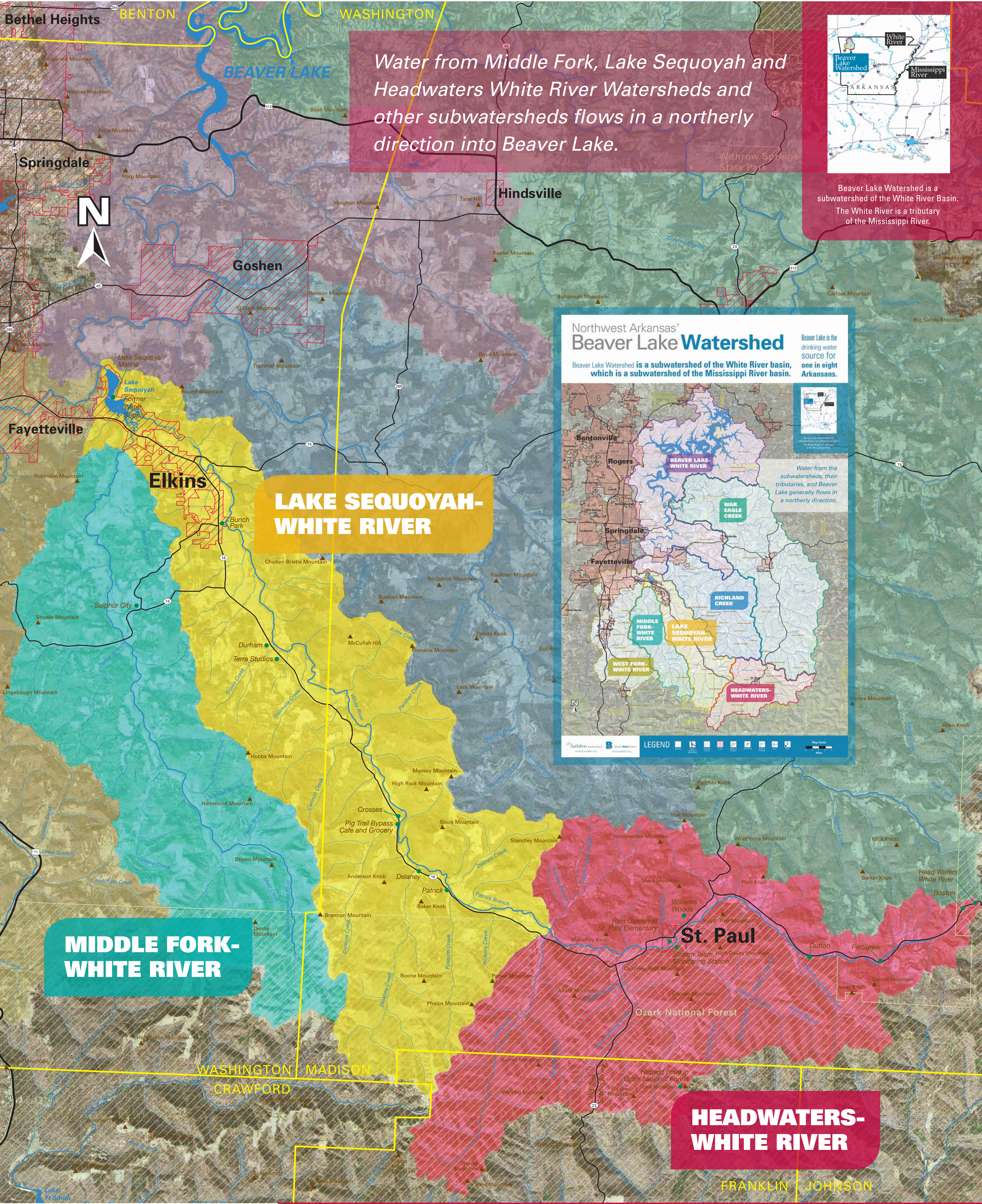


Northwest Arkansas' Middle Fork, Lake Sequoyah and Headwaters-White River Watersheds

are three of seven subwatersheds in the Beaver Lake Watershed.

Beaver Lake Watershed is a part of the White River Watershed.

Beaver Lake is the drinking water source for one in eight Arkansans.



The Middle Fork, Lake Sequoyah, and Headwaters of the White River Watershed

In Northwest Arkansas, quality of life and economic prosperity rely greatly on the health of Beaver Lake and its watershed. The lake provides drinking water to more than 350,000 people and industries. Beaver Lake’s watershed is a subwatershed of the White River Basin, and within Beaver Lake Watershed are seven subwatersheds. This map highlights three of the subwatersheds, encompassing 517 miles of roads and 357 miles of streams. The origin of the White River is a farm pond north of Highway 16 in rural Madison County, in Headwaters subwatershed. The approximate elevation of the source is 2,250 feet above mean sea level. From here it flows 722 miles to its confluence with the Mississippi River in Desha County, Arkansas.



This farm pond is the origin of the White River.



History of the White River Headwaters

Rivers, Roads, and Rail: The Booming Era of St. Paul

For part of its journey, the path of scenic Highway 16 weaves its way through the Boston Mountains and eventually passes through the small sleepy town of St. Paul, which is nestled near the headwaters of the White River. Homesteads that have been abandoned and churches coping with dwindling attendance belie the rich history of this once booming timber town.



Old swing bridge near St. Paul, early 1900's

Photo courtesy of Shiloh Museum of Ozark History
Willie Bohannon Collection (S-83-82-52)

Over two centuries ago, settlers began carving homesteads and small towns into the hills and valleys surrounding the White River, but the population remained sparse and the communities primarily consisted of sustenance farmers. For St. Paul, at least, this all changed amid the westward expansion of the United States in the latter half of the 19th century. During this time period, the demand for railroads exploded and with it came new opportunities for supporting industries. When trains rolled into the area in 1887, St. Paul wholeheartedly embraced these opportunities. What was once essentially a collective of a few farms became St. Paul when lumber and railroad tie industries were developed from the surrounding lush forest.

Numerous sawmills were constructed along the banks of the White River, whose currents served as the primary mechanizing agent for the industry



Swimming at Elkins bridge, early 1900's

Photo courtesy of Shiloh Museum of Ozark History
History Gary King, Reba (Ferris) Lanson Collection (S-98-2-470)

What is a Watershed?

What does it contain?

A “watershed” is the area of land that catches rain and snow which drains or seeps into a marsh, stream, river, lake, or groundwater. Tributaries are smaller streams that flow into other larger streams.

Watershed protection is a key piece of the ecosystem puzzle. Watershed conservation encourages proper land use and uniform protection of tributaries within the watershed.

Watersheds contain:

- Businesses
- Industries
- Farms
- Forests
- Homes
- Lakes
- Pastures
- Riparian zones
- Rivers & Streams
- Wetlands
- Wildlife



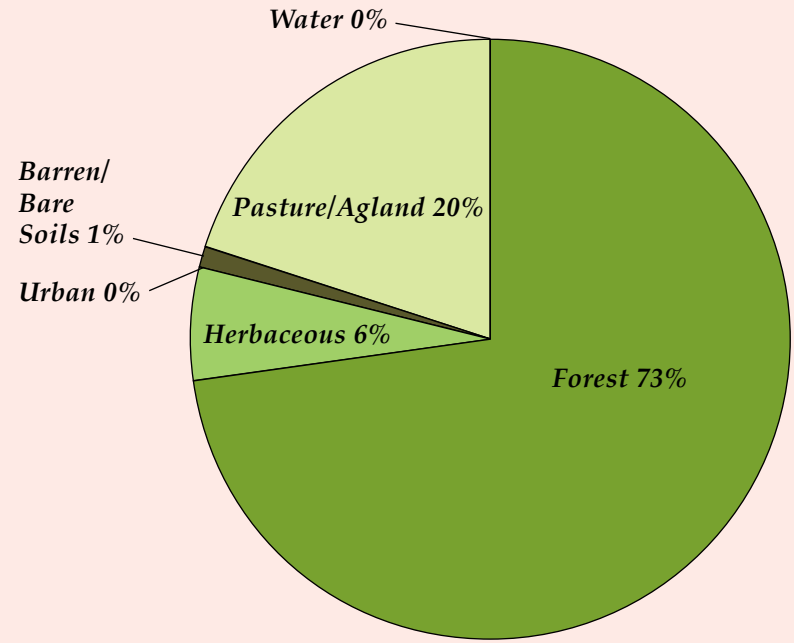
Illustration courtesy of Massachusetts Executive Office of Energy and Environmental Affairs

© 2009 Beaver Water District

The Middle Fork of the White River

A Beaver Lake Subwatershed

This subwatershed shares many of the same geologic features and land use distribution as the Lake Sequoyah subwatershed. Significant urban growth has occurred in the lower reaches of the watershed, while the upper reaches remain dominantly rural. This subwatershed is comprised of 48,410 acres extending through Washington County and into Madison County. Potential threats to water quality include runoff from pasturelands in the upper reaches and on-site septic systems that are being used in the rural areas of the lower reaches. There are 99 miles of streams within this subwatershed, all of which may easily reach flash-flood stage during storm events. During these events, excess nutrients and sediment are washed from fields, lawns and roads into the streams.



Landcover in the Middle Fork-White River subwatershed

Data from the University of Arkansas East Project, 2004

Farmers Taking Care of the Watershed

Implementing Best Management Practices

On any given day, Stacy Cheevers herds beef cattle, bales hay, mends fences, and monitors broiler flocks on his farm in the Middle Fork-White River watershed in Washington County. Cheevers knows firsthand why it is important to take care of the watershed. That's because when he's not farming, he's usually at Beaver Water District, where he serves as Plant Manager for the drinking water facility. The quality of the raw water in Beaver Lake depends upon the health of the watershed that drains to the lake. The higher the water quality in the lake, the less it costs to treat water to make it safe for human consumption. Best Management Practices (BMPs) Cheevers implements on his farm include:

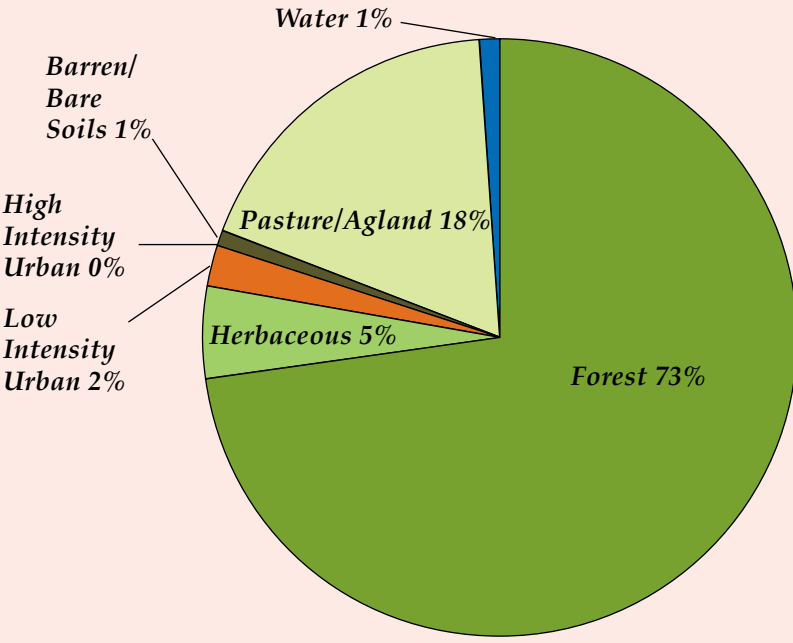
- Using alum as a litter amendment to reduce the amount of soluble phosphorous in the soil where litter is applied.

- Not allowing livestock to water directly from the river.
 - Observing buffer strips around the river and unrolling hay bales to prevent foliage loss and erosion.
 - Building a stacking shed, where litter can be stored safely from the elements until it is applied to land as fertilizer.
- BMPs help protect Beaver Lake. For example, if poultry litter isn't stored properly, it can get wet and seep into the groundwater and into the watershed, which drains into Beaver Lake. Poultry litter contains phosphorous. Excess phosphorous in water can lead to algal growth that depletes oxygen and leads to taste and odor in water.

Lake Sequoyah-White River

A Beaver Lake Subwatershed

This subwatershed encompasses 70,838 acres in an area that spans portions of Washington, Madison, Franklin, and Crawford counties and includes 223 miles of roads and 143 miles of streams within its borders. Located in the northernmost section of the subwatershed is Lake Sequoyah, a 490-acre man-made lake used primarily for recreational fishing. This is the most heavily populated of the three subwatersheds featured here. The 2000 census found a population increase of 42.2% during the previous decade. Water quality concerns in this subwatershed are directly related to the subsequent increase in housing that depends on on-site septic systems. An additional factor that can negatively affect water quality is the loading of nutrients caused by runoff from pastureland.



Landcover in the Lake Sequoyah-White River subwatershed

Data from the University of Arkansas East Project, 2004

Cheevers said his future goals include implementing a spraying regimen, implementing a rotational grazing program, and reducing average cow size in order to become more efficient.



Lauren Cheevers poses in front of the stacking shed where used poultry litter can be stored safely from the elements until it is applied to land as fertilizer. This protects water resources. If litter isn't stored properly, it can get wet and seep into the groundwater and into the watershed, which drains into Beaver Lake.

The Cheevers' family—wife Joyce, and daughters Lauren, Alicia, and Ashdon—received the honor of being selected as Washington County's 2008 Farm Family of the Year for outstanding farming practices. Their farm is located four miles south of Elkins on Harris Community Road. They operate 1,008 acres with 300 acres in hay production and 300 beef/calf pairs and 270,000 broilers per year. They market crops and livestock primarily through the local sale barn. Cheevers said his future goals include implementing a spraying regimen, implementing a rotational grazing program, and reducing average cow size in order to become more efficient. For more information about BMPs and how to implement them on your farm, contact The Washington County Cooperative Extension Service at 479-444-1755 or visit <http://www.uaex.edu/washington/>.

Good Watershed Residents

Build Rain Gardens

St. Paul students are busy diverting rain water so that it soaks into the ground. Sixth-grade teacher Anita Lawrence noticed a problem with gutters overflowing and gravel in the roadway by the school. She wanted to improve the way the school looked while being environmentally conscious about it and creating educational opportunities for study. “We always study the migrating monarchs in the fall and we tag them,” she said. Environmental educator Louise Mann encouraged Lawrence to apply for a grant from the Greenlaw Environmental Education Endowment, established through the Johnson County Community Foundation, for money to build a butterfly/rain garden.



This rain garden was installed at the St. Paul school to soak up storm water runoff and to attract butterflies.



Recycle

Nestled in the backwoods of the upper watershed of the White River is Arkansas' only fully equipped Convenience Center. Set in rural Madison County, not far from St. Paul, the South Madison County Convenience Center accepts all the waste and recyclables from a wide area. The trash and recycling facility is a one-stop drop, similar to the county's award winning Recycling Center in Huntsville located 28 miles away. “People need services in the outlying areas, and the Convenience Center reaches out to a population, some who are 50 miles from disposal services,” says Larry



Madison County Convenience Center

Karigan-Winter, Director, who designed and oversaw construction. “We are especially proud to have this center be the second county-owned collection center to

With 78% of all the land in Madison County draining into Beaver Lake, we believe it is critical to protect the watershed from the waste we create.

accept all household hazardous waste free of charge. We work hard to educate our citizens to bring us their motor oil, paint, bad gasoline, chemicals, batteries, solvents, and other hazardous waste that for years was improperly disposed for lack of services. With 78% of all the land in Madison County draining into Beaver Lake, we believe it is critical to protect the watershed from the waste we create.” The South Madison County Convenience Center is located ¾ mile east of highways 16 & 23 junction heading toward Pettigrew. The Center is staffed, fenced, landscaped and looks like a park. Hours are 8:30 a.m. to 2:30 p.m. on Tuesday and 9 a.m. to noon on Saturday. Call 479-738-6351 for information.

Monitor Streams



Madison County Stream Team Spring 2009

The Madison County Stream Team, based at the St. Paul High School, was formed in the fall of 2008. Led by teacher Karen Lisle, student volunteers monitor the White River as it flows through St. Paul, which is only a 5 minute walk across the road from their school. Students monitor physical and chemical water quality indicators such as pH, turbidity, phosphate, hardness, nitrate, oxygen and temperature.

In addition, they monitor organisms that live in the stream and serve as indicators of water quality. Students use a “kick” net to capture small organisms,

known as macroinvertebrates, which lack an internal skeleton but are large enough to see with the naked eye. Macroinvertebrate populations are affected by water



A member of the team conducts a nitrate test using a colorimeter.

quality. They can be significantly impacted by changes in environmental conditions resulting from pollution. By identifying these organisms and monitoring their changing populations, students can detect trends in water quality over time. Results from student monitoring are collected and shared with Arkansas Stream Teams, a program of the Arkansas Game and Fish Commission.

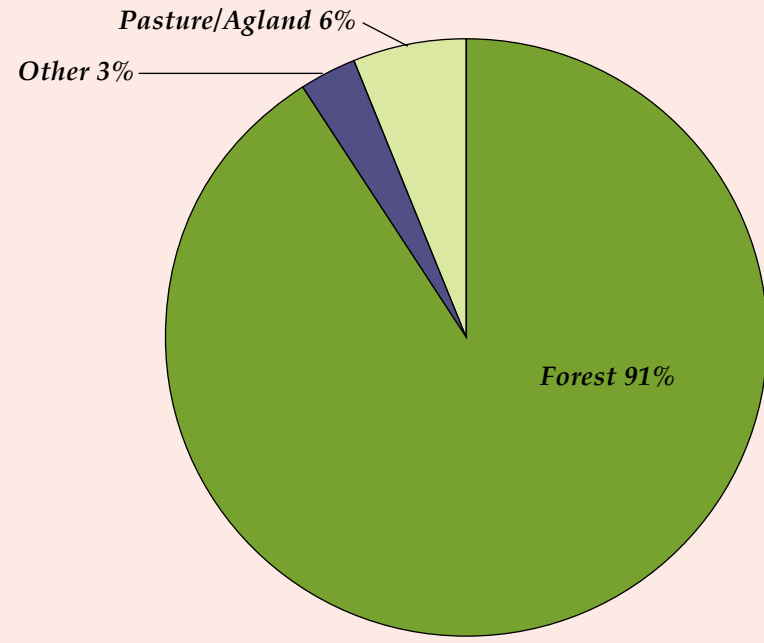


Members of the Madison County Stream Team identify macroinvertebrates collected during a 'kick'.

The Headwaters of the White River

A Beaver Lake Subwatershed

Within this rural subwatershed lies the origin of the White River. It begins as a typical Ozark Mountain stream, with frequent pools and riffles. Then it flows through land that is surrounded by largely undisturbed forest. The forest is characterized by hardwoods such as oak, hickory and maple. It is not until further downstream that this meandering stream develops into the mighty White River, which serves as one of the major economic foundations of eastern Arkansas. The Headwaters-White River subwatershed contains 138 miles of roads and covers 58,206 acres in Madison and Franklin counties. All homes, businesses and schools of St. Paul rely on on-site septic systems for wastewater disposal. Water quality impacts to the shallow aquifer from septic effluent is a potential concern.



Landcover in the Headwaters-White River subwatershed

Data from the University of Arkansas East Project, 2004

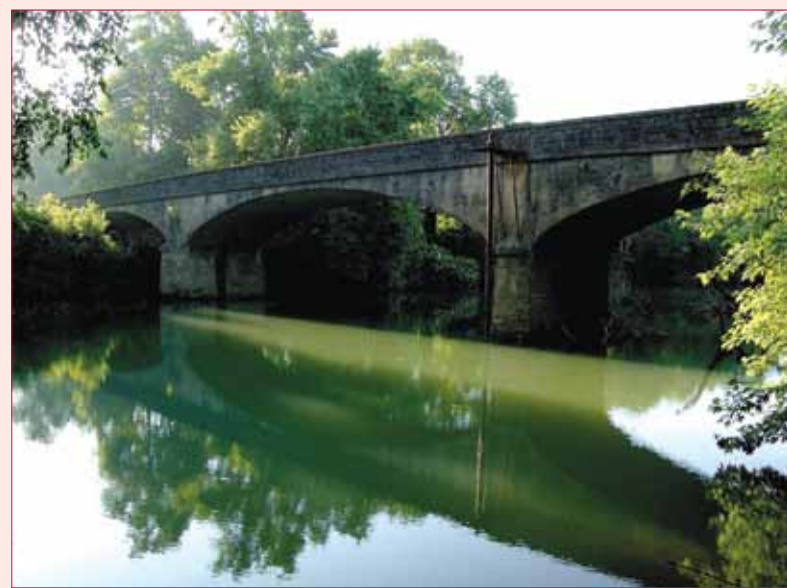
A Snapshot of a White River Community

Elkins, Arkansas

Not far from its origins, the White River flows through the small town of Elkins, Arkansas, where century-old houses and churches dot the surrounding landscape. The White's path through town carries it under a concrete bridge that spans the river in three arches. The bridge was built in 1921 by the Luten Bridge Company of Knoxville, Tennessee, and is commonly referred to as the Elkins Bridge. In January of 2008 it was placed on the National Register of Historic Places.

Immediately downstream from the bridge, the banks of the White define the easternmost boundary of Bunch Park, where the annual Independence Day celebration 4th on the River takes place. Locals gather along the scenic river to enjoy a parade, food, music, and even a fishing derby. The highlight of the festival is the culmination of the day's events

in a fireworks display that illuminates the river in a vibrant reflection of color.



Historic Elkins Bridge

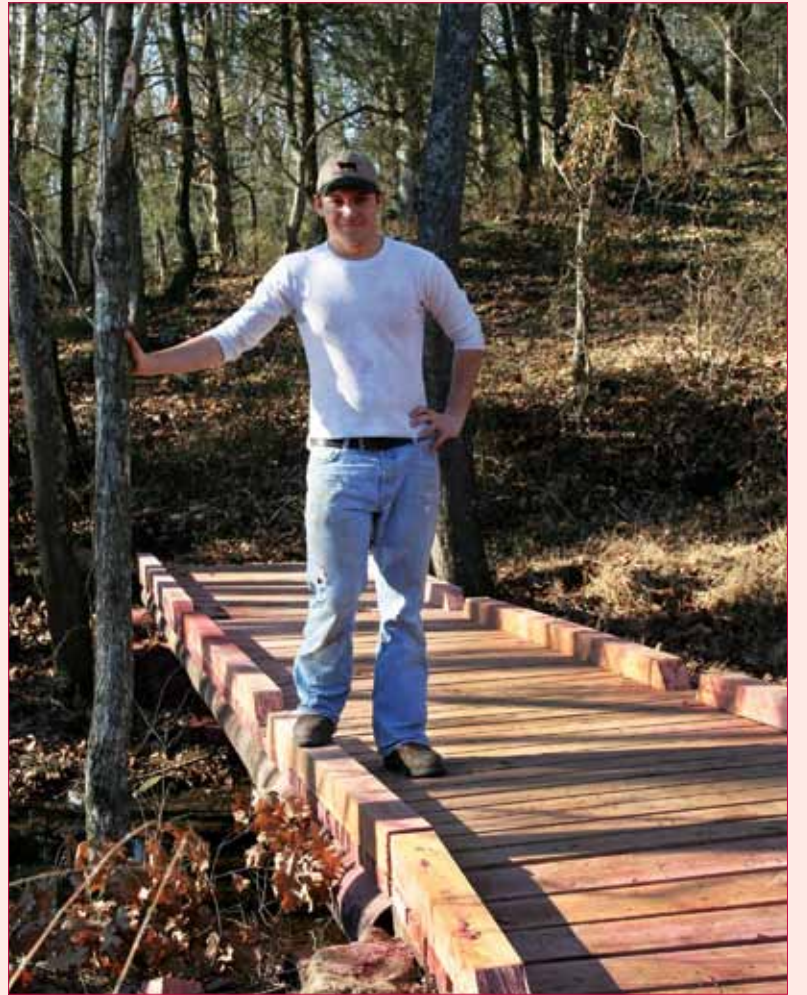
Photo Courtesy of Laura Whitfield

Lake Sequoyah Trails

A Birding Hotspot in the Beaver Lake Watershed

Within the city limits of Fayetteville, the edges of the White River widen into a 490 acre – lake that was built in 1959 as an alternative water source for Fayetteville, Arkansas. While Lake Sequoyah is no longer a drinking water source, it is home to two nature trails that are popular destinations for fishing, hiking and birding.

In 2005, local Boy Scout Troop 116, out of Fayetteville, adopted the trail system at Lake Sequoyah as a community service project. The troop started their trail building projects with a 1.6 mile trail called the Kingfisher Trail that runs along the East bank of Lake Sequoyah. Since that time, other troops have joined the effort with numerous Eagle Scout projects focusing on the trail building effort.



A walking bridge, completed by Fayetteville Eagle Scout Michael Brown and Boy Scout Troop 116, improves hiking and birding access along Lake Sequoyah's scenic edge.



Great Blue Heron Ardea herodias

Photo courtesy of Arthur Salmons

Over 3 miles of natural surface trails extend along the edges of the lake and offer stunning views and ample bird-watching year-round. Wintering waterfowl, such Green-winged Teal, Bufflehead, and Hooded Merganser, find Lake Sequoyah to be an ideal habitat. American White Pelicans land on the lake during migration and occasionally spend the winter as well. Several shorebird species swing through Lake Sequoyah during fall migration; these short-legged sandpipers and plovers feed in shallow water and mudflat habitats. Colorful migratory songbirds feed and breed during spring, summer, and fall including warblers, vireos, thrushes, and tanagers. Birders and nature enthusiasts alike enjoy the Great Blue Herons (the colloquial “cranes”) that breed in a tree-top colony, known as a rookery, along the Eastern lakeshore.