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## Lake Maumelle Watershed

The Lake Maumelle Watershed includes all the land and streams that drain into Lake Maumelle, which provides cities and communities in Central Arkansas with drinking water. The watershed consists of 86,000 acres (137 square miles), with approximately 90% covered in forest. Because the forested vegetation in the watershed provides a filter for contaminants, Lake Maumelle has good water quality.

The sandstone of the Ouachita Mountains weathers into sandy soil, which is favorable to pine trees. The Lake Maumelle Watershed is primarily an oak-pine forest, with great diversity in vegetation. Rare species of biological concern in the watershed include the Marsh Partridge, Clark Chipping Sapsucker, the endangered Darter, and other species of interest to the Osprey, or Osprey, Black-throated Bluebird that lives in the Upper Big Maumelle River.



The Lake Maumelle Watershed is located in the east-central portion of the Ouachita Mountains and lies within Perry, Yellow, and Phillips counties. Photo courtesy of Bruce Baker.

## A Place Worth Protecting

If it rained just 100 meters downstream, it would enter Lake Maumelle and potentially be a biocide, a species whose presence or absence "indicates" the health of an ecosystem. Keeping Bivalves/Shellfish in acidic conditions with low nutrients. If they begin to die, this would indicate that Lake Maumelle could have a problem with an increase in nutrients.

Recreation in the Lake Maumelle Watershed includes fishing, water skiing, and other outdoor activities. The Ouachita National Wildlife Refuge, a 10,000-acre refuge that is considered a bioreactor of water quality.

Excursions. Popular sport fish species in Lake Maumelle include bass, catfish, crappie, and brook trout. Several fishing parties, or boat races, are held throughout the year in Lake Maumelle. The Ouachita Trail, which extends 223 miles through the Ouachita Mountains, starts in Oklahoma and ends near the Lake Maumelle Watershed at Pinnacle Mountain State Park.

Although the Lake Maumelle Watershed is highly forested, about half of the watershed is potentially developable. Agriculture, commercial, and residential land uses are expected to expand in the watershed. Attention must be focused on impacts of this proposed development in order to maintain good quality drinking water, habitat, and living space for extended residents.



Ouachita willow, a 10,000-acre refuge that is considered a bioreactor of water quality. Photo courtesy of Bruce Baker.

## Protecting Lake Maumelle

Utilizing Management Areas within the Watershed

Watershed boundaries are drawn using natural divisions within the landscape: mountains, hills, or high points. These ridges, or high points, are drawn on a map to show the "load line" area that drains water into a river or lake.

The Lake Maumelle watershed is divided into three management areas based on the risk created by potential development in each area. The location of steep slopes, development, timber harvesting, and the drinking water intake were factors in critical area designation. The management areas are named Critical Area A, Critical Area B, and the Upper Watershed. Water travel time was assessed using computerized modeling techniques. Water travel time from watershed to intake is determined by the lay of the land and water bodies.

Management divisions within the watershed, as designed with Critical Areas A, B, & UW, help local decision-makers make more informed decisions about activity within the watershed.



## Birds of Lake Maumelle

Good for the Watershed, Good for the Birds

Birds, like people, require a healthy, clean environment to thrive. When environmental degradation is compromised, both birds and people feel the effects. However, birds are more susceptible to changes in the environment than people. When bird populations show signs of distress, this is an indication that something is out of balance in nature. Bird population workbooks are in decline from changing conditions such as habitat loss and pollution. While something needs to be done globally to address these issues, the way to start is in your own watershed.



Great Egret. Photo courtesy of Tom Rupp.



Osprey in flight. Photo courtesy of Bruce Baker.

If you are looking for recreational birding opportunities, look no further than the forested shoreline of Lake Maumelle, which provides ample nesting or viewing for Bald Eagles and Osprey, Loons, waterfowl, and gulls congregating in winter. The lake also attracts birdwatchers seeking rarely seen species such as Red-throated Loon, Red-necked Grebe, and Black, Surf, and White-winged Scoters. Pinnacle Mountain State Park offers cruises to give you a closer look at eagles and loons. Exploration and birding around Lake Maumelle offers a better appreciation of the high quality water and habitat provided by the lake and watershed, but only if we work to protect it.



Red-tailed Hawk. Photo courtesy of Bruce Baker.

## Landowner Best Management Practices

What Can You Do for Lake Maumelle?

Current water quality conditions in Lake Maumelle are very good, but the ability to protect and maintain these conditions is potentially threatened unless best management practices (BMPs) are implemented. What are these BMPs?

**New Development**  
Direct wastewater discharges from development pose the most serious and dominant threat to Lake Maumelle. In addition, land clearing increases erosion and sedimentation, decreases the filtering capacity of the land, and increases the amount of impervious surfaces contributing to run-off.

**Improvement & Maintenance of Existing Roads**  
Upgraded roads are a major source of sediment load to Lake Maumelle. Minimizing the impacts of roads can be accomplished through proper road design, road surface, and road drainage particularly in steeply sloped areas.



The top image is an example of a good BMP which intercepts a large ditch drain. The lower image shows the soil loss and bank damage that a poorly designed road causes. Photo by Brandon Day.

**Forestry Practices**  
Problems may occur when land is timbered and proper BMPs are not employed. Forestry BMPs must be implemented in order to reduce soil loss and maintain the productivity of forest stands. BMPs can be found in the "Forest Management Guide for Arkansas" Forest Landowners" available for download from the Arkansas Forestry Commission Web site at <http://www.arkforestry.com> or by calling (501) 290-1942.

**Land Acquisition**  
Acquisition of conservation land emphasizes permanent preservation of land around water body sources. Land conservation reduces the risk of conventional pollutant runoff reaching the streams and lake, reduces treatment costs, and maintains consumer confidence in the drinking water supply.

## Watershed Management Measures For Lake Maumelle

A Plan for the Future

In 2006, Central Arkansas Water (CAW) hired Tetra Tech, Inc. to conduct a scientific watershed study and facilitate the development of a watershed management plan. Recognizing the importance of the watershed to stakeholders, CAW emphasized public involvement in the process. Input was sought from the public through a public advisory committee and public meetings.

The resulting watershed plan, adopted by the CAW Board of Commissioners in February 2007, established a goal of maintaining a long-term, abundant supply of high-quality drinking water for present needs and ensuring growth of the community, while providing an equitable sharing of costs and benefits for protecting Lake Maumelle. Management recommendations were made according to three general categories:

**1) Recommended New Regulations**  
Regulations are one of the potential tools in a watershed management plan. While voluntary strategies like those mentioned below are considered important, the growing demand for houses and roads in the watershed has significantly increased the need for regulations. To prevent degradation of the lake, resulting from development, the watershed management plan recommends regulations focused on construction and post-construction activities, wastewater impacts, and streamflow improvements. Primary among these is the prohibition of surface discharges of wastewater in the watershed. Recommended controls on construction and post-construction include storm water management, minimum lot size, undisturbed areas, and minimizing impervious areas.

**2) Recommended Management Actions**  
These are approaches CAW and others may take to improve their ability to protect the watershed.

**Acquire Conservation Land (CAW)**  
CAW currently owns 15 miles of land around Lake Maumelle.



Photo courtesy of Bruce Baker.

**Land and Lake Management Practices (CAW)**  
Management of recreational opportunities on the lake and on CAW land is an important means of preserving the drinking water source. Low impact recreational opportunities promote good will and good stewardship within our community.

**3) Voluntary Stewardship Recommendations**  
Landowners and homeowners of large properties within the watershed play an important role regarding management strategies protective of water quality. Voluntary stewardship practices are an alternative to regulations. By implementing a voluntary stewardship program, it is possible to maintain healthy water quality and limit local ordinances and regulations.

**Forest Practices**  
Well managed forested areas within the watershed serve an important role in maintaining good water quality. Sound forest management practices and good BMPs enhance sediment, nutrients, and other pollutants from entering the watershed.

**Livestock Management**  
Agriculture landowners may also practice good BMPs. The Lake Maumelle Watershed Management Plan suggests strategies to minimize production of excess nutrients in the watershed.

**Household Practices**  
Residents in the watershed can manage their impact by giving consideration to disposal of household chemicals and paints, landscaping and gardening practices, unpaved driveways, septic system maintenance, and water, electrical, and automobile maintenance.

To read the full Lake Maumelle Watershed Management Plan, visit <http://www.caaw.com> or call Central Arkansas Water at (501) 377-1200.



## What is a Watershed?

A Piece of the Ecosystem Puzzle

Wherever you are, you are in a watershed. A "watershed" is an area of land that drains into a river and carries water into a particular lake or river. Because gravity takes water downhill, all water is constantly being "churned" over and through land into bodies of water.

Watersheds can range in size from subwatersheds of a few square miles to larger watersheds like the Lake Maumelle Watershed, which is 137 square miles. Watersheds can even cover thousands of square miles, like the Mississippi River Watershed, which drains a large portion of the continental United States.

Watershed protection is a key piece of the ecosystem puzzle. Considering water quality in terms of a watershed helps us better understand the connection between our activity within the watershed and the water quality of Lake Maumelle.



Illustration courtesy of Mississippi Riverkeeper (City of Memphis and Environmental Affairs). Central Arkansas Water and Audubon ARKANSAS.

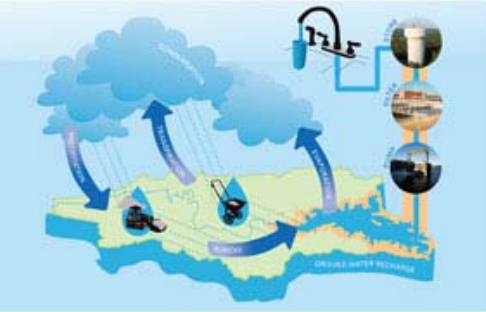
## Lake Maumelle Water Cycle

Water Movement within the Watershed

The water cycle describes the movement of water on, above, and below the surface of the Earth. When water moves from a liquid to a gaseous state, it is called evaporation. Water evaporates directly from Lake Maumelle and from the many trees and plants in the forested watershed. When water evaporates from the surface of plant leaves and stems, the process is called transpiration. The forest areas bound within the watershed play an important role in the water cycle and therefore water conservation. Water, in the atmosphere as a gas, will undergo the process of condensation, where it forms fog or clouds. From clouds, water becomes precipitation in the form of rain, snow, or sleet.

Precipitation reproduces water into the watershed. When a raindrop falls in the Lake Maumelle Watershed it flows over the landscape, into streams, the Big Maumelle River, Lake Maumelle, and eventually out of the consumers' household tap. As the raindrop flows over land within the watershed, it is affected by how the land has been used. Water quality in Lake Maumelle decreases if runoff from the watershed carries contaminants such as fertilizers, oil, gas, and sediments to the lake.

To get the water to the customer, Central Arkansas Water pumps water from Lake Maumelle, at a water intake station, to treatment facilities where the lake water is processed to meet federal and state drinking water requirements. It is then transported to the customer and flows from the tap when needed. Beyond quality water enters the intake station, filtration and treatment of drinking water may become more costly for Central Arkansas Water.



## History of Lake Maumelle

Fifty Years and Counting

Beginning in the early 19th century, letters along the Arkansas River obtained drinking water from small stream tributaries near what would later be known as Little Rock. Later, in 1837, councilmen in the newly incorporated town of Little Rock would lay the groundwork for the city's first public water system in the form of a network of public cisterns used to collect rainwater. This early water system was fiercely protected by councilmen and used solely for fire protection within the growing city. Residents were dependent on natural springs and dug wells for their drinking water. By 1865, the population of Little Rock, which had grown to a substantial 3,700 residents, depended more and more on cistern water to supplement their drinking water. The remainder of the century would bring a flurry of activity with councilmen regularly addressing water issues in order to sort out the firing of water works companies, building a new water system, and installing hydrants and water mains throughout the city. The council would regularly revisit the early site structures including the special flat rate costs of water supply for residential water supply.

Lake Maumelle has been serving drinking water to Central Arkansas since 1936. Construction began on Lake Maumelle after extensive consideration of two sites: the North Fork River near Conroy, 25 miles west of Little Rock, or the Big Maumelle River, just 11 miles northwest of Little Rock. Although both sites were deemed sufficient, the Big Maumelle was chosen due to comparative costs. On June 3, 1936, water began flowing from Lake Maumelle, and the City of Little Rock completely abandoned the use of the Arkansas River as a water supply for the first time in 80 years. Today, Lake Maumelle serves more than 400,000 customers and multiple communities in Central Arkansas. In 2001, the Little Rock Municipal Water Works and the North Little Rock Water Department merged to become Central Arkansas Water (CAW), the Greater Little Rock-North Little Rock metropolitan water service provider.



Workers install sections of the intake piping for a pump. Photo courtesy of Central Arkansas Water.



An early Arkansas Water Works and Pollution Control Association (LAWPCWA) meeting held on June 3, 1936. Photos were believed to have been taken in the old Ballroom Auditorium where the Little Rock Municipal Water Works staff office was located until October 1975. Photo provided by Central Arkansas Water.