

CITIZEN GUIDE  
TO  
ALABAMA RIVERS

Tennessee

Volume 4

Spring 2003

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## Citizen Guide to Alabama Rivers

Volume 1	Black Warrior and Cahaba
Volume 2	Alabama, Coosa and Tallapoosa
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Alabama Water Watch Program  
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**COVER PHOTO.** Bear Creek at State Route 13 in  
Marion County, AL. PHOTO: BRYAN W. PHILLIPS

## About these Guides

Alabama's rivers, streams and lakes are priceless in terms of the ecological, economic and social benefits they provide.

The purpose of this guide is to provide an introduction to the unique history and environmental significance of Alabama's River Basins and invite further investigation into Alabama's abundant but limited water resources.

It is hoped that these guides will enhance the dialogue between citizens and key decision makers and help us move toward strategies of how to best manage and protect Alabama's waters.



**LEAFY PRAIRIE CLOVER, *Dalea foliosa*.** This federally endangered plant lives on the edges of limestone cedar glades, barrens and calcareous prairie habitats in Alabama, Tennessee and Illinois. It can grow to 20 inches. PHOTO: DAREL HESS, [www.2bnthewild.com](http://www.2bnthewild.com)

**Series Editors:** Wendi Hartup and Bill Deutsch

**Contributors:** Justin Ellis, Eric Reutebuch and Emily Mills

**Reviewers:** Eve Brantley, Jeff Garner, Patti Hurley,

Liz Langston, Tom Madigan, Regina McCoy,

Stuart McGregor, Vicky Mitchell, Soos Weber

**Unlabeled Photos and Graphics:** Alabama Water Watch Program



# THE WATER ENVIRONMENT

## The World's Water Supply

If all the Earth's water fit into a **one liter** container,

- ❖ **970 mL** of the container would be saltwater
- ❖ **30 mL** (nail polish container) would be freshwater which includes: atmosphere, lakes, rivers, polar ice caps, and groundwater.
- ❖ Only **2 drops** of freshwater are in lakes and rivers.



## Alabama's Rich Water Resources

- 9 Alabama contains more than 77,000 miles of streams, 3.6 million acres of wetlands and 560,000 acres of lakes, ponds and reservoirs.
- 9 Alabama has more miles of navigable rivers (1,438 miles) than any other state.
- 9 The Mobile River system is the fourth largest watershed in North America, exceeded only by the Mississippi, Yukon and Columbia River systems.
- 9 About 8% of water in the continental U.S. originates in or flows through Alabama.

## What is a Watershed?

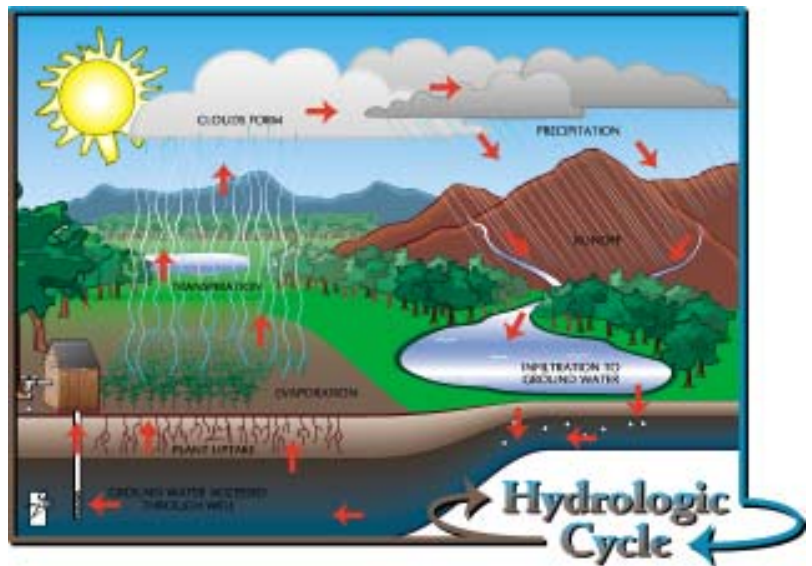
A **watershed** is the total land area that drains to a common point, such as a river, a lake or the ocean. Watersheds come in many sizes.

Very large watersheds are also called **drainage basins**. For example the Coosa, Tallapoosa, Alabama, Cahaba, Black Warrior and Tombigbee River watersheds are all part of the greater Mobile Basin. Everyone lives in a watershed, no matter how far you are from a river or lake.



The Mobile Basin is the largest watershed in Alabama draining 3/4 of the state.

GRAPHIC: MOBILE BAY NATIONAL ESTUARY PROGRAM



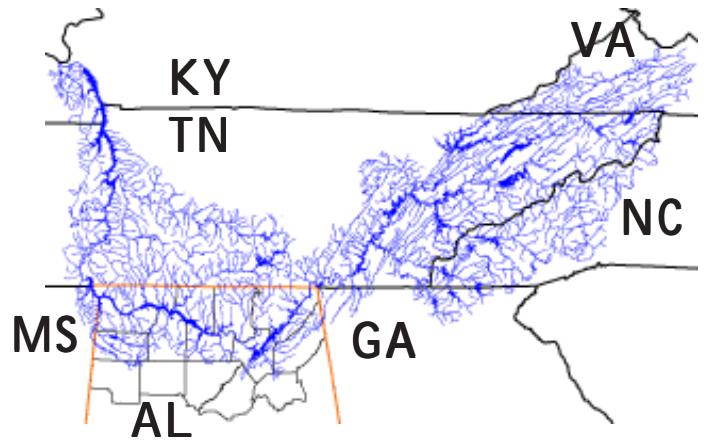
The Hydrologic Cycle, or the Water Cycle, links land, air and water within a watershed. GRAPHIC: STEPHEN ADDUCI AND PERDUE PESTICIDE PROGRAMS

## Nature's Water Recycling Program

When rain falls to the earth, it sinks into the ground (**infiltration**), returns to the air (**evaporation** and **transpiration**) or flows over the land surface (**runoff**). Surface runoff carries dissolved and suspended substances, such as chemicals and sediment. Land use activities in a watershed directly affect both *water quality* and *quantity*. Water supplies are not limitless. Water is never created, it only recycles.

The Tennessee River begins at the confluence of the Holston and French Broad Rivers near Knoxville, TN. It then bends south out of the Appalachian Mountains, cuts across the northern quarter of Alabama and turns north to join the Ohio River near Paducah, KY. The rivers within the Tennessee Basin flow through 123 counties of 7 states (11 VA, 63 TN, 15 NC, 9 GA, 15 AL, 3 MS and 7 KY). Its mainstem is 652 miles long and 17% of its 40,908 square mile watershed is in Alabama.

# THE RIVER BASIN



**1** Pickwick Lake has been designated as the “Small mouth bass Capital of the World” and is one of the world’s most important sources of commercial mussels.

**7** The Tusculumbia Courtland and Decatur RR (1832) was a vital line in the Civil War and ran a total of 45 miles through Colbert and Morgan County, AL to bypass the shoals of the Tennessee River. It was the first railroad west of the Allegheny Mountains.

**9** Today, the industrial facilities in Decatur represent the largest concentration of waterfront industrial development in the Tennessee Valley Region.

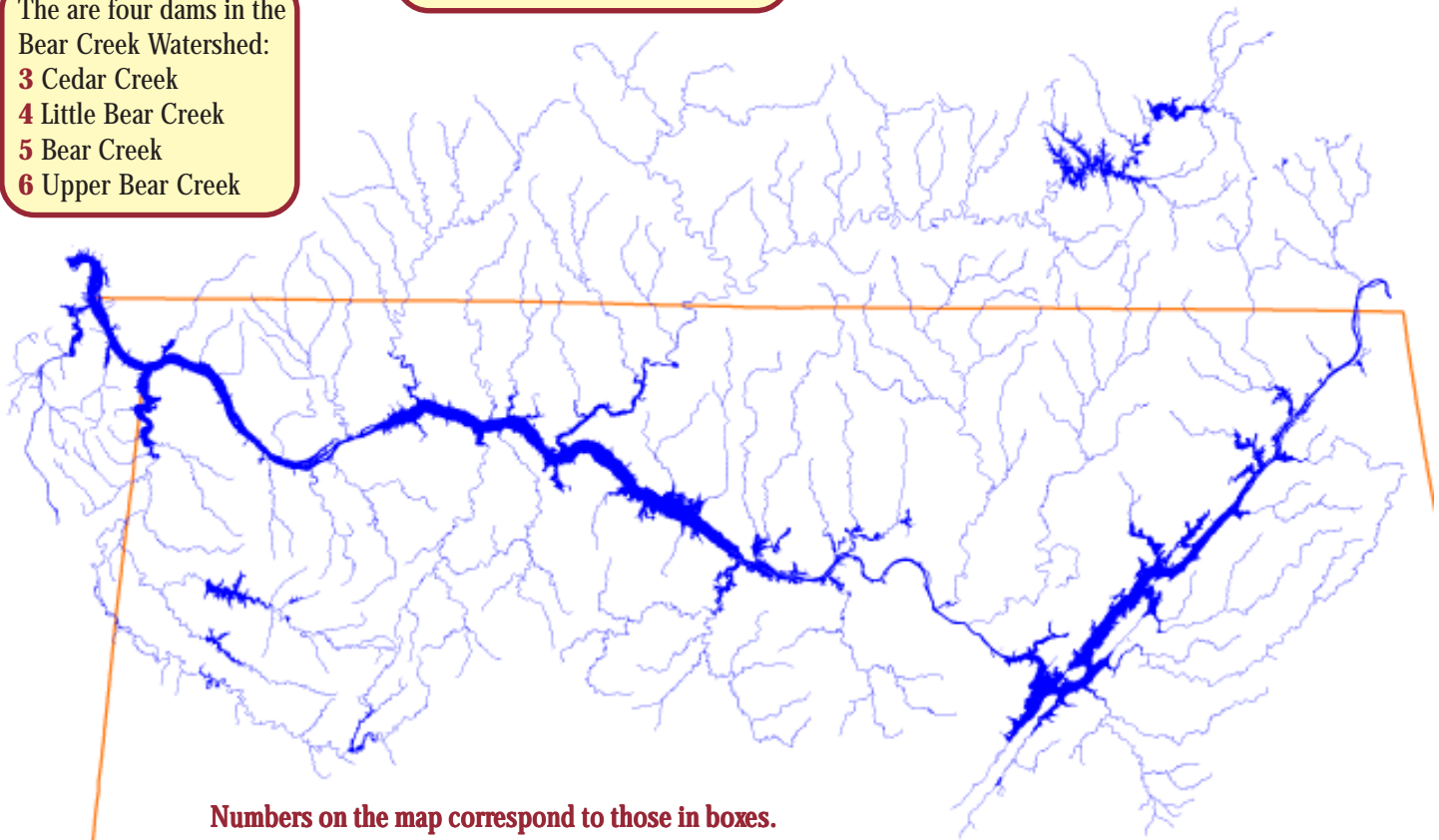
**2** At Muscle Shoals the Tennessee River crosses the Fall Line demarcating the coast of an ancient sea that is almost 400 miles from the present-day Gulf of Mexico.

**8** Wilson Lock and Dam has a lift of 93 ft. and services more than 15 million tons of barge goods per year. Its 13 generators produce more electricity than any other dam on the Tennessee River.

Woods Reservoir (**10**) and Tims Ford (**11**) dams are located in Tennessee on the Elk River. The Elk is a major tributary to the Alabama portion of the Tennessee River. Tims Ford Lake is regarded as one of the top bass fishing and recreational lakes in the southeast.

There are four dams in the Bear Creek Watershed:

- 3** Cedar Creek
- 4** Little Bear Creek
- 5** Bear Creek
- 6** Upper Bear Creek



**Numbers on the map correspond to those in boxes.**





**WHEELER NATIONAL WILDLIFE REFUGE** (on map in green). Alabama's largest refuge covering 35,000 acres of bottomland hardwoods, pine uplands, agricultural fields, and backwater embayments. PHOTO: KEVIN MCIVER

There are nine dams on the mainstem of the Tennessee River. The first four dams are in Tennessee (Fort Loudon, Watts Bar, Chickamauga, and Nickajack). The next three in Alabama are Guntersville (14), Wheeler (12), and Wilson (8), which together create 150,500 acres of lakes. A large portion of Pickwick Lake (1) formed by Pickwick Dam in Tennessee backs up into northwest Alabama. The last dam, Kentucky, forms the largest reservoir on the Tennessee River (160,300 acres).

**13** Huntsville, designated as the first Alabama capital in 1819, is the 4th largest city and overlooks the Tennessee River. Marshall Space Flight Center, an important research and development site for NASA, as well as the U.S. Army's Redstone Arsenal are located here.

**14** Guntersville Lake is the largest Alabama reservoir (67,900 acres), stretching for 76 miles but with a retention time of only 12-13 days.

**15** Buck's Pocket State Park sits in a narrow gorge cut into Sand Mountain by South Sauty Creek. The park covers 2,000 acres and offers some of Alabama's most unique views.

**16** Cathedral Caverns in Grant holds many world records including: widest entrance of any commercial cave (25 ft. tall, 128 ft. wide), largest stalagmite (45 ft. tall, 243 ft. circumference) and largest "frozen waterfall."

**17** There are numerous caves in the Tennessee Basin. Cavers from around the globe come to explore the area located in the three corners where Tennessee, Alabama and Georgia meet. Tennessee has more than 5,500 caves and Jackson County, AL has over 2,000 known caves with the highest subterranean diversity in the U.S. Ellison's Cave, GA is the deepest cave east of the Mississippi River. The national headquarters for the Speleological Society (cave explorers) is in Huntsville.



**NEVERSINK PIT.** Located in Jackson County, AL, the 162 ft. deep sinkhole is considered a "classic" by cavers for its stunning beauty. It is home to rare and endangered ferns which thrive on the pit's ledges in the moist micro-climate. PHOTO: BRUCE BREWER, [www.brucebrewer.com](http://www.brucebrewer.com)

**OLD NACHEZ TRACE.** The Natchez Trace Parkway covers a distance of 445 miles from Natchez, MS to Nashville, TN through forests, cypress swamps, streams, and farmland.



Numerous species of plants (800), mammals (57), birds (216), reptiles (57), and amphibians (36) call this home. PHOTO: [www.byways.org](http://www.byways.org)

# Life Along the River

## Native Culture and European Contact

Paleo-Indians were the first inhabitants of the Tennessee Valley, with remains dating to 12,000 years ago. The region was probably attractive for them because it lies at the southern edge of the hardwood forests where nuts, acorns, fish, mussels, and game were plentiful and the climate warmer. Later Native American cultures built earthen mounds which served as bases for ceremonial temples for chief's houses. The Florence Indian Mound in Lauderdale County, AL (42 ft. high and 180 ft. wide at the base) is the largest in the Tennessee Valley and was built between 1200-1500 A.D.

In 1540 Hernando DeSoto's expedition traveled from the present-day locations of Chattanooga, TN to Guntersville, AL on the Tennessee River. This was the first European record of Cherokee, Creek, and Chickasaw tribal land exploration. Between 1786 and 1816 much of the Indian land was ceded to the U.S.



**RUSSELL CAVE NATIONAL MONUMENT.** This cave offers one of the most complete archeological records in the eastern U.S. Artifacts found here indicate intermittent human habitation for 9,000 years. PHOTO: STEVE TAYLOR

## Early Agricultural Trade

In the early 1800s flour was brought to Ditto Landing (near Huntsville, AL) on flatboats and keelboats in such quantities that the U.S. government made Ditto Landing a "Port of Entry." Government inspectors were sent to the landing where all flour sales were inspected, graded and stamped. The Moulton Valley, west of Moulton, AL was an important southern fruit supplier, and so much grain was produced in this area that it became known as the South's "Cereal Belt."

## "Fighting Joe"



1836-1906, circa 1862.

PHOTO: LIBRARY OF CONGRESS

Joseph Wheeler was a soldier, lawyer, U.S. Congressman and planter. He received the nickname "Fighting Joe" while serving in the New Mexico Territory after he and a teamster fought off a band of Indians which were attacking a wagon bearing a pregnant woman. During the Civil War he was in more than 500 skirmishes, commanded in 127 full-scale battles, had 18 horses shot from under him, and lost 36 staff officers from his side. In 1869 General Wheeler moved to Alabama, practiced law and operated his plantation in Lawrence County. It was his intense desire to show that Southerners could be counted on as citizens of the U.S. that prompted him to volunteer, at 62, for service in the Spanish-American War. Alabama honored its beloved fighting man by placing his bust in Statuary Hall, Washington, D.C. and the nation honored him in 1937 by naming the dam across the Tennessee River at Muscle Shoals for "the South's fightingest general." Joseph Wheeler was the only Confederate general to attain the same rank later in the United States Army.

## NATIVE SONS AND DAUGHTERS

Famous folks from the Tennessee Basin include:

- ❖ **William Christopher Handy** (Florence) - composer, "Father of the Blues", *Memphis Blues*
- ❖ **Tammy Wynette** (Red Bay) - singer, 2 Grammy Awards, *Stand By Your Man*
- ❖ **Joe Louis** (Lexington) - boxer, held world heavyweight championship longer than any man in history
- ❖ **Helen Adams Keller** (Tuscumbia) - author, educator, 1st deaf and blind person to attend college and receive a B.S.
- ❖ **Jesse Owens** (Oakville) - track star, 1936 Olympic Gold Medal winner in four events
- ❖ **Sequoyah, a.k.a. George Gist** (Tuskegee, TN) - developed the Cherokee alphabet





**WHEELER LOCK AND DAM.** PHOTO: TVA

### The Great Mussel Demise

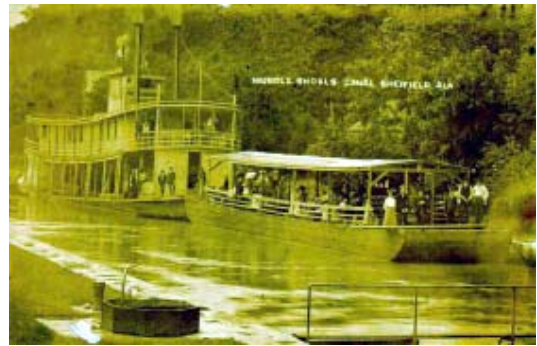
Over the last century, freshwater mussel species in the Tennessee Basin have been killed in incredible numbers for the purpose of man's greed. Four episodes stand out: the Pearl Rush, the Button Industry, the Cultured Pearl Industry and the damming of rivers. In 1857 a freshwater pearl was found in a New Jersey stream and sold to Tiffany's for \$2,500. Soon after millions of mussels, particularly in the southeast, were shucked to find pearls, depleting some streams entirely of mussels. In 1891 button factories began making mother-of-pearl buttons from freshwater mussels. By 1916, the \$12.5 million industry employed 20,000 people, killing as much as 1,800 pounds of living mussels per day. In the past two decades mussels have again become the target of commercialism for the Japanese cultured pearl trade, the main source being mussels from the Tennessee, Wabash, Cumberland and Mississippi rivers. In the Tennessee River alone, 4,750 tons of mussels were killed in one year. By far the largest number of species were lost due to human alterations to river systems.



**CLAMMERS, circa 1911.** Standing atop a mound of dead mussels used to make mother-of-pearl buttons. PHOTO: CONCHOLOGISTS OF AMERICA, [www.brucebrewer.com](http://www.brucebrewer.com)

### Treacherous Shoals and River Commerce

One of the most treacherous stretches of river travel was the area between Florence and Decatur, AL. This area was marked by a series of rapids, shoals and shallow water, known as the Muscle Shoals. Here the river fell 137 feet in 37 miles and served as the dividing line between the upper and lower Tennessee River. The first attempt to overcome the Shoals began in 1836 when the state of Alabama built a canal around the shoals. The canal was very limited in its success, however, some of its remains can still be seen. River commerce began in earnest with the advent of the steamboat and then by diesel-driven barges. River commerce is now possible the length of the Tennessee due to the construction of locks and dams. Today 34,000 barges carry 50 million tons of goods on the Tennessee River annually. In 1993, more than 48.2 million tons of raw materials were transported over the Tennessee River.



**MUSCLE SHOALS CANAL AT SHEFFIELD, AL.** PHOTO: COLLIER LIBRARY SPECIAL COLLECTION, [www2.una.edu/geography/tn\\_web/history](http://www2.una.edu/geography/tn_web/history)

### TVA








The most dramatic change in Valley life came when, after a series of devastating floods, the federal government established the Tennessee Valley Authority (TVA) in 1933 to build and manage a series of dams on the mainstream and tributaries of the river. These dams would provide navigation, protection from floods, erosion control, and electrical power for the rural south. Electric lights and modern appliances made life easier and farms more productive. Electricity also drew industries into the region, providing desperately needed jobs. TVA also developed fertilizers, taught farmers how to improve crop yields as well as helped replant forests, control forest fires, and improve habitat for wildlife and fish. The electricity made possible the large-scale refining of aluminum, a vital commodity during World War II. Currently TVA is the largest producer of electricity in the U.S., providing power to nearly 18 million residents.

# Land Use in the River Basin

The water quality and quantity of the Tennessee Basin is influenced by a variety of urban and rural land uses. The land use map on these pages was generated from 1992-93 satellite images. The river basin is outlined in white and Alabama counties are designated in black. The orange line represents the Fall Line, which is the border between the East Gulf Coastal Plain to the west and the Highland Rim to the east. Other physiographic provinces in the Tennessee Valley (west to east) include Cumberland Plateau, Valley and Ridge and the Blue Ridge.

## LAND USE PERCENTAGES

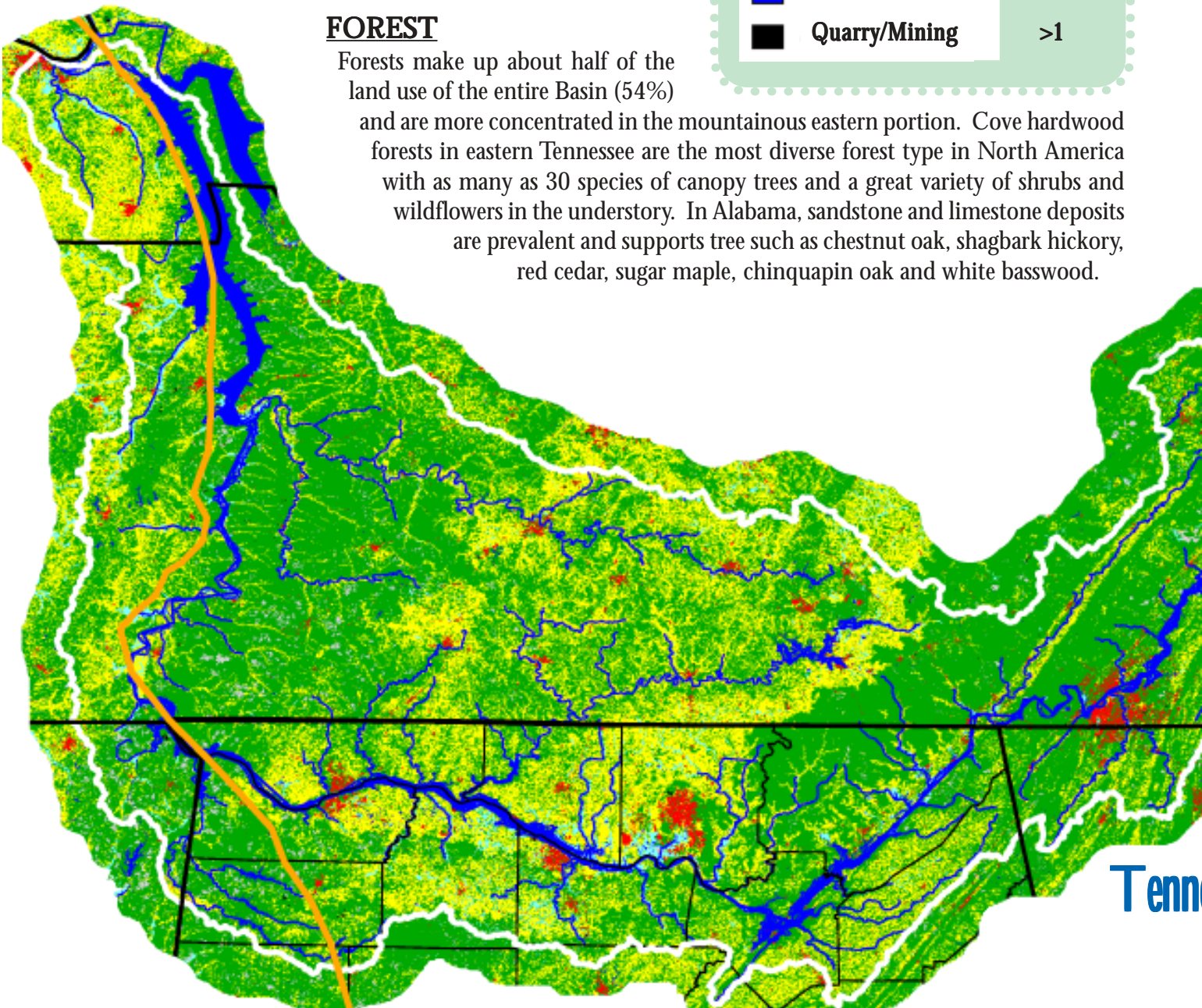
### Tennessee

	Forest	54
	Agriculture	35
	Urban/Suburban	2
	Clearcut/Barren	>1
	Wetland	4
	Water/Lakes	4
	Quarry/Mining	>1

## FOREST

Forests make up about half of the land use of the entire Basin (54%)

and are more concentrated in the mountainous eastern portion. Cove hardwood forests in eastern Tennessee are the most diverse forest type in North America with as many as 30 species of canopy trees and a great variety of shrubs and wildflowers in the understory. In Alabama, sandstone and limestone deposits are prevalent and supports tree such as chestnut oak, shagbark hickory, red cedar, sugar maple, chinquapin oak and white basswood.



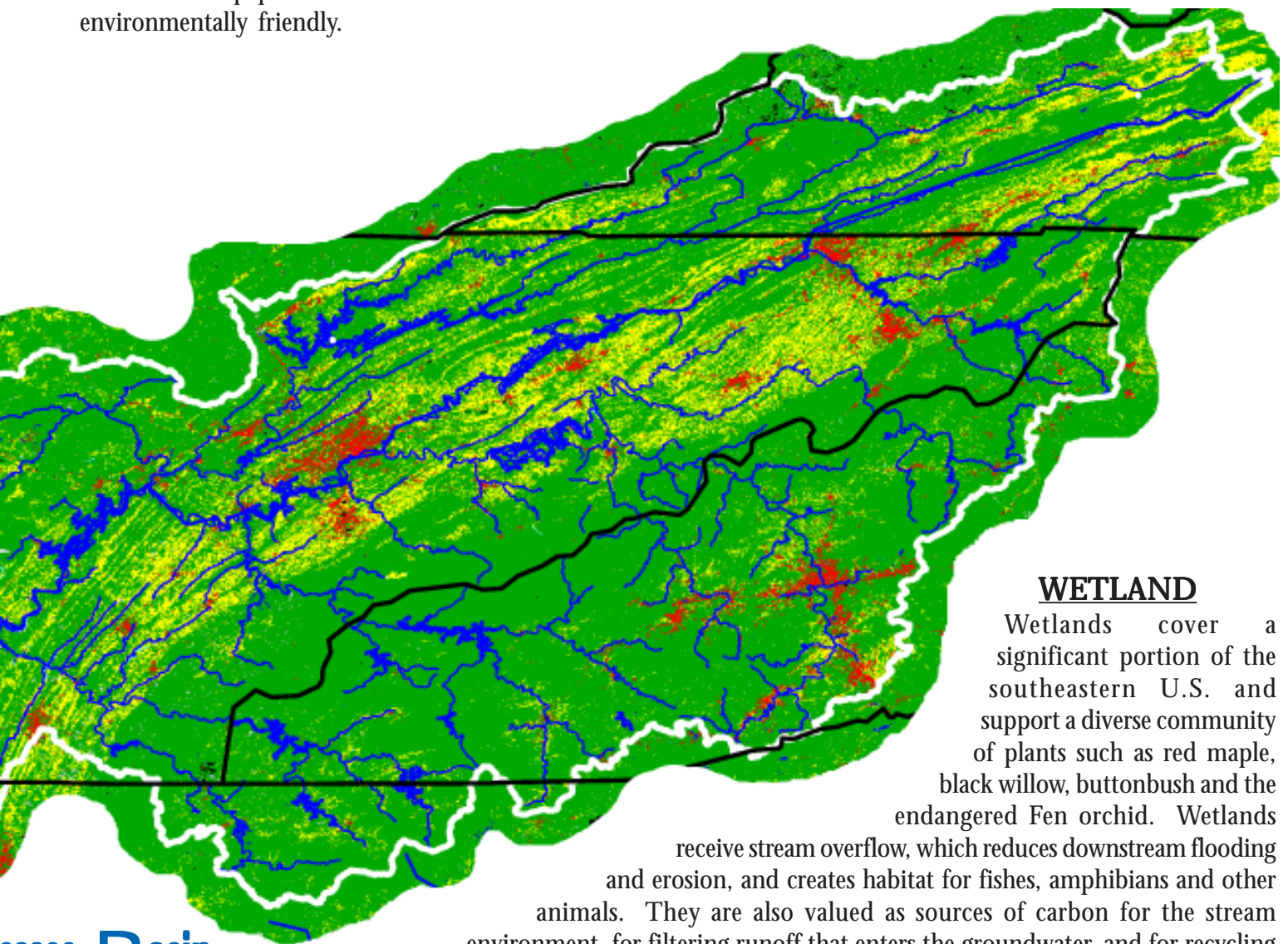


## AGRICULTURE

Agriculture forms a higher proportion of land use in the Tennessee Basin (35%) than in all other river basins of Alabama. It is particularly concentrated in Madison, Limestone, Lauderdale and Lawrence. Principle farm products in the Alabama portion of the basin include cattle, corn, wheat, cotton, soybeans and poultry. The 1962 classic, *Silent Spring*, documented the serious environmental problems caused by DDT pollution in the Flint Creek watershed near Decatur, AL. Since that time, many farmers have adopted the practice of integrated pest management (IPM), where a combination of physical, biological and chemical control of crop pests is more cost-effective and environmentally friendly.

## URBAN/SUBURBAN

Cities have historically polluted the Tennessee River with industrial and municipal effluents. For example, Chattanooga, TN polluted the river and air so much that it was designated the dirtiest city in America by EPA in 1969. In 1984, the city worked with citizens to begin a massive clean-up and in 1995, EPA pronounced Chattanooga an environmental model city. The federal Clean Water Act has done much to regulate point source pollution from urban/suburban areas but nonpoint pollution from stormdrains remains a challenge to control. Urban sprawl and the large increase in impermeable surfaces have resulted in runoff problems, sewage overflows and flooding.



## WETLAND

Wetlands cover a significant portion of the southeastern U.S. and support a diverse community of plants such as red maple, black willow, buttonbush and the endangered Fen orchid. Wetlands receive stream overflow, which reduces downstream flooding and erosion, and creates habitat for fishes, amphibians and other animals. They are also valued as sources of carbon for the stream environment, for filtering runoff that enters the groundwater, and for recycling nutrients. Wetlands cover about 4% of the Tennessee Basin and many were created or enlarged by impoundments. For example, Alabama's largest wetland was greatly expanded by the construction of the Wheeler Reservoir.

# SPECIAL PLANTS AND ANIMALS

Alabama ranks in the top ten in the nation for the most types of native plants and animals. According to The Nature Conservancy of Alabama, there are over 4,000 species of plants, 850 species of vertebrates and nearly 250 species of freshwater mollusks (snails and mussels) in Alabama. In spite of high biodiversity, Alabama has more threatened or endangered species than any state except Hawaii.



**CUMBERLAND MONKEYFACE, *Quadrula intermedia*.** Found in Limestone County, AL and portions of Tennessee and Virginia.

**BIRDWING PEARLYMUSSEL, *Lemiox rimosus*.** Found throughout the Tennessee River in Alabama, Tennessee and Virginia. PHOTOS: CONCHOLOGISTS OF AMERICA, <http://coa.acnatsci.org/conchnet/>



**PRICES'S POTATO BEAN, *Apios priceana*.** This threatened vine blooms from mid-June through August and has potential value as a food source. The large tubers are edible and may have been used by early settlers as food.

PHOTO: KIMBERLIE MCCUE, CENTER FOR PLANT CONSERVATION

Many rare, protected fish in the Tennessee Basin have interesting names such as the Boulder darter (*Etheostoma wapiti*), the Palezone shiner (*Notropis albizonatus*), the Spotfin chub (*Cyprinella monacha*), and the Mountain madtom (*Noturus eleutherus*).

## Why Worry about Loss of Species?

All creatures are interconnected in the web of life. For example, freshwater mussels rely on certain fish species in order to reproduce. In turn, these mussels provide benefits to other aquatic organisms. Mussels filter the water for food while removing organic particles and pollutants at the same time, helping to clean and clarify streams. This, in turn, keeps streams healthy for both humans and wildlife. Mussels are also a food source to many animals. Their shells provide cover for aquatic insects, crayfish and fish and they are good indicators of a stream's condition. Unfortunately mussels are one of the most vulnerable group of animals to pollution and Alabama's diversity of 180 freshwater mussel species is greater than anywhere else in North America. Each time a species disappears, we lose not only those known benefits but benefits we have yet to discover.

- 9 Acknowledged as one of the most biologically diverse and threatened river basins in the nation.
- 9 Harbors a high number of imperiled species including 57 fish species and 47 mussel species considered at-risk.



**HELLBENDER, *Cryptobranchus alleganiensis*.** This large North American salamander is found in clean, cool, rocky-bottomed streams of the eastern U.S. It grows up to 29 inches and feeds on crayfish and aquatic insects. Hellbenders have a flat head, lidless eyes and wrinkled fleshy folds of skin which help to take in oxygen from the water. PHOTO: JOHN WHITE, <http://mysite.verizon.net/vze1m6wp/>

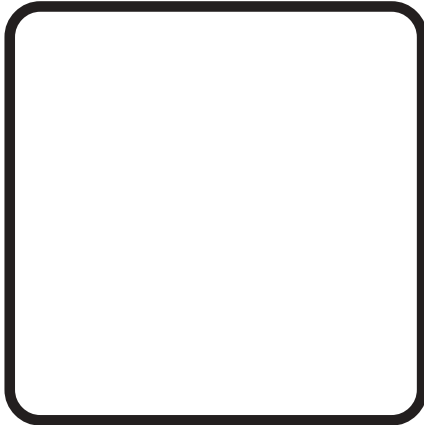


The September elm, *Ulmus serotina*, in Colbert County, AL is listed with the National Register of Trees as the largest of it's kind, measuring 150 ft. tall and 105 in. round with a 64 ft. spread.



**MALE AND FEMALE SLACKWATER DARTERS, *Etheostoma boshungi*.** These federally threatened fish live in a few small tributaries of the Tennessee River in Alabama and Tennessee. They have separate breeding and non-breeding habitats.

PHOTO: J.R. SHUTE, [www.conservationfisheries.org](http://www.conservationfisheries.org)



**ALABAMA CAVEFISH, *Speoplatyihimus poulsoni*.** A small, white, blind fish that exists in Key Cave National Wildlife Refuge in Lauderdale County, AL. The Alabama cavefish is considered to be the rarest freshwater fish in the world. Only 10 have ever been observed in a single visit. This fish is threatened by pollutants placed on row crop lands within

Key Cave's recharge area as well as by competition and predation from other species. PHOTO:



**BALD EAGLE CHICKS, *Haliaeetus leucocephalus*.** This slowly recovering species can be seen throughout the Tennessee Basin. Gunterville State Park is a migration home in the winter for these birds as well as many others including herons and ducks. PHOTO: DAVE MENKE, <http://images.fws.gov>

**INDIANA BAT, *Myotis sodalis*.**

This bat eats up to half its body weight in insects each night. It congregates in a few large caves with as many as 125,000 bats/cave. Fern Cave and Sauta Cave National Wildlife Refuges are critical habitat for the endangered Indiana and gray bats. Over a million gray bats hibernate in Fern Cave, as do several hundred endangered Indiana bats. PHOTO: RICH FIELDS, <http://midwest.fws.gov>



**"DISMALITES", *Arachnocampa luminosa*.**



These unique glow worms are the larval stage of the fungus gnat for 6-9 months. They display a bright blue-green light to attract food like midges, mayflies and caddisflies. These cave-dwelling creatures are only found in large numbers in Dismals Canyon near Phil Campbell, AL and New Zealand. PHOTO: RONNIE HARRIS, [www.dismalscanyon.com](http://www.dismalscanyon.com)

Anthony's riversnail (*Athearnia anthonyi*) lives only in the shoal areas of Limestone Creek in Limestone County, AL and the Sequatchie River, TN. It is relatively large in comparison to other aquatic snails (1 inch long). Most of its historic range has been altered by impoundments.

The Wheeler Refuge hosts numerous species of fish (115), reptiles and amphibians (74), mammals (47) and birds (285). The Refuge also manages and protects 10 federally listed species. It supports the southern-most as well as Alabama's only significant concentration of wintering Canada geese and serves as winter habitat for the state's largest duck population.

# Balancing Economy and Environment in the River Basin

Abundant water, timber, rich soils, minerals, and other natural resources have been important for boosting Alabama's economy, creating jobs and providing necessary products for all of us. The way these natural resources are used can cause environmental problems that negatively affect human health and our quality of life. More than half of these problems come from nonpoint source pollution that enters streams from broad areas of both urban and rural portions of a watershed. Possible problems may include...

## Agriculture

- ❖ Excess nutrients and bacteria from animal wastes, including CAFOs (Concentrated Animal Feeding Operations)
- ❖ Runoff and aerial deposition of pesticides and other chemicals from cropland and pastures

Nitrogen and phosphorus are essential nutrients for plant and animal growth, but excessive amounts can stimulate algal blooms and other aquatic plants in waterbodies. In turn, these blooms can impair water suitability for uses including: drinking, swimming and fishing.



**POULTRY CAFO.** PHOTO: LARRY RANA

## 9 **Dams**

- ❖ Changes in natural river flow patterns and levels
- ❖ Drastic water temperature and oxygen changes in streams from dam releases
- ❖ Often used for flood control but can alter wetland habitats



**WILSON DAM, 1926.** PHOTO: O.T. ERICSON, DLC/PP-1926:46931, <http://memory.loc.gov>

## Forestry Practices

- ❖ Erosion and runoff from improper logging practices
- ❖ Changes vulnerable headwater ecosystems

Erosion and sedimentation have been a problem in Alabama as far back as colonial settlement. In the 1930s, the Soil Conservation Service, now called the Natural Resources Conservation Service (NRCS), was formed to address erosion problems and other land use issues.



**SOIL EROSION AND STREAM SEDIMENTATION FOLLOWING A FOREST CLEARCUT.** PHOTOS: RUSSELL WRIGHT



## Exotic, Invasive Species

- ❖ Replace native plant and animal communities
- ❖ Harm ecosystem functions
- ❖ Expensive to control

Exotic, invasive species are introduced into ecosystems where they did not evolve often spreading rapidly and replacing native species. People are usually the culprits for introduction of non-natives. Examples of invasive species include hydrilla, Eurasian milfoil, kudzu, purple loosestrife, common carp, Asian clam, zebra mussels and privet. TVA now spends millions per year to control hydrilla and Eurasian milfoil which can be so dense they reduce the use of reservoirs.



**EUROPEAN ZEBRA MUSSELS, *Dreissena polymorpha*.** Poses a multi-billion dollar threat to all types of water supplies. They multiply rapidly and settle on top of any

hard surface, like metal, wood, other mussels and even each other to form dense colonies. They can clog intake pipes for power plants, water treatment plants and other industries. They could also become a costly nuisance for freshwater shipping, boating, fishing and clamming. PHOTO: KEN GARDNER, <http://images.usace.army.mil/>

## Industrial Discharge

- ❖ Toxic chemicals
- ❖ Heavy metals
- ❖ Thermal pollution



**AN INDUSTRY PIPE IS A POINT SOURCE DISCHARGE.**

From 1947-71 Olin Corporation's Redstone Arsenal facility in Huntsville discharged 1,000s of tons of the pesticide DDT into the Huntsville Spring Branch, which flows into Indian Creek. A 1979 TVA study found fish from these creeks had DDT levels of 200 ppm, 40 times the federal limit. Nearly 1,200 residents of Triana relied heavily on fish from this creek and had high DDT levels. In the early 1980s the creek was designated one of EPA's top-priority hazardous waste sites for clean-up under the Superfund program and required clean-up as well as healthcare for the victims.

## Urban/Suburban/ Rural Development

- ❖ Concrete and asphalt reduces infiltration of water to soil, inhibiting groundwater recharge
- ❖ Runoff from streets, parking lots and lawns enters storm drains and flows directly to streams untreated
- ❖ Inadequate and failing septic systems



**ERODED SOIL WASHING TO STORM DRAINS AND CREEKS.**

PHOTO: MICHAEL MULLEN



**INADEQUATE BMPs CONTRIBUTE TO SOIL EROSION**

PHOTOS: ADEM



**BMPs CAN DRAMATICALLY REDUCE EROSION AND STREAM SEDIMENTATION**

**Solutions to many environmental problems are achieved through Best Management Practices (BMPs), education, good planning, and enforcement. Specific BMPs for each land use activity may be obtained from the NRCS, the Office of Surface Mining, Alabama Forestry Association, the Alabama Cooperative Extension System or ADEM.**

# WATER POLICY, LAW AND CITIZEN INVOLVEMENT

There are many water policies and laws from various federal, state and local agencies that are sometimes difficult to understand. Virtually all water quality protection laws in Alabama stem from the federal Clean Water Act, passed by the U.S. Congress in 1972. Since that time the quality of our nation's waters has improved dramatically with cooperative effort by federal, state, tribal and local governments and the general public. Much cleanup work remains to be done, however.

The Clean Water Act is subdivided into many sections that influence Alabama's water. Three of the main sections are:

**Section 319**  
Provides federal funds through the U.S. EPA to ADEM for educational and technical assistance and programs such as Alabama Water Watch and the Clean Water Partnerships.  
([www.epa.gov/region4/water/nps/grants/index.htm](http://www.epa.gov/region4/water/nps/grants/index.htm))

**Section 305**  
Requires an assessment of waterbodies every two years to determine whether designated uses are being met. The Biennial Water Quality Report to Congress, or the 305(b) Report, provides summary information about the quality of the state's waters.

**Section 303**  
Charges states and tribes with setting specific water quality criteria and developing pollution control programs to meet them. Designated uses may include drinking water, recreation, aesthetics, irrigation, fishing, swimming or a combination of these and other activities.

Waterbodies that do not meet water quality standards for their designated water use classification are included in a 303(d) list ([www.epa.gov/waters](http://www.epa.gov/waters)). EPA requires ADEM to develop total maximum daily loads (TMDLs) for each waterbody included on the 303(d) list. The TMDL is the maximum quantity of a pollutant that can enter a waterbody without adversely affecting the designated use classification of the waterbody.





# More Info



**For further information about Alabama's waterways or how to get involved in protecting your watershed, contact:**

Alabama Clean Water Partnership

866-346-8426 [www.cleanwaterpartnership.org](http://www.cleanwaterpartnership.org)

Alabama Cooperative Extension System

334-844-4444 [www.aces.edu](http://www.aces.edu)

Alabama Department of Agriculture and Industries

334-240-7100 [www.agi.state.al.us](http://www.agi.state.al.us)

Alabama Department of Conservation and Natural Resources

334-242-3420 [www.dcnr.state.al.us](http://www.dcnr.state.al.us)

Alabama Department of Economic and Community Affairs

334-242-5694 [www.adeca.state.al.us](http://www.adeca.state.al.us)

Alabama Department of Environmental Management

334-271-7700 [www.adem.state.al.us](http://www.adem.state.al.us)

Alabama Department of Industrial Relations

334-242-8990 [www.dir.state.al.us](http://www.dir.state.al.us)

Alabama Forestry Association

334-265-8733 [www.alaforestry.org](http://www.alaforestry.org)

Alabama Land Trust

256-782-3737 [www.allandtrust.org](http://www.allandtrust.org)

Alabama Soil and Water Conservation Committee

334-242-2620 [www.swcc.state.al.us](http://www.swcc.state.al.us)

Alabama Surface Mining Commission

205-221-4130 [www.surface-mining.state.al.us](http://www.surface-mining.state.al.us)

Alabama Water Watch

888-844-4785 [www.alabamawaterwatch.org](http://www.alabamawaterwatch.org)

Geological Survey of Alabama

205-349-2852 [www.gsa.state.al.us](http://www.gsa.state.al.us)

Legacy, Inc.

800-240-5115 [www.legacyenvd.com](http://www.legacyenvd.com)

National Agricultural Library Water Quality Information Center

(301) 504-5755 [www.nal.usda.gov/wqic](http://www.nal.usda.gov/wqic)

**In 1819, when Alabama entered the Union, its leaders designed a great seal that featured the state's waterways. In adopting this symbol they affirmed their belief that the future of Alabama lay with its rivers. It did, and it still does.**

Harvey Jackson, III  
Rivers of History

Natural Resources Conservation Service

334-887-4552 [www.nrcs.usda.gov](http://www.nrcs.usda.gov)

The Nature Conservancy of Alabama

205-251-1155 <http://nature.org/states/alabama>

The Natural Heritage Program

334-834-4519 X29 [www.natureserve.org/nhp/us/al](http://www.natureserve.org/nhp/us/al)

Northwest Alabama Resource Conservation and Development Council

256-383-1446 [www.rcdnet.org](http://www.rcdnet.org)

The Water Course (Alabama Power Company)

800-280-4442

Tennessee Valley Authority

256-386-2601 <http://tva.gov>

Tennessee Valley Resource Conservation and Development Council

256-353-6146 [www.rcdnet.org](http://www.rcdnet.org)

U.S. Environmental Protection Agency (Region 4)

404-562-8357 [www.epa.gov](http://www.epa.gov)

U.S. Fish and Wildlife Service

334-441-5181 [www.fws.gov](http://www.fws.gov)

U.S. Geological Survey

334-213-2332 [www.usgs.gov](http://www.usgs.gov)