe for human consumption.

In October 2009, it was announced OMRPWA will receive \$56 million in grant and loan funding from the USDA through the ARRA Act of 2009. These funds will be used for constructing an intake structure and treatment plant adjacent to Bull Shoals Lake, 115 miles of transmission lines, and booster pumping stations to transport the water across the rugged terrain in the Ozarks. However, these funds must be obligated by September 2010; therefore, OMRPWA must first have a water supply storage agreement executed with USACE by August 2010.

Short Term Interim Action (Critical Needs Phase) versus Long Term Solution – The short term interim action, the Critical Needs Phase, already funded by USDA, Rural Utilities Service, will provide safe water to some Ozark Mountain customers until the long-term new overall water system is constructed. The Critical Needs Phase includes a pipeline between the city of Marshall and the water systems under Administrative Orders from the Arkansas Department of Health to not consume water (these are Mt. Sherman Water Association, South Mountain Water Association, Snowball, Dongola & Marsena Water Association, and Morning Star Water Association). This pipeline will allow clean water from Marshall to be blended with contaminated water to reduce the overall contaminant levels. While the blended water is a short-term solution, Marshall can not sustain the flow to these water systems during dry periods.

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These pipelines are being put into place now and their costs are included in the without project conditions. The without project condition would be the Critical Needs facility in place for a few of the OMRPWA customers and no new water system and continued health and safety risks associated with contaminated water for the majority of customers for OMRPWA. If the reallocation does not take place, a safe water supply system will still be needed. As discussed in Section 6, the next most likely alternative is reallocation of storage in Norfolk Lake and the construction of the associated intake, water treatment plant, pipelines, pumping stations and storage reservoirs.

This water supply reallocation report is an element of a larger overall Ozark Mountain water system project. The water supply agreement between USACE and OMRPWA will be combined with the construction of a water treatment plant, intake structure, and distribution lines adjacent to Bull Shoals Lake and funded with USDA's Rural Development funds to complete the overall water system project. Therefore, the EA and FONSI for the implementation and construction of the new water transmission system are incorporated into this EA by reference and included in Attachment 5 of this EA.

Overall Water System Project versus Corps Action - In the fall of 2009, the United States Department of Agriculture (USDA) secured \$56M in America Reinvestment and Recovery Act (ARRA) funds to construct a water intake structure and treatment system adjacent to Bull Shoals Lake. The ARRA funds must be obligated by September 2010; therefore, OMRPWA must first have a signed water storage agreement executed with the Corps for storage of the water by August 2010. OMRPWA's letter dated February 1, 2007, originally requested 12 MGD; however, since the ESI report showed that 6 MGD would be sufficient, OMRPWA resubmitted a letter on October 8, 2009, requesting the Corps reallocate storage sufficient to supply 6 MGD.

The Corps reallocation action is to determine if there is Federal interest, and if so, from which pool of Bull Shoals Lake to reallocate storage to provide a total yield of 7 MGD. This reallocation request is a precursor to the larger overall Ozark Mountain water system project. In addition to the water supply agreement with the Corps, OMRPWA is constructing a water treatment plant, intake structure, and distribution lines funded with USDA's Rural Development funds. With the addition of one filter and one pump, the capacity of this water treatment facility is 6 MGD and it has a storage tank of 1,000,000 gallons. The water treatment facility will be located adjacent to the south side of Bull Shoals Lake near Diamond City, Arkansas.

It must be emphasized here again that this EA does not address the construction of a new water transmission system, which has been previously addressed under a separate NEPA document, only the reallocation of water storage at Bull Shoals Lake for OMRPWA and MCRWD.

### **3.2 OMRPWA Preliminary Alternatives Eliminated From Further Consideration**

In the Preliminary Engineering Report prepared by Engineering Services, Inc., revised May 2009, the preliminary screening of alternatives for a long term source of water supply for this region includes the following; groundwater wells, treating groundwater, existing surface reservoirs, construction of new surface water reservoirs, purchasing treated water from one or more wholesale water providers, and consideration of conservation methods as a nonstructural measure. The report recommended the construction of a new water intake, treatment, and distribution system at Bull Shoals Lake, which has been previously evaluated and assessed under NEPA guidelines and determined to have no significant environmental impacts.

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### **3.2.1 Ground Water Wells**

As a result of large scale groundwater withdrawals primarily for rice farming, groundwater levels in the state are declining. Declining aquifer water levels create a multitude of problems. Because of the excessive withdrawals of groundwater, the dependable yield has been approached or exceeded in the alluvial and Sparta aquifers. The Arkansas Natural Resources Commission has declared these aquifers at “critical groundwater levels” due to the dependable yield concerns relating to poor water quality and to saline intrusions consistent with declining groundwater levels.

The members of OMRPWA currently depend on wells with poor water quality drilled 20 to 50 years ago to access a groundwater supply. Deep wells in this region have naturally occurring excess amounts of radium 226, radium 228, fluoride, uranium, radon, and hydrogen sulfide. For the past three years, this area has remained the ADH’s top priority due to the serious health risks associated with these contaminants in the drinking water (ADH, 2009). Similar conditions occur in southern Missouri, where radionuclides are present in both shallow and deep aquifers.

Due to these issues with both limited quantity poor quality, utilizing groundwater sources were not considered any further.

### **3.2.2 Treating Groundwater**

In 2003, the South Mountain Water Association and the Snowball, Dongola & Marsena Water Association retained Engineering Services, Inc. to evaluate solutions to the high levels of radium and fluoride found in the existing water supply. Several treatment options were considered. Treatment for radium would create residuals that would be classified as a hazardous waste which cannot be disposed in Arkansas landfills. Handling the concentrated residuals would be expensive, dangerous, and pose a significant environmental threat to the Buffalo National River Watershed. Due to these issues, groundwater treatment facilities were not considered any further.

### **3.2.3 Existing Surface Reservoirs**

Beaver Lake is the first impoundment on the White River watershed. Reallocation from Beaver Lake not only impacts the flood damages prevented and hydropower generation at Beaver Lake, but also Table Rock Lake and Bull Shoals Lake. Given the greater distance to Beaver Lake than to Bull Shoals, and the greater impacts to other authorized purposes, reallocating from Beaver Lake was not considered any further.

Table Rock Lake is the next impoundment downstream from Beaver Lake. Reallocation from Table Rock Lake would impact flood damages prevented and hydropower generation at Bull Shoals Lake. Given the slightly greater distance to Table Rock Lake than to Bull Shoals, and the greater impact to the other authorized purposes, reallocating from Table Rock Lake was not considered any further.

Greers Ferry Lake is another impoundment in the White River watershed. The distance from the OMRPWA area to Greers Ferry Lake is somewhat comparable to the distance from Bull Shoals; however, Greers Ferry has design complications. Water from Bull Shoals would be gravity fed to an area with existing water infrastructure, while water from Greers Ferry Lake would have to be pumped uphill through new infrastructure. Water quality from Greers Ferry Lake is good.

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Cost estimates to construct a new water treatment plant at Greers Ferry and pump the water to OMRPWA and MCRWD customers were estimated at \$7,299,281 of which \$60,000 is the water cost. Due to the high cost of taking the reallocation from Greers Ferry Lake, this alternative was not considered any further.

Norfolk Lake has ample capacity for water supply and is the next most likely alternative to reallocating storage at Bull Shoals Lake; however, the location of the lake with respect to the OMRPWA members is a long distance and the rugged terrain between Norfolk Lake and the OMRPWA members makes this water source very expensive. Only one other utility utilizes Norfolk Lake as a water source. The city of Mountain Home has been allocated approximately 10,000 acre-feet from Norfolk Lake for municipal water supply. Water quality from Norfolk Lake is good. Cost estimates to construct a new water treatment plant at Norfolk Lake and pump the water to OMRPWA and MCRWD customers were estimated at \$5,758,341 of which \$166,600 is the water cost. Due to the high cost of taking the reallocation from Norfolk Lake, this alternative was not considered any further.

Bull Shoals Lake's water quality is excellent resulting in minimal chemical additions being required to achieve full scale water treatment. Only one water provider utilizes Bull Shoals Lake as a municipal water source. Currently, 880 acre-feet of storage is reallocated from the flood control pool to the conservation pool so that MCRWD can obtain 1 MGD. Bull Shoals Lake's overall storage capacity is approximately 5,408,000 acre-feet. Therefore, due to the high quality of water and the large overall storage capacity of Bull Shoals Lake, this lake was carried forward in the final reallocation alternatives to be evaluated in detail.

### **3.2.4 Development of New Surface Reservoirs**

Searcy County worked from 1989 until 2003 to develop a long-term surface water supply for the residents of Searcy County. The Searcy County Regional Water District was formed in order to develop a regional water supply and provide treated water to the residents of Searcy County. They retained a consulting engineer, prepared a preliminary engineering report, made application for state and federal funding, and began work on the environmental phase of the project. Since the selected water shed was on a tributary of the Buffalo National River, extensive environmental studies were required to determine the long-term effect of the watershed on the Buffalo National River. On March 1, 1972, the United States Congress established the Buffalo National River as America's first national river. After 10 years of environmental review, legal challenges, permitting challenges, debate and discussion, the National Park Service and the Corps of Engineers stopped progress on the project. Meanwhile, families within the Buffalo River drainage basin continue to drink water contaminated with radium, fluoride, uranium, and radon. Since 2004, Searcy County has fully backed the efforts of the OMRPWA in developing a water source to serve the region.

In summary, development of a reservoir large enough to supply the region is severely hindered by the proximity of the Buffalo National Park. Therefore, this alternative was not evaluated any further.

### **3.2.5 Purchase Water from Wholesale Providers**

Several wholesale water providers to deliver water to OMRPWA were evaluated: purchase water from Carroll-Boone Regional Water District, purchase water from the city of Clarksville, purchase water from the city of Russellville, and purchase water from MCRWD. Given that



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Carroll-Boone Regional Water District is currently requesting reallocation of storage from Beaver Lake, Carroll-Boone Regional Water District does not have surplus water to sell, and was not evaluated any further. Given that MCRWD is currently requesting reallocation of storage within this report, MCRWD does not have surplus water to sell and was not evaluated any further.

The remaining wholesale water providers are the city of Clarksville and the city of Russellville. According to discussions with the city of Russellville, the city does not have surplus water to sell. According to the Clarksville Light & Water Plant Engineer, the current capacity of the water treatment plant is 15 million gallons per day, and the plant has the ability to sell 7 to 8 million gallons per day. Costs for this alternative are estimated at \$8.7M of which \$4.4M is the water cost.

Of the wholesale water alternatives, the purchase of water from Clarksville is the only viable alternative.

### **3.2.6 Non-Structural Solutions (Conservation)**

The non-structural alternative is to conserve water to reduce the need for additional sources of water supply. Water conservation can include altering the demand for water by water rationing and pricing methods. Several communities are at 50 percent of the state's average per capita usage rate, and have below average system leakage (2 percent compared to an average of 10 percent to 12 percent). While water conservation could improve over time with gradual replacement of older plumbing fixtures, the quantity of water gained through conservation is judged to be insignificant.

Due to the insufficient quantity available under this alternative, it was eliminated from further consideration.

## **3.3 MCRWD Preliminary Alternatives Eliminated From Further Consideration**

### **3.3.1 Structural Solutions**

An Environment Assessment for MCRWD, prepared by Engineering Services, Inc., dated May 1982 (ESI, 1982), evaluated the following alternatives for MCRWD: Bull Shoals Lake, Mountain Home Water System, and Harrison Water System.

The source of water for the Mountain Home Water System is Norfolk Lake. This alternative involves purchasing treated water and construction of transmission lines, water storage tanks, and a booster pumping station to convey the water to the MCRWD service area. An economic analysis found that connection to the Mountain Home Water System would cost more to construct and operate than the proposed system at Bull Shoals Lake (ESI, 1982).

The Harrison Water System alternative includes purchasing treated water from the City of Harrison and constructing transmission lines, a 1,000,000 gallon storage tank and a booster pumping station to convey water to the MCRWD service area. An economic analysis found that this option was not as cost-effective as developing a supply from Bull Shoals Lake (ESI, 1982).

Because the two viable alternatives for water supply were not cost effective compared to developing a supply from Bull Shoals Lake, MCRWD signed a water supply agreement on April 1988 to withdraw 880 ac-ft of storage from the conservation pool of Bull Shoals Lake.

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Currently, MCRWD has a water treatment facility at the town of Bull Shoals, Arkansas, with a maximum capacity of 4 MGD.

Given that Mountain Home Water System is currently requesting reallocation of storage from Norfolk Lake, Mountain Home Water System does not have sufficient water to sell, and it was not evaluated any further. Without another contract with USACE for additional storage in Bull Shoals Lake, MCRWD would likely try to request reallocated storage from Norfolk Lake.

### 3.3.2 Non-Structural Solutions

The non-structural alternative is to conserve water to reduce the need for additional sources of water supply. Water conservation can include altering the demand for water by water rationing and pricing methods. MCRWD users have a per capita daily usage rate at half the state's average usage, and they have below average system leakage (a range of 5 percent to 9 percent compared to a national average of 10 percent to 12 percent). While water conservation could improve over time with gradual replacement of older plumbing fixtures, the quantity of water gained through conservation is judged to be insignificant. Therefore, this alternative was not evaluated any further.

### 3.4 Final Alternatives Considered for Both OMRPWA and MCRWD

After review of the economic analysis for all alternatives, production of the treated water has a tremendous long-term advantage over purchasing treated water from an existing bulk wholesaler. Therefore, in order for the OMRPWA and MCRWD to keep long-term rates to a minimum, it is more economical to construct a water treatment facility and produce drinking water for its members. Based on the above analysis, purchasing water supply storage from Bull Shoals Lake and constructing a OMRPWA water treatment plant on Bull Shoals Lake is viable and the most cost effective alternative. MCRWD will utilize existing infrastructure to distribute its share of the increased water supply to its members.

The new OMRPWA water transmission system includes a new water intake facility at Bull Shoals Lake, and water treatment/pumping plant nearby on existing USACE property, as well as a pipeline transportation/distribution system to deliver the increased water supply to customers. This action has been previously evaluated under NEPA guidelines for environmental impacts and was determined to result in no significant impact to the natural or human environments. The EA and FONSI for that action are hereby incorporated into this EA by reference and the NEPA documents are included in Attachment 5 to this EA.

To evaluate reallocating 6 MGD for OMRPWA and 1 MGD for MCRWA on Bull Shoals Lake, alternatives were analyzed using the SUPER program for conservation, flood control, and inactive storage reallocation.

Brief descriptions of the alternatives that were evaluated using SUPER economic output data for Bull Shoals Lake are as follows:

**Alternative 1 - No Action.** The existing condition represents the current 1698.077 ac-ft of water supply storage within the conservation pool. The top of pool elevation is 659.00 feet. The seasonal pool plan is also part of this condition that raises the top of conservation pool to elevation 662.0 feet from 15 May to 15 June and then to 661 feet from 15 July to 30 September. This alternative includes the reallocation of water supply implemented under the WRMF Project.

**Alternative 2** - Reallocation from the conservation pool (The Proposed Action). This alternative would reallocate an additional 11,886.541 acre-feet of storage from the conservation pool for water supply. The total water supply storage would be 13,584.617 ac-ft. The top of pool elevation would be 659.0 feet, with seasonal pool raises.

**Alternative 3** - Reallocation from the flood control pool. This alternative would reallocate 11,948.151 ac-ft from flood control pool for water supply. The top of conservation pool would be raised to elevation 659.25 with seasonal pool raises. The total water supply storage would be 13,646.229 ac-ft, including the existing allocation. Dependable yield mitigation storage is included (13.221 ac-ft) to keep existing water supply users' yield whole to compensate for the reduction in the dependable yield which occurs when the conservation pool is expanded.

**Alternative 4** - Reallocation from the inactive pool. This alternative would reallocate 11,943.284 ac-ft from the inactive pool for water supply. The top of conservation pool would remain at 659.0 feet with seasonal pool raises and the bottom of conservation pool would be lowered to 628.14 feet. The total water supply storage would be 13,461.361 acre-feet, including the existing allocation. Dependable yield mitigation storage is included (12.975 acre-feet) to keep existing water supply users' yield whole to compensate for the reduction in the dependable yield which occurs when the conservation pool is expanded.

Additional details of these alternatives are presented in tabular form in Table 3.1.

**Table 3.1 Storage Reallocation Alternatives**

<b>Alternative</b>	<b>Water Supply Storage – this action (acre-feet)</b>	<b>Total Water Supply Storage (acre-feet)*</b>	<b>Seasonal Pool Plan</b>	<b>Top of Conservation Pool Elevation (feet)</b>
Alternative #1 – No Action	No Reallocation	1,698.077	Yes	659.0
Alternative #2 – Reallocate from conservation	11,886.541 from Conservation Pool	13,584.617	Yes	659.0
Alternative #3 – Reallocate from flood control	11,934.930 from Flood Pool 13.221 for DYMS	13,646.229	Yes	659.25
Alternative #4 – Reallocate from inactive	11,930.209 from Inactive Pool 12.975 for DYMS	13,641.361	Yes	659.0 **

\*This action plus contracted storage of 880 ac-ft and White River Minimum Flows dependable yield mitigation storage of 818 ac-ft.

\*\* Bottom of Conservation Pool lowered to elevation 628.14 feet.



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# **Section 4.0**

# **Affected Environment**

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## **4.0 AFFECTED ENVIRONMENT**

Much of the information contained in this section, establishing the baseline conditions for the project area, was drawn directly and indirectly from the Final Environmental Impact Statement for the WRMF Project (Revised, January 2009).

### **4.1 Climate**

The climate of the Bull Shoals Lake area is classified as Humid Sub-tropical (Cfa), but it is located at the northern limits of that climate and is very close to the southern border of a more northern climate, Humid Continental (warm summer sub-type) (Dfa). Average annual precipitation in nearby Harrison, Arkansas, is approximately 46.6 inches of rainfall and 15.8 inches of snow. The most significant snowfall typically occurs from late-December to mid-March, and is usually less than three inches per event. Mean maximum temperatures in Harrison are approximately 90° Fahrenheit (F) throughout most of July and August, and in the middle 40° F range throughout most of December, January, and February. Mean minimum temperatures in the area are approximately 70° F in July and August, and in the middle 20° F range throughout late December to mid-February (NOAA, Earth Systems Research Laboratory, 2009).

### **4.2 Land Use**

The White River floodplain, of which Bull Shoals Lake is part, includes a total of 787,170 acres. An unpublished report from the U.S. Department of Agriculture divides the White River floodplain into cropland (55.7 percent), pasture land (2.7 percent), woodland (32.9 percent) water (4.8 percent), and other (3.9 percent). Outside the immediate flood plain, there are considerable acreages of public lands administered by the State wildlife agencies of Arkansas and Missouri, the Corps of Engineers, the U.S. Forest Service, and the National Park Service.

Private landowners own the majority of land in the Ozark Mountains. Major land uses includes timber production and grazing with less than 3.0 percent in cultivated land. Among the areas held by public landholders, the U.S. Forest Service manages almost one million acres, and the National Park Service manages some 90,000 acres. In addition, the U.S. Army Corps of Engineers oversees four reservoirs that have inundated more than 175,000 acres. The State of Arkansas owns and manages more than 45,000 acres in the Ozarks, most of which is set aside for hunting and fishing.

The area immediately surrounding Bull Shoals Lake is mostly rural, undeveloped land, with a few scattered residences and is gently sloped to steep, typical of the Ozark Highlands Ecoregion. Approximately 90 percent of the surrounding land is a mix of forest (pine and hardwood mix) and agricultural, with the remaining 10 percent being mostly hardwood forest (University of Arkansas website, Center for Spatial Technologies, 2009). The project study area around Bull Shoals Lake contains 101,196 acres of land, of which 100,090 acres are owned in fee and 1,106 acres are managed by flowage easement. The 71,240 acres below the top of the flood control pool 695 feet NGVD29 and 75 acres required for the dam and appurtenant works are allocated for Project Operations. There are 9,505 acres allocated for recreation-intensive use and 22,718 acres for wildlife management, which includes areas located below the flood control pool level.

The Land Use/Land Cover data is presented in figures 4.1 (Arkansas land use) and 4.2 (Missouri land use) (please note that the Missouri land use map extends south of the state line for some

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distance into Arkansas). This data comes from the Gap Analysis Program (GAP), which is a “scientific method for identifying the degree to which native animal species and natural plant communities are represented” in the United States’ network of conservation lands. The “gaps” in gap analysis refer to animal species and plant communities that are not adequately represented in conservation lands. GAP is funded and coordinated by United States Geological Survey, but is a cooperation among almost five hundred state and federal agencies, academic and nonprofit institutions, and businesses. Because of the diversity and large number of agencies involved, each state may have different methods of GAP data collection and classification. In Arkansas, 36 land use and land cover classes were derived from 1992 Landsat Thematic Mapper satellite data. In Missouri, 15 land use and land cover classes were derived from 2005 satellite data.

Table 4.1 provides a more detailed description of land use categories presented in Figure 4.2 for GAP mapping of the Missouri portion of Bull Shoals Lake. Table 4.2 presents public land use areas within a five-county area surrounding Bull Shoals Lake, along with the agency charged with management of the public area.

### **4.3 Physiography/Geology/Soils/Prime Farmlands**

#### **4.3.1 Physiography**

Bull Shoals Lake is included in the White River Basin. Much of the following discussion of the physiography, geology, soils and prime farmlands of the Bull Shoals Lake area is adapted from the White River Basin Minimum Flows Final Environmental Impact Statement published in February 2009. Therefore, many references are made to the White River Basin in the following paragraphs, but those references are intended to be applied to the Bull Shoals Lake area in this document.

The White River Basin encompasses parts of two major physiographic divisions, the Interior Highlands and the Atlantic Plain. Each is further divided into provinces and sections. See Figure 4.3 for divisions, provinces, and sections of the State of Arkansas.

The Salem Plateau is the lowest of the plateaus making up the Ozark Plateau province. The Salem Plateau lies essentially north and east of the White River and forms the drainage area of its eastern tributaries. The Springfield Plateau, which lies south and west of the White River in this region, is represented by isolated knobs, such as Bull Shoals Mountain, in the immediate vicinity of the dam. These plateau surfaces are now intricately and deeply dissected by the dendritic pattern of the White River drainage system. The area is characterized by narrow, flat-topped ridges between deeply cut valleys. The prominent topographic features of the area are the extensive and deeply cut meanders of the White River and its principal tributaries. The White River follows a meandering course through a narrow valley, which has an asymmetrical valley profile at the sharp river bends. A steep, rock bluff forms the valley wall on the outside of the bends and a long, gentle, slip-off slope forms the inside valley wall. Along straight courses of the river between bends, both valley walls are steep and more or less symmetrical.



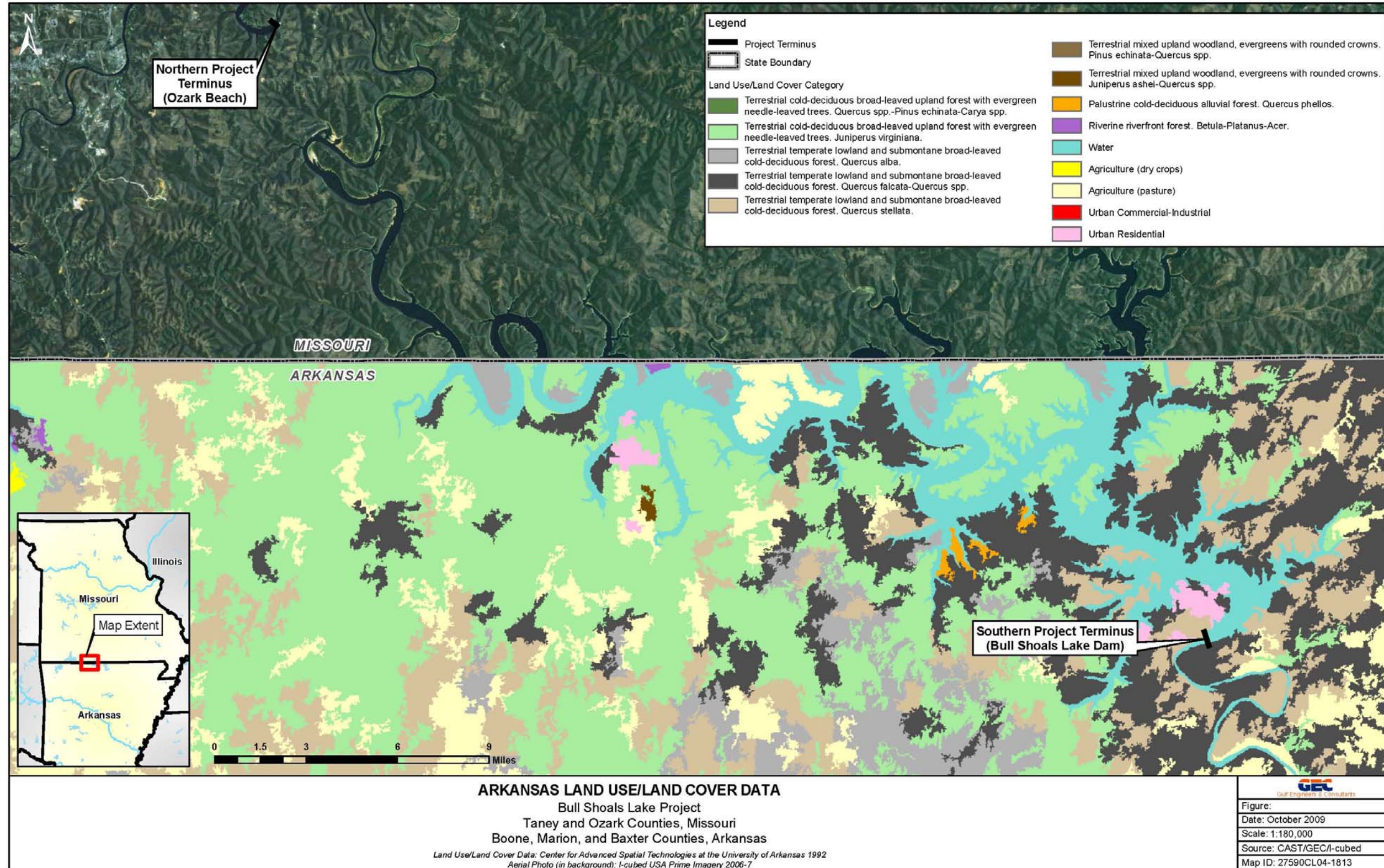


Figure 4.1 Arkansas Land Use/Land Cover Data



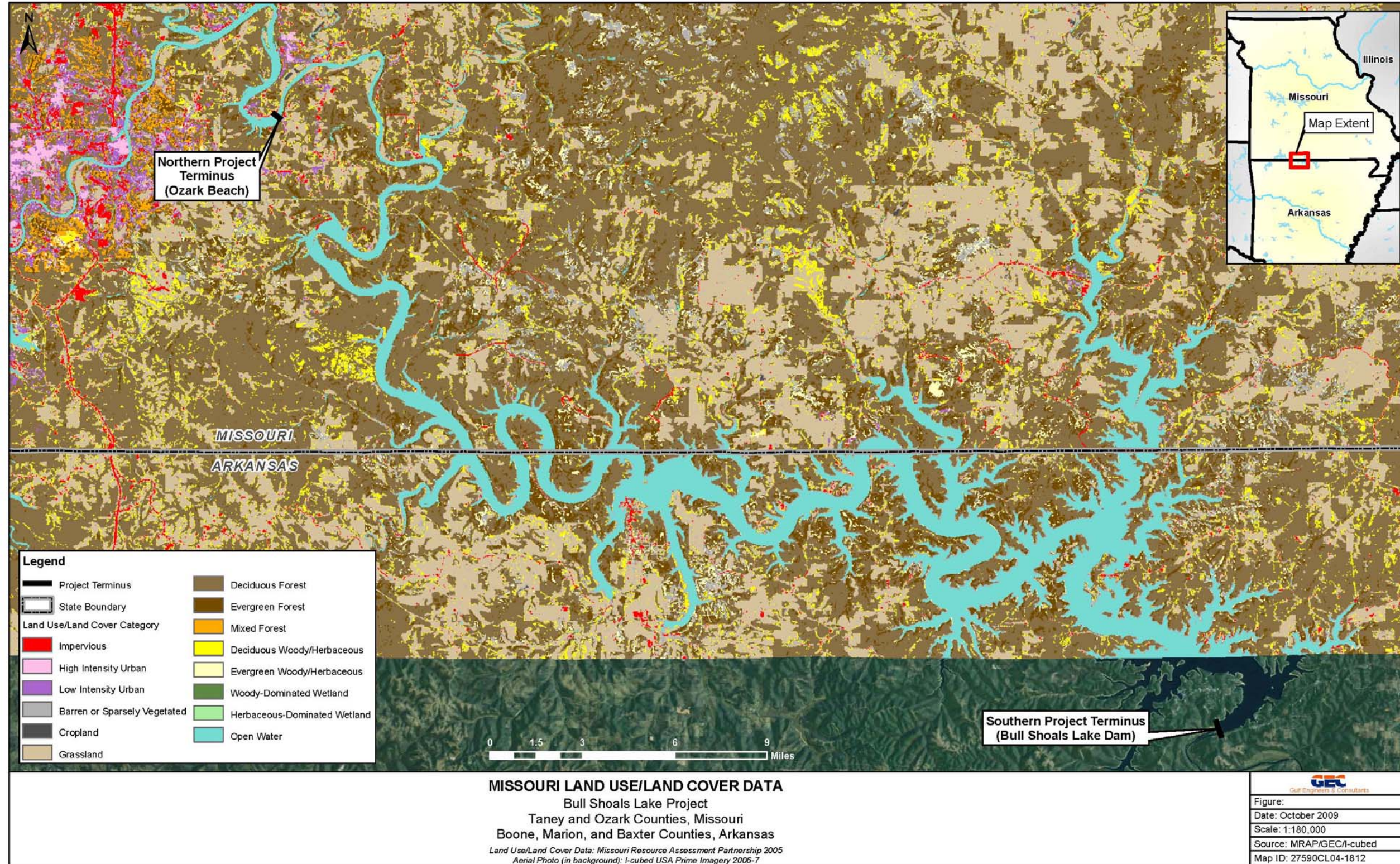


Figure 4.2 Missouri Land Use/Land Cover Data



**Table 4.1 Missouri Land Use/Land Cover Category Descriptions**

Impervious	Non-vegetated, impervious surfaces. Areas dominated by streets, parking lots, buildings. Little, if any, vegetation
High Intensity Urban	Vegetated urban environments with a high density of buildings
Low Intensity Urban	Vegetated urban environments with a low density of buildings
Barren or Sparsely Vegetated	Minimally vegetated areas including bluffs, quarries, and natural expanses of rock, mud, or sand. Areas in transition
Cropland	Predominantly cropland including row, close-grown, and forage crops
Grassland	Grasslands dominated by native warm season or non-native cool season grasses
Deciduous Forest	Forest with greater than 60% cover of deciduous trees
Evergreen Forest	Forest with greater than 60% cover of evergreen trees
Mixed Forest	Forest with greater than 60% cover of a mixture of deciduous and evergreen trees
Deciduous Woody/Herbaceous	Open Woodland (including young woodland) with less than 60% cover of deciduous trees
Evergreen Woody/Herbaceous	Open Woodland (including young woodland) with less than 60% cover of evergreen trees
Mixed Woody/Herbaceous	Open Woodland (including young woodland) with less than 60% cover of deciduous and evergreen trees
Woody-Dominated Wetland	Forest with greater than 60% cover of trees with semi-permanent or permanent flood waters
Herbaceous-Dominated Wetland	Woody shrubland with less than 60% cover of trees with semi-permanent or permanent flood waters
Open Water	Rivers, lakes, ponds, and other open water areas

**Table 4.2 Bull Shoals Lake Area Public Land Use Areas**

Area Name	Management Responsibility <sup>1</sup>	County	Acres	Impoundment Acres
Caney Mountain CA	MDC	Ozark	7,882	0
Ruth and Paul Henning CA	MDC	Taney/Stone	1,534	
Shepherd of the Hills Fish Hatchery and Visitor Center	MDC	Taney	211	
Hollister Towersite	MDC	Taney	180	
Boston Ferry CA	MDC	Taney	180	
Hilltop Towersite	MDC	Taney	3	
Drury-Mincy CA	MDC	Taney	5,699	
Branson MDC Office	MDC	Taney	4	
Cedar Creek Towersite	MDC	Taney	4	
Cooper Creek Access	MDC/EDEC	Taney	29	
Bull Shoals Lake WMA	USCOE/MDC	Various	62,326	45,440
Lake Taneycomo	USCOE/MDC	Taney	NA <sup>2</sup>	2,080
Empire Park	MDC/EDEC	Taney	3	
Table Rock Lake WMA	USCOE/MDC	Various	24,102	43,100
Table Rock State Park	MDNR	Taney	356	
Hercules Glades Wilderness	USFS	Taney	12,315	
Mark Twain National Forest	USFS	Numerous	186,253	
Wildcat Shoals Access	AG&FC	Baxter	2	
Bull Shoals Nursery Pond	AG&FC	Boone	NA <sup>2</sup>	
Bull Shoals State Park	ADP&T	Marion	660	
Crooked Creek Access	AG&FC	Marion	2	
Marion County WMA	AG&FC	Marion	120	
Pot Shoals Net Pen Project	AG&FC	Marion	90	
Ranchette Access	AG&FC	Marion	1	
Marion County Access	AG&FC	Marion	NA <sup>2</sup>	
White Hole Access	AG&FC	Marion	NA <sup>2</sup>	
Jones Point WMA	AG&FC	Marion	NA <sup>2</sup>	
Norfolk Lake WMA	USCOE	Baxter	10,000	
Sylamore WMA	USFS/AG&FC	Baxter/Marion	1,280	

WMA = Wildlife Management Area

CA = Conservation Area

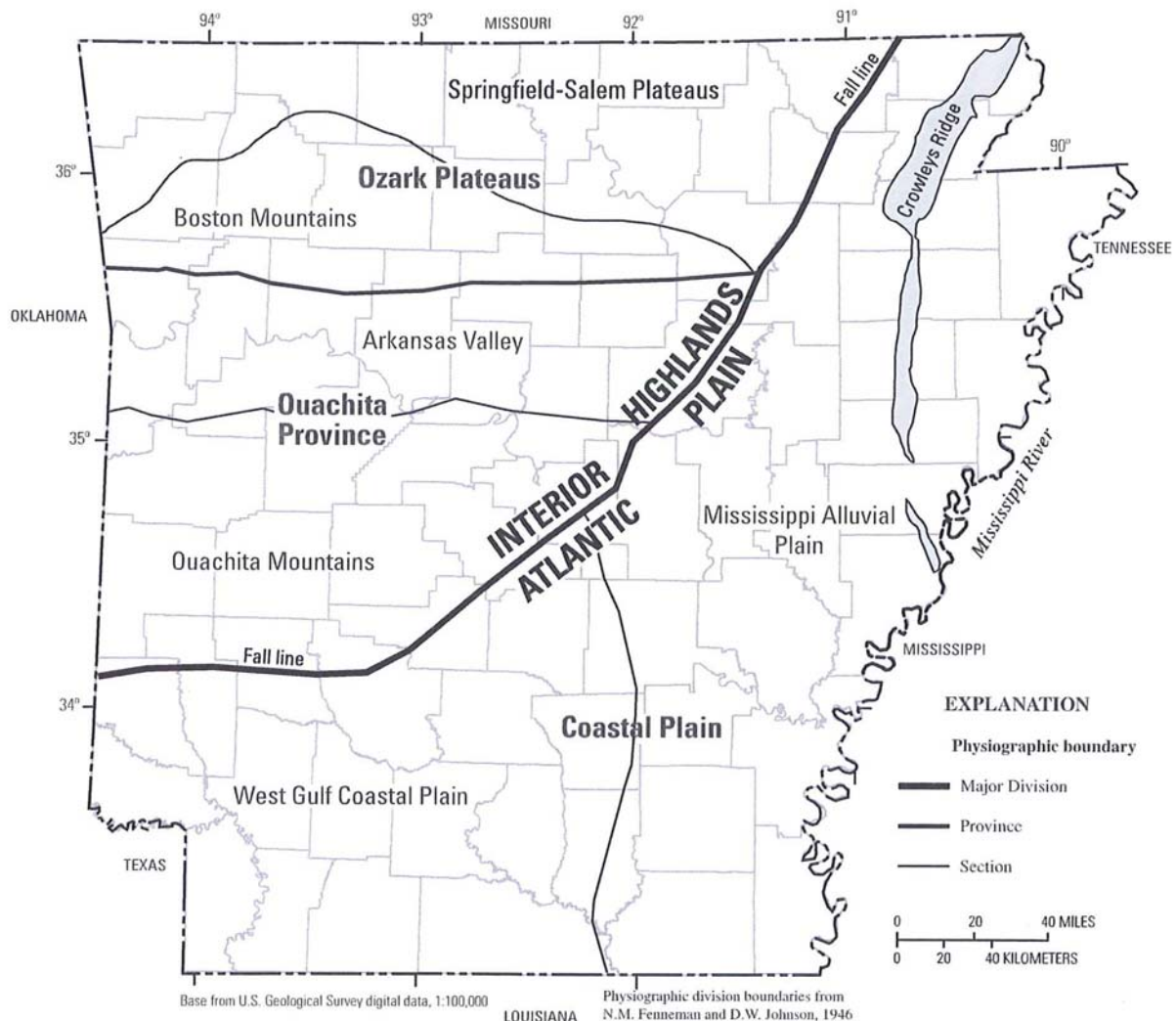
<sup>1</sup>Management responsibility - ADP&T = Arkansas Department of Parks & Tourism; AG&FC = Arkansas Game & Fish Commission; MDC = Missouri Department of Conservation; MDNR = Missouri Department of Natural Resources; EDEC = Empire District Electric Company; NPS = National Park Service; USCOE = United States Army Corps of Engineers; USFS = United States Forest Service

<sup>2</sup>NA indicates that no area was reported at these areas.

Sources: URL: <http://www.mdc.mo.gov/fish/watershed/whriver/landuse/390lut10.htm>;

URL: <http://www.mdc.mo.gov/fish/watershed/whriver/landuse/390lut11.htm>;

URL: <http://www.agfc.com/data-facts-maps/publicland/wma.aspx>.



Source: Summary of Aquifer Test Data for Arkansas -- 1940-2006, USGS, Aaron L. Pugh, 2008.

**Figure 4.3 Physiographic Provinces of Arkansas**

The elevations of the lake area vary from 450 feet NGVD29 in the streambed to 1,100 feet NGVD29 on the adjacent hills and ridge tops. The land generally rises from the narrow alluvial bottom in steep slopes to narrow upland plateaus or ridges. In general, the entire area may be classified as rough and broken.

#### 4.3.1.1 Interior Highlands Division

The Interior Highlands include about three-fourths of the White River Drainage Basin and are characterized by plateau surfaces entrenched by steep-walled valleys. The nearly flat, plateau surfaces tend to delay runoff. Where the plateau surfaces are underlain by calcareous rocks, karst topography develops. This enhances infiltration of precipitation. Karst features are locally prominent in both the Salem and Springfield plateaus (MDNR 1986a). Several faults are present

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in the watershed, but most have only tens of feet of displacement (MDNR 1986a). The fractured limestone of the watershed allows a direct conduit from the surface water to ground water, making aquifers underlying the watershed extremely susceptible to contamination (USGS 1996).

The Interior Highlands surrounding Bull Shoals Lake are within the Ozark Plateaus province. The basin includes parts of the Springfield-Salem Plateaus and Boston Mountains section. The Salem Plateau is underlain by rocks of Ordovician age or older. The Springfield Plateau is underlain by rocks of Mississippian age.

The upland parts of the plateaus are the remains of an old erosional surface. The surface has been modified by continued solution and erosion resulting in a somewhat lowered surface. Local relief of the upland surface generally does not exceed 50 feet. Valleys dividing the upland surfaces range in depth from 50 to 100 feet near their head, to as much as 1,500 feet in the entrenched meanders of larger streams near their mouths.

*The Boston Mountains are a dissected plateau approximately 200 miles long and 35 miles wide. This plateau is underlain by sedimentary rocks of Pennsylvanian age, and bounded on the north by a conspicuous escarpment. Toward the east and west, the summit level declines gradually to that of the surrounding surface. The summit slope is toward the south and is similar to the dip of the underlying formations. It is nearly flat close to the main crest and is steeper near the south edge. Along the southern boundary, the Boston Mountains merges with the hills of the Arkansas Valley section of the Ouachita province.*

The Interior Highlands is separated abruptly from the Coastal Plain by the Fall Line. The Fall Line is the westernmost boundary of rocks of Cretaceous or younger age except for Recent alluvium in stream valleys of the Interior Highlands.

#### **4.3.1.2 Atlantic Plain**

Approximately one-fourth of the White River Basin is in the Mississippian Alluvial Plain section of the Coastal Plain province. Topography of the Atlantic (Coastal) Plain is characterized by flat monotonous plains traversed by sluggish meandering streams. Crowley's Ridge, an important physiographic feature, forms part of the eastern border of the basin area and rises as much as 200 feet above the general level of the Atlantic Plain. The land surface of the rest of the Atlantic Plain is principally made up of Quaternary age terrace deposits and flood plain deposits of the Mississippi River and its tributaries. The land surface slopes southward from an altitude of about 300 feet NGVD29 at Poplar Bluff, Missouri, to about 150 feet NGVD29 at the mouth of White River.

The Grand Prairie region, a low terrace, lies between the White River and Bayou Meto (Arkansas River Basin) south of Wattensaw Bayou, and includes most of Arkansas County and parts of Lonoke, Prairie, and Monroe counties.

In the lower parts of the White River Basin, the drainage divides into the White River and other tributaries of the Mississippi River that are poorly defined and difficult to determine. In many places, the divide is formed by a levee or dike.

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### 4.3.2 Geology

The strata in the region of Bull Shoals Lake have a slight dip to the south. The region is on the southern flank of a large regional dome with its nucleus in the igneous rocks of the St. Francis Mountains, about 200 miles to the northeast. Locally, short anticlines and dome structures with as much as 90 feet of structural relief are noted in the exposures along the White River. Faults with small displacements are found in the vicinity. There is no record of any seismic activity originating in the Bull Shoals Lake area. It is believed that all faults in the region are static and no future movements are expected. Three rock formations of Ordovician age are present above the river level within the region. These formations include the Cotter, Powell, and Everton. The Jefferson City formation underlies the Cotter, and is present only a few feet below river level at Bull Shoals Dam. These formations consist largely of dolomite limestone with occasional lenses of sandstone and shale. The Everton and Powell formations are not present at the dam, but cap the nearby hills. The capped hills are remnants of the Springfield Plateau surface.

The uplands of the Salem Plateau are underlain by Jefferson City dolomite and the Roubidoux formation, and the valleys are floored by Gasconade dolomite of the Ordovician age. The Springfield Plateau is underlain by Mississippian limestones. The Boston Mountain Plateau is underlain by resistant clastic rocks of Pennsylvanian age. The Eureka Springs escarpment is the boundary between the Mississippian limestone and the Springfield Plateau and the Devonian limestone of the Salem Plateau.

The large dolomite mass, which is present in the Ozarks, has tremendous water storing capability, and the Salem Plateau is the locality for the greatest number and largest springs in Missouri, followed secondly by the Springfield Plateau. The large reservoirs in the southern part of the watershed probably cover many springs. Karst features are locally prominent in both the Salem and Springfield plateaus (MDNR 1968a). Several faults are present in the watershed, but most have only tens of feet of displacement (MDNR 1986a). The fractured limestone of the watershed allows a direct linkage from surface waters to ground waters, making aquifers underlying the watershed extremely susceptible to contamination from the surface (USDA, 1996). Figure 4.4 depicts the geology of the White River Basin.

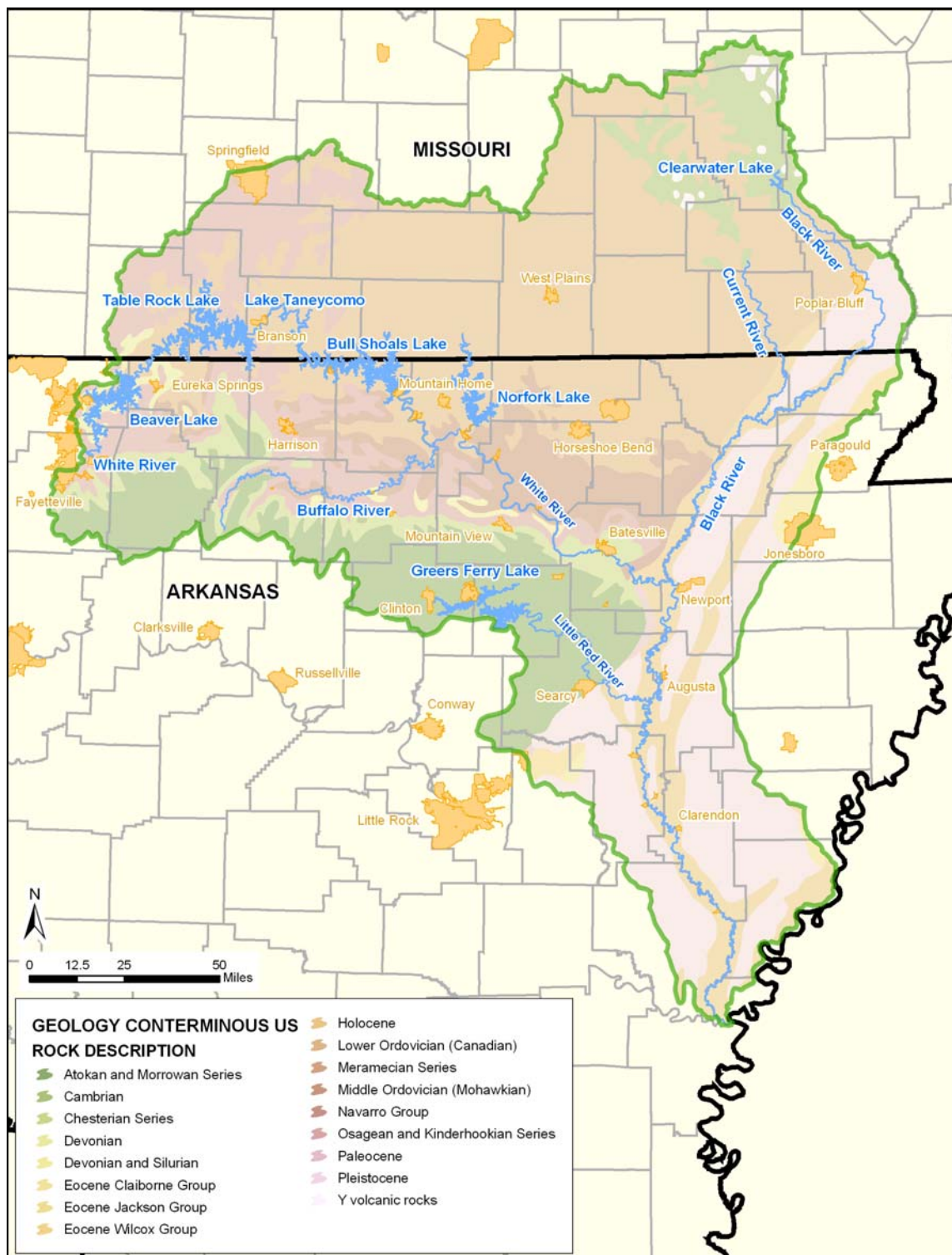


Figure 4.4 Geology of the White River Drainage Basin

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### 4.3.3 Topography

Bull Shoals Lake is located within two physiographic areas of the Ozark Highland. The Salem Plateau is exposed across northern and central Baxter County. The Springfield Plateau is exposed in parts of west central and across most of southern Marion County and most of southern Baxter County, and the Missouri counties of Taney and Ozark. The Salem Plateau is characterized by gently sloping to rolling uplands, and steep, stony side slopes with outcrops of dolomite. The elevation ranges from about 700 to 1,000 feet above sea level. There are a few broad areas on uplands that have a gradient of 1 to 8 percent.

The Springfield plateau is adjacent to and higher in elevation than the Salem plateau. This plateau has been strongly dissected by streams. Steep, V-shaped valleys separated by gently sloping to moderately sloping land characterize it. The side slopes have a gradient of 12 to 50 percent. The elevation atop the ridges ranges from about 1,000 to 1,200 feet above sea level. There are a few broad areas on uplands where the gradient is 1 to 8 percent. Stream valleys are entrenched and are commonly less than one-fourth mile wide. Most flood plains are 100 to 1,000 feet wide.

A general description of Bull Shoals Lake is gently sloped to steep inclines typical of the Ozark highlands. Bluffs of near vertical slope are present where the original White River channel has eroded the residual limestone substrate. Upper reaches of several small tributaries contain small flood plains and gentle slopes of less than five percent. Primary ridges and connecting spur ridges have 0 to 10 percent slope with side slopes ranging from 10 to 25 percent inclines. Aspect is generally described as easterly in nature for all land occurring on the west side of the reservoir and westerly in nature for land occurring on the east side of the reservoir, however the presence of ridges and drainages create aspects of all directions.

### 4.3.4 Soils and Prime Farmlands

Soils in the Missouri portion of the study area are of the Ozark type. The major soil association is Gasconade-Opequon-Clarksville, found in the western and central portions. A Captina-Clarksville-Doniphan association is present on the watershed's eastern edge. Other minor soil associations include Nixa-Clarksville, along the Missouri-Arkansas border, and Needleeye-Viration-Wilderness, near the northwest corner.

Soils in the Missouri portion of the watershed are generally acidic and of moderate to low fertility. Productivity of watershed soils varies widely, with forest and grassland being the dominant land cover. A typical watershed landscape consists of broad, forested areas on moderately steep to very steep slopes and small pastures and cultivated fields on smoother ridge tops and in level valley bottoms. Tall fescue is the main grass used for pastures. Native, tall and mid-tall grasses are found in glade and savannah areas. They are less common than before European settlement. The moisture holding capacity of these soils is limited, adding to the general unsuitability for crop production.

Ozark soils vary widely in character. Some soils are infertile, stoney-clay type soils, while others are loess-capped and fertile. Some watershed soils are stone free, while others may have a stone content exceeding 50 percent, and some areas may have no soils covering bedrock. The



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majority of the watershed is dominated by stoney, cherty soils found on steep slopes with lower stone contents found in soils on more level areas. Soils in Missouri become less stoney on the western fringe of the watershed. Soils in the watershed are formed from residue high in iron, which oxidizes on exposure, giving the soil a red color. Soils formed in the residuum from cherty limestone or dolomite, range from deep to shallow and contain a high percentage of chert in most places. Soils formed in a thin mantle of loess are found on the ridges and have fragipans, which restrict root penetration. Soils formed in loamy, sandy and cherty alluvium are found in narrow bottomland areas, and are the most fertile soils in the watershed.

Soils in the Arkansas portion of the watershed are also Ozarkian. Major soil associations include Clarksville-Nixa-Noark, Captina-Nixa-Tonti, and Arkana-Moko in the Salem and Springfield plateaus and Linker-Mountainburg-Sidon and Enders-Nella-Mountainburg-Steprock in the Boston Mountains.

Soils in the Upper White River area below Bull Shoals Lake and above Batesville, Arkansas, include the following associations: Talbott-Colbert, Corydon-Sogn, and Sogn-Mountainburg in Baxter County; Sturkie-Peridge, Noark-Portia, Arkana-Moko and Brockwell-Boden-Portia in IZard and Stone counties; Clarksville-Gepp-Ventris, Beasley-Gasconade, and Egam-Arrington in Independence County. The Sturkie, Portia and Egam soil series contain lands classified as prime farmlands; while the other series listed contain none. The Corydon-Sogn association is the primary soil association in the vicinity of Bull Shoals Lake. Neither the Corydon nor the Sogn soils are classified as prime farmlands.

Soil resources in the vicinity of the Lower White River include the Sharkey-Boudre association in Woodruff County, the Sharkey-Commerce association in Monroe County, the Sharkey and Newellton-Sharkey-Tunica associations in Phillips County, the Sharkey-Acadia association in Arkansas County, and the Sharkey association in Desha County. The above soils, with the exception of the Commerce series in Monroe County and the Sharkey and Acadia series in Arkansas County, are classified as prime farmlands.

## **4.4 Water Resources**

### **4.4.1 Surface Waters**

#### **4.4.1.1 Lakes**

Bull Shoals Lake is located on the White River and was formed by the construction of the Bull Shoals Hydroelectric Dam in Marion County, Arkansas, which was begun in 1947 and completed in 1951. The elevation of the top of the conservation pool is approximately 659 feet NGVD29 with the flood pool being at 695 feet NGVD29. The conservation pool top area is approximately 48,005 acres and the flood pool top area is approximately 71,240 acres. The shoreline length of the design conservation pool is approximately 740 miles, and the flood pool is approximately 1,050 miles in length. Bull Shoals Lake is located within the White River Drainage Basin, which drains an area of approximately 27,765 square miles in northern Arkansas and southern Missouri. Bull Shoals Lake drains approximately 6,036 square miles of the White River Drainage Basin and has an average depth of 67 feet. The authorized purposes of Bull Shoals Lake are flood control and hydropower generation; and, its authorized uses are recreation,

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fish and wildlife support, water supply (by the Water Supply Act of 1958) and tail water minimum flows (by the WRMF Project).

There are five other large lakes in the Bull Shoals Lake vicinity: (1) Beaver Lake, (2) Table Rock Lake; (3) and Lake Taneycomo on the White River upstream of Bull Shoals; (4) Norfolk Lake approximately 20 miles to the east of Bull Shoals Lake on the North Fork River; and (5) Greers Ferry Lake on the Little Red River, approximately 60 miles to the south of Bull Shoals Lake. With the implementation of the WRMF Project, the total water storage capacity of Bull Shoals Lake is 5.408 million acre-feet, with 2.127 million acre-feet of flood control storage, 1.236 million acre-feet of conservation storage, and 2.045 million acre-feet of inactive storage.

Existing authorized water supply storage is 880 acre-feet at one million gallons per day (mgd) in the conservation pool from flood control by MCRWD and 233,000 acre-feet (242 mgd) soon to be reallocated from the flood control pool for use under the WRMF Project.

#### **4.4.1.2 Rivers**

Bull Shoals Lake is an impounded area of the White River which begins at an elevation of approximately 2,050 feet NGVD29 near the Ozark National Forest in northwest Arkansas. The river runs southeast through northeast Arkansas to its confluence with a branch of the Arkansas River very near its confluence with the Mississippi River in Desha County, Arkansas. The White River flows about one-third of its length through the Ozark highlands to about Independence County, Arkansas, where it enters a lowlands area with lower gradient change. The upper one-third of the river has a gradient change of about three to four feet per mile and the lowlands portion averages about one foot per mile. The flood plain ranges from 200 to 400 feet in width in the highlands to two miles in the lowlands below Independence County.

Other than Bull Shoals Dam, there are three other dams forming lakes on the upper White River:

- 1) the Empire District Electric Company Dam at Ozark Beach that forms Lake Taneycomo
- 2) Table Rock Dam which forms Table Rock Lake
- 3) Beaver Dam forming Beaver Lake.

Norfolk Lake is impounded on the North Fork River about 4.8 miles north of its confluence with the White River. The North Fork River empties into the White River in Baxter County approximately 25 miles south of Bull Shoals Dam, just north of a portion of the Ozark National Forest. It drains approximately 1,825 square miles of the Salem Plateau in northern Arkansas and Southern Missouri.

Another major tributary to the White River is the Buffalo River running easterly to the south of Bull Shoals Lake and meeting the White River in Marion County. The Buffalo River is America's first National River and remains as one of the few unpolluted rivers in the lower 48 states, with both swift-running and placid stretches. About 135 miles of the river's 150-mile length is set aside as the Buffalo National River. It begins as a small stream in the Boston Mountains about 15 miles from the beginning of the national river designated area. The river winds its way through massive limestone cliffs and bluffs while travelling eastward through the Ozark Mountains to the White River. The river's high quality waters serve as an ideal recreation source as well as aquatic habitat offering sport fishing for smallmouth bass, channel catfish, green and long-eared sunfish, and spotted bass.

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Other major rivers in the Bull Shoals Lake area include the Little Red River in the southern part of the basin, and the Current River and Black River in the eastern portion of the basin. The Current River empties into the Black River in Randolph County, Arkansas and the Black River joins the White River in Independence County.

#### **4.4.2 Ground Water Quality/Aquifers**

Most ground water withdrawn from water wells occurs in the Quaternary alluvium in the Bull Shoals Lake area, with most wells being completed at a depth of about 200 – 300 feet below surface. The recharge (outcrop) area for this formation is in southern Missouri. The formation is made up of predominantly limestone, dolomite, sandstone, and shale. The primary porosity of these rocks has been greatly reduced by compaction and cementation, thus a reduction in their ability to supply large withdrawal rates. Ground water occurs mainly in fractures and joints in the sandstone and in solution openings in the limestone and dolomite.

Much of the ground water produced in this area contains high levels of radium 226, radium 228, fluoride, uranium, radon, hydrogen sulfide, and other undesirable naturally occurring substances which are difficult to treat. The radium 226, radium 228, fluoride, and radon levels found in many wells consistently exceed the maximum contaminate (MCL) levels established by the *National Primary Drinking Water Regulations*. Wells completed in shallower water bearing layers are often infiltrated with surface runoff water that tends to contain contaminants that pose potential health risks (ESI, 2009).

The ADH has placed many of the OMRPWA water systems under Administrative Order for continuing to provide unsafe water supplies. Members that do not have contamination issues have source quantity issues. Water shortages are realized most summers, even when “water conservation” orders are implemented. The ADH has issued an Administrative Order Warning to the city of Marshall for not having enough water to serve its customers. As a result of low yields, the cities of Marshall and Jasper cannot extend service to hundreds of households. The families in the region haul water or drink water from shallow contaminated wells. Table 4.3 shows the members of ORMPWA, and the source quality and quantity for each of the member systems.

#### **4.4.3 Surface Water Quality**

Overall surface water quality in the Bull Shoals Lake area is very high and has been designated as an Extraordinary Resource Water Body by the Arkansas Pollution Control and Ecology Commission. It is therefore subject to more stringent regulations controlling pollution discharge and in-stream activities. The waters of the Arkansas portion of the White River watershed have all been designated by the Arkansas Department of Environmental Quality (ADEQ) for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2002).

**Table 4.3 Ozark Mountain Regional Public Water Authority Data**

<b>County</b>	<b>2008 Population</b>	<b>Source Quality Issues</b>	<b>Quantity Issues</b>
<b><u>Newton</u></b>			
City of Jasper	1,530	*	Yes
Mt Sherman	775	Radium	Yes
Nail-Swain	1,975	None	Yes
East Newton County	1,650	Radium, Hydrogen Sulfide	No
Mockingbird Hill	800	Hydrogen Sulfide, Iron	No
Deer	900	*	Yes
Luton-Pelsor	300	Iron	Yes
Western Grove	1,070	Radium, Iron	Yes
Parthenon	400	*	Yes
<b>Subtotal</b>	<b>9,400</b>		
<b><u>Searcy</u></b>			
SPG	1,400	Fluoride	No
Marshall	2,400	None	Yes
South Mountain	700	Radium	Yes
SDM	400	Radium, Fluoride	Yes
Leslie	800	Radium	Yes
Morning Star	1,375	Fluoride	Yes
<b>Subtotal</b>	<b>7,075</b>		
<b><u>Boone</u></b>			
Valley Springs	3,750	Radium, Iron	Yes
Diamond City	700	Radium	No
Lead Hill	515	Radium	No
Lake Bull Shoals Estates	60	None	No
<b>Subtotal</b>	<b>5,025</b>		
*Violates the Surface Water Treatment of the National Primary Drinking Water Source: Preliminary Engineering Report Amendment 1 (August 2009), Engineering Services, Inc.			

Bull Shoals Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). This is mainly due to temperature stratification, which is natural and occurs in many deep reservoirs such as Bull Shoals Lake. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen. As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

In 2004, ADEQ placed the first three miles of the Bull Shoals tail water on the Water Quality Limited Waterbodies list (303(d) list) due to violation of the 6 mg/L dissolved oxygen (DO) standard. The listed source of the DO violation is hydropower (HP). Section 303(d) of the Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non-point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13

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years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. TMDLs have been established by ADEQ for the 3.0 miles of the White River below Bull Shoals Dam. While the first three miles below the Bull Shoals dam is listed on the 303 (d) list, Bull Shoals Lake is not.

In January 2009 the USACE completed the WRMF Study, which will increase the minimum flow below the dam to 800 cfs to benefit the aquatic habitat and may result in water quality improvements in the tail water.

For the Missouri portion of Bull Shoals Lake, the Missouri Department of Natural Resources and the Clean Water Commission are responsible for setting and enforcing water quality standards within the State of Missouri. Classified waters in the state are categorized according to their beneficial water usage. Major reservoirs like Bull Shoals Lake are usually several thousand acres in size and are classified by the state as L2 (comparable to Type A in Arkansas). Bull Shoals Lake, in addition to maintaining L2 water quality standards, is also subject to four other water quality standards: (1) livestock and wildlife watering; (2) protection of warm water aquatic life and human health/fish consumption; (3) whole body contact recreation; and (4) boating and canoeing water quality standards (MDNR, 1996b).

#### 4.4.4 Hydropower

A report was prepared by the USACE Hydropower Analysis Center (HAC) for the proposed project that provides details of the hydropower benefits and economic analysis associated with the Ozark Mountain Regional Public Water Authority's (OMRPWA) request for reservoir storage sufficient to supply 6 MGD (10.83 cfs) from Bull Shoals Lake. A pending water supply request by Marion County Regional Water District (MCRWD) for 1 MGD was included in this study. Analysis of hydropower impacts for reallocating hydropower storage to water supply storage in Bull Shoals Lake includes the computation of the following values:

- power benefits foregone
- revenues foregone
- credit to the Federal power marketing agency

Values were computed for each of these parameters for the proposed reallocation of reservoir storage.

Five existing Corps of Engineers lakes (Beaver Lake, Table Rock Lake, Bull Shoals Lake, Norfolk Lake and Greers Ferry Lake) were constructed between 1940 and 1970 in the White River Basin of Arkansas and Missouri. The five lakes are multi-purpose reservoirs authorized for the primary purposes of flood control and hydroelectric power generation. Other authorized purposes are water supply, recreation and fish and wildlife. A map of the White River Basin is shown in Figure 1-1. Hydropower impacts were computed only for Bull Shoals and Norfolk Lakes because hydrologic effects are shown to be negligible (Hydraulics and Hydrology Report-Appendix A) at the other lakes in the system.

The reservoir system is operated to maintain a balance in the remaining portion of the seasonally defined flood control storage space. Downstream river flow criteria have been established at downstream control points to achieve project benefits. The regulating discharge criteria are

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supplied for all stream control points (including reservoir outflow controls) as a seasonal function of a system state parameter. Runoff forecast and these criteria are used by a system model which iteratively computes reservoir discharges which balances the remaining reservoir storage without exceeding downstream control point criteria.

## 4.5 Cultural Resources

### 4.5.1 Human History

The following is a brief history of the human population of the Bull Shoals Lake area:

**Archaic (8,000-500 B.C.)** - Around 8,000 years ago, the climate began to change. The Pleistocene epoch gave way to the Holocene. Warmer temperatures, along with increased hunting efficiency, brought about the extinction of the megafauna that the Paleo-Indians had followed. Archaic people relied on the animals and plants that we see today. Settlement patterns were seasonal, with bands of people staying in one area for entire seasons before moving on to the next settlement. From these base camps, hunting parties were sent out, sometimes for days, to kill game. Archaic period hunting camps abound in the White River area.

**Woodland (500 B.C. – A.D. 900)** - One major technological change marks the beginning of the Woodland period- pottery. Ceramics had begun to appear during the Archaic period, but their proliferation marks the beginning of the Woodland period. Pottery signifies an increasing reliance on domesticated plants. Horticulture had now spread throughout most of the Eastern Woodlands, with the White River area being no exception. The bow and arrow became a part of the tool assemblage, further increasing the efficiency of hunting game. For the most part, however, the Woodland period is very poorly understood in the White River area. Unfortunately, only a few sites containing Woodland period components have been studied.

**Mississippian (A.D. 900 – 1541)** - The Mississippian period generally marks the transition to full-scale agriculture and a chiefdom level of politics. An influence of religion from Mesoamerica spread rapidly throughout the southeastern U.S. Large mound sites were constructed, elaborate trade networks were established, and populations dramatically increased. Ozark adaptations, however, were unique during the Mississippian period. Domesticated crops were grown in the river valleys, but hunting and gathering likely made up the bulk of the food supply. Small Mississippian period mound sites did exist in the White River area, such as the Loftin Site, inundated by Table Rock Lake. Other Mississippian sites in the area include open-air village sites and rock shelters. It had been speculated that these communities were “outposts” of the Caddo culture located to the southwest. Recently, however, researchers have demonstrated that these societies simply interacted with one another on a frequent basis, with no evidence of Caddo colonization.

**Protohistoric / Historic Periods (A.D. 1541 –1865)** - The Protohistoric period began with the De Soto expedition into the Southeastern United States. Generally speaking, De Soto did not enter the Ozarks, but the aftermath of his expedition definitely did enter the area. Diseases the Spaniard and his men brought with them, such as smallpox and influenza, had a devastating effect. The tribes inhabiting the area had no immunity against these diseases, and up to 90 percent of the populations were decimated. During this time period, the Ozarks were primarily being used as a hunting ground for the Osage, who were centered more to the north.

Euro-American settlement began in the Ozarks in the late 18th century. People generally subsisted on a combination of hunting wild game and herding domesticated animals. With the creation of the Arkansas Territory in 1819, people from the upland South, or Appalachia, began to move into the Ozarks. These people brought with them many aspects of their culture, including fundamentalist religion, unique architectural styles, and an aptitude for farming rocky terrain. Although slave holding was not unheard of, it certainly was not the norm. A few major battles, such as Pea Ridge, were fought in the area. Theoretically, the battle of Pea Ridge solidified Union control over southern Missouri. In reality, the entire Ozark region was hostage to Bushwhackers, or outlaws that roamed the land and robbed people indiscriminately.

#### 4.5.2 Previous Investigation on the White River Area

The last broad cultural resources inventory for the White River area was conducted in 1988 for the *Cultural Resources Priority Plan for the U.S. Army Engineer District, Little Rock, 1988* (Blakey and Bennet, Jr., 1988). Only a few minor surveys have been conducted since that project was completed. The Table below represents the most up to date site information according the records of the Arkansas Archeological Survey and the Missouri Department of Natural Resources.

#### 4.5.3 Recorded Cultural Resources in the Lake Area

The last cultural resources inventory for the White River area was conducted in 1988 for the *Cultural Resources Priority Plan for the U.S. Army Engineer District, Little Rock, 1988* (Blakely and Bennet, Jr., 1988). It should be kept in mind that this inventory only represents sites recorded before 1988 and many have been recorded since that date. In addition, many more sites have yet to be recorded. Table 4.4 summarizes the previously recorded resources at Bull Shoals Lake, as of 1988.

A coordination letter was submitted to the State of Arkansas, Arkansas Historic Preservation Program, requesting views on the proposed project and the potential for known historic or pre-historic sites to be located within the project area. The response received from the Arkansas State Historic Preservation Officer (SHPO) is included in Section 12.0, Agency Coordination. For the portion of Bull Shoals Lake in Missouri, a representative of the Missouri Historic Preservation Program, Ms. Judith Deel with the Missouri State Historic Preservation Office, was consulted by telephone on October 21, 2009, requesting her agency’s views on the proposed project.

**Table 4.4 Previously Recorded Resources at Bull Shoals Lake**

<b>Type of Site</b>	<b>Number of Sites</b>
Historic	3
Prehistoric	114
Multicomponent	20
Total	137
<b>National Register Eligibility Status</b>	
Not Evaluated	131
Not Eligible	5
Eligible	1

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## 4.6 Biological Resources

### 4.6.1 Fish and Wildlife

Bull Shoals Lake is located in the north central portion of Arkansas and the south central portion of Missouri within the Ozark Highlands Ecoregion. Specifically, the lake is within the White River Hills Sub Ecoregion, which is characterized by the Springfield and Salem plateaus along with highly dissected forested slopes. The plateaus are utilized as pastureland and hayland; whereas, the slopes are generally vegetated with oak-hickory forests.

The lake fishery is managed in a cooperative effort between the Arkansas Game and Fish Commission (AGFC) and the Missouri Department of Conservation. Bull Shoals Lake is a warm water fishery with most endemic species of the Ozark Highlands Ecoregion present. Black bass species, white and striped bass, walleye, crappie, channel, flathead and blue catfish, and various sunfish species are common game fish for the lake. Stocking programs of certain game fish occur on the lake at various times of the year and an annual report of stocking rates and species is prepared by AGFC.

Common terrestrial wildlife species to the area include raccoons, opossums, river otters, muskrats, gray and red foxes, gray and red squirrels, beavers, minks, cottontail rabbits, coyotes, skunks, bobwhite quail, eastern wild turkeys, and white-tailed deer. A variety of migratory game birds, such as geese, ducks, and mourning doves as well as various species of neo-tropical and passerine songbirds are found in abundance throughout the project area.

### 4.6.2 Protected Species

In addition to the typical wildlife species, this area with its diverse habitats is also home to many rare species. Attachment 4 provides a list of these rare species (but not all protected) in the Bull Shoals Lake area by county (Missouri Department of Conservation, 2009 and Arkansas Natural Heritage Program, 2009). Species of greatest concern are those that are listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS). Within the general project area are the listed species Tumbling Creek cavesnail, gray myotis, Ozark big-eared bat, and the Indiana bat. Although the bald eagle was delisted in 2007, it continues to be protected by the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. The bald eagle regularly utilizes the lake as hunting grounds and is known to nest along the river downstream of the lake. It has been determined by the USFWS that no impact to these resources is expected to result from the proposed project. See Section 12.0 for copies of the responses.

The Tumbling Creek cavesnail (a Federally endangered species) is a very small, pale, blind snail that occurs only within the Tumbling Creek Cave in Taney County, Missouri, approximately 3.2 miles north of Bull Shoals Lake. Surveys of the cave in 2001 have revealed only 40 individuals and continued monitoring has shown a decline in these numbers since that survey (USFWS, 2009). As a result of coordination with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act for the White River Basin Minimum Flows EIS, it was concluded that the reallocation of five feet of storage of the flood pool of Bull Shoals Lake may affect, but would not likely adversely affect the species (USFWS, 2003).

Another endangered species, the gray bat, is also found within the project area. Karst features within the project area provide the necessary habitat for maternity and hibernacula population of



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this species. The gray bat is the largest of the genus within the project area, weighing from seven to 16 grams. This species can be distinguished from the other species by its unicolored fur on its back and by the wing membrane connecting to the ankle instead of at the toe, as in the other bats. Tumbling Creek Cave supports a large maternity colony of gray bats and according to the Gray Bat Five-Year Review published in 2009, the population within this cave is increasing; however, the overall classification remains the same for this species.

The Indiana bat is another endangered bat that has also been observed within the project area. This bat is roughly two inches long and weighs from six to nine grams. A small hibernating population was historically found within the Tumbling Creek Cave but since 1998, there have been no observations of a hibernating population of this species within the cave (USFWS, 2009). According to the 2009 Indiana Bat Five-Year Review from the USFWS, the population of Indiana bats within 11 Missouri hibernacula declined drastically from 1980 through 1997 but that decline has slowed from 1997 to the present. The many karst features within the project area provide the necessary habitat required by this species and continued management of known populations will provide the protection required to reverse this decline.

Also found in the project area is the Ozark big-eared bat. This bat is medium sized and weighs seven to 12 grams with long ears and distinctive facial glands on either side of the snout. The range of this species is generally within the Ozark Highlands and Boston Mountains ecoregions in northeast Oklahoma, northwest Arkansas, and southwest Missouri utilizing the abundance of caves in the region for hibernation and maternity sites. According to the Ozark Big-Eared Bat Five-Year Review from the USFWS, the census counts for maternity sites indicate that the population of this species is fairly stable ([www.naturalheritage.org/rarespecies](http://www.naturalheritage.org/rarespecies), [www.mdc.mo.gov/cgi-bin/heritage](http://www.mdc.mo.gov/cgi-bin/heritage), [www.fws.gov/midwest/endangered](http://www.fws.gov/midwest/endangered)).

### **4.6.3 Vegetation**

The Ozark Highlands Ecoregion is characterized as a high plateau dissected by deep rugged valleys formed by streams and rivers. Vegetation types within this region include oak-hickory forests, oak-hickory-pine forests, bluestem prairies and cedar glades. Post oaks, blackjack oaks, and black hickory are the dominant species found in the dry upland forests and the areas of sandstone bedrock contain species such as shortleaf pine and various species of oak. The mesic slope forests include species such as white oak, northern red oak, bitternut hickory, and flowering dogwood. The glades within this region are dominated by little bluestem and baldgrass, but with the suppression of fire the eastern red cedars have invaded these prairie habitats. Along the rivers, streams, and lake shores the riparian habitats are characterized by birch and silver maple. Normal operation of the Bull Shoals Dam has created a region along the shoreline that has little or no vegetation, but upslope of this region the shoreline is undeveloped and heavily forested.

### **4.6.4 Wetlands**

Located within the Salem Plateau of the Ozark Mountains region of northern Arkansas and southern Missouri, the project area is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats

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representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. Table 4.5 presents these wetland classes with their respective subclasses and community types. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Bull Shoals Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir and connected lacustrine fringe) and slope wetlands (most likely calcareous slope). More detailed descriptions of these classes, subclasses, and community types can be found at the Arkansas Multi-Agency Wetland Planning Team web site: [www.mawpt.org](http://www.mawpt.org).

#### **4.7 Air Quality**

Bull Shoals Lake is located in the Ozark Mountains, remote from heavy smoke-producing industry or large mining operations. The air is very clean and smog is virtually unknown in this region.

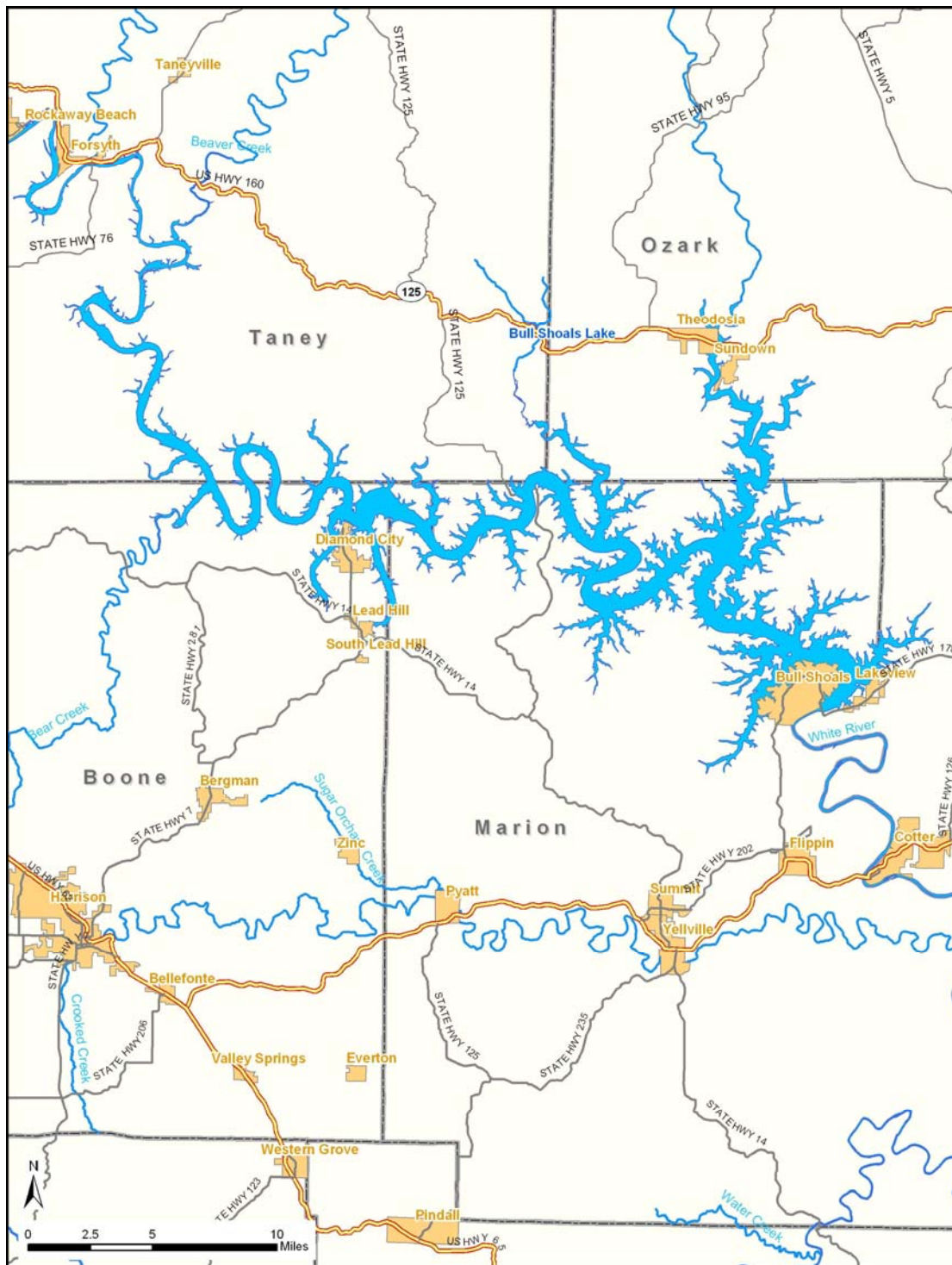
The Clean Air Act of 1977 (CAA), as amended requires Federal facilities to comply with all Federal, state, interstate, and local requirements regarding the control and abatement of air pollution in the same manner as any nongovernmental entity, including any requirement for permits. No particular Federal requirements are involved that are not already incorporated into Arkansas and Missouri State law. The "Conformity Rule" of the Clean Air Act (CAA) of 1977, as amended states that all Federal actions must conform to appropriate State Implementation Plans (SIPs). This rule took effect on January 31, 1994, and at present applies only to Federal actions in nonattainment areas (those not meeting the National Ambient Air Quality Standards for the criteria pollutants in the CAA). The areas of north central Arkansas and south central Missouri where Bull Shoals Lake is located are considered "attainment areas" and are therefore exempt from the "Conformity Rule" of the CAA.

**Table 4.5 Project Area Wetland Classifications**

<b>CLASSIFICATION</b>		
<b>Class</b>	<b>Subclass</b>	<b>Community Types</b>
<b>Depressions</b>	Headwater Depression	Headwater Swamp
	Isolated Depression	Mountaintop Depression Sinkhole Sandpond Valley Train Pond Unconnected Alluvial Depression
	Connected Depression	Connected Floodplain Depression
<b>Flats</b>	Alkali Flats	Alkali Wet Prairie Alkali Post Oak Flat
	Non-Alkali Flats	Wet Tallgrass Prairie Pine Flat Hardwood Flat Post Oak Flat
<b>Fringe</b>	Reservoir Fringe	Reservoir Shore
	Connected Lacustrine Fringe	Connected Lake Margin
	Isolated Lacustrine Fringe	Unconnected Lake Margin
<b>Slope</b>	Calcareous Slope	Calcareous Perennial Seep
	Non-Calcareous Slope	Non-calcareous Perennial Seep Bayhead Wet Weather Seep Sandstone Glade
<b>Riverine</b>	Spring Run	Spring Run
	High-Gradient Riverine	High-Gradient Riparian Zone
	Mid-Gradient Riverine	Mid-Gradient Floodplain Mid-Gradient Backwater
	Low-Gradient Riverine	Low-Gradient Overbank Low-Gradient Backwater Sand Prairie
	Riverine Impoundment	Beaver Complex Wildlife Management Impoundment

#### **4.8 Recreation**

The Bull Shoals project area contains 101,196 acres; 100,090 acres owned in fee and 1,106 acres are managed by flowage easement. The 71,240 acres below the top of Flood Control Pool elevation (695 NGVD29) and 75 acres required for the dam and appurtenant works are allocated for Project Operations. There are 9,505 acres allocated for recreation-intensive use and 22,718 acres for wildlife management, which includes areas located below the Flood Control Pool elevation. Figure 4.5 depicts Bull Shoals Lake and its immediate surrounding area.



**Figure 4.5 Bull Shoals Lake and Surrounding Area**

Table 4.6 depicts the natural and recreational resource benefits that are derived from Bull Shoals Lake.

**Table 4.6 Natural and Recreational Resource Benefits at Bull Shoals Lake**

<b>Social Benefits</b>			
<b>Facilities</b>	<b>Visits (person-trips)</b>	<b>Benefits in Perspective</b>	
- 30 recreation areas	- 5,552,500 in total	By providing opportunities for active recreation, Corps lakes help combat one of the most significant of the nation's health problems: lack of physical activity.  Recreational programs and activities at Corps lakes also help strengthen family ties and friendships; provide opportunities for children to develop personal skills, social values, and self-esteem; and increase water safety.	
- 89 picnic sites	- 277,625 picnickers		
- 930 camping sites	- 30,371 campers		
- 18 playgrounds	- 1,277,075 swimmers		
- 14 swimming areas	- 166,575 water skiers		
- 13 trail miles	- 2,609,675 boaters		
- 1 fishing docks	- 2,221,000 sightseers		
- 28 boat ramps	- 2,887,300 fishermen		
- 13 marinas	- 333,150 hunters		
- 2,058 marina slips	- 888,400 others		
<b>Economic Benefits</b>			
<b>5,552,500 visits per year resulted in:</b>		<b>Benefits in Perspective</b>	
<ul style="list-style-type: none"> <li>- \$95.87 million in visitor spending within 30 miles of the Corps lake.</li> <li>- 67% of the spending was captured by local economy as direct sales effects.</li> </ul>			
<b>With multiplier effect, visitor trip spending resulted in:</b>		The money spent by visitors to Corps lakes on trip expenses adds to the local and national economies by supporting jobs and generating income. Visitor spending represents a sizable component of the economy in many communities around Corps lakes.	
<ul style="list-style-type: none"> <li>- \$122.22 million in total sales.</li> <li>- \$65.36 million in total income.</li> <li>- Supported 3,277 jobs in the local community surrounding the lake.</li> </ul>			
<b>Environmental Benefits</b>			
			<b>Benefits in Perspective</b>
<ul style="list-style-type: none"> <li>- 62,326 land acres</li> <li>- 45,440 water acres</li> <li>- 740 shoreline miles</li> <li>- 126 acres reforested</li> <li>- 2,100 environmental education contacts</li> </ul>		Recreation experiences increase motivation to learn more about the environment; understanding and awareness of environmental issues; and sensitivity to the environment.	

Source: Value to the Nation web site at [www.CorpsResults.us](http://www.CorpsResults.us). Use Fast Facts to view this and other reports.

Public recreational support facilities are located in 19 parks operated by the Corps of Engineers, Arkansas State Parks, local governments and a marina. These parks include 18 boat ramps, 11 campgrounds, 13 picnic shelters, 11 marinas, seven designated swim areas, and hundreds of miles of undeveloped shoreline.

Park areas offer campsites, playgrounds, hiking trails, group picnic shelters, designated swimming areas, and boat-launching ramps. Over 740 miles of shoreline provide opportunities for photography, wildlife viewing, and relaxation. Fees are charged for the use of some facilities. Concessionaire-operated marinas provide boat and motor rentals, fuel and other related supplies and services.

Table 4.7 presents the amenities available and the various parks in the Bull Shoals Lake area.

**Table 4.7 Bull Shoals Lake Recreation Areas and Amenities**

Recreation Area	Public Launch Ramp	Designated Swim Beach	Group Picnic Shelter	Public Playground	Public Camp Ground	Electrical Outlets	Public Drinking Water	Waterborne Restrooms	Showers	Vault Toilet	Sanitary Dump Station	Marina	Marine Dump Station	Scuba Air	Café or Snack Bar	Lodging	Laundromat
Beaver Creek	•		•	•	•	•	•	•	•	•	•	•			→	→	→
Buck Creek	•	•	•	•	•	•	•	•	•	•	•	•		→	→	→	
Bull Shoals	•				•	•	•			•	→	•	•	•	→	→	→
Bull Shoals State Park	•		•	•	•	•	•	•			•	•			→	→	→
Dam Site	•		•	•	•	•	•	•			•	→			→	→	→
Highway 125	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	
Highway K	•											•					
Kissee Mills					•												
Lakeview	•	•	•	•	•	•	•	•	•	•	•	•		→	→	→	→
Lead Hill	•	•	•	•	•	•	•	•	•	•	•	•	•	→	→	→	→
Oakland	•	•	•	•	•	•	•	•	•	•	•	•	•		→	→	→
Ozark Isle	•			•	•	•	•	•	•	•		→	→		→	→	→
Point Return	•	•	•	•	•		•			•	•	→			→	→	
Pontiac	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	→	
River Run	•			•	•	•	•	•	•	•	•	→			→	→	→
Shadow Rock	•		•	•	•	•	•	•	•		•				→	→	→
Spring Creek	•																
Theodosia	•	•	•	•	•	•	•	•	•	•	•	•			•	•	→
Tucker Hollow	•		•	•	•	•	•	•	•	•	•	•				•	
Woodward	•															→	

• = Available on Project Lands      → = Available Nearby

Source: White River Basin, Minimum Flows FEIS, Revised Jan. 2009, USACE.

Trout fishing in northwest Arkansas and southwest Missouri is not only a favorite recreational pursuit but also generates a significant, positive contribution to state and regional economies. The trout fisheries in Arkansas are unique, as they are non-native to Arkansas waters. Except for brown trout, the trout fishery in these waters is largely a put and take population. There is little doubt that a significant number of trout fishermen originate out of the Ozark region to enjoy these 'world class' fisheries. When implemented, the increased minimum flow for the White River will result in an increased wetted perimeter and water quality benefits for the tail water fishery.

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Numerous sport fishing magazines have described the Corps tailwaters as some of the best trout fishing streams in the world. The current all tackle world record brown trout was caught in the Little Red River (the Greers Ferry Lake tail water) in 1992. It weighed 40 lbs 4 oz. Large brown and rainbow trout are present in the White River waters in Arkansas and Missouri. The current Missouri state record brown trout was taken from Lake Taneycomo in 2005 and weighed 27 lbs 10 oz.

Growth rates as high as three pounds per year have historically been reported in the White River system. However, these good fisheries are far short of the fishery, stream ecology, recreation and economic potentials that could be realized with increased minimum flows.

It is important to keep in mind that the life expectancy of naturally occurring trout is on the average four to eight years. In put-and- take fisheries a very large portion of the rainbow trout are caught annually and replenished by stocking. The brown trout persist for longer periods since they are generally harder to catch than rainbows. The larger trout take several years to acquire memorable and trophy sizes (USACE, 1989). In 1987, Barnes and Hudy indicated that more trophy size brown trout exist per mile in some reaches of the White River than any other river in the world.

#### **4.9 Hazardous, Toxic and Radioactive Waste**

A limited HTRW investigation was performed for the Bull Shoals Lake project area in general accordance with guidance from ER 1165-2-132 and ASTM Standard E 2247-08, *Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property*. The goal of this effort is to identify recognized environmental condition (REC) sites or potential REC sites in connection with the study area. The following is a summary of the initial investigation.

An environmental database search was completed by Banks Environmental Data, Inc. (Banks) to locate REC sites within the area surrounding Bull Shoals Lake. Ten federal and 11 state databases were reviewed. The environmental database report developed by Banks includes reports on each REC site tracked with information about the cause(s) for listing and the site's current status. This information is utilized to determine which, if any, sites warrant scrutiny for the potential presence of HTRW.

##### **4.9.1 Limitations**

This limited HTRW assessment was conducted in general accordance with guidelines set forth by Part 7 of ER 1165-2-132 and ASTM Standard E 2247-08. Accordingly, no guarantee is made or intended that all site conditions were observed or that all records were reviewed.

Much of the information provided in the report was compiled from public records and other sources maintained by third parties. Although reasonable care was exercised in its preparation, The USACE cannot be held responsible for errors, omissions, or inaccurate information from third parties.

Finally, any changes in project actions from those provided the USACE may render the recommendations and conclusions presented in this report void.

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## 4.9.2 Environmental Database Review

A thorough search of Federal, state, and local government web-based environmental databases was conducted to obtain and review records and documents that would aid in identifying known or potential environmental concerns in or near the study area.

Table 4.9 provides the results of the search for potential REC sites listed in federal and state environmental databases as part of the environmental records review for the study area. In addition to plottable sites, a search for orphan sites (sites that are only identified as being within the same ZIP code[s] as the property) was conducted. Maps of plottable sites from all databases reviewed are presented in the complete Banks report, a copy of which can be obtained upon request to the USACE, Little Rock District, Environmental Planning Branch, ATTN: Mr. Michael Rodgers, 700 West Capitol Avenue, Little Rock, AR 72201.

## 4.9.3 Findings

A summary of the results of the search for potential REC sites as outlined in the environmental database report are presented in Table 4.8. The fact that 28 sites of registered underground storage tanks (USTs) or aboveground storage tanks (ASTs) exist within the search area is not a significant concern, as this is typical throughout the country. The two reported leaking USTs (LUSTs) appear to have been removed and/or cleaned up several years ago. The one spill reported appears to be a small quantity of gasoline that occurred at a service station, which should not present a threat to Bull Shoals Lake.

## 4.10 Socioeconomics

The region of economic impact consists of 47 counties spread across two states. Thirty-three counties, the majority, are in Arkansas. The remaining 14 counties are in southern Missouri. These counties represent the Bull Shoals survey area. Table 4.9 shows historical, current, and projected population counts of the counties and the states.

Population growth for the study area has been mixed over the past 20 years. Thirty-nine of the 47 counties had population increases during the past 20 years, three counties had decreases in population and five counties had population decreases in the 1980s and increases during the 1990s. Population forecasts show a similar trend through 2005; six counties are estimated to have population declines while the remaining counties are estimated to have increases. Data was not available for eight of 14 Missouri counties. The states of Arkansas and Missouri have had below average growth when compared to the National statistic, 15.9 percent. Arkansas' and Missouri's populations increased 13.7 and 9.3 percent during the 1990s, respectively. Although both states had population increases that were below that of the National statistic, 32 of the 47 counties had population increases that were greater than the National increase; the range of growth for the counties is -8.2 percent (Woodruff, Arkansas) to 66.3 percent (Christian, Missouri).



**Table 4.8 Environmental Database Research Results Summary for Bull Shoals Lake**

Database	Radius (mi)	Site	1/8 mile	1/4 mile	1/2 mile	>1/2 mile	Orphan	Totals
<b>Federal</b>								
NPL	1.00	---	---	---	---	---	---	0
NPL De-listed	0.50	---	---	---	---		---	0
CERCLIS	0.50	---	---	---	---		---	0
NFRAP	0.50	---	---	---	---		---	0
RCRA TSD	0.50	---	---	---	---		---	0
RCRA COR ACT	1.00	---	---	---	---	---	---	0
RCRA GEN	0.25	---	---	---			---	0
ERNS	0.25	---	---	---			---	0
Federal IC/EC	0.50	---	---	---	---		---	0
Tribal Lands	1.00	---	---	---	---	---	---	0
<b>State</b>								
State/Tribal Sites	1.00	---	---	---	---	---	---	0
State/Tribal SWL	0.50	---	---	---	---		---	0
State Spills 90	0.25	1	---	---			---	1
State/Tribal UST/AST	0.25	---	---	---			28	28
State/Tribal LUST	0.50						2	2
State/Tribal EC	0.50	---	---	---	---		---	0
State/Tribal IC	0.25	---	---	---	---		---	0
State/Tribal VCP	0.50	---	---	---	---		---	0
State/Tribal Brownfields	0.50	---	---	---	---		---	0
State Other	0.25	---	---	---			---	0
<b>Totals</b>		1	---	---	---	---	30	31

Notes:

1. --- indicates no sites/items were found.
2. LUST and UST values represent facilities, some of which contain multiple tanks.
3. Some sites are listed in multiple databases.
4. Orphan sites are sites that are in the databases within the zip codes searched, but are not plottable on maps due to an absence of GIS data.
5. Shaded areas indicate search not required per ASTM Standard E2247-08.

Source: Banks Information Solutions, Inc., 2009.

Table 4.9 County and State Populations

County / State	1980		Percent Change 1980 - 1990	2000		Percent Change 1990 - 2000	2005
	Population	Population		Population	Population		Estimate <sup>1</sup>
<b>ARKANSAS</b>	<b>2,286,435</b>	<b>2,350,725</b>	<b>2.8%</b>	<b>2,673,400</b>	<b>13.7%</b>	<b>2,794,974</b>	
Baxter, AR	27,409	31,186	13.8%	38,386	23.1%	39,931	
Benton, AR	78,115	97,499	24.8%	153,406	57.3%	186,540	
Boone, AR	26,067	28,297	8.6%	33,948	20.0%	35,846	
Calhoun, AR	6,079	5,826	-4.2%	5,744	-1.4%	5,670	
Carroll, AR	16,203	18,654	15.1%	25,357	35.9%	27,272	
Cleburne, AR	16,909	19,411	14.8%	24,046	23.9%	26,142	
Conway, AR	19,505	19,151	-1.8%	20,336	6.2%	20,655	
Crawford, AR	36,892	42,493	15.2%	53,247	25.3%	58,122	
Faulkner, AR	46,192	60,006	29.9%	86,014	43.3%	96,916	
Franklin, AR	14,705	14,897	1.3%	17,771	19.3%	18,387	
Fulton, AR	9,975	10,037	0.6%	11,642	16.0%	12,017	
Independence, AR	30,147	31,192	3.5%	34,233	9.7%	35,320	
Izard, AR	10,768	11,364	5.5%	13,249	16.6%	13,344	
Jackson, AR	21,646	18,944	-12.5%	18,418	-2.8%	16,889	
Johnson, AR	17,423	18,221	4.6%	22,781	25.0%	23,536	
Logan, AR	20,144	20,557	2.1%	22,486	9.4%	22,845	
Lonoke, AR	34,518	39,268	13.8%	52,828	34.5%	59,278	
Madison, AR	11,373	11,618	2.2%	14,243	22.6%	15,059	
Marion, AR	11,334	12,001	5.9%	16,140	34.5%	16,739	
Newton, AR	7,756	7,666	-1.2%	8,608	12.3%	8,760	
Perry, AR	7,266	7,969	9.7%	10,209	28.1%	10,760	
Pope, AR	39,021	45,883	17.6%	54,469	18.7%	57,377	
Prairie, AR	10,140	9,518	-6.1%	9,539	0.2%	9,316	
Pulaski, AR	340,613	349,660	2.7%	361,474	3.4%	368,133	
Searcy, AR	8,847	7,841	-11.4%	8,261	5.4%	8,196	
Sebastian, AR	95,172	99,590	4.6%	115,071	15.5%	121,443	
Sharp, AR	14,607	13,637	-6.6%	17,119	25.5%	17,928	
Stone, AR	9,022	9,775	8.3%	11,499	17.6%	11,883	
Van Buren, AR	13,357	14,008	4.9%	16,192	15.6%	16,697	
Washington, AR	100,494	113,409	12.9%	157,715	39.1%	177,709	
White, AR	50,835	54,676	7.6%	67,165	22.8%	72,352	
Woodruff, AR	11,222	9,520	-15.2%	8,741	-8.2%	8,162	
Yell, AR	17,026	17,759	4.3%	21,139	19.0%	21,943	
<b>MISSOURI</b>	<b>4,916,686</b>	<b>5,117,073</b>	<b>4.1%</b>	<b>5,595,211</b>	<b>9.3%</b>	<b>N/A</b>	
Barry, MO	24,408	27,547	12.9%	34,010	23.5%	35,179	
Christian, MO	22,402	32,644	45.7%	54,285	66.3%	N/A	
Dallas, MO	12,096	12,646	4.5%	15,661	23.8%	N/A	
Douglas, MO	11,594	11,876	2.4%	13,084	10.2%	N/A	
Greene, MO	185,302	207,949	12.2%	240,391	15.6%	N/A	
Howell, MO	28,807	31,447	9.2%	37,238	18.4%	37,930	
Lawrence, MO	28,973	30,236	4.4%	35,204	16.4%	N/A	
McDonald, MO	14,917	16,938	13.5%	21,681	28.0%	22,128	
Newton, MO	40,555	44,445	9.6%	52,636	18.4%	N/A	
Ozark, MO	7,961	8,598	8.0%	9,542	11.0%	9,538	
Polk, MO	18,822	21,826	16.0%	26,992	23.7%	N/A	
Stone, MO	15,587	19,078	22.4%	28,658	50.2%	31,160	
Taney, MO	20,467	25,561	24.9%	39,703	55.3%	44,029	
Webster, MO	20,414	23,753	16.4%	31,045	30.7%	N/A	

<sup>1</sup> Population estimates obtained from the Center for Business and Economic Research, University of Arkansas

Source: White River Basin, Minimum Flows FEIS, Revised January 2009, USACE.

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The cost of water supply storage in a public reservoir to a public water system, which is ultimately passed on to the consumer, is affected by the income status of the counties served by the water system, as defined by Section 322 of the Water Resources Development Act of 1990.

Provision of reduced pricing of water supply storage space for low income communities is contained in Section 322. That statute reads as follows:

*Sec. 322. REDUCED PRICING FOR CERTAIN WATER SUPPLY STORAGE.*

- (h) Provision of Storage Space – If a low income community requests the Secretary to provide water supply storage space in a water resources development project operated by the Secretary and if the amount of space requested is available or could be made available through reallocation of water supply storage space in the project or through modifications to operation of the project, the Secretary may provide such space to the community at a price determined under subsection (c)*
- (i) Maximum Amount of Storage Space – The maximum amount of water supply storage space which may be provided to a community under this section may not exceed an amount of water supply storage space sufficient to yield 2,000,000 gallons of water per day.*
- (j) Price – The Secretary shall provide water supply storage space under this section at a price which is the greater of –*
  - a. The updated construction cost of the project allocated to provide such an amount of water supply storage space or \$100 per acre foot of storage space, whichever is less; and*
  - b. The value of the benefits which are lost as a result of providing such water supply storage space.*
- (k) Determinations – For purposes of subsection (c), the determinations of updated construction costs and value of benefits lost shall be made by the Secretary on the basis of the most recent information available.*
- (l) Inflation Adjustment of Dollar Amount – The \$100 amount set forth in subsection (c) shall be adjusted annually by the Secretary for changes in the Consumer Price Index of All Urban Consumers published by the Bureau of Labor Statistics.*
- (m) Non-Federal Responsibilities – Nothing in this section shall be construed as affecting the responsibility of non-Federal interests to provide operation and maintenance costs assigned to water supply storage provided under this section.*
- (n) Low Income Community Defined – The term “low income community” means a community with a population of less than 20,000 which is located in a county with a per capita income less than the per capita income of two-thirds of the counties in the United States.*

The communities which form the OMRPWA are located within Boone, Johnson, Newton, Marion, Pope, and Searcy counties in Arkansas. Each community has a population of less than 20,000 (as seen in Table 4.1) and has a current average daily usage of less than 2,000,000 gallons of water per day. With future growth and higher per capita usage, each community would still have a current average daily usage of less than 2,000,000 gallons of water per day. The U.S. has 3,092 counties, including the District of Columbia. When their per capita income is ranked highest to lowest, the lowest third of counties are ranked 1 to 1,036. Given the most recent income data from the Economic Guidance Memorandum #09-05, the counties’ per capita income is provided in Table 4.10. Almost all of the area serviced by OMPWRA is located in the five

counties which fall within the lowest third of counties and for which Section 322 reduced pricing is available. Only Pope County does not fall within the lowest third of counties and only a small portion of the area served by OMPWRA falls within Pope County.

**Table 4.10 County Per Capita Income (1999)**

County	Income	County Rank
Pope	\$25,693	1,098
Boone	\$25,422	1,026
Marion	\$22,075	343
Johnson	\$21,495	267
Newton	\$19,620	96
Searcy	\$19,373	80
Lowest Third	\$25,477	1,036

The total storage reallocation for OMRPWA is 10,188.463 ac-ft to provide an estimated yield of 6,000,000 gallons per day. Of that total, 10,096.675 ac-ft, estimated to yield 5,946,000 gallons per day, is eligible for the reduced pricing for low income communities. Using the reduced pricing, the cost of this storage will be \$1,669,990, rather than the \$2,031,889 based on the standard calculation of updated cost of storage. Table 4.11 provides the calculation. The reduced price of \$165.40 for each acre foot was determined by indexing \$100 per acre foot to 2010 price levels using the Consumer Price Index. Per Section 322, the price so adjusted must be lower than the updated cost of storage, but greater than the value of benefits lost for providing such storage space. As shown in Table 5.17, that is the case here--\$1,669,990 is less than the standard updated cost of storage and more than the \$77,927 in hydropower benefits foregone.

The part of the OMRPWA system servicing Pope County is the Lurton-Pelsor Water Association (LWPA), representing .9% of the average daily use served by OMRPWA. The LWPA serves a remote rural area spanning the Newton-Pope County line that includes the small communities of Lurton in Newton County and Pelsor in Pope County. Pelsor and the surrounding area are isolated from the rest of Pope County by the Ozark National Forest. They rely on Newton County for several public services, including water and fire protection, and share a zip code centered in Newton County. The pricing of the 91.788 ac-ft of storage necessary to yield 54,000 gallons per day for the LWPA is under consideration by the Department of the Army, but will be no more than the updated cost of storage for this storage, which is \$18,472. Summing the two portions of the system, total cost of storage for OMRPWA will be not more than \$1,688,462 at FY2010 (October 2009) price level.

The communities which form MCRWD are located in Marion County, Arkansas. In Marion County, each community has a population of less than 20,000 (with the largest town, Bull Shoals, having a population of 2,138). MCRWD is requesting storage that yields less than 2,000,000 gallons of water per day. Marion County has a per capita income less than the per capita income of two-thirds of the counties in the United States. Given that MCRWD meets the terms of eligibility for a "low income community" the cost of the storage is calculated using the reduced price of \$165.40 for each acre foot (\$100 per acre foot indexed to 2010 price levels using the Consumer Price Index). Table 4.11 provides the calculation. The adjusted Low Income Price is lower than the updated cost of storage, and greater than the value of benefits lost for providing such storage space. Therefore, the cost of storage to MCRWD is \$280,861.

**Table 4.11 Low Income Price Adjusted for Inflation**

	<b>1990 price</b>	<b>CPI 1990</b>	<b>CPI OCT 2009</b>	<b>2010 price per ac-ft</b>	<b>Acre Feet</b>	<b>Low-Income Cost of Storage</b>
OMRPWA Agreement No. 1	\$100	130.7	216.177	\$165.40	10,096.675	\$1,669,990
MCRWD	\$100	130.7	216.177	\$165.40	1,698.077	\$280,861

(NOTE: Pricing for OMPWRA Agreement No. 2 for 91.788 ac-ft is under consideration, but would not be more than the standard updated cost of storage of \$18,472.)

#### **4.11 Environmental Justice**

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. On February 11, 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.

The purpose of this executive order is to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from Federal actions and policies on minority and low-income populations or communities. An element emanating from this order was the creation on an Interagency Federal Working Group on Environmental Justice comprised of the heads of seventeen Federal departments and agencies, including the U.S. Army. Each department or agency is to develop a strategy and implementation plan for addressing environmental justice.

It is U.S. Army Corps of Engineers policy to fully comply with Executive Order 12898 by incorporating environmental justice concerns in decision-making processes supporting Army policies, programs, projects, and activities. In this regard, the Army ensures that it would identify, disclose, and respond to potential adverse social and environmental impacts on minority and/or low-income populations within the area affected by a proposed Army action. The initial step in this process is the identification of minority and low-income populations that might be affected by implementation of the proposed action or alternatives. For environmental justice considerations, these populations are defined as individuals or groups of individuals, which are subject to an actual or potential health, economic, or environmental threat arising from existing or proposed Federal actions and policies. Low income is defined as the aggregate annual mean income for a family of four in 2000 of \$17,601.

The race and income demographics of the three counties also differ from State and National statistics. Table 4.12 details the race populations, per capita income, and poverty levels for the 47 counties, Arkansas, and Missouri.

The study area race profile is predominantly white with only a few of the counties having non-white populations that make up more than 10 percent of the population. Of the 47 counties 36 have non-white populations that make up less than 10 percent of the population. This contrast is also apparent when compared to the non-white population percentages of the states and nation. Arkansas' and Missouri's non-white population percentages are 20 percent and 15.1 percent, respectively; and the National percentage is 24.9 percent. Forty-four of the 47 counties have non-white populations that are less than National percentage. This difference is most likely a result of the study area rural location. The race profile non-white population range is from 1.8 percent (Cleburne, Arkansas) to 36.0 percent (Pulaski, Arkansas).

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Income statistics for the study area are also well off state and national values. Forty of the 47 counties in the study area have per capita income below their respective state's value. Arkansas and Missouri per capita income, in 1999 dollars, was \$16,904 and \$19,936, respectively. The National statistic is \$21,587; when comparing the counties to the National value, all 47 counties have per capita income less than \$21,587. The per capita income range is from \$12,536 (Searcy, Arkansas) to \$21,466 (Pulaski, Arkansas). Again, this contrast is most likely a result of the rural location of the study area. Almost all of the OMPWRA service area is located in the five counties which fall within the lowest third of counties and for which Section 322 reduced pricing is available. Only Pope County does not fall within the lowest third of counties and only a small portion of the area served by OMPWRA falls within Pope County. The part of the OMRPWA system servicing Pope County is the Lurton-Pelsor Water Association (LWPA), representing .9% of the average daily use served by OMRPWA. The LWPA serves a remote rural area spanning the Newton-Pope County line that includes the small communities of Lurton in Newton County and Pelsor in Pope County. Pelsor and the surrounding area are isolated from the rest of Pope County by the Ozark National Forest. They rely on Newton County for several public services, including water and fire protection, and share a zip code centered in Newton County. The pricing of the 91.788 ac-ft of storage for LWPA is under consideration by the Department of the Army, but will be no more than the updated cost of storage. Marion County, supplied by MCRWD, is eligible for the status of "low income community;" and, therefore MCRWD is eligible under Section 322 for a reduced cost of storage for the reallocated water storage at Bull Shoals Lake.

Lastly, the study area's poverty levels are below their respective state value, but not to the severity of the latter two categories. The percentage of persons in poverty for 24 of the 47 counties is above that of Arkansas and Missouri values of 15.8 percent and 11.7 percent, respectively. When compared to the National statistic of 12.4 percent, 41 of the 47 counties have a greater percentage of poverty. The poverty statistics range is from 9.1 percent (Christian, Missouri) to 27.0 percent (Woodruff, Arkansas).

**Table 4.12 County and State Race, Income, and Poverty Data**

<b>County / State</b>	<b>Total Race Population</b>	<b>White Population</b>	<b>% Non-White Pop. (2000)</b>	<b>Per Capita Income (1999 \$'s)</b>	<b>% Persons in Poverty (1999 %)</b>
<b>ARKANSAS</b>	<b>2,673,400</b>	<b>2,138,598</b>	<b>20.0%</b>	<b>\$16,904</b>	<b>15.8%</b>
Baxter, AR	38,386	37,547	2.2%	16,859	11.1%
Benton, AR	153,406	139,399	9.1%	19,377	10.1%
Boone, AR	33,948	33,132	2.4%	16,175	14.8%
Calhoun, AR	5,744	4,280	25.5%	15,555	16.5%
Carroll, AR	25,357	23,741	6.4%	16,003	15.5%
Cleburne, AR	24,046	23,613	1.8%	17,250	13.1%
Conway, AR	20,336	17,137	15.7%	16,056	16.1%
Crawford, AR	53,247	49,087	7.8%	15,015	14.2%
Faulkner, AR	86,014	75,973	11.7%	17,988	12.5%
Franklin, AR	17,771	17,091	3.8%	14,616	15.2%
Fulton, AR	11,642	11,371	2.3%	15,712	16.3%
Independence, AR	34,233	32,490	5.1%	16,163	13.0%
Izard, AR	13,249	12,773	3.6%	14,397	17.2%
Jackson, AR	18,418	14,840	19.4%	14,564	17.4%
Johnson, AR	22,781	21,344	6.3%	15,097	16.4%
Logan, AR	22,486	21,690	3.5%	14,527	15.4%
Lonoke, AR	52,828	48,089	9.0%	17,397	10.5%
Madison, AR	14,243	13,665	4.1%	14,736	18.6%
Marion, AR	16,140	15,740	2.5%	14,588	15.2%
Newton, AR	8,608	8,385	2.6%	13,788	20.4%
Perry, AR	10,209	9,762	4.4%	16,216	14.0%
Pope, AR	54,469	51,055	6.3%	15,918	15.2%
Prairie, AR	9,539	8,092	15.2%	15,907	15.5%
Pulaski, AR	361,474	231,211	36.0%	21,466	13.3%
Searcy, AR	8,261	8,035	2.7%	12,536	23.8%
Sebastian, AR	115,071	94,745	17.7%	18,424	13.6%
Sharp, AR	17,119	16,630	2.9%	14,143	18.2%
Stone, AR	11,499	11,185	2.7%	14,134	18.9%
Van Buren, AR	16,192	15,673	3.2%	16,603	15.4%
Washington, AR	157,715	138,796	12.0%	17,347	14.6%
White, AR	67,165	62,811	6.5%	15,890	14.0%
Woodruff, AR	8,741	5,932	32.1%	13,269	27.0%
Yell, AR	21,139	18,312	13.4%	15,383	15.4%
<b>MISSOURI</b>	<b>5,595,211</b>	<b>4,748,083</b>	<b>15.1%</b>	<b>\$19,936</b>	<b>11.7%</b>
Barry, MO	34,010	31,999	5.9%	14,980	16.6%
Christian, MO	54,285	52,824	2.7%	18,422	9.1%
Dallas, MO	15,661	15,262	2.5%	15,106	17.9%
Douglas, MO	13,084	12,673	3.1%	13,785	17.5%
Greene, MO	240,391	224,859	6.5%	19,185	12.1%
Howell, MO	37,238	35,902	3.6%	13,959	18.7%
Lawrence, MO	35,204	33,682	4.3%	15,399	14.1%
McDonald, MO	21,681	19,440	10.3%	13,175	20.7%
Newton, MO	52,636	49,086	6.7%	17,502	11.6%
Ozark, MO	9,542	9,310	2.4%	14,133	21.6%
Polk, MO	26,992	26,253	2.7%	13,645	16.3%
Stone, MO	28,658	27,983	2.4%	18,036	12.8%
Taney, MO	39,703	38,202	3.8%	17,267	12.4%
Webster, MO	31,045	29,866	3.8%	14,502	14.8%

Source: White River Basin, Minimum Flows FEIS, Revised January 2009, USACE.

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Economic activity in the study area is varied, but each county hosts a majority of North American Industry Classification System (NAICS) sectors. The Arkansas counties account for nearly two-thirds of the persons employed in the state; this is due in part to the inclusion of Pulaski County, which accounts for 22 percent of the persons employed in the state. Annual payroll in the study area is greater than \$16.8 billion; over 68 percent of total payroll in the state, and again this is in large part to Pulaski County, which accounts for 26 percent of the state total annual payroll. Arkansas also has a total of 63,185 business establishments, of which, over 61 percent are located in the study area. Pulaski County accounts for over 12,000 establishments or 19.1 percent.

The Missouri counties account for a less robust portion of their state profile in most part because only 14 counties from Missouri were included in the study area. The number of persons employed, annual payroll, and total business establishments are 247,423, \$5.6 billion, and 16,900, respectively. This accounts for 10.3, 7.9, and 11.7 percent of the Missouri totals.

See the discussion on low income community status under Section 322 of WRDA (1999) in Section 4.10 and how that affects water supply storage costs passed on to the consumer.



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# **Section 5.0 Environmental Consequences**

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## 5.0 ENVIRONMENTAL CONSEQUENCES

Evaluation of the environmental consequences that are expected to result from the implementation of the proposed action is accomplished by a comparison of the “future without project conditions” (the No-Action Alternative) to the “future with project conditions” the (Proposed Action Alternatives).

It must also be emphasized here that both the future with and without project conditions include the implementation of the WRMF Project, which results in the raising of normal pool levels in Bull Shoals Lake a maximum of approximately five feet. The impacts of that action have been fully addressed in the *Final Environmental Impact Statement, White River Basin, Arkansas, Minimum Flows, Revised January 2009*.

It is also reiterated here that this EA incorporates by reference the EA and FONSI completed and signed by RUS for the new OMRPWA water transmission system and all of its components; i.e., the water intake facility at Bull Shoals Lake, the water treatment plant, pumping stations, and pipeline distribution network. Therefore, none of those specific components are addressed again in this EA, rather any impacts from that project are taken into account under the existing conditions considerations.

The action alternatives addressed in this EA analyze the future with project conditions under three separate scenarios: reallocation from the conservation pool; reallocation from the flood pool; and, reallocation from the inactive pool. Only one of the considered action alternatives results in a physical difference to lake levels, reallocation from the flood pool (Alternative 3), raises the top of the conservation pool by approximately 0.25 ft. (3 inches). Reallocation from the inactive pool (Alternative 4) would lower the top of the inactive pool by approximately 0.36 ft. (4 inches), but does not have any physical effect on the lake surface level.

Therefore, the final alternatives considered for assessing environmental impacts in this EA are: Alternative No. 1 – No-Action; Alternative No. 2 – Reallocation from the Conservation Pool (the Proposed Action); Alternative No. 3 – Reallocation from the Flood Pool; and, Alternative No. 4 – Reallocation from the Inactive Pool.

The Proposed Action is Alternative No. 2 – Reallocation from the Conservation Pool.

### 5.1 Land Use

Alternative 1 – No-Action: No changes to land use are expected under this alternative.

Alternative 2 – Reallocation from the Conservation Pool: Because this alternative involves no construction, no direct impacts to land use are expected from the proposed action. However, an indirect effect may be the increase in land development as a result of the project area becoming more attractive to recreation/vacation seekers, as well as new permanent residents with the improvements to drinking water quality and the quantity of water available that this project will bring. This increase in population and business ventures would possibly result in more land being converted from undeveloped to commercial or residential use; although, this would be expected to be gradual and take place over an extended period of time.

Alternative 3 – Reallocation from the Flood Pool: Anticipated impacts would be similar to those under Alternative 2.

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Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

## **5.2 Geology/Soils/Prime Farmlands**

Alternative 1 – No-Action: No changes to these related resources are anticipated under this alternative.

Alternative 2 – Reallocation from the Conservation Pool: Because the proposed action involves no construction of facilities and results in no changes to lake levels, it is not expected that there will be any effects to geological formations, floodplains, soils, or prime farmlands within the project area.

Alternative 3 – Reallocation from the Flood Pool: Anticipated impacts would be similar to those under Alternative 2.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

## **5.3 Water Resources**

### **5.3.1 Surface Waters**

Alternative 1 – No-Action: No impacts to surface waters are expected under this alternative.

Alternative 2 – Reallocation from the Conservation Pool: Because this alternative results in no changes to lake water levels or quality, no significant impacts to surface waters are expected under this alternative. Calculations by the USACE SUPER computer model for impacts caused by water storage reallocations show minor beneficial impacts to flood control, hydropower and recreational resources (quantified in dollar amounts) within the proposed project area. Please see Table 5.11 of the Reallocation Report for a summary of these impacts.

Alternative 3 – Reallocation from the Flood Control Pool: This alternative would result in a slight rise in the pool level (approximately 0.25 ft.), but it is not considered significant due to normal slight changes in the pool level due to physical influences such as precipitation events, evaporation, wind, droughts, etc. No other impacts to surface waters are expected under this alternative.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

### **5.3.2 Ground Water/Aquifers**

Alternative 1 – No-Action: No impacts to ground water or aquifers are expected under this alternative. However, in the absence of a water supply plan, the population of north central Arkansas would continue to lack enough good quality drinking water available at a reasonable cost and would experience the continued threat to their life and health due to long term exposure to the radioactive pollutants in the existing water supply from ground water. They would also continue to be at risk for their safety due to a lack of water for emergency services.

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Alternative 2 – Reallocation from the Conservation Pool: This alternative will not result in any changes to ground water levels or affect ground water in any way; therefore, no impacts to ground water quality are expected under this alternative.

Alternative 3 – Reallocation from the Flood Control Pool: Anticipated impacts would be similar to those under Alternative 2.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

Under Alternatives 2 through 4 above, current ground water levels, which are lower within the cone of depression around withdrawal wells under heavy use, may recover slightly with reduced use of ground water for M&I by OMRPWA.

### **5.3.3 Surface Water Quality**

Alternative 1 – No-Action: No impacts to surface water quality are expected under this alternative.

Alternative 2 – Reallocation from the Conservation Pool: Because surface waters will not be impacted under this alternative, no impacts to surface water quality are expected under this alternative.

Alternative 3 – Reallocation from the Flood Control Pool: Anticipated impacts would be similar to those under Alternative 2.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

### **5.3.4 Hydropower**

Alternative 1 – No-Action: No changes to hydropower are anticipated under this alternative.

Alternative 2 – Reallocation from the Conservation Pool: Under the proposed action alternative, reallocation of storage from the conservation pool storage for the M&I water needs would reduce the amount of storage available in the lake for other purposes such as hydropower generation.

Hydropower benefits are based on the cost of the most likely alternative source of power. When storage is reallocated for water supply and an impact occurs to hydropower, the power benefits foregone are equivalent to the cost of replacing the lost power with the most likely alternative source of power.

The power benefits foregone can be divided into two components: (1) The lost energy benefits and (2) lost capacity benefits. In the case of water supply withdrawals, there is usually a loss of energy benefits, and lost energy benefits are based on the loss in generation (both at-site and downstream) as a result of water being diverted from the reservoir for water supply rather than passing through the hydro plant.

The second power-related cost is the revenue foregone.

*“The Corps does not market the power it produces; marketing is done by the Federal power marketing agencies (Southeastern Power Administration, Southwestern Power Administration, Western Area Power Administration, Bonneville Power Administration, Alaska Power Administration) through the Secretary of Energy.” ER 1105-2-100, Planning Guidance Notebook (22 April 2000), Appendix E, paragraph E-42, b(2).*

This is the value of the lost hydropower based on the PMA’s (power marketing agency) current energy rates.

There will be some negative impact to hydropower benefits at the Bull Shoals Dam Power Generation Station. Table 5.1 summarizes hydropower benefits foregone due to storage reallocation from conservation storage, flood control storage, and inactive storage in Bull Shoals Lake.

**Table 5.1 Annual Power Benefits Foregone Due to Reallocation of Storage in Bull Shoals Lake**

<b>Alternative</b>	<b>Hydropower Benefits Foregone</b>
Conservation Pool	\$77,927.00
Flood Control Pool	\$56,334.00
Inactive Pool	\$73,368.00

In addition to hydropower benefits foregone as a result of the proposed action, there will also be some hydropower revenues foregone. Table 5.2 summarizes power revenues forgone due to proposed action alternatives.

**Table 5.2 Hydropower Revenue Foregone Due to Reallocation in Bull Shoals Lake**

<b>Alternative</b>	<b>Hydropower Revenue Foregone</b>
Conservation Pool	\$19,935.00
Flood Control Pool	\$12,295.00
Inactive Pool	\$18,509.00

For a more detailed discussion on hydropower benefits and revenues foregone, please see Section 5.2.1 of the Water Supply Storage Reallocation Report and Section 4.4.4 of this EA.

Alternative 3 – Reallocation from the Flood Pool: Lake levels are expected to increase by approximately 0.25 foot (3 inches). See Tables 5.1 and 5.2 above for annual hydropower benefits and revenues foregone under this alternative.

Alternative 4 – Reallocation from the Inactive Pool: See Tables 5.1 and 5.2 above for annual hydropower benefits and revenues foregone under this alternative.

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## 5.4 Cultural Resources

Alternative 1 – No-Action: Because this alternative involves no construction or land disturbance activities, no cultural resources within the project area will be impacted by this alternative.

Alternative 2 – Reallocation from the Conservation Pool: No cultural resources within the project area will be impacted by this alternative. The Arkansas SHPO replied to the coordination letter submitted for the proposed project that no known historic properties will be affected by this undertaking. A copy of the coordination letter with the reply affixed (stamped and signed) is included in Attachment 1.

Ms. Judith Deel with the Missouri SHPO stated in a telephone conversation on the proposed project that with the reallocation of water supply in Bull Shoals Lake resulting in a less than one-foot change in lake water levels and no new construction occurring on the Missouri side of the lake, there would be little to no impact on cultural resources. Ms. Deel also stated that if the change in the normal operating level of the lake was ever determined to be greater than one foot, further coordination would be required. A copy of the email message from the archaeologist who conducted the telephone interview, documenting Ms. Deel's response, is included in Attachment.

The only known members of a recognized Native American Tribe to be within the proposed project area are of the Osage who are mainly located north of the Bull Shoals Lake area. No comments were received by the Osage Nation.

Alternative 3 – Reallocation from the Flood Pool: Anticipated impacts would be similar to those under Alternative 2.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

## 5.5 Biological Resources

Alternative 1 – No-Action: No impacts are expected to biological resources under the No-Action Alternative.

Alternative 2 – Reallocation from the Conservation Pool: The proposed action alternative will have no physical effect on lake surface levels. Although several protected species are located within the project area, the U.S. Fish and Wildlife Service offices in both Arkansas and Missouri agreed that no significant impact to those species is likely as a result of the proposed project. Expanding this line of thinking to all biological resources of the project area, due to the benign nature of the action, it is anticipated that this alternative will have no impact on biological resources of the project area.

Alternative 3 – Reallocation from the Flood Pool: Under this alternative, there will be an increase in lake levels of approximately 0.25 foot. However, in comparison to normal fluctuations in lake water levels due to natural occurrences, this increase will be insignificant to fish and wildlife, protected species, vegetation, and wetlands and floodplains resources of the project area.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

## 5.6 Air Quality

Alternative 1 – No-Action: Because this alternative involves no addition of new air emission sources or changes to existing emission sources, it is not anticipated to have any significant impacts to air quality within the project area.

Alternative 2 – Reallocation from the Conservation Pool: Implementation of the proposed action alternative may result in a slight decrease in hydropower production during severe drought conditions. Under this scenario, electrical power may have to be increased from other hydropower plants, nuclear power plants, or combustion power plants fueled by fossil fuels such as coal, oil or natural gas. Even if all additional power were supplied from combustion plants, air quality within the project area would not be significantly impacted.

The proposed action of reallocation of storage from the conservation pool will decrease both dependable capacity and energy available from the Bull Shoals Lake power plant. To make up for this loss, power would have to be provided from alternative sources. If the increase power generation were provided by combustion power plants, the increase in emissions could potentially have a minor effect on the air quality in the region of production. Assuming the weight of pollutants emitted by a fossil fuel generation plant to be proportional to power production, the increase in pollutants for this increase in power production would be insignificant based upon the following analysis. To analyze this potential impact, tables 5.3 and 5.4 reflect information gathered from the Department of Energy and the Environmental Protection Agency.

**Table 5.3 Southwestern Power Administration (SWPA) Marketing Region Emission Rates for Coal and Natural Gas Power Generation**

*SO <sub>2</sub>	*NO <sub>x</sub>	*CO <sub>2</sub>
0.006	0.003	1.697
*all units in lbs/kWh		

### 5.4 Arkansas and Missouri Annual Emissions

	*Annual SO <sub>2</sub>	*Annual NO <sub>x</sub>	*Annual CO <sub>2</sub>	*Ozone Season NO <sub>x</sub>
Arkansas	71,132.21	38,011.21	29,375,197.8	16,918.57
Missouri	295,031.83	128,506.86	83,903,379.0	45,188.35
*All units in tons				

Data from EPA's E-GRID2007 database includes the following Year 2005 information for the states of Arkansas and Missouri.

Assuming that annual energy losses equal 1,360,000 kWh for the conservation pool, 794,000 kWh for the flood control pool, and 1,360,000 kWh for the inactive pool and using the SWPA emissions rate averages from combustion plants for comparison purposes, Table 5.5 reflects the annual increase in emissions that would occur because of the reallocations, if the potential loss of power were generated by combustion power generation.



**Table 5.5 Annual Increase in Emissions**

	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>CO<sub>2</sub></b>
Rates	0.006 lbs/kWh	0.003 lbs/kWh	1.697 lbs/kWh
Conservation Pool	8,160	4,080	2,307,920
Flood Control Pool	4,764	2,382	1,347,418
Inactive Pool	8,160	4,080	2,307,920

Percentages of emission increases from the proposed water supply reallocation for the states of Arkansas and Missouri are shown in Table 5.6.

The data presented in Table 5.6 shows the annual increase of pollutant emissions expected to result if the power generation that would be lost because of the proposed action were generated by a combustion power plant. The increased emissions would not significantly increase the health risks to humans associated with exposure to the pollutants. Therefore, the impact to the air quality of the project area and region is considered to be insignificant.

Alternative 3 – Reallocation from the Flood Pool: Anticipated impacts would be similar to those under Alternative 1.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 1.

**Table 5.6 Emission Increases for Arkansas and Missouri – If Power is Replaced by Combustion Plants**

<b>Arkansas</b>			
<b>Percent Annual Increase</b>			
<b>Reallocation Source</b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>CO<sub>2</sub></b>
Conservation Pool	0.019600	0.018339	0.013423
Flood Control Pool	0.019660	0.018396	0.013465
Inactive Pool	0.019600	0.018339	0.013423
<b>Missouri</b>			
<b>Percent Annual Increase</b>			
<b>Reallocation Source</b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>CO<sub>2</sub></b>
Conservation Pool	0.004725	0.005424	0.004700
Flood Control Pool	0.004740	0.005441	0.004714
Inactive Pool	0.004725	0.005424	0.004700

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## 5.7 Recreation

The impact to lake recreation was calculated using the SUPER model. SUPER uses seasonal visitor day curves to calculate recreation benefits with respect to pool elevation. The SUPER model analyzes historical information to estimate damages based on changes to stage and duration levels. There is a negative correlation between high-water conditions and visitor accessibility. SUPER model used the historical data and unit day values to determine the change in recreation benefits. If storage is reallocated from the conservation pool or inactive pool, there is no rise in the conservation pool. Recreational changes are negligible. If storage is reallocated from the flood pool, there is a three-inch raise to the top of the conservation pool. Since the White River Basin Lakes are operated as a system, the changes in Bull Shoals pool elevations and pool durations affect the hydropower and flood releases at both Bull Shoals and Norfolk. In turn, the other White River Basin Lakes' pool elevations and durations are affected. A reallocation from the flood pool, while only three inches of storage, has rippling effects across the recreational opportunities of the entire White River Basin.

The unit day value estimate was based on a point scale where points were assigned, by informed opinion, to five different categories: Recreation Experience, Availability of Opportunity, Carrying Capacity, Accessibility, and Environmental Quality. This value was used in conjunction with the SUPER model's stage duration and visitor data to determine the change in recreation benefits due to a change in stage and duration.

Recreation visitation data was updated in SUPER in 1994. To adjust the values to FY2010, an analysis of the five unit day value categories and annual visitor hours was performed. To assess the possible change in Recreation Experience, Availability of Opportunity, Carrying Capacity, Accessibility, and Environmental Quality, a group of District personnel, who are familiar with the White River lakes, were given the Guidelines for Assigning Points for General Recreation (Table 1, Economic Guidance Memorandum 10-03 and asked to compare the five categories of recreational experience at each lake in 1994 to 2010. No significant changes have occurred that would change the total point values for each lake. Visitor hours for each lake were compiled for the years 1994 to 2010. The only lake with a significant change in visitor hours is Table Rock. Visitor hours between 1994 – 1996 ranged between 35 million and 40 million; visitor hours between 1997 and 2008 ranged between 14 million and 20 million. Given that recreational benefits is a combination of unit day value and visitor days, the SUPER benefits for Table Rock were multiplied by  $\frac{1}{2}$  to adjust for the 50 percent drop in visitation. To update unit day values, SUPER recreational benefits were indexed with the Consumer Price Index from July 1994 to October 2009. While this methodology would not be used in a study where recreation is a significant portion of the benefits – it is warranted in this specific study.

Changes in annual recreation benefits are shown in Table 5.7 for each alternative as compared to the base condition. A reduction in recreation benefits, a negative value, would indicate a potential loss and/or cost as modeled by SUPER.

**Table 5.7 Average Annual Recreational Benefits by Alternative October 2009 values (\$1,000)**

	Base	Conservation	Flood	Inactive
Beaver	9,016.7	9,016.9	9,016.9	9,016.9
Table Rock	4,206.6	4,206.7	4,206.5	4,206.7
Bull Shoals	13,898.9	13,900.4	13,883.0	13,900.2
Norfolk	6,815.6	6,815.8	6,814.8	6,815.8
Greers Ferry	16,347.3	16,347.2	16,347.2	16,347.2
Clearwater	1,176.1	1,176.1	1,176.1	1,176.1
<b>Total Flood Damages</b>	51,461.3	51,463.1	51,444.5	51,463.0
<b>Change In Recreation (\$1000)</b>		1.8	-16.8	1.7
<b>Change in Recreation (\$)</b>		1,823.4	-16,774.9	1,677.5

Alternative 1 – No-Action: No impacts to recreation are expected under this alternative.

Alternative 2 – Reallocation from the Conservation Pool: If storage is reallocated from the conservation pool, there is no rise in the conservation pool. Recreational changes are negligible. The impact to lake recreation was calculated using the SUPER model. Under the proposed action alternative, there would be the highest net gain in recreational benefits of the action alternatives.

Changes in annual recreation benefits are shown in Table 5.7 for each alternative as compared to the base condition. A reduction in recreation benefits, a negative value, would indicate a potential loss and/or cost as modeled by SUPER.

Alternative 3 – Reallocation from the Flood Pool: Under this alternative, there would be a net loss to recreational benefits for Bull Shoals Lake. If storage is reallocated from the flood pool, there is a three-inch raise to the top of the conservation pool. Since the White River Basin Lakes are operated as a system, the changes in Bull Shoals pool elevations and pool durations affect the hydropower and flood releases at both Bull Shoals and Norfolk. In turn, the other White River Basin Lakes' pool elevations and durations are affected. A reallocation from the flood pool, while only three inches of storage, has rippling effects across the recreational opportunities of the entire White River Basin.

Alternative 4 – Reallocation from the Inactive Pool: If storage is reallocated from the inactive pool, there is no rise in the conservation pool. Recreational changes are negligible, but this alternative would result in a slight net gain in recreational benefits.

## **5.8 Hazardous, Toxic and Radioactive Waste**

Alternative 1 – No-Action: Because this alternative involves no construction or land disturbance, no REC sites will be impacted; therefore, no impacts to hazardous, toxic or radioactive wastes (HTRW) are expected under this alternative.

Alternative 2 – Reallocation from the Conservation Pool: Under this alternative, anticipated impacts would be similar to those of Alternative 1.

Alternative 3 – Reallocation from the Flood Pool: Although this alternative would result in a very minor increase in lake levels, no REC sites have been identified in close proximity. Therefore, no impacts to HTRW are anticipated under this alternative.

Alternative 4 – Reallocation from the Inactive Pool: Impacts anticipated under this alternative would be similar to Alternative 1.

## 5.9 Socioeconomics

Alternative 1 – No-Action: The relationship of water supply to the socioeconomic atmosphere of north-central Arkansas is a very close one. Without the implementation of the proposed action, residents and visitors to the north-central Arkansas area will continue to be provided with water of impaired quality. This could have a negative impact on socioeconomics by influencing some residents to move from the area and discouraging new residents and visitors from coming in. As a result, future development of the area, and jobs that may be created as a result, may be curtailed. Tables 5.8 and 5.9 present the expected future population growth by county for the four counties of the project area.

**Table 5.8 Ozark Mountain Regional Public Water Authority Projected Population in Member Counties**

County	1970	1980	1990	2000	Annual Growth 1970-2000	2010*	2020*	2030*	2040*	2050*	2060*	Annual Growth 2000-2060
NEWTON	5,859	7,745	7,685	8,639	1.30%	8,400	8,674	8,973	9,257	9,547	9,837	0.17%
SEARCY	7,790	8,825	7,819	8,276	0.20%	8,046	7,781	7,535	7,281	7,030	6,779	-0.32%
BOONE	19,110	26,119	28,360	36,041	2.13%	38,070	42,228	46,394	50,570	54,740	58,910	0.85%
TOTAL	32,759	42,689	43,864	52,956	1.61%	54,516	58,683	62,902	67,108	71,317	75,526	0.59%
*Population projection for 2010-2030 provided by Center for Business and Economic Research, University of Arkansas. Growth rate extrapolated to 2060 by Little Rock District												

**Table 5.9 Marion County Water Authority Projected Population in Marion County**

County	1970	1980	1990	2000	Annual Growth 1970-2000	2010*	2020*	2030*	2040*	2050*	2060*	Annual Growth 2000-2060
MARION	7,105	11,352	12,039	16,173	2.80%	18,283	20,600	23,071	25,444	27,842	30,240	1.14%
*Population projection for 2010-2030 provided by Center for Business and Economic Research, University of Arkansas. Growth rate extrapolated to 2060 by Little Rock District												

The rate of population growth for the populations of Newton, Searcy, and Boone counties averaged 1.6 percent annually between 1970 and 2000. The rate of population growth, as estimated by the Center for Business and Economic Research at the University of Arkansas, for 2000 to 2060 averages 0.59 percent annually. The rate of population growth for Marion County averaged 2.8 percent annually between 1970 and 2000. The rate of growth for 2000 to 2060 averages 1.14 percent annually. As the OMRPWA member towns have grown, the members have not been able to extend water service to new customers. Currently, there are unfulfilled extension requests for Mt. Sherman, Nail-Swain, East Newton County, Deer, Western Grove, SPG, Marshall, and South Mountain. The Arkansas Board of Health will not allow these

extensions until an adequate water source is available. The lack of safe, clean water is a burden to the residents of these counties, and is a detriment to growth.

Future water supply demands, current water supply, along with the resulting deficits for both OMRPWA and Marion County are shown in tables 5.10 and 5.11.

Alternative 2 – Reallocation from the Conservation Pool: The implementation of the water supply reallocation of the proposed action alternative will provide the project area with a reliable supply of good quality water for expected future growth and water supply demands. Under this alternative, area governments, civic and public organizations and businesses will be able to plan for growth in an organized and confident manner that will benefit both current and new residents and visitors to the region.

**Table 5.10 Ozark Mountain Regional Public Water Authority Water Supply Forecast - Water Deficit**

Year	Maximum Daily Use (gdp*)			Water Supply (gpd)**	Water Deficit (gpd*)		
	Low	Mid	High		Low	Mid	High
2012	4,092,660	4,092,660	4,092,660	700,000	3,392,660	3,392,660	3,392,660
2022	4,175,254	4,627,080	5,140,850	700,000	3,475,254	3,927,080	4,440,850
2032	4,259,514	5,231,340	6,457,496	700,000	3,559,514	4,531,340	5,757,496
2042	4,345,475	5,914,620	8,111,354	700,000	3,645,475	5,214,620	7,411,354
2052	4,433,170	6,687,000	10,188,789	700,000	3,733,170	5,987,000	9,488,789
2062	4,522,636	7,560,360	12,798,286	700,000	3,822,636	6,860,360	12,098,286

\* Gallons per day

\*\* Non-contaminated sources: Nail-Swain, Marshall, Leslie, and Lake Bull Shoals Estates

**Table 5.11 Marion County Regional Water District Water Supply Forecast - Water Deficit**

Year	Maximum Daily Use (gdp*)			Water Supply (gpd*)	Water Deficit (gpd*)		
	Low	Mid	High		Low	Mid	High
2012	1,032,845	1,032,845	1,032,845	1,000,000	32,845	32,845	32,845
2022	1,163,698	1,361,360	1,588,694	1,000,000	163,698	361,360	588,694
2032	1,311,129	1,794,320	2,443,684	1,000,000	311,129	794,320	1,443,684
2042	1,477,238	2,365,000	3,758,808	1,000,000	477,238	1,365,000	2,758,808
2052	1,664,392	3,117,180	5,781,694	1,000,000	664,392	2,117,180	4,781,694
2062	1,875,257	4,108,555	8,893,241	1,000,000	875,257	3,108,555	7,893,241

\* Gallons Per Day

Alternative 3 – Reallocation from the Flood Pool: Impacts anticipated under this alternative would be similar to Alternative 2.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

## 5.10 Environmental Justice

Alternative 1 – No-Action: Under this alternative it is anticipated that low income communities served by OMRPWA in Boone, Marion, Johnson, Newton and Searcy Counties and Lurton-

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Pelsor in Pope County, as well as communities in Marion County served by MCRWD, would be disproportionately adversely affected.

Alternative 2 – Reallocation from the Conservation Pool: Under the proposed action alternative, no disproportional adverse impacts are anticipated to any racial or ethnic minority, low-income, or otherwise disadvantaged population within the project area. Conversely, the implementation of this alternative is anticipated to improve the water quality supplied to the low income communities served by OMRPWA and MCRWD.

Alternative 3 – Reallocation from the Flood Pool: Anticipated impacts would be similar to those under Alternative 2.

Alternative 4 – Reallocation from the Inactive Pool: Anticipated impacts would be similar to those under Alternative 2.

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# **Section 6.0**

# **Cumulative Impacts**

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## 6.0 CUMULATIVE IMPACTS

Cumulative impacts are defined in 40 CFR 1508.7 as those impacts that result from:

*“. . .the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”*

Cumulative impacts result when the effects of an action are added to or interact with other effects in a delineated geographic space and within a defined time period. The combination of these effects, and any resulting environmental degradation, is the focus of cumulative impact analysis. The concept of cumulative impacts considers all disturbances, direct or indirect, because cumulative impacts result in the compounding of the effects of all actions over time. Consequently, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or community of the proposed action and all other actions affecting that item regardless of the entity (i.e., federal, non-federal, or private) responsible for the actions.

Activities that may result in cumulative impacts include, but are not limited to, the addition of materials to the environment from multiple sources, repeated removal of materials or organisms from the environment, and repeated environmental changes over large areas and long periods. Complicated cumulative effects occur when stresses of different types combine to produce a single effect or suite of effects. Large, contiguous habitats can be fragmented, making it difficult for organisms to locate and maintain populations in disjunctive habitat fragments. Cumulative impacts may also occur when the timing of perturbations is so close in space that their effects overlap.

In assessing cumulative impacts, consideration should be given to the following items:

- The degree to which the proposed action affects public health and safety;
- Unique characteristics of the geographic area;
- The degree to which the possible effects on the human environment are highly controversial; and
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts on the environment.

Council on Environmental Quality (CEQ) regulations explicitly state that cumulative impacts must be evaluated and with direct and indirect effects of alternatives in NEPA documents. By mandating the assessment of cumulative impacts, the regulations ensure that the range of actions considered in NEPA documents includes not only the proposed action but also all past, present, or reasonably foreseeable future actions that could contribute to cumulative impacts. With this guidance in mind, the following section discusses actions that have been identified that when combined with the current proposed action of storage reallocation from Bull Shoals Lake could have a cumulative effect on the environment.

### 6.1 Geographic and Temporal Boundaries

This analysis begins with the establishment of a set of geographic and temporal boundaries within which the cumulative effects of past, present, and reasonably foreseeable future actions

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will be assessed. Defining these boundaries is an important process in refining the scope of the cumulative impact assessment.

### **6.1.1 Geographic Boundaries**

The geographic boundaries for the Bull Shoals Lake project area include the lake itself, the surrounding shoreline, and the upland habitat and communities immediately adjacent to the shoreline.

The Bull Shoals Lake begins at the Bull Shoals Dam, which is located at river mile 79.0 on the White River. The lake is about seven miles northwest of Mountain Home. The lake is located mainly within Marion and Boone Counties, Arkansas, but also extends into Baxter County, Arkansas, as well as Taney and Ozark Counties, Missouri. The lake surface area covers 48,005 acres (at 659 ft. NGVD). The lake drains approximately 6,036 square miles of surrounding land.

### **6.1.2 Temporal Boundaries**

The cumulative impacts from past actions at Bull Shoals Lake involve predominantly the impoundment of the White River and one subsequent reallocation of water supply storage from the lake. Because significant impacts to natural resources and human communities began with the impoundment of the lake, the temporal boundary for cumulative impact is considered to have begun in 1947, when dam construction began. Because the lake was created under the authority of the Flood Control Act of 1938, it will remain an authorized project until Congress determines otherwise. Consequently, the lake's status must be considered indefinite and no future temporal boundary can be established for cumulative impacts assessment.

## **6.2 Past Actions**

### **6.2.1 Past Engineering Projects**

The only significant engineering project undertaken for Bull Shoals Lake was the creation of the lake by the construction of Bull Shoals Dam and the impoundment of the White River, which was completed in 1951. The creation of Bull Shoals Lake altered aquatic and terrestrial habitat in the project area, converting the area within the lake's footprint from a riverine to a lacustrine environment. The creation of the lake significantly transformed environmental and economic conditions in the region. Human communities and industries in the footprint of the lake were forced to relocate. Cultural resources within the new lake footprint may have been inundated. The portion of the main stem of the White River, where the lake was formed, was transformed from a lotic (free-flowing) aquatic habitat to a lentic (static) aquatic habitat. Additionally, the surrounding uplands within the lake footprint were likewise converted to a lotic aquatic habitat. This habitat conversion restricted the terrestrial habitat diversity in the region but increased the available aquatic habitat, resulting in the proliferation of a number of game fish species. The increase in fish species together with the increased area for water sports led to an increase in recreational opportunities and activities in the region, which in turn led to the growth of communities to support recreation at the lake. Therefore, the creation of Bull Shoals Lake resulted in a net benefit to socioeconomic conditions in the project area.

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## **6.2.2 Water Storage Projects**

There has been only one M&I water supply storage reallocation from Bull Shoals Lake since the project's inception. The Corps reallocated 880 acre-feet under the general authority of the Water Supply Act of 1958, as amended, for use by Marion County Regional Water District, intended to yield 1 MGD water supply.

As part of this study, the volume required to yield 1 MGD will be updated based upon the current reallocation request, as well as the reallocation for the WRMF Project summarized below.

The WRMF Project report and the ROD were completed in January 2009. Project BS-3, the recommended plan specific to Bull Shoals Lake was authorized by the FY06 EWDAA Section 132(a). Plan BS-3 reallocates five feet of flood control storage, totaling 233,000 acre-feet, for the target minimum flow release of 800 cfs. The top of the conservation pool will be raised 5 feet from elevation 654 to 659 feet NGVD29.

## **6.3 Present Actions**

### **6.3.1 Current and Pending Engineering Projects**

Current engineering project outputs for Bull Shoals Lake through Fiscal Year (FY) 2008 (U.S. Army Corps of Engineers Little Rock District, White River Basin, Arkansas Minimum Flows Project Report, January 2009) include:

- \$190 million estimated for cumulative flood damages prevented;
- 3 million visitors annually for recreational use of the lake and land resources;
- 753,700 megawatt hours for average annual hydropower generation; and
- 0.85 MGD average daily demand for water supply by Marion County Regional Water Authority.

### **6.3.2 Current and Pending Storage Reallocations**

There is currently one M&I water supply storage reallocation from Bull Shoals Lake. It is for MCRWD for 880 acre-feet, intended to yield 1 MGD.

The WRMF Project report and the ROD were completed in January 2009. Project BS-3, the recommended plan specific to Bull Shoals Lake was authorized by the FY06 EWDAA Section 132(a). Plan BS-3 reallocates five feet of flood control storage, totaling 233,000 acre-feet, for the target minimum flow release of 800 cfs. The top of the conservation pool was raised 5 feet from elevation 654 to 659 feet NGVD29. The project is nearing the end of the engineering and design phase.

## **6.4 Reasonably Foreseeable Future Actions**

### **6.4.1 Future OMRPWA and MCRWD Water Delivery Systems**

With the population of north central Arkansas area expected to continue increasing at the current rate, it is reasonable to expect that OMRPWA (and perhaps MCRWD, as well) may seek

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additional water supply at some future time. Another reallocation would likely require additional infrastructure (pumping plants, treatment facilities, pipelines, etc.).

There are currently plans to construct a new water delivery system for OMRPWA members that would provide approximately 4.5 MGD to the region in order to meet current water consumption, although it would be designed to provide 6.0 MGD, as needed in the future. The project currently includes the following features:

- Construct a water intake structure on Bull Shoals Lake;
- Construct a 6.0 MGD water treatment facility to be located near Diamond City, Arkansas;
- Install ductile iron transmission lines connecting the intake structure and treatment facility to OMRPWA member systems;
- Construct water storage tanks, which will supply water by gravity flow to each bulk customer; and,
- Construct booster pumping stations and install pressure reducing valves in order to serve the mountainous regions.

The environmental effects of this proposed action have been evaluated in an EA completed by the USDA Rural Utility Service (RUS) in August 2009, which resulted in a finding of no significant impact. The cumulative effects of this proposed action in combination with the impacts being evaluated in this EA are not anticipated to result in any significant adverse environmental impacts.

Additional future water supply needs could also result in the need to develop new water supply sources such as creating reservoirs by damming other currently free-flowing rivers and streams, which would result in the loss of wildlife habitat and the alteration of existing aquatic habitat in those stream sections affected by the dams. Economic impacts would also be felt by land owners who would be affected by the acquisition of their property for use in the reservoirs.

Potential impacts from future infrastructure improvements will require detailed analysis and documentation of compliance with federal laws such as the NEPA, Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA), among others, before any construction begins, if any federal agencies are involved or any federal funds are utilized to plan or construct these improvements.

Potential impacts, depending on the amount of the reallocation of storage and/or the exact location of water treatment facilities, pipeline routes, etc. could have impacts on most of the resources identified in this EA, such as land use, water resources, biological resources, cultural resources, and floodplains and wetlands. Permits such as that required under Section 404 of the Clean Water Act for impact to wetlands would almost certainly be required for any pipeline crossings of streams and other water bodies.

Currently, MCRWD intends to use the existing infrastructure to supply water from Bull Shoals Lake. No additional treatment facilities or line work are currently planned by MCRWD and are, therefore, not considered part of this reallocation.

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## 6.5 Cumulative Impacts Assessment

Table 6.1 summarizes the cumulative impacts resulting from the proposed action and any reasonably foreseeable future actions related to the proposed action. Cumulative impacts are assessed individually for each significant resource discussed in Section 4.0.

## 6.6 Summary and Conclusion

The most significant environmental impacts, in consideration of cumulative effects, undoubtedly occurred at the time of construction of the Bull Shoals Dam and the creation of Bull Shoals Lake in the late 1940s.

Future reallocations, depending on size, areas impacted, and design features, could result in adverse cumulative impacts (at least potentially) to almost all of the resources evaluated above. Minor temporary impacts to biological and water resources and soils will likely result from the construction of new pump stations and pipelines. Potential impacts to cultural resources could result from pipeline and pump station construction, should any such resources be disturbed by construction activities. Minor permanent cumulative impacts to air quality, the noise environment, and HTRW sources would occur should diesel power be selected for the pump.

With the increase in availability of water for municipal and industrial use will likely come an increase in development and population in the project areas. These actions could result in minor adverse impacts to land use, water resources, cultural resources, biological resources, air quality, and the noise environment. However, beneficial impacts may occur to the socioeconomic structure and recreational opportunities and facilities as a result of the proposed action and reasonably foreseeable future actions.

**Table 6.1 Cumulative Impacts Assessment**

<b>Resource Area</b>	<b>Past Actions</b>	<b>Proposed Action/ Reallocation/ Present Actions</b>	<b>Reasonably Foreseeable Future Actions</b>	<b>Cumulative Impact</b>
<b>Land Use</b>	These actions resulted in the removal of some lands from agricultural or industrial use due to submersion. Some lands were also removed by increased development of lands surrounding the lakes.	Potential increase in development due to availability of additional M&I water supply.	Potential increase in development due to availability of additional M&I water supply.	Lands inundated by the formation of the lakes have been eliminated from human use. Otherwise, no change from current conditions.
<b>Topography, Physiography, and Soils</b>	Submersion of upland terrestrial soils from lake creation converted upland soils to aquatic soils. Some area soils were converted to urban environment because of an increase in development resulting from additional M&I water supply. Flood control benefits from construction of dam.	Potential conversion of soils to urban environment could result if development increases because of additional M&I water supply.	Potential conversion of soils to urban environment could result if development increases because of additional M&I water supply.	Soils inundated by the formulation of the lakes have been converted from terrestrial to aquatic soils. Some soils in the vicinity of the lakes have been converted to urban environment because of increased development of areas surrounding the lakes.
<b>Water Resources</b>	These actions have increased the quantity of water available in the project area by creating Bull Shoals Lake.  Increase in water needs from increase in development due to availability of M&I water supply.	These actions have reduced, to a minor amount, the quantity of water in Bull Shoals Lake available for other purposes.  Potential increase in future water needs from potential increase in development due to availability of additional M&I water supply.	Future pipeline crossings of streams and other water bodies could potentially require Section 404 permits.	Congressional approval may be required for future storage reallocations at Bull Shoals Lake should they exceed the Corps' limit of 50,000 AF.

<b>Resource Area</b>	<b>Past Actions</b>	<b>Proposed Action/ Reallocation/ Present Actions</b>	<b>Reasonably Foreseeable Future Actions</b>	<b>Cumulative Impact</b>
<b>Cultural Resources</b>	Submersion of some cultural resources caused by increase in water levels resulting from lake creation.	No adverse effects anticipated from storage reallocations due to no change in water levels.	Potential adverse effect due to construction depending upon future infrastructure locations and route of pipelines. Cultural resources investigations would be required to obtain necessary clearances prior to construction. Possibility of minor cultural resource disturbance from potential increase in development due to availability of additional M&I water supply.	Original formation of lakes likely resulted in loss of some cultural resources.
<b>Biological Resources</b>	Habitat disturbance resulting from the conversion of lotic aquatic and terrestrial upland and wetland habitat to lentic aquatic habitat. Increase in aquatic habitat and, in particular, fishery resources.	Possibility of minor habitat disturbance from potential increase in development due to availability of additional M&I water supply.	Possibility of minor habitat disturbance from future water treatment plant and pipeline construction. Coordination with state and federal agencies would insure no significant impacts to valuable habitat. Future regional water needs may result in the necessary damming and reservoir construction of currently free-flowing rivers. This would result in the loss of wildlife habitat and the alteration of existing aquatic habitat.	Original formation of lakes converted significant amounts of land from wildlife habitat to aquatic habitat. Only minor construction related habitat disturbance due to new water intake and pipeline. No endangered or threatened species would be impacted.
<b>HTRW</b>	None	None	HTRW investigations would be performed prior to construction.	None, currently.

<b>Resource Area</b>	<b>Past Actions</b>	<b>Proposed Action/ Reallocation/ Present Actions</b>	<b>Reasonably Foreseeable Future Actions</b>	<b>Cumulative Impact</b>
<b>Air Quality</b>	Increases in air emissions due to additional thermal (coal, etc.) generation of electricity resulting from a small loss in hydropower generation.	Minor increases in air emissions due to additional thermal (coal, etc.) generation of electricity resulting from a small loss in hydropower generation. None	Potential minor and temporary increases in emissions if other sources of power generation are required to mitigate hydropower losses from future infrastructure improvements. Possible temporary increases in noise emissions from construction activities should infrastructure improvements be included.	Potential minor increase in emissions if other sources of electrical power generation are required to mitigate hydropower losses. None
<b>Noise</b>	Temporary increases in noise emissions from construction activities.	None	Benefit to local economic growth potential because of a reliable water supply distribution. Should increased regional water supply needs result in the creation of new reservoirs on rivers and streams, local economic impacts could result from the acquisition of land from land owners for reservoir use.	Cumulative impacts to hydropower production could result from future storage reallocations as a result of decreased storage. Whether this impact would be significant depends upon the size of future reallocations and is in fact regulated by the authority given to the Chief of Engineers in paragraph 4-32d(1) of ER 1105-2-100, Policy and Planning, which states that the Commander, USACE is authorized to reallocate up to 15 percent or 50,000 AF, whichever is less, of the total storage capacity allocated to all authorized project purposes, provided the reallocation has no severe effect on other authorized purposes and will not involve major structural or operational changes.



<b>Resource Area</b>	<b>Past Actions</b>	<b>Proposed Action/ Reallocation/ Present Actions</b>	<b>Reasonably Foreseeable Future Actions</b>	<b>Cumulative Impact</b>
<b>Recreation</b>	The formation of Bull Shoals Lake created significant new recreational opportunities for the area. No adverse impacts to any existing recreation resources.	No significant adverse impacts to any recreational resources.	No significant adverse impacts to any recreational resources.	No adverse cumulative impacts to recreation.



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# **Section 7.0**

# **Environmental Compliance**

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## 7.0 ENVIRONMENTAL COMPLIANCE

Table 7.1 presents amplifying information on the environmental compliance of the proposed project.

**Table 7.1 Status of Project with Applicable Laws and Statutes**

Item	Compliance
<b><u>Federal Statutes</u></b>	
Archaeological and Historic Preservation Act, as amended, 16 U.S.C. 469, <i>et seq.</i>	Full
Clean Air Act of 1977, as amended, 42 U.S.C. 7609, <i>et seq.</i>	Full
Clean Water Act, as amended, (Federal Water Pollution Control Act) 33 U.S.C. 1251, <i>et seq.</i>	Full
Coastal Zone Management Act, 16 U.S.C. 1451, <i>et seq.</i>	N/A
Endangered Species Act, 16 U.S.C. 1531, <i>et seq.</i>	Full
Estuary Protection Act, 16 U.S.C. 1221, <i>et seq.</i>	N/A
Federal Water Project Recreation Act, 16 U.S.C. 460-12, <i>et seq.</i>	Full
Fish and Wildlife Coordination Act, 16 U.S.C. 661, <i>et seq.</i>	Full
Land and Water Conservation Fund Act, 16 U.S.C. 460/ -460/-11, <i>et seq.</i>	N/A
Marine Protection, Research and Sanctuary Act, 33 U.S.C. 1401, <i>et seq.</i>	N/A
National Environmental Policy Act, 42 U.S.C. 4321, <i>et seq.</i>	Ongoing
National Historic Preservation Act, 16 U.S.C. 470a, <i>et seq.</i>	Full
Rivers and Harbor Act, 33 U.S.C. 401, <i>et seq.</i>	N/A
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, <i>et seq.</i>	N/A
Wild and Scenic Rivers Act, 16 U.S.C. 1271, <i>et seq.</i>	Full
<b><u>Executive Orders, Memorandums, etc.</u></b>	
Executive Order 11988, Floodplain Management, May 24, 1977 (42 CFR 26951; May 25, 1977)	Full
Executive Order 11990, Protection of Wetlands, May 24, 1977 (42 CFR 26961; May 25, 1977)	Full
Council on Environmental Quality Memorandum of August 11, 1980: Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act.	Full
Executive Order 12114, Environmental Effects Abroad of Major Federal Actions.	N/A
Executive Order 12898, Feb. 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	Full
<b><u>State and Local Policies</u></b>	
Arkansas Water Quality Standards	Full

### Notes:

**Full Compliance (Full):** Having met all requirements of the statute, E.O. or other environmental requirements for the current stage of planning.

**Ongoing:** Coordination ongoing, and will be completed prior to signing of FONSI.

**Not Applicable (N/A):** No requirements for the statute, E.O. or other environmental requirement for the current stage of planning.



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# **Section 8.0**

# **Conclusions**

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## 8.0 CONCLUSIONS

*This EA has evaluated the proposed action of reallocating water supply storage from Bull Shoals Lake. The EA has considered and evaluated the reallocation of storage from the flood control pool, the conservation pool (hydropower pool), and the inactive pool; along with the No-Action Alternative. Consideration was given to alternatives such as water withdrawal from groundwater sources, existing surface water sources, development of new reservoirs, purchase of water from other water authorities, and structural and non-structural solutions. These alternatives were not viable either economically and/or environmentally and would not meet the needs of the sponsor.*

*The proposed action, the reallocation from the conservation pool, results in fewer potentially adverse impacts to the environment than the other alternatives presented in this EA. The proposed action would have a slight annual hydropower benefits reduction (\$77,927.00), but that reduction is not substantial when the existing current reductions are considered (for details on methods and calculations for hydropower benefits foregone, please see Section 4.4.4). There have been no significant impacts to the natural or human environment identified as a result of this assessment of the proposed Ozark Mountain Water Public Water Authority and Marion County Regional Water District Water Supply Storage Reallocation.*

The OMRPWA and MCRWD requests for the Municipal and Industrial water supply storage from the conservation pool at Bull Shoals Lake would meet the future water supply needs of north central Arkansas.

In accordance with NEPA statutory and CEQ regulation guidelines, based upon the analysis in this Environmental Assessment, it is recommended that a Finding of No Significant Impacts (FONSI) be prepared for the reallocation of 11,886.541 ac-ft of conservation pool at Bull Shoals Lake from hydropower purpose to Municipal and Industrial water supply for OMRPWA and MCRWD pursuant to the Water Supply Act of 1958, Public Law 85-500, as amended.



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# **Section 9.0**

# **List of Preparers**

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## 9.0 LIST OF PREPARERS

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# **Section 10.0 References**

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- Environmental FirstSearch Report*, October 7, 2009, Banks Environmental Data
- Finding Of No Significant Impact*, August 24, 2009, Rural Utility Service, U.S. Department of Agriculture



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# **Section 11.0 Public Involvement/ Workshops**

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## **11.0 PUBLIC INVOLVEMENT/WORKSHOPS**

A public workshop was held on June 30, 2009, from 6 to 8 pm at the Gaston's Visitor Center at Bull Shoals Dam with 74 people attending. A second public workshop was held in Diamond City, Arkansas on July 1, 2009, from 6 to 8 p.m. at the Diamond City Community Center with 24 people attending. Copies of news releases announcing these two meetings are included in Attachment 1, Public Scoping Materials. There were no comments in opposition to the proposed reallocation of 7 MGD from Bull Shoals Lake (conservation pool or flood pool or a combination of both) for OMRPWA and MCRWD. Therefore, the decision was made to proceed with an Environmental Assessment, not an Environmental Impact Statement, for the reallocation study.

Please see Attachment 1 for copies of press releases published for announcement of the workshops.



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# **Section 12.0**

# **Agency Coordination**

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## 12.0 AGENCY COORDINATION

Coordination letters were sent out September 15, 2009, requesting agency comments and concerns regarding an Environmental Assessment for the Reallocation at Bull Shoals Lake. No major concerns have been received to date. Please see Section 12.0 Agency Coordination for a complete list of agencies, organizations, and offices solicited for their views on the proposed project.

Table 12.1 lists agencies, organizations, and offices solicited for their views on the proposed project, along with summary descriptions of any responses received to date.

**Table 12.1 Project Agency/Office Coordination**

Agency/Office Solicited	Response Received	Response/Concerns
<b>Missouri Addressees:</b>		
U.S. Fish and Wildlife Service Columbia, MO 65203	Oct. 19, 2009	No protected species or critical habitat within project area.
U.S. Department of Agriculture St. Louis, MO 63141		
U.S. Natural Resources Conservation Service Springfield, MO 65802	Oct. 19, 2009	Will comment upon reviewing draft EA.
Missouri NRCS State Office Columbia, MO 65203		No response received to date.
Missouri State Historic Preservation Office Jefferson City, MO 65102	Oct. 21, 2009	Project not likely to affect any known cultural resources within project area.
<b>Arkansas Addressees:</b>		
Arkansas Historic Preservation Program Little Rock, AR 72201	Oct. 9, 2009	No known historic properties will be affected by this undertaking.
Department of Finance & Administration Little Rock, AR 72203	Sep. 22, 2009	Will comment upon reviewing draft EA.
Arkansas Soil and Water Conservation Comm. Little Rock, AR 72201		No response received to date.
Arkansas Forestry Commission Little Rock, AR 72201		No response received to date.

Arkansas Game and Fish Commission Little Rock, AR 72205	Sep. 25, 2009	Concerns were in regards to new water supply pipeline that will be required under a different action.
Arkansas Dept of Environmental Quality Little Rock, AR 72118		No response received to date.
Arkansas Natural Heritage Commission Little Rock, AR 72201		No response received to date.
U.S. Geological Survey Little Rock, AR 72211		No response received to date.
Arkansas Natural Resources Commission Little Rock, AR 72201		No response received to date.
Arkansas Department of Parks and Tourism Little Rock, AR 72201		No response received to date.
Arkansas Department of Health Little Rock, AR 72205		No response received to date.
U.S. Department of Agriculture, NRCS Little Rock, AR 72201	Sep. 24, 2009	No effect on Prime Farmland or Farmland of Statewide Importance.
Arkansas Highway and Transportation Department Little Rock, AR 72211		No response received to date.
U.S. Fish and Wildlife Service Conway, AR 72032	Nov. 5, 2009	No federally listed endangered, threatened or candidate species present within project area.
<b>Other Addressees:</b>		
Southwestern Power Administration Tulsa, OK 74103	Oct. 20, 2009	Impacts and costs of increased air emissions should be quantified and impacts to hydropower should be detailed. Strongly objects to the use of the inactive pool as a viable alternative for the report and EA.
U.S. Environmental Protection Agency, Region 6 Dallas, TX 75202		No response received to date.
National Park Service, Midwest Region		No response received to date.

<p>Omaha, NE 68102</p> <p>FEMA, Region VI Denton, TX 76210</p>	<p>Oct. 15, 2009</p>	<p>Possible negative impacts on identified special flood hazard areas within project area. Also, referred to floodplain managers for Marion and Baxter Counties.</p>
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For a copy of an example coordination letter mailed to the addressees in the above table, and copies of correspondence received thus far, please go to Attachment 2, Initial Agency Coordination.



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# **Attachment 1**

# **Public Scoping Materials**

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**US Army Corps  
of Engineers®**  
Little Rock District

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**Release No. 63-09**

**Contact: P.J. Spaul**

**Phone: (501) 324-5551**

***For Release: Immediately***

Downloadable District news is available at <http://www.swl.usace.army.mil/news&info/newsrel.html> on the World Wide Web.

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## **WORKSHOP SET TO DISCUSS WATER SUPPLY PROPOSAL AT BULL SHOALS LAKE**

LITTLE ROCK, Ark., June 8 --The Army Corps of Engineers' Little Rock District will host a public workshop June 30 to provide information and gather public input about the proposed reallocation of storage space in Bull Shoals Lake to provide four to six million gallons of water a day supply to Ozark Mountain Regional Public Water Authority.

The meeting will be held from 6 to 8 p.m. Tuesday, June 30, in the James A. Gaston Visitor Center at the Bull Shoals-White River State Park adjacent to Bull Shoals Dam.

OMRPWA is a coalition of 22 water systems in Arkansas that was formed in 2004 to pursue a future water supply for the north central Arkansas area. The authority serves 22,000 people in Boone, Newton, Searcy and parts of Marion counties.

Studies of the proposed storage reallocation are about to begin, and Corps officials are conducting the workshop to help dispel rumors and gather public input. Among other things, the studies will determine whether the potential reallocation would come from the flood pool or the conservation pool. If it comes from the flood pool, there will be minimal lake level changes. If it comes from the conservation pool, there will be no change in the lake level.



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The meeting will be an open house format. Interested persons are invited to drop by any time during the two-hour workshop to review information about the proposal, ask questions one-on-one of the study team, and submit written comments. All interested parties are urged to attend.

**-MORE-**

**WORKSHOP SET TO DISCUSS WATER SUPPLY PROPOSAL...**

For those who are unable to attend but who would like to submit comments, please mail them to Little Rock Engineer District, attn: CESWL-PE, P.O. Box 867, Little Rock, AR 72203-0867. Submissions must be postmarked by June 30. You can also send comments by e-mail by June 30 to [Renee.S.Wright@usace.army.mil](mailto:Renee.S.Wright@usace.army.mil).

**--30--**



**US Army Corps  
of Engineers®**  
Little Rock District

# News Release

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**Release No. 66-09**

**Contact: P.J. Spaul**

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**Phone: (501) 324-5551**

*For Release: Immediately*

Downloadable District news is available at <http://www.swl.usace.army.mil/news&info/newsrel.html> on the World Wide Web.

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## **SECOND WORKSHOP SET TO DISCUSS WATER SUPPLY PROPOSAL FOR BULL SHOALS LAKE**

LITTLE ROCK, Ark., June 12 --The Army Corps of Engineers Little Rock District has announced it will hold a second public workshop, this one on July 1 in Diamond City, Ark., to discuss and gather input about the proposed reallocation of storage space in Bull Shoals Lake to provide water supply to Ozark Mountain Regional Public Water Authority.

The second workshop will be held from 6 to 8 p.m. July 1 at the Diamond City Community Center at 232 Grand Ave. Last week the Corps announced the first workshop will be held from 6 to 8 p.m. June 30 in the James A. Gaston Visitor Center at the Bull Shoals-White River State Park.

OMRPWA is a coalition of 22 water systems that serve 22,000 people in Boone, Newton, Searcy and parts of Marion counties. It is seeking lake storage to provide four to six million gallons of water a day.

Studies are about to begin, and Corps officials are conducting the workshops to help dispel rumors and gather public input. Among other things, the studies will determine whether the potential reallocation would come from the flood pool or the conservation pool. If it comes

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from the flood pool, there will be minimal lake level changes. If it comes from the conservation pool, there will be no change in the lake level.

Interested persons are invited to drop by any time during the two-hour workshops to review the proposal, ask questions one-on-one of the study team, and submit written comments.

**-MORE-**

## **WORKSHOP SET TO DISCUSS WATER SUPPLY PROPOSAL...**

**2.**

For those who are unable to attend either workshop but who would like to submit comments, please mail them to Little Rock Engineer District, attn: CESWL-PE, P.O. Box 867, Little Rock, AR 72203-0867. Submissions must be postmarked by June 30. You can also send comments by e-mail by June 30 to [Renee.S.Wright@usace.army.mil](mailto:Renee.S.Wright@usace.army.mil).

**--30--**

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# **Attachment 2 Initial Agency Coordination**

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**EXAMPLE COORDINATION LETTER**



15 September 2009

To: [ADDRESSEE]

**RE: Preparation of an Environmental Assessment  
For Ozark Mountain Regional Public Water Authority  
Water Supply Reallocation  
Bull Shoals Lake, Arkansas**

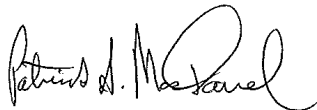
Dear Madame/Sir:

On behalf of our client, the U.S. Army Corps of Engineers, Little Rock District (USACE-SWL), G.E.C., Inc. (GEC), is submitting the following information regarding an Environmental Assessment (EA) that GEC is preparing under guidelines set forth by the National Environmental Policy Act (NEPA). This EA will evaluate the reallocation of water storage from Bull Shoals Lake, Arkansas.

In February 2007, the Ozark Mountain Regional Public Water Authority (OMRPWA) requested that the Little Rock District reallocate storage sufficient to supply six (6) million gallons per day (MGD) from Bull Shoals Lake for Municipal and Industrial (M&I) purposes. OMRPWA is a coalition of 22 water systems in the north central Arkansas area that serves about 22,000 people in Newton, Searcy, and parts of Boone, Marion, Johnson and Pope Counties. In order to approve this request, the Little Rock District must conduct a reallocation study including an EA for this proposed action.

GEC respectfully requests any information from your office within 30 days of the date of this letter regarding existing environmental resources within the project area. If comments are not received by this date, we will assume your agency has no comments on the proposed action. Should you have any questions or require further information, please contact me at (225) 612-4117 or [macdanel@gecinc.com](mailto:macdanel@gecinc.com); or, Mike Rodgers with the Little Rock District at (501) 324-5030 or [Michael.r.rodgers@usace.army.mil](mailto:Michael.r.rodgers@usace.army.mil).

Sincerely,



Patrick S. MacDanel  
Senior Environmental Scientist/Wildlife Biologist

Please submit comments to:

Patrick S. MacDanel  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808



70634  
COE  
~~63024~~  
~~USACE ROD~~  
~~692459~~

15 September 2009

Arkansas Historic Preservation Program  
Attn: Ms. Frances McSwain  
1500 Tower Building  
323 Center Street  
Little Rock, AR 72201

**AHPP**  
**SEP 21 2009**

**RE: Preparation of an Environmental Assessment  
For Ozark Mountain Regional Public Water Authority  
Water Supply Reallocation  
Bull Shoals Lake, Arkansas**

Dear Madame/Sir:

On behalf of our client, the U.S. Army Corps of Engineers, Little Rock District (USACE-SWL), G.E.C., Inc. (GEC), is submitting the following information regarding an Environmental Assessment (EA) that GEC is preparing under guidelines set forth by the National Environmental Policy Act (NEPA). This EA will evaluate the reallocation of water storage from Bull Shoals Lake, Arkansas.

In February 2007, the Ozark Mountain Regional Public Water Authority (OMRPWA) requested that the Little Rock District reallocate storage sufficient to supply six (6) million gallons per day (MGD) from Bull Shoals Lake for Municipal and Industrial (M&I) purposes. OMRPWA is a coalition of 22 water systems in the north central Arkansas area that serves about 22,000 people in Newton, Searcy, and parts of Boone, Marion, Johnson and Pope counties. In order to approve this request, the Little Rock District must conduct a reallocation study including an EA for this proposed action.

GEC respectfully requests any information from your office within 30 days of the date of this letter regarding existing environmental resources within the project area. If comments are not received by this date, we will assume your agency has no comments on the proposed action. Should you have any questions or require further information, please contact me at (225) 612-4117 or [macdanel@gecinc.com](mailto:macdanel@gecinc.com); or Mike Rodgers with the Little Rock District at (501) 324-5030 or [Michael.r.rodgers@usace.army.mil](mailto:Michael.r.rodgers@usace.army.mil).

Sincerely,

Patrick S. MacDanel  
Senior Environmental Scientist/Wildlife Biologist

Please submit comments to:

Patrick S. MacDanel  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

10-5-09  
No known historic properties will be affected by this undertaking. This effect determination could change should new information come to light.  
  
Frances McSwain, Deputy State  
Historic Preservation Officer

## Patrick MacDanel

---

**From:** Page, Christopher M SWL [Christopher.M.Page@usace.army.mil]  
**Sent:** Wednesday, October 21, 2009 8:48 AM  
**To:** Patrick MacDanel  
**Cc:** Rodgers, Michael R SWL  
**Subject:** [NEWSENDER] - MO SHPO Call - Message is from an unknown sender

Patrick,

I spoke with Judith Deel in the Missouri SHPO's office this morning and she stated that because the physical impacts to Bull Shoals in Missouri is small, they would just coordinate the project through their natural resources department. That said, she said if the impacts were determined to be larger (i.e. a foot or more of water level change) further coordination would be required.

As far a letter to the Osage is concerned this scoping letter probably won't elicit a response from them, but as soon as actual impacts to the normal operating water level are known we will probably need to coordinate with them further. If you have any questions or need any further information please let me know.

Thanks,

Chris

Christopher M. Page, RPA  
District Archeologist  
Little Rock District  
US Army Corps of Engineers  
PO Box 867  
Little Rock, AR 72203-0867  
(501) 324-5752  
christopher.m.page@usace.army.mil



**Patrick MacDanel**

---

**From:** Mike Smith [Mike.Smith@mdc.mo.gov]  
**Sent:** Monday, October 19, 2009 7:37 AM  
**To:** Patrick MacDanel  
**Cc:** Michael.r.rodgers@usace.army.mil; David Thorne  
**Subject:** [NEWSENDER] - EA Preparation for Ozark Mountain Regional Public Water Authority Water Supply Reallocation Bull Shoals Lake, AR - Message is from an unknown sender

Mr. MacDanel:

The Department of Conservation contacted Mr. Michael Rodgers, USACE regarding this matter. He indicated there would be a public review of the assessment next spring. We are going to wait for the completion of that document before considering whether additional comment is warranted.

Sincerely,

MS

Michael S. Smith  
Policy Coordinator  
Missouri Department of Conservation  
PO Box 180  
Jefferson City, MO 65102-0180  
573-522-4115 ext. 3152  
573-526- 4495 FAX

10/19/2009

## Patrick MacDanel

---

**From:** Rodgers, Michael R SWL [Michael.R.Rodgers@usace.army.mil]  
**Sent:** Friday, September 25, 2009 1:54 PM  
**To:** Mike Smith  
**Cc:** Patrick MacDanel  
**Subject:** RE: Preparation of EA for Ozark Mtn Regional Public Water Authority - Water Supply Reallocation

Mike

Complete answers are not available at this time but preliminary analysis showed that 6-8000 acre feet would yield the 6 MGD depending on which pool (Conservation or Flood) the storage would be reallocated from. Reallocation from the conservation pool will not result in a pool elevation change and a flood pool reallocation could result in approximately 0.25 feet change in the top of conservation pool elevation. The Water Reallocation Report which is currently under development will identify specifics and which pool to take the storage from.

There will be a 30 day public review period of those documents when complete (next spring). The letter that GEC sent is an early agency coordination effort soliciting information that we should be aware of to be included and/or considered in the development of the EA.

Give me a call if you would like

Thanks

Mike Rodgers  
501-324-5030

-----Original Message-----

From: Mike Smith [mailto:Mike.Smith@mdc.mo.gov]  
Sent: Friday, September 25, 2009 11:36 AM  
To: Rodgers, Michael R SWL  
Subject: Preparation of EA for Ozark Mtn Regional Public Water Authority - Water Supply Reallocation

Mr. Rodgers: Do you have any additional information on this reallocation request? I have received a request from GEC for comments. I would be interested in knowing more about the reallocation process specific to Bull Shoals. Also, some relative sense as to what the amount of water means to pool elevations and other users and uses. It doesn't like that much water.

Thanks,

MS

Michael S. Smith

Policy Coordinator

Missouri Department of Conservation

PO Box 180

Jefferson City, MO 65102-0180

573-522-4115 ext. 3152

573-526- 4495 FAX

**Patrick MacDanel**

---

**From:** Tracy Copeland [Tracy.Copeland@dfa.arkansas.gov]  
**Sent:** Tuesday, September 22, 2009 8:33 AM  
**To:** Patrick MacDanel  
**Subject:** [NEWSENDER] - "Needing Copy of Bull Shoals Lake, AR- Environmental Assessment" - Message is from an unknown sender

Good Morning Mr. MacDanel:

I called you earlier this morning after receiving your letter regarding an Environmental Assessment For Ozark Mountain Regional Public Water Authority Water Supply Reallocation in Bull Shoals Lake, Arkansas...Our office will need copies of the Environmental Assessment, as soon as possible, so it can be sent out to our 13 Member Technical Review Committee, requesting their comments should they have any.

Should you have questions, please call out office at (501) 682-1074.

Sincerely,  
Tracy





Scott Henderson  
Director

Loren Hitchcock  
Deputy Director

Keeping the Natural State natural.

## Arkansas Game and Fish Commission

Mike Gibson  
Assistant Director

Mike Armstrong  
Assistant Director

September 23, 2009

Mr. Patrick MacDanel  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

Re: Dear Mr. MacDanel:

Biologists from our agency have reviewed the Environmental Assessment request for the Ozark Mountain Regional Public Water Authority Water Supply Reallocation – Bull Shoals Lake, Arkansas which is located in Newton, Searcy, Boone, Marion, Johnson and Pope Counties, Arkansas. We are submitting the following comments to reduce possible impacts to fish and wildlife resources.

- All wetlands in the project area should be avoided or impacts should be minimized where possible. Unavoidable impacts should be mitigated.
- All stream crossings should use best management practices for erosion control.
- Stream crossing sites should be surveyed for freshwater mussels or evaluated by a malacologist to assess their potential for freshwater mussels.
- Large streams should be crossed by attaching a pipe to a bridge if possible or by boring under the streambed. If these two options are unachievable, then the work should be scheduled for June, July, or August to avoid peak spawning times and our agency should be contacted prior to construction.
- Applicant should be advised that this area has some karst topography and could potentially have impacts to cave recharge zones. For information about these zones we suggest contacting David Kampwerth who is a karst biologist that works for the U.S. Fish and Wildlife Service. His number is (501) 513-4477.

We recommend that you contact the U.S. Fish and Wildlife Service for an endangered species review, since our agency adheres to the federal listing and you will need to get clearance from them. Their address is 110 South Amity Rd., Suite 300, Conway, Arkansas 72032.

If our agency can be of further assistance, please feel free to contact us.

Sincerely,

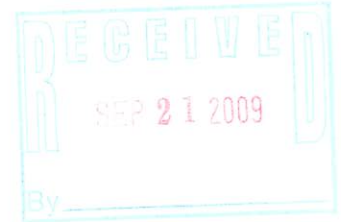
Robert K. Leonard, Biologist  
River Basins Division

Cc: Mark Oliver  
David Goad  
USFWS, Conway Office  
State Clearinghouse

2 Natural Resources Drive • Little Rock, AR 72205 • www.agfc.com  
Phone (800) 364-4263 • (501) 223-6300 • Fax (501) 223-6448



15 September 2009



U.S. Fish and Wildlife Service  
Mr. Charlie Scott, Field Supervisor  
101 Park Deville Drive, Suite A  
Columbia, MO 65203

**RE: Preparation of an Environmental Assessment  
For Ozark Mountain Regional Public Water Authority  
Water Supply Reallocation  
Bull Shoals Lake, Arkansas**

Dear Madame/Sir:

On behalf of our client, the U.S. Army Corps of Engineers, Little Rock District (USACE-SWL), G.E.C., Inc. (GEC), is submitting the following information regarding an Environmental Assessment (EA) that GEC is preparing under guidelines set forth by the National Environmental Policy Act (NEPA). This EA will evaluate the reallocation of water storage from Bull Shoals Lake, Arkansas.

In February 2007, the Ozark Mountain Regional Public Water Authority (OMRPWA) requested that the Little Rock District reallocate storage sufficient to supply six (6) million gallons per day (MGD) from Bull Shoals Lake for Municipal and Industrial (M&I) purposes. OMRPWA is a coalition of 22 water systems in the north central Arkansas area that serves about 22,000 people in Newton, Searcy, and parts of Boone, Marion, Johnson and Pope counties. In order to approve this request, the Little Rock District must conduct a reallocation study including an EA for this proposed action.

GEC respectfully requests any information from your office within 30 days of the date of this letter regarding existing environmental resources within the project area. If comments are not received by this date, we will assume your agency has no comments on the proposed action. Should you have any questions or require further information, please contact me at (225) 612-4117 or [macdanel@gecinc.com](mailto:macdanel@gecinc.com); or Mike Rodgers with the Little Rock District at (501) 324-5030 or [Michael.r.rodgers@usace.army.mil](mailto:Michael.r.rodgers@usace.army.mil).

Sincerely,

Please submit comments to:

Patrick S. MacDanel  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

"The U.S. Fish and Wildlife Service (Service) has reviewed the proposed action and determined that no federally listed species, candidate species, or designated critical habitat occurs within the project area. Furthermore, the Service has determined that this action will have negligible impacts on wetlands, migratory birds, and other priority fish and wildlife resources."

ogist

Field Supervisor  
Date 10/14/09





*Margaret Harvey*  
 Environmental Coordinator  
 U.S. Fish and Wildlife Service  
 Log# TA0097-CPA0095  
 Oct 29, 2009  
 Date

15 September 2009

U.S. Fish and Wildlife Service  
 Attn: Mr. Mark Sattelberg  
 110 South Amity Rd., Suite 300  
 Conway, AR 72032

RECEIVED  
 SEP 18 2009  
 ARK FIELD OFFICE

**RE: Preparation of an Environmental Assessment  
 For Ozark Mountain Regional Public Water Authority  
 Water Supply Reallocation  
 Bull Shoals Lake, Arkansas**

Dear Madame/Sir:

No federally listed endangered,  
 threatened or candidate species present

On behalf of our client, the U.S. Army Corps of Engineers, Little Rock District (USACE-SWL), G.E.C., Inc. (GEC), is submitting the following information regarding an Environmental Assessment (EA) that GEC is preparing under guidelines set forth by the National Environmental Policy Act (NEPA). This EA will evaluate the reallocation of water storage from Bull Shoals Lake, Arkansas.

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Sincerely,

Patrick S. MacDanel  
 Senior Environmental Scientist/Wildlife Biologist

Please submit comments to:

Patrick S. MacDanel  
 GEC, Inc.  
 P.O. Box 84010  
 Baton Rouge, LA 70808



**FEMA**

October 9, 2009

Patrick S. MacDanel  
Senior Environmental Scientist  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

Re: Ozark Mountain Regional Public Water Authority  
Water Supply Reallocation  
Bull Shoals Lake, Arkansas

Dear Mr. MacDanel:

We have received your letter dated September 15, 2009. Thank you for the opportunity to comment on the above-proposed project.

The concerns of the Federal Emergency Management Agency (FEMA) are directed toward the National Flood Insurance Program (NFIP) and the possible negative impact upon identified special flood hazard areas within the outlined project boundaries.

The counties of Marion and Baxter Counties do not participate in the National Flood Insurance Program (NFIP). Any development that may take place within the county must be reviewed and appropriate permits issued to ensure compliance with their adopted county rules or regulations. Our records show that Mr. James Giles is the County Judge for Marion County and he can be reached at (870) 449-6231. Our records show that Mr. Joe Bodenhamer is the County Judge for Baxter County and he can be reached at (870) 425-2755.

Coordination with the County Judge for Marion County and Baxter County can ensure that this project is in compliance with any County regulations/requirements.

Sincerely,

A handwritten signature in blue ink that reads "Roy B. McClure".

Roy B. McClure, CFM  
Natural Hazards  
Program Specialist





RECEIVED BY: KPL, PA, V  
FEMA, REGION VI

2009 SEP 18 A 10: 28

15 September 2009

FEMA, Region VI  
Attn: Mr. Gary Jones  
800 North Loop 288  
Denton, TX 76210

**RE: Preparation of an Environmental Assessment  
For Ozark Mountain Regional Public Water Authority  
Water Supply Reallocation  
Bull Shoals Lake, Arkansas**

Dear Madame/Sir:

On behalf of our client, the U.S. Army Corps of Engineers, Little Rock District (USACE-SWL), G.E.C., Inc. (GEC), is submitting the following information regarding an Environmental Assessment (EA) that GEC is preparing under guidelines set forth by the National Environmental Policy Act (NEPA). This EA will evaluate the reallocation of water storage from Bull Shoals Lake, Arkansas.

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Sincerely,

Patrick S. MacDanel  
Senior Environmental Scientist/Wildlife Biologist

Please submit comments to:

Patrick S. MacDanel  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808



**Department of Energy**  
Southwestern Power Administration  
One West Third Street  
Tulsa, Oklahoma 74103-3502

October 15, 2009

Patrick S. MacDanel  
Senior Environmental Scientist/Wildlife Biologist  
Gulf Engineers & Consultants, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

Dear Mr. MacDanel:

This is in response to your letter dated September 15, 2009, requesting information pertaining to the preparation of an Environmental Assessment (EA) for a proposed water storage reallocation at Bull Shoals Lake for the Ozark Mountain Regional Public Water Authority (OMRPWA). Southwestern Power Administration (Southwestern) is pleased to offer comments to assist you in the development of the EA.

Southwestern is an agency within the U.S. Department of Energy which is responsible for marketing the hydroelectric power and energy from 24 Corps of Engineers (Corps) projects in the region, including Bull Shoals Dam. As the Federal agency responsible for marketing the hydropower from Bull Shoals, Southwestern has concerns with the storage reallocation request. Federal hydropower will be the project purpose most adversely affected by the proposed reallocation. As stated in the coordination meeting on September 24, 2009, at the Little Rock District (LRD) office, the proposed reallocation should meet three criteria: 1) the reallocated storage is to satisfy an immediate need for water supply; 2) the reallocation is the lowest cost alternative for the water supply; and 3) Federal hydropower must be properly compensated for losses due to the reallocation. The third criterion is typically not met in Corps studies.

Southwestern understands that OMRPWA originally requested water supply storage in Bull Shoals Reservoir yielding 12 million gallons per day (MGD) and has since reduced that request to 6 MGD. We are concerned that the Corps calculations greatly underestimate the impacts to the Federal hydropower purpose. Corps energy loss calculations are based on the yield of the contracted storage, but water supply users are able to withdraw more than the "safe yield" of the storage in all years except the critical drought period without depleting their contracted storage. The Corps energy loss calculations should include additional withdrawals above the yield of contracted storage, or the water supply storage contract should limit the amount the user can withdraw to only the yield of the contracted storage.

It is imperative that the economic impacts of the reallocation alternatives be properly evaluated. In almost all reallocation studies evaluated by Southwestern, reallocation of flood storage provides the least benefits foregone and is the National Economic Development (NED) plan. We would expect the same result in the current study. In addition to a flood pool reallocation, the



use of storage for hydropower yield protection operation (HYPO) is an available option that should be utilized. Corps ER 1105-2-100 recommends the use of operational changes, when possible, to compensate hydropower users. The use of HYPO, similar to dependable yield mitigation storage (DYMS) for existing water supply users, is another method of protecting the hydropower purpose. LRD has the discretion to include HYPO and in fact did so in the White River Minimum Flow Study. It is a viable alternative that should be considered in formulating the NED plan. The use of HYPO as part of a storage reallocation would maintain the current yield of the hydropower storage and, therefore, minimize the hydropower losses, especially capacity and on-peak energy losses.

Southwestern is also concerned with the environmental impacts and the potential for high costs of replacement energy and capacity relating to greenhouse gas (GHG) emissions. Capacity and energy to replace the renewable hydropower lost as a result of the reallocation will likely come from a fossil-fuel generating plant, resulting in increased GHG emissions. With the current emphasis on climate change legislation, non-renewable generation that results in the increased GHG emissions could have significant additional costs associated with climate change legislation currently pending in Congress. The environmental impacts and potential costs of the increased emissions should be quantified and included in the EA.

We appreciate the opportunity to provide comments concerning the preparation of the reallocation report and EA for the proposed storage reallocation. Please contact Michael Denny at 918-595-6683 or Michael.Denny@swpa.gov if you have any questions concerning our comments.

Sincerely,

A handwritten signature in blue ink that reads "Michael R. Denny". The signature is written in a cursive style and is positioned above the typed name.

for George Robbins

Director

Division of Resources and Rates

cc:

Ted Coombes

Executive Director

Southwestern Power Resources Association

09/30/09

Southwestern Power Administration (Southwestern) does not recall any mention of inactive storage as a storage reallocation alternative during the September 24 meeting, and we cannot find any mention of it in the meeting minutes. Southwestern strongly opposes the consideration of inactive storage as an alternative for storage reallocation for water supply in all storage reallocation studies. That opposition is based in part on the following points:

1. Inactive storage is set aside for hydropower head and/or the storage of sediment expected to accumulate over the life of the project. By definition, it is inactive or unusable. Reallocation of that storage would in effect lower the bottom of the conservation pool. Typically, at hydropower projects, the size of the inactive storage is designed to provide sufficient head for hydropower generation.
2. The Little Rock District produced a report in September 1968 entitled "White River Rule Curve Studies – 1968, White River Hydroelectric System." Section V of that report discusses the possible use of a portion of the inactive storage as emergency power storage. Emergency power storage could potentially be utilized to sustain firm power generation during a more severe drought than had been experienced at the time. It would be for emergency use only in a significant drought. Use of the inactive storage for any other purpose was not contemplated and would negatively impact hydropower production.
3. The Little Rock District draft storage reallocation report for the Trout Production Facility at Beaver Lake dated July 2000 mentions and dismisses the consideration of inactive storage as a reallocation alternative, citing ER 1105-2-100:

*Inactive Pool. This pool is used to provide a hydraulic head for hydropower generation, space for sediment storage, and an area for recreation and fish habitat. Per paragraph 4-32d, page 4-55, Engineering Regulation 1105-2-100, dated 28 December 1990, this storage is not to be included as usable storage when computing the water user's pro-rata share of updated cost of storage. Therefore, this pool was excluded from these analyses as a storage option.*

The latest version of ER 1105-2-100, dated April 22, 2000, includes similar language concerning the calculation of the updated cost of storage on page E-217: "In this computation, usable storage does not include space set aside for sediment distribution or for hydropower head." Based on that definition, inactive storage is not "usable" and should not be considered for reallocation.

4. In the Little Rock District storage reallocation report for the Mid Arkansas Water Alliance at Greers Ferry Lake dated June 2007, inactive storage is not contemplated as an option for reallocation, in recognition that it is not usable storage. On page 7, the report states:



*Two options will be evaluated for reallocation of storage in Greers Ferry Lake. The effects of reallocating storage from current flood control storage or conservation (hydropower) storage will be considered. These are the **only usable storage spaces** in Greers Ferry Lake. (emphasis added)*

5. As in the previously mentioned report for Greers Ferry, the Little Rock District draft storage reallocation report for the City of Mountain Home, Arkansas, at Norfolk Lake dated August 2007, similarly dismisses inactive storage as an option to be considered for reallocation. On page 10, the report contains similar language to the June 2007 report for Greers Ferry:

*Two options will be evaluated for reallocation of storage in Norfolk Lake. The effects of reallocating storage from current flood control, or hydropower storage will be considered. These are the **only usable storage spaces** in Norfolk Lake. (emphasis added)*

6. In the recently completed White River Minimum Flows Study performed by the Little Rock District, the Corps performed an evaluation of various reallocation scenarios at Beaver, Table Rock, Bull Shoals, Norfolk, and Greers Ferry. In recognition of the fact that inactive storage is not usable for any purpose other than hydropower head and sediment storage, the Corps did not consider that storage space as an alternative for reallocation at any of the five projects. Inactive storage at Bull Shoals was correctly excluded from consideration for that study, as it should be for the current study.

In consideration of all the examples mentioned here as well as many others that could be noted, the Corps should dismiss any consideration of inactive storage at Bull Shoals and all other projects for the current study and for future studies.

United States Department of Agriculture



Natural Resources Conservation Service  
Room 3416, Federal Building  
700 West Capitol Avenue  
Little Rock, Arkansas 72201-3225

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SEP 21 2009

Patrick S. MacDanel  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, Louisiana 70808

Dear Mr. MacDanel:

This letter is in response to your request for information related to Prime Farmland or Farmland of Statewide Importance for the Water Supply Reallocation for the Ozark Mountain Regional Public Water Authority for Bull Shoals Lake, Arkansas. After visiting with Mike Rogers, Little Rock District (USACE-SWL), it was determined that this reallocation would not affect the current flood pool of Bull Shoals Lake. This reallocation will have no affect on Prime Farmland or Farmland of Statewide Importance. Enclosed is form AD1006 for your use.

Should you have any questions or need additional information, please call me at (501) 301-3172 or email at [edgar.mersiovsky@ar.usda.gov](mailto:edgar.mersiovsky@ar.usda.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Edgar Mersiovsky", written over a circular stamp or mark.

EDGAR P. MERSIOVSKY  
Assistant State Soil Scientist

Enclosure

cc: Luis Hernandez, Soil Survey Region 16 Leader/State Soil Scientist, NRCS, Little Rock, AR

U.S. Department of Agriculture

## FARMLAND CONVERSION IMPACT RATING

<b>PART I</b> (To be completed by Federal Agency)	Date Of Land Evaluation Request 9/15/09
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Name Of Project Bull Shoals Lake-Water Supply Reallocation	Federal Agency Involved USACE
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Proposed Land Use Water Supply	County And State Boone and Marion Counties, Arkansas
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<b>PART II</b> (To be completed by NRCS)	Date Request Received By NRCS 9/18/09
------------------------------------------	---------------------------------------

Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply -- do not complete additional parts of this form).	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Acres Irrigated	Average Farm Size
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Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %	Amount Of Farmland As Defined in FPPA Acres: %
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Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS
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<b>PART III</b> (To be completed by Federal Agency)	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	0.0	0.0	0.0	0.0

<b>PART IV</b> (To be completed by NRCS) Land Evaluation Information	Site A	Site B	Site C	Site D
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				

<b>PART V</b> (To be completed by NRCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)	0	0	0	0
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<b>PART VI</b> (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
<b>TOTAL SITE ASSESSMENT POINTS</b>	160	0	0	0	0

<b>PART VII</b> (To be completed by Federal Agency)	Maximum Points	Site A	Site B	Site C	Site D
Relative Value Of Farmland (From Part V)	100	0	0	0	0
Total Site Assessment (From Part VI above or a local site assessment)	160	0	0	0	0
<b>TOTAL POINTS (Total of above 2 lines)</b>	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>
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Reason For Selection:



## STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 – Federal agencies involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form.

Step 2 – Originator will send copies A, B and C together with maps indicating locations of site(s), to the Natural Resources Conservation Service (NRCS) local field office and retain copy D for their files. (Note: NRCS has a field office in most counties in the U.S. The field office is usually located in the county seat. A list of field office locations are available from the NRCS State Conservationist in each state).

Step 3 – NRCS will, within 45 calendar days after receipt of form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland.

Step 4 – In cases where farmland covered by the FPPA will be converted by the proposed project, NRCS field offices will complete Parts II, IV and V of the form.

Step 5 – NRCS will return copy A and B of the form to the Federal agency involved in the project. (Copy C will be retained for NRCS records).

Step 6 – The Federal agency involved in the proposed project will complete Parts VI and VII of the form.

Step 7 – The Federal agency involved in the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA and the agency's internal policies.

## INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

**Part I:** In completing the "County And State" questions list all the local governments that are responsible for local land controls where site(s) are to be evaluated.

**Part III:** In completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities) that will cause a direct conversion.

**Part VI:** Do not complete Part VI if a local site assessment is used.

Assign the maximum points for each site assessment criterion as shown in § 658.5 (b) of CFR. In cases of corridor-type projects such as transportation, powerline and flood control, criteria #5 and #6 will not apply and will be weighed zero, however, criterion #8 will be weighed a maximum of 25 points, and criterion #11 a maximum of 25 points.

Individual Federal agencies at the national level, may assign relative weights among the 12 site assessment criteria other than those shown in the FPPA rule. In all cases where other weights are assigned relative adjustments must be made to maintain the maximum total weight points at 160.

In rating alternative sites, Federal agencies shall consider each of the criteria and assign points within the limits established in the FPPA rule. Sites most suitable for protection under these criteria will receive the highest total scores, and sites least suitable, the lowest scores.

**Part VII:** In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, adjust the site assessment points to a base of 160. Example: if the Site Assessment maximum is 200 points, and alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site "A."}$$





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# **Attachment 3 Draft EA and Reallocation Report Public Review/Comments**

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## PUBLIC REVIEW / COMMENTS SUMMARY

The draft environmental assessment (Draft EA) and reallocation report for this action were released concurrently for public review and comment on May 11, 2010. The comment period ran for 30 days from May 11, 2010 to June 11, 2010 and was announced via a public notice which ran in five (5) newspapers covering the project area. These newspapers are identified in the Affidavit of Insertion included in this attachment. Copies of the Draft EA were mailed on compact disk to recipients listed on the mailing list included in this attachment. In addition, an electronic copy was posted on the Little Rock District webpage. Hardcopies were made available at the Mountain Home Project Office, the Searcy County Library, the Marion County Library in Yellville, Arkansas and at the Little Rock District headquarters building. A mailing list, copies of the public notice, newspaper notices, and other information pertaining to the public review period follow in this attachment.

Overall, ten (10) comment letters from agencies and private individuals were received during the comment period. Included were letters from eight (8) agencies or organizations and two (2) individual citizens. Copies of all letters are included in this attachment. A brief description of each comment letter and, where appropriate, a summary of substantial comments raised are provided below. In addition, a brief summary of the Little Rock District's evaluation of substantial issues raised in these comments is also included.

### COMMENTS RECEIVED

Department of Energy, Southwestern Power Administration (letter dated June 11, 2010). The Southwestern Power Administration (SWPA) provided a significant number of comments on matters ranging from water supply needs and withdrawal rates, concern over USACE policies regarding reallocating storage for water supply, hydropower crediting calculations and procedures, methods of alternatives evaluation and resulting selection of the proposed plan, and consideration of the inactive pool for storage reallocation. In addition, SWPA identified the need to provide revisions based on an alternate Southwestern power marketing area, recently-renewed contracts, and recently-updated power rates.

A thorough analysis of comments received from SWPA was conducted by the Little Rock District and the Corps' Hydropower Analysis Center (HAC). Based on a review of the appropriate power marketing area and newly-revised rates, HAC revised calculations in its hydropower report (Reallocation Report, Appendix D). Similar changes were reflected in updates to the Reallocation Report and EA, as appropriate. Many comments received from SWPA concern long-standing and well-known areas of disagreement between SWPA and the Corps regarding USACE policy for evaluating impacts to hydropower and hydropower crediting procedures. In instances where Corps policy was applicable to methodology used in this study, such policy was consistently applied. These policy issues will likely continue to be a point of disagreement between the Corps and SWPA on this and future reallocations involving hydropower considerations.

One comment provided by SWPA was a recommendation to evaluate a flood pool reallocation alternative employing hydropower yield protection operation ("HYPO"), a methodology similar to dependable yield mitigation storage (DYMS) for existing water supply users. Such an

Department of Arkansas Heritage (letter dated May 13, 2010): The Department of Arkansas Heritage (DAH) concluded that the proposed project would not affect any known historic properties.

The Little Rock District acknowledges these comments.

U. S. Fish and Wildlife Service (USFWS)(letter dated June 3, 2010): The USFWS concurred with the assessment that this project will have no significant negative environmental impacts. Therefore, the Service had no objection to the proposed issuance of a Finding of No Significant Impact for the proposed action.

The Little Rock District acknowledges these comments.

Federal Emergency Management Agency (FEMA): FEMA requested that the county floodplain administrators be contacted for the review of the project and possible permit requirements for the proposed project.

The Little Rock District determined that the proposed action will result in no impact to floodplains; therefore, county floodplain administrators were not involved.

Comments from Individuals: Additional comments were provided by two (2) individual citizens (undated and handwritten letters by Mr. Gary Honeycutt, and one with an illegible signature and no return address). Both are included in this attachment. The comments from these individuals focused on the potential negative impacts of reallocating storage for water supply. All of the concerns expressed by these individuals are addressed in the Environmental Assessment and Finding of No Significant Impact. One individual questioned the authority to utilize Bull Shoals Lake for public water supply. The other individual seemed to focus on the use of the land that Bull Shoals Lake occupies for a public water supply reservoir.

The Little Rock District operates the Bull Shoals Dam and Lake Project as a multi-purpose reservoir, as authorized by the Congress of the United States. The project was authorized for flood control, hydroelectric power and other purposes, including fish/wildlife and recreation, by the Flood Control Act of 28 June 1938, as modified by the Flood Control Act of 1941. The Water Supply Act of 1958 provides general authorization for construction or reallocation of storage for water supply uses at all Corps lakes, provided such construction or reallocation does not seriously affect other authorized project purposes. The Chief of Engineers has delegated authority to approve reallocations of up to 15 percent of total storage capacity, or 50,000 ac-ft, whichever is less. This report concluded the reallocation for water supply will have no significant impacts to the authorized operating purposes of Bull Shoals Lake.

## CONCLUSIONS

The draft and final EA were prepared in accordance with ER 200-2 “Procedures for Implementing NEPA”, which provides guidance for implementation of the procedural provisions of the National Environmental Policy Act (NEPA) of 1970 (42 USC 4321 *et seq.*, as amended) for the Civil Works Program of the U.S. Army Corps of Engineers, per regulations set forth by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508).

analysis was conducted by the Little Rock District for the White River Minimum Flow (WRMF) study at Bull Shoals Lake. However, there are several distinctions between WRMF and the current study. These include special project-specific authorizing legislation, a reallocation for non-municipal and industrial (M&I) water supply purposes for WRMF, a reallocation of nearly twenty (20) times the storage volume for WRMF relative to the currently-proposed action, and a much greater adverse effect on hydropower. While not in accordance with USACE policy, alternative evaluation using HYPO was conducted for WRMF based on these considerations and the project-specific authority. The current USACE policy regarding existing hydropower users is that compensation may be considered through minor operational changes for the reallocation from the flood control pool to M&I water supply, and therefore, HYPO is not a viable consideration for the currently-proposed action.

Southwestern Power Resources Association (letter dated June 11, 2010). The Southwestern Power Resources Association (SPRA) provided comments which were very similar in nature and specific content to those provided by SWPA. In summary, SPRA expressed concern over an appropriate power marketing area, newly-revised hydropower rates, calculations of the hydropower impacts of storage reallocations including pricing, the period included in the evaluation, definition of usable storage, and cumulative effects of past reallocations.

The Little Rock District and HAC thoroughly evaluated comments received from SPRA. As many of these issues were similar to those raised by SWPA, conclusions were likewise similar. Most of the comments were addressed by identifying the USACE policy used in the evaluation of hydropower impacts and crediting procedures. Where necessary based on newly-revised rates and other considerations, revisions were incorporated in the HAC report, the reallocation report, and EA. In instances where comments provided by SPRA were in conflict with USACE policy, USACE policy was consistently applied.

The SPRA likewise provided comments regarding cumulative effects on hydropower production and mitigation considerations for such effects. The USACE believes that mitigation for hydropower effects is provided for by credits to SWPA in accordance with Corps' policy and procedures. Finally, SPRA commented that the EA should consider cumulative effects of storage reallocations on greenhouse gas emissions at the 24 Corps projects from which SWPA markets hydroelectric energy and capacity owing to replacement of hydropower losses by thermal generation. While the EA does provide estimates of the increase in greenhouse gas emissions resulting from the proposed action, the widespread geographic range of the 24 Corps projects and uncertainties regarding location of thermal generation facilities make it difficult to quantify cumulative effects on ambient air quality. It should be noted, however, that such thermal facilities are subject to air quality regulations and permitting requirements aimed at attainment of air quality standards.

T. David Carruth, Attorney at Law (letter dated June 10, 2010). Mr. Carruth provided comments reported to be on behalf of himself, "the White River Conservancy, and are available as comments for the Arkansas Wildlife Federation, the Clarendon Chamber of Commerce and a loose (*sic*) association of individuals who use the waters of the White River for recreation, fishing and hunting. This association is known as the B.P.F.M.A.O.R.R.R." Mr. Carruth commented that he had trouble accessing the draft Reallocation Report and EA for review from the Corps' website and for that reason requested an extension of the comment period. He also expressed

concerns that the reallocation of water supply storage would “have a profound impact on both the human and natural environment”. He stated that “Water supply is not an authorized use of the water impounded by Bull Shoals Dam”. He expressed concern about how the reallocated water supply storage will be managed and utilized, as well as how downstream waters will be managed. He expressed the opinion that the “allocation should not take place”, that a full environmental impact study should be conducted, and that to do less “would be in violation of the National Environmental Policy Act”.

The Little Rock District has thoroughly evaluated Mr. Carruth’s comments. The Corps provided opportunity for document review via the internet and hard copies in four (4) locations throughout the state, to include the Mountain Home Project Office, the Searcy County Library, the Marion County Library, and Little Rock District Office. During the comment period, the majority of the responses received indicated that the individuals or agencies had reviewed documents with no indications of problems or inabilities in accessing the documents, thus validating the distribution methods. There were also no known problems with the website link throughout the comment period. Therefore, it was determined that there was no reason for extending the comment period.

Other concerns expressed are addressed in the Environmental Assessment and Finding of No Significant Impact. These two documents complete the requirements called for by the National Environmental Policy Act of 1970 (42 USC 4321, *et seq.*, as amended), under guidelines set for by the Council on Environmental Quality (CEQ) regulations (40 CFR, Parts 1500-1508). The Bull Shoals Dam and Lake Project is a multi-purpose reservoir. The project was authorized for flood control, hydroelectric power and other purposes, including fish/wildlife and recreation, by the Flood Control Act of 28 June 1938, as modified by the Flood Control Act of 1941. The Water Supply Act of 1958 provides general authorization for construction or reallocation of storage for water supply uses at all Corps lakes, provided such construction or reallocation does not seriously affect other authorized project purposes. The Chief of Engineers has delegated authority to approve reallocations of up to 15 percent of total storage capacity, or 50,000 ac-ft, whichever is less. This report concluded the reallocation for water supply will have no significant impacts to the authorized operating purposes of Bull Shoals Lake which include flood control, hydropower, water supply and fish and wildlife. The USACE does not operate for or regulate the downstream use of the water in the White River System.

Arkansas Game and Fish Commission (letter dated June 1, 2010): The Arkansas Game and Fish Commission (AGFC) did not have any specific concerns with the proposed reallocation of water supply storage in Bull Shoals Lake from a fish and wildlife management standpoint.

The Little Rock District acknowledges these comments.

Arkansas Department of Health (letter dated May 13, 2010): The Arkansas Department of Health (ADH) reviewed the proposed project and concluded that it would provide the local area with a safe drinking water supply.

The Little Rock District acknowledges these comments.

Department of Arkansas Heritage (letter dated May 13, 2010): The Department of Arkansas Heritage (DAH) concluded that the proposed project would not affect any known historic properties.

The Little Rock District acknowledges these comments.

U. S. Fish and Wildlife Service (USFWS)(letter dated June 3, 2010): The USFWS concurred with the assessment that this project will have no significant negative environmental impacts. Therefore, the Service had no objection to the proposed issuance of a Finding of No Significant Impact for the proposed action.

The Little Rock District acknowledges these comments.

Federal Emergency Management Agency (FEMA): FEMA requested that the county floodplain administrators be contacted for the review of the project and possible permit requirements for the proposed project.

The Little Rock District determined that the proposed action will result in no impact to floodplains; therefore, county floodplain administrators were not involved.

Comments from Individuals: Additional comments were provided by two (2) individual citizens (undated and handwritten letters by Mr. Gary Honeycutt, and one with an illegible signature and no return address). Both are included in this attachment. The comments from these individuals focused on the potential negative impacts of reallocating storage for water supply. All of the concerns expressed by these individuals are addressed in the Environmental Assessment and Finding of No Significant Impact. One individual questioned the authority to utilize Bull Shoals Lake for public water supply. The other individual seemed to focus on the use of the land that Bull Shoals Lake occupies for a public water supply reservoir.

The Little Rock District operates the Bull Shoals Dam and Lake Project as a multi-purpose reservoir, as authorized by the Congress of the United States. The project was authorized for flood control, hydroelectric power and other purposes, including fish/wildlife and recreation, by the Flood Control Act of 28 June 1938, as modified by the Flood Control Act of 1941. The Water Supply Act of 1958 provides general authorization for construction or reallocation of storage for water supply uses at all Corps lakes, provided such construction or reallocation does not seriously affect other authorized project purposes. The Chief of Engineers has delegated authority to approve reallocations of up to 15 percent of total storage capacity, or 50,000 ac-ft, whichever is less. This report concluded the reallocation for water supply will have no significant impacts to the authorized operating purposes of Bull Shoals Lake.

## CONCLUSIONS

The draft and final EA were prepared in accordance with ER 200-2 “Procedures for Implementing NEPA”, which provides guidance for implementation of the procedural provisions of the National Environmental Policy Act (NEPA) of 1970 (42 USC 4321 *et seq.*, as amended) for the Civil Works Program of the U.S. Army Corps of Engineers, per regulations set forth by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508).



After careful evaluation of all comments received, the conclusions and recommendations expressed in the draft report and EA remain the same. None of the comments received warrant a change to the conclusion that the proposed action has no significant effects on the environment. Therefore an Environmental Impact Statement (EIS) is not warranted and a "Finding of No Significant Impact" (FONSI) is appropriate.

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Southwestern Power Resources  
Administration  
P.O. Box 471827  
Tulsa, OK 74147-1827

Mr. Mark Sattelberg  
Field Supervisor  
U.S. Fish and Wildlife Service  
110 South Amity Road, Suite 300  
Conway, AR 72032

Mr. Robert Pine  
U.S. Fish and Wildlife Service  
10711 Burnet Road, Suite 200  
Austin, TX 78758

Mr. Michael Deihl  
Administrator  
Southwestern Power Administration  
One West Third Street  
Room 1400  
Tulsa, OK 74103-3519

Mr. Steven R. Spencer  
Regional Environmental Officer  
U.S. Department of the Interior  
P.O. Box 26567 (MC-9)  
Albuquerque, NM 87125-6567

Mr. John Hoskins  
Director  
Missouri Department of Conservaton  
P.O. Box 180  
Jefferson City, MO 65102

Mr. George Robbins  
Southwestern Power Administration  
One West Third Street  
Tulsa, OK 74103-3519

Mr. Robert Lawrence  
U.S. Environmental Protection Agency,  
Region 6  
1445 Ross Avenue  
Dallas, TX 75202

Ms. Loretta Sutton  
U.S. Department of the Interior  
1849 C Street NW  
(MS 2342)  
Washington, DC 20240



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
LITTLE ROCK DISTRICT CORPS OF ENGINEERS  
POST OFFICE BOX 867  
LITTLE ROCK, ARKANSAS 72203-0867

(501) 324-5751 □ FAX: 501-324-5605 □ <http://www.swl.usace.army.mil>

May 10, 2010

Planning and Environmental Division  
Environmental Branch

«fn» «ln»  
«title»  
«agency»  
«office»  
«add1»  
«add2»  
«city», «state» «zip»

Dear «salutation» «ln»:

Enclosed for your review is a compact disc containing a copy of the water supply storage reallocation report for the Ozark Mountain Regional Public Water Authority (OMRPWA) and the Marion County Regional Water District (MCRWD), Bull Shoals Lake, Arkansas. The draft water supply report includes, as Appendix C, the Draft Environmental Assessment (DEA) and Draft Finding of No Significant Impact. The DEA has been prepared in accordance with the National Environmental Policy Act (NEPA) and U.S. Army Corps of Engineers Engineering Regulation ER-200-2-2. The draft document presents results of the feasibility study to reallocate a total of 11,866.54 acre feet (AF) storage from the Bull Shoals Lake conservation pool to the two water districts and associated potential impacts to the human environment. This total AF represents less than one percent of the total conservation pool storage of 1,236,000 AF in the lake.

Your comments are requested as part of a 30-day public review period and should be received no later than June 11, 2010. Written comments should be provided to Mr. Patrick MacDanel, at GEC, Inc., P.O. Box 84010, Baton Rouge, LA 70808 or by e-mail to [macdanel@gecinc.com](mailto:macdanel@gecinc.com). For more information you may contact Patrick MacDanel (212-612-4117) or Mike Rodgers (501-324-5030) at the Little Rock District Office.

Sincerely,

Dana Coburn  
Chief, Environmental Branch

Enclosure



U.S. Army Corps  
of Engineers  
Little Rock District

# News Release

Back to [News Release Index](#)

Release No: 43-10  
Release: Immediately  
May 10, 2010  
Contact:  
Laurie Driver, 501-324-5551  
[Laurie.T.Driver@usace.army.mil](mailto:Laurie.T.Driver@usace.army.mil)

## **COMMENTS SOUGHT ON PROPOSED BULL SHOALS LAKE WATER SUPPLY**

LITTLE ROCK, Ark. -- The Army Corps of Engineers' Little Rock District is seeking public comments through June 11 on environmental documents that examine a proposed reallocation of storage in Bull Shoals Lake to provide additional water supply for two regional water districts.

The Ozark Mountain Regional Public Water Authority and the Marion County Regional Water District are seeking to use Bull Shoals Lake as a water source to provide water supply into the future for more than 22,000 customers in the north central Arkansas area.

The documents are a Draft Feasibility Report, which includes a Draft Environmental Assessment and a Draft Finding of No Significant Impact. The report presents the results of a study to reallocate 11,866.54 acre feet of storage from the conservation pool to the two water utilities. Ozark Mountain's share would yield 6 million gallons per day, and Marion County's share would yield 1 million gallons per day.

The draft documents indicate the reallocation would cause no significant adverse effects to the human environment, and an Environmental Impact Statement will not be required.

The documents can be reviewed between 7:45 a.m. and 4:30 p.m. weekdays at the Mountain Home Project Office at 324 West 7th, Mountain Home, at the Searcy County Library at 202 East Main Street, Marshall, at the Marion County Library at 308 Old Main, in Yellville or at the Little Rock District Office in Room 7403 of the Federal Building at 700 W. Capitol Ave. in Little Rock. The documents can also be viewed on the Internet at <http://www.swl.usace.army.mil/> and click "Proposed Bull Shoals Water Supply."

Written comments should be mailed to Mr. Patrick MacDanel at GEC Inc., P.O. Box 84010, Baton Rouge, LA 70808 or e-mailed to [macdanel@gecinc.com](mailto:macdanel@gecinc.com). Mailed comments must be post-marked by June 11 and e-mailed comments must be received by then to become part of the official record.

For more information contact Mike Rodgers at (501-324-5030) at the Army Corps of Engineers Little Rock District Office.



**Arkansas Press Services, Inc**  
411 S. Victory Street  
Little Rock, AR 72201-2932  
(501) 374-1500 • Fax (501) 374-7509

### AFFIDAVIT OF INSERTION

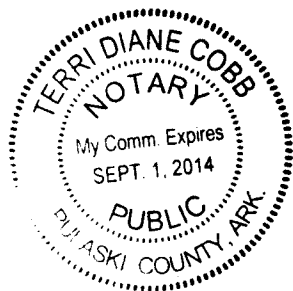
This is to certify that the advertisement for US ARMY CORPS of ENGINEERS "Public Notice: Proposed Reallocation for Water Supply on Bull Shoals Lake Seeks Public Comments"

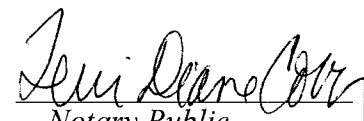
Appeared in the ARKANSAS DEMOCRAT-GAZETTE on May 11, 2010; in the HARRISON DAILY TIMES and MOUNTAIN HOME BAXTER BULLETIN on May 12, 2010; and in the FLIPPIN MOUNTAINEER-ECHO and MARSHALL MOUNTAIN WAVE on May 13, 2010; with tearsheets also attached as evidence.

  
(Print Media Planner/Buyer)

State of Arkansas  
County of Pulaski

Sworn to and subscribed before me this 19 day of May, 2010.



  
Notary Public

My commission expires  
9-1-2014

...for Attorney General. Before being elected, he was employed by Real Practices, a medical and real-estate development firm based in Northwest Arkansas.

Jim Milum, chairman of the Board of Trustees of North Arkansas College, will give the invocation and benediction. Diplomas will be awarded by Dr. Jeff Olson.

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new funds, the Morris Jack and Jessie Morris Ima Douglas Scholarship, AIE Endowed Scholarship Scholarships.

...er with General Electric, resident at Thorsen Tool and as the president and his own company, Lyons has a master's degree from university, and Betty Morris from Syracuse University. ...en, Ron and Robert, and ... Ron, is a 1984 graduate ...s, and one granddaughter, ...university in 2008.

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**The Misunderstood Epidemic: Depression**

A film that explores the difficulties faced by those coping with varying levels of depression.

Immediately following the documentary, AETN presents

**HOUSE CALLS-"Depression"**

This program features host Dr. T Glenn Pait interviewing Dr. Lawrence Miller, Medical Director for the Arkansas Department of Human Services, Division of Behavior Health Services and Kim Arnold, Executive Director for the Arkansas Chapter of the National Alliance for Mental Illness (NAMI Arkansas).

**Tuesday, May 18, 7-8:30 p.m. on AETN**



This content purchase is made possible through funding from Intel. The Misunderstood Epidemic: Depression is a production of Intel. Intel Films, and is supported by NPS.

**PUBLIC NOTICE**  
**PROPOSED REALLOCATION FOR WATER SUPPLY ON**  
**BULL SHOALS LAKE CORPS SEEKS PUBLIC COMMENTS**

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**Saint Joe AR**

- Chance L. Case
- Kristen Carey Dornburg
- \*Michael S. Elliott
- Jessica M. Fletcher
- Tiffany Dawn Harmon
- \*\*Amber R. Jones
- Jordan Methvin
- \*Joe C. Reed
- Tressa D. Scott
- Dawn M. Stills
- Tara Leanne Warren

Medical Center sings and plays his guitar for recuperative care patients every other Sunday.

Medicare requires that activities are offered for Recuperative Care patients twice daily. Examples of activities would be puzzles, cards, ball toss, play-doh, etc. Anything that mimics an activity they enjoy and may have done or still do when they are at home. Most of NARMC activities are done one on one as patients may be unable to go to the Activity Room for

**Woman Plants Spring Flowers on 18<sup>th</sup> Green After Using Thera-Gesic®**

BEXAR COUNTY – Apparently inspired by Earth Day, Mary W. applied Thera-Gesic® to her sore lower back and proceeded to plant 55 beautiful petunias on the 18th green of the local golf course during the night. When asked why she chose a busy putting green, she painlessly replied: "None of your dang business!"



Go painlessly with Thera-Gesic®



**PUBLIC NOTICE**

**PROPOSED REALLOCATION FOR WATER SUPPLY ON BULL SHOALS LAKE CORPS SEEKS PUBLIC COMMENTS**

**Public Involvement:** The Army Corps of Engineers' Little Rock District is seeking public comments through June 11 on environmental documents that examine a proposed reallocation of storage in Bull Shoals Lake to provide additional water supply for the Ozark Mountain Regional Public Water Authority and the Marion County Regional Water District.

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For more information contact Mike Rodgers at (501-324-5030) at the Army Corps of Engineers Little Rock District Office.

*Marshall 5-13*

**UNOPPOSED DEMOC VOTE**

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501-228-7230  
TRUSTED BY OVER  
20,000 CUSTOMERS

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...continued to its  
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...questioning the man  
...yet determined a

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...f Bloomberg News  
...by Rahim Faiez of  
...Press.



## ROCK CREEK WINES AND SPIRITS

Sale Prices May 11 - May 17

### WINES

	Reg Price	Sale	Case per btl.
Landmark Overlook Chard	26.99	23.52 btl	19.99
Ferrari-Carano Pinot Grigio	16.99	14.99 btl	12.74
Beringer Founders Estate 1.5	14.99	12.92 btl	10.98
Alexander Valley Vineyards	14.99	12.92 btl	10.98
Jacobs Creek 1.5	15.99	11.74 btl	9.98
Liberty School Cab or Chard	14.99	11.74 btl	9.98
Chateau St. Jean	13.99	10.56 btl	8.98
Dashwood Sauvignon Blanc	14.99	9.99 btl	8.49
Stone Cellars 1.5	9.99	8.99 btl	7.64
Yellow Tail Reserves	11.99	7.99 btl	6.79
Concha y Toro Frontera 1.5	8.99	7.75 btl	6.54

### SPIRITS

	Reg Price	Sale	Case per btl.
Glenlivet Scotch 1.75	72.99	67.99 btl	61.19
Bushmills 1.75	43.99	38.87 btl	34.98
Stolichnaya Vodka 1.75	36.99	29.99 btl	26.99
Knob Creek 750	25.99	19.44 btl	17.49
Benchmark Bourbon 1.75	14.99	12.66 btl	11.69

12310 CHENAL PKWY LR, AR 72211  
(501) 219-9463

### PUBLIC NOTICE PROPOSED REALLOCATION FOR WATER SUPPLY ON BULL SHOALS LAKE CORPS SEEKS PUBLIC COMMENTS

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**Information:** The documents are a Draft Feasibility Report, which includes a Draft Environmental Assessment and a Draft Finding of No Significant Impact. The report presents the results of a study to reallocate 11,866.54 acre feet of storage from the conservation pool to the two water districts. The 6 million gallons per day requested by OMRPWA will be provided by 10,188.463 acre feet of storage and 1,698.077 acre feet will provide one million gallons per day for Marion County.

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In Kansas Democrat Gazette 5-11

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do destroyed a pre-  
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and damaged other  
parts of the campus,  
Superintended John  
Sheridan said.

Siblings Maria and  
Alejandro Martinez sifted  
through debris Tuesday  
at the site where their  
mobile home had stood.  
The storm had blown it  
off of its foundation and  
threw it 50 feet away,  
scattering their furniture,  
appliances and other  
household items around  
the yard.

Alejandro, 14, said the  
family was inside their  
home when it started  
moving Monday evening.  
They were thrown from  
the home and suffered  
cuts and bruises. Their  
father, who also was at  
home, had a broken arm,  
they said.

"It started shaking and

were expected  
but they were not pre-  
dicted to be as severe,  
said meteorologist Ty  
Judd with the National  
Weather Service.

"We're not looking at  
what we saw yesterday,"  
Judd said. He said a pre-  
liminary estimate count-  
ed 10 tornado touch-  
downs in Oklahoma  
Monday.

Gov. Brad Henry on  
Tuesday declared a state  
of emergency in 56  
Oklahoma counties. He  
and U.S. Reps. Tom Cole  
and Mary Fallin were  
scheduled to tour dam-  
aged areas in central  
Oklahoma.

In Kansas, the most  
serious damage was  
reported in Belmont,  
west of Wichita, where  
several homes were hit  
and there were wide-  
spread power outages.  
But no injuries were  
reported.

**PUBLIC NOTICE  
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ENGINEERS "Public Notice:  
s Public Comments"

11, 2010; in the HARRISON  
on May 12, 2010; and in the  
RAIN WAVE on May 13, 2010:

*[Signature]*  
Print Media Planner/Buyer

2010.

*[Signature]*  
Notary Public

My commission expires  
9-1-2011

**41-5379**

Harrison 5-102

• Serving Arkansas 137 Years

# Big Ten denies rumors

COLUMBUS, Ohio (AP) — Big Ten commissioner Jim Delany e-mailed conference officials Tuesday to stamp out a rumor that four schools had already been offered a chance to join the league.

Ohio State athletic director Gene Smith confirmed Tuesday that Delany had dashed a report that the Big Ten had offered expansion bids to Missouri, Nebraska, Notre Dame and Rutgers.

Asked if there was anything to that speculation, Smith said, "Nothing. There's no truth to it whatsoever. Actually, Jim sent us all an e-mail telling us there's no

truth to that — which we knew. There's no extensions of offers that have been made, so that's not true."

The conference is looking at expanding from its current 11 members so that it can extend the reach of its lucrative cable network and add a league championship game in football.

The Big Ten athletic directors will meet May 17-19 in downtown Chicago. They will be joined by faculty representatives, senior women's administrators and the head coaches in football and men's and women's basketball. But Smith said the meetings

were routine and nothing would be decided in terms of expansion.

"This is our normal meetings, the ones we have every year," Smith said. "Jim (Delany) will probably give us an update on what the consultant has shared, and I don't even know if the consultant report is done. He'll give us an update and then move on doing what he's been doing. I think they meet with the (university) presidents in June or something like that. So the timeline hasn't changed, but there won't be any action next week."

# Cushing suspended for HCG

NEW YORK (AP) — Houston Texans linebacker Brian Cushing tested positive for HCG, a fertility drug that is on the NFL's banned substance list.

A person familiar with Cushing's case told The Associated Press on Tuesday that Cushing had one positive test last September, then subsequently tested negative several times. The person spoke on condition of anonymity because the test results were supposed to remain confidential.

"He had one low-level positive test for HCG in September, and then every test after that was negative," the person said. "He has said he has no idea where the positive test came from."

The NFL has suspended Cushing for the first four games of the season. He won the AP's NFL Defensive Rookie of the Year honor in January for outstanding on-field performance. Now, the league is taking a revote for the award, as well as All-Pro outside linebacker because Cushing made the second

ESPN first reported the banned substance was human chorionic gonadotropin, which is widely taken by steroid users to help restart natural testosterone

production. HCG can mitigate the side effects of ending a cycle of drugs. It's also used to induce ovulation and treat ovarian disorders in women.

## PUBLIC NOTICE PROPOSED REALLOCATION FOR WATER SUPPLY ON BULL SHOALS LAKE CORPS SEEKS PUBLIC COMMENTS

**Public Involvement:** The Army Corps of Engineers' Little Rock District is seeking public comments through June 11 on environmental documents that examine a proposed reallocation of storage in Bull Shoals Lake to provide additional water supply for the Ozark Mountain Regional Public Water Authority and the Marion County Regional Water District.

**Information:** The documents are a Draft Feasibility Report, which includes a Draft Environmental Assessment and a Draft Finding of No Significant Impact. The report presents the results of a study to reallocate 11,866.54 acre feet of storage from the conservation pool to the two water districts. The 6 million gallons per day requested by OMRPWA will be provided by 10,188.463 acre feet of storage and 1,698.077 acre feet will provide one million gallons per day for Marion County.

The draft documents indicate the reallocation would cause no significant adverse effects to the human environment, and an Environmental Impact Statement will not be required.

**Point of Contact:** The documents can be reviewed between 7.45 a.m. and 4:30 p.m. weekdays at the Mountain Home Project Office at 324 West 7th, Mountain Home, at the Searcy County Library at 202 East Main Street, Marshall, at the Marion County Library at 308 Old Main, in Yellville or at the Little Rock District Office in Room 7403 of the Federal Building at 700 W. Capitol Ave. in Little Rock. The documents can also be viewed on the Internet at [www.swl.usace.army.mil](http://www.swl.usace.army.mil) and click "Proposed Bull Shoals Water Supply."

Written comments should be mailed to Mr. Patrick MacDanel at GEC Inc., P.O. Box 84010, Baton Rouge, LA 70808 or e-mailed to [macdanel@gecinc.com](mailto:macdanel@gecinc.com). Mailed comments must be post-marked by June 11 and e-mailed comments must be received by then to become part of the official record.

For more information contact Mike Rodgers at (501-324-5030) at the Army Corps of Engineers Little Rock District Office.

ENGINEERS "Public Notice:  
Public Comments"

, 2010; in the HARRISON  
on May 12, 2010; and in the  
WAVE on May 13, 2010;

*Debra [Signature]*  
Media Planner/Buyer

7, 2010.

*Joni Deane [Signature]*  
Notary Public

My commission expires

9-1-2014

10 • Serving Arkansas 137 Years

# **PUBLIC NOTICE**

## **PROPOSED REALLOCATION FOR WATER SUPPLY ON BULL SHOALS LAKE CORPS SEEKS PUBLIC COMMENTS**

**Public Involvement:** The Army Corps of Engineers' Little Rock District is seeking public comments through June 11 on environmental documents that examine a proposed reallocation of storage in Bull Shoals Lake to provide additional water supply for the Ozark Mountain Regional Public Water Authority and the Marion County Regional Water District.

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For more information contact Mike Rodgers at (501-324-5030) at the Army Corps of Engineers Little Rock District Office.



# Arkansas Department of Health

4815 West Markham Street • Little Rock, Arkansas 72205-3867 • Telephone (501) 661-2000

**Governor Mike Beebe**

**Paul K. Halverson, DrPH, FACHE, Director and State Health Officer**

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Engineering Section, Slot 37  
www.HealthyArkansas.com/eng/

Ph 501-661-2623

Fax 501-661-2032

After Hours Emergency 501-661-2136

May 13, 2010

Ms. Dana Coburn  
Department of the Army  
Little Rock District Corps of Engineers  
P.O. Box 867  
Little Rock, AR72203-0867

RE: Draft Reallocation Report  
Ozark Mountain Public Water Authority (OMPWA)  
Marion County Regional Water Authority (MCRWA)  
Bull Shoals Lake

Ms. Coburn:

This office has reviewed the above referenced report and concur with the reallocation that would provide water to OMPWA and additional water to MCRWA for the purposes of providing a safe drinking water supply to the areas served by these utilities.

If you have any questions concerning our support of this reallocation, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeff Stone', is written over a horizontal line.

Jeff Stone, P.E.  
Chief Engineer  
Engineering Section

RH:JS:CSC:KY

Cc: Mr. Tim Mays, Engineering Services, Inc.



The Department of  
**Arkansas  
Heritage**

Mike Beebe  
Governor

Cathie Matthews  
Director

Arkansas Arts Council

\*

Arkansas Natural Heritage  
Commission

\*

Delta Cultural Center

\*

Historic Arkansas Museum

\*

Mosaic Templars  
Cultural Center

\*

Old State House Museum



Arkansas Historic  
Preservation Program

1500 Tower Building  
323 Center Street  
Little Rock, AR 72201

(501) 324-9880

fax: (501) 324-9184

tdd: (501) 324-9811

e-mail:

[info@arkansaspreservation.org](mailto:info@arkansaspreservation.org)

website:

[www.arkansaspreservation.com](http://www.arkansaspreservation.com)

An Equal Opportunity Employer



May 13, 2010

Mr. Patrick MacDanel  
GEC, Inc.  
Post Office Box 84010  
Baton Rouge, Louisiana 70808

RE: Multi County - General  
Section 106 Review - COE  
Water Supply Storage Reallocation Report; Bull Shoals Lake  
AHPP Tracking No: 72431

Dear Mr. MacDanel:

This letter is written in response to your inquiry regarding properties of architectural, historical, or archeological significance in the area of the referenced project. The staff of the Arkansas Historic Preservation Program has reviewed the records pertaining to the area in question, and reported that the proposed undertaking will not affect any known historic properties. This effect determination could change should new information come to light.

Thank you for the opportunity to comment on this undertaking. If you have any questions, please contact Steve Imhoff of my staff at (501) 324-9880.

Sincerely,

Frances McSwain  
Deputy State Historic Preservation Officer

cc: Dr. Richard Allen, Cherokee Nation  
Mr. Earl J. Barbry, Tunica-Biloxi Tribe of Louisiana, Inc.  
Ms. Margaret Bell, Wichita & Affiliated Tribes  
Mr. Robert Cast, Caddo Nation  
Ms. Dana Coburn, Little Rock District, Corps of Engineers  
Dr. Ann M. Early, Arkansas Archeological Survey  
Ms. Tamara Francis, The Delaware Nation  
Dr. Andrea A. Hunter, Osage Nation  
Ms. Karen Kaniatobe, Absentee Shawnee Tribe  
Ms. Lisa Larue-Stopp, United Keetoowah Band of Cherokees  
Ms. Belinda Pryor, Shawnee Tribe of Oklahoma  
Ms. Glenna J. Wallace, Eastern Shawnee Tribe of Oklahoma  
Ms. Carrie V. Wilson, Quapaw Tribe of Oklahoma



Scott Henderson  
Director

Keeping the Natural State natural.

## Arkansas Game and Fish Commission

Loren Hitchcock  
Deputy Director

Mike Armstrong  
Assistant Director

June 1, 2010

Mrs. Dana Coburn  
U.S. Army Corps of Engineers  
Planning and Environmental Division  
P.O. Box 867  
Little Rock, Arkansas 72203-0867

Dear Mrs. Coburn:

Your letter to Scott Henderson dated May 10, 2010, concerning the water supply storage reallocation report, has been referred to me for reply.

Biologists from our Agency have reviewed the water supply storage reallocation report, for the Ozark Mountain Regional Public Water Authority and the Marion County Regional Water District, concerning Bull Shoals Lake, Arkansas. The draft document presents results of the feasibility study to reallocate 11,867 acre-feet (AF) of storage from Bull Shoals Lake conservation pool to the two water districts. Since this 11,867 AF of water represents less than one percent of the total conservation pool storage of 1,236,000 AF in the lake and equals less than 3 inches of water at the conservation pool, we do not have specific problems with this removal from a fish and wildlife management standpoint.

We appreciate the opportunity to review this project proposal. If our agency can be of further assistance with the proposed project, don't hesitate to call us.

Sincerely,

Robert K. Leonard, Biologist  
Ecological & Engineering Services

Cc: David Goad  
Mark Oliver  
USFWS, Conway Office

2 Natural Resources Drive • Little Rock, AR 72205 • [www.agfc.com](http://www.agfc.com)  
Phone (800) 364-4263 • (501) 223-6300 • Fax (501) 223-6448

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*The mission of the Arkansas Game and Fish Commission is to wisely manage all the fish and wildlife resources of Arkansas while providing maximum enjoyment for the people.*



# T. David Carruth, Attorney at Law

P. O. Box 91  
152 Madison Street  
Clarendon, Arkansas 72029

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870-747-3839 office  
870-747-5695 fax  
870-747-1130 mobile

June 10, 2010

Mr. Patrick McDanel  
GEC, Inc.  
P. O. Box 84010  
Baton Rouge, LA 70808

Re: Bull Shoals Lake Proposed Reallocation  
Via email to [macdanel@gecinc.com](mailto:macdanel@gecinc.com)

Dear Mr. McDaniel:

These comments are submitted in regard to a Public Notice of a proposed reallocation for water supply on Bull Shoals Lake of 11,866.54 acre feet to two water districts. The first is the Ozark Mountain Regional Public Water Authority and the other is Marion County Regional Water District. These comments are made on behalf of myself, the White River Conservancy and are available as comments for the Arkansas Wildlife Federation, the Clarendon Chamber of Commerce and a loose association of individuals who use the waters of the White River for recreation, fishing and hunting. This association is known as the B.P.F.M.A.O.R.R.R. I thank you and the Corps of Engineers for the opportunity to comment.

First, I attempted to open the file on the website listed in the Public Notice, [www.swl.usace.army.mil](http://www.swl.usace.army.mil) however the file would not open. Therefore, I have been unable to read the reports regarding this proposal, i.e. the Draft Feasibility Report, the Draft Environmental Assessment and Draft Finding of No Significant Impact. I would request that the problem be investigated and, if it is determined the problem was in the USCOE website, that it be corrected and the time for comment be extended.

As to the proposal to “reallocate” water from Bull Shoals Lake for the two water districts, I submit that such a reallocation will have a profound impact on both the human and natural environment. Because of this impact, an environmental impact statement should be prepared prior to any reallocation.

Bull Shoals Dam was installed on the White River for the purpose of flood *control* as a result of flood events in the lower Mississippi River valley. The Congressionally authorized purposes for the dam and the impounded water are flood control and hydro-power generation. Water supply is



not an authorized use of the water impounded by Bull Shoals Dam. It is the authorization for flood **control** which causes there to be a strong likelihood of impact to the human and natural environment if the proposed allocation is implemented.

As stated, Bull Shoals Dam was installed to control flooding on the White and Mississippi Rivers. Its purpose is to hold back runoff so that high level crests downstream are reduced or eliminated. Instead of the water traveling down the White River resulting in a high crest, the water is withheld in the Lake until the downstream flood event passes. Then the impounded water is released gradually so as not to cause further flooding. But management of the dam and water levels can release water into the lower White River system at a time when it is needed for the lower river ecosystem, aquifer recharge of the alluvial aquifer or agricultural irrigation. The current construction of the Grand Prairie Area Demonstration Project makes such a situation assured. Said another way, because Bull Shoals Dam was built for flood control, once the Grand Prairie and other projects are completed, the flood water impounded in Bull Shoals Lake should be released from the lake so that it can be picked up for irrigation by the White River Regional Irrigation District.

This result is supported not only by the authorization for Bull Shoals Dam, but by Arkansas law as pronounced by the Arkansas Supreme Court in the 1955 case of Harris vs. Brooks. Under Harris vs. Brooks uses other than domestic use are equal in priority. If there is a conflict, a latter use much yield to a prior use. By “allocating” water for an unauthorized use, i.e. water supply, the users of that water are subject to being enjoined by users of an authorized use and/or prior users.

Certainly either or both of the water districts could counter this by saying that the proposed reallocated water will be used for domestic purposes. However, this cannot be assured. The water is being used for a, “Public Water Authority” and “Regional Water District.” This water Authority and water District assumably distribute the water to its customers for sale. This is not a domestic use but a commercial one, i.e. the sale of water. Certainly the argument will be advanced that this Authority and District sell the water to domestic users. Perhaps, but it is equally as likely the water is also distributed to car washes, restaurants, laundry mats and other industrial and commercial users. This is not domestic use but commercial use of the water. Certainly not an authorized use of the dam and impounded water. It is also not one worthy of higher consideration as to irrigation water.

For these reasons, I submit that the allocation should not take place and, at least, the impact to both the human and natural environment on both the upper and lower White River should be studied in more detail. Therefore, a full environmental impact study should be conducted. To do less, given the facts and consequences of this allocation, would be in violation of the National Environmental Policy Act.

Mr. Patrick McDanel  
June 10, 2010  
Page 3

Again, thank you for the opportunity to comment. Please investigate the issue regarding the website and, if the time for comment is extended, please advise as I would like to read the documents and make such comments as may be appropriate.

Very truly yours,

/s/ David Carruth

T. David Carruth

MR. MACDANIEL;

IT IS IMPOSSIBLE FOR ME TO EXPRESS THE ENORMOUS AMOUNT OF CONTEMPT THAT I HAVE FOR THE CORPS OF ENGINEERS IN REGARD TO BULL SHOALS LAKE. FIRST IT WAS THE "MINIMUM FLOW" ATTACK ON THE LAKE & NOW YOU WANT TO START USING THE LAKE FOR PUBLIC WATER SUPPLY. THIS IS AN OUT-RAGE. YOU GUYS WILL NOT BE SATISFIED UNTIL YOU COMPLETELY DRAIN THE LAKE.

(2)

WE ARE JUST NOW STARTING  
TO HAVE DECENT RAINFALL. FOR  
THE PAST THREE YEARS BULL SHOALS  
HAS HAD SOME GOOD SPAWNS.  
PRIOR TO THIS WE HAVE HAD NIGAR  
DROUGHT CONDITIONS. THIS WAS  
CAUSED IN PART BY USING  
LAKE NORFOLK AS A WATER  
SUPPLY FOR MT. HOME ARKANSAS.  
BULL SHOALS CANNOT PROVIDE  
ALL OF THIS. YOU LIED TO US  
ABOUT THE "MINIMUM FLOW"  
ISSUE AND YOU ARE LYING TO  
US ABOUT WHAT WILL HAPPEN

③

WHEN YOU START DRAINING THE  
LAKE FOR PUBLIC WATER. KEEP  
YOUR CORRUPT HANDS OFF BILL  
STOALS.

IN CONCLUSION, WHY DON'T  
YOU GET OFF YOUR BUTTS & MAKE  
TYSON FOODS PAY UP. THEY HAVE  
POLLUTED ARKANSAS WITH THEIR  
CHICKEN PLANTS. MY FINAL STATEMENT  
IS THIS: THE CORP OF ENGINEERS  
HAS LONG OUT LIVED ITS USEFULNESS.  
YOU GUYS ARE WORKING FOR THE  
FEDERAL GOVERNMENT, PROBABLY GOT

(4)

your  
JOB BECAUSE YOU ~~DI~~ KNEW SOME  
ONE, OR YOUR DADDY ~~HE~~ HAD  
CONNECTIONS. YOU HAVE TOO MUCH  
TIME ON YOUR HANDS. IF YOU WANT  
TO DO SOMETHING GO TO THE  
OIL SPILL & HELP THEM.

Sincerely,

Kevin Jones

U. S. Department of Homeland Security  
FEMA Region 6  
800 North Loop 288  
Denton, TX 76209-3698



**FEMA**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
REGION VI  
MITIGATION DIVISION

**PUBLIC NOTICE REVIEW/ENVIRONMENTAL  
CONSULTATION**

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We have no comments to offer.       We offer the following comments:

**WE WOULD REQUEST THAT THE COUNTY FLOODPLAIN ADMINISTRATOR BE  
CONTACTED FOR THE REVIEW AND POSSIBLE PERMIT REQUIREMENTS FOR  
THIS PROJECT.**

---

REVIEWER: *Mayra G. Diaz*  
940-898-5541  
Natural Hazards Program Specialist

DATE:

*5/12/10*



I read an article in our local newspaper regarding Comments of the issue of Marion County Ark. using the Bull Shoals as a public water supply. I thought that this was designed for flood control. My Dad Stenford Honeycutt helped build the dam I had a lot of realtives who had to give up their lands for this why do you want to change things also the few farms left, ~~so~~ PS the lake took the least land, we use the spring branches for watering our livestock, what is this going to do to us would it not be a lot better to drill wells, also what about the Recreation areas of the lake levels what will this do to the economy, PS I believe God gave us this land to use and take care of I have a well myself Mt Home can drill their own wells we in Missouri should not have to supply them water just because they want the Conscience of it, we should not have to give up our freedoms just because they want to take them, we in America ~~don't~~ don't want to look at the right or wrong problem some of the big wigs in Ark. are wanting to pad their pockets if you will really check things out you will find I'm right, also what would happen

(over)



If you had an earthquake and  
the dam got busted they would loose  
their water supply verses if they had  
their wells they would not have this  
problem.

Thanks

Gary Honeycutt  
HCR 2 Box 27  
Wassila, Mo 65773

417-265-0008

PS What about the New Madrid fault



# SOUTHWESTERN POWER RESOURCES ASSOCIATION

*PARTNERS WITH THE RIVER - HYDROPOWER TO THE PEOPLE*

June 11, 2010

Mr. Patrick MacDanel  
GEC Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

RE: Draft Water Supply Storage Reallocation Report, Reallocation of Storage at Bull Shoals Lake, Arkansas, for Ozark Mountain Regional Public Water Authority and Marion County Regional Water District (Draft Bull Shoals Reallocation Report)

Dear Mr. MacDanel:

On behalf of Southwestern Power Resources Association (SPRA), I respectfully submit the following comments concerning the above cited document. SPRA represents the rural electric cooperatives and municipally owned electric utilities that purchase the energy and capacity generated at 24 Corps of Engineers multipurpose projects in this region, including the Bull Shoals project. This energy and capacity is marketed to our membership by Southwestern Power Administration (SWPA), an agency of the U.S. Department of Energy.

The draft reallocation report makes a compelling case for reallocation of storage at Bull Shoals Lake to meet the municipal and industrial (M&I) water supply needs of Ozark Mountain Regional Public Water Authority (Ozark Mountain) and Marion County Rural Water District (Marion County). SPRA recognizes the need for quick action on these M&I water supply requests, both because of Ozark Mountain's contaminated drinking water supply source and because of the need to obligate available funding from the American Recovery and Reinvestment Act (ARRA).

We are quite concerned, therefore, about several fatal flaws in the data and report provided by the Corps' Hydropower Analysis Center (HAC), which serve as the basis for the determination of which pool should serve as the source for the storage reallocation, compensation to the hydropower purpose for impacts of the proposed storage reallocation, and determination of costs assigned to any reallocated storage. These flaws include:

- Use of pricing data for electric energy and capacity from the Southeast Electric Reliability Council (SERC). SWPA markets the energy and capacity from the Bull Shoals project in the Southwest Power Pool (SPP) region. This pricing data serves as the basis for compensation for hydro benefits foregone during the remaining term of SWPA's



outstanding contracts.<sup>1</sup> To the extent that SERC prices do not reflect SPP prices, hydropower impacts will not be correctly compensated.

- Assumption that SWPA's outstanding contracts for hydro energy and capacity marketed from Bull Shoals expire in 2015. In fact, contracts extend through the year 2025. Even using the Corps' flawed procedure of limiting hydro compensation to benefits foregone during the remaining term of outstanding wholesale power contracts, the HAC report would have the Corps shortchanging compensation of the power purpose for 10 years.
- Use of outdated SWPA rates for energy and capacity to determine hydropower compensation for revenues foregone. The HAC report uses an energy charge of 7.00 mills/kWh and a capacity charge of \$30.72/kW-year<sup>2</sup>. In actuality, SWPA's current rates for these commodities are 15.30 mills/kWh for on-peak energy; an off-peak energy rate of 8.60 mills/kWh; and a capacity charge of 48.94/kW-year. The HAC report uses energy and capacity charges *which have not been in effect since 2002* as the basis for compensating the hydropower purpose for the remaining life of the project after current contracts expire.<sup>3</sup> Thus, the estimated compensation for power revenues foregone again shortchanges hydropower customers.
- The Corps uses the highest of benefits foregone, revenues foregone, replacement costs and updated cost of storage to determine the cost to be charged for reallocated storage. In the instant case, the draft reallocation report concludes that updated cost of storage (either using full updated costs or reduced costs if low-income status is granted) is the highest of the four calculations.<sup>4</sup> However, if correct replacement costs for energy and capacity from the SPP region (rather than the incorrect SERC region used by HAC) were used, it is possible that replacement costs/benefits foregone would be greater than the updated cost of storage (whether using full updated cost of storage or reduced costs eligible to low-income counties).

Here is where the rub comes. Corps policy restricts hydropower compensation to no more than the revenue received for the reallocated storage.<sup>5</sup> To secure the ARRA funding needed to complete the acquisition of Bull Shoals storage and construct infrastructure needed to treat and deliver this new source of M&I water, contracts for storage must be signed in August and September of 2010. If, in its haste to complete the contracts within these time constraints, the Corps includes storage costs in the contracts that are less than the compensation due to the power purpose, hydropower customers risk receiving full and just compensation due them unless the

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<sup>1</sup> SPRA disagrees with limiting hydro compensation based on benefits foregone only for the remainder of outstanding contracts (see arguments below).

<sup>2</sup> The actual capacity charge listed on p. 37 of Appendix D of the draft reallocation report is \$30.72/W-year. This is obviously a typographical error and yet another example of the sloppy job done in preparing the report.

<sup>3</sup> Again, SPRA disagrees with this policy as providing incomplete compensation to the hydropower purpose.

<sup>4</sup> Draft Reallocation Report, p. 5-16.

<sup>5</sup> Yet another policy with which SPRA disagrees.

Corps waives its policy of limiting compensation to the revenues received for the reallocated storage.

SPRA has no desire to derail funding for a reallocation that needs to take place. To the contrary, we believe all efforts should be made to replace Ozark Mountain's contaminated drinking water sources as soon as possible. To accommodate this end, we offer the following alternatives:

- Accept the hydropower compensation as recommended by SWPA in its letter of January 28, 2010 and its most recent comments submitted on the instant draft reallocation report, and use these costs as the basis for the cost charged for reallocated storage.
- Waive the Corps' policy of limiting hydro compensation to the revenues received from reallocated storage and fully compensate the power purpose on the basis of accurate data.
- Include a provision in the contracts that the costs for reallocated storage are estimates only, and that the costs will be updated after compensation due the power purpose is recalculated using accurate data.

SPRA must strongly protest any contractual actions that would prevent full and fair compensation of the power purpose for all impacts associated with the proposed storage reallocation.

### **Other Comments**

SPRA has read the comments submitted by SWPA and supports them in their entirety. As SWPA noted, many of these reflect long-standing issues that have been aired in previous reallocation proposals. Rather than again delving at length in these issues, we list them briefly below. This treatment should not be taken, however, as any indication that we feel any less strongly about these items than those previously set forth.

Specifically:

- SPRA supports SWPA's estimates of energy and capacity losses associated with the proposed reallocation as being much more accurate than those provided by HAC.
- HAC's estimates of hydroelectric energy and capacity losses are based on the dependable yield of the storage that would be reallocated. Traditionally, however, M&I water supply storage contracts do not limit storage withdrawals to the dependable yield, except during droughts that approach the drought of record. SPRA supports SWPA's adjustment of energy and capacity losses to correctly reflect withdrawals in excess of the dependable yield of the storage to be provide Ozark Mountain and Marion County.
- Use of platt's M2M Power product does not accurately reflect the replacement cost of energy during the "super-peak" and thus does not reflect the product marketed by SWPA to SPRA's members.



- SWPA markets only hydroelectric energy and capacity. Further, marketed capacity is limited to dependable capacity; *e.g.* capacity that remains available during the drought of record. It is appropriate, therefore, to determine capacity losses on the basis of the drought of record – the same process used by the Corps to determine yield impacts to existing M&I water supply customers when a storage reallocation takes place.
- SWPA’s 1980 Final Power Allocations provide for renewal of its wholesale power supply contracts with SPRA’s members on the basis of current capacity allocations. The impacts of the proposed reallocations on energy and capacity do not end with the term of the existing power contracts; rather, they will continue for the life of the project. Compensation of the power purpose should reflect replacement costs for energy and capacity losses for the economic life of the project.
- ER 1105-2-100 states that storage reallocations or additions “should serve immediate needs.” In practice, immediate need has been limited to the following 10 years. The draft report recommends the reallocation of sufficient storage to provide 6 million gallons per day (MGD) to Ozark Mountain and 1 MGD to Marion County (raising the total yield of Marion County’s Bull Shoals storage to 2 MGD). However, the draft reallocation report estimates that in the year 2022 (10 years from the estimated first withdrawals from the reallocated storage – the functional definition of immediate need) Ozark Mountain’s average daily use will range from less than 2.1 MGD to as much as 2.6 MGD. The mid-range estimate for Ozark Mountain’s maximum daily use in 2022 is only 4.6 MGD.<sup>6</sup> For Marion County, estimated average daily use in 2022 is from less than 1.2 MGD to less than 1.6 MGD, while the mid-range estimate of maximum daily use in 2022 is less than 1.4 MGD.<sup>7</sup> Obviously, the immediate needs of Ozark Mountain and Marion County are much less than 6.0 and 2.0 MGD, respectively. The reallocation should be adjusted to reflect projected water supply needs in the year 2022.
- SPRA agrees with SWPA’s computations that indicate reallocation from the flood control pool is the NED Plan and should be recommended. As noted by SWPA, HAC computations showing a greater loss of capacity from a flood pool reallocation than from a conservation pool reallocation just don’t make sense and reflect the general accuracy of the entire HAC report. SPRA concurs that a reallocation from the flood control pool would greatly reduce the impacts on capacity and on-peak energy.
- SPRA concurs with SWPA that the Corps’ Little Rock District has the discretion to reallocate a sufficient amount of additional flood pool storage to maintain the dependable yield of the power pool, and that such action has been taken in the White River Minimum Flows reallocation. A flood pool reallocation that maintains the yield of the power pool would eliminate capacity losses and limit most energy losses to off-peak periods, thus greatly reducing the impacts on the power purpose and reducing required compensation.

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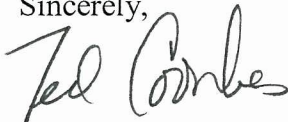
<sup>6</sup> Table 4.9, p. 4-8, draft reallocation report.

<sup>7</sup> Table 4.10, p. 4-9, draft reallocation report.

- ER 1105-2-100 clearly states that “usable storage does not include space set aside for sediment distribution or for hydropower head.” Portions of the draft reallocation report exploring reallocation from the inactive storage should be removed from the report, and future reallocation reports should not include reallocation from inactive storage as a viable alternative.
- The draft Environmental Assessment (EA) is required to assess the cumulative effects on hydro production of past reallocations, the current proposal and anticipated future reallocations. This would include not only storage reallocations at Bull Shoals, but reallocations that have taken place or can be reasonably anticipated at all 24 Corps projects from which SWPA markets hydroelectric energy and capacity. The draft EA should be revised to include this data, and the cumulative effects should be considered and, if necessary, mitigated.
- The draft EA should consider the cumulative impacts of past, proposed, and reasonably anticipated future storage reallocations on greenhouse gas emissions at the 24 Corps projects from which SWPA markets hydroelectric energy and capacity. The HAC report concludes that thermal generation would be the most likely alternative to hydro energy and capacity lost due to the proposed reallocations. Hydro generation does not produce greenhouse gases; generation from coal and natural gas does. The draft EA should carefully quantify the increase in greenhouse gas emissions anticipated due to the shift to thermal power generation to offset losses associated with the past, proposed and previous storage reallocations at the 24 Corps projects.

SPRA respectfully requests a copy of the reallocation report after it is revised to reflect public comment and is forwarded to the Southwestern Division for review.

Sincerely,



Ted Coombes  
Executive Director



## Department of Energy

Southwestern Power Administration  
One West Third Street  
Tulsa, Oklahoma 74103-3519

June 11, 2010

Mr. Patrick MacDanel  
GEC Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

Dear Mr. MacDanel:

This letter provides the comments of Southwestern Power Administration (Southwestern) on the Draft Water Supply Storage Reallocation Report, Reallocation of Storage at Bull Shoals Lake, Arkansas, for Ozark Mountain Regional Public Water Authority and Marion County Regional Water District, dated May 2010. Southwestern's preliminary estimate of the hydropower impacts of the proposed reallocation was provided to the U.S. Army Corps of Engineers (Corps) on January 28, 2010, and is included in the draft report. Southwestern has several major concerns with the proposed reallocation which are summarized in the following paragraphs. Most of those major concerns were discussed in our January 28 letter. In addition, please find Southwestern's specific comments on the report detailed in Enclosure 1.

Corps guidance states that "All reallocations or additions of storage should be to serve immediate needs" (ER 1105-2-100). The Corps has typically interpreted "immediate needs" to be those needs up to ten years in the future. The draft report reveals that Ozark Mountain Regional Public Water Authority (OMRPWA) will not need 6 million gallons per day (MGD) for over forty years, stating "OMRPWA has a current need for 3.4 MGD, expanding to 4.5 MGD by 2032 and 6 MGD by 2052." The draft report does not demonstrate an "immediate need" for the 6 MGD included in the reallocation request. The reallocation should only be requested to meet the demonstrated needs over the next ten years. The construction of a water treatment facility with a capacity of 4.5 MGD also seems to verify that amount will be sufficient to meet the needs of OMRPWA for the next ten to twenty years. OMRPWA has already reduced their request from 12 MGD to 6 MGD. They should further reduce their request to no more than 4.5 MGD. As Marion County is doing now, OMRPWA can request additional storage later when they have additional need.

Southwestern has provided comments for all recent water storage reallocation reports prepared by the Corps' Little Rock District (LRD) for storage at LRD projects. The issues and disagreements between Southwestern and the Corps concerning hydropower impacts of storage reallocations and the compensation due to Federal hydropower are long-standing. Recently, to ensure adequate compensation to Federal hydropower for one of the largest storage reallocations ever performed by the Corps, Congress directed Southwestern to compute the hydropower impacts of the White River Minimum Flows project. For another recent major reallocation, the Secretary of the Army, recognizing that Corps policy shortchanges Federal hydropower,

overruled both the Corps' Tulsa District and Corps Headquarters and agreed with Southwestern on the issue of compensation for hydropower lost as a result of a reallocation of up to 300,000 acre-feet at Lake Texoma. Agreement between the Corps and the Federal hydropower interests on the issues would simplify the preparation and evaluation of future storage reallocation reports and would speed the approval of the reports. We urge the Corps to work with Southwestern and the other Power Marketing Administrations to resolve those long-standing issues.

Southwestern is concerned that the Corps' calculations underestimate the impacts to the Federal hydropower purpose. The Corps' simulation models and energy loss calculations are based on the yield of the contracted storage. However, based on the Corps' water storage accounting procedures and lack of contractual limitations, water supply users are able to withdraw more than the "safe yield" of the storage in all but the critical drought without depleting their contracted storage. Accordingly, Southwestern included what it calls "additional energy losses" in its calculations to conservatively account for withdrawals in excess of the yield of the contracted storage. The Corps' energy loss calculations should include additional withdrawals above the yield of contracted storage, or the water supply storage contract should limit the amount the user can withdraw to only the yield of the contracted storage. Also, the Corps' calculates the capacity benefits foregone based on an average capacity loss, unlike its calculation of capacity revenues foregone which is based on the critical period capacity loss. All of the Corps' capacity loss calculations should reflect actual market conditions and use the critical period method for a more accurate calculation of the capacity lost due to the proposed storage reallocation.

Additionally, the calculations by the Corps' Hydropower Analysis Center (HAC) are based on several flawed assumptions. The first concerns Southwestern's marketing area. HAC incorrectly assumed that Southwestern markets its hydropower in the Southeastern Electric Reliability Council (SERC) region instead of the Southwest Power Pool (SPP) region. HAC must correct its report and calculations to reflect Southwestern's presence in the SPP area. Second, the dependable capacity calculations were developed utilizing 1956 as the critical year. The critical year for Southwestern's system was at one time 1956, but Southwestern has utilized 1954 as the critical year for its system since 2001 when it added four additional projects into its interconnected system. Third, the HAC report utilized rates for Southwestern which were last used in 2002. Southwestern's rates as of January 1, 2010, are included in our specific comments on the HAC report. The revenues foregone calculations must be recomputed to reflect Southwestern's current rates. The HAC calculations must be updated in both the HAC report and in the main report. Finally, it is unclear why Norfolk is included in the HAC report. The proposed reallocation is at Bull Shoals, and the report states that the impacts at Norfolk are negligible. Norfolk should be removed from the report. The HAC report appears to be a poor, cut and paste effort that should be completely updated.

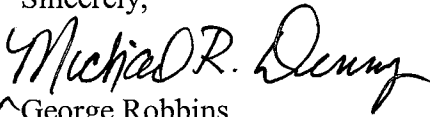
Southwestern performed its own analysis of the reallocation alternatives using the Corps' SUPER model, and a summary of the analysis is included in Enclosure 2. That analysis revealed that a reallocation from flood storage would have significantly less impact on hydropower energy



and capacity than the conservation or inactive pool options if the hydropower impacts are properly quantified and valued. In addition, Southwestern performed a SUPER evaluation of a flood storage reallocation including hydropower yield protection operation (HYPO) storage for hydropower. The use of HYPO, similar to dependable yield mitigation storage (DYMS) for existing water supply users, would maintain the current yield of the hydropower storage and, therefore, minimize the hydropower losses, especially capacity and on-peak energy losses. LRD has the discretion to include HYPO and in fact did so in the White River Minimum Flow Study. The results from Southwestern's analysis of a flood storage reallocation including HYPO are included for your consideration. Based on Southwestern's analysis, the National Economic Development plan for the proposed reallocation is a flood storage reallocation including HYPO.

Southwestern continues to oppose the consideration of inactive storage as a reallocation alternative. Inactive storage is set aside for hydropower head and/or the storage of sediment expected to accumulate over the life of the project. LRD has not considered the reallocation of inactive storage since the early 1990s. Since that time, reallocation reports developed by LRD have correctly recognized that the inactive storage is not appropriate storage for reallocation consideration. In Corps design and study reports which discuss the inactive storage at Bull Shoals, the only use considered for that storage other than hydropower head is emergency power storage. A reallocation of any portion of the inactive storage was not contemplated. The alternative should be removed from consideration, and inactive storage should not be considered a viable alternative in any future reallocation study. Otherwise, it should be treated the same as a reallocation from hydropower storage.

We appreciate the opportunity to provide comments on the draft report. Hydropower is the project purpose most affected by storage reallocations. Therefore, it is vital to Federal hydropower and our customers that the hydropower losses are properly quantified and valued. Please contact Mr. Michael Denny at 918-595-6683 or [michael.denny@swpa.gov](mailto:michael.denny@swpa.gov) if you have any questions.

Sincerely,  
  
for George Robbins  
Director  
Division of Resources and Rates

Enclosures (2)

cc: Ted Coombes (SPRA)

June 11, 2010

**Southwestern Power Administration Comments on the Draft Water Supply Storage Reallocation Report – Reallocation of Storage at Bull Shoals Lake, Arkansas, for Ozark Mountain Regional Public Water Authority and Marion County Regional Water District dated May 2010**

(Note: Paragraphs are numbered from the beginning of the referenced section or sub-section)

1. Page iii, EXECUTIVE SUMMARY, Paragraph 10, Sentence 1. For the proposed reallocation of conservation storage, the storage amount for Marion County Regional Water District should be 1,698.077 as stated throughout the report and not 1,698.007.
2. Page iii, EXECUTIVE SUMMARY, Paragraph 11, Sentence 3. Inactive storage should not have been considered in the study. The inactive storage is set aside for hydropower head, sediment distribution, and emergency power storage. It was not designed for reallocation to municipal and industrial water supply storage. Southwestern strongly opposes the consideration of inactive storage as an alternative for reallocation to water supply storage.
3. Page iii, EXECUTIVE SUMMARY, Paragraph 12, Fifth bullet. While one storage reallocation may have a “relatively small impact” on hydroelectric power production, the cumulative effect of multiple reallocations will undoubtedly have a significant effect on Federal hydropower. The hydropower impacts of even the smallest storage reallocation must be properly quantified and valued by the Corps.
4. Page v, TABLE OF CONTENTS. Please correct alignment issues with the table.
5. Page 2-2, 2.0 PROJECT BACKGROUND, 2.1 Project Authorization, Construction, and Operation History, Bull Shoals Lake, Paragraph 1, Sentence 1. Fish/wildlife and recreation were not added as authorized project purposes at Bull Shoals in the Flood Control Act of 1941. Recreation and fish and wildlife mitigation were added as project purposes at Bull Shoals in Section 304 of WRDA 1996, “to the extent that the additional purposes do not adversely affect flood control, power generation, or other authorized purposes of the project.” Please correct.
6. Page 2-2, 2.0 PROJECT BACKGROUND, 2.1 Project Authorization, Construction, and Operation History, Bull Shoals Lake, Paragraph 1, Sentence 3. The language originally authorizing minimum flows was in Section 374 of WRDA 1999 and in Section 304 of WRDA 2000. The specific minimum flows alternative being implemented at Bull Shoals, Alternative BS-3, was authorized in Section 132 of Public Law 109-103. That legislation repealed the authorizations in WRDA 1999 and WRDA 2000. Please correct.
7. Page 2-3, 2.0 PROJECT BACKGROUND, 2.2 Project Location, Purpose, and Outputs, Paragraph 3, Third bullet. The average annual generation at Bull Shoals from 1964

through 2009 is 753,700 megawatt-hours (MWh), not the 518,284 MWh shown in the report.. Please correct.

8. Page 2-4, 2.0 PROJECT BACKGROUND, 2.3 Project Data, Table 2.1 Bull Shoals Lake Physical Features (After Reallocation for White River Minimum Flows). Inactive storage should be listed as the entire storage below elevation 628.5. Please correct.
9. Page 2-4, 2.0 PROJECT BACKGROUND, 2.3 Project Data, Table 2.1 Bull Shoals Lake Physical Features (After Reallocation for White River Minimum Flows). According to the Corps' Engineering Regulation 1105-2-100, "usable storage does not include space set aside for sediment distribution or for hydropower head." Inactive storage is being utilized for its designed purposes and should not be included in the table as "Usable storage." Please correct.
10. Page 2-5, 2.0 PROJECT BACKGROUND, 2.3 Project Data, Paragraph 4, Sentences 7 and 8. As correctly stated, the inactive storage provides for hydropower head and sediment. See previous comment. Sentence 8 states that the inactive storage is "available for emergency uses during drought conditions that include hydroelectric power operations and M&I water supply." It is being utilized as designed and is available for emergency use only, not for permanent reallocation to another project purpose. Please remove consideration of inactive storage from the report and environmental assessment.
11. Page 2-6, 2.0 PROJECT BACKGROUND, 2.3 Project Data, Figure 2.2 Bull Shoals Lake and Dam with Pool Elevations and Volumes. The inactive storage should be shown as all storage below elevation 628.5. Please correct.
12. Page 3-5, 3.0 PLAN FORMULATION, 3.3 Preliminary Reallocation Alternatives for MCRWD, 3.3.1 Structural Solutions, Paragraph 4, Sentence 2. The sentence states that MCRWD's water treatment facility has a maximum capacity of 4 MGD. Even with the new storage allocation, MCRWD will only have contracted for storage with a yield of 2 MGD. As Southwestern continues to assert in comments on storage reallocations for water supply, the water supply contracts should limit the withdrawals of the water supply users. Compensation to Federal hydropower is based on energy losses which are calculated based on the yield of the contracted storage, which is a minimum amount available to the water supply user.
13. Page 3-8, 3.0 PLAN FORMULATION, 3.4 Final Reallocation Alternatives for OMRPWA and MCRWD to Evaluate in Detail. In its preliminary comments provided to the Corps on January 28, 2010, Southwestern presented an additional alternative utilizing flood storage and hydropower yield protection operation (HYPO) storage. A summary of Southwestern's analysis is included in Enclosure 2. HYPO was utilized in the White River Minimum Flows study and should be considered a viable alternative in storage reallocations. Please include an evaluation of the additional alternative in the report.

14. Page 4-9, 4.0 ECONOMIC ANALYSIS, 4.1 Water Supply and Demand Analysis, 4.1.6 Water Supply, Paragraph 1, Sentence 7. Corps guidance states that “All reallocations or additions of storage should be to serve immediate needs” (ER 1105-2-100). The Corps has typically interpreted “immediate needs” to be those needs up to ten years in the future. The sentence states that “OMRPWA has a current need for 3.4 MGD, expanding to 4.5 MGD by 2032 and 6 MGD by 2052.” The draft report does not demonstrate an “immediate need” for the 6 MGD included in the reallocation request. The construction of a water treatment facility with a capacity of 4.5 MGD also seems to verify that amount will be sufficient to meet the needs of OMRPWA for the next ten to twenty years. OMRPWA has already reduced their request from 12 MGD to 6 MGD. They should further reduce their request to no more than 4.5 MGD. As Marion County is doing now, OMRPWA can request additional storage later when they have additional need.
15. Page 5-1, 5.0 DERIVATION OF USER COST, 5.1 Yield/Storage Analysis, Paragraph 1, Sentences 1 and 2. The additional alternative presented by Southwestern (see Enclosure 2) should be considered in the report. See comment 13.
16. Page 5-2, 5.0 DERIVATION OF USER COST, 5.1 Yield/Storage Analysis, 5.1.2 Flood Pool, Paragraph 2, Sentences 3 and 4. It may not be Corps “policy” to include DYMS for hydropower, but it was included as HYPO storage in the White River Minimum Flows Study. Southwestern’s analysis, included in Enclosure 2, revealed a flood pool alternative including HYPO storage to be the alternative with the greatest net benefits. See Comment 13.
17. Page 5-3, 5.0 DERIVATION OF USER COST, 5.1 Yield/Storage Analysis, 5.1.3 Inactive Pool. Paragraph 1, Sentence 2. As noted previously, the inactive storage is “available for emergency uses during drought conditions that include hydroelectric power operations and M&I water supply.” It is being utilized as designed and is available for emergency use only, not for permanent reallocation to another project purpose. Please remove consideration of inactive storage from the report and environmental assessment.
18. Page 5-5, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.1 Hydroelectric Power Benefits Foregone. The section correctly states that hydroelectric energy and capacity are lost when storage is reallocated for water supply. However, the Corps’ study underestimates the amount of energy and capacity lost and the value of the lost energy and capacity. Southwestern’s analysis (see Enclosure 2) is a more accurate reflection of the magnitude and value of the losses and correctly incorporates how the capacity and energy are currently marketed.
19. Page 5-6, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.1 Hydroelectric Power Benefits Foregone, Table 5.6 Hydroelectric Power Benefits Foregone. The Corps’ report significantly undervalues the energy and capacity lost due to the proposed reallocation. Southwestern’s analysis (see Enclosure 2) provides a more realistic accounting of the benefits foregone.

20. Page 5-6, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.1 Hydroelectric Power Benefits Foregone, Table 5.6 Hydroelectric Power Benefits Foregone. The benefits foregone are incorrectly based on energy prices in the Southeastern Electric Reliability Council (SERC) region and not the Southwest Power Pool (SPP) region. It should be corrected. See comments on Hydropower Analysis Center (HAC) report.
21. Page 5-6, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.1 Hydroelectric Power Benefits Foregone, Paragraph 5, Sentence 1. It is not logical to think that a reallocation of flood control storage would result in a greater capacity loss than a reallocation of conservation storage. The result reveals a flawed methodology in the analysis and a lack of knowledgeable review and study oversight. Southwestern's analysis (see Enclosure 2) provides a more reasonable and accurate calculation of the capacity losses resulting from the proposed reallocation.
22. Page 5-6, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.1 Hydroelectric Power Benefits Foregone, Paragraph 6, Sentence 2. Southwestern does not market "average" capacity. The capacity marketed by Southwestern must be available at all times, including through the critical drought. The capacity must be dependable to be marketable. Please recalculate using the correct critical year.
23. Page 5-6, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.1 Hydroelectric Power Benefits Foregone, Paragraph 6, Sentence 3. See Comment 21.
24. Page 5-7, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.2 Hydroelectric Power Revenues Foregone, Table 5.7 Hydroelectric Power Revenues Foregone. The revenues foregone are based on underestimated energy and capacity losses resulting from the proposed reallocation. Southwestern's analysis (see Enclosure 2) is a more accurate reflection of the magnitude of the losses in the current market.
25. Page 5-7, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.2 Hydroelectric Power Revenues Foregone, Table 5.7 Hydroelectric Power Revenues Foregone. The revenues foregone are based on Southwestern rates in place from January 1998 to October 2002. Please update the table based on Southwestern's current rates as shown in Enclosure 2 and in the comments on the HAC report.
26. Page 5-7, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.2 Hydroelectric Power Revenues Foregone, Table 5.7 Hydroelectric Power Revenues Foregone. Negative revenues foregone, or hydropower benefits, are not logical and reflect a flawed methodology in the analysis. It appears there is no understanding of hydropower operations at even the basic level.

27. Page 5-7, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.3 Hydroelectric Power Replacement Cost. See Comments 19 and 20.
28. Page 5-8, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.4 Flood Control Benefits Foregone, Paragraph 2, Sentence 7. The sentence states the SUPER economic data for flood control calculations was last updated in 1994. The SUPER economic data should be updated to account for the five-foot pool rise for White River minimum flows and raising the lake facilities, and the flood damage analysis should be recalculated.
29. Page 5-9, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.4 Flood Control Benefits Foregone, Table 5.9 Average Annual In-Pool Damages by Alternative – October 2009 values (\$1,000). See previous comment.
30. Page 5-9, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.4 Flood Control Benefits Foregone, Paragraph 4, Sentence 1. The reallocation is referred to as a “water” reallocation. The reallocation will be a reallocation of storage, not water. Please correct.
31. Page 5-9, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.5 Recreation Benefits, Paragraph 1, Sentence 11 (last sentence). Presumably, the sentence is referring to a reallocation from the flood pool and not the conservation pool. An annual impact of \$16,800, mainly at Bull Shoals, compared to annual recreation benefits of over \$51 million at six projects is hardly a “rippling effect.” Please delete the biased statement from the report.
32. Page 5-9, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.5 Recreation Benefits, Paragraph 3, Sentence 1. The sentence states the SUPER recreation visitation data was last updated in 1994. The SUPER recreation visitation data should be updated to account for the five-foot pool rise for White River minimum flows and raising the lake facilities, and the recreation benefits analysis should be recomputed.
33. Page 5-10, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.5 Recreation Benefits, Table 5.10 Average Annual Recreational Benefits by Alternative – October 2009 values (\$1,000). See previous comment.
34. Page 5-11, 5.0 DERIVATION OF USER COST, 5.2 Impacts to Other Project Purposes, 5.2.6 Total Impacts, Table 5.11 Average Annual Net Benefits from Reallocation – October 2009 values (\$). If hydropower losses are properly quantified and valued, a reallocation of flood storage, especially with HYPO storage for hydropower, would provide the greatest net benefits as revealed in Southwestern’s analysis (see Enclosure 2).
35. Page 5-11, 5.0 DERIVATION OF USER COST, 5.3 Updated Cost of Storage, 5.3.1 Ozark Mountain Regional Public Water Authority, Paragraph 1, Sentence 2. According

to the Corps' Engineering Regulation 1105-2-100, "usable storage does not include space set aside for sediment distribution or for hydropower head." Inactive storage is being utilized for its designed purposes and should not be included in the Total Usable Storage calculation. Please correct.

36. Page 5-11, 5.0 DERIVATION OF USER COST, 5.3 Updated Cost of Storage, 5.3.2 Marion County Regional Water District, Paragraph 1, Sentence 2. See previous comment.
37. Page 6-5, 6.0 OTHER CONSIDERATIONS, 6.2 Cost Account Adjustments to Power Marketing Agency, Paragraph 1, Sentences 7 and 8. Energy and capacity benefits and revenues foregone must be corrected to reflect correct assumptions. See comments on the HAC report for details.
38. Page 6-5, 6.0 OTHER CONSIDERATIONS, 6.2 Cost Account Adjustments to Power Marketing Agency, Paragraph 1, Sentences 7 and 8. Why do capacity and energy credits for benefits foregone only go through the year 2015? Southwestern's last current contract with customers taking energy from the project expires in 2025. Further, Southwestern's 1980 Final Power Allocation provides renewal of the contracts with the current power allocations. Therefore, the benefits lost are throughout the project life. Please correct the credits to Southwestern.
39. Page 6-8, 6.0 OTHER CONSIDERATIONS, 6.5 Risk and Uncertainty, Paragraph 2, Sentences 1 and 2. Hydropower benefits foregone are also highly sensitive to fluctuations in energy and capacity prices. Selection of the flood pool, with reduced energy and capacity losses, should result in the greatest net benefits among the reallocation alternatives.
40. Page 6-9, 6.0 OTHER CONSIDERATIONS, 6.6 Summary of Dam Safety Considerations, Paragraph 1, Sentence 6. The proposed project is a reallocation of storage, not water.
41. Page 7-1, 7.0 SELECTED ALTERNATIVE, 7.1 Description, Paragraph 3, Sentence 2. Southwestern's analysis revealed the "lowest-impact" reallocation is a reallocation of flood control storage utilizing HYPO storage for hydropower. Proper project formulation should consider the alternative provided by Southwestern in Enclosure 2.
42. Page 7-1-2, 7.0 SELECTED ALTERNATIVE, 7.2 Rationale for Selection, Paragraph 2. The purpose of the paragraph is unclear. Do OMRPWA and MCRWD intend to contract for the identified storage in increments? If so, the reallocation should be sized to provide the water supply users' immediate needs. See Comment 14.
43. Page 7-2, 7.0 SELECTED ALTERNATIVE, 7.2 Rationale for Selection, Paragraphs 3 and 4. Southwestern will receive credit for its losses. However, if the amount and value of the losses are underestimated in accordance with the current draft report, Federal hydropower and its customers will suffer the impacts.

44. Page 7-2, 7.0 SELECTED ALTERNATIVE, 7.2 Rationale for Selection, Paragraphs 3 and 4. Southwestern's 1980 Final Power Allocation provides renewal of the contracts with the current power allocations. Therefore, the benefits lost are throughout the project life. Current Corps policy fails to recognize that fact.
45. Page 8-1, 8.0 IMPLEMENTATION, 8.1 Federal and Non-Federal Costs, Federal Costs, Paragraph 1, Sentences 4 and 5. Why do capacity and energy credits for benefits foregone only go through the year 2015? Southwestern's last current contract with customers taking energy from the project expires in 2025. Further, Southwestern's 1980 Final Power Allocation provides renewal of the contracts with the current power allocations. Therefore, the benefits lost are throughout the project life. Please correct the credits to Southwestern.
46. Page 9-1, 9.0 CONCLUSIONS AND RECOMMENDATIONS, 9.1 Findings, Paragraph 5, Sentences 4 and 5. See previous comment.
47. Page C-6, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, TABLE OF CONTENTS, Section 6.3.2. The section title should be "Current and Pending Storage Reallocations." Please correct.
48. Page C-17, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 1.0 INTRODUCTION, 1.2 Background, Bull Shoals Lake, Paragraph 1. See Comments 5 and 6 on a similar paragraph in the reallocation report.
49. Page C-18, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 1.0 INTRODUCTION, 1.2 Background, Bull Shoals Lake, Paragraph 4, Sentences 7 and 8. As correctly stated, the inactive storage provides for hydropower head and sediment. Sentence 8 states that the inactive storage is "available for emergency uses during drought conditions that include hydroelectric power operations and M&I water supply." It is being utilized as designed and is available for emergency use only, not for permanent reallocation to another project purpose. Please remove consideration of inactive storage from the report and environmental assessment.
50. Page C-20, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 1.0 INTRODUCTION, 1.2 Background, Bull Shoals Lake, Figure 1.5 Bull Shoals Lake Pool Elevations and Volumes. The inactive storage should be shown as all storage below elevation 628.5. Please correct.
51. Pages C-25-26, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 2.0 DESCRIPTION OF PROPOSED ACTION, Paragraph 6, Sentences 7 and 8. As correctly stated, the inactive storage provides for hydropower head and sediment. Sentence 8 states that the inactive storage is "available for emergency uses during drought conditions that include hydroelectric power operations and M&I water supply." It is being utilized as designed and is available for emergency use only, not for



permanent reallocation to another project purpose. Please remove consideration of inactive storage from the report and environmental assessment.

52. Page C-50, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 4.0 AFFECTED ENVIRONMENT, 4.4 Water Resources, 4.4.4 Hydropower. As is typical in Corps studies, the HAC analysis underestimates the hydropower losses and the value of those losses. See comments on HAC report.
53. Page C-73-74, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 5.0 ENVIRONMENTAL CONSEQUENCES, 5.3 Water Resources, 5.3.4 Hydropower. See previous comment.
54. Page C-78, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 5.0 ENVIRONMENTAL CONSEQUENCES, 5.7 Recreation, Paragraph 1, Sentence 11. An annual impact of \$16,800, mainly at Bull Shoals, compared to annual recreation benefits of over \$51 million at six projects is hardly a “rippling effect.” Please delete the biased statement from the report.
55. Page C-84, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 6.0 CUMULATIVE IMPACTS, Paragraph 5, Sentence 3 (last sentence). The current proposed action is a reallocation of storage, not water. Please correct.
56. Page C-86, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 6.0 CUMULATIVE IMPACTS, 6.3 Present Actions, 6.3.2 Current and Pending Water Reallocations. The heading should be “Current and Pending Storage Reallocations.” Please correct.
57. Page C-89-91, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 6.0 CUMULATIVE IMPACTS, 6.5 Cumulative Impacts Assessment, Table 6.1 Cumulative Impacts Assessment. All references to water reallocation should be corrected to say storage reallocation.
58. Page C-96, APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, 8.0 CONCLUSIONS, Paragraph 2, Sentence 2. The cumulative impact of multiple reallocations resulting in “slight annual hydropower benefits reductions” is incorrect and will have a major impact on Federal hydropower and its customers. Corps policy must be changed to allow the Corps to properly evaluate the impact of the hydropower losses. Those losses are real and do have a “substantial” impact.
59. Page C-132 (estimated), APPENDIX C, DRAFT ENVIRONMENTAL ASSESSMENT, Attachment 6 Agency Coordination, October 15, 2009, letter from Southwestern Power Administration to Mr. Patrick MacDanel. The document dated 09/30/09 accompanying the letter was actually sent to the Corps in an email on September 30, 2009. It articulates Southwestern’s arguments against consideration of inactive storage for reallocation and includes reasons the Corps has used in past studies to eliminate inactive storage from consideration. Please properly identify.

60. Title Page, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT. It is unclear why Norfolk is included in the Hydropower Analysis Center (HAC) report. The proposed reallocation is at Bull Shoals. Norfolk is not downstream of Bull Shoals and should not be impacted by the proposed reallocation. Please remove Norfolk from the report.
61. Page 2, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 1. INTRODUCTION, 1.2 Project Description, 1.2.2 Bull Shoals Lake, Paragraph 2, Sentence 4. The Corps completed a storage reallocation report, not a water reallocation report. Please correct.
62. Page 2, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 1. INTRODUCTION, 1.2 Project Description, 1.2.3 Norfolk Lake. See Comment 60. Norfolk Lake should be removed from the report.
63. Page 10, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 2. POWER BENEFITS FOREGONE, 2.7 Simulation with SWD-SUPER Streamflow Routing Model, Paragraph 2. See Comments 60 and 62. Impacts at the other White River lakes were “deemed negligible and thus not presented.” However, impacts at Norfolk were shown in the report to be negligible and were presented. Why? Additional analysis including Norfolk seems to have been a lot of additional work and pages in the report with no discernible benefit. The proposed reallocation is at Bull Shoals, and the impacts will be at Bull Shoals. Please remove Norfolk from the report.
64. Page 15, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 3. ENERGY BENEFITS FOREGONE, 3.4 Computation of Energy, Table 3-6 Average Monthly Energy Losses at Bull Shoals & Norfolk Lakes under Reallocation Alternatives. All computed energy losses are based on water supply withdrawals equal to the yield of the reallocated storage. However, the water supply users can withdraw more than the yield in all years except a critical drought. The water supply contract should limit the user’s withdrawals to the yield. Since that is not the case, Southwestern’s analysis (see Enclosure 2) includes an additional energy loss to account for those increased withdrawals.
65. Page 16, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 3. ENERGY BENEFITS FOREGONE, 3.5 Basis for Computing Energy Benefits Foregone, 3.5.1 Energy Value. Previously, Platts produced a “High Fuel” energy cost scenario that was representative of the cost of replacing lost hydroelectric energy due to a reallocation. Unfortunately, Platts no longer produces that product. The M2M Power product is more of a “base cost” energy price forecast that is not representative of the “super-peak” product marketed by Southwestern and significantly underestimates the value of lost hydropower. More representative energy costs must be identified and used.

66. Page 17, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 3. ENERGY BENEFITS FOREGONE, 3.5 Basis for Computing Energy Benefits Foregone, 3.5.2 Procedure. Power generated at Bull Shoals and Norfolk, like that generated at the other projects in Southwestern's interconnected system, is marketed primarily to customers in the Southwest Power Pool (SPP) region and not in the SERC region. The report should be corrected to reflect that throughout and the price forecasts for the SPP region should be utilized in the calculations.
67. Page 18, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 3. ENERGY BENEFITS FOREGONE, 3.5 Basis for Computing Energy Benefits Foregone, 3.5.2 Procedure, Paragraph 3. See Comment 65. Platts price forecasts are not representative of the "super-peak" product marketed by Southwestern, and those forecasts underestimate the value of replacing the lost hydropower due to a reallocation. More realistic energy values are required.
68. Page 18, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 3. ENERGY BENEFITS FOREGONE, 3.5 Basis for Computing Energy Benefits Foregone, 3.5.2 Procedure, Paragraph 4. Nominal dollars should be utilized to properly reflect the future replacement cost of lost energy. The energy losses are already undervalued in the Platts estimates. Using constant dollars that do not accurately reflect expected future conditions further magnifies the error.
69. Page 19, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 3. ENERGY BENEFITS FOREGONE, 3.5 Basis for Computing Energy Benefits Foregone, 3.5.2 Procedure, Figure 3-3. See previous comment.
70. Page 21, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 4. CAPACITY BENEFITS FOREGONE, 4.1 Dependable Capacity, 4.1.1 Dependable Capacity Evaluation Method, Paragraph 1, Sentence 2. Southwestern's system is hydropower only. The average availability method is not applicable. The capacity marketed by Southwestern must be available at all times. Southwestern doesn't market "average" capacity. The capacity must be dependable to be marketable. Southwestern has a longstanding disagreement with the Corps on the use of the average availability method to represent how the capacity is marketed and used in Southwestern's marketing area.
71. Page 21, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 4. CAPACITY BENEFITS FOREGONE, 4.1 Dependable Capacity, 4.1.1 Dependable Capacity Evaluation Method, Paragraph 2. See previous comment. To properly evaluate its loss of marketable capacity, Southwestern used the critical period method. HAC uses the critical period method in its evaluation of the capacity loss for revenues foregone, in recognition that the lost capacity is no longer dependable or marketable by Southwestern. The HAC analysis should also use the critical period method to properly quantify the lost capacity for benefits foregone.

72. Pages 21-22, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 4. CAPACITY BENEFITS FOREGONE, 4.1 Dependable Capacity, 4.1.1 Dependable Capacity Evaluation Method, Paragraph 3 and Figure 4-1. Southwestern markets its hydropower primarily in the SPP region. Please change all references to SERC to reflect SPP and SPP data.
73. Page 23, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 4. CAPACITY BENEFITS FOREGONE, 4.1 Dependable Capacity, 4.1.4 Criteria for Computing Dependable Capacity, Paragraph 1, Sentence 1. The critical year for Southwestern's system was at one time 1956, but Southwestern has utilized 1954 as the critical year for its system since 2001 when it added four additional projects into its interconnected system. Please correct the analysis to utilize 1954 as the critical year for Southwestern's system.
74. Pages 24-29, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 4. CAPACITY BENEFITS FOREGONE, 4.1 Dependable Capacity, 4.1.6 Dependable Capacity Evaluation Method and 4.1.7 Dependable Capacity Losses Summarized. The average availability method utilized by HAC simply does not capture the true impact of the capacity lost due to the reallocation. The small capacity losses calculated, as well as calculating a greater capacity loss in a flood storage reallocation, are indications of a flawed methodology. For more realistic capacity losses, see Southwestern's analysis (see Enclosure 2).
75. Page 29, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 4. CAPACITY BENEFITS FOREGONE, 4.1.7 Dependable Capacity Losses Summarized, Table 4-6 Dependable Capacity Losses. Both this table and Table 6-2 on page 38 say they are dependable capacity losses while showing different values. Please clarify.
76. Pages 29-35, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 4. CAPACITY BENEFITS FOREGONE, 4.2 Computation of Capacity Values. Even though the screening curve methodology used by HAC results in a higher capacity unit value, Southwestern believes the cost of a combustion turbine should be utilized as a much simpler methodology and as the most likely source for replacing lost hydropower capacity.
77. Page 36, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 5. BENEFITS FOREGONE. When the energy and capacity losses and the value of the lost energy are underestimated, the results are an underestimation of the power benefits foregone due to the reallocation. See Southwestern's analysis in Enclosure 2 for a more realistic picture of the hydropower benefits foregone.
78. Page 37, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 6. REVENUE FOREGONE. The HAC report utilized rates for Southwestern which were last used in 2002. As of January 1, 2010, Southwestern's on-peak energy rate is 15.30 mills/kWh and its off-peak energy rate is 8.60 mills/kWh. Southwestern's current

capacity charge is \$48.94/kW-yr. Please update the report to reflect Southwestern's current rates.

79. Page 37, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 6. REVENUE FOREGONE. When the energy and capacity losses and the value of the lost energy and capacity are underestimated, the results are an underestimation of the power revenues foregone due to the reallocation. See Southwestern's analysis in Enclosure 2 for a more realistic picture of the hydropower revenues foregone.
80. Page 37, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 6. REVENUE FOREGONE, 6.1 Average Energy Loss, Table 6-1 Average Energy Loss Due to Reallocation of Storage in Bull Shoals and Norfolk Lakes. All computed energy losses are based on water supply withdrawals equal to the yield of the reallocated storage. However, the water supply users can withdraw more than the yield in all years except a critical drought. The water supply contract should limit the user's withdrawals to the yield. Since that is not the case, Southwestern's analysis includes an additional energy loss to account for those increased withdrawals. Please correct analysis.
81. Page 38, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 6. REVENUE FOREGONE, 6.2 Capacity Loss, Table 6-2 Dependable Capacity Loss Due to Reallocation of Storage in Bull Shoals and Norfolk Lakes. Both this table and Table 4-6 on page 29 say they are dependable capacity losses while showing different values. Please clarify.
82. Page 38, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 6. REVENUE FOREGONE, 6.2 Capacity Loss, Table 6-2 Dependable Capacity Loss Due to Reallocation of Storage in Bull Shoals and Norfolk Lakes. The small capacity losses calculated, as well as calculating a capacity gain in a flood storage reallocation, are indications of a flawed methodology. For more realistic capacity losses, see Southwestern's analysis.
83. Page 38, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 6. REVENUE FOREGONE, 6.3 Marketable Capacity vs. Dependable Capacity. For Southwestern, dependable capacity and marketable capacity are synonymous. If the capacity is not dependable, it can not be marketed. The critical period method should be utilized to determine the capacity losses.
84. Page 39, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 6. REVENUE FOREGONE, 6.4 Total Revenues Foregone, Table 6-3 Hydropower Revenue Foregone Due to Reallocation of Storage in Bull Shoals and Norfolk Lakes. The values should be recalculated to reflect Southwestern's current rates. See Comment 78.
85. Pages 41-47, APPENDIX D, HYDROPOWER ANALYSIS CENTER REPORT, 7 CREDIT TO POWER MARKETING AGENCY, 7.1 Remaining Period of Contract

and 7.2 Computation of Credit to Power Marketing Agency. Southwestern's last current contract with customers taking energy from the project expires in 2025. Further, Southwestern's 1980 Final Power Allocation provides renewal of the contracts with the current power allocations. Therefore, the benefits lost are throughout the project life. Please correct the PMA credits.

**Southwestern Power Administration**  
**Hydropower Impacts of Proposed Reallocation at Bull Shoals**  
**For Ozark Mountain Regional Public Water Authority**  
**And Marion County Regional Water District**  
**June 11, 2010**

<b>Bull Shoals - Benefits Foregone</b>	<b>Conservation Storage</b>	<b>Flood Storage</b>	<b>Inactive Storage</b>	<b>Flood w/HYPO</b>
Reduction in streamflow (mgd)	7.0	7.0	7.0	7.0
Annual on-peak energy losses (MWh)	1,360	643	1,360	0
Additional on-peak energy losses (MWh) <sup>1</sup>	<u>1,374</u>	<u>643</u>	<u>1,374</u>	<u>0</u>
Total on-peak energy losses (MWh)	2,734	1,285	2,734	0
Annual off-peak energy losses (MWh)	0	151	0	300
Additional off-peak energy losses (MWh) <sup>1</sup>	<u>0</u>	<u>731</u>	<u>0</u>	<u>1,374</u>
Total off-peak energy losses (MWh)	0	882	0	1,674
On-peak energy value (\$/MWh) <sup>2</sup>	56.93	56.93	56.93	56.93
Off-peak energy value (\$/MWh) <sup>2</sup>	33.51	33.51	33.51	33.51
<b>Average Annual Energy Benefits Foregone</b>	<b>\$155,647</b>	<b>\$102,711</b>	<b>\$155,647</b>	<b>\$56,096</b>
Capacity losses (kW)	1,111	520	1,111	0
Capacity value (\$/kW-year) <sup>3</sup>	59.20	59.20	59.20	59.20
<b>Average Annual Capacity Benefits Foregone</b>	<b>\$65,771</b>	<b>\$30,784</b>	<b>\$65,771</b>	<b>\$0</b>
<b>Average Annual Hydropower Benefits Foregone</b>	<b>\$221,418</b>	<b>\$133,495</b>	<b>\$221,418</b>	<b>\$56,096</b>
Annual Flood Control Benefits Foregone Downstream <sup>4</sup>	\$954	\$11,442	\$2,225	\$40,525
Annual Flood Control Benefits Foregone In Pool <sup>4</sup>	(\$1,112)	\$159	(\$1,112)	\$3,337
Annual Recreation Benefits Foregone <sup>4</sup>	(\$1,823)	\$16,775	(\$1,677)	\$32,893
<b>Average Annual Total Benefits Foregone</b>	<b>\$219,437</b>	<b>\$161,871</b>	<b>\$220,854</b>	<b>\$132,851</b>

Base Run includes White River Minimum Flows alternative BS-3 - Top of power pool raised five feet. Conservation, Flood, and Inactive Alternatives as modeled by the Little Rock District. Flood Pool with Hydropower Yield Protection Operation (HYPO) modeled by Southwestern Power Administration.

<sup>1</sup>Additional losses are SWPA estimates based on user's ability to withdraw more than the yield in all years except the critical drought.

<sup>2</sup>Energy Benefit Values based on Platts High Fuel values for SPP - October 2009.

<sup>3</sup>Capacity Benefit Values based on FERC values from Hydropower Analysis Center - October 2009. Capacity Benefit Values based on combustion turbine (Arkansas).

<sup>4</sup>SUPER Flood Control and Recreation Benefits foregone for Conservation, Flood, and Inactive Alternatives from the May 2010 Draft Report - Section 5, Page 5-11, Table 5.11. SUPER benefits foregone for SWPA's HYPO Alternative based on LRD Section 5 methodology.

**Southwestern Power Administration**  
**Hydropower Impacts of Proposed Reallocation at Bull Shoals**  
**For Ozark Mountain Regional Public Water Authority**  
**And Marion County Regional Water District**  
**June 11, 2010**

<b>Bull Shoals - Revenues Foregone</b>	<b>Conservation Storage</b>	<b>Flood Storage</b>	<b>Inactive Storage</b>	<b>Flood w/HYPO</b>
Reduction in streamflow (mgd)	7.0	7.0	7.0	7.0
Annual on-peak energy losses (MWh)	1,360	643	1,360	0
Additional on-peak energy losses (MWh) <sup>1</sup>	<u>1,374</u>	<u>643</u>	<u>1,374</u>	<u>0</u>
Total on-peak energy losses (MWh)	2,734	1,285	2,734	0
Annual off-peak energy losses (MWh)	0	151	0	300
Additional off-peak energy losses (MWh) <sup>1</sup>	<u>0</u>	<u>731</u>	<u>0</u>	<u>1,374</u>
Total off-peak energy losses (MWh)	0	882	0	1,674
On-peak energy value (\$/MWh) <sup>2</sup>	15.30	15.30	15.30	15.30
Off-peak energy value (\$/MWh) <sup>2</sup>	8.60	8.60	8.60	8.60
<b>Average Annual Energy Revenues Foregone</b>	<b>\$41,830</b>	<b>\$27,246</b>	<b>\$41,830</b>	<b>\$14,396</b>
Capacity losses (kW)	1,111	520	1,111	0
Capacity value (\$/kW-year) <sup>3</sup>	48.94	48.94	48.94	48.94
<b>Average Annual Capacity Revenues Foregone</b>	<b>\$54,373</b>	<b>\$25,449</b>	<b>\$54,373</b>	<b>\$0</b>
<b>Average Annual Hydropower Revenues Foregone</b>	<b>\$96,203</b>	<b>\$52,695</b>	<b>\$96,203</b>	<b>\$14,396</b>

Base Run includes White River Minimum Flows alternative BS-3 - Top of power pool raised five feet. Flood, Conservation, and Inactive Alternatives as modeled by the Little Rock District. Flood Pool with Hydropower Yield Protection Operation (HYPO) modeled by Southwestern Power Administration.

<sup>1</sup>Additional losses are SWPA estimates based on user's ability to withdraw more than the yield in all years except the critical drought.

<sup>2</sup>Energy Revenue Values based on Southwestern's rates as of January 1, 2010.

<sup>3</sup>Capacity Revenue Values based on Southwestern's rates as of January 1, 2010.





IN REPLY REFER TO:

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

110 S. Amity Road, Suite 300

Conway, Arkansas 72032

Tel.: 501/513-4470 Fax: 501/513-4480

June 3, 2010

Mr. Patrick MacDanel  
GEC, Inc.  
P.O. Box 84010  
Baton Rouge, LA 70808

Dear Mr. MacDanel

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (DEA) for the proposed water supply storage reallocation for the Ozark Mountain Regional Public Water Authority (OMRPWA) and the Marion County Regional Water District (MCRWD), Bull Shoals Lake, Arkansas. Our comments and recommendations are submitted in accordance with the National Environmental Policy Act of 1969, Executive Order 12372, Endangered Species Act of 1973 (Public Law 93-205, as amended) and the Fish and Wildlife Coordination Act (Public Law 85-624; 16 U.S.C. 661-666e.).

The Proposed draft document presents results of the feasibility study to reallocate a total of 11,866.55 acre feet (AF) storage from the Bull Shoals Lake conservation pool to the two water districts and associated potential impacts to the human environment. This total AF represents less than one percent of the total conservation pool storage of 1,236,000 AF in the lake.

The Service concurs with the assessment that this project will have no significant negative environmental impacts. Therefore, the Service has no objection to the proposed issuance of a finding of no significant impact for the proposed action. If you have any questions, please contact me at (501) 513-4489.

Sincerely,

Lindsey Lewis  
Environmental Coordinator

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# **Attachment 4**

# **Lists of Rare Species**

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# Missouri Department of Conservation

## MDC Heritage Database Results for Taney County

Species and natural communities of conservation concern in Taney county

Scientific Name	Common Name	State Rank (Code)	Global Rank (Code)	State Status (Code)	Federal Status (Code)
		Apparently Secure S4	Not Ranked GNR		
Cave					
Creeks and small rivers (ozark)			Not Ranked GNR		
Dolomite glade		Vulnerable S3	Not Ranked GNR		
Dry chert woodland		Apparently Secure S4	Not Ranked GNR		
Dry limestone/dolomite woodland		Vulnerable S3	Not Ranked GNR		
Effluent cave			Not Ranked GNR		
Limestone glade		Imperiled S2	Not Ranked GNR		
Limestone/dolomite talus		Apparently Secure S4	Not Ranked GNR		
Pond marsh		Critically Imperiled S1	Not Ranked GNR		
Wet pit cave			Not Ranked GNR		
Orobanche multiflora	A Broomrape	Critically Imperiled S1	Secure G5		
		Unranked	Apparently Secure		

Bryum cyclophyllum	A Moss	S?	Secure G4G5		
Syntrichia papillosa	A Moss	Unranked S?	Secure G5		
Panicum portoricense	A Panic Grass	Critically Imperiled Unranked S1?	Secure G5T5		
Triodanis lamprosperma	A Venus' Looking Glass	Imperiled S2	Secure Inexact Numeric Rank G5?		
Cheilanthes alabamensis	Alabama Lip- fern	Critically Imperiled S1	Apparently Secure Secure G4G5		
Macrochelys temminckii <a href="#">More Information</a>	Alligator Snapping Turtle	Imperiled S2	Vulnerable Apparently Secure G3G4		
Etheostoma euzonum euzonum	Arkansas Saddled Darter	Imperiled S2	Vulnerable Apparently Secure G3G4T3		
Yucca arkansana	Arkansas Yucca	Imperiled S2	Secure G5		
Brackenridgia ashleyi	Ashley's Isopod	Imperiled S2	Critically Imperiled Vulnerable G1G3		
Aimophila aestivalis <a href="#">More Information</a>	Bachman's Sparrow	Imperiled S2	Vulnerable G3	Endangered E	
Haliaeetus leucocephalus <a href="#">More Information</a>	Bald Eagle	Vulnerable S3	Secure G5		
Phlox bifida ssp.		Critically	Vulnerable Secure		



stellaria <a href="#">More Information</a>	Bifid Phlox	Imperiled S1	Inexact Numeric Rank G5?T3		
Coragyps atratus <a href="#">More Information</a>	Black Vulture	Vulnerable S3	Secure G5		
Callirhoe bushii <a href="#">More Information</a>	Bush's Poppy Mallow	Imperiled S2	Vulnerable G3		
Causeyella dendropus	Causeyella Cave Millipede	Imperiled S2	Critically Imperiled Vulnerable G1G3		
Noturus flavater <a href="#">More Information</a>	Checkered Madtom	Vulnerable Apparently Secure S3S4	Vulnerable Apparently Secure G3G4		
Carex cherokeensis <a href="#">More Information</a>	Cherokee Sedge	Imperiled S2	Apparently Secure Secure G4G5		
Sisyrinchium atlanticum	Eastern Blue- eyed Grass	Imperiled S2	Secure G5		
Crotaphytus collaris <a href="#">More Information</a>	Eastern Collared Lizard	Apparently Secure S4	Secure G5		
Callicarpa americana	French Mulberry	Critically Imperiled S1	Secure G5		
Myotis grisescens <a href="#">More Information</a>	Gray Bat	Vulnerable S3	Vulnerable G3	Endangered E	Endangered E
Geococcyx californianus <a href="#">More Information</a>	Greater Roadrunner	Vulnerable S3	Secure G5		
Eurycea spelaea <a href="#">More Information</a>	Grotto Salamander	Imperiled Vulnerable S2S3	Apparently Secure G4		
			Apparently		

Carpiodes velifer <a href="#">More Information</a>	Highfin Carp sucker	Imperiled S2	Secure Secure G4G5		
Myotis sodalis <a href="#">More Information</a>	Indiana Bat	Critically Imperiled S1	Imperiled G2	Endangered E	Endangered E
Mustela frenata <a href="#">More Information</a>	Long-tailed Weasel	Imperiled S2	Secure G5		
Cissus trifoliata	Marine Vine	Imperiled S2	Secure G5		
Stygobromus ozarkensis	Ozark Cave Amphipod	Vulnerable Unranked S3?	Apparently Secure G4		
Gomphus ozarkensis	Ozark Clubtail	Vulnerable S3	Apparently Secure G4		
Somatochlora ozarkensis <a href="#">More Information</a>	Ozark Emerald	Imperiled Vulnerable S2S3	Vulnerable G3		
Notropis ozarcanus <a href="#">More Information</a>	Ozark Shiner	Imperiled S2	Vulnerable G3		
Tradescantia ozarkana <a href="#">More Information</a>	Ozark Spiderwort	Imperiled S2	Vulnerable G3		
Spilogale putorius interrupta <a href="#">More Information</a>	Plains Spotted Skunk	Critically Imperiled S1	Apparently Secure Secure G5T4	Endangered E	
Toxolasma lividus <a href="#">More Information</a>	Purple Lilliput	Imperiled S2	Imperiled G2		
Necturus maculosus louisianensis <a href="#">More Information</a>	Red River Mudpuppy	Unrankable SU	Apparently Secure Secure G5T4		
Ambystoma annulatum <a href="#">More Information</a>	Ringed Salamander	Vulnerable S3	Apparently Secure G4		
Glyceria acutiflora	Sharp-scaled	Vulnerable	Secure		

	Manna Grass	<a href="#">S3</a>	<a href="#">G5</a>		
<i>Paspalum setaceum</i> var. <i>setaceum</i> <a href="#">More Information</a>	Slender Paspalum	Critically Imperiled <a href="#">S1</a>	Secure <a href="#">G5T5</a>		
<i>Stenosiphon linifolius</i>	Stenosiphon	Imperiled <a href="#">S2</a>	Secure <a href="#">G5</a>		
<i>Limnothlypis swainsonii</i> <a href="#">More Information</a>	Swainson's Warbler	Imperiled <a href="#">S2</a>	Apparently Secure <a href="#">G4</a>	Endangered <a href="#">E</a>	
<i>Carex timida</i>	Timid Sedge	Critically Imperiled Imperiled <a href="#">S1S2</a>	Imperiled Vulnerable <a href="#">G2G3</a>		
<i>Antrobia culveri</i> <a href="#">More Information</a>	Tumbling Creek Cavesnail	Critically Imperiled <a href="#">S1</a>	Critically Imperiled <a href="#">G1</a>	Endangered <a href="#">E</a>	Endangered <a href="#">E</a>
<i>Eriogonum longifolium</i> var. <i>longifolium</i>	Umbrella Plant	Imperiled <a href="#">S2</a>	Apparently Secure <a href="#">G4T4</a>		
<i>Astranthium ciliatum</i>	Western Daisy	Imperiled <a href="#">S2</a>	Secure <a href="#">G5T5</a>		
<i>Ophiogomphus westfalli</i> <a href="#">More Information</a>	Westfall's Snaketail	Vulnerable <a href="#">S3</a>	Vulnerable <a href="#">G3</a>		
<i>Orconectes williamsi</i> <a href="#">More Information</a>	Williams' Crayfish	Imperiled <a href="#">S2</a>	Vulnerable Apparently Secure <a href="#">G3G4</a>		
<i>Fragaria vesca</i> var. <i>americana</i>	Woodland Strawberry	Critically Imperiled <a href="#">S1</a>	Secure <a href="#">G5T5</a>		

[Return to Heritage Search Map](#)



# Missouri Department of Conservation

## MDC Heritage Database Results for Ozark County

Species and natural communities of conservation concern in Ozark county

Scientific Name	Common Name	State Rank (Code)	Global Rank (Code)	State Status (Code)	Federal Status (Code)
Creeks and small rivers (ozark)			Not Ranked GNR		
Dolomite glade		Vulnerable S3	Not Ranked GNR		
Dry chert woodland		Apparently Secure S4	Not Ranked GNR		
Dry-mesic chert woodland		Apparently Secure S4	Not Ranked GNR		
Headwater streams (ozark)			Not Ranked GNR		
Mdc cave			Not Ranked GNR		
Oxbows and sloughs (ozark)			Not Ranked GNR		
Ozark fen		Imperiled S2	Not Ranked GNR		
<i>Liatis scariosa</i> var. <i>nieuwlandii</i>	A Blazing Star	Imperiled S2	Vulnerable Secure Inexact Numeric Rank G5?T3T		
<i>Orobanche multiflora</i>	A Broomrape	Critically Imperiled S1	Secure G5		
<i>Amblytropidia mysteca</i>	A Glade Grasshopper	Unrankable SU	Secure G5		
<i>Pardalophora saussurei</i>	A Glade Grasshopper	Vulnerable S3	Secure G5		

Usnea angulata	A Lichen	Critically Imperiled <a href="#">S1</a>	Vulnerable Secure <a href="#">G3G5</a>		
Brachythecium acutum	A Moss	Unrankable <a href="#">SU</a>	Questionable Taxonomy Not Ranked <a href="#">GNRQ</a>		
Mnium thomsonii	A Moss	Unranked <a href="#">S?</a>	Secure <a href="#">G5</a>		
Ptychomitrium sinense	A Moss	Critically Imperiled <a href="#">S1</a>	Apparently Secure Secure <a href="#">G4G5</a>		
Carex arkansana	A Sedge	Vulnerable <a href="#">S3</a>	Apparently Secure <a href="#">G4</a>		
Carex fissa var. fissa <a href="#">More Information</a>	A Sedge	Critically Imperiled <a href="#">S1</a>	Vulnerable Apparently Secure Inexact Numeric Rank <a href="#">G4?T3T</a>		
Cheilanthes alabamensis	Alabama Lip-fern	Critically Imperiled <a href="#">S1</a>	Apparently Secure Secure <a href="#">G4G5</a>		
Macrochelys temminckii <a href="#">More Information</a>	Alligator Snapping Turtle	Imperiled <a href="#">S2</a>	Vulnerable Apparently Secure <a href="#">G3G4</a>		
Etheostoma euzonum euzonum	Arkansas Saddled Darter	Imperiled <a href="#">S2</a>	Vulnerable Apparently Secure <a href="#">G3G4T3</a>		
Yucca arkansana	Arkansas Yucca	Imperiled <a href="#">S2</a>	Secure <a href="#">G5</a>		
Agalinis auriculata <a href="#">More Information</a>	Auriculate False Foxglove	Vulnerable <a href="#">S3</a>	Vulnerable <a href="#">G3</a>		

Aimophila aestivalis <a href="#">More Information</a>	Bachman's Sparrow	Imperiled <a href="#">S2</a>	Vulnerable <a href="#">G3</a>	Endangered <a href="#">E</a>	
Haliaeetus leucocephalus <a href="#">More Information</a>	Bald Eagle	Vulnerable <a href="#">S3</a>	Secure <a href="#">G5</a>		
Marshallia caespitosa var. signata	Barbara's Buttons	Critically Imperiled <a href="#">S1</a>	Apparently Secure <a href="#">G4T4</a>		
Ursus americanus <a href="#">More Information</a>	Black Bear	Vulnerable <a href="#">S3</a>	Secure <a href="#">G5</a>		
Caecidotea antricola	Cave Isopod	Apparently Secure <a href="#">S4</a>	Secure <a href="#">G5</a>		
Dendroica cerulea <a href="#">More Information</a>	Cerulean Warbler	Imperiled Vulnerable <a href="#">S2S3</a>	Apparently Secure <a href="#">G4</a>		
Noturus flavater <a href="#">More Information</a>	Checkered Madtom	Vulnerable Apparently Secure <a href="#">S3S4</a>	Vulnerable Apparently Secure <a href="#">G3G4</a>		
Amsonia ciliata var. filifolia	Ciliate Blue Star	Imperiled Vulnerable <a href="#">S2S3</a>	Apparently Secure Secure Inexact Numeric Rank <a href="#">G5?T4?</a>		
Crotaphytus collaris <a href="#">More Information</a>	Eastern Collared Lizard	Apparently Secure <a href="#">S4</a>	Secure <a href="#">G5</a>		
Carex communis var. communis	Fibrous-root Sedge	Imperiled <a href="#">S2</a>	Secure <a href="#">G5T5</a>		
Eurybia furcata <a href="#">More Information</a>	Forked Aster	Imperiled <a href="#">S2</a>	Vulnerable <a href="#">G3</a>		
Clematis fremontii	Fremont's Leather Flower	Vulnerable <a href="#">S3</a>	Secure <a href="#">G5</a>		
Callicarpa americana	French Mulberry	Critically Imperiled	Secure <a href="#">G5</a>		



		<a href="#">S1</a>			
<i>Macromia pacifica</i>	Gilded River Cruiser	Vulnerable <a href="#">S3</a>	Apparently Secure <a href="#">G4</a>		
<i>Myotis grisescens</i> <a href="#">More Information</a>	Gray Bat	Vulnerable <a href="#">S3</a>	Vulnerable <a href="#">G3</a>	Endangered <a href="#">E</a>	Endangered <a href="#">E</a>
<i>Geococcyx californianus</i> <a href="#">More Information</a>	Greater Roadrunner	Vulnerable <a href="#">S3</a>	Secure <a href="#">G5</a>		
<i>Eurycea spelaea</i> <a href="#">More Information</a>	Grotto Salamander	Imperiled Vulnerable <a href="#">S2S3</a>	Apparently Secure <a href="#">G4</a>		
<i>Polypremum procumbens</i>	Juniper-leaf	Imperiled <a href="#">S2</a>	Secure <a href="#">G5</a>		
<i>Gomphus ozarkensis</i>	Ozark Clubtail	Vulnerable <a href="#">S3</a>	Apparently Secure <a href="#">G4</a>		
<i>Cryptobranchus alleganiensis bishopi</i> <a href="#">More Information</a>	Ozark Hellbender	Critically Imperiled <a href="#">S1</a>	Imperiled Vulnerable Apparently Secure <a href="#">G3G4T2</a>	Endangered <a href="#">E</a>	Candidate <a href="#">C</a>
<i>Notropis ozarcanus</i> <a href="#">More Information</a>	Ozark Shiner	Imperiled <a href="#">S2</a>	Vulnerable <a href="#">G3</a>		
<i>Tradescantia ozarkana</i> <a href="#">More Information</a>	Ozark Spiderwort	Imperiled <a href="#">S2</a>	Vulnerable <a href="#">G3</a>		
<i>Spilogale putorius interrupta</i> <a href="#">More Information</a>	Plains Spotted Skunk	Critically Imperiled <a href="#">S1</a>	Apparently Secure Secure <a href="#">G5T4</a>	Endangered <a href="#">E</a>	
<i>Necturus maculosus louisianensis</i> <a href="#">More Information</a>	Red River Mudpuppy	Unrankable <a href="#">SU</a>	Apparently Secure Secure <a href="#">G5T4</a>		
<i>Ambystoma annulatum</i>	Ringed Salamander	Vulnerable <a href="#">S3</a>	Apparently Secure		

<a href="#">More Information</a>			G4		
<a href="#">Accipiter striatus</a> <a href="#">More Information</a>	Sharp-shinned Hawk	Vulnerable S3	Secure G5		
<a href="#">Cypripedium reginae</a> <a href="#">More Information</a>	Showy Lady-slipper	Imperiled Vulnerable S2S3	Apparently Secure G4		
Carex laxiculmis	Spreading Sedge	Imperiled S2	Secure G5		
Stenosiphon linifolius	Stenosiphon	Imperiled S2	Secure G5		
Carex timida	Timid Sedge	Critically Imperiled Imperiled Imperiled S1S2	Imperiled Vulnerable G2G3		
Tingupa pallida	Tingupa Cave Millipede	Apparently Secure S4	Apparently Secure G4		
Eriogonum longifolium var. longifolium	Umbrella Plant	Imperiled S2	Apparently Secure G4T4		
Hydrocotyle verticillata	Water Pennywort	Critically Imperiled S1	Secure G5		
<a href="#">Ophiogomphus westfalli</a> <a href="#">More Information</a>	Westfall's Snaketail	Vulnerable S3	Vulnerable G3		

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### **Heritage Database Codes**

## **TERMS AND DEFINITIONS**

### **FEDERAL STATUS**

The federal status is derived from the provisions of the Endangered Species Act of 1973, as amended, which is administered by the U.S. Fish and Wildlife Service. Passage of the Endangered Species Act of 1973 gave the United States one of the most far-reaching laws ever enacted by any country to prevent the extinction of imperiled animals and plants. Protecting endangered and threatened species and restoring them to the point where their existence is no longer jeopardized is the primary objective of the Fish and Wildlife Service's Endangered Species Program.

E: Endangered:

Any species which is in danger of extinction throughout all or a significant portion of its range.

T: Threatened:

Any species which is likely to become endangered within the foreseeable future.

C: Candidate:

Plants or animals which the Service is reviewing for possible addition to the list of endangered and threatened species.

PE: Proposed Endangered:

Species officially proposed for listing as endangered; final ruling not yet made.

PT: Proposed Threatened:

Species officially proposed for listing as threatened; final ruling not yet made.

### **STATE STATUS**

Rule 3CSR10-4.111 of the Wildlife Code of Missouri and certain state statutes apply to state Code listed species.

E: "Endangered":

Determined by the Department of Conservation under constitutional authority.

### **GLOBAL RANK**

A numeric rank (G1 through G5) of relative endangerment based primarily on the number of occurrences of the Element (i.e., species, subspecies, or variety) globally. Other factors in addition to the



number of occurrences are considered when assigning a rank, so the numbers of occurrences suggested for each numeric rank below are not absolute guidelines.

**G1: Critically Imperiled:**

Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2000) or linear miles.

**G2: Imperiled:**

Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction or elimination. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or linear miles (10 to 50).

**G3: Vulnerable:**

Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

**G4: Apparently Secure:**

Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.

**G5: Secure:**

Common; widespread and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

**G#G#: Range Rank:**

A numeric range rank (e.g., G2G3) is used to indicate uncertainty about the exact status of a taxon. Ranges cannot skip more than one rank (e.g., GU should be used rather than G1G4).

**GNR: Not Ranked:**

Status has not been assessed.

**GU: Unrankable:**

Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. Note: Whenever possible, the most likely rank is assigned and the question mark qualifier is added (e.g., G2?) to express uncertainty, or a range rank (e.g., G2G3) is used to delineate the limits (range) of uncertainty.

**GH: Possibly Extinct/Extirpated:**

Known from only historical occurrences, but may nevertheless still be extant; further searching needed.

**GX: Presumed Extinct:**

Believed to be extinct throughout its range. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

**SUBRANK:**

**T: Taxonomic Subdivision:**

Rank applies to a subspecies or variety.

**QUALIFIERS:**

**?: Inexact Numeric Rank:**

Denotes inexact numeric rank. (The ? is not used in combination with range ranks.)

**Q: Questionable Taxonomy:**

Distinctiveness of this entity as a taxon or community at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, inclusion of this taxon in another taxon, or inclusion of this community within another community, with the resulting Element having a lower-priority (numerically higher) conservation status rank.

**STATE RANK**

A numeric rank (S1 through S5) of relative endangerment based primarily on the number of occurrences of the Element (i.e., species, subspecies, or variety) within the state. Other factors considered when assigning a rank include: abundance, population trends, distribution, number of protected sites, degree of threat, suitable habitat trends, level of survey effort and life history. Thus, the number of occurrences suggested for each numeric rank below are not absolute guidelines. Missouri species of conservation concern typically do not fall within the range of S4-S5.

**S1: Critically Imperiled:**

Critically imperiled in the nation or state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).

**S2: Imperiled:**

Imperiled in the nation or state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or state (1,000 to 3,000).

**S3: Vulnerable:**

Vulnerable in the nation or state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

**S4: Apparently Secure:**

Uncommon but not rare, and usually widespread in the nation or state. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.

**S5: Secure:**

Common, widespread, and abundant in the nation or state. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

**S#S#: Range Rank:**

A numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the Element. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

**S?: Unranked:**

Species is not yet ranked in the state.

**SU: Unrankable:**

Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

**SE: Exotic:**

An exotic established in the state; may be native in nearby regions (e.g., house finch or catalpa in eastern U.S.)

**SA: Accidental/Nonregular:**

Accidental or casual in the state (i.e., infrequent and outside usual range).

**SP: Potential:**

Potentially occurring in the state but no occurrences reported.

**SR: Reported:**

Element reported in the state but without persuasive documentation which would provide a basis



for either accepting or rejecting (e.g., misidentified specimen) the report.

SRF: Reported Falsely:

Element erroneously reported in the state and the error has persisted in the literature.

SH: Historical:

Element occurred historically in the state (with expectation that it may be rediscovered). Perhaps having not been verified in the past 20 years, and suspected to be still extant.

SX: Extirpated:

Element is believed to be extirpated from the state.

QUALIFIERS:

?: Inexact or Uncertain:

Denotes inexact or uncertain numeric rank. (The ? qualifies the character immediately preceding it in the SRANK. The ? is not used in combination with range ranks.)

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## Boone

Name	Status		Rank	
	Federal	State	Global	State
<b>Animals - Invertebrates</b>				
<a href="#">Arrhopalites clarus</a> (a springtail)	-	INV	G4	S1S2
<a href="#">Bombus fervidus</a> (golden northern bumblebee)	-	INV	GNR	S1
<a href="#">Caecidotea ancyla</a> (an isopod)	-	INV	G3G4	S1?
<a href="#">Caecidotea stiladactyla</a> (an isopod)	-	INV	G3G4	S1?
<a href="#">Cicindela duodecimguttata</a> (twelve-spotted tiger beetle)	-	INV	G5	S3S4
<a href="#">Crosbyella distincta</a> (a cave obligate harvestman)	-	INV	G1G2	S1
<a href="#">Gastrocopta rogersensis</a> (a land snail)	-	INV	G3G4	S2
<a href="#">Gryllotalpa major</a> (prairie mole cricket)	-	INV	G3	S1S2
<a href="#">Laphria vorax</a> (a robberfly)	-	INV	GNR	S1
<a href="#">Lirceus bidentatus</a> (an isopod)	-	INV	G1?	S1?
<a href="#">Orconectes williamsi</a> (William's crayfish)	-	INV	G3	S1
<b>Animals - Vertebrates</b>				
<a href="#">Empidonax traillii</a> (Willow Flycatcher)	-	INV	G5	S1B,S3N
<a href="#">Myotis grisescens</a> (gray myotis)	LE	INV	G3	S2S3
<a href="#">Terrapene ornata ornata</a> (ornate box turtle)	-	INV	G5T5	S2
<a href="#">Thryomanes bewickii</a> (Bewick's Wren)	-	INV	G5	S2B,S3N
<b>Plants - Vascular</b>				
<a href="#">Amorpha canescens</a> (leadplant)	-	INV	G5	S1
<a href="#">Antennaria neglecta</a> (field pussytoes)	-	INV	G5	S1
<a href="#">Calopogon oklahomensis</a> (Oklahoma grass-pink)	-	INV	G4?	S2
<a href="#">Carex bicknellii</a> (a caric sedge)	-	INV	G5	S1
<a href="#">Carex gravida</a> (a caric sedge)	-	INV	G5	S2S3
<a href="#">Carex opaca</a> (a caric sedge)	-	SE	G5T4	S2S3
<a href="#">Castanea pumila var. ozarkensis</a> (Ozark chinquapin)	-	INV	G5T3	S3S4
<a href="#">Cypripedium kentuckiense</a> (Kentucky lady's-slipper)	-	INV	G3	S3
<a href="#">Delphinium treleasei</a> (Trelease's larkspur)	-	INV	G3	S3
<a href="#">Echinacea paradoxa var. paradoxa</a> (Bush's yellow coneflower)	-	ST	G2T2	S2
<a href="#">Erythronium mesochoreum</a> (prairie trout lily)	-	INV	G4G5	S1S2
<a href="#">Gentiana puberulenta</a> (downy gentian)	-	INV	G4G5	S2
<a href="#">Helianthus pauciflorus ssp. pauciflorus</a> (prairie sunflower)	-	INV	G5T5?	S1
<a href="#">Heuchera villosa var. arkansana</a> (Arkansas alumroot)	-	INV	G5T3Q	S3
<a href="#">Lithospermum incisum</a> (fringed puccoon)	-	INV	G5	S2S3
<a href="#">Nemastylis nuttallii</a> (Nuttall's pleat-leaf)	-	INV	G4	S2
<a href="#">Pediomelum esculentum</a> (prairie turnip)	-	INV	G5	S2
<a href="#">Penstemon cobaea</a> (showy beard-tongue)	-	INV	G4	S3

<a href="#">Perideridia americana</a> (American squaw-root)	-	INV	G4	S2
<a href="#">Potentilla arguta</a> (tall cinquefoil)	-	ST	G5	S1S2
<a href="#">Sida elliotii</a> (a sida)	-	INV	G4G5	S2S3
<a href="#">Silene regia</a> (royal catchfly)	-	ST	G3	S2
<a href="#">Solidago gattingeri</a> (Gattinger's goldenrod)	-	INV	G3?Q	S1
<a href="#">Symphyotrichum sericeum</a> (silky aster)	-	INV	G5	S2
<a href="#">Trillium pusillum var. ozarkanum</a> (Ozark least trillium)	-	INV	G3T3	S3
<a href="#">Viburnum molle</a> (soft-leaved arrow-wood)	-	INV	G5	S1
<a href="#">Viola pedatifida</a> (prairie violet)	-	INV	G5	S2
<a href="#">Zephyranthes chlorosolen</a> (rain lily)	-	INV	G5	S1S2
<a href="#">Zizia aptera</a> (golden Alexanders)	-	INV	G5	S1S3

### Special Elements - Natural Communities

Central Interior Highlands Calcareous Glade and Barrens	-	INV	GNR	SNR
Ozark Prairie and Woodland	-	INV	GNR	SNR

### Special Elements - Other

Colonial nesting site, water birds	-	INV	GNR	SNR
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**Baxter**

Name	Status		Rank	
	Federal	State	Global	State
<b>Animals - Invertebrates</b>				
<a href="#">Arrhopalites clarus</a> (a springtail)	-	INV	G4	S1S2
<a href="#">Caecidotea dimorpha</a> (an isopod)	-	INV	G2G3	S1?
<a href="#">Caecidotea stiladactyla</a> (an isopod)	-	INV	G3G4	S1?
<a href="#">Epioblasma triquetra</a> (snuffbox)	-	INV	G3	S1
<a href="#">Gastrocopta rogersensis</a> (a land snail)	-	INV	G3G4	S2
<a href="#">Lampsilis abrupta</a> (pink mucket)	LE	INV	G2	S2
<a href="#">Somatogyryus crassilabris</a> (thickclipped pebblesnail)	-	INV	GX	SX
<b>Animals - Vertebrates</b>				
<a href="#">Ambystoma annulatum</a> (ringed salamander)	-	INV	G4	S3
<a href="#">Cryptobranchus alleganiensis bishopi</a> (Ozark Hellbender)	C	INV	G3G4T2Q	S2
<a href="#">Cyprinella camura</a> (bluntnose shiner)	-	INV	G5	SH
<a href="#">Erimystax harrisi</a> (Ozark chub)	-	INV	G3G4Q	S3S4
<a href="#">Eurycea spelaea</a> (grotto salamander)	-	INV	G4	S3
<a href="#">Haliaeetus leucocephalus</a> (Bald Eagle)	-	INV	G5	S2B,S4N
<a href="#">Lampetra appendix</a> (American brook lamprey)	-	INV	G4	S2?
<a href="#">Myotis grisescens</a> (gray myotis)	LE	INV	G3	S2S3
<a href="#">Notropis ozarcanus</a> (Ozark shiner)	-	INV	G3	S2
<a href="#">Rana sylvatica</a> (wood frog)	-	INV	G5	S3
<a href="#">Typhlichthys subterraneus</a> (southern cavefish)	-	INV	G4	S1
<b>Plants - Vascular</b>				
<a href="#">Acalypha deamii</a> (Deam's copperleaf)	-	INV	G4?	S1
<a href="#">Arabis shortii</a> var. <a href="#">shortii</a> (Short's rockcress)	-	INV	G5T5	S1
<a href="#">Argyrochosma dealbata</a> (powdery cloak fern)	-	INV	G4G5	S2
<a href="#">Arnoglossum reniforme</a> (great Indian plantain)	-	INV	G4	S2
<a href="#">Brickellia grandiflora</a> (tassel flower)	-	INV	G5	S2
<a href="#">Carex careyana</a> (Carey's caric sedge)	-	INV	G4G5	S3
<a href="#">Carex davisii</a> (Davis' caric sedge)	-	INV	G4	S3
<a href="#">Carex gracillima</a> (graceful caric sedge)	-	INV	G5	S1
<a href="#">Carex gravida</a> (a caric sedge)	-	INV	G5	S2S3
<a href="#">Carex hirtifolia</a> (a caric sedge)	-	INV	G5	S3
<a href="#">Carex hitchcockiana</a> (Hitchcock's caric sedge)	-	INV	G5	S1S2
<a href="#">Carex leptalea</a> var. <a href="#">harperi</a> (threadstem caric sedge)	-	INV	G5T4T5	S2S3
<a href="#">Carex mesochorea</a> (a caric sedge)	-	INV	G4G5	S2
<a href="#">Carex shortiana</a> (Short's caric sedge)	-	INV	G5	S2
<a href="#">Carex sparganioides</a> (a caric sedge)	-	INV	G5	S3

<i>Carex suberecta</i> (a caric sedge)	-	INV	G4	S2
<i>Carex timida</i> (a caric sedge)	-	INV	G2G3	S2S3
<i>Castanea pumila</i> var. <i>ozarkensis</i> (Ozark chinquapin)	-	INV	G5T3	S3S4
<i>Cheilanthes eatonii</i> (Eaton's lip fern)	-	INV	G5?	SH
<i>Cypripedium reginae</i> (showy lady's-slipper)	-	SE	G4	S1
<i>Delphinium treleasei</i> (Trelease's larkspur)	-	INV	G3	S3
<i>Diphasiastrum digitatum</i> (southern running-pine)	-	INV	G5	S1S2
<i>Dryopteris celsa</i> (log fern)	-	INV	G4	S2
<i>Dryopteris goldiana</i> (giant wood fern)	-	INV	G4	S1
<i>Dryopteris x australis</i> (southern hybrid log fern)	-	INV	GNA	S1
<i>Dryopteris x leedsii</i> (Leed's hybrid log fern)	-	INV	GNA	S1
<i>Echinacea paradoxa</i> var. <i>paradoxa</i> (Bush's yellow coneflower)	-	ST	G2T2	S2
<i>Elymus churchii</i> (Church's wild rye)	-	INV	G2G3	S2?
<i>Euonymus obovatus</i> (running strawberry bush)	-	INV	G5	S3
<i>Hexalectris spicata</i> var. <i>spicata</i> (crested coralroot)	-	INV	G5T4T5	S2
<i>Hieracium scabrum</i> (rough hawkweed)	-	INV	G5	S2
<i>Huperzia lucidula</i> (shining club-moss)	-	INV	G5	S2S3
<i>Juglans cinerea</i> (butternut)	-	INV	G4	S3
<i>Leavenworthia uniflora</i> (glade cress)	-	INV	G4	S3
<i>Melanthium woodii</i> (false hellebore)	-	INV	G5	S3
<i>Mentha arvensis</i> (field mint)	-	INV	G5	S1
<i>Mimulus ringens</i> var. <i>ringens</i> (monkey flower)	-	INV	G5T5	S1S2
<i>Mitella diphylla</i> (two-leaf bishop's cap)	-	INV	G5	S2
<i>Pediomelum esculentum</i> (prairie turnip)	-	INV	G5	S2
<i>Penstemon cobaea</i> (showy beard-tongue)	-	INV	G4	S3
<i>Phacelia gilioides</i> (hairy scorpionweed)	-	INV	G5	S2S3
<i>Plantago cordata</i> (heartleaf plantain)	-	ST	G4	S2
<i>Prenanthes crepidinea</i> (nodding rattlesnake-root)	-	INV	G4	S1
<i>Ranunculus aquatilis</i> var. <i>diffusus</i> (white water crowfoot)	-	INV	G5T5	S2S3
<i>Rhynchospora capillacea</i> (capillary beakrush)	-	INV	G4	S2
<i>Scutellaria bushii</i> (Bush's skullcap)	-	ST	G3	S2
<i>Silene ovata</i> (ovate-leaved catchfly)	-	ST	G3	S3
<i>Solidago ptarmicoides</i> (white-flowered goldenrod)	-	INV	G5	S1S2
<i>Spiranthes lucida</i> (shining ladies'-tresses)	-	INV	G5	S2
<i>Stenosiphon linifolius</i> (false gaura)	-	ST	G5	S1
<i>Stylophorum diphyllum</i> (celandine poppy)	-	INV	G5	S3
<i>Tradescantia ozarkana</i> (Ozark spiderwort)	-	INV	G3	S3
<i>Valerianella ozarkana</i> (Ozark cornsalad)	-	INV	G3	S3
<i>Viola canadensis</i> var. <i>canadensis</i> (Canada violet)	-	INV	G5T5	S2
<i>Zannichellia palustris</i> (horned pondweed)	-	INV	G5	S2S3

### Special Elements - Natural Communities

Central Interior Highlands Calcareous Glade and Barrens	-	INV	GNR	SNR
Ozark-Ouachita Dry-Mesic Oak Forest	-	INV	GNR	SNR

### Special Elements - Other

Colonial nesting site, water birds	-	INV	GNR	SNR
------------------------------------	---	-----	-----	-----

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## Marion

Name	Status		Rank	
	Federal	State	Global	State
<b>Animals - Invertebrates</b>				
<i>Alasmidonta marginata</i> (elktoe)	-	INV	G4	S3
<i>Caecidotea dimorpha</i> (an isopod)	-	INV	G2G3	S1?
<i>Caecidotea stiladactyla</i> (an isopod)	-	INV	G3G4	S1?
<i>Cyclonaias tuberculata</i> (purple wartyback)	-	INV	G5	S3?
<i>Cyprogenia aberti</i> (western fanshell)	-	INV	G2G3Q	S2
<i>Epioblasma triquetra</i> (snuffbox)	-	INV	G3	S1
<i>Lasmigona costata</i> (flutedshell)	-	INV	G5	S3
<i>Millerelix peregrina</i> (white liptooth)	-	INV	G2	SNR
<i>Ptychobranchus occidentalis</i> (Ouachita kidneyshell)	-	INV	G3G4	S3
<i>Rimulincola divalis</i> (a beetle)	-	INV	G1	S1
<i>Venustaconcha pleasii</i> (bleedingtooth mussel)	-	INV	G3G4	S3
<i>Villosa iris</i> (rainbow)	-	INV	G5Q	S2S3
<b>Animals - Vertebrates</b>				
<i>Corynorhinus townsendii ingens</i> (Ozark big-eared bat)	LE	INV	G4T1	S1
<i>Erimystax harrisi</i> (Ozark chub)	-	INV	G3G4Q	S3S4
<i>Eurycea spelaea</i> (grotto salamander)	-	INV	G4	S3
<i>Haliaeetus leucocephalus</i> (Bald Eagle)	-	INV	G5	S2B,S4N
<i>Lampetra aepyptera</i> (least brook lamprey)	-	INV	G5	S2?
<i>Lampetra appendix</i> (American brook lamprey)	-	INV	G4	S2?
<i>Limnothlypis swainsonii</i> (Swainson's Warbler)	-	INV	G4	S3B
<i>Myotis grisescens</i> (gray myotis)	LE	INV	G3	S2S3
<i>Myotis sodalis</i> (Indiana bat)	LE	INV	G2	S1
<i>Notropis ozarcanus</i> (Ozark shiner)	-	INV	G3	S2
<i>Rana sylvatica</i> (wood frog)	-	INV	G5	S3
<b>Plants - Vascular</b>				
<i>Amorpha canescens</i> (leadplant)	-	INV	G5	S1
<i>Arabis shortii</i> var. <i>shortii</i> (Short's rockcress)	-	INV	G5T5	S1
<i>Argyrochosma dealbata</i> (powdery cloak fern)	-	INV	G4G5	S2
<i>Asclepias incarnata</i> ssp. <i>incarnata</i> (northern swamp milkweed)	-	INV	G5T5	S2
<i>Brickellia grandiflora</i> (tassel flower)	-	INV	G5	S2
<i>Callirhoe bushii</i> (Bush's poppy mallow)	-	INV	G3	S3
<i>Carex hitchcockiana</i> (Hitchcock's caric sedge)	-	INV	G5	S1S2
<i>Carex mesochorea</i> (a caric sedge)	-	INV	G4G5	S2
<i>Carex pellita</i> (a caric sedge)	-	INV	G5	SH
<i>Carex sparganioides</i> (a caric sedge)	-	INV	G5	S3



<a href="#">Carex stricta</a> (tussock sedge)	-	INV	G5	S3
<a href="#">Carex suberecta</a> (a caric sedge)	-	INV	G4	S2
<a href="#">Carex timida</a> (a caric sedge)	-	INV	G2G3	S2S3
<a href="#">Castanea pumila var. ozarkensis</a> (Ozark chinquapin)	-	INV	G5T3	S3S4
<a href="#">Delphinium treleasei</a> (Trelease's larkspur)	-	INV	G3	S3
<a href="#">Desmodium illinoense</a> (Illinois tick trefoil)	-	INV	G5	S2
<a href="#">Euonymus obovatus</a> (running strawberry bush)	-	INV	G5	S3
<a href="#">Juglans cinerea</a> (butternut)	-	INV	G4	S3
<a href="#">Leavenworthia uniflora</a> (glade cress)	-	INV	G4	S3
<a href="#">Lithospermum incisum</a> (fringed puccoon)	-	INV	G5	S2S3
<a href="#">Pediomelum esculentum</a> (prairie turnip)	-	INV	G5	S2
<a href="#">Penstemon cobaea</a> (showy beard-tongue)	-	INV	G4	S3
<a href="#">Perideridia americana</a> (American squaw-root)	-	INV	G4	S2
<a href="#">Philadelphus hirsutus</a> (mock orange)	-	INV	G5	S2S3
<a href="#">Phlox bifida</a> (sand phlox)	-	INV	G5?	S3
<a href="#">Rhynchospora capillacea</a> (capillary beakrush)	-	INV	G4	S2
<a href="#">Ribes cynosbati</a> (prickly gooseberry)	-	INV	G5	S2S3
<a href="#">Silene regia</a> (royal catchfly)	-	ST	G3	S2
<a href="#">Spiranthes lucida</a> (shining ladies'-tresses)	-	INV	G5	S2
<a href="#">Stylophorum diphyllum</a> (celandine poppy)	-	INV	G5	S3
<a href="#">Symphyotrichum sericeum</a> (silky aster)	-	INV	G5	S2
<a href="#">Tradescantia ozarkana</a> (Ozark spiderwort)	-	INV	G3	S3
<a href="#">Valerianella ozarkana</a> (Ozark cornsalad)	-	INV	G3	S3
<a href="#">Waldsteinia fragarioides</a> (barren strawberry)	-	INV	G5	S1
<b>Special Elements - Natural Communities</b>				
Central Interior Highlands Calcareous Glade and Barrens	-	INV	GNR	SNR
Ozark-Ouachita Dry Oak Woodland	-	INV	GNR	SNR
Ozark-Ouachita Fen	-	INV	GNR	SNR

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## LEGEND

### STATUS CODES

#### FEDERAL STATUS CODES

- C = Candidate species. The U.S. Fish and Wildlife Service has enough scientific information to warrant proposing this species for listing as endangered or threatened under the Endangered Species Act.
- LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.
- LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

#### STATE STATUS CODES

- INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.
- SE = State Endangered; this is an administrative designation applied by the Arkansas Natural Heritage Commission to native plant taxa which are in danger of being extirpated from the state.
- ST = State Threatened; this is an administrative designation applied by the Arkansas Natural Heritage Commission to native plant taxa which are believed likely to become endangered in Arkansas in the foreseeable future, based on current inventory information.

### DEFINITION OF RANKS

#### Global Ranks

- G1 = Critically imperiled globally. At a very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
- G2 = Imperiled globally. At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
- G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
- G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- G5 = Secure globally. Common, widespread and abundant.
- GH = Of historical occurrence, possibly extinct globally. Missing; known from only historical occurrences, but still some hope of rediscovery.
- GU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- GX = Presumed extinct globally. Not located despite intensive searches and virtually no likelihood of rediscovery.
- GNR = Unranked. The global rank not yet assessed.
- GNA = Not Applicable. A conservation status rank is not applicable.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

#### State Ranks

- S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2	=	Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.
S3	=	Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	=	Apparently secure in the state. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	=	Secure in the state. Common, widespread and abundant.
SH	=	Of historical occurrence, with some possibility of rediscovery. Its presence may not have been verified in the past 20-40 years. A species may be assigned this rank without the 20-40 year delay if the only known occurrences were destroyed or if it had been extensively and unsuccessfully sought.
SU	=	Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SX	=	Presumed extirpated from the state. Not located despite intensive searches and virtually no likelihood of rediscovery.
SNR	=	Unranked. The state rank not yet assessed.
SNA	=	Not Applicable. A conservation status rank is not applicable.

#### General Ranking Notes

Q	=	A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.
RANGES=		Ranges are used to indicate a range of uncertainty about the status of the element.
?	=	A question mark is used to denote an inexact numeric rank.
B	=	Refers to the breeding population of a species in the state.
N	=	Refers to the non-breeding population of a species in the state.



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# **Attachment 5**

# **EA and RUS FONSI**

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*ENVIRONMENTAL REPORT*

*FOR*

***OZARK MOUNTAIN REGIONAL  
PUBLIC WATER AUTHORITY***

*TO SERVE*

***NORTH CENTRAL ARKANSAS***

*JANUARY 2008  
(REVISED APRIL 2009)*

Prepared In Accordance With:  
*RUS Bulletin 1794A-602  
March 2008  
Version 1.2*





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## 1.0 PURPOSE AND NEED OF THE PROPOSAL

### 1.1 Project Description (Proposed Action)

The Ozark Mountain Regional Public Water Authority (OMRPWA) was formed in 2004 to assist small cities, communities, and rural water systems in North Central Arkansas secure a safe and dependable long term water supply for over 21,500 persons. OMRPWA has been working extremely hard since April of 2004 in trying to obtain and develop a long term regional water supply for Newton County, Searcy County, and portions of Boone, Marion, Johnson, and Pope Counties. Since most of the water systems have similar problems, it made sense that they act together to formulate a plan that will best serve the region. Having each system constructing long term water sources individually would be extremely expensive and not very cost effective.

A collaborative effort on behalf of the member water systems to formulate a long-term water source plan that will best serve the region made sense since a number of member water systems share common water quality and quantity problems, and the fact that the individual evaluation of water sources for each public water system would be prohibitively expensive. The public water systems that are currently members of the OMRPWA are listed below:

#### **NEWTON COUNTY**

- City of Jasper
- Mt. Sherman Water Association
- Nail-Swain Water Association
- East Newton County Water Association
- Mockingbird Hill Water Association
- Deer Community Water Association
- Lurton-Pelsor Water Association
- Town of Western Grove
- Parthenon Water Association

#### **BOONE COUNTY**

- Town of Valley Springs
- Town of Diamond City
- Town of Lead Hill
- Lake Bull Shoals Estates

#### **SEARCY COUNTY**

- SP&G Water Association  
*(St. Joe, Pindall & Gilbert)*
- City of Marshall
- South Mountain Water Association
- SDM Water Association  
*(Snowball, Dongola & Marsena)*
- Town of Leslie
- Morning Star Water Association

#### **MEMBERS AT LARGE**

- Buffalo River (National Park Service)

Engineering Services, Inc. (ESI) was contracted by OMRPWA to conduct a detailed feasibility study and make recommendations on a long-term water source for the region. After an intensive evaluation of water sources and transmission alternatives, construction of a new regional water system to serve the 20 member entities was recommended. The system will need to provide approximately 6 million gallons per day to the region in order to meet current water consumption as well as expected future growth. The current project includes leaving the Buffalo River drainage basin and constructing the following:

- Construct a water intake structure on Bull Shoals Lake;
- Construct a 6 million gallon per day water treatment facility to be located near Diamond City, Arkansas;
- Install ductile iron transmission lines connecting the intake structure and treatment facility to the OMRPWA member systems;
- Construct water storage tanks, which will supply water by gravity flow to each bulk customer; and
- Construct booster pumping stations and install pressure reducing valves in order to serve the mountainous regions.

### **25 Years of Effort to Develop a Safe and Plentiful Drinking Water Supply**

The North Central Arkansas region has worked very hard over the past 25 years to develop a long term regional water supply. Since the early 1980's, four (4) separate studies have been completed by four (4) separate organizations. These are listed below:

- Water Supply for Newton and Searcy Counties  
*Arkansas Soil and Water Comm. (Recommended Watershed Development in BNR basin)*
- Preliminary Engineering Report - Searcy County Regional Water District  
*NRS Consulting Engineer's (Recommended Watershed Development in BNR basin)*
- Water Needs Feasibility Study - NW Ark. Resource Conservation & Dev. Council  
*Crafton, Tull & Associates (Recommended Watershed in Wild and Scenic basin)*
- Feasibility Study - Ozark Mountain Regional Public Water Authority  
*Engineering Services, Inc. (Recommended Obtaining Source from Bull Shoals)*

The first three (3) reports prepared recommended developing a watershed in either Searcy or Newton County in order to supply a safe and plentiful water supply for the region. Permitting, legal challenges, and environmental concerns have stopped development of any impoundments within the Buffalo River drainage basin and delayed a safe water supply for over 25 years. Families within the Buffalo River drainage basin continue to drink water contaminated with radium, fluoride, uranium, radon, and other contaminants.

It should be noted, Searcy County has worked since the late 1980's to develop a long term surface water supply for the residents of Searcy County. The Searcy County Regional Water District (SCRWD) was formed in order to develop a regional water supply and provide treated water to the residents of Searcy County.

The SCRWD made good progress in the early stages of developing the water supply. They retained a consulting engineer, prepared a preliminary engineering report, made application for state and federal funding, and began work on the environmental phase of the project. However, since the selected watershed was on a tributary of the Buffalo National River, extensive environmental studies were required to determine the long term effect of the watershed on the Buffalo National River. After approximately ten (10) years of environmental review, debate and discussion, the National Park Service determined that the District would have to provide detailed environmental impact studies to determine the long term effects of the watershed development. The cost of these studies was anticipated to be in excess of \$500,000, which is not feasible for the District. Ultimately, progress on the SCRWD regional water supply was stopped. Therefore, the SCRWD fully supports the efforts of the Ozark Mountain Regional Water Public Authority in developing a water source to serve the region.

### **Impact of Living Within the Buffalo River Drainage Basin**

On March 1, 1972, the United States Congress established the Buffalo National River as America's first national river. While the beauty of the Buffalo River and entire Ozark Mountain region is truly a blessing, thousands of families within the Buffalo River drainage basin are suffering from the lack of a safe and plentiful water supply. Due to the Buffalo National River watershed regulations, OMRPWA or other water systems are unable to tap into local water resources normally available for drinking water. This inability to tap into the Buffalo River drainage basin is adding \$15 - \$20 million to the total project cost.

This additional cost is the primary reason this project is forced to request such a large amount of grant funds. It is unfair and punitive that families within this protected basin would be required to pay substantially more for water than other customers throughout the State.

### **Full Support of National Park Service (Watershed Rehabilitation / Protection for Buffalo River Basin)**

The National Park Service and the Department of Interior fully support our project. We have worked closely with the National Park Service to select a route that avoids sensitive environmental areas. The National Park Service has also indicated this project will provide an environmental enhancement to the Buffalo National River. Please refer to the excerpt below from a letter from the National Park Service.

*“This proposal is the least environmentally impacting way to supply safe, dependable, and affordable water to the region as well as provide direct benefits for the Buffalo National River (America's 1<sup>st</sup> National River) and the one million Americans that visit this resource each year. This project will also alleviate damming the Buffalo River tributaries to provide water to individual districts, and eliminate the Cities of Marshall and Leslie withdrawing from Hughes Spring / Brush Creek, a tributary to the Buffalo National River. It will also lessen the*

*dependency of the region on groundwater by replacing wells with a single surface water source, thus reducing withdrawal from aquifers feeding the Buffalo River.”*

### **OMRPWA Progress to Date**

The OMRPWA has made tremendous progress since forming in 2004. The Board of Directors have conducted productive monthly meetings since 2005 and maintained close contact with state and federal agencies concerning the project. Interest in the project remains passionate, and the member entities are hopeful that construction can begin soon. Shown below are some of the items completed since inception of the OMRPWA.

- Determined the organization structure of the Alliance and elected board of directors;
- 9 Board of Directors; 3 from Searcy County, 3 from Newton County, and 3 from Boone County;
- Worked very closely with the Arkansas Department of Health, USDA Rural Development, Arkansas Natural Resources Commission, U.S. Fish and Wildlife and the National Park Service.
- Conducted frequent informative meetings in Boone, Newton and Searcy Counties;
- Retained consulting engineer and legal counsel;
- Received \$25,000 grant funding to conduct feasibility study, and received \$60,000 to complete cultural resources survey of the project.
- Completed Feasibility Study and Environmental Report;
- Prepared funding applications through federal, state, and local sources;
- Conducted public hearing in order to achieve water plan compliance;
- Published public notices in accordance with USDA and USACE procedures;
- Requested allocation from USACE from Bull Shoals Reservoir;
- Obtained environmental approval in accordance with USDA / NEPA guidelines;
- Obtained approximately \$6.7 million from the State of Arkansas;
- Plans and specifications are approximately 70% complete and will be submitted to the review agencies in stages to expedite the review process.
- State of Arkansas authorized use of \$250,000 to begin acquisition of properties and easements;
- Easement documents are 70% complete by the attorney and abstractors; and
- Water purchase contracts are currently being signed by all member entities.

A vicinity map showing the project area can be found on the following page.



*INSERT PROJECT VICINITY MAP*

## 1.2 Purpose and Need of the Proposal

Historically, this area of North Central Arkansas has suffered from the lack of a good, safe, and plentiful water supply. This region has over thirty (30) public water systems that receive their water supply from either deep wells, shallow wells, or ground water purchased from neighboring water systems. The members of the Ozark Mountain Regional Public Water Authority (OMRPWA) currently depend on both deep and shallow wells with poor water quality drilled twenty to fifty years ago to access a groundwater supply. Many deep wells in this region have excess amounts of radium 226, radium 228, fluoride, uranium, radon, hydrogen sulfide, and other undesirable naturally occurring substances which are difficult to treat. Shallow wells are often infiltrated with surface water runoff that tends to contain contaminants that pose potential health risks. Since only 5 of the 20 members provide water treatment beyond chlorine disinfection, the quality of the water distributed to their customers is a serious issue.

State and federal water quality regulations have tightened making many of these water sources unsafe by current water quality standards. Consequently, the EPA has certified that many of these water sources in the area are unsafe for consumption and the Arkansas Department of Health has placed many of the systems under Administrative Order since the 1990's for continuing to provide unsafe water supplies. Many of these systems have been facing relentless legal issues and fines by the Arkansas Department of Health. Since 2005, the following OMRPWA member systems have been required to publish information in the local newspapers indicating that their water supply is/was unsafe for consumption:

- Mt. Sherman Water Association
- East Newton County Water Association
- Deer Community Water Association
- Lurton-Pelsor Water Association
- Town of Western Grove
- South Mountain Water Association
- SDM Water Association  
(*Snowball, Dongola & Marsena*)
- Morning Star Water Association
- Town of Valley Springs

The twenty (20) public water systems that make up the OMRPWA are eager to develop and implement a long term water supply, as the water quality throughout North Central Arkansas is a serious issue. The majority of the water supplies throughout North Central Arkansas contain excessive amounts of radium 226, radium 228, uranium, fluoride, radon, hydrogen sulfide, and other undesirable substances. The radium 226, radium 228, fluoride, and radon levels found in many of these water supplies consistently exceed the maximum contaminate levels (MCL) established by the federal *National Primary Drinking Water Regulations*. The maximum allowable contaminate level for radium is 5 pCi/L, and several members of the OMRPWA exceed this level. It should also be noted that most of the other systems are just below the MCL of 5 pCi/L. Likewise, the fluoride levels found in many of the water supplies throughout North Central Arkansas are excessive. Although the primary maximum contaminant level for fluoride in drinking water is 4 mg/L to protect against adverse health effects, a

secondary maximum contaminant level of 2 mg/L was set to protect against cosmetic dental effects linked to excess fluoride consumption, such as discoloration, enamel loss, and pitting of the teeth. Many of the OMRPWA systems are above this secondary 2.0 mg/L concentration with three of the systems exceeding the 4.0 mg/L concentration.

Data for each water system was obtained from individual water systems and through sanitary surveys which were conducted by the Arkansas Department of Health. After carefully reviewing data from each system, it was determined that eighteen (18) of the twenty (20) members of the OMRPWA had water quality or water quantity problems, as documented by the Arkansas Department of Health.

In May of 2005, the original Preliminary Engineering Report for the OMRPWA was submitted to the appropriate agencies for review. OMRPWA's regional proposal was presented to the Arkansas Department of Health and they agreed that progress on the Regional Water Project is critical in order to achieve better water quality and avoid pending legal issues. Every year since OMRPWA's conception, this project has remained the Arkansas Department of Health's top (1<sup>st</sup>) priority project due to the serious health risks associated with the drinking water. This top ranking is primarily due to the immediate health concerns associated with drinking contaminated water as well as inadequate yields of water for other member systems.

### **Economic Opportunities and a Better Way of Life**

Due to the unsafe water supply and limited water supply available from existing wells and springs, Searcy County, Newton County, and portions of Boone and Marion Counties have never had opportunities to solicit or obtain industrial or commercial development. That is the primary reason why the Median Household Incomes in Searcy and Newton County are some of the poorest in the state, ranking 2nd and 8th lowest incomes in the State respectively. This project will give them an opportunity for a much better way of life and healthier way of life.

### **Benefits of Proposed Project**

The social and environmental benefits of this project are rare and unique. Not only will this project provide a safe, plentiful, and dependable water supply, but it will also act as a watershed protection / rehabilitation to the Buffalo National River. Some of the benefits of the proposed project are as follows:

- Safe Water Supply and Plentiful Water Supply (free from cancer causing contaminants);
- No Damming of any Tributaries of Buffalo River or other Scenic Rivers;
- Environmental Enhancement by allowing aquifers currently used to replenish the BNR;
- Economic Growth and a Better Way of Life. It gives communities, cities, and towns an opportunity that they have never had.

## 2.0 ALTERNATIVES TO THE PROPOSED ACTION

There were several alternatives considered to provide safe and plentiful water for the Ozark Mountain Regional Public Water Authority. The Ozark Mountain Regional Public Water Authority will have three (3) basic options:

1. Purchase treated water from one or more wholesale water providers;
2. Construct the OMRPWA's own surface water treatment facilities; or
3. A combination of purchasing water from a wholesale provider and constructing the OMRPWA's own treatment facilities.

Several important factors must be considered in evaluating alternatives to provide a long term water source for the region. Some of these factors include:

1. Capacity of water supply;
2. Quality of water supply;
3. Location of water supply;
4. Pumping requirements;
5. Capacity of existing water treatment facilities;
6. Cost of water from wholesale providers;
7. Cost to treat and distribute water from a new water treatment facility; and
8. Capital costs required to implement the alternative.

We have evaluated twelve (12) alternatives for implementing a long term regional water supply for the Authority. The Preliminary Engineering Report further details the alternatives considered. A list of each alternative with brief description follows:

<u>ALTERNATIVE</u>	<u>DESCRIPTION OF ALTERNATIVE</u>
A	<b>Marion County Regional Water District (Purchase Water)</b> <i>Upgrade existing water treatment facilities, water transmission mains, and water storage capacity. Construct water transmission mains to serve OMRPWA Members (via Hwy 412 &amp; 65).</i>
B	<b>Carroll-Boone Regional Water District (Purchase Water)</b> <b>Construct Water Treatment Facility on Bull Shoals Lake</b> <i>Construct water treatment facilities on Bull Shoals Reservoir and connect to the Carroll - Boone Water District to purchase a supplemental supply. Construct water transmission mains to serve OMRPWA Members.</i>
C	<b>Construct Water Treatment Facility on Bull Shoals Lake</b> <i>Construct water treatment facilities on Bull Shoals Reservoir and construct water transmission mains to serve OMRPWA Members.</i>
D	<b>Construct Water Treatment Facility on Greers Ferry Lake</b> <b>Construct Water Treatment Facility on Bull Shoals Lake</b> <i>Construct water treatment facilities on Greers Ferry Lake to serve Searcy County and construct a water treatment facility on Bull Shoals Reservoir to serve Newton and Boone Counties. Construct water transmission mains to serve OMRPWA Members.</i>

**ALTERNATIVE    DESCRIPTION OF ALTERNATIVE**

- E            Clinton Water System (Purchase Water)  
Carroll-Boone Regional Water District (Purchase Water)**  
*Connect to the Clinton Water System and provide treated water to Searcy County via a water transmission main. Connect to Carroll - Boone Water District and provide treated water to Newton and Boone County via a water transmission mains.*
- F            Construct Water Treatment Facility on Norfolk Lake**  
*Construct water treatment facilities on Norfolk and construct water transmission mains to serve OMRPWA Members.*
- G            Marion County Regional Water District (Purchase Water)**  
*Upgrade existing water treatment facilities, water transmission mains, and water storage capacity. Construct water transmission mains to serve OMRPWA Members (via Highway 14 to Searcy County and via Highway 412 & 65 to Newton County).*
- H            City of Clarksville (Purchase Water)**  
*Connect to the Clarksville Water System and provide treated water to OMRPWA members via water transmission mains.*
- I            City of Russellville (Purchase Water)**  
*Connect to the Russellville Water System and provide treated water to OMRPWA members via water transmission mains.*
- J            Marion County Regional Water District (Purchase Water)  
Carroll-Boone Regional Water District (Purchase Water)**  
*Increase the capacity of the water treatment facilities from 2 to 6 mgd and perform water transmission mains upgrades to the Marion County District. Also, connect to the Carroll - Boone Water District for a supplemental water supply. Construct water transmission mains to serve OMRPWA Members.*
- K            City of Clarksville (Purchase Water)  
Construct Water Treatment Facility on Bull Shoals Lake**  
*Connect to the Clarksville Water System and provide treated water to OMRPWA members via south of the Buffalo National River. Also, construct water treatment facilities on Bull Shoals Reservoir and serve OMRPWA members north of the Buffalo National River.*
- L            City of Russellville (Purchase Water)  
Construct Water Treatment Facility on Bull Shoals Lake**  
*Connect to the Russellville Water System and provide treated water to OMRPWA members via south of the Buffalo National River. Also, construct water treatment facilities on Bull Shoals Reservoir and serve OMRPWA members north of the Buffalo National River.*

### **Surface Water Sources Considered**

Each of the alternatives described in the previous section was analyzed for water quality, water quantity and capacity, reliability, and environmental impact. The final step in the selection process is to compare the economic impact of constructing the water system for the Ozark Regional Public Water Authority. These include the capital costs and the total life cycle costs associated with each alternative. Capital costs and operation and maintenance costs are broken down for each alternative in the previous section of this report. A 20 year and 30 year life cycle costs which takes into consideration the probable loan conditions, projected usage, construction costs, operation and maintenance expenses, and the cost to purchase water (where appropriate).

A chart summarizing the economic analysis of the six (6) most practical alternatives is found on the next page followed by a breakdown of each 20 and 30 year life cycle cost analysis.

### **Alternative Selected**

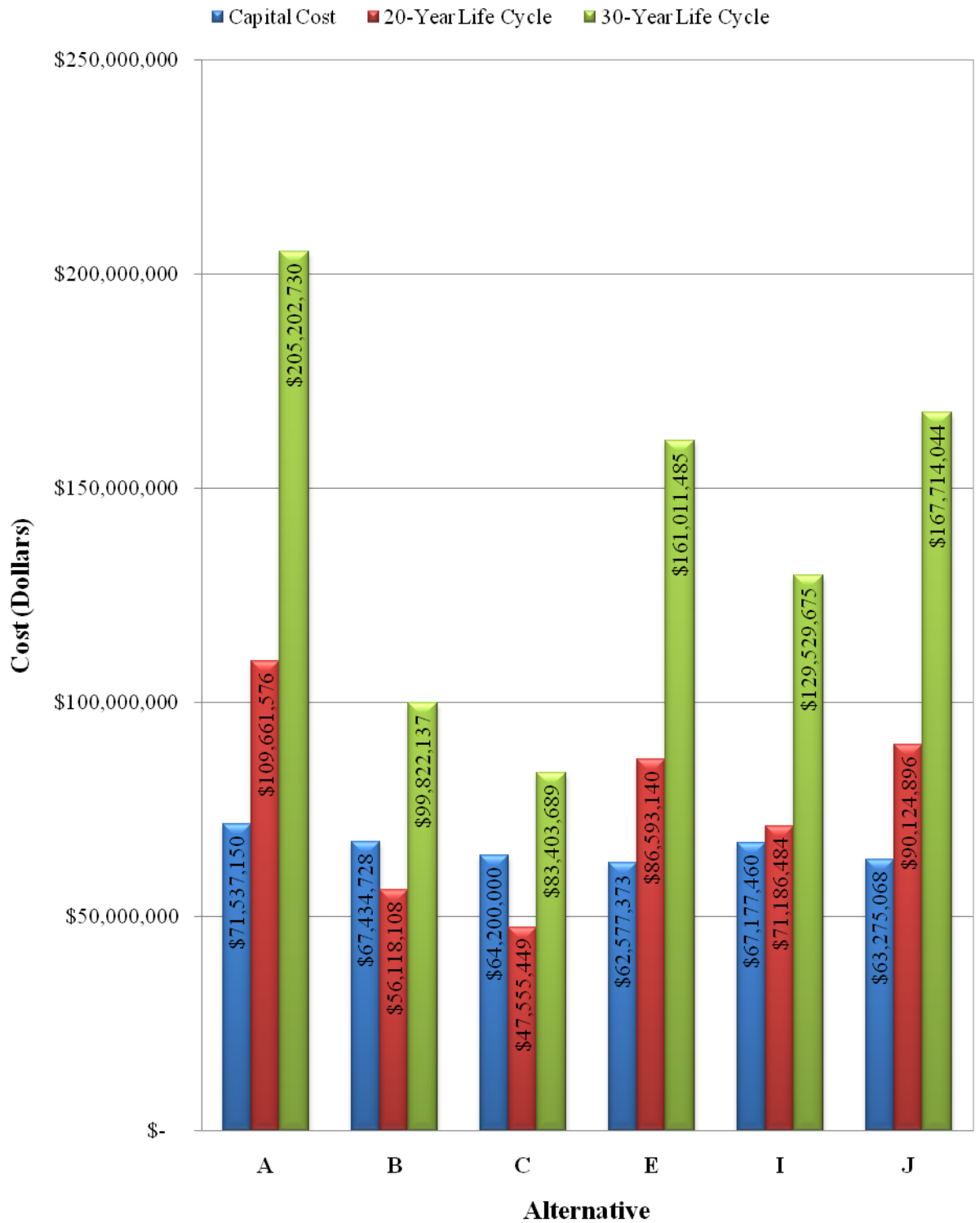
After careful review of the economic analysis for all alternatives, it is evident that production of the treated water has a tremendous long term advantage over purchasing treated water from an existing bulk wholesaler. Therefore, in order for the OMRPWA to keep long term rates to a minimum, it is in the best interest for the Authority to construct a water treatment facility and produce drinking water for its member entities. This long term savings is most evident when evaluating the four (4) alternatives with the lowest capital cost and comparing them with the 20 year and 30 year life cycle costs, as shown below:

<u>Alternative</u>	<u>Capital Cost</u>	<u>Life Cycle Costs</u>	
		<u>20 Yr</u>	<u>30 Yr</u>
“E” (Buy from Clinton/Carroll-Boone)	\$62,577,373	\$ 86,593,140	\$161,011,485
“J” (Buy from MCRWD / Carroll-Boone)	\$63,275,068	\$ 90,124,896	\$167,714,044
“C” (Construct Bull Shoals WTP)	\$64,200,000	\$ 47,555,449	\$ 83,403,689
“I” (Purchase from City of Russellville)	\$67,177,460	\$ 71,186,484	\$129,529,675

Based our evaluation of the 12 alternatives, Alternate “C” (Construct WTP on Bull Shoals) is the most cost effective for the OMRPWA. It is our recommendation that the Authority proceed with constructing an intake structure and water treatment facility on Bull Shoals Lake near Lead Hill. The treated water would then be delivered via water transmission mains, booster stations, and water storage tanks to all members of the OMRPWA.

Again, the engineering design information is discussed more in-depth in the Preliminary Engineering Report.

## SUMMARY OF CAPITAL AND LIFE CYCLE COST





## **Conclusions and Recommendations**

1. The twenty (20) water systems that make up the Ozark Mountain Regional Public Water Authority are in dire need of a safe, dependable, and plentiful water supply. This region receives their water supply from either deep wells, shallow wells, or purchases ground water from neighboring water systems. Deep wells in this region have excessive levels of one or more contaminants. These contaminants include radium 226, radium 228, uranium, radon, fluoride, hydrogen sulfide, and other undesirable substances.
2. Several of these systems are under Administrative Order by the Arkansas Department of Health for continuing to use unsafe water supplies. Over half of these systems are required to frequently publish information in local newspapers indicating their water supply is unsafe for consumption.
3. Since most of the water systems in this region have similar problems, it makes sense these water systems to work together to formulate a long term water source plan that will best serve the region. Each system evaluating long term water sources individually is expensive and not very cost effective.
4. The Median Household Income (MHI) for this region is extremely low. The MHI in Newton County is \$24,756 per year, and the MHI in Searcy County is \$21,397 per year. Based on the latest MHI data, the only county in the State of Arkansas with a lower MHI than Searcy County is Lee County. Unfortunately, the overall MHI for State of Arkansas ranks 48 among the 50 states. The U.S. average MHI is \$43,527 per year compared to the Arkansas Average of \$31,845 per year.
5. Of the twelve (12) alternatives studied, we recommend that the Ozark Mountain Regional Public Water Authority construct a new regional water system to serve the 20 member entities throughout North Central Arkansas. The construction would consist of a new intake structure on Bull Shoals Reservoir, a water treatment facility located west of Diamond City, ductile iron water transmission mains to each entity, water storage tanks, along with master meters, valves, etc.
6. In order for the Ozark Mountain Regional Public Water Authority to keep long term water costs to a minimum, it is recommended that the Authority maintain control over the wholesale water cost by constructing a water treatment facility and producing the potable water required. Alternate "C" is the most cost effective long term water source and energy efficient alternative. The total cost of this alternative is \$64,200,000.
7. The project as proposed is intended to be an area wide solution to the serious water quality and quantity problems these water systems are experiencing. This project will alleviate the problem for those water systems unable to meet the new water quality standards. Also, a significant cost savings will be realized by those systems since

they will not have to finance improvements to their existing treatment systems and since the existing treatment systems can be discontinued.

- 8.** Based on projected water sales, the project can justify a loan of approximately \$19,410,000. The balance of the funds needed could be obtained in grants from various agencies.
- 9.** It is recommended that the Ozark Mountain Regional Public Water Authority seek financing as outlined in this report to construct the facilities to implement a long term water supply for North Central Arkansas.
- 10.** It is critical that funding for this project be pursued and secured as quickly as possible or many of the OMRPWA members may receive enforcement action from the EPA and Arkansas Department of Health.

### **3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES**

This section of the Environmental Report focuses on responses received from government agencies regarding the project. This section describes the areas under construction, the environmental resources affected, and the mitigation required if necessary. The correspondence letters summarized below can be found in Exhibit C.

#### **3.1 Land Use/Important Farmland/Formally Classified Lands**

3.1.1 Affected Environment – The project consists of constructing a water transmission system to serve existing and proposed customers within the counties. A water treatment facility, a booster pumping stations and water storage tanks will be constructed to provide adequate pressure to the proposed member entities. This project will extend from the Bull Shoals Lake paralleling United States Highway 65, United States Highway 62/412, Arkansas Highway 14, Arkansas Highway 123, Arkansas Highway 16, Arkansas Highway 7, Arkansas Highway 333, Arkansas Highway 27, and Arkansas Highway 74. Other roads that are paralleled are Lead Hill Zinc Road, Meeks Creek Road, Manor Road, County Road 24 and County Road 333. Please refer to Exhibit A for a preliminary layout map of the project.

- ADEQ determined perennial streams would be crossed that include the Buffalo River, Crooked Creek, West Sugarloaf Creek, and Bear Creek. The Buffalo River would be crossed in two locations, by attaching the water main to the existing bridges. The other streams would be trench crossings.
- NRCS determined that farmland would be crossed by the transmission lines or the water facilities.
- AGC determined that the geology of the region produces karst terrain that has such features as saves, sinkholes, and springs that can be encountered during construction projects.
- AGFC determined that streams will be crossed and possible karst terrain might be encountered.
- AFC determined that forest resources will be crossed
- ADPT determined that several park lands have been developed in the project region.
- NPS determined that the water lines will cross the Buffalo National River.

3.1.2 Environmental Consequences –Best Management Practices will be implemented during construction of this project, as recommended by several agencies. Specifically, the BMP describes the procedure to be followed if a cave is encountered. If a cave is found within 300 feet of the project area, work will cease in that area and U.S. Fish and Wildlife will be notified immediately.

- ADEQ determined the project will not physically alter a significant

segment of the streams and will not violate the water quality criteria. They recommended Best Management Practices shall be utilized to prevent sedimentation and turbidity. The contractor shall perform all work in low flow conditions if possible and shall provide the ADEQ a stream crossing schedule.

- NRCS determined there would be no adverse impact on formal farmland, as all lines and water facilities appear to be the best and least intrusive route and/or sites. There will be no conversion of any prime or important farmlands as a result of this project.
- AGFC recommended BMPs be used for erosion control and that stream crossings be performed in June, July, and August to avoid spawning periods.
- AFC determined that there will be no long term adverse impacts on the forest resources of the area as provisions are in place to reduce and offset any temporary environmental impacts.
- ADPT requested that any disturbed park property must be restored to its original condition upon construction completion.
- NPS recommended approval of the project and has submitted a Determination of Effect that is included in the Exhibit C.

Mitigation – No mitigation will be needed on this resource, as no prime or important farmland is present. However, Best Management Practices will be implemented for specific land uses during construction of this project, as recommended by several agencies. Best Management Practices are outlined in Exhibit G of this report.

## **3.2 Floodplains**

- 3.2.1 Affected Environment – The project contains some flood plain areas where the water mains cross creeks and streams. The primary streams crossed with this project are Crooked Creek, West Sugarloaf Creek, Bear Creek, Little Buffalo River, and the Buffalo River. The Buffalo River and the Little Buffalo River will be crossed by attaching water mains to the bridge structures. The FEMA Flood Plain Maps for this area of Newton, Searcy, Boone and Marion Counties are shown in Exhibit B.
- 3.2.2 Environmental Consequences – The creek crossings will be constructed during low or no flow, and preferably during the months of July, August or September. The Best Management Practice plan will be implemented throughout this project, with special considerations made to the creek crossings. Section 404 permits from the U.S. Army Corps of Engineers will be required for each creek crossing. A copy of this permit is included in Exhibit C.
- 3.2.3 Mitigation – All water main crossings of the flood plain will be restored to the original shape and contours to reduce any environmental impacts.

### **3.3 Wetlands**

- 3.3.1 Affected Environment – The project crosses Crooked Creek, West Sugarloaf Creek, Bear Creek, Little Buffalo River, and the Buffalo River. There are no hydric soils or wetlands within the project area. The reply letters from the Arkansas Game and Fish Commission and the U. S. Army Corps of Engineers are contained in Exhibit C.
- 3.3.2 Environmental Consequences – There are no known adverse environmental consequences for wetlands due to these improvements. If any wetland areas are found to be present, they will be avoided.
- 3.3.3 Mitigation – Under Section 404 of the Clean Water Act, a permit is required from the U.S. Army Corps of Engineers for any construction activity that affects or crosses “waters of the United States”. A copy of the permit is included in Exhibit C.

### **3.4 Historical Properties**

- 3.4.1 Affected Environment – The State Historic Preservation Officer (SHPO) has been contacted regarding this project. The report by Weaver & Associates is contained in Exhibit C, which indicates 20 of the 47 known archeological sites are outside the Area of Potential Effect. The reply letter is also contained in Exhibit C indicates 16 known historic sites that are located in close proximity to the proposed project area.
- 3.4.2 Environmental Consequences – There are no known adverse environmental consequences for cultural resources due to these improvements. However, a professional archeologist will monitor site 3SE265 during construction, which is a 19<sup>th</sup> century gravesite. A qualified archeologist will be retained to monitor all earthmoving activities at this site during the construction of the waterline. If the gravesite is encountered, all work will be stopped in the area and the grave will be removed and reinterred in accordance with state law. Construction in some locations will be limited to within existing right-of-way corridors.
- 3.4.3 Mitigation – As requested by SHPO, a cultural resources survey of portions of the project where slope gradients are less than or equal to 12% was conducted to determine the presence of additional unrecorded sites. The results of this survey are included in Exhibit C.

Mitigation will be established, if necessary, to avoid impacting significant historical sites, should any be encountered. If cultural materials are encountered during construction, work will cease in the immediate area. Notification will be made to the State Historical Preservation Officer and the Rural Development State Environmental Coordinator. Work in the

area of the finding will not commence until authorization by the above agencies.

### 3.5 Biological Resources

- 3.5.1 Affected Environment – There are no known impacts of the project to the biological resources in this project area.
- 3.5.2 Environmental Consequences – It is anticipated that the project will not have a significant impact on threatened or endangered species or their habitat. However, several endangered and threatened species are known to be present in Project Counties. The endangered species are: Gray Bat (*Myotis grisescens*), Indiana Bat (*Myotis sodalis*), Ozark Big-eared Bat (*Corynorhinus townsendii ingens*), Pink Mucket (*Lampsilis abrupta*), and Scaleshell (*Leptodea leptodon*). The American Bald Eagle (*Haliaeetus leucocephalus*) is a threatened species found in the Project Counties. The project should not adversely affect these species, since the Contractor will utilize a Best Management Practice plan and follow suggestions by the U.S. Fish and Wildlife Service. Specifically, the BMP describes that if a cave is found within 300 feet of the project area, work will cease in that area and U.S. Fish and Wildlife will be notified immediately. The BMPs are outlined in Exhibit G of this report.

The Department of Arkansas Heritage expressed concern for the following sites:

<b>Type of Elements</b>	<b>T/R/S</b>	<b>Comments</b>
Plant	T15N/R16W/S18	East bank of ditch on Hwy 65
Animals	T15N/R19W/S06	Buffalo National River
Animals	T16N/R19W/S36	Buffalo National River
Animal	T16N/R19W/S04	Spring at Yardelle
Animal	T16N/R21W/S26	Little Buffalo River
Plant & Animal	T15N/R16W/S20	Bluffs along east side of Hwy. 65
Animal	T15N/R16W/S28	Bluffs along east side of Hwy. 65
Plant	T15N/R21W/S02	Roadside, Hwy. 7 (West side)
Plant	T15N/R21W/S11	Roadside, Hwy. 7 (West side)
Plant	T20N/R18W/S05	Roadside
Plants in glade community	T20N/R18W/S09	0.2 miles east of jct. Hwy. 14 & Hwy 7 (North side of Hwy. 14)
Plant	T20N/R18W/S28	Roadside, Lead Hill-zinc Road (West side)
Plants in glade community	T21N/R18/S20	Jct. 7 & Sunset Drive, Jct. Cedar & Short Street
Plants in glade community	T21N/R18W/S29	East side of Hwy. 7
Plants in glade community	T21N/R19W/S26	North side of road

Also, the Arkansas Natural Heritage Commission has the following special conditions regarding glade species within the proposed project area:

*“Glades often support rare plant species, including the federally threatened plant, Missouri Bladderpod (Lesquerella filiformis). Where possible efforts should be made to avoid and limit impact to glade habitat. Work should be kept as narrow as possible, and glades should not be used to stage materials or park equipment.”*

The process of addressing glades is presented in the Best Management Practices attached in Exhibit G.

- 3.5.3 Mitigation – Proper mitigating measures will be taken during construction as recommended by the U.S. Fish and Wildlife Service and the Arkansas Natural Heritage Commission. Provisions will be taken regarding common construction procedures and restoration of the project areas. The contractor will restore all disturbed areas to existing conditions, and measures will be taken to avoid soil erosion, degradation, and siltation into adjacent waters. Wherever necessary, the disturbed area will be terraced to prevent soil erosion and runoff. Slopes will be restored to original grades and will be stabilized by over-seeding, matting, and diversion of runoff to deter erosion.

If a cave, sinkhole, losing stream, or spring is found within the project area, a buffer zone of 300 feet will be established around the feature and the Service will be contacted. This project will utilize the Best Management Practice plan (BMP) as recommended by the above agency. Copies of the reply letters from the U.S. Army Corps of Engineers, Arkansas Natural Heritage Commission, Arkansas Game and Fish Commission, Arkansas Natural Resources Commission, and the U.S. Fish and Wildlife Service are shown in Exhibit C.

## 3.6 **Water Quality Issues**

- 3.6.1 Affected Environment – Construction of the proposed improvements and extensions will not result in any discharge into streams that will affect water quality in the area. Construction measures will be taken to avoid soil erosion, degradation, and siltation into adjacent waters to prevent adverse impact to water quality in creeks. A letter from the Arkansas Department of Environmental Quality (ADEQ) is included in Exhibit C. In accordance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, a permit is required from the U.S. Army Corps of Engineers for construction of the intake structure and for all stream crossings. A copy of the permit from the Corps is included in Exhibit C of this report.



- 3.6.2 Environmental Consequences – Construction of the proposed project will not have a significant impact to water quality in the area with regards to groundwater, creeks, and streams. The Owner will be required to submit a Storm Water Pollution Prevention Plan to ADEQ for approval before construction begins.
- 3.6.3 Mitigation – According to the letter from ADEQ, it will be necessary to implement Best Management Practices to reduce turbidity impacts to streams. A Storm Water Pollution Prevention Plan will be submitted to AEDQ and a construction permit will be obtained. The Authority has already received a Section 10 and Section 404 permit from the U.S. Army Corps of Engineers which is included in Exhibit C of this report.

### 3.7 Coastal Resources

- 3.7.1 Affected Environment – The project is not located in a coastal area.
- 3.7.2 Environmental Consequences – There are no environmental consequences for the project concerning coastal resources.
- 3.7.3 Mitigation – There are no mitigation measures for the proposed project regarding coastal resources.

### 3.8 Socio-Economic / Environmental Justice Issues

- 3.8.1 Affected Environment – The Cities and Counties will benefit from the proposed improvements by having a clean and safe drinking water supply. These improvements will allow economic development to occur in an area where economic development has been stagnant.
- 3.8.2 Environmental Consequences – The proposed project will not result in any adverse environmental effects to minorities or low-income population. There is no known civil rights impact due to this project.
- 3.8.3 Mitigation – There are no mitigation measures for the proposed project regarding environmental justice issues.

### 3.9 Miscellaneous Issues

#### 3.9.1 Transportation

- 3.9.1.1 Affected Environment – The major transportation routes within the project area are provided by United States Highway 62/412 and Highway 65, and Arkansas State Highways 14, 123, 16, 7, 333, 27, and 74. Other county roads also provide transportation into the

area. In areas where the lines cross U.S. or State Highways, permits will be obtained from the Arkansas Highway and Transportation Department (AHTD). Standard requirements of the AHTD will be met.

3.9.1.2 Environmental Consequences – No changes or modifications of traffic patterns will arise as a result of the improvements made. No existing capacities of the transportation facilities in the area will be exceeded as a result of this project.

3.9.1.3 Mitigation – There are no mitigation measures for the proposed project regarding transportation in the area.

### **3.9.2 Air Quality**

3.9.2.1 Affected Environment – The Project counties are unclassified in the National Ambient Air Quality Standards for all six criteria air pollutants and therefore general conformity does not apply.

3.9.2.2 Environmental Consequences – The only air emissions with this project will be from the machinery used during the actual construction of this project and dust produced during construction activities. The quantity of such emissions and dust will be minimal and will not significantly impact air quality in the project area.

3.9.2.3 Mitigation – There are no mitigation measures for the proposed project regarding air quality issues.

### **3.9.3 Solid Waste Management**

3.9.3.1 Affected Environment – There will be no additional solid waste continuously generated by this project.

3.9.3.2 Environmental Consequences – There are no known environmental consequences for solid waste disposal.

3.9.3.3 Mitigation – There are no mitigating measures proposed for the project regarding solid waste issues.

### **3.9.4 Noise**

3.9.4.1 Affected Environment – The proposed project will not create any additional noise, with the exception of the noise created during construction. This noise will be temporary and confined to limited areas.

3.9.4.2 Environmental Consequences – There are no known environmental consequences for noise.

3.9.4.3 Mitigation – There are no mitigating measures proposed for the project regarding noise.

#### 4.0 Summary of Mitigation

Some mitigating measures are necessary for this project regarding environmental resources in the area. A full-time resident inspector will be at the construction site to ensure construction plans and the Contractor will follow mitigating measures. The OMRPWA will also be actively involved with construction of this project. The engineer to ensure that adverse environmental impacts associated with this project do not occur will provide periodic inspections. The following is a summary of the mitigation measures required for this project:

<b>Environmental Mitigation Summary</b>		
<b><u>SECTION</u></b>	<b><u>ENVIRONMENTAL RESOURCE</u></b>	<b><u>MITIGATION MEASURES REPORTED</u></b>
3.1	Land Use	None
3.2	Flood Plains	Flood plain will be restored to the original shape and contours.
3.3	Wetlands	Avoid wetland areas.
3.4	Cultural Resources	A cultural resources survey was obtained. If cultural materials are encountered during construction, work will cease in the immediate area. Notification will be made to the State Historical Preservation Officer. Site 3SE265 will be monitored by a professional archeologist.
3.5	Biological Resources	Stop work if cave is found within 300 ft. of project area. Notify U.S. Fish and Wildlife Services immediately. Utilize BMP's as required. An alternative route may be utilized to avoid caves.
3.6	Water Quality	Implement BMP's as required. Owner shall submit a Storm Water Pollution Prevention Plan to ADEQ. A Section 10 and 404 permit from the U.S. Army Corps of Engineers has been obtained and is included in this report.
3.7	Coastal Resources	None
3.8	Socio-Economic/Environmental Justice	None
3.9	Miscellaneous Items	None

## 5.0 Correspondence

Various federal and state agencies were contacted to review and comment on potential environmental impacts that the proposed project may have on resources in the area. The list below indicates the agency contacted and additional measures required.

<b>AGENCY</b>	<b>ADDITIONAL MEASURES REQUIRED</b>
USDA Natural Resources Conservation Service	None
U.S. Army Corp of Engineers	See 6.0 Exhibit C
Arkansas Historical Preservation Program	See 6.0 Exhibit C
Arkansas Natural Resources Commission	See 6.0 Exhibit C
U.S. Forest Service	None
U.S. Fish and Wildlife Service	See 6.0 Exhibit C
Federal Emergency Management Agency	None
Arkansas Department of Health	None
Northwest Arkansas Planning and Development District	None
State Clearinghouse	None
Arkansas Department of Environmental Quality	See 6.0 Exhibit C
Arkansas Geological Commission	None
Arkansas Game and Fish Commission	See 6.0 Exhibit C
Arkansas Highway and Transportation Department	See 6.0 Exhibit C
Arkansas Department of Parks and Tourism	None

All correspondence has been included in Exhibit C.

## **6.0 Exhibits**

The exhibits included in this section are as follows:

- A. Preliminary Layout Map
- B. Topographic Maps, County Road Maps, Soil Survey Maps, FEMA Flood Plain Maps
- C. Comment Letter from State and Federal Agencies
- D. Letters of Support
- E. Civil Rights Impact Analysis
- F. Demographic Characteristics of Newton, Searcy, Boone, and Marion County
- G. Best Management Practices

## 7.0 List of Preparers

The list below indicates the companies and people involved in preparing this document:

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***EXHIBIT G***

**BEST MANAGEMENT PRACTICES**

*ENVIRONMENTAL REPORT  
AMENDMENT NO. 1*

*FOR*

***OZARK MOUNTAIN REGIONAL  
PUBLIC WATER AUTHORITY***

*TO SERVE*

***NORTH CENTRAL ARKANSAS***

*AUGUST 2009*

Prepared In Accordance With:  
*RUS Bulletin 1794A-602  
March 2008  
Version 1.2*

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	C. Comment Letters from State and Federal Agencies (Additional)	
	AA. Advertisement of Environmental Assessment and Response Letter	
	BB. Summary Report for Biological Evaluation Field Survey	
	CC. Biological Evaluation Report	

## INTRODUCTION TO AMENDMENT NO. 1

This Amendment to the Environmental Report (originally dated January 2008 and revised June 2009) is presented to provide clarification or to revise items from the aforementioned report in response to comments provided to this office by USDA Rural Development on July 17, 2009.

Below are the six (6) comments from the USDA Rural Development in italics with responses in normal text. The following changes or additions have been made:

- Comment:** *The Sections on pp. 1-2 through 1-4, starting with the paragraph entitled “25 Years of Effort” should be deleted.*

**Response:** A revised Section 1.1 has been included in this Amendment with the referenced section removed.
- Comment:** *The Conclusions and Recommendations under Section 2.0 re-state elements and of the purpose and need, are irrelevant to the environmental and alternatives analysis, or are inappropriate. The entire section should be deleted. The last full paragraph on page 2-3 is sufficient to summarize the alternatives analysis.*

**Response:** A revised Section 2.0 has been included in this Amendment with the referenced section removed. A revised financial analysis is also included.
- Comment:** *On page 3-1, it is stated that the Arkansas Forestry Commission determined that the Ozark National Forest will be crossed. The AFC letter in Exhibit C, Section M, says nothing about this and in any case the AFC would not have jurisdiction over USFS land. Correspondence from the USFS from the Ozark, NF, Big Piney Ranger District refers to permit issuance pending environmental review. Please clarify when the Ozark NF would issue the permit and whether its issuance is dependent on the adequacy of our environmental assessment.*

**Response:** A revised Section 3.1 has been included and removes National Forest comment attributed to the Arkansas Forestry Commission. Mitigation required by the U.S. Forest Service includes preparation of a biological (including botanical) study of the project. The U.S. Forest Service provides this study. However, due to a project backlog, the Ozark Regional Public Water Authority retained a private company to perform the field study which is attached as Exhibit BB. The U.S. Forest Service then prepared their Biological Evaluation which is attached as Exhibit CC. After concurrence from the U.S. Fish and Wildlife Service, the U.S. Forest Service will complete a separate analysis based on these reports plus the Environmental Report which includes a public comment period. They estimate that this could be completed in 90 to 120 days. Once this analysis is completed, a permit can be issued. Also, no herbicides will be used on Forest Service land. A mist net survey is required for Indiana Bats before any timber is cut down unless construction activities are implemented between December 1<sup>st</sup> and March 15<sup>th</sup>. Section 3.5.3 has been revised to include these mitigations. A copy of the letter from the U.S. Forest Service (dated August 19, 2009) is included in the Amended Exhibit C. A revised Section 4.0, Summary of Mitigation, is also included in this Amendment.

4. **Comment:** *It does not appear that consultation under NHPA S. 106 has been concluded. RUS has not made a finding to the SHPO, and no tribes were consulted.*  
**Response:** An additional mitigation to be added to Section 3.4.3 has been included in this Amendment. Responses from the Quapaw Tribe and the Osage Nation are included in the amended Exhibit C. A revised Section 4.0, Summary of Mitigation, is also included in this Amendment.
  
5. **Comment:** *Section 3.6.3 states that “The system (OMRPWA) will obtain a water allocation report from the Corps of Engineers and a water allocation agreement prior to beginning construction.” This statement needs more detail and supporting information. What is the time frame for completion of the report and issuance of the agreement?*  
**Response:** The Authority is working to secure water allocation from Bull Shoals Reservoir for the purpose of providing drinking water to member entities on or before August 2010. The U.S. Army Corps of Engineers has provided a letter showing a timeline that includes approving the “Water Storage Agreement” by August 2, 2010. The mitigation section of Water Quality Issues (Section 3.6.3) has been amended.
  
6. **Comment:** *Concurrence from the U.S. Fish and Wildlife Service on threatened and endangered species is 3 years old and needs to be verified/updated.*  
**Response:** U.S. Fish and Wildlife verifies in a letter dated July 21, 2009 that they have no additional concerns to add to their previous comments already included in the Environmental Report. A copy of that letter is attached to this Amendment. However, they have requested adaptation of new Best Management Practices (BMP’s) being developed by the Service for the Natural Gas Pipeline and Maintenance Activities in the Fayetteville Shale Area. This is added as a mitigation to Section 3.5.3 and a revised Section 4.0, Summary of Mitigation.

#### **ADDITIONAL REVISIONS/ADDITIONS TO ORIGINAL ENVIRONMENTAL REPORT**

1. The environmental assessment was advertised three times in the Harrison Daily Times (July 7-9, 2009). The only response was from Michael and Elba Cotignola (in a letter dated July 15, 2009). Both their letter and a response from Engineering Services, Inc. (dated July 28, 2009) are included in Exhibit AA.
  
2. The Preliminary Engineering Report has been amended (August 2009) reducing the capacity of the water treatment plant from 6 million gallons per day to 4.5 million gallons per day. All references in the Environmental Report should be considered revised to match.

## 1.0 PURPOSE AND NEED OF THE PROPOSAL

*DELETE SECTION 1.1 AND REPLACE WITH THE FOLLOWING REVISED SECTION:*

### 1.1 Project Description (Proposed Action)

The Ozark Mountain Regional Public Water Authority (OMRPWA) was formed in 2004 to assist small cities, communities, and rural water systems in North Central Arkansas secure a safe and dependable long term water supply for over 21,500 persons. OMRPWA has been working extremely hard since April of 2004 in trying to obtain and develop a long term regional water supply for Newton County, Searcy County, and portions of Boone, Marion, Johnson, and Pope Counties. A collaborative effort on behalf of the member water systems to formulate a long-term water source plan that will best serve the region made sense since a number of member water systems share common water quality and quantity problems, and the fact that the individual evaluation of water sources for each public water system would be prohibitively expensive. The public water systems that are currently members of the OMRPWA are listed below:

#### NEWTON COUNTY

- City of Jasper
- Mt. Sherman Water Association
- Nail-Swain Water Association
- East Newton County Water Association
- Mockingbird Hill Water Association
- Deer Community Water Association
- Lurton-Pelsor Water Association
- Town of Western Grove
- Parthenon Water Association

#### BOONE COUNTY

- Town of Valley Springs
- Town of Diamond City
- Town of Lead Hill
- Lake Bull Shoals Estates

#### SEARCY COUNTY

- SP&G Water Association  
*(St. Joe, Pindall & Gilbert)*
- City of Marshall
- South Mountain Water Association
- SDM Water Association  
*(Snowball, Dongola & Marsena)*
- Town of Leslie
- Morning Star Water Association

#### MEMBERS AT LARGE

- Buffalo River (National Park Service)

Engineering Services, Inc. (ESI) was contracted by OMRPWA to conduct a detailed feasibility study and make recommendations on a long-term water source for the region. After an intensive evaluation of water sources and transmission alternatives, construction of a new regional water system to serve the 20 member entities was recommended. The system will need to provide approximately 4.5 million gallons per day to the region in order to meet current water consumption as well as expected future growth. The current project includes leaving the Buffalo River drainage basin and constructing the following:

- Construct a water intake structure on Bull Shoals Lake;
- Construct a 4.5 million gallon per day water treatment facility to be located near Diamond City, Arkansas;
- Install ductile iron transmission lines connecting the intake structure and treatment facility to the OMRPWA member systems;
- Construct water storage tanks, which will supply water by gravity flow to each bulk customer; and
- Construct booster pumping stations and install pressure reducing valves in order to serve the mountainous regions.

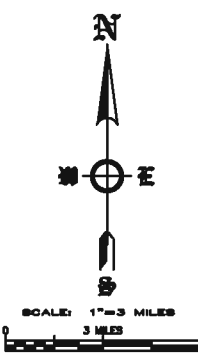
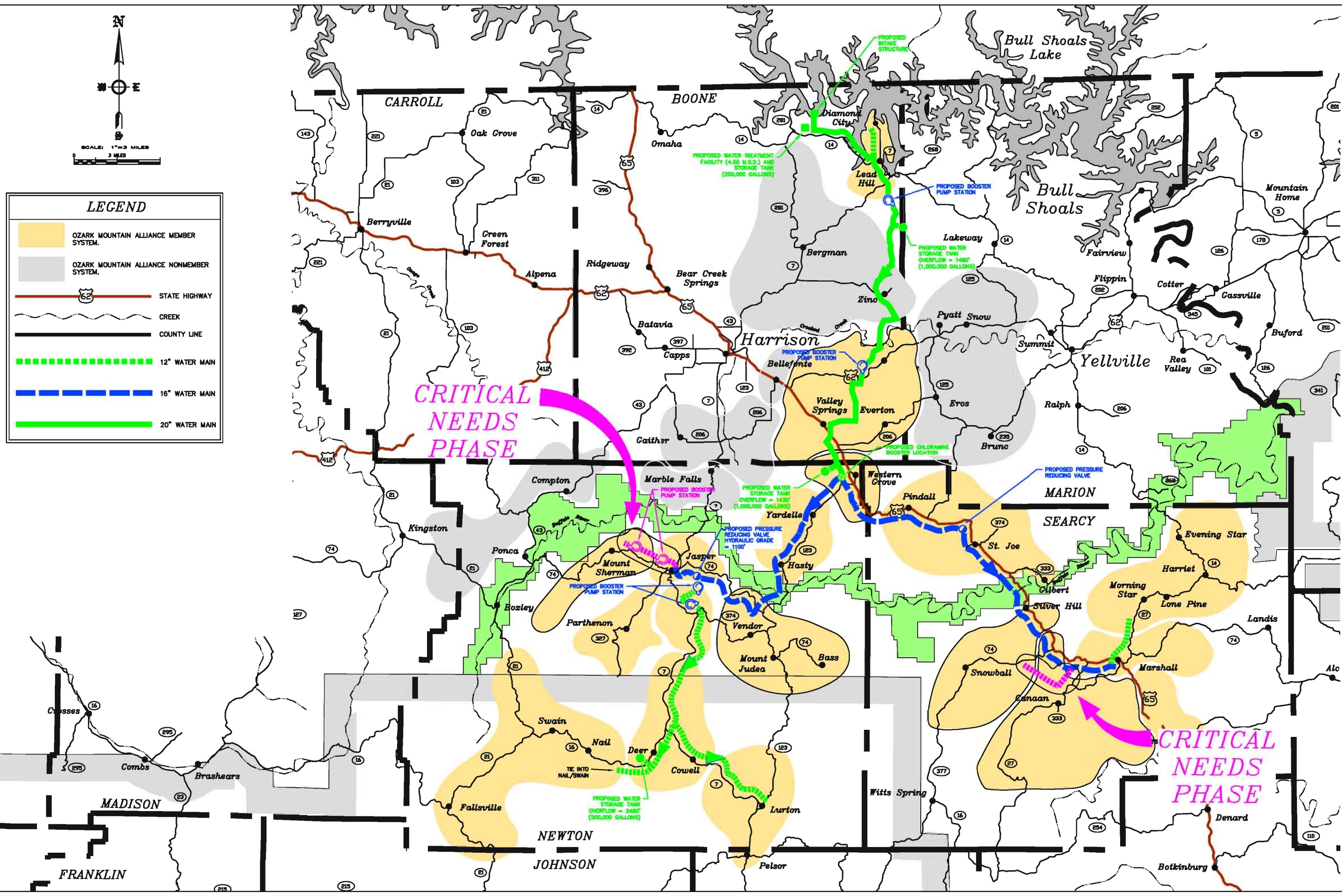
A vicinity map showing the project area can be found on the following page.

*Remaining text from Section 1.1 from original Environmental Report deleted.*



REVISION	DATE	DESCRIPTION

DATE: APR. 2009  
 DRAWN BY: \_\_\_\_\_  
 W.O. # 04807



**LEGEND**

- OZARK MOUNTAIN ALLIANCE MEMBER SYSTEM.
- OZARK MOUNTAIN ALLIANCE NONMEMBER SYSTEM.
- STATE HIGHWAY
- CREEK
- COUNTY LINE
- 12" WATER MAIN
- 16" WATER MAIN
- 20" WATER MAIN



DELETE SECTION 2.0 AND REPLACE WITH FOLLOWING REVISED SECTION:

## 2.0 ALTERNATIVES TO THE PROPOSED ACTION

There were several alternatives considered to provide safe and plentiful water for the Ozark Mountain Regional Public Water Authority. The Ozark Mountain Regional Public Water Authority will have three (3) basic options:

1. Purchase treated water from one or more wholesale water providers;
2. Construct the OMRPWA's own surface water treatment facilities; or
3. A combination of purchasing water from a wholesale provider and constructing the OMRPWA's own treatment facilities.

Several important factors must be considered in evaluating alternatives to provide a long term water source for the region. Some of these factors include:

1. Capacity of water supply;
2. Quality of water supply;
3. Location of water supply;
4. Pumping requirements;
5. Capacity of existing water treatment facilities;
6. Cost of water from wholesale providers;
7. Cost to treat and distribute water from a new water treatment facility; and
8. Capital costs required to implement the alternative.

We have evaluated twelve (12) alternatives for implementing a long term regional water supply for the Authority. The Preliminary Engineering Report further details the alternatives considered. A list of each alternative with brief description follows:

<u>ALTERNATIVE</u>	<u>DESCRIPTION OF ALTERNATIVE</u>
A	<b>Marion County Regional Water District (Purchase Water)</b> <i>Upgrade existing water treatment facilities, water transmission mains, and water storage capacity. Construct water transmission mains to serve OMRPWA Members (via Hwy 412 &amp; 65).</i>
B	<b>Carroll-Boone Regional Water District (Purchase Water)</b> <b>Construct Water Treatment Facility on Bull Shoals Lake</b> <i>Construct water treatment facilities on Bull Shoals Reservoir and connect to the Carroll - Boone Water District to purchase a supplemental supply. Construct water transmission mains to serve OMRPWA Members.</i>
C	<b>Construct Water Treatment Facility on Bull Shoals Lake</b> <i>Construct water treatment facilities on Bull Shoals Reservoir and construct water transmission mains to serve OMRPWA Members.</i>
D	<b>Construct Water Treatment Facility on Greers Ferry Lake</b> <b>Construct Water Treatment Facility on Bull Shoals Lake</b> <i>Construct 2 water treatment facilities, one on Greers Ferry Lake to serve Searcy County and one on Bull Shoals Reservoir to serve Newton and Boone Counties. Construct water transmission mains to serve OMRPWA Members.</i>

**ALTERNATIVE    DESCRIPTION OF ALTERNATIVE**

- E            Clinton Water System (Purchase Water)  
Carroll-Boone Regional Water District (Purchase Water)**  
*Connect to the Clinton Water System and provide treated water to Searcy County via a water transmission main. Connect to Carroll - Boone Water District and provide treated water to Newton and Boone County via a water transmission mains.*
- F            Construct Water Treatment Facility on Norfolk Lake**  
*Construct water treatment facilities on Norfolk and construct water transmission mains to serve OMRPWA Members.*
- G            Marion County Regional Water District (Purchase Water)**  
*Upgrade existing water treatment facilities, water transmission mains, and water storage capacity. Construct water transmission mains to serve OMRPWA Members (via Highway 14 to Searcy County and via Highway 412 & 65 to Newton County).*
- H            City of Clarksville (Purchase Water)**  
*Connect to the Clarksville Water System and provide treated water to OMRPWA members via water transmission mains.*
- I            City of Russellville (Purchase Water)**  
*Connect to the Russellville Water System and provide treated water to OMRPWA members via water transmission mains.*
- J            Marion County Regional Water District (Purchase Water)  
Carroll-Boone Regional Water District (Purchase Water)**  
*Increase the capacity of the water treatment facilities and perform water transmission mains upgrades to the Marion County District. Also, connect to the Carroll - Boone Water District for a supplemental water supply. Construct water transmission mains to serve OMRPWA Members.*
- K            City of Clarksville (Purchase Water)  
Construct Water Treatment Facility on Bull Shoals Lake**  
*Connect to the Clarksville Water System and provide treated water to OMRPWA members via south of the Buffalo National River. Also, construct water treatment facilities on Bull Shoals Reservoir and serve OMRPWA members north of the Buffalo National River.*
- L            City of Russellville (Purchase Water)  
Construct Water Treatment Facility on Bull Shoals Lake**  
*Connect to the Russellville Water System and provide treated water to OMRPWA members via south of the Buffalo National River. Also, construct water treatment facilities on Bull Shoals Reservoir and serve OMRPWA members north of the Buffalo National River.*

### Surface Water Sources Considered

Each of the alternatives described in the previous section was analyzed for water quality, water quantity and capacity, reliability, and environmental impact. The final step in the selection process is to compare the economic impact of constructing the water system for the Ozark Regional Public Water Authority. These include the capital costs and the total present worth costs associated with each alternative. The present worth analysis takes into account capital costs, operation and maintenance, wholesale water costs, and salvage value. All values are based on current market prices.

### Alternative Selected

After careful review of the economic analysis for all alternatives, it is evident that production of the treated water has a tremendous long term advantage over purchasing treated water from existing bulk wholesalers. Therefore, in order for the OMRPWA to keep long term rates to a minimum, it is in the best interest for the Authority to construct a water treatment facility and produce drinking water for its member entities. This long term savings is most evident when evaluating the five (5) alternatives with the lowest capital cost and comparing them with the 20 year and 30 year present worth costs, as shown below:

<u>Alternative</u>	<u>Capital Cost</u>	<u>Present Worth Value</u>	
		<u>20 Yr</u>	<u>30 Yr</u>
“B” (Bull Shoals WTP/Buy from Carroll-Boone)	\$ 66,832,228	\$ 63,104,919	\$ 79,789,050
<b>“C” (Construct Bull Shoals WTP)</b>	<b>\$ 62,995,000</b>	<b>\$ 57,378,418</b>	<b>\$ 70,114,833</b>
“E” (Buy from Clinton/Carroll-Boone)	\$ 62,577,373	\$ 70,865,092	\$ 88,674,720
“T” (Purchase from City of Russellville)	\$ 67,177,460	\$ 68,606,558	\$ 84,618,806
“J” (Buy from MCRWD / Carroll-Boone)	\$ 62,973,818	\$ 74,634,629	\$ 91,432,719

Based our evaluation of the 12 alternatives, Alternate “C” (Construct WTP on Bull Shoals) is the most cost effective for the OMRPWA. It is our recommendation that the Authority proceed with constructing an intake structure and water treatment facility on Bull Shoals Lake near Lead Hill. The treated water would then be delivered via water transmission mains, booster stations, and water storage tanks to all members of the OMRPWA.

Again, the engineering design information is discussed more in-depth in the Preliminary Engineering Report.

*“Conclusions and Recommendations” section from original Environmental Report is deleted.*

### 3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

*THE FOLLOWING ADDITIONS OR REVISIONS SHOULD BE MADE:*

*DELETE SECTION 3.1 AND REPLACE WITH THE FOLLOWING REVISED SECTION:*

#### **3.1 Land Use/Important Farmland/Formally Classified Lands**

3.1.1. Affected Environment – The project consists of constructing a water transmission system to serve existing and proposed customers within the counties. A water treatment facility, a booster pumping stations and water storage tanks will be constructed to provide adequate pressure to the proposed member entities. This project will extend from the Bull Shoals Lake paralleling and/or crossing United States Highway 65, United States Highway 62/412, Arkansas Highway 123, Arkansas Highway 16, Arkansas Highway 7, Arkansas Highway 27, and Arkansas Highway 74. Other roads that are paralleled are Lead Hill Zinc Road, Meeks Creek Road, Manor Road, County Road 24 and County Road 333. Overall the project will affect approximately 450 acres of land mostly along the narrow linear route of the water transmission main. Please refer to Exhibit A for a preliminary layout map of the project.

- The Natural Resources Conservation Service determined that farmland would be crossed but no important farmland would be converted as a result of the construction of the transmission lines or the water treatment and storage facilities.
- The U.S. Forest Service is reviewing existing cultural and biological studies provided and will complete their own public comment period and NEPA analysis. Approximately 3.2 miles of water transmission mains are proposed to cross the Ozark National Forest. The U.S. Forest Service expects to issue the construction permit within 90 to 120 days. (Also refer to Biological Resources – Section 3.5)
- The Arkansas Department of Parks and Tourism determined that several park lands have been developed in the project region.
- The National Parks Service determined that the water lines will cross the Buffalo National River. The Buffalo River would be crossed in two locations by attaching the water main to existing vehicular bridges.

3.1.2. Environmental Consequences –Best Management Practices will be implemented during construction of this project, as recommended by several agencies.

- The Natural Resources Conservation Service determined there would be no adverse impact on important farmland, as all lines and water facilities appear to be the best and least intrusive route and/or sites. There will be no conversion of any prime or important farmlands as a result of this project.



- The Arkansas Forestry Commission determined that there will be no long term adverse impacts on the forest resources of the area as provisions are in place to reduce and offset any temporary environmental impacts.
- The U.S. Forest Service will complete its public comment period and conduct review of cultural and biological information provided in this report. The U.S. Forest Service expects to issue the construction permit within 90 to 120 days. (Also refer to Biological Resources – Section 3.5)
- The Arkansas Department of Parks and Tourism requested that any disturbed park property must be restored to its original condition upon construction completion.
- NPS recommended approval of the project and has submitted a Determination of Effect that is included in Exhibit C of the original Environmental Report.

3.1.3 Mitigation –No further mitigation will be needed on this resource with regards to prime or important farmland as none are present. However, Best Management Practices will be implemented for specific land uses during construction of this project, as recommended by several agencies. Best Management Practices are outlined in Exhibit G of the original Environmental Report.

Also, the U.S. Forest Service has issued a letter stating that they will be reviewing existing cultural and biological information in the report, and they will complete their own NEPA analysis and public comment period. Issuance of the permit is expected in 90 to 120 days. Other mitigation includes mist netting for Indiana Bats unless construction activities in specific areas are conducted between December 1<sup>st</sup> and March 15<sup>th</sup>. The Biological Evaluation is also being forwarded to the U.S. Fish and Wildlife for concurrence. No herbicides or pesticides can be used on U.S. Forest Service lands. Please refer to Section 3.5 – Biological Resources.

### **3.4 Historic (or Cultural) Properties**

*Add the Following to Section 3.4.3 to Mitigation:*

3.4.3 The USDA Rural Development State Office contacted Native American tribes potentially affected by the project (Quapaw Tribe and Osage Nation). Responses from the Quapaw Tribe and the Osage Nation are included in the amended Exhibit C. The Osage Nation requests that construction operations cease and the Osage Nation Historic Preservation Office be contacted if human remains are encountered.

### **3.5 Biological Resources**

*Add the Following to Section 3.5.3 to Mitigation:*

- 3.5.3 U.S. Fish and Wildlife verifies in a letter dated July 21, 2009 that they have no additional concerns to add to their previous comments already included in the environmental report. A copy of that letter is attached in an amendment to Exhibit C. However, they have requested adaptation of new Best Management Practices (BMP's) being developed by the Service for the Natural Gas Pipeline and Maintenance Activities in the Fayetteville Shale Area. The U.S. Forest Service required a private consultant Biological Study, which is attached as Exhibit BB. The U.S. Forest Service concurred with the Biological Study then prepared their Biological Evaluation which is attached as Exhibit CC. The U.S. Forest Service will complete a separate NEPA analysis based on these reports plus the Environmental Report which includes a public comment period. They estimate that this could be completed in 90 to 120 days. Once this analysis is completed, a permit can be issued. Also, no herbicides will be used on Forest Service land. A mist net survey is required for Indiana Bats before any timber is cut down unless construction activities are implemented between December 1<sup>st</sup> and March 15<sup>th</sup>. A copy of their letter is included in the Amended Exhibit C.

### **3.6 Water Quality Issues**

*Add the Following to Section 3.6.3 to Mitigation:*

- 3.6.3 The Authority is working to secure water allocation from Bull Shoals Reservoir for the purpose of providing potable drinking water to member entities on or before August 2010. Two public meetings were held in Diamond City and Bull Shoals, respectively. Over 100 people were in attendance. There were no adverse comments received at these meeting opposing the project.

The U.S. Army Corps of Engineer's provided a letter dated August 24, 2009, detailing the schedule that is being implemented in order to obtain the water allocation from Bull Shoals Reservoir by August 2, 2010.



*DELETE SECTION 4.0 AND REPLACE WITH THE FOLLOWING REVISED SECTION:*

**4.0 Summary of Mitigation**

Some mitigating measures are necessary for this project regarding environmental resources in the area. A full-time resident inspector will be at the construction site to ensure construction plans and the Contractor will follow mitigating measures. The OMRPWA will also be actively involved with construction of this project. The engineer to ensure that adverse environmental impacts associated with this project do not occur will provide periodic inspections. The following is a summary of the mitigation measures required for this project:

<b>Environmental Mitigation Summary</b>		
<b><u>SECTION</u></b>	<b><u>ENVIRONMENTAL RESOURCE</u></b>	<b><u>MITIGATION MEASURES REPORTED</u></b>
3.1	Land Use	Best Management Practices. Restore land to original grade and condition. A permit to cross U.S. National Forest Service is expected to be obtained within 90 to 120 days. Also refer to U.S. Forest Service mitigation within Section 3.5 - Biological Resources.
3.2	Flood Plains	Flood plain will be restored to the original shape and contours. Section 404 (stream crossings) and Section 10 (intake structure) permits obtained from the Corps of Engineers.
3.3	Wetlands	Avoid wetland areas.
3.4	Cultural Resources	A cultural resources survey was obtained. If cultural materials are encountered during construction, work will cease in the immediate area. Notification will be made to the State Historical Preservation Officer (SHPO). Site 3SE265 will be monitored by a professional archeologist. Water transmission main will be routed to avoid identified known historic sites either to across road or into existing disturbed corridors. Work will cease and the Osage Nation Historic Preservation Office and the State Historical Preservation Officer will be contacted if human remains are found.

3.5	Biological Resources	<p>Stop work if cave is found within 300 ft. of project area. Notify U.S. Fish and Wildlife Services immediately. Utilize BMP's as required. An alternative route may be utilized to avoid caves. Cofferdams (or other flow diversion techniques) utilized to protect streams. Restore land to original grade and condition. Avoid glades and do not use for storage or to stage equipment. Adaptation of new BMP's developed by the Service for the Natural Gas Pipeline and Maintenance Activities in the Fayetteville Shale Area requested by U.S. Fish and Wildlife. On U.S. Forest Service land, mist net surveys for Indiana Bats are required before any timber is cut down unless construction is implemented between December 1<sup>st</sup> and March 15<sup>th</sup>. No herbicides are permitted on U.S. Forest land.</p>
3.6	Water Quality	<p>Implement BMP's as required. Owner shall submit a Storm Water Pollution Prevention Plan to ADEQ. A Section 10 and 404 permit from the U.S. Army Corps of Engineers has been obtained and is included in this report. Attach water line to bridge across Buffalo National River. Restore trench line to original grade and condition. Work closely with the U.S. Army Corps of Engineer's to obtain water allocation from Bull Shoals Reservoir before August 2, 2010.</p>
3.7	Coastal Resources	None
3.8	Socio-Economic/Environmental Justice	None
3.9	Miscellaneous Items	None

## 6. Exhibits

*The following exhibits have been revised as follows for this Amendment:*

Amended Exhibit C: Comment Letters from State and Federal Agencies

*Add USDA Letter to Quapaw Tribe Dated July 23, 2009 and Follow Up Dated August 11, 2009*

*Add Response from Quapaw Tribe Dated August 11, 2009*

*Add USDA Letter to Osage Nation Dated July 23, 2009 and Follow Up Dated August 11, 2009*

*Add Letter from Osage Nation Dated August 14, 2009*

*Add Letter from U.S. Fish and Wildlife Dated July 21, 2009*

*Add Letter from U.S. Forest Service Dated August 19, 2009*

*Add Letter from U.S. Army Corps of Engineers Dated August 24, 2009*

Exhibit AA: Advertisement of Environmental Assessment and Response Letter  
*Advertisement of Environmental Assessment (Harrison Daily Times)*

*Letter from Michael and Elba Cotignola (Dated July 15, 2009)*

*Letter from Engineering Services, Inc. to Michael and Elba Cotignola (Dated July 28, 2009)*

Exhibit BB: Summary Report for Biological Evaluation Field Survey

Exhibit CC: Biological Evaluation Report

***AMENDED EXHIBIT C***

**ADDITIONAL COMMENT LETTERS FROM FEDERAL AND STATE AGENCIES**

**USDA Letter to Quapaw Tribe (July 23, 2009)  
Follow Up Letter to Quapaw Tribe (August 11, 2009)  
Response from Quapaw Tribe (August 11, 2009)**

**USDA Letter to Osage Nation (July 23, 2009)  
Follow Up Letter to Osage Nation (August 11, 2009)  
Letter from Osage Nation (August 14, 2009)**

**U.S. Fish and Wildlife (July 21, 2009)**

**U.S. Forest Service (August 19, 2009)**

**U.S. Army Corps of Engineer's (August 24, 2009)**

   
United States Department of Agriculture  
Rural Development  
Arkansas State Office

July 23, 2009

QUAPAW TRIBE OF OKLAHOMA  
NAGPRA and Section 106 Review Coordinator  
Ms. Carrie V. Wilson  
223 E. Lafayette  
Fayetteville, AR 72701

Dear Ms. Wilson,

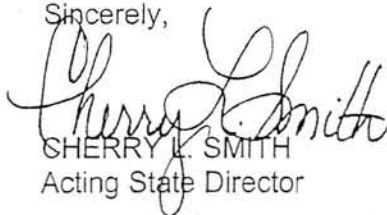
The USDA Rural Development Agency continues to identify historic properties of religious and cultural significance to Indian Tribes that may have potential for impact by the Agency programs, services, and its applicant's activities. Therefore, we will always consult with those federally recognized Tribes and organizations that attach religious and cultural significance to historic properties regardless of their location during the Agency's Section 106 review process.

Rural Development has consulted with the Arkansas State Historic Preservation Officer (SHPO) on a project known as Ozark Mountain Regional Water Authority. The project consists of a new water treatment plant near Bull Shoals Lake in the vicinity of Diamond City and multiple transmission lines with tanks and pump stations in Boone, Newton, and Searcy Counties of Arkansas.

The Agency's goal with this letter is to obtain any comments or suggestions from the **Quapaw Tribe of Oklahoma** concerning the proposed project. We have provided a map of the area showing approximate locations for the project's components, correspondence from SHPO, and a copy of the Phase I Cultural Resources Survey that was completed.

For further information contact Larry Duncan, State Environmental Coordinator, 501-301-3265.

Sincerely,

  
CHERRY L. SMITH  
Acting State Director

Attachments

USDA Service Center- Federal Building-Room 3416 • 700 West Capitol Avenue • Little Rock, AR 72201-3225  
Phone: (501) 301-3200 • Fax: (501) 301-3278 • TDD: (501) 301-3279 • Web: <http://www.rurdev.usda.gov/ar>

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## Duncan, Larry - Little Rock, AR

---

**From:** Duncan, Larry - Little Rock, AR  
**Sent:** Tuesday, August 11, 2009 10:55 AM  
**To:** 'nagpra.106@earthlink.net'  
**Subject:** Section 106 Review for Ozark Mtn. Regional Water Authority

Ms. Carrie V. Wilson,  
Section 106 Review Coordinator  
Quapaw Tribe of Oklahoma

This email is to follow-up on our conversation earlier this morning discussing the previous letter to you by USDA-Rural Development that pertain to the new water system that Rural Development, along with the State of Arkansas, was attempting to fund for construction. Along with the letter, we provided a map showing proposed site of water treatment site on Bull Shoals Lake and the path of the transmission lines to the various water systems in three counties (Boone, Newton, & Searcy), correspondence from SHPO, and a copy of the Cultural Resource Survey. We requested any comments or suggestions you might have concerning this project.

In our conversation you stated that as long as Arkansas SHPO signed-off on project and the Cultural Resource Survey, and we followed their guidance, you were okay with it. Again, I thank you for your time and apologize for the hurry, since the project is time sensitive.

Sincerely,

*Larry Duncan*

Larry Duncan, PE  
State Engineer & Environmental Coordinator  
USDA - Rural Development  
Little Rock, Arkansas  
501-301-3269

**Duncan, Larry - Little Rock, AR**

---

**From:** Carrie V. Wilson [nagpra.106@earthlink.net]  
**Sent:** Tuesday, August 11, 2009 12:17 PM  
**To:** Duncan, Larry - Little Rock, AR  
**Subject:** Re: Section 106 Review for Ozark Mtn. Regional Water Authority

I concur with the SHPO's findings of no effect.  
Carrie Wilson

-----Original Message-----

From: "Duncan, Larry - Little Rock, AR"  
Sent: Aug 11, 2009 10:54 AM  
To: "nagpra.106@earthlink.net"  
Subject: Section 106 Review for Ozark Mtn. Regional Water Authority

Ms. Carrie V. Wilson,  
Section 106 Review Coordinator  
Quapaw Tribe of Oklahoma

This email is to follow-up on our conversation earlier this morning discussing the previous letter to you by USDA-Rural Development that pertain to the new water system that Rural Development, along with the State of Arkansas, was attempting to fund for construction. Along with the letter, we provided a map showing proposed site of water treatment site on Bull Shoals Lake and the path of the transmission lines to the various water systems in three counties (Boone, Newton, & Searcy), correspondence from SHPO, and a copy of the Cultural Resource Survey. We requested any comments or suggestions you might have concerning this project.

In our conversation you stated that as long as Arkansas SHPO signed-off on project and the Cultural Resource Survey, and we followed their guidance, you were okay with it. Again, I thank you for your time and apologize for the hurry, since the project is time sensitive.

Sincerely,

*Larry Duncan*

Larry Duncan, PE  
State Engineer & Environmental Coordinator  
USDA - Rural Development  
Little Rock, Arkansas  
501-301-3269

Red Sun Cultural Resource Consulting  
223 E. Lafayette St.  
Fayetteville, AR 72701  
Phone: 479-442-7576, Fax: 479-575-5453

**USDA**  
Rural  
Development  
**United States Department of Agriculture**  
**Rural Development**  
**Arkansas State Office**

July 23, 2009

**THE OSAGE NATION**  
**Tribal Historic Preservation Officer**  
**Dr. Andrea A. Hunter, Director**  
**P.O. Box 779**  
**Pawhuska, OK 74056**

Dear Dr. Hunter,

The USDA Rural Development Agency continues to identify historic properties of religious and cultural significance to Indian Tribes that may have potential for impact by the Agency programs, services, and its applicant's activities. Therefore, we will always consult with those federally recognized Tribes and organizations that attach religious and cultural significance to historic properties regardless of their location during the Agency's Section 106 review process.

Rural Development has consulted with the Arkansas State Historic Preservation Officer (SHPO) on a project known as Ozark Mountain Regional Water Authority. The project consists of a new water treatment plant near Bull Shoals Lake in the vicinity of Diamond City and multiple transmission lines with tanks and pump stations in Boone, Newton, and Searcy Counties of Arkansas.

The Agency's goal with this letter is to obtain any comments or suggestions from the **Osage Nation** concerning the proposed project. We have provided a map of the area showing approximate locations for the project's components, correspondence from SHPO, and a copy of the Phase I Cultural Resources Survey that was completed.

For further information contact Larry Duncan, State Environmental Coordinator, 501-301-3265.

Sincerely,

  
CHERRY L. SMITH  
Acting State Director

Attachments

USDA Service Center- Federal Building-Room 3416 • 700 West Capitol Avenue • Little Rock, AR 72201-3225  
Phone: (501) 301-3200 • Fax: (501) 301-3278 • TDD: (501) 301-3279 • Web: <http://www.rurdev.usda.gov/ar>

Committed to the Future of Rural Communities.

"USDA is an equal opportunity provider, employer and lender."  
To file a complaint of discrimination write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W.,  
Washington, DC 20250-9410 or call (800)795-3272 (voice) or (202) 720-6382 (TDD).



## Duncan, Larry - Little Rock, AR

---

From: Duncan, Larry - Little Rock, AR  
Sent: Tuesday, August 11, 2009 11:31 AM  
To: 'ahunter@osage.tribe.org'  
Subject: Section 106 Review for Ozark Mtn. Regional Water Authority

Dr. Andrea A. Hunter  
Tribal Historic Preservation Officer  
The Osage Nation

This email is to follow-up on my attempt to contact you by phone earlier this morning. I was hoping to discuss the previous letter of July 23rd that was sent to you by USDA-Rural Development and pertained to the new water system that Rural Development, along with the State of Arkansas, was attempting to fund for construction. Along with the letter, we provided a map showing proposed site of water treatment site on Bull Shoals Lake and the path of the transmission lines in three counties (Boone, Newton, & Searcy) to the various water systems (22 utilities), correspondence from SHPO, and a copy of the Cultural Resource Survey.

We requested any comments or suggestions you might have concerning this project. Arkansas SHPO has signed-off on project and Cultural Resource Survey, and we will be adhering to their guidance. Since the project is time sensitive I was asked to attempt to contact you by phone. Again, I thank you for your time and apologize for the hurry.

Sincerely,

*Larry Duncan*

Larry Duncan, PE  
State Engineer & Environmental Coordinator  
USDA - Rural Development  
Little Rock, Arkansas  
501-301-3269



## TRIBAL HISTORIC PRESERVATION OFFICE

Date: August 14, 2009

File: 0809-752AR-8

RE: Ozark Mountain Regional Water Authority Treatment Plant and Transmission Lines in Boone, Newton, and Searcy counties, Arkansas

Larry Duncan  
State Environmental Coordinator  
USDA - Rural Development  
Federal Building, Room 3416  
700 West Capitol Avenue  
Little Rock, AR 72201-3225

Dear Mr. Duncan,

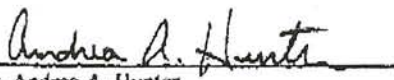
The Osage Nation Historic Preservation Office has received the cultural resources survey report for the proposed project listed as **Ozark Mountain Regional Water Authority Treatment Plant and Transmission Lines in Boone, Newton, and Searcy counties, Arkansas**. The Osage Nation Historic Preservation Office concurs with the recommendation for Phase II assessment or avoidance for 3NW16/41, 3NW17/18/92, 3NW1235, 3SE117, 3SE265, and 3SE532 as well as construction monitoring by a professional archaeologist for 3SE265.

In accordance with the National Historic Preservation Act, (NHPA) [16 U.S.C. 470 §§ 470-470w-6] 1966, undertakings subject to the review process are referred to in 5101 (d)(6)(A), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969).

The Osage Nation anticipates reviewing and commenting on the recommended Phase II assessments or avoidance plans for the project listed as **Ozark Mountain Regional Water Authority Treatment Plant and Transmission Lines in Boone, Newton, and Searcy counties, Arkansas**.

The Osage Nation has a vital interest in protecting its historic and ancestral cultural resources. If human remains or associated elements are discovered during the mitigation or construction process, we ask that work cease immediately and the Osage Nation Historic Preservation Office be contacted.

Should you have any questions or need any additional information please feel free to contact me at the number and/or email address listed below. Thank you for consulting with the Osage Nation on this matter.

  
Dr. Andrea A. Hunter  
Tribal Historic Preservation Officer

  
James Munkras  
Archaeologist I



IN REPLY REFER TO:

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

110 S. Amity Road, Suite 300

Conway, Arkansas 72032

Tel.: 501/513-4470 Fax: 501/513-4480

July 21, 2009

Mr. Tim Mays  
Engineering Services, Inc.  
1207 S. Old Missouri Rd.  
Springdale, AR 72765-0282

RE: Request for Updated Environmental Information Regarding the  
Ozark Mountain Regional Public Water Authority  
Searcy County, Newton County, and Portions of Boone and Marion Counties

Dear Mr. Mays:

The U.S. Fish and Wildlife Service (Service) previously provided the following comments in a July 21, 2006 letter from you requesting environmental information for the early planning process of the Ozark Mountain Regional Water Authority's project in north central Arkansas. The Service does not have any additional concerns since writing that letter and only has one additional recommendation at this time. Therefore we would like to reiterate the previous comments with the one additional recommendation:

The Service reviewed the comments provided by the National Park Service (NPS) and we support and concur with the strategy and plan that you both propose. In addition, we are actively requesting and searching for information to assist you and NPS in making your determinations and in the development of appropriate Best Management Practices (BMPs). We will provide you and NPS with any new information, issues, or recommendations as it becomes available. However, based on current information we do not anticipate any environmental issues that can not be resolved through normal consultation, mitigation, and/or minor project modifications.

According to our records, there are no federally listed or proposed threatened or endangered species occurring in the impact area of the project. However, there are several listed threatened and endangered species that have documented ranges extending into these counties including the Ozark Big-Eared Bat (*Corynorhinus townsendii ingens*), Bald Eagle (*Haliaeetus leucocephalus*), Pink Mocket (*Lampsilis abrupta*), Scaleshell (*Leptodea leptodon*), Indiana bat (*Myotis sodalis*), and Gray bat (*Myotis grisescens*). The Environmental Report should indicate that these threatened and endangered species are known or have been known to occur in the project area; however, the Service does not expect any of these species to be affected by the proposed project. Therefore, no further consultation regarding threatened and endangered species is required at this time.

There are no known caves within the project impact area; however, much of the geology in the Ozarks is comprised of a karst topography resulting in interaction of surface waters within these watersheds with the hydrogeologic processes of large and complex underlying cave ecosystems. Excavation, trenching, blasting, drilling, and associated activities within these areas, across fractures, and/or at stream crossings in karst habitat could have detrimental impacts on species within these streams and the connected cave ecosystems. Water and air flow may be diverted or lost if new openings are created or natural ones area closed, thus altering both surface and subsurface ecosystems and possibly resulting in the loss of species and habitat. In addition, activities associated with the project could result in the leaking or spilling of chemicals such as petroleum or

chlorinated water into these systems, which could significantly alter water chemistry resulting in species mortality and/or extirpation of sensitive species. However, with careful and proper consideration of these concerns through the use of BMPs and with further consultation with the resource agencies, the potential for adverse affects to the fish and wildlife resources may be significantly reduced or avoided.

The Service has advised and commented on similar projects in this region. With proper coordination and consultation applicants and the Service have cooperated to develop BMPs that accomplished the applicant's goals while reducing project impacts and potential impacts to fish and wildlife resources in addition to conserving karst ecosystems. The Service offers its assistance to you and the Alliance through further consultation and cooperation to accomplish our mutual goals. Please find attached to this letter an example of appropriate BMPs titled, "Community Growth Best Management Practices for Conservation of the Cave Springs Cave Recharge Zone". We recommend adapting these BMPs for this project as appropriate.

As stated in our previous letter, we are encouraged by the efforts of the Alliance to develop a long term, safe, economical, and environmentally conscious water supply to serve the dire needs of these north central Arkansas communities. After reviewing the various alternatives we are in agreement that the Bull Shoals Reservoir option would provide an affordable, long term, and high quality water source with minimal environmental impacts. We fully support the concept and look forward to further cooperation and coordination through the project development and environmental review process. We offer our encouragement, assistance, and cooperation to you and the Alliance toward accomplishing this vitally important project.

The only additional recommendation that the Service has at this time is that you consider and adapt new BMPs being developed by the Service for the Natural Gas Pipeline Construction and Maintenance Activities in the Fayetteville Shale Area – Upper Little Red River Watershed into the BMPs for this project. Many of the BMPs for construction of pipelines and the control of sediment and erosion in Ozark Mountain terrain and geology are applicable to this project and would assist in minimizing impacts. The BMPs are not yet finalized, but will be available in the near future. You may request a copy of the BMPs from the Service or download them from our website at: <http://arkansas-es.fws.gov/>, once they are available. If you have any questions or require any assistance please contact me at 501-513-4489.

Sincerely,



Lindsey Lewis  
Environmental Coordinator



United States  
Department of  
Agriculture

Forest  
Service

Big Piney  
Ranger District

12000 SR 27  
Hector, AR 72843  
479-284-3150  
FAX 479-284-2015

Hwy 7 North  
P.O. Box 427  
Jasper, AR 72641  
870-446-5122  
FAX 870-446-2063

---

File Code: 2700

Date: August 19, 2009

Tim Mays  
Engineering Services, Inc.  
1207 S. Old Missouri Rd.

Dear: Mr. Mays

The U.S. Forest Service is aware of the lack of adequate community water in our area and encouraged by the efforts of the Water Alliance to develop a long term, and environmentally sensitive water distribution system to serve the needs of our area. The Forest Service cannot issue a permit for the water line until we have complied with the National Environmental Policy Act (NEPA). We will utilize information from your environmental report/assessment and the information your heritage and biological surveys; however we will have to complete a separate analysis which includes a public comment opportunity. An estimated timeline of 90 to 120 days for the completion of the NEPA process before issuance of the permit could be accomplished. Once the decision is signed and any appeal period is over the issuance of a permit can be done in a matter of days.

Enclosed is a copy of the Biological Evaluation (BE) by Wildlife Biologist, Dwayne Rambo. The BE included the cumulative effects within the proclamation boundary with the possible use of herbicide on private lands however, no herbicide use on Forest Service lands has been evaluated. The BE used information from your biological surveys conducted in August of 2009. Our Forest Plan in collaboration with the U.S. Fish and Wildlife Service established a standard that biological surveys are only valid for two years. Therefore if implementation is not completed by June 1, 2011 additional mist net surveys for Indiana Bats will be required unless activities are implemented between December 1<sup>st</sup>. and March 15th. The BE will be sent to the U.S. Fish and Wildlife Service for concurrence, however, additional mitigation may be required by the Fish and Wildlife Service.

We look forward to further cooperation and coordination through as this project moves forward. If you have any questions or require any assistance please contact Terrell Hope at 870-446-5122 ext. 5135.

Sincerely,

/s/ Gary D. Knudsen  
GARY D. KNUDSEN  
Acting District Ranger Big Piney

cc: Judi Henry

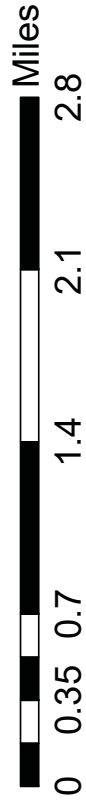
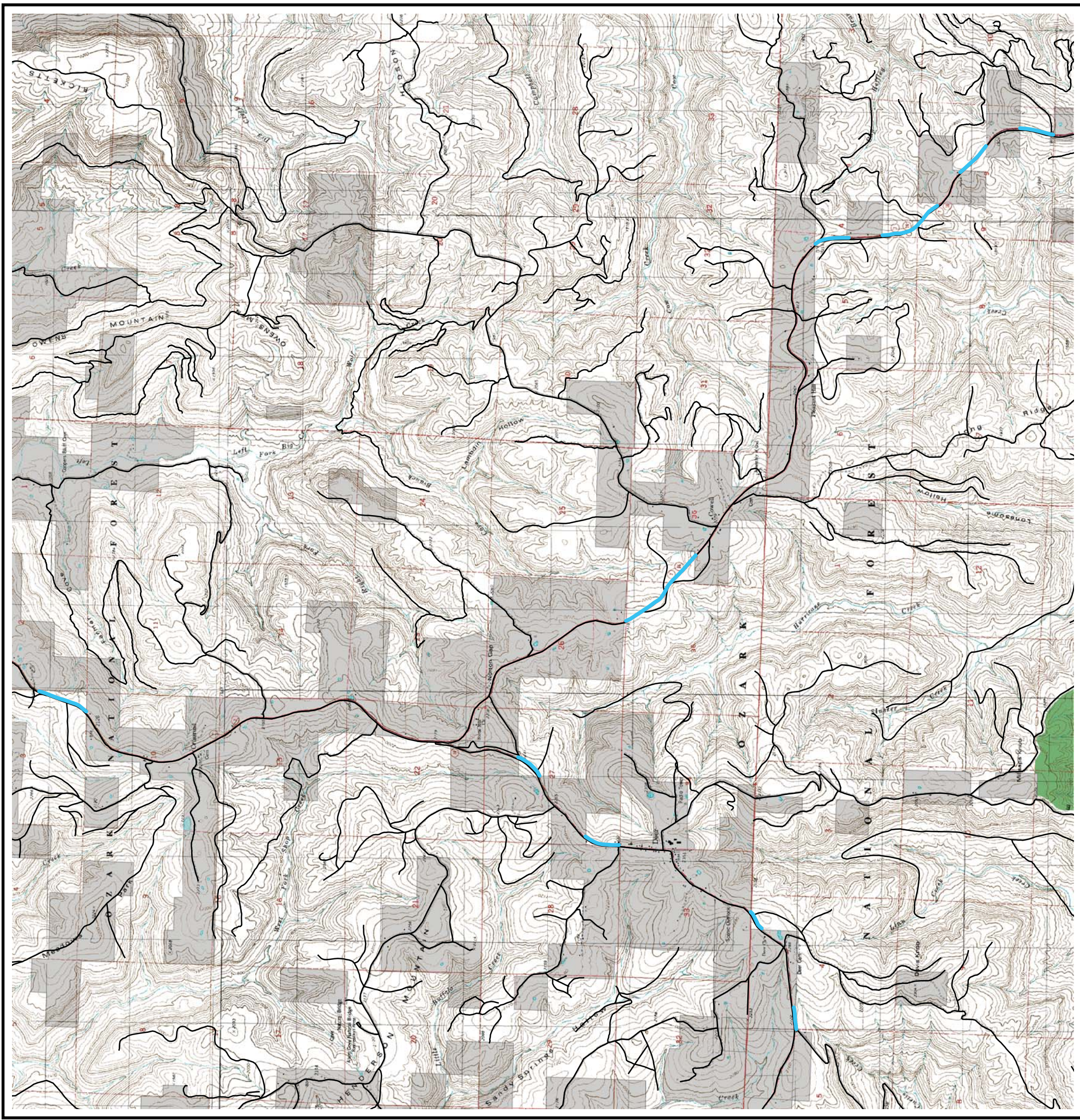
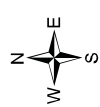


Ron Klouzek  
Dwayne Rambo  
Terrell Hope  
Bruce Davenport








# Ozark Mtn Regional Public Water Authority



## Legend

-  Water Line Location Across Government
-  Roads\_with\_INFRA\_061808
-  fs\_private

The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created, may yield inaccurate or misleading results.

The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information, contact:  
Ozark-St. Francis National Forest, 605 West Main, Russellville, AR 72608, (479)964-7211









**DEPARTMENT OF THE ARMY**  
LITTLE ROCK DISTRICT CORPS OF ENGINEERS  
POST OFFICE BOX 867  
LITTLE ROCK, ARKANSAS 72203-0867

August 24, 2009

Planning and Environmental Office

Mr. Jim Maras, Deputy Assistant Administrator  
USDA, Rural Development Utilities Program  
1400 Independence Ave, SW  
Washington, DC 20250

Dear Mr. Maras:

This letter confirms that the U.S. Army Corps of Engineers, Little Rock District, is conducting a water storage reallocation study on Bull Shoals Reservoir for the Ozark Mountain Regional Public Water Authority (OMRPWA). This study is conducted in response to a letter from OMRPWA received in February 2007. OMRPWA requested a water storage reallocation from Bull Shoals Reservoir adequate to supply 6 million gallons a day (MGD) for municipal water supply. The Little Rock District has committed over \$250,000 in funds necessary to initiate the study and to complete the reallocation report, Environmental Assessment (EA) and draft water supply agreement in August 2010. We recognize the urgency of OMRPWA to obtain the water supply agreement by this date in order to commit \$60 million from USDA American Recovery and Reinvestment Act funds to construct the water in-take structure, treatment plant and distribution lines.

We conducted two public meetings in June 2009 and did not receive any opposition to the proposed reallocation. Therefore, the decision was made to proceed with an EA, not an Environmental Impact Statement (EIS), in accordance with the National Environmental Policy Act (NEPA). During the course of this study, if potential significant impacts are identified, an EIS may be required. If an EIS is required, study costs will increase and it would add 12-18 months to the overall process.

The water storage reallocation report will analyze the water supply needs, alternative sources for water, and perform economic and environmental analysis of impacts from reallocating water from either the flood control or conservation (hydropower) pool of the reservoir. The study will determine the costs related to reducing the storage in the flood control pool or the hydropower pool which will include impacts to Southwestern Power Administration, the federal hydropower permittee. OMRPWA must prove their ability to pay for the water. The water storage agreement will outline the annual requirement for payment of the water storage and OMRPWA's portion of operations and maintenance (O&M) of the reservoir.

The proposed study schedule will include a 30-day public review of the draft EA, internal quality control and quality assurance reviews, and policy compliance reviews. Final report

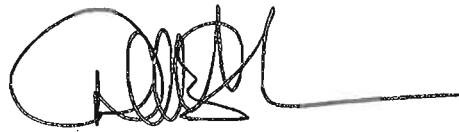
approval resides with Headquarters, U.S. Army Corps of Engineers and must occur prior to the Assistant Secretary of the Army for Civil Works approving the draft water storage agreement. No water can be allocated or withdrawn until the water storage agreement is approved and signed. We are proceeding forward with the full intent of providing an approved reallocation report and water storage agreement in August 2010. If at any time it appears that the schedule would significantly slip we will inform you, OMRPWA, and interested Congressional representatives of the reasons why and the impact on the completion date. Some of the critical milestones for completion of the report and water storage agreement are as follows:

Draft Water Storage Reallocation Schedule (Milestones)	
TASK	COMPLETION DATE
Coordination Meeting (Study team members and Contractor)	Sep 2009
Coordination Meeting (Alternatives Review)	Jan 2010
Draft Water Reallocation Report, Draft EA, and Draft Water Storage Agreement	Mar 2010
30 Day Public Review of Draft EA/Report	Jun 2010
Final Reallocation Report Approval	July 2010
Water Storage Agreement Approval	Aug 2010

We appreciate that you recognize our commitment along with the potential uncertainties associated with completing a reallocation report, EA, and water storage agreement of such complexity. We look forward to working with you as an integral member of the project team, and we will continue to keep you informed along the way.

If you have any questions or need additional information, please contact Dr. Randy Hathaway, Deputy District Engineer at 501-324-5053.

Sincerely,



Donald E. Jackson, Jr.  
Colonel, Corps of Engineers  
District Engineer

Copy Furnished:

Mr. Andy Anderson  
Ozark Mountain Regional Public Water Authority  
P.O. Box 1020  
Diamond City, AR 72630

Mr. Rickey Carter  
USDA  
700 West Capitol  
Mail Room 3416  
Little Rock, AR 72201

Mr. Tim Mays  
Engineering Services, Inc.  
P.O. Box 282  
Springdale, AR 72765-0282

Senator Blanche Lincoln  
355 Dirksen Senate Office Building  
Washington, DC 20510

Senator Blanche Lincoln  
912 West Fourth Street  
Little Rock, AR 72201

Senator Mark Pryor  
255 Dirksen Senate Office Building  
Washington, DC 20510

Senator Mark Pryor  
The River Market  
500 Clinton Ave  
Suite 401  
Little Rock, AR 72201

Congressman Marion Berry  
2305 Fayburn H.O.B.  
Washington, DC 20515

Congressman Marion Berry  
108 E. Huntington  
Jonesboro, AR 72401

Congressman John Boozman  
1519 Longworth House Office Building  
Washington, DC 20515

Congressman John Boozman  
4943 Old Greenwood Road  
Suite 1  
Fort Smith, AR 72903



DEPARTMENT OF THE ARMY  
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS  
POST OFFICE BOX 867  
LITTLE ROCK, ARKANSAS 72203-0867

REPLY TO  
ATTENTION OF

August 26, 2009

Planning and Environmental Office

Mr. Jim Maras, Deputy Assistant Administrator  
USDA, Rural Development Utilities Program  
1400 Independence Ave, SW  
Washington, DC 20250

Dear Mr. Maras:

This letter serves as a follow up to our letter dated August 24, 2009 in regards to the Ozark Mountain Regional Public Water Authority (OMRPWA) water storage reallocation study. The Corps of Engineers does not object to USDA requiring as a mitigation measure of your Environmental Assessment the condition that the water reallocation study be completed and a water supply agreement be executed before OMRPWA begins any construction.

If you have any questions or need additional information, please contact Dr. Randy Hathaway, Deputy District Engineer at 501-324-5053.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald E. Jackson, Jr.", written over a large, circular scribble.

Donald E. Jackson, Jr.  
Colonel, Corps of Engineers  
District Engineer

Copy Furnished:

Mr. Andy Anderson  
Ozark Mountain Regional Public Water Authority  
P.O. Box 1020  
Diamond City, AR 72630

Mr. Rickey Carter  
USDA  
700 West Capitol  
Mail Room 3416  
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4943 Old Greenwood Road  
Suite 1  
Fort Smith, AR 72903

***EXHIBIT AA***

**ADVERTISEMENT OF ENVIRONMENTAL ASSESSMENT**

**Advertisement of Environmental Assessment (Harrison Daily Times)**

**Michael and Elba Cotignola Letter (July 15, 2009)  
Response from Engineering Services, Inc. (July 28, 2009)**



# Notice of Availability of Environmental Assessment

The USDA, Rural Utilities Service has received an application for financial assistance

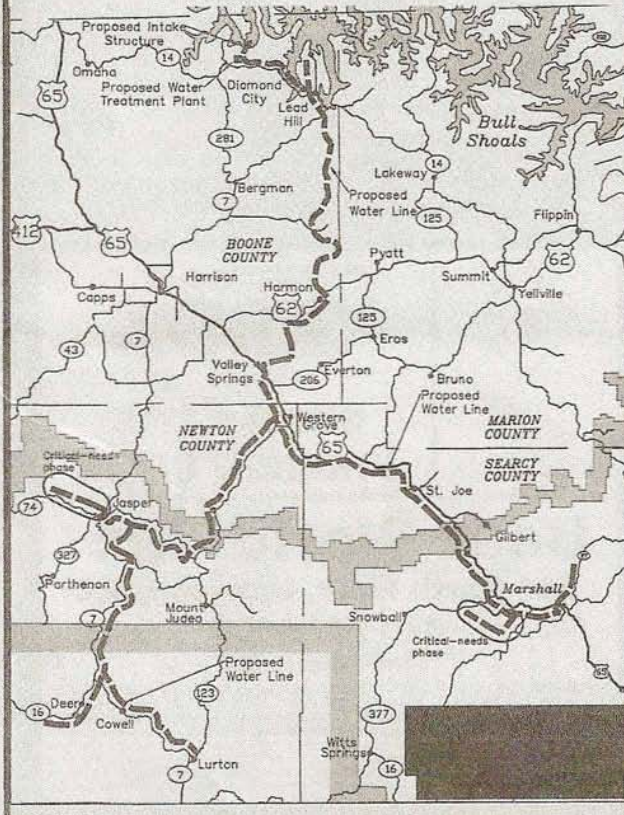
from the Ozark Mountain Regional Public Water Authority. As required by the National Environmental Policy Act, the Rural Utilities Service prepared an Environmental Assessment that evaluated the potential environmental effects and consequences of the proposed project. This notice announces the availability of the Environmental Assessment for public review and comment.

The project consists of a regional water system to serve over 20 municipal and rural water systems in Newton County, Searcy County, and portions of Boone and Marion Counties. The proposed project includes a water intake structure on Bull Shoals Lake, a water treatment facility west of Lead Hill, water transmission mains, water storage tanks, and booster pumping facilities. The proposed project location is hilly with some relatively flat areas. The project will cross private lands. To minimize any impact to environmentally sensitive areas, alternate routes will be considered when possible. Area streams, being of major concern, will be crossed when flows are at a minimum. Siltation screens will be employed to reduce turbidity and disturbances to stream beds, and best management practices will be used throughout the construction phase of the project to reduce runoff into sensitive areas.

Twelve alternatives were developed and thoroughly evaluated. Several important factors were considered in evaluating a long term water supply for the region. Some of these factors include: (1) capacity of water supply; (2) quality of water supply; (3) location of water supply; (4) pumping requirements; (5) capacity of existing water treatment facilities; (6) cost of water from wholesale providers; (7) cost to treat and distribute water from new facilities; (8) environmental disturbances; (9) capital costs to implement the alternatives; and (10) twenty-five year cost of the alternatives. Following a detailed economic and environmental evaluation, it was determined that the water supply from Bull Shoals Lake was most effective.

Copies of the Environmental Assessment are available for review at Rural Development at 402 North Walnut Street, Suite 130, Harrison, Arkansas 72601, (870) 741-4424. For further information contact Rural Development. Any person interested in commenting on this proposal should submit comments to the address above no later than 30 days from this publication.

A general location map of the proposal is shown below.





Garland Mountain Regional Public  
Water Authority

### Certificate of Publication

STATE OF ARKANSAS  
COUNTY OF BOONE

Environmental Assessment  
SS

I, Carol Lawson upon oath  
state that I am Business Manager of the HARRISON DAILY TIMES, a  
daily newspaper published at Harrison, Boone County, Arkansas, and

that said newspaper has a bona fide circula-  
tion in said county, that the annexed adver-  
tisement was inserted, and published, in said  
newspaper for 37 consecutive weeks, as  
follows: 1st insertion

on the 7 day of July 2009

2nd on the 8 day of July 2009

3rd on the 9 day of July 2009

4th on the \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

5th on the \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

6th on the \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

Carol Lawson  
Business Manager

Subscribed and sworn to before me  
this 10<sup>th</sup> day of July 2009

Lynnda Treat, P.C.

FEE 550.88

### of Availability of Environmental Assessment

ities Service has received an application for

tain Regional Public Water Authority. As  
nvironmental Policy Act, the Rural Utilities  
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alternatives. Following a detailed economic  
on, it was determined that the water supply  
most effective.

7/15/2009

To Whom This May CONCERN

RECEIVED

2009 JUL 20 AM 9:27

HARRISON SERVICE CENTER

Hi, how ARE YOU Today  
THIS LETTER COMES FROM

MICHAEL & ELBA COTIGNOLA  
OF 40 YEARS

OUR HOME ADDRESS IS

160-21 99TH STREET

HOWARD BEACH NY  
11414

WE ARE WRITING YOU NOW  
ASKING FOR YOUR TIME AND

HELP SINCE WE OWN

PROPERTY IN BOONE

COUNTY ARKANSAS.



#1 - In 1999 we bought  
a 1 acre lake front lot  
off of Hwy # 65-14 right  
before the  
Cricket Creek Marina  
on Table Rock Lake

for only \$4,500 with 991'  
on the water.

#2 - Then in 2008 we  
bought a 60' x 120'  
lot in Diamond City  
also in Boone County  
Arkansas.

This lot has water/  
sewer & electric  
to it the other

ONE DOES NOT YET.

A- I'm WRITING YOU RIGHT NOW  
ASKING YOU TO PLEASE  
MAIL US COPIES OF THE  
ENVIRONMENTAL ASSESSMENT

B- WE ARE ALSO WRITING YOU  
NOW IN SUPPORT OF THIS  
WATER PROJECT BECAUSE WE BELIEVE  
THAT IT IS IMPORTANT AND  
WILL HELP WITH AREA  
GROWTH AND DEVELOPMENT

C- IF YOU LOOK AT DIAMOND  
by CITY ON YOUR MAP  
DIAMOND CITY



YOUR PLAN TO BUILD A

PROPOSED INTAKE STRUCTURE

(QUESTION) CAN YOU EXPLAIN  
TO US WHAT THAT IS AND  
WHAT IT WILL MEAN FOR  
OUR LAND IN DIAMOND CITY  
ARKAWAY

SO PLEASE DON'T FORGET  
WE OK

WE LOOK FORWARD TO GETTING  
COPIES OF YOUR ENVIRONMENTAL  
ASSESSMENT, AND ANSWER TO OUR  
OUR QUESTION

D- WE DON'T OWN OR KNOW HOW TO USE A  
COMPUTER SO COULD YOU  
PUT WORK A "NEW LETTER  
LIST"

THANK YOU FOR YOUR TIME  
AND HELP

M. Robert Elba Lopez

*fax to Bill Rowland,  
USDA*

# Engineering Services, Inc.

1207 S. Old Missouri Rd • P.O. Box 282 • Springdale, Arkansas 72765-0282

Phone: 479-751-8733 • Fax: 479-751-8746

July 28, 2009

Sent Via UPS  
Signature Required

Michael and Elba Cotignola  
160-21 99<sup>th</sup> Street  
Howard Beach, NY 11414

RE: Ozark Mountain Regional Public Water Authority  
Boone County, Arkansas

Dear Mr. and Mrs. Cotignola:

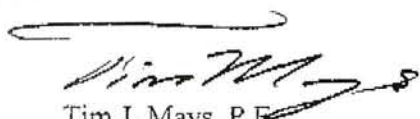
Thank you for your letter regarding the proposed intake structure on Bull Shoals Reservoir for the Ozark Mountain Regional Public Water Authority. Enclosed is a copy of the Environmental Assessment as requested. This project will provide safe, clean, and reliable drinking water to 20 cities and rural water systems in North Central Arkansas including the Diamond City water system. In addition to the intake structure, the proposed project calls for construction of a water treatment plant and an extensive distribution system that will deliver water over a three county area.

Once the system is in place, your water provider (Diamond City) will cease operation of its deep well and obtain treated surface water from Bull Shoals Reservoir. This will result in an increased available and more reliable water supply for Diamond City. Also, the quality of water will increase with the change from a groundwater source to a surface water source. The groundwater in many deep wells in this part of Arkansas have a history of high levels of radium and other contaminants. Although Diamond City's groundwater has not exceeded the allowable level of radium, current radium levels are nearing the maximum as determined by the Arkansas Department of Health and the Environmental Protection Agency.

We appreciate your support of this project. We know it will improve the quality of life for small cities and rural areas of North Central Arkansas and provide opportunities for economic development.

If you have any questions, please feel free to contact us for more information.

Sincerely,



Tim J. Mays, P.E.  
Secretary-Treasurer

Enclosures

cc: Mr. Rickey Carter, USDA Rural Development  
Mr. Andy Anderson, Ozark Mountain Regional Public Water Authority



Consulting Engineers and Surveyors

[www.engineeringservices.com](http://www.engineeringservices.com)

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***EXHIBIT BB***

**SUMMARY REPORT FOR BIOLOGICAL EVALUATION FIELD STUDY**

**Final Summary Report  
Biological Evaluation Field Survey  
Ozark Mountain Regional Public Water Authority  
Proposed Water Main  
Newton County, Arkansas**

**Provided To:  
Big Piney Ranger District  
Ozark-St. Francis National Forests**

Prepared by

John S. Osborne, Wildlife Biologist  
11 Butler Lane  
Russellville, AR 72802

August 13, 2009

## Introduction

The purpose for this Biological Evaluation (BE) field survey was to identify, map, and describe species of concern within the right of way proposed for installation of a water main along Arkansas Highways 7 and 16. The proposed water main will cross national forest lands on the Big Piney Ranger District of the Ozark-St. Francis National Forests (OSF).

The Field survey was designed in accordance with contract specifications provided by the OSF to search for populations of federally listed species (T&E), Regional Forester listed sensitive species (RFSS), non-native invasive species (NNIS), caves and bluff shelters, and uncommon habitats of management concern.

This field survey has been procured and provided to the OSF by Engineering Services Inc., Springdale, AR. (ESI) The field survey will be used by the Forest Service to support the preparation of a BE for the proposed project.

## Methods

A walk through survey of all Forest Service lands within Newton County, Arkansas along the proposed water main corridor was planned using maps provided by ESI. A review of the OSF GIS database indicated occurrence of 5 RFSS plants within the landscape area of the proposed water main as follows:

French's Shooting Star *Dodecatheon frenchii*  
Blue Ridge Catchfly *Silene ovata*  
Ozark Chinquapin *Castanea pumila* var. *ozarkensis*  
Ozark Spiderwort *Tradescantia ozarkana*  
Moore's Delphinium *Delphinium newtonianum*

A pre-field review of aerial imagery was done to become familiar with forest conditions, access, and to search for possible rare communities or habitats of management concern. Transects to be searched were digitized using Garmin mapsource software and were downloaded into a Garmin GPS map 60csx GPS unit. Transect history was recorded using this same GPS unit. Track logs of all walk through transects were defined using Forest Service naming conventions. Individual waypoints representing individual element occurrence records were also defined using the naming conventions. Notes were collected at each waypoint and digital images of RFSS and NNIS were taken at each location. Digital images were identified using Forest Service naming conventions.

## Results

Field survey was done August 08 and 10, 2009. A total of 4.5 miles of transects were surveyed. The track logs are summarized in Table 1.

Table 1. Track Log Summary, Ozark Regional Water Main Biological Evaluation Field Survey

Track Number	Waypoints Associated with Track
BE080809A	None
BE080809B	ALJU080809B1
BE080809C	CAPU080809C1
BE080809D	ALJU080809D1, CAPU080809D1, CAPU080809D2
BE080809E	SPDI081009E1 (Diana Fritillary Butterfly, species of concern)
BE081009A	ALJU081009A1, MIVI081009A1
BE081009B	None
BE081009C	None
BE081009D	ROMU081009D1, ROMU081009D2, ACST081009D1 (Sharp-shinned Hawk, species of concern)

This summary shows the waypoints associated with each track log using standard naming conventions. Naming conventions are shown in Attachment 1.

A narrative of individual waypoints is shown in Table 2. Garmin mapsource gdb files showing both tracks and waypoints are included in Attachment 3.

## Species and Habitats Encountered

No federally listed T&E species were identified during this field survey. No rare communities or habitats of management concern were encountered as part of this survey.

The dominant forest cover types for the areas surveyed were immature dry oak-hickory forest and immature dry pine-oak forest. The dominant and co-dominant trees were of small saw timber and/or round wood size. All of the area surveyed had been impacted by a severe ice storm the previous winter which resulted in many of the remaining trees having broken tops. Dead and down large woody debris was abundant on the forest floor. Transects surveyed occurred on upper slopes and ridge tops with variable aspect. Small inclusions of dry-mesic oak hickory forest was noted where transects crossed the upper reaches of ephemeral streams. Linear patches of herbaceous open land, shrub-scrub, and early successional oak-hickory forest were encountered within existing power line rights of way.

These cover types would provide suitable foraging habitat for Gray bat *myotis grisescens*, Indiana bat *Myotis sodalis*, and Ozark big-eared bat *Corrhonorhinus townsendii ingens*. These forested areas adjacent to the proposed water main would also provide suitable breeding habitat for Indiana bat.

## Regional Forester Sensitive Species

Ozark chinquapin *Castanea pumila var. ozarkensis*, was found at 3 locations generally near the intersection of State Highway 7 and State Highway 16. Single and multiple individual Ozark chinquapin plants were encountered. None of the stems or sprout clumps encountered showed sign of reproduction and all of the stems showed sign of chestnut blight infection. The naming conventions used for individual waypoints are shown in Attachment 1. Digital images of all Ozark chinquapin locations are included in Attachment 2.

Table 2. GPS coordinates and field notes for Ozark chinquapin locations

Waypoint Number / Coordinates	Notes
<p><b>CAPU080809C1</b> N 35.84230 W093.19814</p>	<p>Found 1 Ozark chinquapin sprout clump about 2 feet tall. This sprout shows sign of blight infection and previous die back. Seed production is not possible due to the small size of this sprout. Habitat in the area is closed canopy dry oak-hickory forest. There were no additional sprout clumps noted in the general area of this record.</p>
<p><b>CAPU080809D1</b> N 35.84920 W093.19642</p>	<p>Found 2 Ozark chinquapin sprout clumps about 2.5 feet tall separated by about 6 feet. These sprouts show sign of blight infection and previous die back. No seed production would be possible due to the small size of these sprouts. Habitat in the area is closed canopy dry oak-hickory forest. There were no additional sprout clumps noted in the general area of this record</p>
<p><b>CAPU080809D2</b> N 35.84758 W093.19661</p>	<p>Found 2 Ozark chinquapin sprout clumps each about 4 feet tall separated by about 2 feet. These sprouts show sign of blight infection and previous die back. No seed production would be possible due to the small size of these sprouts. Habitat in the area is closed canopy dry oak-hickory forest. There were no additional sprout clumps noted in the general area of this record</p>

## Non-Native Invasive Species

GPS coordinates and field notes for non-native invasive species locations are shown in table 3. The naming conventions used for individual waypoints are shown in Attachment 1. Digital images of all NNIS locations are included in Attachment 2.

Table 3. Non-native Invasive Species Field Notes

Waypoint Number / Coordinates	Notes
<p><b>ALJU080809B1</b></p> <p>N 35.83564 W093.20800</p>	<p>Found 1 mimosa tree adjacent to the road and house at the north end of the Track. The tree is about 6 feet tall. There was no landline found at this location and it is possible that the location might be on private land. Having worked on this forest, I have knowledge that there are a number of landline disputes between Forest Service and private landowners in this general area.</p>
<p><b>ALJU080809D1</b></p> <p>N 35.85270 W093.19546</p>	<p>Found 1 mimosa tree growing in the middle of the existing Deer waterline right of way. The tree is about 12 feet tall and there is no sign of reproduction from this tree. Control would be very easy right now with a combination of cutting and herbicide application.</p>
<p><b>ALJU080810A1</b></p> <p>N 35.80209 W093.12722</p>	<p>Found multiple mimosa trees in and adjacent to the power line right of way. The extent of spread of this site is approximately .01 acre. There are about 8-10 seedlings in the vicinity of a 7 foot tall tree in the middle of the power line and there is a tree about 12 feet tall down slope of the right of way. Other Mimosa trees were noted upslope along State Highway 7. Herbicide control of all of the stems in the area would be the only way to stop the spread of this tree. Soil disturbance with the installation of the water main would probably increase the number of mimosa trees in the area.</p>
<p><b>MIVI081009D1</b></p> <p>N 35.80767 W093.12817</p>	<p>Found a dense stand of microsteguum in the existing buried telephone line right of way which is adjacent to the proposed water main. The extent of coverage is an area about 10 feet wide and 100 feet long. This species is growing in partial shade and will no doubt colonize the adjacent proposed water main right of way. Herbicide control prior to installation of the water main would reduce the chance that this species would become established on the water main right of way</p>
<p>ROMU081009D1</p> <p>N35.82268 W93.17330</p>	<p>Found multiple Multiflora rose clumps near the intersection of an old forest road and State Highway 7. Not surprisingly there is an old home site close by. The clumps are scattered over an area about .05 acre and comprise about 5-10% of the total ground cover. This site could be easily treated with herbicide</p>
<p>ROMU081009D2</p> <p>N 35.82569 W93.17308</p>	<p>Found 1 clump of Multiflora rose in the middle of the old abandoned forest road. This single plant could be easily treated with herbicide.</p>

## Species of Concern

2 species of management concern were noted during this survey. These species were reported because they are uncommon and known to be declining range wide or are uncommon as breeding species on the Ozark-St. Francis National Forests. These locations are provided as a courtesy to forest managers.

Table 4 Species of Concern

<b>Waypoint Number / Coordinates</b>	<b>Notes</b>
<b>SPDI080809E1</b> N 35.89135 W093.19113	Observed 1 female Diana Fritillary butterfly in the power line right of way. The observation was brief with no opportunity to get a photograph. Populations of this butterfly have declined range wide and the species is uncommon in the interior highlands.
<b>ACST081009D1</b> N 35.82526 W093.17323	Flushed a Sharp-shinned Hawk from the forest canopy adjacent to the old closed road. The observation was brief with no opportunity to photograph the bird. Sharp-shinned Hawks are an uncommon breeding species for this area but are a common winter migrant. This observation is post breeding season but prior to the onset of fall migration suggesting this might have been a breeding bird.



Attachment 1. Naming Conventions for Track Logs, Waypoints and Digital Images:  
Threatened and Endangered Species

Scientific Name	Common Name	Abbreviation
<i>Myotis grisescens</i>	Gray Bat	mygr
<i>Myotis sodalis</i>	Indiana Bat	myso
<i>Corynorhinus townsendii ingens</i>	Ozark Big-eared Bat	coti
<i>Cambarus zophonastes</i>	Hell Creek Cave Crayfish	cazo
<i>Lesquerella filiformis</i>	Missouri Bladderpod	lefi
<i>Alligator mississippiensis</i>	American Alligator	almi
<i>Amblyopsis rosae</i>	Ozark Cavefish	amro
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	scal
<i>Nicrophorus americanus</i>	American Burying Beetle	niam
<i>Campephilus principalis</i>	Ivory-billed Woodpecker	ibwo
<i>Sterna antillarum</i>	Interior Least Tern	ilte
<i>Potamilus capax</i>	Fat Pocketbook	poca
<i>Lampsilis streckeri</i>	Speckled Pocketbook	last
<i>Lampsilis abrupta</i>	Pink Mucket	laab
<i>Leptodea leptodon</i>	Scaleshell Mussel	
<i>Inflectarius magazinensis</i>	Magazine Mountain Shagreen	inma
<i>Cambarus aculabrum</i>	Cave Crayfish	caac
<i>Lindera mellissifolia</i>	Pondberry	lime
<i>Geocarpon minimum</i>	Geocarpon	gemi

## Regional Forester's Sensitive Species and Other Species of Interest

Scientific Name	Common Name	Abbreviation
<i>Myotis leibii</i>	Eastern small-footed bat	myle
<i>Aimophila aestivalis</i>	Bachman's sparrow	basp
<i>Haliaeetus leucocephalus</i>	Bald Eagle	baea
<i>Dendroica ceruea</i>	Cerulean Warbler	cewa
<i>Eurycea tynerensis</i>	Oklahoma salamander	oksa
<i>Notropis ozarcanus</i>	Ozark shiner	nooz
<i>Percina nasuta</i>	Longnose darter	pena
<i>Typhlichthys subterraneus</i>	Southern cavefish	tysu
<i>Orconectes williamsi</i>	William's crayfish	orwi
<i>Lampsilis rafinesqueana</i>	Neosho mucket	lara
<i>Paduniella nearctica</i>	Nearctic paduneillan caddisfly	pane
<i>Lirceus bicuspidatus</i>	An isopod	libi
<i>Amorpha ouachitensis</i>	Ouachita false indigo	amou
<i>Callirhoe bushii</i>	Bush's poppymallow	cabu
<i>Castanea pumila var. ozarkensis</i>	Ozark chinquapin	capu
<i>Cypripedium kentuckiense</i>	Southern Lady's slipper	cyke
<i>Delphinium newtonianum</i>	Moore's delphinium	dene
<i>Delphinium treleasei</i>	Glade larkspur	detr
<i>Dodecatheon frenchii</i>	French's shooting star	dofr
<i>Draba aprica</i>	Open-ground draba	drap
<i>Eriocaulon koernickianum</i>	Small-headed pipewort	erko
<i>Fothergilla major</i>	Large witchalder	foma
<i>Juglans cinerea</i>	Butternut	jubu
<i>Neviusia alabamensis</i>	Alabama snow-wreath	neal
<i>Quercus acerifolia</i>	Mapleleaf oak	quac
<i>Schisandra glabra</i>	Bay starvine	scga
<i>Silene ovata</i>	Blue Ridge catchfly	siov
<i>Silene regia</i>	Royal catchfly	sire
<i>Solidago ouachitensis</i>	Ouachita Mountain goldenrod	soou
<i>Tradescantia ozarkana</i>	Ozark spiderwort	troz
<i>Trillium pusillum var. ozarkanum</i>	Ozark least trillium	trpu
<i>Valerianella nuttallii</i>	Nuttall's cornsalad	vanu
<i>Valerianella ozarkana</i>	Ozark cornsalad	vaoz

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<b>Rare Community or Habitat of Interest</b>	<b>Abbreviation</b>
Glade	glade
Seep	seep
Sinkhole	sink
Wetland	wetlnd
Pond (man made)	pond
Bluff shelter	blsh
Cane break	cane
Vernal pond (natural)	vpond
Cave	cave
Historic Evidence of Fire	fire
Homesite	home

### Non-native Invasive Species

<b>Scientific Name</b>	<b>Common Name</b>	<b>Abbreviation</b>
<i>Ailanthus altissima</i>	Tree of Heaven	aial
<i>Elaeagnus umbellata</i>	Autumn Olive	elum
<i>Lonicera japonica</i>	Japanese Honeysuckle	loja
<i>Lespedeza bicolor</i>	Lespedeza Bicolor	lebi
<i>Lespedeza cuneata</i>	Lespedeza Sericea	lecu
<i>Microstegium vimineum</i>	Japanese Stilt Grass	mivi
<i>Paulownia tomentosa</i>	Princess Tree	pato
<i>Rosa multiflora</i>	Multiflora Rose	romu
<i>Ligustrum sp.</i>	Privet	lisp
<i>Pueraria montana</i>	Kudzu	pumo
<i>Alliaria petiolata</i>	Garlic Mustard	alpe
<i>Centaurea beibersteiniil</i>	Spotted Knapweed	cebe
<i>Albizia julibrissin</i>	<i>Silktree, Mimosa</i>	alju
<i>Lythrum salicaria</i>	Purple Loosestrife	lysa
<i>Wisteria sinense</i>	Asian Wisteria	wisi
<i>Melilotus alba</i>	Sweetclover	meal

Attachment 2. Photos taken at RFSS and NNIS locations:

CAPU080809C1

CAPU080809D1

CAPU080809D2

ALJU080809B1

ALJU080809D1

MIVI081009A1

ROMU081009D1

ROMU081009D2

***EXHIBIT CC***

**BIOLOGICAL EVALUATION REPORT  
U.S. FOREST SERVICE**



*Ozark Mountain Regional Water Project*  
*Biological Evaluation*  
FOR  
**Federally Listed & Regional Forester's Sensitive SPECIES**

**Ozark-St. Francis National Forest**  
Big Piney Ranger Districts  
Newton County, Arkansas

Prepared by  
*Ronald D. Rambo*  
District Wildlife Biologist

## **Introduction**

The purpose of this Biological Evaluation (BE) is to identify the likely effects of the proposed action and alternatives on Federally-listed Threatened and Endangered. The Biological Evaluation is done to ensure that Forest Service actions do not contribute to loss of viability or trend toward Federal listing of any species; to comply with the requirements of the Endangered Species Act that actions of Federal agencies not jeopardize or adversely modify critical habitat of Federally-listed or proposed species; to provide a process and standard by which to ensure that Threatened and Endangered species receive full consideration in the decision making process; and to ensure compliance with Biological Assessment for the OSFNF Land and Resource Management Plan (7/27/05) and the September 22 2005 Biological Opinion for the American Burying Beetle OSFNF Arkansas. The best available science was used in the site specific analysis for all species covered in this BE. The BE will be divided into two sections a Federally Threatened and Endangered Section and a Regional Forester's Sensitive Species Section.

### **Project Location:**

The project area is adjacent to highway 7 from the northern proclamation boundary south to Lurton Arkansas and west from intersection of highway 7 and 16 to Deer, Arkansas. For specific, see attached maps.

### **Proposed Management Actions:**

The Big Piney Ranger District is proposing to issue a permit to allow the Ozark Mountain Regional Public Water Authority (OMRPWA) to construct approximately 3.2 miles of waterline on National Forest Land. The Right of way for the line will be 25 feet wide. Within the right of way, a trench measuring 30 inches wide by 54 inches deep will be dug. A 12 " ductile iron pipe will be laid at least 36 inches deep. It is estimated that the project will need 2 to 3 months to complete. All federal lands will be seeded, fertilized and mulched, as required by U.S. Forest Service officials. No additional work areas for construction of the 12" water transmission main will be required on federal lands. Areas for storage of materials and equipment will be acquired on private lands. Once installed and operational, the water transmission main will be used 365 days a year to transport treated water to nearby water associations and communities. The OMRPWA will have booster pumping facilities and water storage tanks on private property

It is anticipated that the brush will be removed (by cutting / trimming) every three (3) to four (4) years. The Ozark Mountain Regional Public Water Authority (OMRPWA) will not use herbicides or pesticides for maintaining the right-of-way on U.S. Forest Service properties. Also since most of the proposed water transmission main is adjacent to or within other existing utility right-of-ways, maintenance performed may be shared by utilities. It is likely that in addition to the water transmission main on U.S. Forest Service property, a couple of water valves will be installed. All valves will be below grade with only the top of the valve box visible from the ground. The valve boxes are typically flush with the ground. The valve is operated via a 2" nut on top of the valve, which is accessed through the valve box. At these valve locations, a visual marker will be placed at the Arkansas Highway Department Right-of-Way to allow for the operations manager to identify the locations of the valves. Other than opening and closing valves, little maintenance is required. In the event a leak is found on the transmission main along U.S. Forest Service property, the leak will be repaired, cleaned-up, seeded, fertilized and mulched. OMRPWA will contact the local U.S. Forest Service to advise of the repair activities.

## Assumptions of the Project Analysis

- Mature forest cover is maintained within 100 feet slope distance from the top of bluffs and 200 feet slope distance from the base to provide wildlife habitat associated with unique landform. Within this zone, activities are limited to those needed to ensure public safety or to maintain and improve habitat for federally listed species or other species whose viability is at risk.
- Herbicides and application methods are chosen to minimize risk to human and wildlife health and the environment. Diesel oil will not be used as a carrier for herbicides, except as it may be a component of a formulated product when purchased from the manufacturer. Vegetable oils will be used as a carrier for herbicides when available and compatible with the application proposed.
- Herbicides are applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human and wildlife health. Application rate and work time must not exceed levels that pose an unacceptable level of risk to human or wildlife health. If the rate or exposure time being evaluated causes the Margin of Safety or the Hazard Quotient computed for a proposed treatment to fail to achieve the current Forest Service Region 8 standard for acceptability (acceptability requires a MOS > 100 or, using the SERA Risk Assessments found on the Forest Service website, a HQ of < 1.0), additional risk management must be undertaken to reduce unacceptable risks to acceptable levels or an alternative method of treatment must be used.
- Weather is monitored and the project is suspended if temperature, humidity, and/or wind do not meet the criteria shown in Table 3-2.

○ **Table 3-2: Necessary Criteria for Herbicide Application.**

Application Techniques	Temperatures Higher Than	Humidity Less Than	Wind (at Target) Greater Than
<b>Ground</b>			
Hand (cut surface)	NA	NA	NA
Hand (other)	98°	20%	15 mph
Mechanical (liquid)	95°	30%	10 mph
Mechanical (granula	NA	NA	10 mph

- No soil-active herbicide is ground applied within 30 feet of the drip line of non-target vegetation specifically designated for retention (e.g., den trees, hardwood inclusions, adjacent untreated stands) within or next to the treated area. However, chemical side pruning is allowed in this buffer if necessary, but movement of herbicide to the root systems of non-target plants must be avoided. Buffers are clearly marked before treatment so applicators can easily see and avoid them.
- No herbicide is ground broadcast within 60 feet of any known threatened, endangered, proposed, or sensitive species except for endangered bats. Selective applications may be done closer than 60 feet, but only when supported by a site-specific analysis. Selective herbicide treatments using a non-soil active herbicide may be used closer than 60 feet to protect TES plants from encroachment by invasive plants.

- Application equipment, empty herbicide containers, clothes worn during treatment, and skin are not cleaned in open water or wells. Mixing and cleaning water must come from a public water supply and be transported in separate labeled containers.
- Herbicide mixing, loading, or cleaning areas in the field are not located within 300 feet of private lands, open water or wells, or other sensitive areas.
- Herbicide will not be used within the appropriate SMZs or within 300 feet of any public or domestic water intake. Selective treatments may occur within SMZs only when a site-specific analysis of actions to prevent significant environmental damage such as noxious weed infestations supports a "Finding of No Significant Impact" (FONSI), and then using only herbicides labeled for both terrestrial and aquatic use within these areas.
- Promote and implement current Best Management Practices (BMPs) for forestry as recommended by the Arkansas Forestry Commission to all management activities in order to control non-point source pollution and comply with state water quality standards.
- Tree cutting are prohibited in primary and secondary Indiana bat zones between May 1 and November 30. Adjustments to these dates may be made on a project-specific basis through coordination with the Arkansas Field Office, USFWS. Site-specific inventories are good for two calendar years from the date of survey completion.
- Tree cutting and salvage operations can occur between December 1 and March 15 without a site-specific inventory. Additional coordination with USFWS is not required.

All standards and guidelines set forth in the Forest Plan and the State Best Management Practices (BMPs) would be followed in all alternatives for the various activities proposed in the project on Forest Service Land.

#### **Consultation History:**

The US Forest Service sent a Biological assessment that assessed the potential effects of implementation of the 2005 Revised Land and Resource Management Plan for the Ozark-St. Francis National Forest to the US Fish and Wildlife Service (USFWS) for review on August 9, 2005. USFWS sent a concurrence letter and initiated formal consultation in accordance with Section 7 (a) 2 of the Endangered Species Act on August 17, 2005.

On September 22, 2005, A non-jeopardy Biological Opinion for the American Burying Beetle (*Nicrophorus americanus*) was issued on the effects of implementation of the 2005 Revised Land and Resource Management.

#### **Species Considered**

Federally Endangered or Threatened known or likely to occur on Ozark National Forest are in Tables 1. Presence and absence of these species in or around the project area was determined by using Arkansas Heritage Database; fish, crayfish, and Mussel information from John Harris (November 2003), Henry Robison (2004), Chris Davidson (2004), Thomas Buchanan, (2004) and the Ozark-St. Francis National Forest SVE Database (SVE).

The Arkansas Heritage Database contains information on specific locations for Threatened and Endangered species as well as sensitive species. This information is compiled from field surveys and research conducted by the Arkansas Game and Fish Commission, U.S. Forest Service, and other agencies.

SVE is a database that was compiled by the U.S. Forest Service in partnership with various State and Federal Agencies, local and regional organizations, universities and local experts. This database contains information on distribution, species status, species habitat and conservation strategies for all species of concern on the forest. This information will be periodically updated as new information becomes available.

### **Project Surveys**

The following surveys have been conducted in the project area:

- Bat Mist Net Surveys, Dr. Thomas Risch (ASU)
- Walk through surveys for sensitive and federally threatened and endangered species and rare communities, Steve Osborne.

### **General Surveys**

Surveys that were used to determine potential habitats and distribution within the vicinity of the project are

- Winter eagle surveys
- Forest bat surveys
- Arkansas breeding bird survey routes
- Christmas Bird count,
- Spring Migration Bird Count.

### **Federally Listed (Endangered or Threatened) Species:**

Nineteen federally listed species have been identified by the US Fish and Wildlife Service, Conway Office as occurring or having the potential to occur on the Ozark-St. Francis National Forests. These species are listed below in Table 1.

Sixteen of these federally listed species, from Table 1 were eliminated from consideration because 1) they do not occur on the Forest, 2) their known distribution is well outside the counties that make up the Big Piney Ranger District or the project does not contain potential habitat. These species are in regular type (i.e. not bolded) in Table 1. The proposed action will have “*no effect*” on these species or their habitat and they will not be considered further in this BA/E. No further consultation with the US Fish and Wildlife Service for these species is required. Indiana Bat, Ozark Big Eared Bat and Gray bat will be given further consideration in this document due to their known occurrence or presences of potential habitats within the project area. These species are indicated in **bold print** in Table 1.

### **Critical Habitat**

The Endangered Species Act (1973) defines “critical habitat” for a threatened or endangered species as follows: “(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and(ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.”

There is no critical habitat for any federally-listed species on the Big Piney Ranger District of the OSFNF. There is no known occupied or unoccupied habitat required for recovery of any of these species discussed here in the project area, or the Big Piney Ranger District.

## White-nose Syndrome

In the Northeast, bat populations are experiencing massive die offs due to a cold loving fungus called the white-nose syndrome (WNS). The syndrome is named after the white coloration that typically appears around the muzzle of infected individuals. The fungus is a member of the group *Geomyces* that live in soil, water and air. This group of fungus can grow and reproduce in refrigerator-level temperatures. This syndrome has killed over 100,000 hibernating bats in New York Vermont, Western Massachusetts and northwestern Connecticut. Currently, the vector or source of this fungus is unknown. WNS has infected populations of Indiana bat in the Northeast and conservationists are extremely concerned that it will spread to new populations of bats. Currently no WNS has been documented in Arkansas.

## Gray Bat (*Myotis grisescens*)

### Life History/Species and Habitat Description / Distribution

Gray bat (Federally Endangered) are medium-sized with a wingspan of 10-11 inches, and are the largest *Myotis* species in the eastern United States. They have grayish-brown fur and are the only *Myotis* species whose wing membrane attaches to their ankle instead of the base of the first toe. The gray bat range is limited to the limestone karst areas of the southeastern and central United States.

The gray bat is primarily restricted to cave habitats and will rarely use other habitats. This species has very specific cave requirements; as a result, less than five percent of available caves are utilized. These requirements vary depending on time of year, age, and sex. Summer caves must be warm (55°-77° F), or with restricted rooms that can trap the body heat of roosting bats, and winter caves are very cold with a range in temperature between 42° and 52° F. These caves are deep with vertical walls and act as cold air traps. During transient periods, gray bats may use transient caves that have less restrictive requirements than summer and winter caves. In addition, males and yearling females will use a wider variety of caves and roost sites throughout the year than mature females.

Summer caves are typically located within 1 mile, rarely over 2 miles, from rivers and reservoirs over which they forage. Gray bats primarily forage on emergent aquatic insects.

Gray bats breed at winter caves during September. Females will store sperm over the winter and become pregnant after emerging in late March. A single offspring is born in late May or early June. Young become volant 20 to 25 days after birth.

Reasons for the decline of the gray bat are as follows:

1. Human disturbance of the bats,
2. Human disturbance to the environment such as vegetation manipulation in riparian areas and around caves, and road construction across streams,
3. Cave destruction from impoundments,
4. Cave commercialization, and
5. Natural sources of mortality.

## Site-Specific Effects

This project will be within 2 miles of a known hibernaculum for this species. The primary concern is potential effects to foraging habitat from loss of prey base due to increase sedimentation rates in local streams. The risk of this project increasing sedimentation in the streams to the point of affecting aquatic biota is low due to the location of the line, on ridge tops. In addition, the seeding and mulching the line will further reduce the risk.

No caves were identified in the project area during surveys and the project is approximately 2 miles from a known occupied cave. This project will not affect cave habitats.

## Cumulative Effects

The project does contain approximately 11.8 miles of line on privateland within the proclamation boundary and another 100 miles outside. Activities in these areas will include use of herbicide for maintenance of line construction of facilities for boosters and storage of equipment along with the activities identified above. In a letter from The US Fish and Wildlife Service dated 07/21/09, the Service stated they did not expect any effects to this species from these activities.

## Effects Determination

The determination for gray bats is **No Effect**.

### Indiana Bat (*Myotis sodalis*)

#### Life History/Species and Habitat Description/Distribution

The Indiana bat (Federally Endangered) is a medium-sized bat with a total length of 3 to 4 inches and a wingspan of 9.5 to 10.5 inches. This bat closely resembles the little brown bat (*Myotis lucifugus*) and the northern long-eared bat (*Myotis septentrionalis*). The Indiana bat usually has a distinctly keeled calcar; hind feet tend to be small with shorter hairs on the toes that do not extend beyond the toenails; and fur exhibits a faint three-colored pattern when parted, basal 2/3 brownish black followed by a narrow grayish band and a cinnamon brown tip. The fur of the belly and chest on an Indiana bat is lighter than the flat pinkish-brown fur of the back, but this character is not as distinct for the Indiana bat as the little brown bat and northern long-ear bat. Also, the Indiana bat has a smaller sagittal crest and tends to have a smaller, lower, and narrower braincase than the little brown bat. The Indiana bat is found throughout the eastern half of the United States.

Indiana bats hibernate in caves and mines during the winter. These sites tend to have temperatures between 39° and 46° F and relative humidity above 74% and below saturation. The Indiana bat has been documented using sites other than caves and mines (e.g. hydroelectric dam), but these sites have favorable microclimates. Summer habitat for Indiana bats are floodplains, and riparian and upland forest with trees that have ex-foliating bark for roosting. This bat will also use old fields and pastures with scattered trees for foraging habitats. Some tree species the Indiana bat will use for roosting are American beech (*Fagus grandifolia*), black gum (*Nyssa sylvatica*), black locust (*Robinia pseudo-acacia*), elm (*Ulmus* spp.), hickory (*Carya* spp.), maple (*Acer* spp.), pine (*Pinus* spp.), oak (*Quercus* spp.), sassafras (*Sassafras albidum*), sourwood (*Oxydendrum arboreum*), sweet birch (*Betula lenta*), and yellow buckeye (*Aesculus octandra*). Most of these tree species have the proper characteristics for roost sites after they are dead or dying, but species such as shagbark hickory and white oak are used while they are still living. Romme, et al. (1995) found that maternity roost sites were usually located in areas with 60 to 80% canopy cover. Indiana bats will also utilize roosts where the canopy closure is higher than 80% when temperatures are above normal or during periods of precipitation.



Indiana bats forage in and around the forest tree canopy for aquatic and terrestrial flying insects. Some of these insects are moths (Lepidoptera), caddisflies (Trichoptera), stoneflies (Plecoptera), beetles (Coleoptera), flies (Diptera), leafhoppers and treehoppers (Homoptera), and lacewings (Neuroptera). Foraging heights are usually from 6 to 100 feet above ground level. Also, canopy closure for foraging habitat has been found to range from 30% to 100% in floodplain habitats.

Indiana bats begin to swarm in August-September, and breeding usually occurs in the latter half of this time period. After mating, females will enter directly into hibernation and store sperm over the winter. Females become pregnant after emerging the following spring. Indiana bats typically form maternity colonies with 100 or fewer adult bats. Young are born in late June or early July, and become volant within a month after birth.

Arkansas population estimate from priority 1 and 2 hibernacula and priority 3 and 4 when available for 2007 is 1,829 bats which is slightly down from 2,067 bats in 2005. This estimate is 0.4 % of the rangewide population estimate of 468,184.

Possible reasons for the decline of the Indiana bat are:

1. Human disturbance and vandalism of hibernacula caves,
2. Improper cave gates and structures,
3. Natural hazards such as cave collapsing or flooding,
4. Changes in cave microclimates,
5. Changes in land use practices (e.g. fire suppression and an increase in density of forest surrounding hibernacula caves), and
6. Chemical contamination.

### **Site-Specific Effects**

The project is within a 5 mile buffer zone for Indiana Bat. The primary concern for this species is potential loss of prey base due to increase sedimentation in local streams, direct mortality of individuals from cutting trees, and loss of potential roost trees.

The potential risk to the species prey base is low for the reasons identified in the gray bat section.

Risk of direct mortality of individuals from cutting trees would be highest for non-volant young. There are no known maternity sites on the Ozark National Forest or in Arkansas. Older volant individuals are highly mobile and are not likely to be harmed by this activity. In addition, these trees will be removed adjacent to state highways with a considerable amount of traffic. The disturbance is likely to reduce the suitability of these trees for roost.

If the trees are cut between December 1 and March 15<sup>th</sup>, any risk to the bat will be eliminated and no further measures will need to be taken. Outside of this time period, surveys will have to occur within 2 years of the actual removal of trees. Surveys were conducted between June and August 15<sup>th</sup> of 2009 in and around the proposed project area. No bats were captured. Additional surveys will not need to be done until June 1, 2011.

The surrounding area has more than 6 suitable roost trees per acre on average so the loss of these trees will not affect the species potential roosting habitat in that area

### **Cumulative Effects**

See Gray bat section for potential cumulative effects. Also the project is only expected to affect approximately 28 acres of forested land within the proclamation boundary of the Ozark National Forest.

### **Effects Determination**

Indiana bats have been documented in the vicinity of the project area. No Indiana bats were identified during recent mist net surveys conducted in and around the project area but it is within 5 miles of known locations for this species. There is some risk of direct harm or mortality of individuals from the tree cutting operation but it is considered extremely low. For this reason, the determination is MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT.

### **Ozark Big-eared Bat (*Corynorhinus townsendii ingens*)**

#### **Life History/Species and Habitat Description / Distribution**

The Ozark big-eared bat is the largest and reddest of the five subspecies of *Corynorhinus townsendii*. The species is medium-sized and weighs from 0.2-0.4 ounces. It has very large (1 inch) ears that connect at the base across the forehead. The snout has prominent lumps due to the large facial glands. The Ozark big-eared bat closely resembles the eastern big-eared bat, but has tan instead of white underparts and brown instead of gray dorsal hair.

This species historically occurred in Northeastern Oklahoma, Northwestern Arkansas and Southwestern Missouri. The total population is believed to be comprised of less than 2000 individuals with the majority in Oklahoma. The Ozark big-eared bat is believed to be extirpated from Missouri. This species has been reported in Crawford, Marion, Franklin, and Washington counties in AR.

This species inhabits karst regions dominated by mature hardwood forests and utilizes caves year around as roost. It primarily forages on lepidoptera. The primary threat is believed to be disturbance and vandalism of their cave habitats.

#### **Site Specific effects**

This species has not been documented on the Big Piney Ranger District, but potential sign of Ozark Big-eared bat use has been documented on the District. As stated in the gray bat section, no caves were identified in the project area; therefore potential cave habitats would not be affected and due to the size of the trench that will be constructed it is not likely to affect caves adjacent to the project area.

The project area would be suitable forage habitat. The construction of a 25 foot wide corridor would not affect the suitability of the project area for foraging. In fact where it meanders outside of the existing right of way, bats are known to utilize these areas for both travel and foraging.

#### **Cumulative Effect**

This project is only expected to affect 28 acres of forested habitats within the proclamation boundary of the Ozark national Forest. Also see the gray bat section for additional information.

### **Effects Determination**

This project is not expected to affect potential or known habitats for this species. For this reason, the determination is **NO EFFECT**.

### **Effects Determination**

The activities identified in this project can affect sedimentation rates in the streams, but with the project standards, these effects should be insignificant and are not likely to affect the aquatic biota. For this reason, a determination of **MAY AFFECT, NOT LIKELY TO ADVERSLY AFFECT** is made for this species.

## **Regional Forester's Sensitive Species Site-Specific Effects & Determinations**

Thirty-two species occurring or having the potential to occur on the Ozark-St. Francis National Forests have been identified by the Regional Forester (Region 8) as Sensitive. These species are listed in Table 2.

28 of the Forest Sensitive species, taken from Table 2, were eliminated from further consideration for projects on the Ozark National Forest. These eliminated species either 1) do not occur on the Big Piney Ranger District, 2) do not have potential habitat in the project area, and/or 3) do not occur as defined by the known and historic ranges of these species and habitat requirements. These species are in regular type (i.e., not in bold) in the following table. Therefore the proposed project will have "**no impact**" on these species, and they will not be considered further in this BE.

The remaining Sensitive species will be given further consideration in this document due to their known occurrence on the Big Piney Ranger District or their potential for occurrence due to the presence of suitable habitat and nearby records. These species are indicated in bold print in Table 2.

### **Bald Eagle (*Haliaeetus leucocephalus*)**

#### **Life History/Species and Habitat Description /Distribution**

Bald eagles are large birds with a body length of 32 inches and wingspan of 80 inches. Adult birds have a brown body with a white head and tail. Immatures are brown, mottled irregularly with white until approximately their fourth year. This eagle is similar to the golden eagle, but can be distinguished from it by the bald eagle's much heavier bill, legs feathered halfway down the tarsus, flying with deep strokes, and soaring on flattened wings. Bald eagles occur in most of the United States and Canada.

The bald eagle is associated with aquatic environments throughout the majority of its range. Fish is the primary prey item. They will also feed on many other types of prey such as waterfowl and small mammals, and have been observed feeding on carrion, especially in wintering areas.

Nesting activities may begin as early as January with incubation and rearing of young occurring from March through mid-May. Nesting sites are usually in mature trees along shorelines, but they may also use cliffs or rock outcrops where large trees are not available. These sites are typically within two miles of water. Females lay one to three eggs, depending on environmental conditions and the fitness of the female. Incubation lasts about 35 days, and young fledge 10-14 weeks after hatching. In Missouri, most young fledge from June 1 to mid-July.

Reasons for the decline of the bald eagle have been well documented:

- Environmental contamination, particularly organochlorine insecticides like DDT-caused egg-shell thinning and reproductive failure and the illegal use of pesticides,
- Human disturbance of eagle nests and night roosts,
- Intentional killing by shooting or poisoning, and
- The degradation and alteration of roosting and nesting habitats.

### **Site-specific and Cumulative Effects**

No communal roost or even secondary roosts were identified in the project area for this species. If the area is used, it is probably only transient in nature. US Fish and Wildlife Service also looked at the potential effects to this species for the entire project and found that the project is not expected to impact this species (letter dated 2009 signed by Lindsey Lewis).

### **Impacts Determination**

The determination is NO impact.

### **An Isopod (*Lirceus Bicuspidatus*)**

#### **Life History/ Habitat Description / Distribution**

This Isopod is found in small cave streams, seeps and small headwater streams but optimal habitat is believed to be spring runs. Little is known about the life history and distribution of this species. It has been recorded in the Arkansas River drainage in the Boston and Ouachita Mountains ecoregions, and White River drainage in the Boston Mountain and Ozark Highlands ecoregions, Threats to species are believed to be point source pollution and sedimentation from resource extraction.

### **Direct, indirect and cumulative effects**

There is some potential of contamination of aquatic habitats from use of herbicide, and chlorinated water. The Fish and Wildlife Service has assisted in developing BMPs to reduce the potential of contamination of the water. Along with Forest Plan Standards, this should minimize the risk to this species

### **Effects Determination**

The determination is May Impact individuals but not likely to cause a trend to federal listing or a loss of viability.

### **Ozark Chinquapin (*Castanea pumila var. ozarkensis*)**

#### **Life History/ Habitat Description / Distribution**

Ozark chinquapin, *Castanea pumila var. ozarkensis* is a forest sensitive species. Until the introduction into this country of the chestnut blight (*Endothia parasitica*) and its subsequent spread, the Ozark chinquapin had been considered a locally abundant and widespread tree species in the Interior Highland region. As a result of the spread of this parasite, few mature trees of this species still exist although sprouting from stumps is quite common (Tucker, 1980).

This species is found on all Ozark NF districts, except the St. Francis NF.

**Direct, Indirect and Cumulative Impacts:**

Three sprout clumps were identified in the project area. All were infected with the blight. These activities will remove these individuals on Forest Service land and potential others from privateland. There is some risk from the herbicide spray on privatelands.

**Impacts Determination**

This species has been documented in the project area. The primary threat to the species is the chestnut blight. This species is wide spread on the district and Ozark National Forest. In addition the area affect is relatively small 28 acres over 15 miles; for these reasons, the determination is May Impact individuals but not likely to cause a trend to federal listing or a loss of viability.

**Moore's larkspur (*Delphinium newtonianum*)****Life History/ Habitat Description / Distribution**

Moore's delphinium is endemic to and locally abundant in two disjunct regions of the Interior Highlands regions of Arkansas, but it is unknown from either Missouri or Oklahoma. Preliminary biological data indicates it is of widespread occurrence within a relatively small area in the Ozark National Forest, where it occurs in both mature and early successional vegetation types. Moore's delphinium "prefers light to heavy shade of hardwoods, a moist loamy clay or sandy clay loam" (Kral, 1983). It also occurs on sites having at least some pine in the overstory and along roads, trails, and openings in forested areas (Tucker, 1990).

**Direct, indirect and cumulative Impacts**

This species is known to occur in the project area. Construction of the corridor may remove individuals from the project area but likely to re-colonize the area from the surrounding area. In fact, the narrow corridors will open the canopy some and increase the suitability for this species along the edges of the corridor. On National Forest land, where herbicide will not be applied the species will probably persist in the area after the implementation of the project. Herbicide treatment could impact individuals on privateland.

**Impacts Determination**

This species is common on the District, particularly in this area and is likely to continue to persist in the project area. For these reasons, the determination is May Impact individuals but not likely to cause a trend to federal listing or a loss of viability.

*/s/ Ronald DRambo*

8/18/09

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District Wildlife Biologist

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Date

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### **Databases and Websites**

Ozark-St. Francis National Forest SVE Database

Arkansas Natural Heritage Commission database

<http://www.natureserve.org/explorer/>

[http://www.fws.gov/northeast/white\\_nose.html](http://www.fws.gov/northeast/white_nose.html)

<http://www.fws.gov/midwest/endangered/mammals/inba/index.html>

### **Personal Communications**

Margaret Harney, Acting Field Supervisor, U.S. Fish and Wildlife Service, Conway Arkansas

Steve Osborne, Wildlife Biologist, Russellville Arkansas.



Table 2. A list of Regional Forester's Sensitive Speceis considered in this project BE. Species in Bold were identified or found to have potential habitat.

<b>Group</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>G-Rank</b>
Amphibian	<i>Eurycea tynnerensis</i>	Oklahoma salamander	G3
Bird	<i>Aimophila aestivalis</i>	Bachman's sparrow	G3
<b>Bird</b>	<b><i>Haliaeetus leucocephalus</i></b>	<b>Bald Eagle</b>	<b>G4</b>
Crustacean	<i>Orconectes williamsi</i>	A crayfish	G2
Fish	<i>Notropis ozarcanus</i>	Ozark shiner	G3
Fish	<i>Percina nasuta</i>	Longnose darter	G3Q
Fish	<i>Typhlichthys subterraneus</i>	Southern cavefish	G3
Insect	<i>Paduniella nearctica</i>	Nearctic paduneillan caddisfly	G1?
<b>Other Invert.</b>	<b><i>Lirceus bicuspicatus</i></b>	<b>An isopod</b>	<b>G3Q</b>
Mammal	<i>Myotis leibii</i>	Eastern small-footed bat	G3
Mollusk	<i>Lampsilis rafinesqueana</i>	Neosho mucket	G2
Vascular Plant	<i>Amorpha ouachitensis</i>	Ouachita false indigo	G3Q
Vascular Plant	<i>Callirhoe bushii</i>	Bush's poppymallow	G3
<b>Vascular Plant</b>	<b><i>Castanea pumila var. ozarkensis</i></b>	<b>Ozark chinquapin</b>	<b>G5T3</b>
Vascular Plant	<i>Cypripedium kentuckiense</i>	Southern Lady's slipper	G3
<b>Vascular Plant</b>	<b><i>Delphinium newtonianum</i></b>	<b>Moore's larkspur</b>	<b>G3</b>
Vascular Plant	<i>Delphinium treleasei</i>	Glade larkspur	G3
Vascular Plant	<i>Dodecatheon frenchii</i>	French's shooting star	G3
Vascular Plant	<i>Draba aprica</i>	Open-ground draba	G3
Vascular Plant	<i>Eriocaulon koernickianum</i>	Small-headed pipewort	G2
Vascular Plant	<i>Fothergilla major</i>	Large witchalder	G3
Vascular Plant	<i>Juglans cinerea</i>	Butternut	G3G4
Vascular Plant	<i>Neviusia alabamensis</i>	Alabama snow-wreath	G2
Vascular Plant	<i>Quercus acerifolia</i>	Mapleleaf oak	G1
Vascular Plant	<i>Schisandra glabra</i>	Bay starvine	G3
Vascular Plant	<i>Silene ovata</i>	Ovate-leaf catchfly	G2G3
Vascular Plant	<i>Silene regia</i>	Royal catchfly	G3
Vascular Plant	<i>Solidago ouachitensis</i>	Ouachita Mountain goldenrod	G3
Vascular Plant	<i>Tradescantia ozarkana</i>	Ozark spiderwort	G3
Vascular Plant	<i>Trillium pusillum var. ozarkanum</i>	Ozark least trillium	G3T3
Vascular Plant	<i>Valerianella nuttallii</i>	Nuttall's cornsalad	G1G2
Vascular Plant	<i>Valerianella ozarkana</i>	Ozark cornsalad	G3

**Table 1** – Federally Threatened and Endangered species considered in this BE. This table includes scientific name, common name, status, occurrence and determinations.

Species	Common	Status	Comments	Determination
<i>Lesquerella filiformis</i>	Missouri Bladderpod	T	Not reported on the Ozark National Forest. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Lindera mellissifolia</i>	Pondberry	E	Not reported on the Ozark National Forest. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Geocarpon minimum</i>	Geocarpon	T	Known from only 4 southern counties. Not reported on the Ozark National Forest. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Potamilus capax</i>	Fat Pocketbook	T	Not reported on the Ozark National Forest. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Lampsilis abrupta</i>	Pink Mucket	E	Not reported on the Ozark National Forest.No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Leptodea leptodon</i>	Scaleshell Mussel	E	Not reported on the Ozark National Forest.No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Lampsilis streckeri</i>	Speckled Pocketbook Mussel		Occurs in the Little Red River. No element of occurrence records or potential habitat in the analysis area.. This species has been found down stream of the project area	May affect Not likely to adversely affect.
<i>Cambarus aculabrum</i>	Cave Crayfish	E	Only occurs in Northwest Arkansas. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Cambarus zophonastes</i>	Hell Creek Cave Crayfish	E	No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Amblyopsis rosae</i>	Ozark Cavefish	T	Only occurs in Northwest Arkansas. No element of occurrence records or potential habitat in the analysis area	NO EFFECT

Table 1. Continued.

Species	Common	Status	Comments	Determination
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	E	Known from the St. Francis and Mississippi Rivers. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Nicrophorus americanus</i>	American Burying Beetle	E	Occurs on western edge of Mt. Magazine District. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Infligatorius magazinensis</i>	Magazine Mountain Shagreen	T	Occurs in restricted habitat on Mt. Magazine. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Alligator mississippiensis</i>	American Alligator	T	Found on St. Francis NF. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Sterna antillarum</i>	Interior Least Tern	E	Found on St. Francis NF. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Campephilus principalis</i>	Ivory-billed Woodpecker	E	Not reported on the Ozark National Forest. No element of occurrence records or potential habitat in the analysis area	NO EFFECT
<i>Myotis grisescens</i>	Gray Bat	E	No occurrences within 19 miles of the project, but potential habitat does exist	NO EFFECT
<i>Myotis sodalis</i>	Indiana Bat	E	No occurrences within 19 miles of the project, but potential habitat does exist	May Affect Not Likely to Adversely Affect
<i>Corynorhinus townsendii ingens</i>	Ozark Big-eared Bat	E	Not reported on the Big Piney Ranger District, but potential habitat does exist	NO EFFECT

**EXHIBIT F – Notification Letter to Processing Office of a  
Finding of No Significant Impact Letter**



**SUBJECT:** Ozark Mountain Regional Public Water Authority  
Long Term Regional Water Supply  
Finding of No Significant Impact

**TO:** Rural Development Area 1 Office  
Harrison, Boone County, Arkansas  
Attn: Bill Rowland, Area Specialist

In accordance with 7 CFR Part 1794, Rural Utilities Service's Environmental Policies and Procedures, I have reviewed and approved a Finding of No Significant Impact for the above project. To inform the public of our decision, please direct the applicant to publish the appropriate public notice. An example of a public notice for the Finding of No Significant Impact can be found in Appendix B-4 in Bulletin 1794-602.

If you have any questions, please contact Larry Duncan, State Environmental Coordinator at 501-301-3269.

for

**CHERRY L. SMITH**  
Acting State Director  
Rural Development

**August 24, 2009**

Date

**EXHIBIT A – Environmental Report/Environmental Documentation  
Acceptance Letter**



August 24, 2009

**SUBJECT:** Ozark Mountain Regional Public Water Authority  
Long Term Regional Water Supply  
Exhibit A – Environmental Report/Environmental Documentation

**TO:** Area 1 Office  
Harrison, Boone County, Arkansas  
Attn: Bill Rowland, Area Specialist

**FROM:** Larry Duncan  
State Environmental Coordinator

I have reviewed the Environmental Report/Environmental Documentation for the Ozark Mountain Regional Public Water Authority's Long Term Regional Water Supply project and have made the following determinations:

**CONCURRENCE WITH CLASSIFICATION OF PROPOSAL**

- Categorical Exclusion with an Environmental Report (7CFR 1794.22(b) and (c))
- Environmental Assessment (7 CFR 1794.23 (a) and (b))

**ACCEPTANCE OF ENVIRONMENTAL REPORT/ENVIRONMENTAL DOCUMENTATION.**

- Acceptable
- Unacceptable. In order to bring the report into compliance with regulatory and Agency requirements please address the items listed in Exhibit B.

**PUBLIC NOTIFICATION REQUIREMENTS**

Please inform the applicant to publish the following public notices in the non-classified section of newspapers of local circulation:

- CATEGORICAL EXCLUSION**
- NO PUBLIC NOTICE REQUIRED**
- PRELIMINARY NOTICE**

The items checked shall be included in this public notice:

- Important Farmland (conversion of)
- Floodplains (Facility construction in, not utility lines)
- Wetlands (Facility construction, not utility lines)
- Cultural Resources (Adverse Effect of)

**ENVIRONMENTAL ASSESSMENT**

**NOTICE ANNOUNCING THE AVAILABILITY OF ENVIRONMENT ASSESSMENT**

If any of the following are checked integrate the information normally included in a Preliminary Notice.

- Important Farmland (Conversion of)
- Floodplains (Facility construction in, not utility lines)
- Wetlands (facility construction in, not utility lines)
- Cultural Resources (Adverse effect of)

**FINDING OF NO SIGNIFICANT IMPACT**

**SEE EXHIBIT C FOR SPECIFIC PUBLIC NOTICE REQUIREMENTS**

If you have any questions, please call me at 501-301-3269.



Larry Duncan  
State Environmental Coordinator

**EXHIBIT D – Recommendation of a Finding of No  
Significant Impact Letter**




**SUBJECT:** Ozark Mountain Regional Public Water Authority  
Long Term Regional Water Supply  
Recommendation of a Finding of No Significant Impact

**TO:** Cherry L. Smith  
State Director

I have reviewed the environmental documentation for Ozark Mountain Regional's New Water Supply project. In accordance with 7 CFR Part 1794, Rural Utilities Service's Environmental Policies and Procedures, the proposed project meets the classification criteria for an Environmental Assessment. The public review period is complete and all public comments and outstanding issues have been addressed and resolved to the extent practicable. Therefore in accordance with 40 CFR 1508.13, I recommend that the Agency issue a determination that the proposed project will not have a significant effect on the human environment and that an Environmental Impact Statement will not be prepared.

Attached for your approval is the Finding of No Significant Impact document. Please sign, forward the document to the Rural Development processing office and the attached cover letter and have them request that the applicant publish a public notice informing the public of our decision.

  
Larry Duncan  
State Environmental Coordinator  
Rural Development

August 24, 2009  
Date



**EXHIBIT E – Finding of No Significant Impact Letter**

**SUBJECT:** Ozark Mountain Regional Public Water Authority  
Long Term Regional Water Supply  
Finding of No Significant Impact

**TO:** Project File

The attached Environmental Assessment has been prepared and reviewed in accordance with the National Environmental Policy Act, as amended (42 U.S.C. 6941 et seq.); the Council on Environmental Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Parts 1500-1508); and 7 CFR Part 1794, Rural Utilities Service's Environmental Policies and Procedures. Upon review of the environmental documentation included and referenced in the Environmental Assessment, I find that the proposed project will not have a significant impact on the human environment and for which an Environmental Impact Statement therefore will not be prepared.

A handwritten signature in cursive script, appearing to read 'Cherry L. Smith', written over a horizontal line.

*for* CHERRY L. SMITH  
Acting State Director  
Rural Development

**August 24, 2009**

Date

*Delivered to the Daily 9-24-09*



community publishers

# Harrison Daily Times

PO BOX 40 \* 111 West Rush Avenue \* Harrison, AR 72601 \* Phone (870)741-2325 \* FAX (870)741-5632

## Affidavit

Before me, a notary public, personally appeared CAROL LAWSON, who being duly sworn, states that the following ad(s)

*Notice*

Appeared in the Harrison Daily Times on:

*SEP. 1, 2 & 3*

For *Clark Mt Regional public water Authority.*

Cost \$ *901.44*

*Carol Lawson*  
CAROL LAWSON  
Business Manager

State ARKANSAS

County Boone

Sworn to and subscribed before me

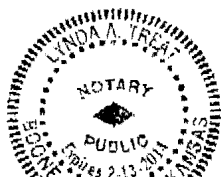
This 8<sup>th</sup> day of September, 2009.

Notary Public Seal

*Linda A. Treat*  
Notary Public Signature

My Commission Expires

2-13-2014



more daughter-in-law mentioned that her honor would be up to me about a I was initially stic, but upon 1, thought this ld a greater bur- hose planning to ic wedding. Is it late to hold a when it is a desti- redding? I feel a arressed to send as to my family s.

—Deborah

Deborah: If the takes place where i lives, it actually an opportunity s who are unable l the wedding to : with the bride- ther way, only sts should be with the excep- ie mothers and thers of the bride m. Those who cessive can

Annie: This is in to "Not Family ose fiance's molested his d sister and the is kept the secret aps. Covering up social embarrass- like hiding evi- a crime. eds to tell her at she cannot to a family that nspire to come- ne against chil- d that the family ; need to seek grandpa and re sister-in-law, ill have no choice eak off the ent and call the es. I know from experience the ffect childhood use causes.

—Been There

bird showed no physi- cal signs of trauma. After he was notified of the dead bird, Bunch contacted the Harrison Animal Control officer who came and retrieved the dead swan. He was later told that nothing on the outside seemed array.

Bunch speculated that the bird might have



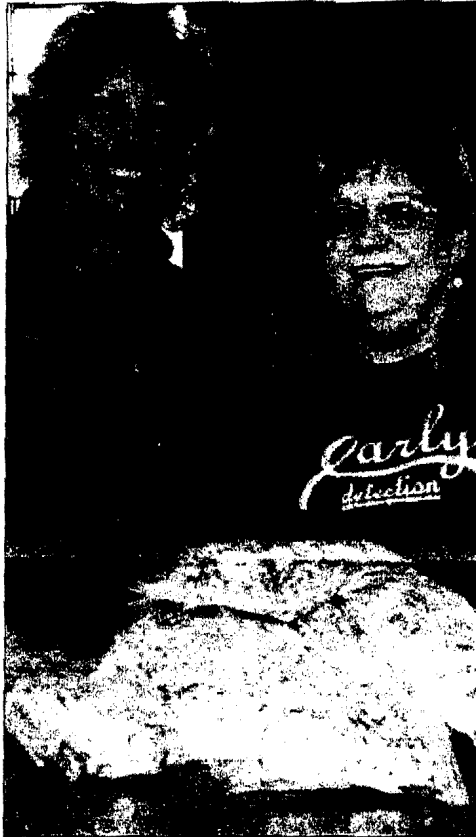
FILE PHOTO

This pair of mute swans appeared on Lake Harrison this summer, and were inseparable until one of them was found dead of undetermined causes several weeks ago. The widowed swan has stayed on the lake.

ingested a lead fishing sinker or something else from the bottom of the

lake. Earlier this year, two of the trumpeter swans

from the Boxley pond paid a short visit to Lake Harrison.



LEE H. DUNLAP/STAFF

## TABS FOR RONALD

Patty Turney (right) presents 7,200 pop tabs to Robin Reeves of the Harrison McDonald's. The tabs will be sent to St. Jude's Hospital to help operate the Ronald McDonald House there. Turney is a breast and kidney cancer survivor.

## Iron deficiency may lead to anemia

Doctors at the hospital who took a real look at the records and found the problem had been there for a long time. The description of acid- ity for about 10 years. Medication that bit iron from the system. Bingo! This has happened. We have heard a lot of our neighbors and acquaintances have been on

throughout the body. The result is fatigue, weakness, shortness of breath, poor appetite, irritability, a pale or ashen color to the skin and more.

The most common reasons for this condition are blood loss, a lack of iron in the diet and an inability to absorb iron. Afflictions such as Crohn's or celiac disease affect the intestine's ability to absorb nutrients from digested

fibroids or to identify other causes of heavy menstrual bleeding.

Unfortunately for my partner, he was late being diagnosed and his quality of life suffered dramatically. Fortunately, he finally found someone who took the time to get a complete history to include his medications and the physician made the connection. At long last, he is on the right track.

Gather Your Items for Deb's Annual

# Fall Frame Sale

**20% OFF** Now thru Sep. 12<sup>th</sup>

Custom or ready-made frames

Deb's Frames and Things

70-741-6070

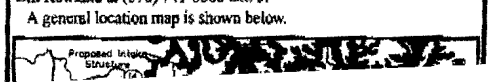
## Notice of a Finding of No Significant Impact

The USDA, Rural Utilities Service has received an application for financial assistance from the Ozark Mountain Regional Public Water Authority. The proposal consists of a regional water system to serve approximately 20 municipal and rural water systems in Newton County, Searcy County, and portions of Boone and Marion Counties. The proposed project includes a water intake structure on Bull Shoals Lake, a water treatment facility west of Lead Hill, water transmission mains, water storage tanks, and booster pumping facilities. The proposed project will avoid designated wetlands, avoid historic properties, and not convert any important farmlands.

As required by the National Environmental Policy Act and agency regulations, the Rural Utilities Service prepared an Environmental Assessment of the proposal that assessed the potential environmental effects of the proposal and the effect of the proposal may have on historic properties. The Environmental Assessment was published on July 7th, 8th, and 9th, 2009 for a 30-day public comment period. One letter was received in support of the overall project and requested review of the Environmental Report. A copy of the Environmental Report was made available for review on July 28, 2009 to meet this request. Upon consideration of the applicant's proposal, federal and state environmental regulatory and natural resource agencies have assessed the potential environmental effects of the proposed project and determined that the proposal will not have a significant effect on the human environment and for which an Environmental Impact Statement will not be prepared. The basis of this determination was arrived at through contact with federal agencies, state agencies, local agencies, and general public in accordance with NEPA procedures.

In order to avoid or minimize any adverse environmental impacts, the Rural Utilities Service will require the applicant to incorporate the certain mitigation measures into the proposal's design. These measures include implementing Best Management Practices; obtaining all required permits; water mains routed to avoid wetlands, historical properties, and glades; provide an on-site archeologist for SHPO Site #3SE265; cease work if cultural materials are encountered until investigated and resolved; cease work if a cave is found within 300 ft of construction and notify the U.S. Fish and Wildlife Service; restore land to original slopes and grades; mist net surveys required for Indiana Bats before timber is cut on U.S. Forest Service land between March 16th and November 30th; Storm Water Pollution Prevention Plan submitted to the Arkansas Department of Environmental Quality; attach water mains to vehicular bridges when crossing the Buffalo River; prohibit use of herbicides and pesticides on federal properties; and obtain water allocation from the U.S. Army Corps of Engineers.

Copies of the Environmental Assessment can be reviewed or obtained at the Rural Development office at 402 North Walnut Street, Suite 219, Harrison, Arkansas 72601. For further information, please contact Mr. Bill Rowland at (870) 741-8600 ext. 5.



Amme: This is in  
 ve to "Not Family  
 those fiance's  
 a molested his  
 nd sister and the  
 nas kept the secret  
 wraps. Covering up  
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 of a crime.  
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 nent and call the  
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 l experience the  
 effect childhood  
 abuse causes.

—Been There



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## Iron deficiency may lead to anemia

the doctors at the  
 l who took a real  
 he sorted through  
 records and found  
 npanion had been  
 prescription acid-  
 medicine for about  
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R READER: Iron-  
 cy anemia is a con-  
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 provide energy.  
 : significant iron,  
 y cannot produce  
 hemoglobin, a  
 ent in red blood  
 allows oxygenat-  
 d to be carried

throughout the body. The  
 result is fatigue, weakness,  
 shortness of breath, poor  
 appetite, irritability, a pale  
 or ashen color to the skin  
 and more.

The most common rea-  
 sons for this condition are  
 blood loss, a lack of iron  
 in the diet and an inability  
 to absorb iron. Afflictions  
 such as Crohn's or celiac  
 disease affect the intes-  
 tine's ability to absorb  
 nutrients from digested  
 food. And some medica-  
 tions, such as those taken  
 for combating excess  
 stomach acid, are known  
 to interfere with iron  
 absorption. Thus, I'm  
 quite surprised your part-  
 ner's primary-care physi-  
 cian, who prescribed the  
 medication, was in the  
 dark.

Diagnostic testing to  
 identify possible underly-  
 ing causes includes  
 endoscopy, colonoscopy  
 and ultrasound (for  
 women). The endoscopy  
 you refer to was to discover  
 a possible bleed from an  
 ulcer or hiatal hernia. A  
 colonoscopy zeros in on  
 possible bleeding from the  
 colon. Ultrasound is  
 ordered to rule out uterine

fibroids or to identify  
 other causes of heavy  
 menstrual bleeding.

Unfortunately for your  
 partner, he was late being  
 diagnosed and his quality  
 of life suffered dramati-  
 cally. Fortunately, he finally  
 found someone who took  
 the time to get a complete  
 history to include his med-  
 ications and the physician  
 made the connection. At  
 long last, he is on the right  
 track.

Dr. Peter Gott is a  
 retired physician and the  
 author of the book "Dr.  
 Gott's No Flour, No Sugar  
 Diet," available at most  
 chain and independent  
 bookstores, and the  
 recently published "Dr.  
 Gott's No Flour, No Sugar  
 Cookbook."

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A general location map is shown below.

