Tennessee River Basin Watershed Management Plan

Clean Water Partnership
May 2003

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PREFACE

Tennessee River Basin Watershed Management Plan

The purpose of this plan is to initiate, revitalize, and encourage local restoration efforts to improve, maintain, and protect the waters of the Tennessee River basin to the intended goals of the original Clean Water Act of 1972, "fishable and swimmable waters for all Americans".

The Tennessee River Basin Watershed Management Plan builds on two primary components: people and science. People; the citizens, residents, and stakeholders who live, work, and play in the richness of the Tennessee River basin know their waters, issues, desires, and actions that can be taken. Science; the technical basis of water condition, sources of impairments, and treatments that can improve or protect the waters provide a diagnostic basis for where, why, how improvements and protection can be achieved. These two components are woven in this Plan.

Sections 1 and 2 of the plan provide a description of the basin and the water quality conditions, respectively, in the Tennessee River basin. Section 3 provides the stakeholder inputs, objectives, and strategies to be used in the Tennessee River basin. Sources of information used to describe the water and watershed conditions in the basin included published State reports; primarily the State's 305(b) Report to Congress, the State's 303(d) list and total maximum daily load schedule, and the local Soil and Water Conservation Districts' watershed assessments. A series of facilitated stakeholder meetings in the sub-basins of the Tennessee River basin provided feedback and input for basin goals, objectives, and strategies. Together, the Plan encompasses the scientific knowledge and local desires in the Tennessee River basin. This Plan serves as a springboard for the next step of watershed management in the Tennessee River basin: watershed implementation plans.

Tennessee River basin stakeholders emphasized the desire for specific plans and actions. Development of local watershed implementation plans that focus on impaired waters, local initiatives, and state and federal program cycles will meet the intent and goals of the Tennessee River Watershed Management Plan. But more than this Plan, the desires of the Tennessee basin stakeholders will continue the long tradition of successful watershed water quality improvements and progressive initiatives in the Tennessee River basin.

Acknowledgments

Development and preparation of the Tennessee River Watershed Management Plan takes the effort and inputs of many. On behalf of the Tennessee River Clean Water Partnership, we wish to acknowledge and thank the many participants in this Plan.

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Vicky Mitchell, Facilitator
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Tennessee River Basin Watershed Management Plan
Executive Summary

To improve, protect, and maintain multiple beneficial uses, water quality standards, and experiences of the Tennessee River and its tributaries for fishing, swimming, drinking, and recreating through basin-wide public-private partnerships for the benefit of current and future generations.

Tennessee River Basin Stakeholder Meeting Participants
March 2003

The Tennessee River basin is one of the more biologically diverse basins in Alabama and the nation for aquatic species, and one of the more agriculturally important regions of the state. The Tennessee River basin is a basin in transition. Still predominantly rural and agricultural, many areas of the basin that are adjacent to urban-suburban areas are undergoing a transition from agricultural uses to developed uses. Between 1990 and 2000, more than 50,000 acres of agricultural lands were converted to developed areas. There was a gain of more than 62,000 people in the basin between the 1990 and 2000 census, greater than an 8 % increase.

The Tennessee Valley region of Alabama has a long history of cooperative, voluntary nonpoint source projects. Several successful projects have built the knowledge and cooperative spirit of locally-led watershed restorations, particularly in the agricultural portions of the basin. The early Bear Creek, Sand Mountain-Lake Guntersville, and Flint Creek watersheds highlight this tradition of successful projects and contribute to the sense of "can do" for watershed projects in the basin.

This Management Plan reflects the changing character in the basin. Many of the water quality impairments on the state's list of impaired waters are attributed to agricultural nonpoint sources (NPS). There is continued progress and reductions of agricultural NPS loadings to Tennessee River basin waters. The concern is that progress made with agricultural contributions is being off-set by development impacts. The objectives and strategies in this Plan reflect the dual concerns of stakeholders in the basin. Consensus among stakeholders is that the Tennessee River Clean Water Partnership through this Plan should:

1. Support local watershed implementation planning and projects in progress;
2. Assist development of implementation plans by start-up watershed groups up in needed areas of the basin; and
3. Promote basin-wide education and outreach efforts that increase awareness and involvement with watershed improvements or protection.

Sixteen objectives are identified for the Tennessee River basin based on stakeholder input. These set a framework for future watershed project planning and implementation. Specific watershed implementation plans will be locally developed and are the next step of the Tennessee River Basin Watershed Management Plan. The local plans will align with one or more of the following basin-wide objectives and strategies.

Objective 1. Reduce nonpoint source pollution from agriculture

Strategy: ***Work with the planning processes and cycles of the USDA and local SWCD programs to use appropriate BMP programs needed for the type and source of water quality impairment from agricultural activities***

Objective 2. Reduce nonpoint source pollution from urban development activities

Strategies:

- ***Demonstrate design and construction BMPs***
- ***Conduct training and outreach events for builders, developers, planners***
- ***Support Huntsville streams mitigation program development***
- ***Track and support legislation in Alabama that allows improved local codes and ordinances for development***

Objective 3. Reduce nutrient loadings to basin reservoirs where applicable

Strategies:

- ***Coordinate with ADEM regulatory and non-regulatory programs to address nutrient loadings to basin reservoirs. Load reductions may involve different programs (point source and non-point source) depending on the reservoir, the watershed, and the sources of the loads***
- ***Track ADEM's reservoir nutrient criteria development and implications***
- ***Select and develop a reservoir-watershed project scope with ADEM***

Objective 4. Improve compliance with water quality standards in north Alabama

Strategies: ***Work with appropriate regulatory agency for the water quality issue***

- ***Point sources refer to ADEM***
- ***Nonpoint source issues refer to ADEM***
- ***Wetland issues refer to Corps of Engineers***
- ***Construction in navigable waters refer to Corps and TVA***

Objective 5. Identify and designate outstanding waters in north Alabama

Strategy: ***Develop individual smart growth actions in relatively un-impacted waters***

Objective 6. Protect diminishing farmlands

Strategy: ***Create vision of the future project with the 3 local councils of governments in the basin (e.g. Jefferson County 20/20 project)***

Objective 7. Reduce nonpoint source pollution from (residential sources) onsite sewage systems

Strategies:

- ***Promote training programs and education activities that ensure proper installation, operation, and maintenance of onsite sewage systems***
- ***Seek and target alternative funding and grant sources for areas with high failing septic systems***

Objective 8. Seek and resolve commercial mussel fishing issue on Tennessee River related to water quality

Strategy: ***Track progress and development of Alabama Mussel Catchers Association initiatives***

Objective 9. Reduce water-related recreational activities pollution

Strategy: Continue education and outreach efforts and events through TVA's Clean Marina Initiative, the Clean Boating Campaign, Project ROSE, and the Coast Guard Auxiliary inspection program

Objective 10. Protect groundwater resources

Strategies:

- ***Continue participation in education and outreach events in local groundwater festivals basin-wide***
- ***Develop education-outreach programs where projects are needed***
- ***Track State's monitoring results of groundwater resources in the basin***

Objective 11. Reduce threat to endangered aquatic species from loss of habitat or water quality degradation

Strategy: ***Support mussel re-introduction project in the Bear Creek watershed; tie this objective to the strategy for objective 13, riparian buffers***

Objective 12. Develop and demonstrate environmentally friendly golf, residential, and recreation areas

Strategy: ***Develop specific strategies within the local watershed implementation planning process***

Objective 13. Protect and enhance riparian buffer zones throughout the basin

Strategy: ***Target and apply USDA, US FWS, The Nature Conservancy, and Land Trusts program funds for conservation easements and practices***

Objective 14. Sustain public water supply and promote conservation efforts

Strategy: ***Target and utilize existing public education programs throughout the basins that promote water conservation***

Objective 15. Reduce nonpoint source pollution from silvicultural activities

Strategy: ***Promote, apply, and follow Alabama Forestry Commission BMPs throughout the Tennessee River basin***

Objective 16. Reduce nonpoint source pollution from mining activities

Strategies:

- ***Develop specific goals in the effected local watersheds***
- ***Coordinate implementation plans with Alabama Mining Division, US Office of Surface Mines, and USDA***

Tennessee River Basin Stakeholders
March 2003

Tennessee River Basin Watershed Management Plan

Section 1
Watershed Description and Background Information

1.1 Natural Setting

1.1 .1 Surface Drainage

The Tennessee River basin in Alabama drains about 6,826 square miles (13 %) of the land area in Alabama. The drainage covers portions of 15 northern counties. (Figure 1.1.1 ADEM, 2000)

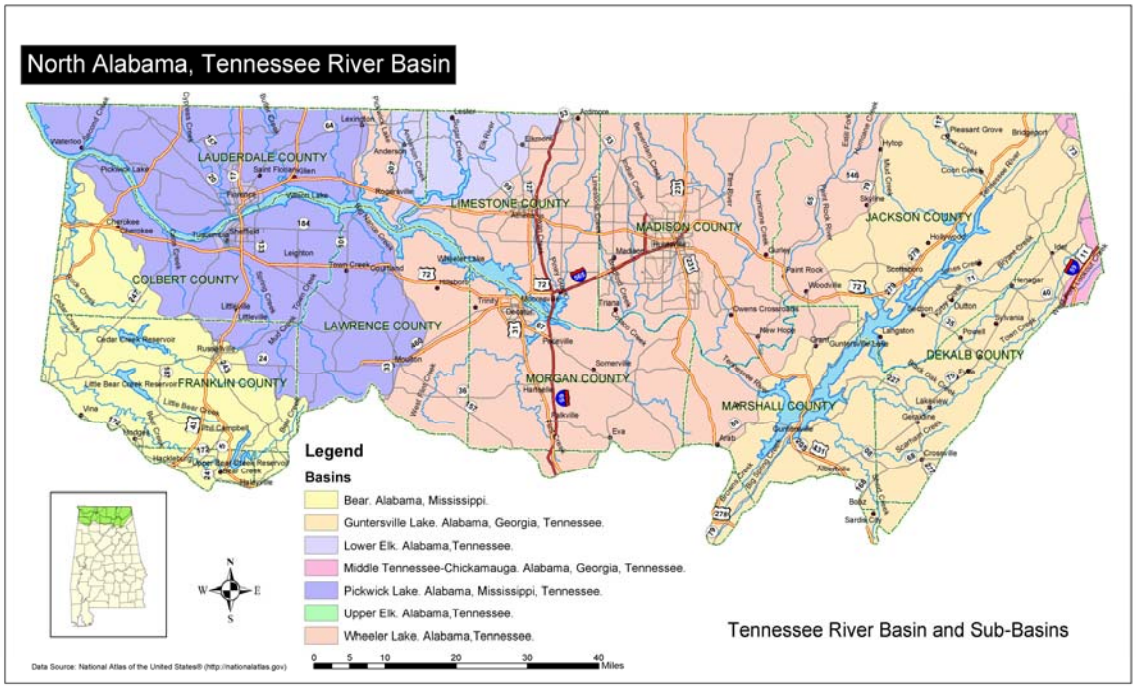


Figure 1.1.1 Tennessee River Basin and Alabama Counties
(Source: Alabama's 2002 Water Quality Report, ADEM)

There are seven watershed, or cataloging units, in this portion of the Tennessee River in Alabama. More than 95% of the Tennessee basin in Alabama is contained in four of these cataloging units: Guntersville Lake, Wheeler Lake-Elk River, Pickwick/Wilson Lake, and Bear Creek units. (*Definition:* A cataloging unit is a numerical designation by the USGS for a standardized hydrologic area or watershed, i.e. the land area that drains to a common point on a stream or lake. The cataloging unit, or hydrologic unit code (HUC) is a unique number assigned to each watershed. As watersheds are subdivided and delineated, additional numerical digits are added to the 8-digit code. Thus an 11-digit

HUC is a sub watershed within the larger 8-digit watershed unit. Conversely, the larger the watershed, the fewer the digits; for example the entire Tennessee River watershed has a two-digit code: "06".)

Sub-Basin	Cataloging Unit
Guntersville	0603-0001
Wheeler	0603-0002
Lower Elk River	0603-0004
Pickwick/Wilson	0603-0005
Bear Creek	0603-0006

The Tennessee Valley Authority dam and reservoir system dominates the mainstem Tennessee River and Bear Creek tributary. There are four dams on the Tennessee River: Guntersville, Wheeler, Wilson, Pickwick; and four on the Bear Creek tributary: Upper Bear, Bear, Cedar, and Little Bear Creeks. A recreational floatway is maintained for 26 miles downstream of the Upper Bear Creek dam, near Haleyville, Alabama.

1.1.2 Land Use

General land cover and land use patterns in the Tennessee River basin are highlighted in Figure 1.1.2.1, a satellite image of the basin taken during the early 1990's (https://zulu.ssc.nasa.gov/mrsid). The basin is predominantly woodland (dark green highlights) and agricultural land (lighter green and light "pink" highlights). Urban/suburban and bare areas, e.g. mine lands and construction areas, appear as darker red areas on the image. Open water appears as dark blue or black.

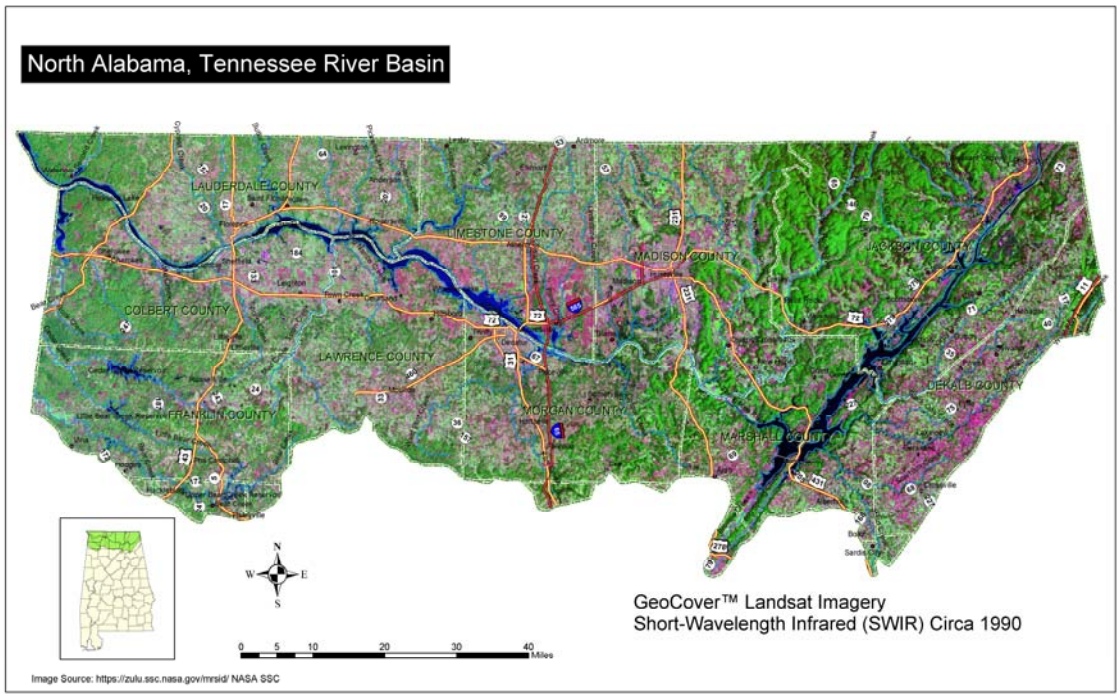


Figure 1.1.2.1 Tennessee River Basin General Land Cover Distribution
(Source: NASA Marshall Space Flight Center; personal communication with Scott Stevens)

Figure 1.1.2.1 gives a good overview representation of the Tennessee basin vegetative (trees, grass, cropland) cover. However, a significant feature in the Tennessee basin, and much of the country, is the change in land use distributions. This is highlighted in Figure 1.1.2.2 which shows the change in farmland to "developed" lands (e.g. subdivisions, commercial, industrial uses) between 1982 and 1997. (USDA/NRCS National Resource Inventory data, 2001).

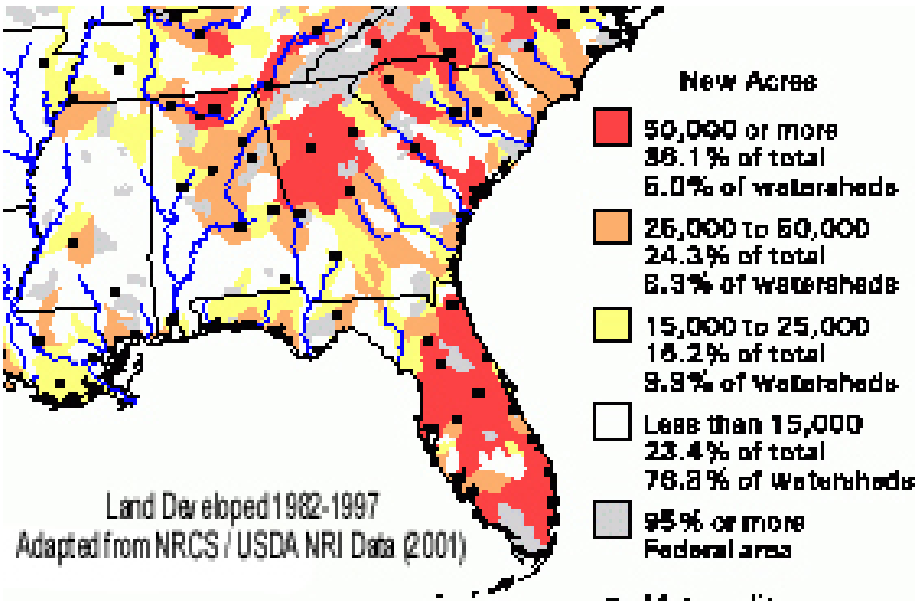


Figure 1.1.2.2. Farm Land Developed Between 1982-1997
(Adapted from USDA NRI, 2001)

1.1.3 Ecoregions

Ecoregions serve as a framework for stream assessments, monitoring, and management targets to establish water quality standards for biological criteria and to evaluate watershed conditions. The Tennessee Basin comprises three ecoregions (Level III) and several sub-regions, or level IV. (Figure 1.1.3) The Interior Plateau ecoregion (71) includes the Highland Rim, Outer Nashville basin, and Little Mountain. This ecoregion dominates the Tennessee basin. The Southwest Appalachians ecoregion (68) includes the Cumberland Plateau, Sequatchie Valley, Plateau Escarpment, Southern Table Plateaus, Dissected Plateau, and Shale Hills. The Southeast Plains ecoregion includes (65) the Transitional Hills and makes up a fraction of the basin in the northwest corner of the state. (Griffith, G.E., Omernik, J. M., et.al. Ecoregions of Alabama and Georgia, 2000).

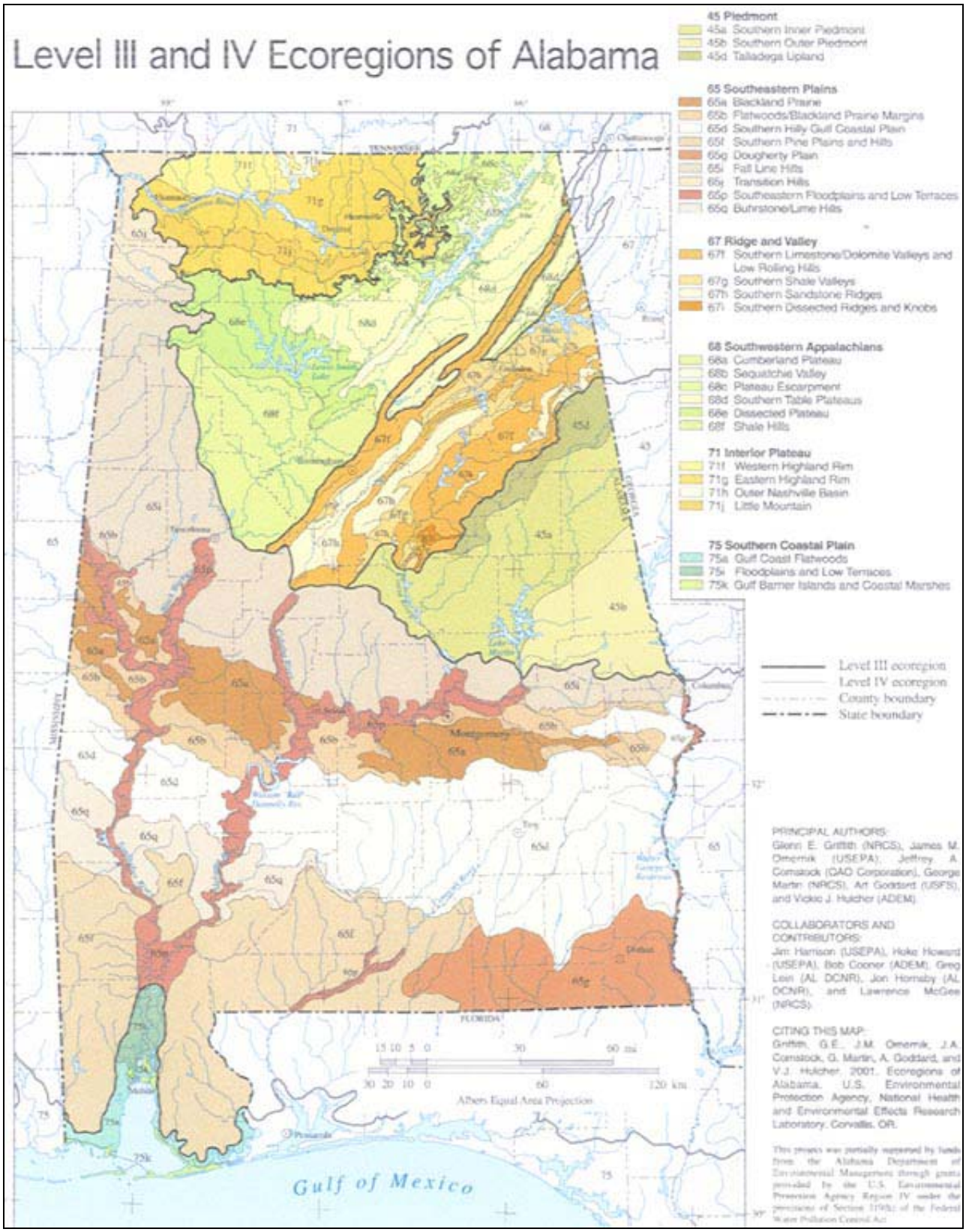


Figure 1.1.3 Ecoregions of Alabama

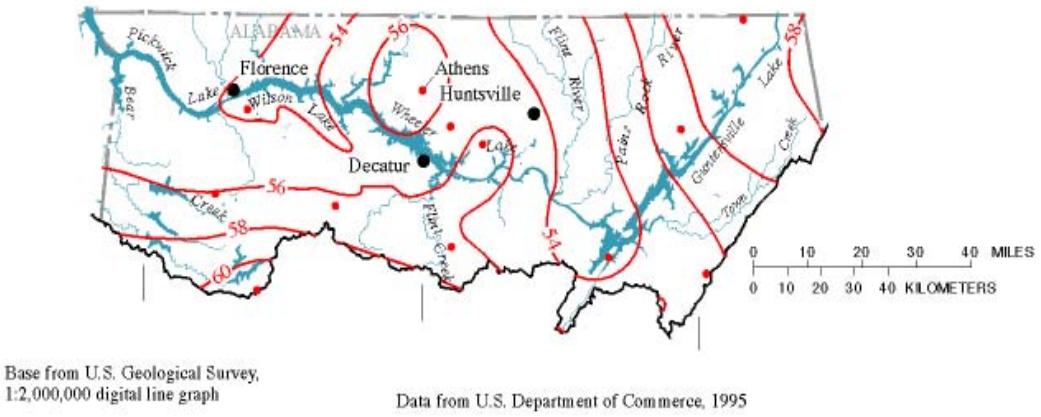
1.1.4 Geology and Soils

The Tennessee basin includes parts of three physiographic provinces: Coastal Plain, Interior Low Plateaus, and Appalachian Plateau. The region is of relatively low topographic relief except in the eastern portion of the basin where the Cumberland Plateau and escarpment (about 1000-1300 feet in elevation) meet the ridge and valley (generally 500 to 900 feet). (Figure 1.1.4, Sub-units in the Lower Tennessee River Basin, USGS National Water Quality Assessment Study, 2000). Karsts features such as limestone, caves, sinkholes, springs, and rock outcrops characterize much of the Interior and Appalachian Plateau area. Soils in the basin generally have slow to moderate infiltration rates. This has a bearing on surface runoff rates, groundwater recharge, and soil erosion potential.

Figure 1.1.4 Physiographic Provinces of the Tennessee River Basin
(Source: Adapted from USGS Lower Tennessee River NAWQA Study, 2000)

1.1.5 Climate

The area is characterized as subtropical (warm, humid summers, mild winters). An average of 54 to 60 inches of rain falls in the basin annually. (Figure 1.1.5 USGS Lower Tennessee River NAWQA 2000). Rainfall occurs throughout the year, with the winter-early spring months experiencing higher amounts than summer-fall seasons.



Distribution of average annual precipitation in the lower Tennessee River Basin, 1961-90.

Figure 1.1.5 Average Annual Precipitation in Tennessee River Basin
(Source: Adapted from USGS Lower Tennessee River NAWQA Study, 2000)

1.1.6 Threatened and Endangered Aquatic Species (Federally listed)

The Tennessee basin is one of the more biologically diverse systems for freshwater animals in the hemisphere, particularly mussels. Human activities (point, nonpoint sources of pollution, and hydrological modifications) have reduced habitat and aquatic conditions for many species. Declines in aquatic species are indicative of watershed activities that impact water quality and habitat. Aquatic species are considered the "canary in the mine".

A species is listed as endangered if it is likely to become extinct throughout all or a major portion of its range, and listed as threatened if it is likely to become endangered in the near future. Additional species (many more in fact are in decline) are not included in this summary. Some, however, are noted as potential candidates for listing as threatened or endangered.

Table 1.1.6 summarizes state and federal listings of species considered threatened or endangered for fish, mussels, snails, and crustaceans (crayfish and shrimp). A complete listing by sub-basin and species is provided in Appendix E. There are many more state listed species than federal. This is partly due to species ranges. The federal listing looks at the total range for a species which may cover multiple states. A species with a population in a limited area of a state may be "rare" for the state, but not for the broader range covering multiple states; thus a difference in listing numbers. A species listed on both the federal and state lists is one that is very limited in number and range. This summary indicates the richness of aquatic biological diversity in the Tennessee basin.

	Number of State Listings	Number of Federal Listings
Fish	**13**	**6**
Mollusks	**65, plus 8 extinct**	**24, plus 2 candidate species**
Snails	**17**	**3**
Crustaceans	**7**	**1**

Table 1.1.6. Tennessee River Basin Threatened and Endangered Species
(Source: personal communications Peggy Shute, TVA. Adapted from TVA and Alabama Heritage Programs, April 2003)

1.2 Social and Economic Highlights

1.2.1 Demographics and Jurisdictions

Portions of 15 north Alabama counties drain into the Tennessee River basin. Of these, ten counties: Colbert, Lauderdale, Limestone, Franklin, Lawrence, Morgan, Marshall, Madison, Jackson, and Dekalb have more than 50% of the county within the Tennessee River basin, Figure 1.2.1.1. Table 1.2.1.1 provides a summary of the counties and municipalities in the Tennessee River Basin.

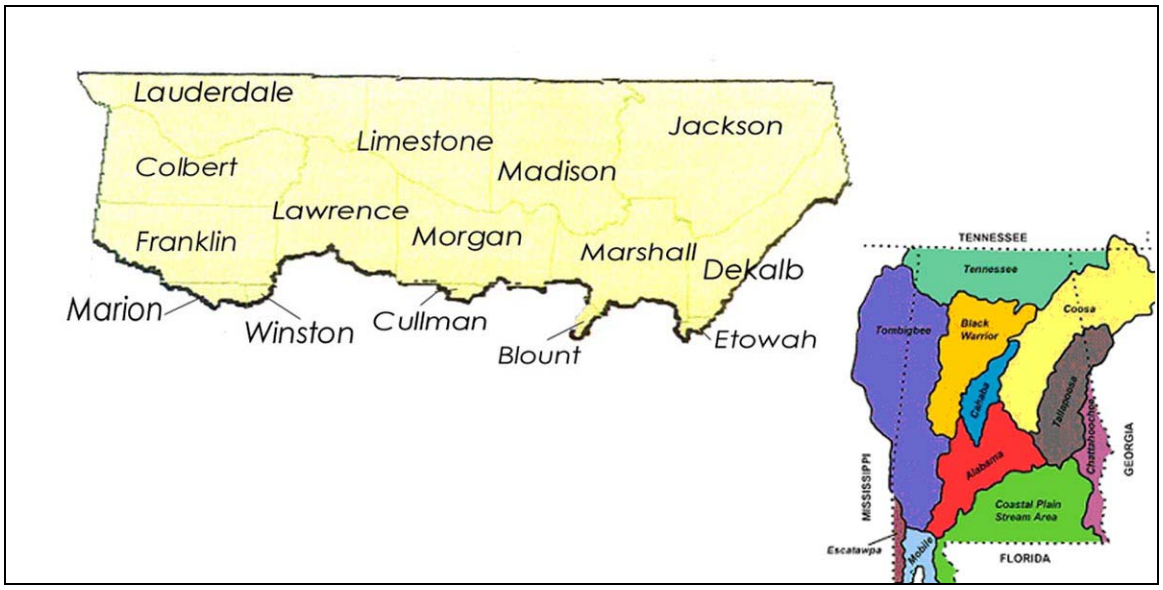


Figure 1.2.1.1 Counties in the Tennessee River Basin
(adapted from Alabama's 2002 Water Quality Report, ADEM)

Table 1.2.1.1 Counties and Municipalities in the Tennessee River Basin

County	% of County Within Watershed	Municipalities
Blount	4%	No incorporated communities within the Watershed
Colbert	100%	Muscle Shoals, Tuscumbia, Sheffield, Leighton
Cullman	5%	Vinemont
Dekalb	54%	Rainsville, Henagar, Ider, Crossville, Geraldine, Sylvania, Fyffe
Etowah	4%	No incorporated communities within the Watershed
Franklin	90%	Russellville, Red Bay, Phil Campbell, Vina, Littleville
Jackson	99%	Scottsboro, Bridgeport, Stevenson, Hollywood, Section, Paintrock Valley, Dutton, Pisgah, Woodville, Skyline, Langston
Lauderdale	100%	Florence, Killen, Saint Florian, Rogersville, Lexington, Cloverdale, Anderson, Underwood, Petersville, Waterloo
Lawrence	83%	Moulton, Courtland, Town Creek, East Lawrence, Danville, Hatton, Hillsboro
Limestone	100%	Athens, Elkmont, Tanner, Mooresville, Ardmore, Lester
Madison	100%	Madison, Huntsville, Owens Crossroads, New Hope, Triana, Meridianville, Hazel Green, Toney, Gurley, New Market, Harvest, Moores Mill
Marion	9%	Hamilton, Hackleburg
Marshall	84%	Guntersville, Arab, Union Grove, Albertville
Morgan	99%	Decatur, Priceville, Trinity, Summerville, Hartselle, Falkville
Winston	3%	No incorporated communities within the Watershed

Estimated population in the basin is 830,000 (Table 1.2.1.2). The largest population gains between 1990 and 2000 occurred in Limestone, Marshall and Dekalb counties (U.S. Census data, 2001). Principal towns in the basin (population over 10,000) include: Huntsville, Decatur, Florence, Madison, Albertville, Scottsboro, Hartselle, Muscle Shoals, Tuscumbia, and Athens.

Table 1.2.1.2. Estimated Populations and Median Incomes in the Tennessee River Basin (adapted from US Census data 2001).

County	Total Population	Estimated Population within Watershed	Percent Change since 1990	Median Household Income
Blount *	52,239	2,090	30.0%	$35,241
Colbert	55,106	55,106	6.4%	$31,954
Cullman *	77,900	3,895	14.6%	$32,256
Dekalb	65,506	35,373	17.9%	$30,137
Etowah *	103,014	4,121	3.6%	$31,170
Franklin	30,914	27,823	12.3%	$27,177
Jackson	54,147	53,605	12.8%	$32,020
Lauderdale	87,422	87,422	10.4%	$33,354
Lawrence	34,928	28,990	10.4%	$31,549
Limestone	66,980	66,980	21.3%	$37,405
Madison	281,931	281,931	15.8%	$44,704
Marion *	30,621	2,756	4.6%	$27,475
Marshall	82,329	69,081	16.1%	$32,167
Morgan	111,429	110,315	11%	$37,803
Winston *	24,654	740	12.7%	$28,435
Total	**1,159,120**	**830,228**	-----	**$32,856**

* < 15% of the county is within the Tennessee Basin.

Four sub-watershed (11-digit) hydrologic units around Huntsville have had the greatest population gains in the Tennessee River basin of Alabama. (Figure 1.2.1.2 and Appendix F) In the Huntsville area, Limestone Creek (0603-0002-300), Indian Creek (0603-0002-260), and Flint River (0603-0002-190) had the largest number of population gains since 1990 (14,000; 11,000; and 6,000 respectively). In the Decatur area, the Flint Creek unit (0603-0002-350) had a gain of 6,000 in population in the 10-year period since 1990. (Source: personal communications, Don Anderson, Don Dycus, Dennis Yankee; 2003 TVA; adapted from US Census 2000)

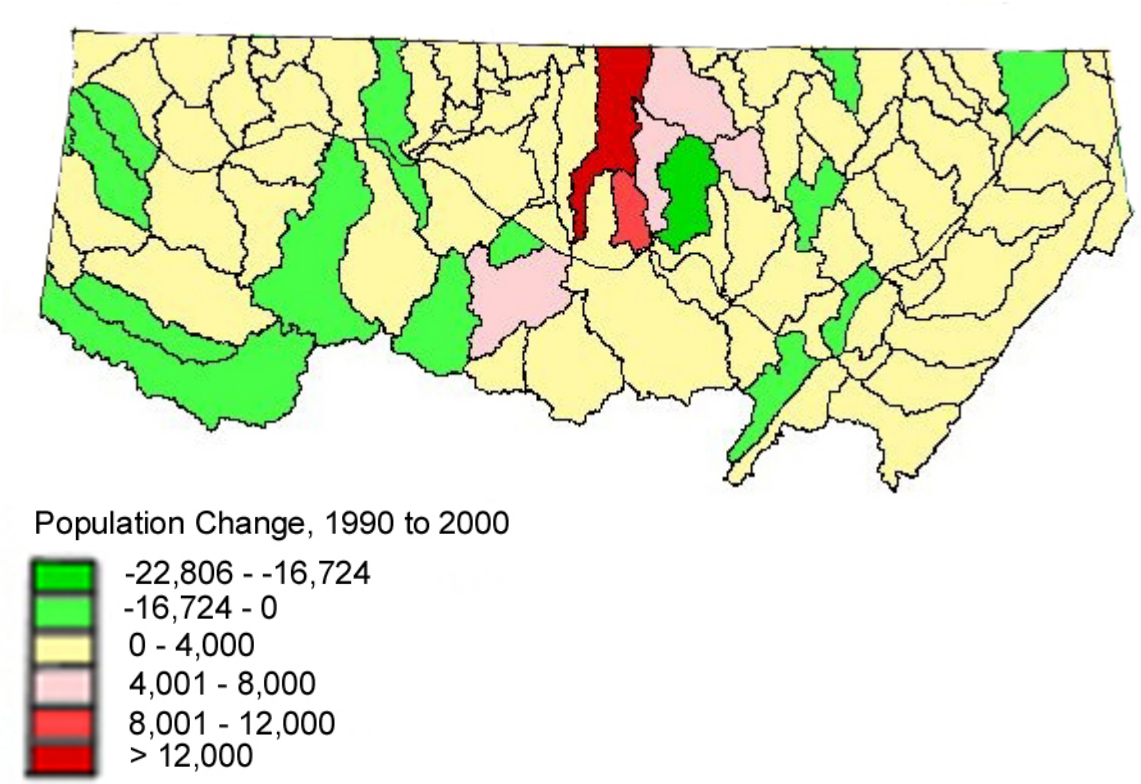


Figure 1.2.1.2 Population Change in the Tennessee Basin 11 digit Hydrologic Cataloging Units
(Source: TVA 2003 Adapted from US Census, 2000)

1.2.2 Economic Sectors

Manufacturing, industry, trade, and agriculture are dominant economic sectors within the basin. (Table 1.2.2.2) Median incomes for the counties range from $44,704 in Madison County to $27,177 in Franklin County (Table 1.2.1.2. U.S. Bureau of the Census, 2001).

1.2.2.1 Agriculture

The north Alabama counties account for $81 M of the state's $ 4.3 B agricultural sector. The dominant agricultural commodities in the basin are cotton and poultry (Table 1.2.2.2)

Inventory of all cattle in Alabama on January 1, 2003, totaled 1,440,000 head, up five percent from 2002. Beef cows at 761,000 head are up one percent from 2001. Alabama ranked 23rd nationally in cattle inventory and 14th in beef cow inventory. Cullman County ranked first in the state for cattle inventory with 67,000 head. Other leading counties are Dekalb, Marshall, Lowndes, Montgomery, and Lauderdale. Cullman County leads in number of beef cows with 38,000 head.

Jackson County topped all Alabama counties in corn production for 2002, with 1,890,000 bushels from the 22,000 acres. Other top producing counties for the year were: Madison, Lawrence and Colbert. Alabama corn producers harvested a total of 180,000 acres in 2002. Production totaled 15.8 million bushels and was valued at $42.8 million. Alabama is ranked 28th in the United States in corn grain production.

Item	Amount
Row Crops	***Acres***
Cotton	220,533
Corn	77,557
Soybeans	76,833
Livestock	***Head***
Beef	293,505
Poultry	4,353,000
Swine	48,616

Table 1.2.2.1. Agricultural Activities within the Tennessee River Basin http:///www.acenet.auburn.edu/dept.nass/
(Source: Alabama Agricultural Statistics)

Table 1.2.2.2. Receipts for Major Economic Sectors for Counties within the Tennessee River Basin

County	Manufacturing	Wholesale Trade	Retail Trade	Agriculture
	----------1000 $----------			
Blount *	403,498	-D-	202,003	157,998
Colbert	1,491,610	404,318	527,473	49,188
Cullman *	964,101	256,055	650,927	454,645
Dekalb	1,285,968	309,628	343,027	312,664
Etowah *	1,577,010	-D-	737,764	62,368
Franklin	645,846	99,780	184,459	128,295
Jackson	1,253,523	203,180	299,787	48,332
Lauderdale	885,082	368,876	780,838	48,332
Lawrence	-D-	-D-	116,561	106,846
Limestone	1,321,007	-D-	404,610	89,166
Madison	6,991,727	-D-	2,610,697	52,037
Marion *	964,161	243,719	167,610	31,378
Marshall	2,616,683	858,820	1,008,171	212,551
Morgan	-D-	-D-	1,136,530	93,300
Winston *	858,671	127,208	103,774	80,934

Notes:
D –Withheld to avoid disclosure
* - < 15% of the county within the watershed

(Source: US Census Bureau, 1997 Economic Census
Agriculture Source: Alabama Agricultural Statistic 2002)

1.2.2.2 Recreation-Tourism

Recreation accounts for $1.1 billion annually in the north Alabama counties according to the North Alabama tourism council located in Decatur, Alabama. Annual north Alabama tourism is $402 million in salary and wages. Tourism in north Alabama creates approximately 22,054 jobs. For every $1 in travel-related spending, workers in north Alabama earn 41 cents, State government collects 4 cents and local government collects 2 cents. There are six State Parks (Guntersville, Bucks Pocket, Joe Wheeler, Monte Sano, Cathedral Caverns and Little River Canyon); 2 National (federal) facilities (Wheeler National Wildlife Refuge, Russell Cave National Monument); several whitewater outfitters and canoe clubs on Bear Creek Floatway and Flint River; and 23 marinas/resorts.

County	Tourism Dollars
Blount	$6,198,945
Colbert	$44,748,388
Cullman	$61,426,359
Dekalb	$38,830,389
Etowah	$83,395,602
Franklin	$6,931,797
Jackson	$19,238,432
Lauderdale	$57,140,593
Lawrence	$11,794,136
Limestone	$45,370,870
Madison	$529,831,916
Marion	$9,074,444
Marshall	$69,826,545
Morgan	$128,920,253
Winston	$5,267,605
Total	**$1,117,996,274**

(Source: Adapted from information collected by north Alabama Tourism Council 2003)

1.2.2.3 Commercial Fishing

There are two primary commercial fisheries commodities in the basin: freshwater mussel (shell) harvesting and commercial fishing (catfish) on the mainstem Tennessee River reservoirs. Figures for these commodities are not readily available by county or reservoir. However, local interest in commercial fisheries is consistently highlighted during public meetings about water resources on Tennessee basin reservoirs.

1.2.3 Water Usage

Surface water withdrawals for all purposes (domestic, industrial, agricultural) are estimated to be 9400 million gallons per year. About 87 percent of this annual

withdrawal is for agricultural (irrigation) uses, 8 percent for industrial uses, and 5 percent for domestic use. *(Source: Personal communication Marcella Jenkins, ADECA).*

1.2.4 Wastewater Generation

1.2.4.1 Permitted Discharges

ADEM administers the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act. A regulated entity is required to obtain a discharge permit from ADEM in order to discharge treated wastewater to Alabama water bodies. These include schools and other public institutions, municipal sewage treatment plants, and corporate/private industrial and commercial wastewater treatment facilities. Table 1.2.4.1 summarizes the number of permits and permitted (allowable) design volumes for treated wastewater discharges in the Tennessee River basin.

Table 1.2.4.1 Permitted Wastewater Discharges in the Tennessee River Basin

	Guntersville	Wheeler	Lower Elk	Pickwick/ Wilson	Bear Creek
Number public/municipal permits	30	38	2	24	5
Design flow, mgd	25.7	105.6	0.3	29.9	1.5
Number industrial permits	n/a	n/a	n/a	n/a	n/a
Design flow, mgd	n/a	n/a	n/a	n/a	n/a

(Source: Personal communications, Steve Foster, ADEM. Volumes for industrial discharges were not available.)

1.2.4.2 Domestic onsite wastewater systems (septic tank-drainfields)

The Alabama Department of Public Health (ADPH) oversees and administers, through county Health Departments, all permits and investigations of complaints related to septic systems. It is estimated that there are 281,000 systems in the Tennessee River basin.

Table 1.2.4.2 Septic Systems in the Tennessee River Basin

County	Systems	Failing
Blount County (4% in Basin)	1,020	83
Colbert County (100% in Basin)	22,250	1,750
Cullman County (5% in Basin)	2,440	200
Dekalb County (54% in Basin)	29,430	2,408
Etowah County (4% in Basin)	2,200	160
Franklin County (90% in Basin)	19,450	954
Jackson County (99% in Basin)	20,790	1,601
Lauderdale County (100% in Basin)	22,000	1,350
Lawrence County (83% in Basin)	14,940	448
Limestone County (100% in Basin)	19,500	1,920
Madison County (100% in Basin)	59,550	4,764
Marion County (9% in Basin)	1,530	122
Marshall County (84% in Basin)	21,630	2,163
Morgan County (99% in Basin)	44,125	3,220
Winston County (3% in Basin)	405	31
Totals	**281,260**	**21,174**

(Source: County Environmental Health Departments and Alabama Department of Public Health)

1.2.4.3 Agricultural

As a general rule, agriculture is exempt from permitting requirements of the Clean Water Act, such as that for municipal and industrial discharges. However, large livestock operations are required to have an approved operational nutrient management plan for livestock operations. Commonly referred to as AFO (animal feeding operations) and CAFO (confined animal feeding operations) in the 1995 Farm Bill, landowners with large numbers of dairy, beef cattle, swine, or poultry are required to have an approved nutrient management plan. There are 132 CAFOs in the Tennessee River basin. Specific information about AFO and CAFO within the basins is provided in section 1.3.3.1.

1.3 Projects and Programs

An excellent summary of water quality improvement programs in the State is provided in the publication **"30 Years of Clean Water in Alabama"** by ADEM published in 2002. This section of the Management Plan intends to list the more commonly used elements of the Clean Water Act and other pertinent federal or state programs that assist the development and implementation of watershed management goals and projects.

1.3.1 Regulatory Programs of the Clean Water Act

This section of the Management Plan gives an overview of programs in the Federal Clean Water Act (CWA) that are administered by ADEM. At some point in the development and implementation of watershed management plans by watershed stakeholders, elements or combination of program elements in the Clean Water Act will be part of the stakeholder objectives and strategies and watershed implementation plans.

Key CWA elements that factor into watershed management plans include:

- NPDES: point source permitting
- Section 305(b): water quality assessments (to determine ability of water to meet state standards for uses)
- Section 319(h): nonpoint source pollution assessments and implementations
- Section 303(d): total maximum daily loads (to correct waters not meeting state standards; may be a point and nonpoint source action).

A generalization of the CWA is related to "point" and "nonpoint" sources of pollution. Typically, "point" sources are wastewater discharges that are permitted by the State. Point sources are loosely referred to as "end of pipe" outlets of treated wastewater and include sewage and industrial operations, and more recently urban stormwater outlets. Point sources of pollution are regulated through National Pollutant Discharge Elimination System (NPDES) permits.

"Nonpoint" sources are typically polluted runoff water from land activities such as construction, farming, residential, and urban areas (Table 1.3.1). Nonpoint sources are approached in a voluntary, non-regulated manner. This Management Plan could serve as a reference for the development of watershed NPS implementation plans to improve water quality in streams of Alabama.

Table 1.3.1 Designated EPA Nonpoint Pollutant Categories/Subcategories
(Source: adapted from US EPA)

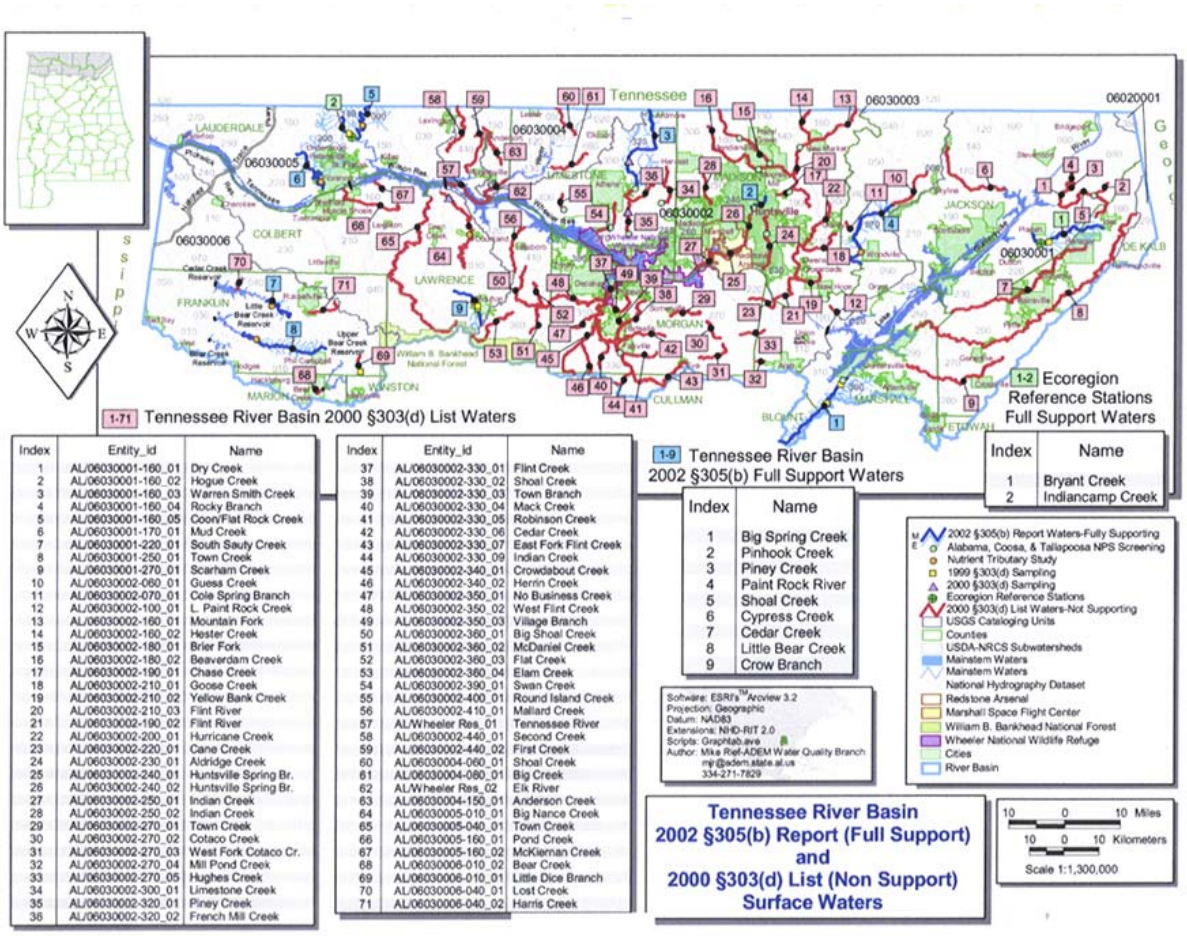
Code	Description
0000	**All Sources**
1000	**Agriculture**
1100	Non-Irrigated Crop Production
1200	Irrigated Production
1300	Specialty Crop e.g. horticulture, citrus, fruit
1350	Grazing-Related Sources
1400	Pasture Grazing
1500	Range Grazing
1510	Range Grazing – Riparian
1520	Range Grazing – Upland
1700	Aquaculture
1600	**Animal Feeding Operations**
2000	**Silviculture**
2100	Harvesting, Residue Management
2200	Forest Management e.g. pumped drainage, fertilization, pesticide application
2300	Road Construction/Maintenance
2990	Reforestation
3000	**Construction**
3100	Highways/Roads/Bridges
3200	Land Development or Redevelopment
4000	**Urban Runoff/Stormwater**
4190	Municipal
4191	Commercial
4192	Residential e.g. non-commercial automotive, pet waste, etc.
4400	Illicit Connections/Illegal Hook-ups
4450	Dry Weather Flows
4500	Highway, Road, Bridge Runoff
4590	Post Development Erosion and Sedimentation
4650	Salt Storage Sites
5000	**Resource Extraction**
5100	Surface Mining
5200	Subsurface Mining
5290	Open Pit Mining
5300	Placer Mining
5400	Dredge Mining
5500	Petroleum Activities
5600	Mill Tailings
5700	Mine Tailings
5800	Abandoned Mine Drainage
5990	Sand/Gravel Mining
6000	**Land Disposal/Storage/Treatment**
6200	Wastewater
6300	Landfills
6350	Inappropriate Waste Disposal
6400	Industrial Land Management
6500	On-site/Decentralized Wastewater Treatment
6600	Hazardous Waste
6700	Septage Disposal
6800	Waste Storage/Storage Tank Leaks (above ground)
6900	Waste Storage/Storage Tank Leaks (underground)
7000	**Hydro modification**
7100	Channelization
7190	Channel Erosion/Incision
7200	Dredging
7300	Dam Construction
7350	Upstream Impoundment
7400	Flow Regulations/Modification
7550	Other Habitat Modification
7600	Removal of Riparian Vegetation
7700	Streambank or Shoreline Modification - Destabilization
7800	Drainage/Filling of Wetlands
7850	Groundwater Withdrawal
7900	**Marinas and Recreational Boating**
7990	Pumpouts
7991	Sanitary On-Vessel Discharges
7992	Other On-Vessel Discharges
7994	Boat Construction
7995	Boat Maintenance
7996	Shoreline Erosion
7997	Fueling
7998	Dredging
8000	**Other NPS Pollution**
8050	Erosion From Derelict Land
8100	Atmospheric Deposition
8400	Spills
8600	Natural Sources
8700	Recreational and Tourism Activities (non-boating)
8910	Groundwater Loadings
8950	Wildlife
8500	**Historical Pollutants**
8590	Contaminated Sediments
8591	Clean Sediments
8592	Other Historical Pollutants
8700	**Turf Management**
8710	Golf Courses
8790	Yard Maintenance
8791	Other Turf Management

1.3.1.1.1 Section 303(d) Lists and Total Maximum Daily Loads (TMDLs)

Section 303(d) of the Clean Water Act requires each state to prepare a list of waters that do not support designated uses for swimming, aquatic life, drinking sources, agriculture, and industrial uses. The 303(d) "list" establishes which segments of streams or reservoirs do not meet state criteria and the pollutant(s) causing the problem. Figure 1.3.1.1 shows the 303(d) listed streams in the Tennessee River basin. Appendix B lists the impaired stream segments and summarizes information about the pollutant causing the stream listing and the potential pollutant sources.

TMDL is a comprehensive review and modeling procedure used to establish waste load allocations for each pollutant. Point and/or nonpoint sources are considered in the TMDL process. The schedule and date for TMDL developments is listed in Appendix C.

Figure 1.3.1.1 Tennessee River Basin 303(d) Listed Stream Segments
(Source: Alabama's 2002 Water Quality Report to Congress, ADEM 2000)



Index	Entity_id	Name
1	AL/06030001-160_01	Dry Creek
2	AL/06030001-160_02	Hogue Creek
3	AL/06030001-160_03	Warren Smith Creek
4	AL/06030001-160_04	Rocky Branch
5	AL/06030001-160_05	Coon/Flat Rock Creek
6	AL/06030001-170_01	Mud Creek
7	AL/06030001-220_01	South Sauty Creek
8	AL/06030001-250_01	Town Creek
9	AL/06030001-270_01	Scarham Creek
10	AL/06030002-060_01	Guess Creek
11	AL/06030002-070_01	Cole Spring Branch
12	AL/06030002-100_01	L. Paint Rock Creek
13	AL/06030002-160_01	Mountain Fork
14	AL/06030002-160_02	Hester Creek
15	AL/06030002-180_01	Brier Fork
16	AL/06030002-180_02	Beaverdam Creek
17	AL/06030002-190_01	Chase Creek
18	AL/06030002-210_01	Goose Creek
19	AL/06030002-210_02	Yellow Bank Creek
20	AL/06030002-210_03	Flint River
21	AL/06030002-190_02	Flint River
22	AL/06030002-200_01	Hurricane Creek
23	AL/06030002-220_01	Cane Creek
24	AL/06030002-230_01	Aldridge Creek
25	AL/06030002-240_01	Huntsville Spring Br.
26	AL/06030002-240_02	Huntsville Spring Br.
27	AL/06030002-250_01	Indian Creek
28	AL/06030002-250_02	Indian Creek
29	AL/06030002-270_01	Town Creek
30	AL/06030002-270_02	Cotaco Creek
31	AL/06030002-270_03	West Fork Cotaco Cr.
32	AL/06030002-270_04	Mill Pond Creek
33	AL/06030002-270_05	Hughes Creek
34	AL/06030002-300_01	Limestone Creek
35	AL/06030002-320_01	Piney Creek
36	AL/06030002-320_02	French Mill Creek

Index	Entity_id	Name
37	AL/06030002-330_01	Flint Creek
38	AL/06030002-330_02	Shoal Creek
39	AL/06030002-330_03	Town Branch
40	AL/06030002-330_04	Mack Creek
41	AL/06030002-330_05	Robinson Creek
42	AL/06030002-330_06	Cedar Creek
43	AL/06030002-330_07	East Fork Flint Creek
44	AL/06030002-330_09	Indian Creek
45	AL/06030002-340_01	Crowdabout Creek
46	AL/06030002-340_02	Herrin Creek
47	AL/06030002-350_01	No Business Creek
48	AL/06030002-350_02	West Flint Creek
49	AL/06030002-350_03	Village Branch
50	AL/06030002-360_01	Big Shoal Creek
51	AL/06030002-360_02	McDaniel Creek
52	AL/06030002-360_03	Flat Creek
53	AL/06030002-360_04	Elam Creek
54	AL/06030002-390_01	Swan Creek
55	AL/06030002-400_01	Round Island Creek
56	AL/06030002-410_01	Mallard Creek
57	AL/Wheeler Res_01	Tennessee River
58	AL/06030002-440_01	Second Creek
59	AL/06030002-440_02	First Creek
60	AL/06030004-060_01	Shoal Creek
61	AL/06030004-080_01	Big Creek
62	AL/Wheeler Res_02	Elk River
63	AL/06030004-150_01	Anderson Creek
64	AL/06030005-010_01	Big Nance Creek
65	AL/06030005-040_01	Town Creek
66	AL/06030005-160_01	Pond Creek
67	AL/06030005-160_02	McKiernan Creek
68	AL/06030006-010_02	Bear Creek
69	AL/06030006-010_01	Little Dice Branch
70	AL/06030006-040_01	Lost Creek
71	AL/06030006-040_02	Harris Creek

Index	Name
1	Big Spring Creek
2	Pinhook Creek
3	Piney Creek
4	Paint Rock River
5	Shoal Creek
6	Cypress Creek
7	Cedar Creek
8	Little Bear Creek
9	Crow Branch

Index	Name
1	Bryant Creek
2	Indiancamp Creek

1.3.1.2 Stormwater Management and Construction Permitting

There are several provisions of the Clean Water Act related to stormwater management as administered by ADEM. Three provisions are highlighted here.

Construction management for all land disturbing activities greater than 1 acre in size must obtain a permit for an approved plan for discharges of stormwater from construction sites. These are revised provisions that went into effect March 2003. Table 1.3.1.2.1 summarizes the number of general permits under the previous provision for construction: for sites equal to or greater than 5 acres in size. While the number of permits under the new provision is not available at the time of this report, Table 1.3.1.2.1 does suggest relative construction activities in the sub-basins of the Tennessee River. The Wheeler basin has four times more permits than Pickwick or Guntersville.

Table 1.3.1.2.1 General Permits for Construction Sites > 5 Acres *

Sub-basin	Number of permits
Guntersville (0603-0001)	139
Wheeler (0603-0002)	805
Lower Elk River (0603-0004)	15
Pickwick/Wilson (0603-0005)	202
Bear Creek (0603-0006)	63

(Source: Adapted from personal communication; Steve Foster, ADEM)

* Note: Size provision is now 1 acre or greater; information for new size provision was not available for the preparation of this Plan; May 2003.

Stormwater management for cities and urbanized areas has been phased in. Phase I, implemented in 1990, affected communities with populations greater than or equal to 100,000. Huntsville is the only community in the Tennessee River basin to comply with Phase I regulations and provisions.

Phase II applies to communities with populations greater than or equal to 10,000. Table 1.3.1.2.2 lists Phase II communities in the Tennessee River basin (personal communication; Patti Hurley, ADEM). These communities will be preparing stormwater management plans over the next 5 years (permit cycle period) and provide an opportunity for stakeholder involvement.

Table 1.3.1.2.2 Phase II Communities in the Tennessee River Basin

Community	Sub-basin	Associated Sub-watershed Hydrologic Units
Tuscumbia	Pickwick (0603-0005)	-200, -220
Sheffield	Pickwick (0603-0005)	-160, -210
Muscle Shoals	Pickwick (0603-0005)	-160
Florence	Pickwick (0603-0005)	-150, -160, -200
Colbert County	Pickwick (0603-0005); Bear Creek (0603-0006)	5-210, 5-230, 5-240, 5-040, 6-070, 6-110
Lauderdale County	Pickwick (0603-0005)	-030, -090, -140, -150, -180, -200, -220, -250, -270, -280
Limestone County	Wheeler (0603-0002); Lower Elk (0603-0004)	2-280, 2-300, 2-320, 2-390, 2-400, 4-020, 4-060, 4-070, 4-080, 4-120, 4-130, 4-150
Madison County	Wheeler (0603-0002)	-100, -110, -130, -140, -160, -180, 190, -200, -210, -250, 260
Decatur	Wheeler (0603-0002)	-350, -370

(Source: Adapted from personal communication; Patti Hurley, ADEM.)

1.3.1.3 Nonpoint Source Management

The Tennessee Valley of Alabama has a long history of cooperative nonpoint source projects and voluntary efforts (Table 1.3.1.3.1). While some of the more recent projects or activities have received funding through Section 319 grant awards of the Clean Water Act, most projects developed from diverse interests involving a variety of stakeholders and funded through a combination of sources. Prior to the passage of the Water Quality Act of 1987, and implementation of Section 319 Nonpoint Source Program, locally led conservation was in effect in the Tennessee River basin.

Two of the first projects initiated in the basin during the 1980's were the Sand Mountain-Lake Guntersville Watershed Project and the Bear Creek Watershed Project; both agriculturally impacted watersheds. The projects were initiated by motivated local groups of agricultural stakeholders with support of the Tennessee Valley Authority, Soil Conservation Service (now the NRCS), the Agricultural Stabilization & Conservation Service (now the FSA), Extension, local Soil and Water Conservation districts, and other agencies. It is important to note that these watersheds continue to have active efforts that utilize a variety of funding mechanisms to accomplish the goal of nonpoint source load reductions.

As a result of the early cooperative watershed water quality efforts of stakeholders in the Tennessee River basin, many new projects have developed. Figure 1.3.1.3 shows the distribution of cooperative projects in the Tennessee River basin. Strong local leadership, commitment, and progressiveness on the part of a number of local Soil and Water Conservation Districts, Resource Conservation and Development Councils, and local

watershed groups have resulted in widespread coverage of local nonpoint source water quality projects in the basin which continue today. Table 1.3.1.3.1 summarizes the status of active and planned watershed projects in the basin.

Table 1.3.1.3.1 Summary of ADEM Section 319 NPS Watershed Projects

Map Index	8- digit HUC	Sub-basin	Watershed Project	Funding Date(s)
3	06030006	Bear Creek	Bear Creek	1986, 1990, 1991, 2000
4	06030005	Pickwick/Wilson	Big Nance	1999
21	06030002	Wheeler	Flint Creek	1992-1995
22	06030002	Wheeler	Flint River	2000
27	06030002	Wheeler	Paint Rock River	1995
28	06030002	Wheeler	Piney Creek	1999
31	06030001	Guntersville	Sand Mountain-Lake Guntersville	1986, 1991, 1992, 1994, 1995
33	06030001	Guntersville	Short-Scarham	2001
34	06030001	Guntersville	S. Sauty Creek	2001
35	06030001	Guntersville	Town Creek	2001
(Source: Personal Communication Steve Foster, ADEM)				

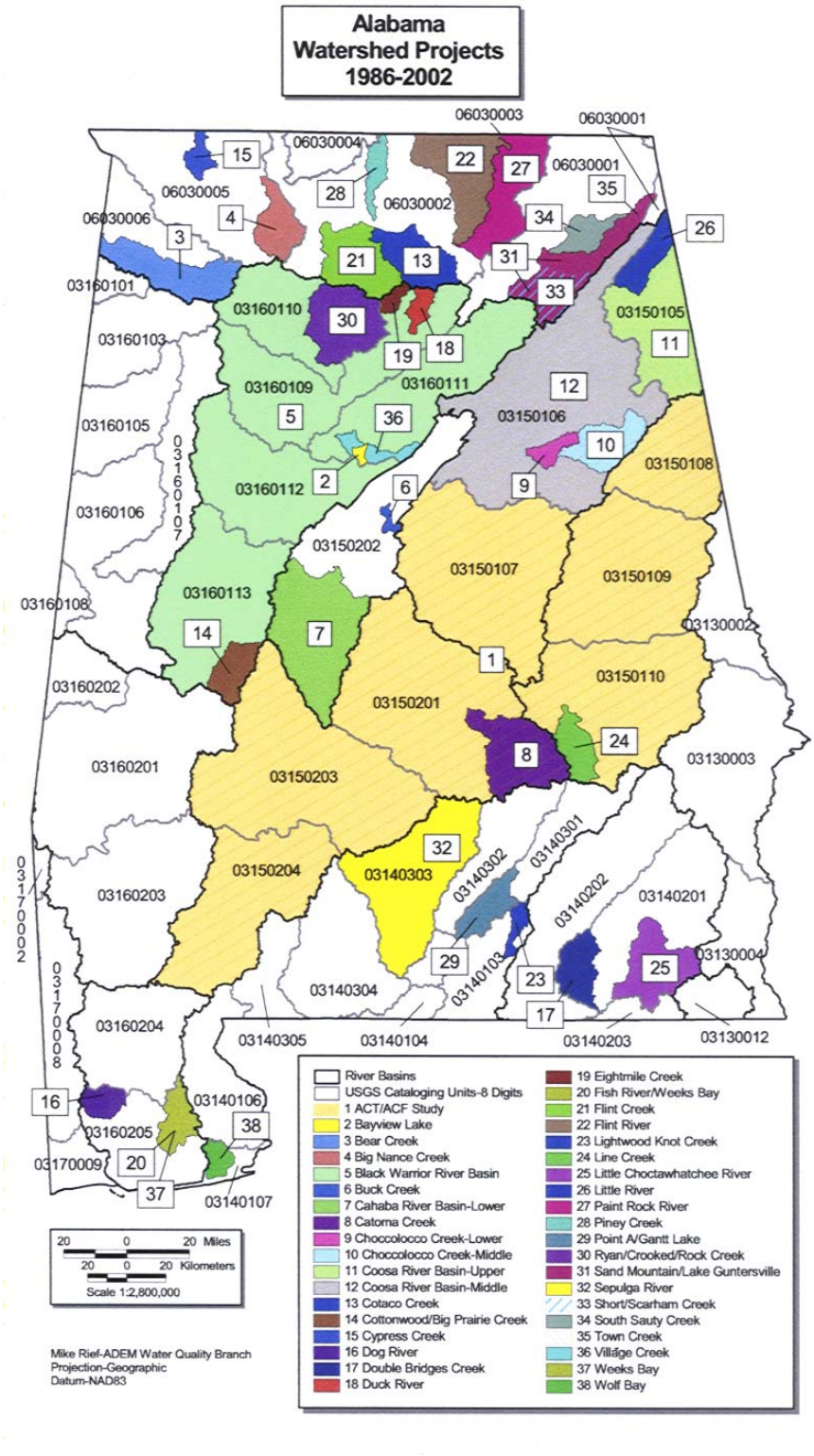


Figure 1.3.1.3 Alabama NPS Watershed Projects
(Source: Alabama 2002 Water Quality Report to Congress, ADEM 2002)

Table 1.3.1.3.2 Status of Watershed Projects in Tennessee River Basin

Project	Sub-basin	Funding	Status
Hester Creek Streamside Zone	Wheeler	319	active
Flint Creek Watershed GIS	Wheeler		proposed
Recreational Sediment Control		other	active
Goose Creek Watershed Education	Wheeler		proposed
Cypress Creek Initiative	Pickwick	319, other	active
Short/Scarham Watershed BMPs	Guntersville	319	active
Town Creek Watershed BMPs	Guntersville	319	active
S. Sauty Creek Watershed BMPs	Guntersville	319	active
Waterway Trash Removal Program	Guntersville		developing
AWA Wetland Restoration			developing
Stevenson Middle School Dock	Guntersville		developing
Youth Driven Anti-Litter Education	Guntersville		developing
Tennessee River Basin Brochures	Basin-wide	other	active
Waterloo Streambank Stabilization	Pickwick	other	active
Onsite Sewage Maintenance System	Basin-wide	319	active
Pesticide Mixing Facility	Guntersville		proposed
Second/First Creeks Watershed Initiative	Wheeler	319	active
Cotaco Clean & Green Sediment Reduction	Wheeler	319	active
Flint Creek Septic Tank Pumpout Program	Wheeler		proposed
DeKalb County Septic Tank Pumpout	Guntersville		proposed
NW DeKalb Ag BMP Project	Guntersville		proposed
Colbert County Water Festival	Pickwick		active/proposed
NEMO and Karsts Project	Basin-wide		developing
Clements Stormwater Mgt Demo	Wheeler		proposed
Bear Creek Video	Bear Creek	319	active
Mussel Re-introduction Project	Bear Creek	other	active
Watershed Coordinator	Bear Creek		proposed
Shoreline Stabilization Project	Bear Creek		proposed

(Source: Adapted from Tennessee River Clean Water Partnership)

1.3.2 Regulatory Programs of the Safe Drinking Water Act

The source water assessment program (SWAP) of the Safe Drinking Water Act provides an opportunity to complement interests and goals of the Clean Water Act, particularly in the area of watershed assessments and protection. SWAP requires public water suppliers to conduct an assessment of potential pollution sources upstream of water supply intakes and to develop a monitoring and reporting system that tracks surface water contaminants of interest to public health.

Groundwater sources require source water protection plans also. Many of the larger groundwater systems in the Tennessee River basin such as Madison County have developed plans through other water programs.
The Geological Survey of Alabama (GSA) has delineated wellhead protection areas and conducted potential contaminant inventories for 14 public water supply systems and 43 well or spring systems. (Figure 1.3.2.1)

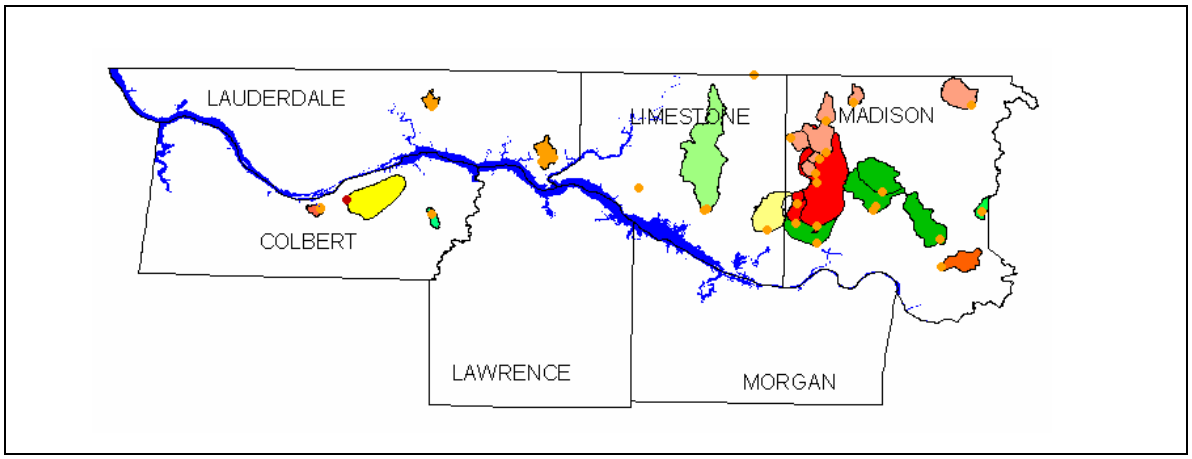


Figure 1.3.2.1 Delineated Wellhead Protection Areas and
Public Water Supplies in the Tennessee Basin

(Source: ADEM Water Division, Groundwater Section)

ADEM conducted an immunoassay test of private residential wells in the Tennessee Basin from 1996 through 2001. Figure 1.3.2.2 indicates the site locations of the sampling. There were 100 wells sampled in Lauderdale, Limestone, Madison, and Lawrence Counties; 80 wells sampled in Jackson and Dekalb Counties; and 30 wells in Colbert and Marshall Counties. Morgan County was previously studied as part of the Flint Creek Watershed Study.

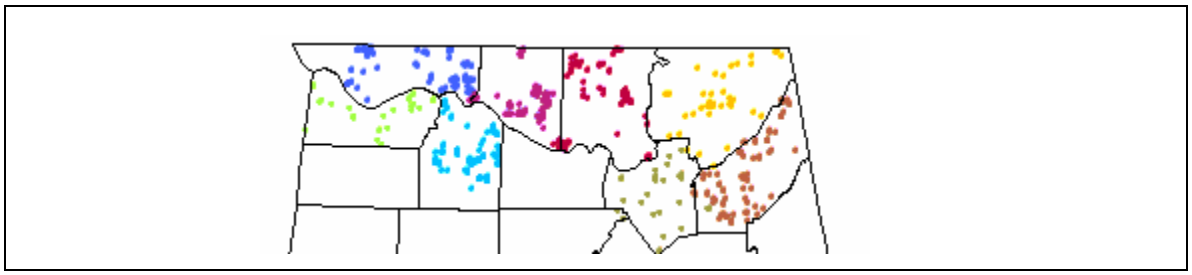


Figure 1.3.2.2 Residential Wells Sampled in the Tennessee River Basin

(Source: ADEM Water Division, Groundwater Section)

Nonpoint source pollution contributes to the overall quality of source (surface) water and may represent the greatest threat to source water quality. Nutrients and organic enrichment (two parameters routinely reported on Clean Water Act 303d streams) could affect a surface water supply's taste and odor; effecting treatment costs. Thus, efforts to reduce nonpoint source nutrient and organic loads would benefit surface water supplies and provide an opportunity to achieve multiple water program objectives (Clean Water and Safe Drinking Water Acts).

Due to national security concerns following September 11, 2001, a map of source waters will not be included in this report. It is suggested that contact be made with the local public water supply utilities as a partner in watershed restoration or protection efforts as local watershed implementation projects are developed and prepared.

1.3.3 Farm Bill Provisions

The Farm Security and Rural Investment Act of 2002 is landmark legislation for conservation funding and for focusing on environmental issues. The conservation provisions will assist farmers and ranchers in meeting environmental challenges on their land. This legislation simplifies existing programs and creates new programs to address high priority environmental and production goals. The 2002 Farm Bill enhances the long-term quality of our environment and conservation of our natural resources. USDA programs include:

- Agricultural Management Assistance Program
- Conservation Security Program
- National Natural Resources Conservation Foundation
- Resource Conservation & Development Program

1.3.3.1 AFO/CAFO

Animal Feeding Operation (AFO): An operation is an animal feeding operation if you confine animals for at least 45 days in a 12-month period and there's no grass or other vegetation in the confinement area during the normal growing season. The NRCS objective in working with AFOs is to help AFO owners and operators to achieve their production and natural resource conservation goals through development and implementation of comprehensive nutrient management plans (CNMPs). Each CNMP includes the following characteristics:

- A subset of a conservation plan that is unique to the animal feeding operation.
- Combines management activities and practices into an integrated system.
- Site specific.
- Voluntary.
- Focuses on nutrient and sediment aspects of water quality.

Concentrated Animal Feeding Operation (CAFO): An operation is a CAFO if it meets the definition of an AFO and one of the following CAFO definitions. There are 132

CAFOs in the Tennessee River basin. Table 1.3.3.1 gives a summary by county. A complete listing is provided in Appendix I.

Large operation:

- 700 mature dairy cows
- 1,000 beef cattle or heifers
- 2,500 swine (each 55 lbs or more)
- 10,000 swine (each under 55lbs)
- 30,000 ducks (other than liquid manure handling systems)
- 125,000 chickens except laying hens (other than liquid manure handling systems)
- 82,000 laying hens (other than liquid manure handling systems)
- 1,000 veal calves
- 500 horses
- 10,000 sheep or lambs
- 55,000 turkeys

Medium:

- 200 mature dairy cows
- 300 beef cattle or heifers
- 750 swine (each 55lbs or more)
- 3,000 swine (each under 55lbs)
- 10,000 ducks (other than liquid manure handling systems)
- 1,500 ducks (liquid manure handling systems
- 9,000 chickens (liquid manure handling systems)
- 37,500 chickens except laying hens (other than liquid manure handling systems)
- 25,000 laying hens (other than liquid manure handling systems)

County	CAFO's
Blount	3
Colbert	11
Cullman	3
Dekalb	36
Franklin	22
Jackson	5
Lauderdale	1
Lawrence	17
Limestone	1
Marion	8
Marshall	17
Morgan	8
Total	**132**

Table 1.3.3.1
Tennessee River Basin
County Summary of CAFOs

(Source: personal communications USDA NRCS District Conservationists)

1.3.3.2 USDA Agricultural Incentive Programs

Cost-share incentive programs appear to be the most effective way to achieve landowner cooperation in the Watershed. Most landowners do not have the funds or initiative to undertake a project of such magnitude on their own.

- Conservation Reserve Program (CRP)
  This USDA program, administered by NRCS, was established as a conservation provision of the Farm Bill to encourage and assist farm producers willing to set aside highly erodible, riparian, and other environmentally sensitive lands from crop production for a 10 or 15 year period. Producers may enroll in the CRP program according to USDA program rules. If a landowner's CRP bid is accepted, a Conservation Plan of Operation is developed. In addition to an annual CRP payment, USDA will provide a 50% cost-share to establish the selected conservation practice. Landowners may receive a maximum of $50,000 annually in CRP payments.

- Environmental Quality Incentives Program (EQIP)
  This USDA program is administered by NRCS. EQIP works primarily in locally identified conservation priority areas where there are significant problems with natural resources. High priority is given to areas where State or local governments offer financial, technical, or educational assistance and to areas where agricultural improvements will help meet water quality objectives. Landowners can apply to the program for assistance in solving problems related to animal waste management, erosion, and other environmental problems. EQIP will provide up to 60% cost-share for restoration. A landowner may receive up to $50,000 annually in EQIP payments.

- Wildlife Habitat Incentives Program (WHIP)
  The Wildlife Habitat Incentives Program (WHIP) is a voluntary program for landowners who want to develop and improve wildlife habitat on private lands. Participants work with NRCS to prepare a wildlife habitat development plan. USDA provides technical assistance and cost-share payments up to 75% of the cost of installing the wildlife habitat practices. USDA and the participant enter into a cost-share agreement that usually lasts a minimum of 10 years.

- Wetlands Reserve Program (WRP)
  This voluntary USDA program for restoring wetlands is administered by NRCS with technical assistance from the Fish and Wildlife Service (FWS). Participating landowners can establish conservation easements of either permanent or 30-year duration or can enter into restoration cost-share agreements where no easement is involved. NRCS and FWS assist private landowners with site selection and development of restoration plans for the site. Up to 100% of the cost of restoring the wetland is provided by USDA.

- Farmland Protection Program (FPP)
  The FPP provides funds to help purchase development rights to keep productive farmland in agricultural use. Seventeen states are currently implementing the FPP program. Alabama is not currently implementing this program.

1.3.4 Local Watershed Coalitions

The Tennessee River Basin Clean Water Partnership (TR CWP) is one of ten Alabama river basins covered by public-private stakeholder groups working to restore and protect Alabama's water resources. TR CWP facilitates and coordinates local watershed projects and groups in the Tennessee River basin. Table 1.3.4 lists the active Tennessee River basin watershed groups. These local watershed groups develop and prepare project proposals, oversee implementation, and represent the local interests at both the basin-level Partnership of TR CWP and state-wide meetings and planning sessions (Table 1.3.4).

Table 1.3.4 Tennessee River Basin Watershed Groups and Organizations

Group	Sub-basin
Sand Mountain-Lake Guntersville Conservancy District	Guntersville
Flint River Conservation Association	Wheeler
Flint Creek Conservancy District	Wheeler
Piney Creek Watershed	Wheeler
Big Nance Creek Watershed	Pickwick
Cypress Creek Watershed	Pickwick
Pond Creek Restoration Group	Pickwick
Bear Creek Watershed Association	Bear Creek
Millennium Group	Bear Creek
Cotaco Creek Watershed	Wheeler
Paint Rock River Conservancy District	Wheeler
Friends of Pisgah Gorge	Guntersville
Coast Guard Auxiliary	Guntersville, Wheeler
Sierra of Madison (Huntsville)	Wheeler
Aldridge Creek Clean Water Association	Wheeler

(Source: Tennessee River Clean Water Partnership)

1.4 Water Monitoring in the Tennessee River Basin

The Tennessee River basin has a tremendous amount of water quality monitoring data. Several agencies have conducted on-going monitoring or special projects for decades. ADEM, TVA, USGS, Geological Survey of Alabama (GSA), Alabama Water Watch, area universities, and others have conducted surface water quality surveys over the years to answer questions about ambient conditions of water or to track progress and recovery of waters from project implementations. In addition, GSA, ADECA, ADPH and others have conducted groundwater assessments and studies.

Watershed groups developing implementation plans are encouraged to refer and use water quality data and information cited in this plan. Several maps and tables are included to show which studies may be in your watershed project area. Again, contact

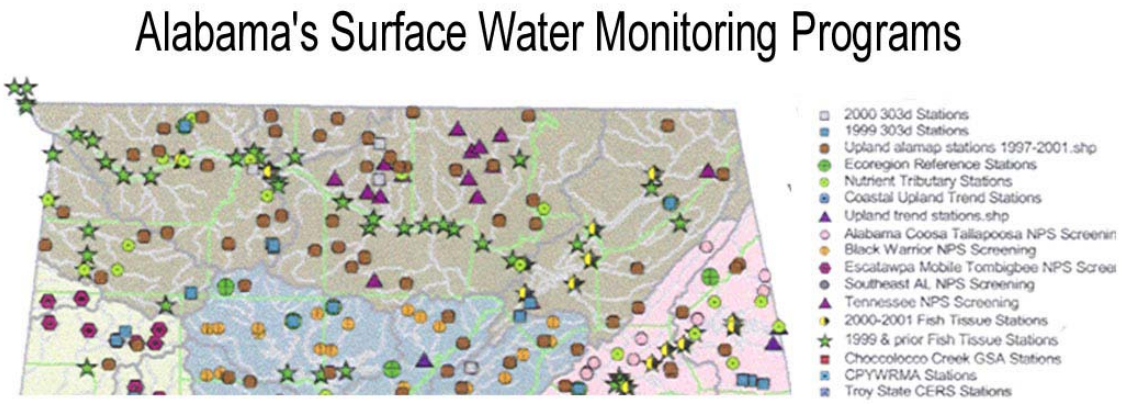
the agency cited for follow-up information which may help in developing your local watershed implementation plan.

1.4.1 Alabama Department of Environmental Management (ADEM)

ADEM maintains several water quality monitoring programs in the state which provide valuable information about water quality conditions in the Tennessee River basin. These monitoring programs provide the basis of the assessments used to report to EPA and Congress about the condition of state waters and is information used during local stakeholder meetings to prepare this management plan. (Figure 1.4.1.1) The monitoring program includes:

- Nonpoint Source Assessment (key to this plan)
- Ecoregion Reference Assessment
- Upland Alabama Monitoring and Assessment
- Ambient Trend Monitoring
- Reservoir Water Quality Monitoring (trophic studies, nutrient tributary studies)
- Fish Tissue Monitoring (public health)
- Alabama Water Watch (citizen-trained monitoring)

Figure 1.4.1.1 Map of ADEM monitoring sites



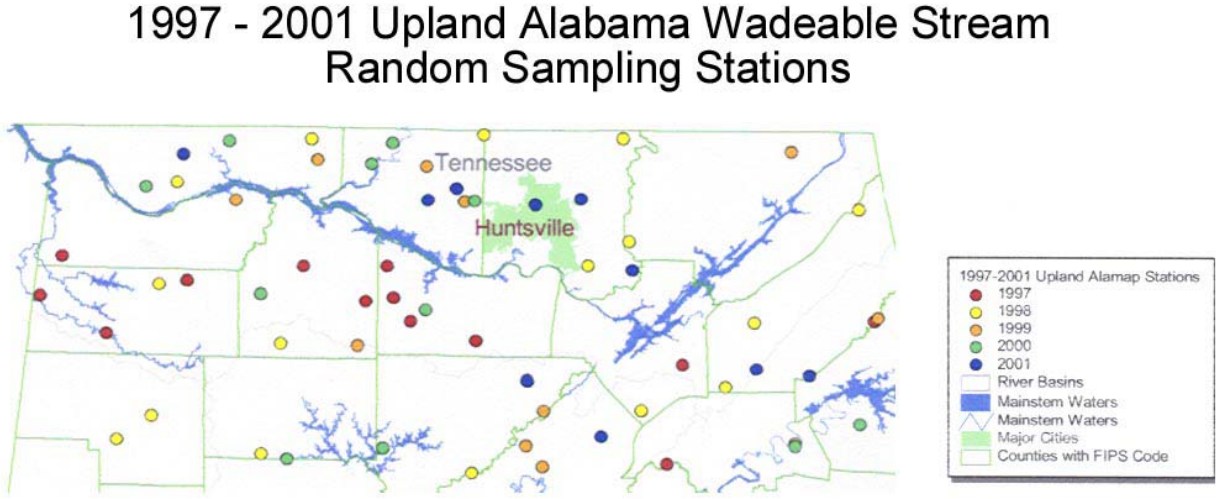
(Source: Adapted Alabama 2002 Water Quality Report to Congress, ADEM)

Nonpoint Source Assessment: "The Surface Water Quality Screening Assessment of the Tennessee River Basin in 1998" conducted by this ADEM program was a key source of water quality information in the preparation of this management plan. The Tennessee NPS assessment had two parts: basin-wide collection of surface water quality and habitat conditions on selected 303(d) listed streams; and basin-wide NPS screening assessment based on water quality data and local soil and water conservation district assessments. In the Tennessee basin study, sampling was not done in streams which were part of a watershed NPS control implementation project, influenced by urban or point source discharges, or too small (low flow) to sample.

Ecoregion Reference Assessment: With increasing emphasis on biological measures to describe "fishable and swimmable" water, aquatic macro-invertebrates and fish communities are being used in watershed screening assessments. A relatively un-impacted stream in the ecoregion is used as a basis (reference) to describe stream quality conditions that can be expected if impacts were minimized in streams. These reference conditions can set the basis for water quality targets.

Upland Alabama Monitoring and Assessment: This program enhances the ambient monitoring program by using a representative selection of "wadeable" stream sites sampled annually in August to estimate status of all streams in the watershed. (Figure 1.4.1.2)

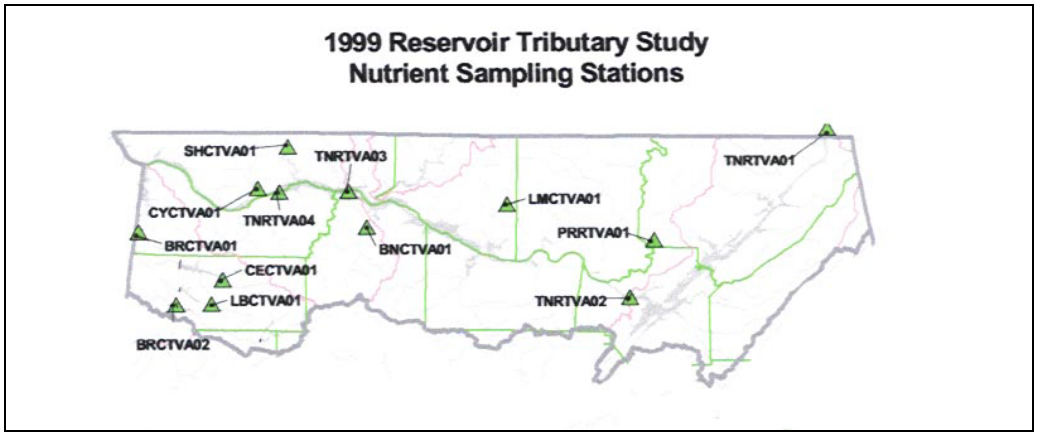
Figure 1.4.1.2 Locations of ADEM Upland Wadeable Stream Sampling Sites



(Source: Adapted Alabama 2002 Water Quality Report to Congress, ADEM)

Reservoir Water Quality Monitoring Tributary Nutrient Studies: This study determined the watersheds which contributed the highest nutrient loads to Alabama's reservoirs in order to estimate relative nutrient contributions from point and nonpoint sources in watersheds. Seven of the eight reservoirs in the Tennessee River basin system were monitored. (Figure 1.4.1.3)

Figure 1.4.1.3 Location of ADEM Tributary Nutrient Sampling Sites



(Source: Adapted Alabama 2002 Water Quality Report to Congress, ADEM)

Alabama Water Watch: This citizen-trained program is described in section 1.4.4. It is sponsored by ADEM and administered by Auburn University.

1.4.2 Geological Survey of Alabama (GSA)

GSA provides information about mussel and fisheries resources in the Tennessee River basin. Additionally, GSA conducts stream biological assessments (fish communities and macro-invertebrates) to indicate overall stream condition. This serves as screening information about watershed water quality conditions, as well as serving as reference to track performance of watershed implementation projects.

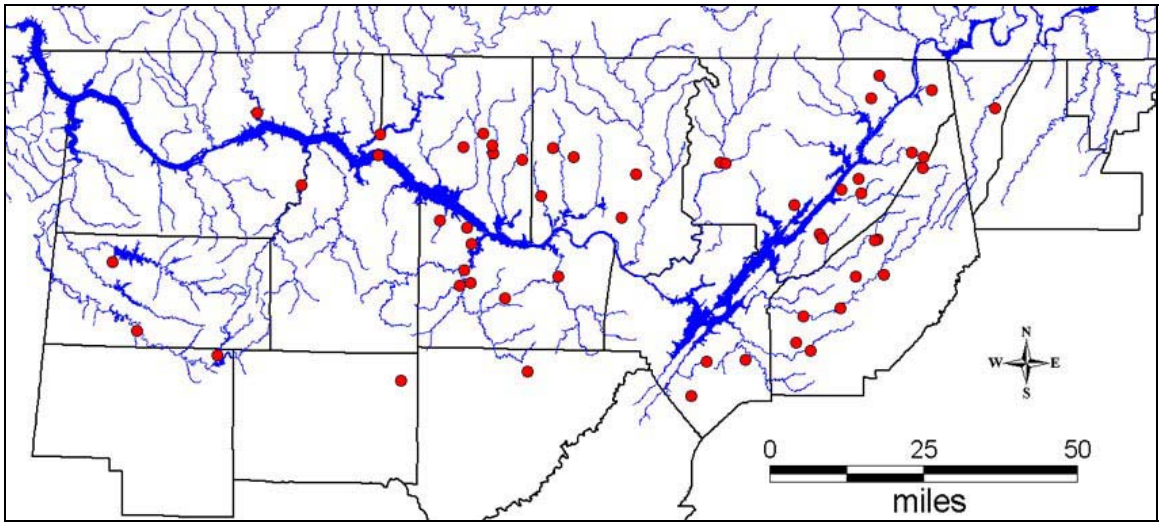
1.4.3 Tennessee Valley Authority (TVA)

TVA conducts annual monitoring of reservoirs and selected streams in the Tennessee River basin. The reservoir monitoring evaluates reservoir water quality, fish community, and benthic (bottom) communities at 2-3 locations in the reservoir: upstream inflow, mid-reservoir, and forebay (dam area). Stream monitoring consists primarily of biological indicators (fish community and macro-invertebrates) to evaluate stream conditions as part of screening watershed conditions, monitoring watershed NPS projects, or trends in watersheds. All TVA data is provided to ADEM as part of ADEM's reporting process to EPA (section 305 b of the Clean Water Act). A listing of TVA's reservoir monitoring sites is provided in Appendix G.

1.4.4 Alabama Water Watch (AWW)

AWW trains citizens to monitor streams in their "neighborhood" watersheds for physical, biological, and chemical parameters. AWW groups' data and information provide screening information about watershed conditions and could identify areas of concern that guide additional monitoring by ADEM. Figure 1.4.4 shows the AWW groups in the Tennessee River basin. Table 1.4.4 gives a trainer contact for Water Watch groups in the basin. A listing of groups can be found in Appendix J, or at http://www.alabamawaterwatch.org/watershedsites/tenshedgroups.htm

. Figure 1.4.4 Tennessee River Basin Map of AWW Monitoring Groups



(Source: AWW website)

Table 1.4.4 AWW Contact Information for Tennessee River Basin Groups.

Tennessee River Basin Trainers for Water Watch
Chip Blanton (Water Chemistry Monitoring)
Jason Burcham (Water Chemistry Monitoring)
Marshall Carter (QA Officer)
Jay Grantland (Water Chemistry Monitoring , Bacteria)
Frances Patterson (QA Officer)
Linda Taylor (Water Chemistry Monitoring , Bacteria, Bio-assessment)
Lynne Weninegar (Bacteria, Bio-assessment)

1.4.5 Universities (A&M and UAH)

Alabama A & M University and UAH conduct monitoring of streams in the following watersheds.

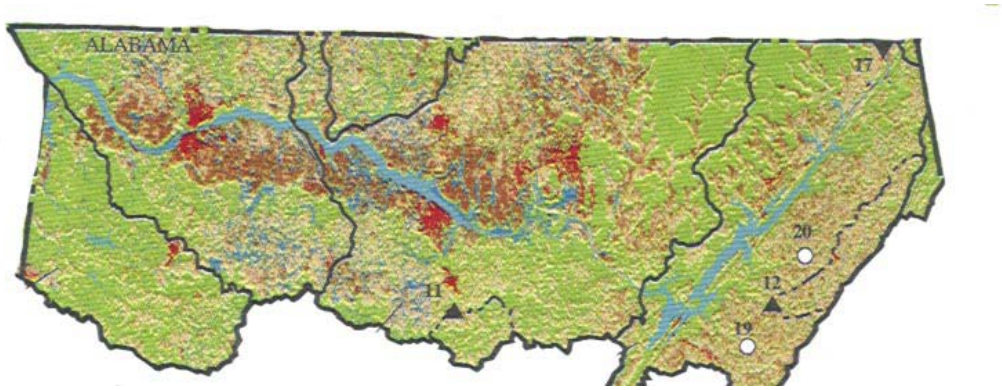
Watershed	Sub-basin	Number of sites	College
Flint River	Wheeler	3	A&M
Flint Creek	Wheeler	3	A&M
Flint River	Wheeler	1	UAH

(Source: personal communication, Dirk Spencer, A&M, and Kate Leonard, UAH)

1.4.6 United States Geological Survey (USGS)

The USGS conducted a special study on the lower Tennessee River basin from Chattanooga, Tennessee, to the confluence with the Ohio River as part of the National Water Quality Assessment Program (NAWQA). The study covered the period from 1980-1996 and focused on the sources, transport, and trends of nutrients and sediment in the lower Tennessee River basin. Several monitoring locations for the study were in Alabama.

Figure 1.4.6 USGS Monitoring Sites as Part of Lower Tennessee River NAWQA Study



(Source: Adapted from USGS NAWQA Program)

1.5 Education/Outreach

1.5.1 Groundwater Resources

ADEM supports and sponsors several Groundwater Festivals in the Tennessee River basin: Madison, Limestone, Lauderdale, and Colbert counties. The programs are targeted to students to build awareness of Alabama's groundwater resource.

1.5.2 Surface Water Resources

Watersheds: Numerous field days, stream clean-ups, and water festivals are part of the nonpoint source program outreach and education efforts in Flint Creek, Flint River, and other watersheds. These public events call attention to the streams in these watersheds and provide an opportunity to see the effort of several agencies and watershed groups working cooperatively for improving and protecting water resources.

Reservoirs: TVA's Clean Marina Initiative and the National Clean Boating Campaign are designed to promote water quality friendly practices on area reservoirs by the boating public. The Clean Marina program is a "seal" of approval that a marina earns if it utilizes practices that reduce fuel spillage, wastewater discharges, and solid waste disposal. The Clean Boating Campaign is part of a national affiliation to promote environmental education about boating practices to the boating public. Annual events are held on several of the TVA reservoirs.

Tennessee River Basin Watershed Management Plan

Section 2
Basin Summary
Water Quality Status and Issues

2.1 Surface Waters

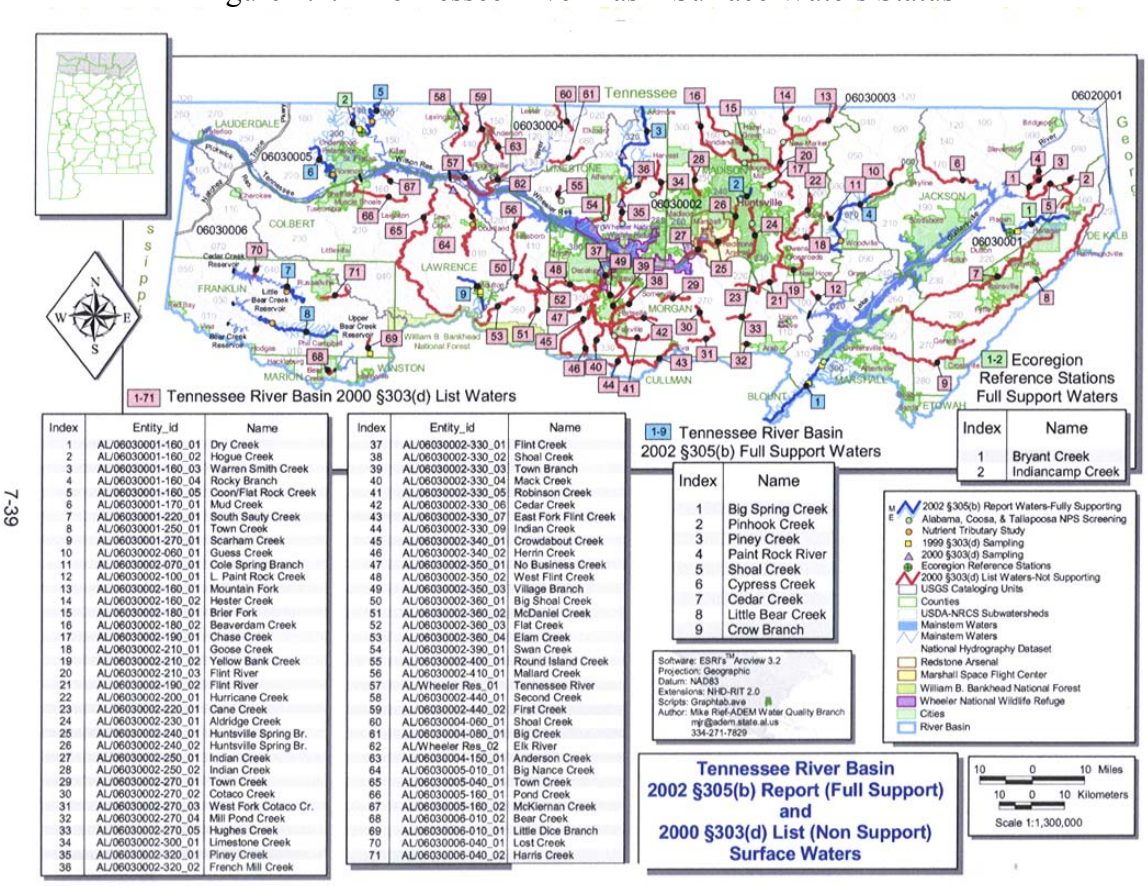
Official reporting (to Congress, EPA, and the public) regarding the status of surface water quality in Alabama is the responsibility of the Alabama Department of Environmental Management (ADEM). Several groups and agencies monitor water quality in the Tennessee River and provide data and information to ADEM as they prepare and report on the status of waters in the state every 2 years.

Water quality status is summarized for the entire basin by five major sub-basins of the Tennessee River watershed. Sources of these summaries include ADEM's "Alabama 2002 Water Quality Report to Congress", Alabama's 2000 303(d) list, and "Surface Water Quality Screening Assessment of the Tennessee River Basin: 1998". The Water Quality Report to Congress, commonly referred to as the "305(b) report" (referring to section 305(b) of the federal Clean Water Act), gives a summary of the status of waters in the state every 2 years. In this report, streams and reservoirs are evaluated as supporting and meeting state water quality standards and criteria, or if waters are partially or non-supporting of state criteria. Streams that do not support state criteria appear on the state's "303(d)" list of non-supporting waters." This list simply refers to section 303(d) of the federal "Clean Water Act". It requires that states list non-supporting streams, causes for the impairment, and plans to restore or reclaim waters to supporting public uses.

2.1.1 Streams

The 2000 ADEM 303(d) list identifies 71 stream segments in the Tennessee River Basin comprising more than 750 miles of streams in the basin as partially or not supporting designated uses for fish and wildlife, agriculture and industry, swimming and public water supply (Figure 2.1.1 Tennessee River Basin Surface Waters (305b and 303d) Status). The Tennessee Basin has more stream segments listed than any of the 10 major basins in the State (Table 2.1.1.1).

Figure 2.1.1 Tennessee River Basin Surface Waters Status



Index	Entity_id	Name
1	AL/06030001-160_01	Dry Creek
2	AL/06030001-160_02	Hogue Creek
3	AL/06030001-160_03	Warren Smith Creek
4	AL/06030001-160_04	Rocky Branch
5	AL/06030001-160_05	Coon/Flat Rock Creek
6	AL/06030001-170_01	Mud Creek
7	AL/06030001-220_01	South Sauty Creek
8	AL/06030001-250_01	Town Creek
9	AL/06030001-270_01	Scarham Creek
10	AL/06030002-060_01	Guess Creek
11	AL/06030002-070_01	Cole Spring Branch
12	AL/06030002-100_01	L. Paint Rock Creek
13	AL/06030002-160_01	Mountain Fork
14	AL/06030002-160_02	Hester Creek
15	AL/06030002-180_01	Brier Fork
16	AL/06030002-180_02	Beaverdam Creek
17	AL/06030002-190_01	Chase Creek
18	AL/06030002-210_01	Goose Creek
19	AL/06030002-210_02	Yellow Bank Creek
20	AL/06030002-210_03	Flint River
21	AL/06030002-190_02	Flint River
22	AL/06030002-200_01	Hurricane Creek
23	AL/06030002-220_01	Cane Creek
24	AL/06030002-230_01	Aldridge Creek
25	AL/06030002-240_01	Huntsville Spring Br.
26	AL/06030002-240_02	Huntsville Spring Br.
27	AL/06030002-250_01	Indian Creek
28	AL/06030002-250_02	Indian Creek
29	AL/06030002-270_01	Town Creek
30	AL/06030002-270_02	Cotaco Creek
31	AL/06030002-270_03	West Fork Cotaco Cr.
32	AL/06030002-270_04	Mill Pond Creek
33	AL/06030002-270_05	Hughes Creek
34	AL/06030002-300_01	Limestone Creek
35	AL/06030002-320_01	Piney Creek
36	AL/06030002-320_02	French Mill Creek

Index	Entity_id	Name
37	AL/06030002-330_01	Flint Creek
38	AL/06030002-330_02	Shoal Creek
39	AL/06030002-330_03	Town Branch
40	AL/06030002-330_04	Mack Creek
41	AL/06030002-330_05	Robinson Creek
42	AL/06030002-330_06	Cedar Creek
43	AL/06030002-330_07	East Fork Flint Creek
44	AL/06030002-330_09	Indian Creek
45	AL/06030002-340_01	Crowdabout Creek
46	AL/06030002-340_02	Herrin Creek
47	AL/06030002-350_01	No Business Creek
48	AL/06030002-350_02	West Flint Creek
49	AL/06030002-350_03	Village Branch
50	AL/06030002-360_01	Big Shoal Creek
51	AL/06030002-360_02	McDaniel Creek
52	AL/06030002-360_03	Flat Creek
53	AL/06030002-360_04	Elam Creek
54	AL/06030002-390_01	Swan Creek
55	AL/06030002-400_01	Round Island Creek
56	AL/06030002-410_01	Mallard Creek
57	AL/Wheeler Res_01	Tennessee River
58	AL/06030002-440_01	Second Creek
59	AL/06030002-440_02	First Creek
60	AL/06030004-060_01	Shoal Creek
61	AL/06030004-080_01	Big Creek
62	AL/Wheeler Res_02	Elk River
63	AL/06030004-150_01	Anderson Creek
64	AL/06030005-010_01	Big Nance Creek
65	AL/06030005-040_01	Town Creek
66	AL/06030005-160_01	Pond Creek
67	AL/06030005-160_02	McKiernan Creek
68	AL/06030006-010_02	Bear Creek
69	AL/06030006-010_01	Little Dice Branch
70	AL/06030006-040_01	Lost Creek
71	AL/06030006-040_02	Harris Creek

Index	Name
1	Big Spring Creek
2	Pinhook Creek
3	Piney Creek
4	Paint Rock River
5	Shoal Creek
6	Cypress Creek
7	Cedar Creek
8	Little Bear Creek
9	Crow Branch

Index	Name
1	Bryant Creek
2	Indiancamp Creek

(Source: Alabama's 2002 Water Quality Report to Congress, ADEM 2002)

Table 2.1.1.1 Summary of Impaired Stream Segments by River Basin in Alabama

River Basin:	Number of Segments
Alabama River	4
Black Warrior River	37
Cahaba River	12
Chattahoochee River	6
Coosa River	12
Escambia River	7
Mobile River	19
Perdido River-Escambia	9
Tallapoosa River	10
Tombigbee River	5
Tennessee River	71

(*Source: Alabama Clean Water Partnership)*

The causes (pollutants) most frequently cited as the reason for these streams not meeting state water quality standards and criteria are shown in Table 2.1.1.2 (ADEM, 2002). Organic enrichment and dissolved oxygen (OE/DO) impacts 62 percent of the listed stream segments (467 miles of streams). Siltation is the next most frequent cause of stream impairment with 42 percent of the listed segments (318 miles), followed by pathogens in 35 percent of the listed segments (265 miles). A complete listing of impaired stream segments (303d streams) in the Tennessee River basin is provided in Appendix B.

Table 2.1.1.2 Summary of Tennessee River Basin Non-Support Surface Waters

Pollutant	Number of Streams Cited	Basin Stream Miles Impaired	% Total Impaired Miles *
pH	10	150.3	20
Siltation	35	318.6	42
Organic enrichment/ dissolved oxygen	44	467.5	62
Nutrients	6	65.4	9
Pathogens	21	264.6	35
Pesticides	3	59.2	8
Unknown toxicity	3	23.2	3
Metals	5	47.4	6
Organic contaminants	2	17.6	2

(Source: Adapted from "Alabama's 2002 Water Quality Report to Congress, Final 2000 303(d) List", ADEM, 2002)

* Note: Total impaired stream mileage is 751.5 miles. Multiple pollutants may impair a stream, thus percents do not total to 100. Percent of total impaired miles is basin stream miles for the given pollutant divided by the total mileage of all listed streams, as a percent.

2.1.2 Reservoirs

The Tennessee River basin has 4 major reservoirs on the Tennessee River and four reservoirs on the Bear Creek tributary. These reservoirs are operated and managed by TVA for a variety of purposes; e.g. flood control, navigation, water supply, recreation, hydro-power, economic development. Note that not all of these purposes apply to all the reservoirs in the system. Reservoirs are a focal point for public uses. The status or condition of the reservoir to meet current and future user demands for water "quality" uses such as fishing, swimming, and drinking is an important element of surface water evaluations. Trophic status index (TSI) is used as a measure of reservoir "quality".

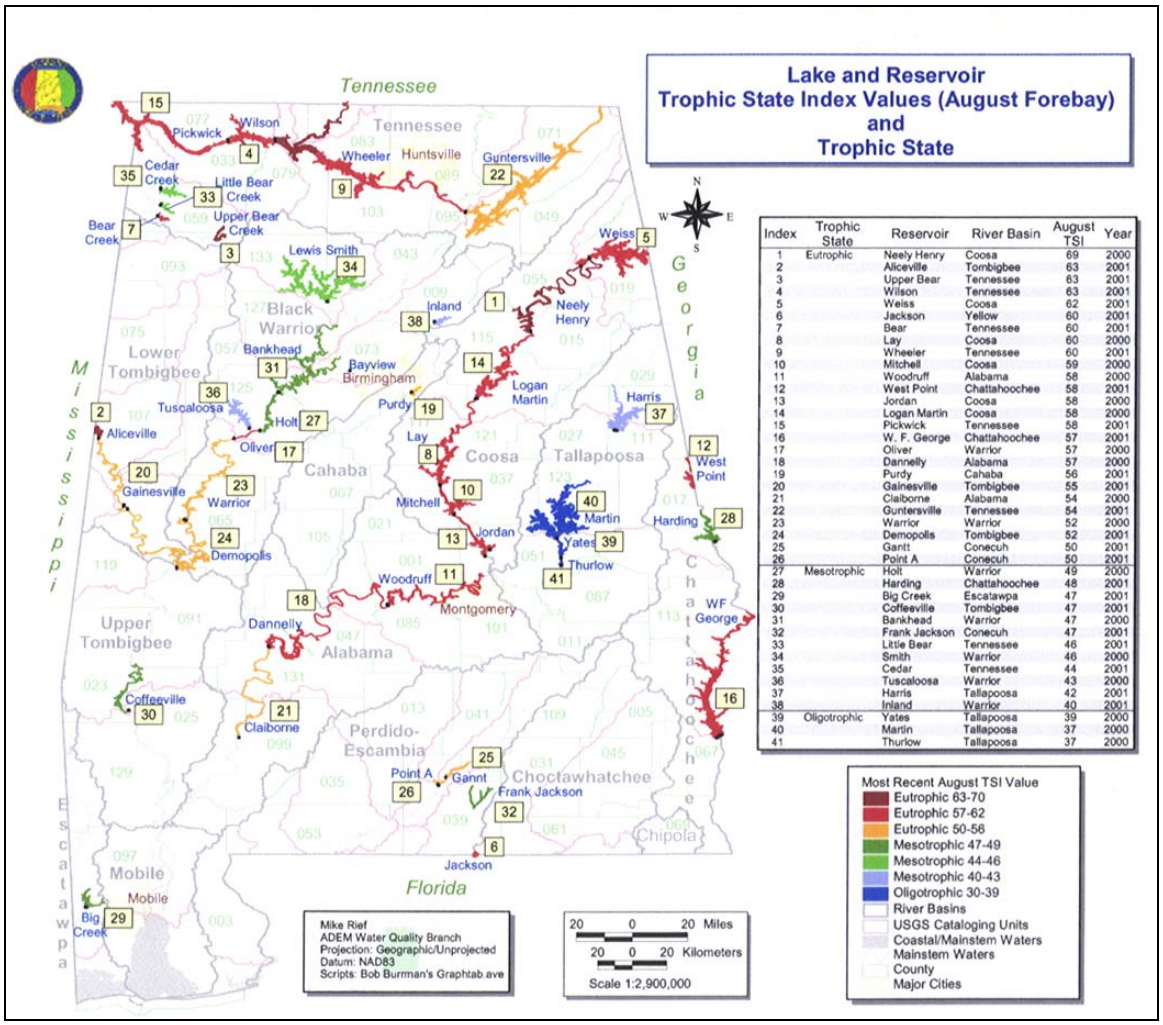
ADEM monitors the trophic status of reservoirs in the state to evaluate the level of "eutrophication": the "higher" the number the greater the eutrophication. (Eutrophication is an indicator of a reservoir's ability to assimilate watershed nutrient

inputs.) Scores 70 or greater indicate a reservoir system with nutrient enrichment. This would require regulatory actions to reduce nutrient levels. A eutrophic system is subject to reservoir degradation from algal response to nutrient inflows resulting in widely varying dissolved oxygen levels on a day/night basis which could lead to fish kills. Eutrophic conditions reduce visibility/water clarity, increase tastes and odors in water supplies, and increase precursor formation of human health carcinogens. Mesotrophic conditions indicate some level of nutrient enhancement but not to the level that results in detrimental algal blooms. Oligotrophic conditions indicate reservoir systems very low in nutrient inputs and primary (algae) productivity. These reservoirs are characteristically clear, with low fish/aquatic life numbers and community diversity.

Six Tennessee River basin reservoirs rate as "eutrophic" with a TSI score of greater than 50. The order of most eutrophic in the basin: Upper Bear Creek, Wilson, Bear Creek, Wheeler, Pickwick, and Guntersville. None of the Tennessee River systems are oligotrophic.

Table 2.1.2 and Figure 2.1.3 provide a summary of trophic state for the Tennessee River Basin reservoirs and rankings compared to other reservoirs in the state.

Figure 2.1.3 Trophic State of Tennessee River Basin Reservoirs



Index	Trophic State	Reservoir	River Basin	August TSI	Year
1	Eutrophic	Neely Henry	Coosa	69	2000
2		Aliceville	Tombigbee	63	2001
3		Upper Bear	Tennessee	63	2001
4		Wilson	Tennessee	63	2001
5		Weiss	Coosa	62	2001
6		Jackson	Yellow	60	2001
7		Bear	Tennessee	60	2001
8		Lay	Coosa	60	2000
9		Wheeler	Tennessee	60	2001
10		Mitchell	Coosa	59	2000
11		Woodruff	Alabama	58	2000
12		West Point	Chattahoochee	58	2001
13		Jordan	Coosa	58	2000
14		Logan Martin	Coosa	58	2000
15		Pickwick	Tennessee	58	2001
16		W. F. George	Chattahoochee	57	2001
17		Oliver	Warrior	57	2000
18		Dannelly	Alabama	57	2000
19		Purdy	Cahaba	56	2001
20		Gainesville	Tombigbee	55	2001
21		Claiborne	Alabama	54	2000
22		Guntersville	Tennessee	54	2001
23		Warrior	Warrior	52	2000
24		Demopolis	Tombigbee	52	2001
25		Gantt	Conecuh	50	2001
26		Point A	Conecuh	50	2001
27	Mesotrophic	Holt	Warrior	49	2000
28		Harding	Chattahoochee	48	2001
29		Big Creek	Escatawpa	47	2001
30		Coffeeville	Tombigbee	47	2001
31		Bankhead	Warrior	47	2000
32		Frank Jackson	Conecuh	47	2001
33		Little Bear	Tennessee	46	2001
34		Smith	Warrior	46	2000
35		Cedar	Tennessee	44	2001
36		Tuscaloosa	Warrior	43	2000
37		Harris	Tallapoosa	42	2001
38		Inland	Warrior	40	2001
39	Oligotrophic	Yates	Tallapoosa	39	2000
40		Martin	Tallapoosa	37	2000
41		Thurlow	Tallapoosa	37	2000

(Source: Alabama's 2002 Water Quality Report to Congress, ADEM)

ADEM has established a schedule to develop nutrient criteria for lakes and reservoirs in the state. Table 2.1.3 gives the schedule for the Tennessee River basin reservoirs. Appendix D lists the criteria of the Tennessee River Basin reservoirs.

Table 2.1.3 Implementation Schedule for Reservoir Nutrient Criteria

Year	Reservoirs
2002	Guntersville, Wheeler, Wilson, Pickwick, Little Bear, Cedar
2004	Bear, Upper Bear

(Source: Adapted from ADEM 305b Report, 2002)

While trophic status gives an overall view of the reservoir condition and its ability to "handle" watershed inputs, TSI does not necessarily mean that state standards and water quality criteria are being exceeded. Like stream segment reporting, reservoirs are also evaluated for state standards and criteria that maintain and support designated uses by the public (e.g., dissolved oxygen levels for fish and aquatic life, pH, organic contamination of fish tissue or sediments, pathogens for swimming, etc.). Only Wheeler Reservoir is listed as not supporting state criteria for water quality in 3 locations of the reservoir: Flint Creek embayment, Elk River embayment, and Wheeler forebay, the area behind Wheeler dam on the Tennessee River (Figure 2.1.4).

Figure 2.1.4, Lakes and Reservoirs Listed as Non-Supporting

(Source: Alabama's 2002 Water Quality Report to Congress, ADEM)

2.2 Major Sub-basins of the Tennessee River Watershed

The Tennessee River basin is summarized by four major sub-basin areas: Guntersville Lake, Wheeler Lake-Elk River, Pickwick/Wilson Lake, and Bear Creek.

Information sources used to prepare the following sub-basin summaries included: (1) published water quality reports by ADEM and (2) published local input on priorities and perspectives by the Alabama Soil and Water Conservation Committee (ASWCC) conservation worksheets.

Three ADEM water quality publications provided documentation about water quality conditions in the Tennessee River basin: "Alabama 2002 Water Quality Report to Congress" (Clean Water Act 305(b) Report); Final 2000 "303(d)" List; and "Surface Water Quality Screening Assessment of the Tennessee River Basin: 1998".

Other agencies and groups monitor and collect water quality data (e.g., USGS, TVA, Alabama Water Watch, area universities, others). Their data and information are incorporated and reflected in the official state reports cited previously. ADEM's reports

provided water quality documentation of problem areas and a "water quality" perspective of priorities.

Local public input and perspectives were obtained from published conservation worksheets prepared by the ASWCC from a series of public meetings in 1998. Local Soil and Water Conservation Districts led the meetings. The 1998 survey provides a perspective about potential non-point pollution sources and priority sub-watersheds based on local knowledge and perceptions.

The following summaries are adapted from the sources cited above. The summaries provide a snap-shot of the sub-basins with respect to miles of impaired waters, fish kills, land use patterns, estimated livestock numbers, estimated septic system condition, on-going watershed projects, and sub-watershed priorities.

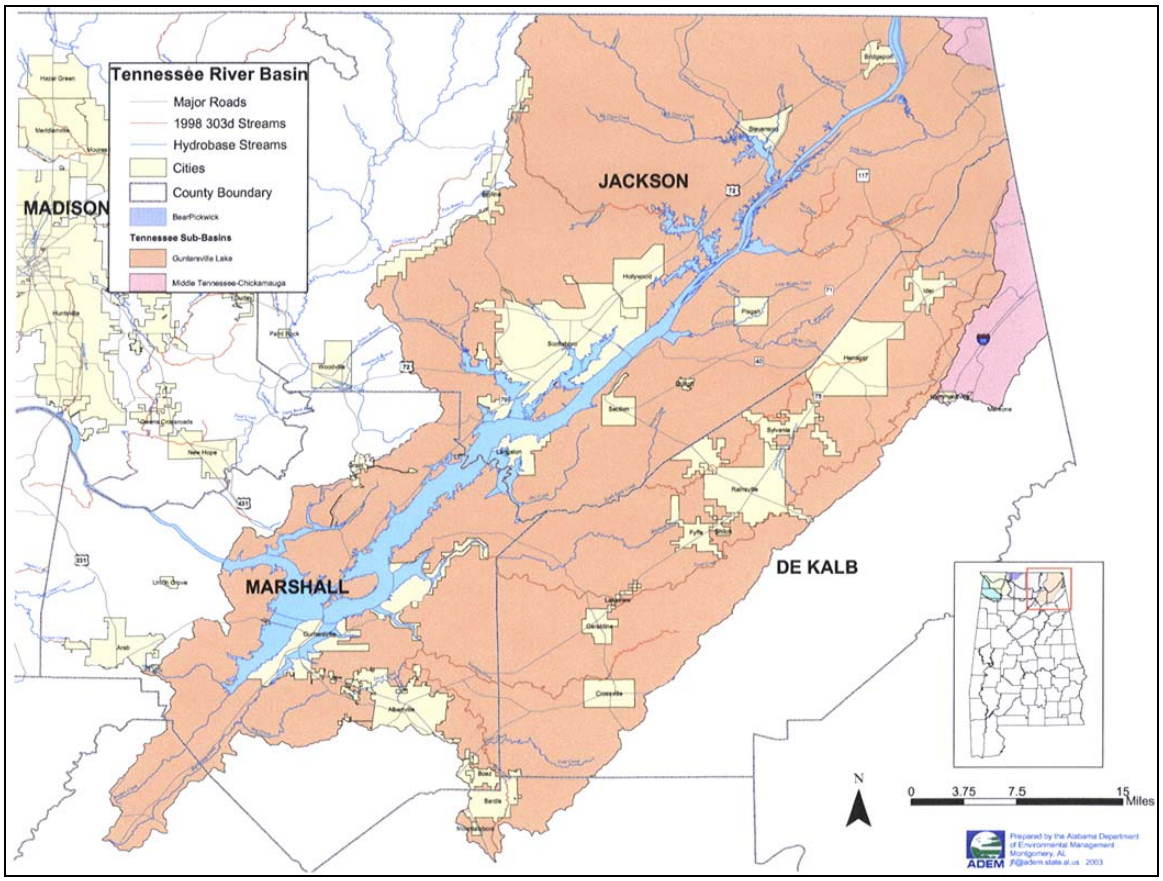
Note that two sub-watershed priority rankings are given in the following sub-basin summaries. The rankings reflect the basis of the information: the ADEM set is based on water quality monitoring; the ASWCC set is based on local public and natural resource professional inputs. Priority rankings by ASWCC represent local public perceptions and knowledge, and served as a basis for further, in-depth water quality evaluations.

The nonpoint source sub-watershed priority rankings by ADEM were based on biological (fish and macro-invertebrate assessments), habitat, and chemical assessments. Fish communities exhibiting poor or very poor quality and not impacted by a point source or urban runoff (i.e. regulated sources) were considered as priority areas.

2.2.1 Guntersville Lake Watershed Unit (0603-0001)

The following summaries provide a snap-shot of conditions in the Guntersville Lake watershed. Key elements summarized include status of streams and reservoirs that meet state water quality standards and criteria, land use, animal (livestock) numbers, septic system conditions, and sub-watershed priority rankings.

Figure 2.2.1 Guntersville Lake Watershed Area Map



(Source: ADEM)

Streams:

- 10 listed streams: (1998 "303d list")
- 9 listed streams: 174 miles (2000 "303d list")
- Causes: pH, siltation, organic enrichment, dissolved oxygen
- Sources: agriculture, abandoned surface mining

Guntersville "303d" Listed Streams

Sub-watershed name:	Hydrologic unit code (0603-0001-)
Scarham Creek	270
Town Creek	250
South Sauty Creek	220
Mud Creek	170
Coon/Flat Rock Creek	160-05
Dry Creek	160-01
Hogue Creek	160-02
Warren Smith Creek	160-03
Rocky Branch	160-04

Lakes:

- Trophic status score: 54 (eutrophic)
- Statewide ranking: 22nd out of 41

Fish:

- Fish kills: none (2000-2001)
- Advisories: none (2002)

Public water supplies:

- Compliance violations: one
- 8 surface water sources: Guntersville, Albertville, Grant, Arab, Scottsboro, Section/Dutton, Rainsville, Ft. Payne (seasonal July-September)

Watershed Screening Assessment **

Land Use Type(*)	Percent	Animal Type (**)	Numbers	Septic systems (**)
Forest	50	Beef	93,000	Est. number: 35,000
Pasture	22	Dairy	1,200	Est. failing: 11,500
Cropland	18	Swine	76,500	
Urban	2	Broilers	25,182,000	
Open water/other	7	Layers	1,524,500	
Mineland	1			

Guntersville Overall NPS Pollution Potential: high (*)

Concerns: sedimentation, animal unit densities, development

Guntersville Priority Sub-watersheds

Sub-watershed (0603-0001)	ADEM ranking *	ASWCC ranking**	Active Group ***
Widows Creek (-060)	priority (low)	-	No
Long Island Creek (-080)	n/a (no data)	priority (2nd)	No
Crow Creek (-100)	n/a (good/fair)	-	No
Little Coon Creek (-120)	priority	-	No
Big Coon Creek (-140)	n/a (not ranked)	-	No
Lower Crow Creek (-150)	n/a (small)	-	No
Coon Creek (-160)	priority	-	SMLGWCD
Mud Creek (-170)	priority	priority (3rd)	SMLGWCD
Jones Creek (-180)	n/a (low flows)	priority (4th)	SMLGWCD, Friends of Pisgah Gorge
Roseberry Creek (-190)	n/a (Scottsboro)	-	No
Chisenhall Spring Branch (-200)	n/a (small)	-	No
N. Sauty Creek (-210)	n/a (not ranked)	-	No
S. Sauty Creek (-220)	NPS project	priority	SMLGWCD, RSVP
Town Creek (-250)	NPS project	priority	SMLGWCD, RSVP
Scarham Creek (-270)	NPS project	priority	SMLGWCD, RSVP
Short Creek (-280)	NPS project	priority	SMLGWCD, RSVP
Lower Short Creek (-290)	n/a (small)	priority (5th)	RSVP
Big Spring Creek (-300)	priority	priority (1st)	RSVP
Browns Creek (-310)	n/a (no data)	priority (2nd)	RSVP

Notes:

"n/a" indicates not assessed by ADEM because:
drainage is too small or flows too low,
watershed is influenced by point source or urban runoff,
watershed is part of an on-going NPS control project (denoted where applicable),
no available data from any agency, or
watershed does not rank as a priority based on assessment data.

"-" indicates not assessed as a priority by local SWCDs. Since multiple (county) SWCDs are involved in assessments of watersheds in the cataloging unit, it is possible to have "same" numerical priority ranking in ASWCC column.

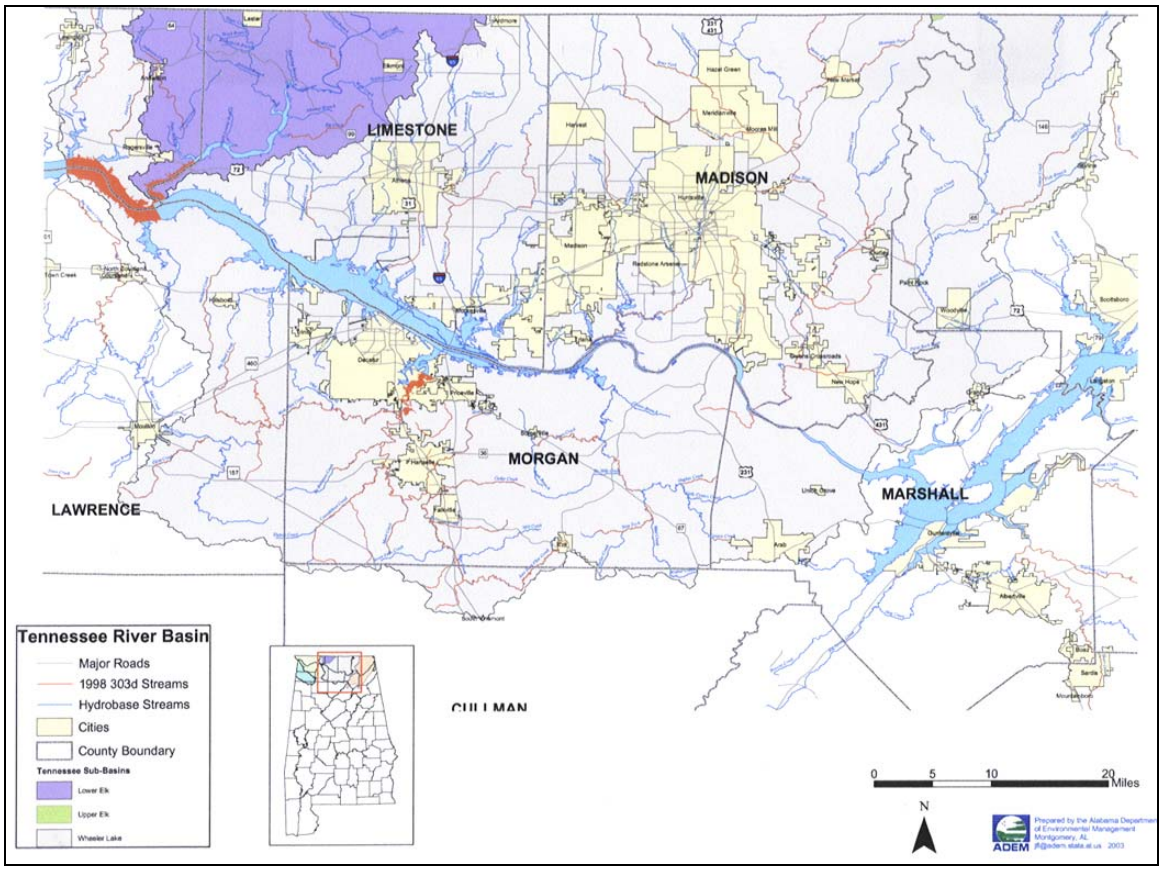
Reference Sources:

* Surface Water Quality Screening Assessment, ADEM, 2000
** ASWCC, 1998 Conservation Assessment Worksheets
*** Groups:
SMLGWCD –Sand Mountain Lake Guntersville Watershed Conservancy District
RSVP - Retired Senior Volunteer Program

2.2.2 Wheeler Lake Watershed Unit (0603-0002)

The following summaries provide a snap-shot of conditions in the Wheeler Lake watershed. Key elements summarized include status of streams and reservoirs that meet state water quality standards and criteria, land use, animal (livestock) numbers, septic system conditions, and sub-watershed priority rankings.

Figure 2.2.2 Wheeler Lake Watershed Area Map



(Source: ADEM)

Streams:

- 49 listed streams (2000) ~ 430 miles
- Causes: pathogens, siltation, organic enrichment, dissolved oxygen, nutrients, fecal coliforms, metals/priority organics
- Sources: agriculture, mixed agriculture/urban, urban

Wheeler "303d" Listed Streams

Sub-watershed name	Hydrologic unit code (0603-0002)
Guess Creek	-060
Cole Spring Branch	-070
L. Paint Rock Creek	-100
Mountain Fork	-160-01
Hester Creek	-160-02
Brier Fork	-180-01
Beaverdam Creek	-180-02
Chase Creek	-190
Goose Creek	-210
Yellow Bank Creek	-210-02
Flint River	-210-03
Flint River	-190
Hurricane Creek	-200
Cane Creek	-220
Aldridge Creek	-230
Huntsville Spring Branch	-240-01
Huntsville Spring Branch	-240-02
Indian Creek	-250-01
Indian Creek	-250-02
Town Creek	-270-01
Cotaco Creek	-270-02
W. Fork Cotaco Creek	-270-03
Mill Pond Creek	-270-04
Hughes Creek	-270-05
Limestone Creek	-300
Piney Creek	-320-01
French Mill Creek	-320-02
Flint Creek	-330-01
Shoal Creek	-330-02
Town Creek	-330-03
Mack Creek	-330-04
Robinson Creek	-330-05
Cedar Creek	-330-06
E. Fork Flint Creek	-330-07
Indian Creek	-330-09
Crowdabout Creek	-340-01
Herrin Creek	-340-02
No Business Creek	-350-01
W. Flint Creek	-350-02
Village Creek	-350-03
Big Shoal Creek	-360-01
McDaniel Creek	-360-02
Flat Creek	-360-03
Elam Creek	-360-04
Swan Creek	-390
Round Island Creek	-400
Mallard Creek	-410
Second Creek	-440-01
First Creek	-440-02

Lakes:

- Trophic status score: 60 (eutrophic)
- Statewide ranking: 9th out of 41
- 3 non-support status lake areas (2000, 303d list): ~ 10,000 acres
    - Elk River embayment (0603-0002-02)
    - Flint Creek embayment
    - Tennessee River from Wheeler dam to Elk River (0603-0002-01)

Fish:

- Fish kills: 4 (2000-2001)
- Advisories: 2 (2002) (Huntsville Spring Br., Indian Cr)

Public water supplies:

- Compliance violations: 3 (Athens, Decatur, NE Morgan Co)

* ADEM, 2002 Water Quality Report (305b)

Watershed Screening Assessment **

Land Use Type(*)	Percent	Animal Type (**)	Numbers	Septic systems (**)
Forest	43	Beef	182,000	Est. number: 113,000
Pasture	28	Dairy	4,600	Est. failing: 24,800
Cropland	18	Swine	7,900	
Urban	7	Broilers	12,612,000	
Open water/other	4	Layers	603,000	

Wheeler Overall NPS Pollution Potential: high(*)

Concerns: Erosion, sediment, nutrients, and pathogens from development, animal unit densities, and cropland erosion

Wheeler Priority Sub-watersheds

Priority sub-watersheds	ADEM ranking *	ASWCC ranking **	Active Group ***
Upper Paint Rock River (-070)	NPS project	priority (5th)	PRRWCD
Lower Paint Rock River (-100)	NPS project	priority (4th)	PRRWCD
Mountain Fork of Flint R (-160)	priority	priority (1st)	FRCA
Brier Fork of Flint R (-180)	priority	-	FRCA
Middle Flint River (-190)	priority	-	FRCA
Hurricane Creek (-200)	n/a (no data)	priority (5th)	FRCA
Lower Flint River (-210)	n/a (Huntsville)	priority (2nd)	FRCA
Dry Creek (-220)	priority	priority (4th)	No
Cotaco Creek (-270)	priority	priority (4th)	Cotaco Cr W'shed Project
Limestone Creek (-300)	priority	priority (2nd, 3rd)	Keep Limestone Beautiful
Piney Creek (-320)	priority	priority (1st)	Piney Cr W'shed Project
Upper Flint Creek (-330)	NPS project	priority (1st)	FCWCD
Crowdabout Creek (-340)	NPS project	priority (3rd)	FCWCD
Lower Flint Creek (-350)	NPS project	priority (2nd)	FCWCD
West Flint Creek (-360)	NPS project	priority (2nd)	FCWCD
Swan Creek (-390)	n/a (Athens)	priority (3rd)	No
Round Island Creek (-400)	priority	priority (4th)	No
Mallard Creek (-410)	n/a (not rated)	priority (3rd)	No
Spring Creek (-420)	n/a (small)	priority (4th)	No
Second Creek (-440)	priority	-	No

Notes:

"n/a" indicates not assessed by ADEM because:
drainage is too small or flows too low,
watershed is influenced by point source or urban runoff,
watershed is part of an on-going NPS control project (denoted where applicable),
no available data (from any agency), or
watershed does not rank as a priority based on assessment.

"-" indicates not assessed as a priority by local SWCDs. Since multiple (county) SWCDs are involved in assessments of watersheds in the cataloging unit, it is possible to have "same" numerical priority ranking in ASWCC column.

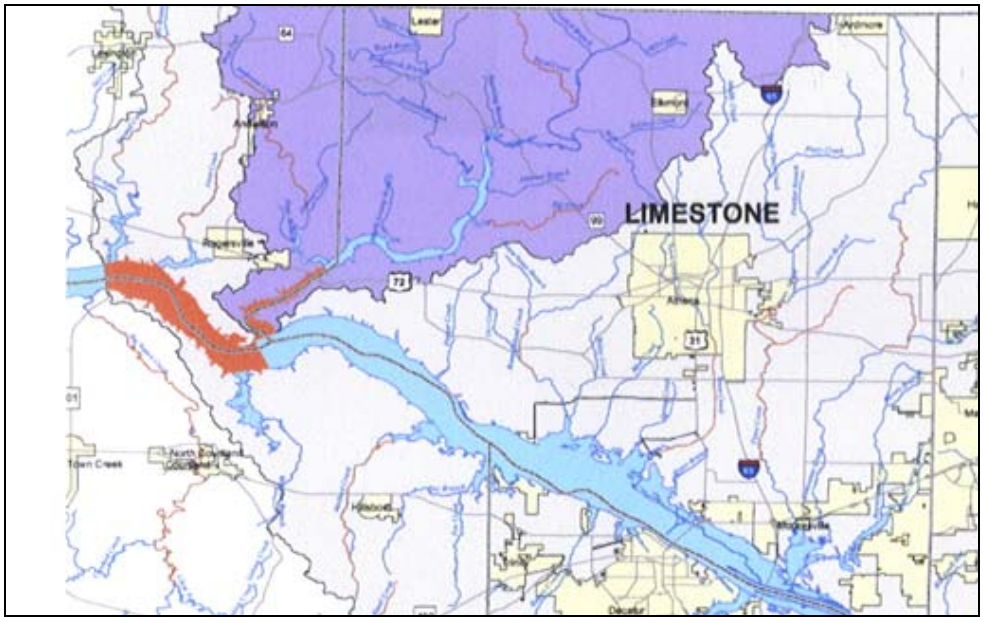
Reference Sources:

* Surface Water Quality Screening Assessment, ADEM, 2000
** ASWCC, 1998 Conservation Assessment Worksheets
*** Groups:
PRRWCD – Paint Rock River Watershed Conservancy District
FRCA – Flint River Conservation Association
FCWCD – Flint Creek Watershed Conservancy District

2.2.3 Lower Elk River Watershed Unit (0603-0004)

The following summaries provide a snap-shot of conditions in the Lower Elk River watershed. Key elements summarized include status of streams and reservoirs that meet state water quality standards and criteria, land use, animal (livestock) numbers, septic system conditions, and sub-watershed priority rankings.

Figure 2.2.3 Lower Elk River Watershed Area Map



(Source: ADEM)

Streams:

- 4 listed streams (1998, 2000) ~ 29 miles
- Shoal, Big, Anderson Cr, Elk R
  - Causes: pathogens, organic enrichment, dissolved oxygen
  - Sources: agriculture (grazing)

Lower Elk "303d" Listed Streams

Sub-watershed name	Hydrologic unit code (0603-0004)
Shoal Creek	-060
Big Creek	-080
Anderson Creek	-150

Lakes:

- Trophic status score (Wheeler Reservoir): 60 (eutrophic)
- Statewide ranking: 9th out of 41

- non-support status: Elk River embayment

Fish:

- Fish kills: none (2000-2001)
- Advisories: none (2002)

Public water supplies:

- Compliance violations: none

* ADEM, 2002 WQ Report (305b)

Watershed Screening Assessment **

Land Use Type(*)	Percent	Animal Type (**)	Numbers	Septic systems (**)
Forest	37	Beef	16,000	Est. number: 2600
Pasture	35	Dairy	350	Est. failing: 300
Cropland	22	Swine	4,100	
Urban	3	Broilers	184,000	
Open water/other	3	Layers	138,000	

Lower Elk Overall NPS Pollution Potential: low

Concerns: nutrients, pathogens from animal unit densities

Lower Elk River Priority Sub-watersheds

Priority sub-watersheds:	ADEM ranking: *	ASWCC ranking **	Active Groups ***
Big Creek (-080)	Priority	Priority	Elk River User Group
Anderson Creek (-150)	Priority	Priority	Elk River User Group

Reference Sources:

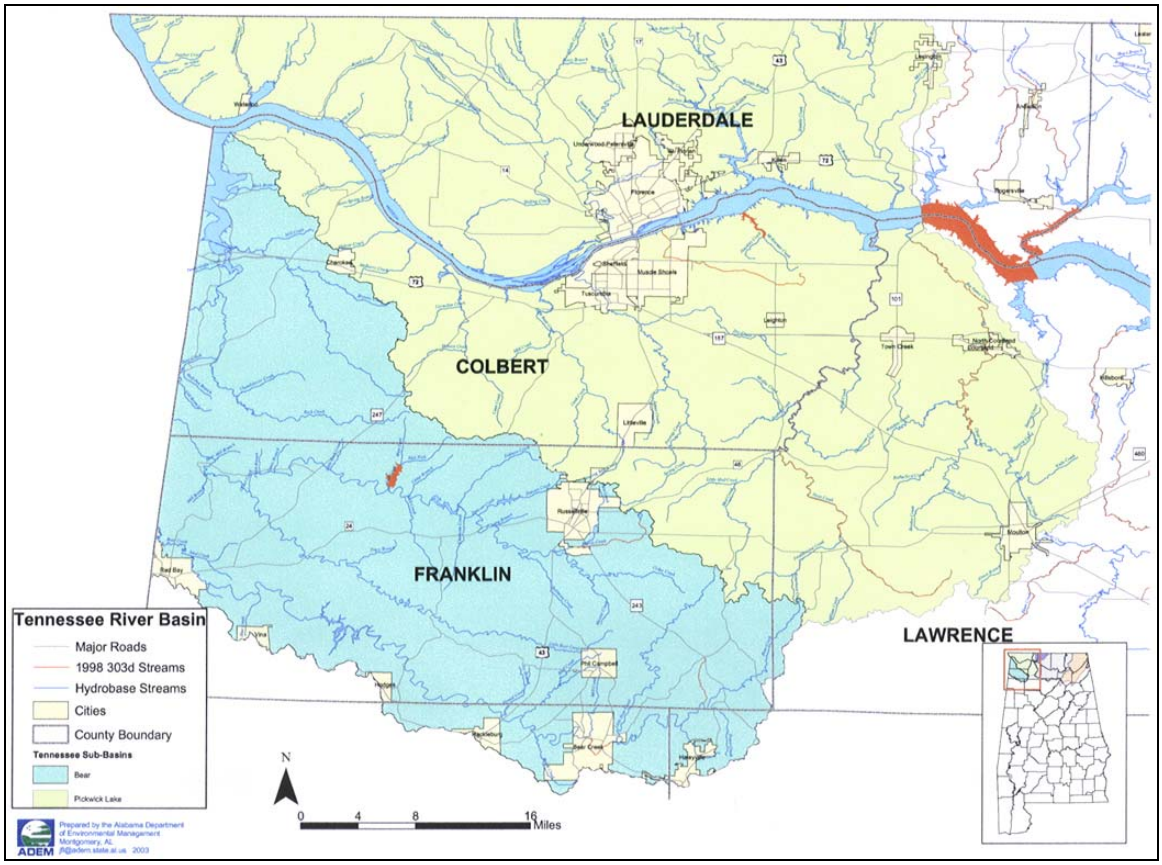
* Surface Water Quality Screening Assessment, ADEM, 2000

** ASWCC, 1998 Conservation Worksheets

2.2.4 Pickwick/Wilson Lake Watershed Unit (0603-0005)

The following summaries provide a snap-shot of conditions in the Pickwick-Wilson Lake watersheds. Key elements summarized include status of streams and reservoirs that meet state water quality standards and criteria, land use, animal (livestock) numbers, septic system conditions, and sub-watershed priority rankings.

Figure 2.2.4 Pickwick/Wilson Lake Watersheds Area Map



(Source: ADEM)

Streams:

- 4 listed streams: 84 miles total
- Causes: pathogens, ammonia, siltation, organic enrichment, dissolved oxygen, nutrients, metals
- Sources: agriculture, urban/storm sewer

"303d" Listed Stream Segments

Sub-watershed name	Hydrologic unit code (0603-0005)
Big Nance Creek	-010
Town Creek	-040
Pond Creek	-160-01
McKiernan Creek	-160-02

Lakes:

- Trophic status score: 58 (eutrophic)
- Statewide ranking: 15th out of 41

Fish:

- no fish kills
- no advisories

Public water supplies:

- compliance violations: none
- 5 surface water sources (3 reservoirs, 2 streams)

Watershed Screening Assessment **

Land Use Type(*)	Percent	Animal Type (**)	Numbers	Septic systems (**)
Forest	48	Beef	76,000	Est. number: 31,400
Pasture	20	Dairy	1,100	Est. failing: 7,000***
Cropland	23	Swine	5,600	*** Note: Big Nance has >80 % failure
Urban	7	Broilers	4,108,000	
Open water/other	3	Layers	451,000	

Pickwick-Wilson Overall NPS Pollution Potential: moderate(*)

Concerns: sedimentation from pasture, row crops, and construction

Pickwick-Wilson Priority Sub-watersheds

Priority sub-watersheds	ADEM ranking *	ASWCC ranking**	Active Groups ***
Big Nance Creek (-010)	priority	priority (1st)	Water Watch (inactive)
Bluewater Creek (-030)	n/a (good condition)	priority (5th)	No
Town Creek (-040)	priority	priority (1st)	Water Watch (inactive)
Upper Cypress Creek (-180)	priority	priority (2nd)	No
Lower Cypress Creek (-200)	n/a (Florence)	priority (1st)	No
Spring Creek (-210)	n/a (good condition)	priority (4th)	No
Sinking Creek (-220)	priority	priority (3rd)	No
Cane Creek (-230)	n/a (good condition)	priority (2nd)	No

Notes:

"n/a" indicates not assessed by ADEM because:
drainage is too small or flows too low,
watershed is influenced by point source or urban runoff,
watershed is part of an on-going NPS control project (denoted where applicable),
no data available (from any agency), or
watershed does not rank as a priority based on "good" assessment.

"-" indicates not assessed as a priority by local SWCDs. Since multiple (county) SWCDs are involved in assessments of watersheds in the cataloging unit, it is possible to have "same" numerical priority ranking in ASWCC column.

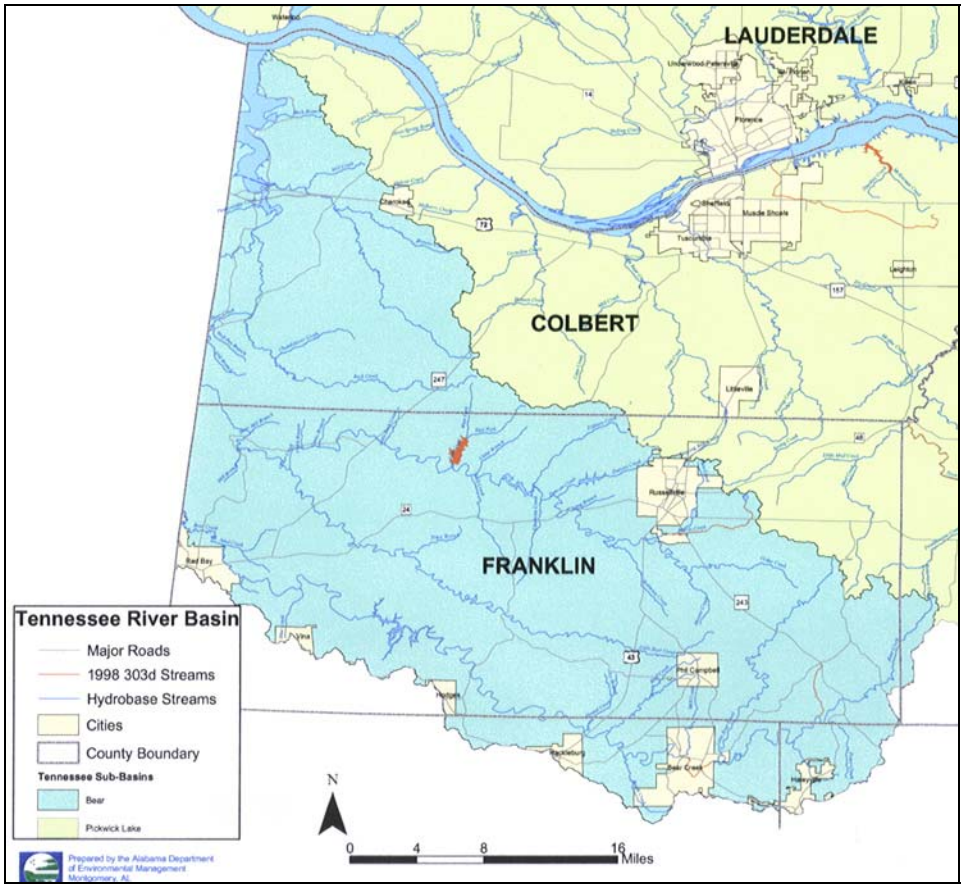
Reference Sources:

* Surface Water Quality Screening Assessment, ADEM, 2000
** ASWCC, 1998 Conservation Assessment Worksheets

2.2.5 Bear Creek Watershed Unit (0603-0006)

The following summaries provide a snap-shot of conditions in the Bear Creek watershed. Key elements summarized include status of streams and reservoirs that meet state water quality standards and criteria, land use, animal (livestock) numbers, septic system conditions, and sub-watershed priority rankings.

Figure 2.2.4 Bear Creek Watershed Area Map



(Source: ADEM)

Streams

- 4 listed streams: 14.5 miles total
- Causes: pH, siltation, organic enrichment, dissolved oxygen, metals
- Sources: abandoned mines, agriculture

Bear Creek "303d" Listed Stream Segments

Sub-watershed name	Hydrologic unit code 0603-0006
Bear Creek	010-02
Little Dice Branch	010-01
Lost Creek	040
Harris Creek	040-02

Lakes:

- Trophic Status: 4 reservoirs rated

Reservoir	Score	Statewide ranking	Classification
Upper Bear Creek	63	3	eutrophic
Bear Creek	60	7	eutrophic
Little Bear Creek	46	33	mesotrophic
Cedar Creek	44	35	mesotrophic

Fish:

- Advisories: none
- Fish kills: none (2000-2002)

Public water supplies:

- Compliance violations: none
- 5 surface water sources (4 reservoirs, 1 stream)

Watershed Screening Assessment **

Land Use Type(*)	Percent	Animal Type (**)	Numbers	Septic systems (**)
Forest	72	Beef	24,500	Est. number: 5,400
Pasture	12	Dairy	600	Est. failing: 1,600
Cropland	6	Swine	1,000	
Urban	3	Broilers	6,238,000	
Open water/other	4	Layers	179,000	
Mining	2			

Bear Creek Overall NPS Pollution Potential: moderate (*)

Concerns: land application of animal wastes (poultry), nutrients and pesticides, sedimentation from sand & gravel pits, woodlands, mining, construction

Bear Creek Priority Sub-watersheds

Priority subwatersheds:	ADEM ranking: *	ASWCC ranking: **	Active Group
Upper Bear Creek (-010)	n/a (good condition)	priority (1st)	Millennium Group
Little Bear Creek (-030)	n/a (good condition)	priority (3rd)	Millennium Group
Upper Cedar Creek (-040)	n/a (good condition)	priority (2nd)	Millennium Group
Lower Cedar Creek (-050)	n/a (small)	priority (5th)	No
Rock Creek (-070)	n/a (good condition)	priority (3rd)	No

Notes:

"n/a" indicates not assessed by ADEM because:
drainage is too small or flows too low,
watershed is part of an on-going NPS control project (denoted where applicable),
no data available (from any agency), or
watershed does not rank as a priority based on "good" assessment.

Since multiple (county) SWCDs are involved in assessments of watersheds in the cataloging unit, it is possible to have "same" numerical priority ranking in ASWCC column.

Reference Sources:

* Surface Water Quality Screening Assessment, ADEM, 2000
** ASWCC, 1998 Conservation Assessment Worksheets

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Section 3
Objectives and Strategies

To improve, protect, and maintain multiple beneficial uses, water quality standards, and experiences of the Tennessee River and its tributaries for fishing, swimming, drinking, and recreating through basin-wide public-private partnerships for the benefit of current and future generations.

Tennessee River Basin Stakeholder Meeting Participants
March 2003

Overall basin strategies to meet the goal are:

1. Support watershed implementation plans in progress or being developed
2. Support development of watershed groups in "303d" stream watersheds
3. Support basin-wide education /outreach projects

3.1 Tennessee River Basin Objectives

Sixteen objectives were identified for the Tennessee River watershed management plan. These are based on stakeholder comments during a series of facilitated meetings in each of the sub-basins of the Tennessee River basin. The order of listing does not constitute a basin priority or ranking. However, each sub-basin did rank the objectives to reflect local perception to the objectives. The sub-basin rankings of the objectives are summarized in Table 3.1.

1. Reduce non-point source pollution from agricultural activities
2. Reduce non-point source pollution from urban development activities
3. Reduce nutrient loadings to basin reservoirs where applicable
4. Improve compliance with water quality standards in north Alabama
5. Identify and designate outstanding waters in north Alabama
6. Protect diminishing farmlands
7. Reduce non-point source pollution from residential sources (e.g., septic systems, lawn fertilizer, solid wastes, and household hazardous wastes such as pesticides, paint)
8. Seek and resolve commercial mussel fishing issue on Tennessee River
9. Reduce water-related recreational activities pollution

10. Protect groundwater resources
11. Reduce threat to endangered aquatic species (fish and mussels) from loss of habitat or water quality degradation; support mussel reintroductions
12. Develop and demonstrate environmentally (water quality) friendly golf course, residential, and recreation areas
13. Protect and enhance riparian buffer zones in basin
14. Sustain public water supply and promote water conservation efforts
15. Reduce non-point source pollution from silvicultural activities
16. Reduce non-point source pollution from mining activities

Table 3.1 Sub-basin Rankings of Objectives

Objective:		Pickwick	Guntersville	Wheeler
1.	Reduce non-point source pollution from agricultural activities.	6	19	18
2.	Reduce non-point source pollution from urban development activities	9	8	20
3.	Reduce nutrient loadings to basin reservoirs where applicable	0	7	1
4.	Improve compliance with water quality standards in north Alabama	1	8	8
5.	Identify and designate outstanding waters in north Alabama	1	0	2
6.	Protect diminishing farmlands	6	3	1
7.	Reduce non-point source pollution from residential sources (for example, septic systems, lawn fertilizer, solid wastes, pesticides, and household hazardous wastes)	5	18	13
8.	Seek and resolve commercial mussel fishing issue on Tennessee River related to water quality	0	0	0
9.	Reduce water-related recreational activities pollution	0	1	0
10.	Protect groundwater resources	3	2	4
11.	Reduce threat to endangered aquatic species (including fish and mussels) from loss of habitat or water quality degradation; reintroduction of mussels	5	0	5
12.	Develop/demonstrate environmental (water quality) friendly golf courses, residential, and recreational areas	4	0	0
13.	Protect and enhance riparian buffer zones	6	8	10
14.	Sustain public water supply and promote water conservation efforts	0	2	1
15.	Reduce non-point source pollution from silviculture activities.	0	2	0
16.	Reduce non-point source activities from mining activities.	0	0	1

Priority Rankings by sub- basin	
1st Priority	
2nd Priority	
3rd Priority	

3.1.1 Discussion

The goal and objectives of the Tennessee River Watershed Basin Management Plan align with the intent of Tennessee River watershed stakeholders, the Tennessee River Basin Clean Water Partnership, and technical advisors working in the basin. Consensus among stakeholders is that the Tennessee River Basin Clean Water Partnership through this Plan identified three high level guiding principles for the Tennessee basin. The Plan should:

1. ***Support*** local watershed implementation planning and projects in progress;
2. ***Assist*** development of new implementation plans by watershed groups starting up in needed areas of the basin; and
3. ***Promote*** basin-wide education and outreach efforts that increase awareness and involvement with watershed improvements or protection.

The Tennessee River Basin Watershed Management Plan is designed to assist development of local watershed implementation plans by assembling pertinent water quality information and stakeholder inputs, and serving as a reference for planning at the local watershed level. By identifying "where" problems are in the basin, "what" needs to be done, and "who" can work on the issues, the Plan sets the stage for developing detailed, localized watershed management plans. The Tennessee River Plan provides the overview, background, and basin perspectives for local watershed groups to develop and prepare implementation plans.

During the stakeholder meetings common questions, approaches, and themes emerged from participants regardless of sub-basin location or issue. A "common sense" approach in the words of one stakeholder to describe basin management planning, is that this Plan sets up the "steps for the next step"---local watershed management planning. During the facilitated sessions, many comments focused on "how to" correct problems identified on the State's "303d" list. In their words, the "steps" to improve water quality problems locally include:

1. target where (streams and/or subwatersheds) the water quality problems are
2. identify the water quality problems (causes)
3. identify the source(s) of the problem
4. target critical areas/sites
5. determine how much pollution reduction is needed
6. determine how much reduction is possible
7. determine who needs to be involved
8. determine who will be involved (a search for real commitment)
9. estimate how much will it cost
10. estimate how long will it take
11. identify possible barriers e.g. funding, technical assistance/support, local (political) willpower and support, monitoring, etc.
12. how can the barriers be overcome

Much of the focus of this Plan is on nonpoint sources (NPS) of pollution. Most of the impaired water bodies documented by the state in the Tennessee River basin are due to

NPS impacts. The Tennessee River Basin is traditionally rural and is a highly developed agricultural region of the state. However, in the last 10-15 years, portions of the basin have transitioned from agricultural uses to more suburban-urban uses. The water quality pollutants causing impairment and listing on the State's 303(d) list may be the same (e.g. pathogens, nutrients, sediment, organic enrichment, dissolved oxygen), but the "sources" of these pollutants have changed.

Transitioning land uses in the Tennessee basin underscores a need to address suburban-urbanization sources and effects while still continuing progress on the agricultural front. The "urban" front is not easy. The agricultural sector has a much more extensive and well established institutional framework in the Tennessee basin to address agricultural NPS than does the urban-suburban sector. Urban BMPs and planning on a watershed scale do not have the same quantifiable water quality improvements record as have been realized in agriculturally-impacted watershed improvement projects in the Tennessee River Basin. There is much to be developed, tried, and implemented in suburban-urban watersheds.

Each of the Tennessee sub-basin stakeholder meetings cited "development" as an issue to be addressed--even the less populated, more rural sub-basins in the Tennessee basin. There is ***stakeholder consensus that "development" is detrimental to water quality and that "something" must be done to prevent unchecked degradation (a view of many meeting attendees).***

3.2 Tennessee River Basin Strategies

The crux of the planning and implementation work is at the local watershed level. Tennessee River basin stakeholders emphasized the desire and need to allow flexibility in developing strategies and proposals specific to local watershed needs, a common interest of watershed-based planning by federal and state partners. Stakeholders attending the sub-basin meetings wanted the Tennessee River Basin Plan to set high-level goals, objectives, and strategies, but not necessarily specific prescriptive strategies. Strategies in this section are flexible and align with the 16 objectives developed by Tennessee River basin stakeholders. Note that some of the objectives, for example agricultural NPS, have an extensive discussion and focused strategy statements. Other objectives have a more general strategy, reflecting either the sub-basin specific nature of the problem/issue or the relative newness of the issue and uncertainty as to how to address the issue at this time, for example urban-suburban "development/growth". A period of time is needed for local, specific strategies, partnerships, and plans to emerge for the urban/development NPS issue. This Plan, captures the sentiments of stakeholders on the issue of "urban growth and development" in the basin. The "urban NPS" objective is posed for innovation and further development in the Tennessee basin

Development of local watershed implementation plans will include specific actions consistent with EPA's "Nine Elements of a Watershed Protection Plan" (see description in Section 3.4.1).

3.2.1 Objective 1: Reduce nonpoint source pollution from agriculture

Strategy: ***Work with the planning processes and cycles of the USDA and local SWCD programs to engage appropriate BMP programs for the type and source of water quality impairment from agricultural activities.***

Discussion: North Alabama has a long tradition and success with experimenting and utilizing conservation techniques and management practices to control agricultural NPS. From a water perspective, agricultural NPS is generally non-regulatory and involves voluntary conservation and on-farm management. Traditionally, USDA Natural Resources Conservation Service, Farm Service Agency, Extension System, and local soil and water conservation districts work with the agricultural community to reduce NPS loads in watersheds. A brief description of programs that provide cost-share assistance and incentives to farmers and landowners which promote and utilize best management practices (BMPs) follows. The type of agricultural contribution causing the water quality impairment (e.g. pathogens, nutrients, sediment, and organics) and the appropriate BMPs to reduce the contributions will be watershed specific; identified and addressed in the local watershed implementation plan. On a basin-wide level, actions to meet this strategy and objective will include the following.

Actions:

1. Participate in local SWCD conservation assessment updating process in 2003-2004.
2. Coordinate and participate with local planning on an annual, continual basis in targeted, priority subwatersheds specifically to:
    a. Identify water quality parameters of interest based on State assessments and total maximum daily loads (TMDL) targets where and when TMDL available for nutrients, pathogens, sediment, organic enrichment, habitat losses, etc.
    b. Determine appropriate suite of agricultural NPS control BMPs for the water quality parameters (e.g. to reduce sediment erosion use land treatment BMPs; to reduce pathogen loadings use animal waste and stream watering BMPs, etc.)
    c. Estimate gross load reductions that are possible with the selected suite of BMPs
    d. Estimate percent of local (landowner) participation
    e. Determine timeline for implementation (including funding/grant cycles and on-the-ground implementation)
    f. Determine monitoring needs and who will lead/conduct
3. Coordinate and participate in basin-wide education/outreach events such as field days/tours, agricultural chemical collection promotions, bio-fuels and poultry litter workshops and seminars, etc.

Responsible/lead entities: USDA NRCS, FSA, ASCCW, SWCD, ADEM, ACES
Cooperators/traditional partners in Ag: Landowners, USDA NRCS, FSA, ACES, ASWCC, SWCDs, RC&D councils (e.g. Northwest Alabama, Tennessee Valley), TVA, ADEM; Sand Mountain-Lake Guntersville, Flint Creek, Flint River, Paint Rock conservancy districts
"New" and non-traditional partners: CWP, AWW (for monitoring), Millennium Group (for riparian restoration), USFWS
Potential funding: USDA (see programs listed below), ASWCC Agricultural Cost Share, ADEM (via section 319)
Schedule: On-going
Load Reductions: based on ADEM TMDL targets when and where available for targeted sub-watersheds (see Appendix C for TMDL status)
Estimated Cost: not estimated
Education and Outreach, Citizen Participation: CWP quarterly meetings; TAC coordination; attendance/presentation to monthly SCWD meetings and other (local) public organization meetings
Progress and Success Criteria (Basin Level; high level reporting):
Many of the following can be updated annually by the Tennessee River CWP through the continual planning and coordination processes of the Tennessee River CWP. These progress and success criteria at a basin-wide level include:

1. number of (targeted) local watershed implementation plans developed
2. number of targeted watershed improvement projects proposed, in-progress, completed

3. number of BMPs completed (e.g. acres treated, animal waste management systems installed, etc.) in the targeted watersheds
4. number of stream segments (and miles) improved i.e. trend over time of streams de-listed on state's biennial assessments; summaries in this Plan serves as benchmark
5. number of field day/outreach events promoting sound agricultural BMPs

Suite of Agricultural NPS Reduction Programs:

The following descriptions of USDA programs and selected others provide an overview of some of the agricultural programs available to assist with development and implementation of local watershed projects. Local teams are encouraged to coordinate and access any of the following program areas as they develop their watershed management plans to address agricultural NPS. This is not an exhaustive listing. During the development of local plans, additional or non-traditional programs and partners are likely to be identified. Many state and federal agencies, and foundations have program missions that could be tapped for agricultural BMPs.

Conservation Reserve Program (CRP)

This USDA program was established as a conservation provision of the Farm Bill to encourage and assist farm producers willing to set aside highly erodable, riparian, and other environmentally sensitive lands from crop production for a 10 or 15 year period. Producers may enroll in the CRP program according to USDA program rules. If a landowner's CRP bid is accepted, a Conservation Plan of Operation is developed. In addition to an annual CRP payment, USDA will provide a 50% cost-share to establish the selected conservation practice. Landowners may receive a maximum of $50,000 annually in CRP payments.

Wetlands Reserve Program (WRP)

This voluntary USDA program for restoring wetlands is administered by NRCS with technical assistance from the Fish and Wildlife Service (FWS). Participating landowners can establish conservation easements of either permanent or 30-year duration or can enter into restoration cost-share agreements where no easement is involved. NRCS and FWS assist private landowners with site selection and development of restoration plans for the site. Up to 100% of the cost of restoring the wetland is provided by USDA.

Environmental Quality Incentives Program (EQIP)

This USDA program works primarily in locally identified conservation priority areas where there are significant problems with natural resources. High priority is given to areas where State or local governments offer financial, technical, or educational assistance and to areas where agricultural improvements will help meet water quality objectives. Landowners can apply to the program for assistance in solving problems related to animal waste management, erosion, and other environmental problems. EQIP will provide up to 60% cost-share for restoration. A landowner may receive up to $50,000 annually in EQIP payments.

Wildlife Habitat Incentives Program (WHIP)
The Wildlife Habitat Incentives Program (WHIP) is a voluntary program for landowners who want to develop and improve wildlife habitat on private lands. Participants work with NRCS to prepare a wildlife habitat development plan. USDA provides technical assistance and cost-share payments up to 75% of the cost of installing the wildlife habitat practices. USDA and the participant enter into a cost-share agreement that usually lasts a minimum of 10 years.

Farmland Protection Program (FPP)
The FPP provides funds to help purchase development rights to keep productive farmland in agricultural use. Seventeen states are currently implementing the FPP program. Alabama is not currently implementing this program.

Partners for Fish and Wildlife
This incentive program is administered by US Fish and Wildlife Service (FWS). The Partners for Wildlife program restores, improves, and protects fish and wildlife habitat on private lands through alliances between the FWS, other organizations, and individuals, while leaving the land in private ownership. Funds received cannot exceed $10,000 during one fiscal year and projects with private landowners must secure a minimum 10-year habitat development agreement. Landowners can receive up to 100% funding for project expenses. The program emphasizes Federal trust resources; e.g., migratory birds, endangered and threatened species, wetlands, flood plains and riparian areas.

3.2.2 Objective 2: Reduce nonpoint source pollution from urban development activities

Strategies:

1. ***Track legislation in Alabama;***
2. ***Demonstrate design and construction BMPs;***
3. ***Conduct training and outreach events;***
4. ***Support Huntsville mitigation program development***

Discussion: In the urban-suburban setting, both regulatory and non-regulatory programs are available to address urban and/or construction runoff issues. The strategies proposed by this Plan, reflect the multi-faceted and evolving institutional arrangements, new programs, and new partnerships that address NPS from urban/development areas in the Tennessee basin.

There is a range of stakeholder perceptions that "something" needs to be done to address growth and development (urban) issues in the basin. Some point to home rule legislation as needed to allow local flexibility to develop and implement codes and ordinances related to planning and development. Some stakeholders perceive that sufficient flexibility already exists. This range underscores the diverse interests and positions in the "urban" setting. (In this Plan, this term refers to both the built-up city center and the adjoining suburban areas).

The strategy of "tracking legislation" is intended to keep the members of the Tennessee CWP abreast of legislation that may influence local decisions and actions. The Tennessee CWP relies on the members that are city/county planners and policy makers that are routinely networked with planning and development issues in the state. These members bring this information back to the Tennessee CWP. While this strategy "tracks" legislative development, the other strategies promote action: "demonstrate construction BMPs"; "conduct training and outreach events e.g. NEMO; and "support Huntsville mitigation program development". The multi-faceted strategies of this objective reflects local concerns with urban NPS, and the more pervasive basin-wide concern by adjoining communities (watersheds) of urban "sprawl" into their watersheds. Demonstrations, workshops, and emerging programs that could serve as a model to other communities will go a long way toward refining the strategy(s) needed to reduce nonpoint source pollution from urban development. In the meantime, some actions underway in the Tennessee basin include the following.

Regulatory actions: Stormwater management regulations promulgated by ADEM address stormwater and runoff quality from Huntsville, a "Phase I" community with a population >100,000. The regulations require the city to obtain water quality permits for storm water outfalls (i.e. discharge pipes to streams) and to implement a management plan with practices that control and reduce construction site runoff, and that increases stormwater retention from developed, impervious areas. (*Definition:* Impervious refers to restriction of water passage into the ground or soil e.g., parking areas, roofs,

commercial/industrial sites, malls, paving, etc.). Landscaped "ponds" adjacent to parking lots are an example of stormwater retention practices (i.e., BMPs) used by Phase 1 communities like Huntsville.

In March 2003, several smaller communities (referred to as "Phase II" communities with populations >10,000 but < 100,000) in the basin are required to obtain storm water management permits (see Section 1, Table 1.3.1.2.2). These communities must have approved stormwater management plans. These are 5 year permits from ADEM. Many of the Tennessee basin communities have been given the next 5 years to prepare and develop their plans. This presents an opportunity to work with non-traditional watershed partners to evaluate and develop creative approaches and partnerships. While Phase II communities in the Tennessee basin may not have the extensive stormwater collection and permitted outfall system like Huntsville, these communities will have to develop and implement a management plan with practices that reduce construction site runoff and/or increase stormwater retention. Educational or demonstration projects for storm water management practices (designs and options) may greatly assist these communities over the next 5 years as they move into this aspect of clean water regulation and watershed protection.

Non-regulatory actions: Huntsville is pursuing a non-regulatory approach to address degraded streams in the city limits. This includes a stream restoration program, a mitigation streambank program, and a wetland mitigation bank for streams on the state's 303d list in the city limits. These streams have been degraded due to channelization and lost of riparian (streamside woody vegetative plant) cover and do not meet state water quality criteria for aquatic life and other parameters. The proposed program in Huntsville intends to restore streamside/riparian capacity to the degraded streams as well as reduce the loadings to the streams with additional BMPs in the watersheds. This developing program could serve as a model to other communities in the basin to learn about practices, costs, and approaches that a community could initiate.

Education and outreach/training opportunities for developers, builders, and planners are another non-regulatory action proposed in the Tennessee basin to demonstrate alternative designs and construction BMPs that minimize stormwater runoff.

Additionally, Alabama has adapted and modified NEMO (nonpoint education for municipal officials) as an education/awareness building tool that highlights watershed processes and issues with water quality improvement and protection. There are several trained NEMO presenters in the Tennessee River basin (Appendix K) that can be called upon to give a presentation to local city, county, or watershed planning groups. The Tennessee River Basin Clean Water Partnership maintains a list of these resources.

Another educational and practical tool is the Center for Watershed Protection's Handbook for Changing Development Rules. Changing development rules locally in Alabama cannot currently be done due to "home rule" clauses in enabling legislation. The handbook provides suggestions for codes and ordinances, evaluation techniques to

determine your county's index for "watershed friendly" codes, and BMPs for developments that reduce stormwater runoff and preserve open space.

Actions:

1. Present or conduct NEMO training and outreach to communities throughout the basin to build awareness and interest in actions that address urban concerns in the basin(basin-wide)
2. Highlight and promote (basin-wide) the stormwater management demonstrations as they are completed (e.g. Clements campus, Cotaco unpaved roads sealant, Huntsville streambank mitigation),
3. Target "youth driven" anti-litter education campaigns to community schools (targeted to specific groups throughout the basin)
4. Conduct CWP presentation before the Huntsville mitigation program planning group (targeted to the HUs in the Huntsville project area)
5. Track legislation related to planning/development issues

Responsible/lead entities: Tennessee River CWP
Cooperators/partners: ADEM, NEMO trainers, Huntsville Public Works
Potential Funding: ADEM via section 319
Schedule: FY 03-04
Load reductions: not applicable; this is an outreach effort targeted to urban areas
Estimated costs: not available
Progress and Success Criteria: number of presentations to community groups; completion of demonstration BMPs; annual status of Huntsville program

3.2.3 Objective 3: Reduce nutrient loadings to basin reservoirs where applicable

Strategy: ***Reservoir load reductions may involve different programs (point source and non-point source) depending on the reservoir, the watershed, and the sources of the loads; work with ADEM regulatory and non-regulatory programs to address nutrient loadings to basin reservoirs***

Discussion: ADEM has established nutrient criteria for 6 of the 8 reservoirs in the Tennessee River basin. The other two reservoirs are scheduled for 2004 development. These criteria are based on chlorophyll a concentrations, a pigment in algae and an indication of primary productivity reflective of watershed nutrient inputs from both point and nonpoint sources. The criteria for the Tennessee basin reservoirs are: **18 ug/l chlorophyll a** concentrations for Guntersville, Wheeler, Wilson, and Pickwick reservoirs; and **8 ug/l** for Cedar and Little Bear Creek reservoirs. These criteria establish which reservoirs exceed recommended nutrient levels (as indicated by chlorophyll a). These criteria also set nutrient targets for reservoir improvement projects. The link between reservoir nutrient levels and watershed inputs involve complex monitoring and modeling. However, once established, a reservoir target can guide which watershed loadings need reductions. The reservoir target can help set watershed nutrient reduction targets and

guide watershed BMP scenarios. Appendix D refers to the State's reservoir nutrient criteria for the Tennessee River basin reservoirs.

Actions:

1. Track ADEM's reservoir nutrient criteria implications;
2. Work with ADEM to select and develop a reservoir-watershed pilot project

Responsible/lead entities: ADEM, TVA
Cooperators/partners: ADEM (regulatory and NPS programs), TVA, Tennessee CWP, ADECA, trade/business organizations
Potential Funding: ADEM
Schedule: on-going
Load reductions: to be determined and consistent with ADEM's reservoir nutrient targets
Estimated costs: to be determined during scoping phase of a pilot project
Progress and Success Criteria:

1. Pilot project area selected;
2. Scope developed;
3. Plan of work developed (including timeline, costs, activities, and responsibilities)

3.2.4 Objective 4: Improve compliance with water quality standards in north Alabama

Strategy: ***Work with appropriate regulatory agency for the specific category of water quality issue or concern. General responsibilities are:***

1. ***ADEM for point source and nonpoint sources of water pollution and complaints***
2. ***Corps of Engineers for wetland issues***
3. ***TVA and Corps of Engineers for construction in navigable waters of the Tennessee River***

Discussion Regulatory Issues: Several state and federal regulatory programs govern compliance with water quality standards or activities that may impact water quality. Tennessee River basin stakeholders' concerns and comments pertain to a general perception that there are enough regulations but that the issue is meaningful enforcement of the rules for non-compliance or for investigation by the regulator based on citizens' complaints/tip-offs. A summary of pertinent regulatory programs follows.

National Pollutant Discharge Elimination System Permits (NPDES)
The NPDES was established by the Federal Water Pollution Control Act (1972) to control point source discharges to streams. In Alabama, this program is administered by ADEM. This permitting system sets effluent limitations for discharges of treated municipal, industrial, and mining wastes. Also, construction sites over five acres in size are included under the mining provisions of this program. Effluent limitations specify the level of wastewater treatment required prior to its discharge into a stream. Permittees

are required to submit discharge monitoring reports (DMR) to ADEM. The DMR contains data for all parameters and monitoring frequency specified by the NPDES permit.

Nonpoint Source Discharge "Regulations"
Congress enacted Section 319 of the Clean Water Act in 1987 to provide for assessment of the degree and nature of water quality impacts due to nonpoint source (NPS) water pollution and to provide for implementation of programs to deal with NPS water pollution. ADEM is responsible for the administration of Section 319 in Alabama. This responsibility involves the use of funds for NPS pollution education and demonstration projects. There are no present limitations for NPS pollution discharges. The responsibility of NPS pollution education and control lies within the agencies that oversee the activities of each NPS category. The Alabama Forestry Commission is responsible for conducting compliance inspections on forestry sites and the Natural Resources Conservation Service (NRCS) is responsible for NPS control on agricultural lands. Stormwater permits for municipalities come under the authority of ADEM's Municipal Branch; industrial wastewater discharge falls under the authority of ADEM's Industrial Branch.

Although there are no effluent limitations for NPS discharges and BMP implementation is voluntary, ADEM may take enforcement action on any site or activity where discharges result in a water quality violation in waters of the State.

Other Regulatory Programs:
Army Corps of Engineers Regulatory Programs
Wetlands are considered one type of "waters of the United States" that are protected from unauthorized discharges of dredged or fill material under Section 404 of the Clean Water Act. The purpose of Section 404 is to protect and enhance water quality by regulating the discharge of dredged or fill material into wetlands. EPA and the Army Corps of Engineers (COE) jointly define wetlands as: "..those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." (EPA 40 C.F.R. ξ 230.3 and COE 33 C.F.R. ξ 328.3)

The Section 404 regulatory program authorizes the COE to issue permits, after public notice and opportunity for public comment, and take enforcement action for unauthorized activities in wetlands and other U.S. waters.

Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any "navigable water of the United States" except by permit from the COE. Regulated activities include dredging, placement of dredged or fill material, and construction in or over navigable waters. The regulatory definition of navigable waters of the United States is: "Those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use, to transport interstate or foreign commerce." (33 C.F.R. ξ 329.4)

Tennessee Valley Authority: regulatory
Section 26a of the Tennessee Valley Authority (TVA) Act requires that TVA prohibits the construction, operation, or maintenance of any structure affecting navigation, flood control, public lands, or reservations across, along, or in the Tennessee River or any of its tributaries until plans for such construction, operation, or maintenance have been submitted to and approved by TVA..

Tennessee Valley Authority: non-regulatory
TVA participates in numerous public outreach programs to foster better stewardship of land and water resources in the basin. The Clean Marina Initiative is one example of promoting sound, environmentally responsible marina and boating practices on TVA reservoirs that contributes toward the objective of reducing water-based recreational impacts.

Actions:
1. Follow-up on citizen complaints
2. Expand and continue local de-briefings between AWW groups and ADEM, TVA, Corps, and others in the Tennessee basin for specific findings/concerns of the volunteer monitors

Responsible/lead entities: as noted in above strategy
Cooperators/partners: ADEM, TVA, Corps of Engineers, public
Potential Funding: in-kind programs of the respective agencies
Schedule: on-going
Load reductions: case by case
Estimated costs: unknown; not applicable
Progress and Success Criteria:
1. ADEM: number of complaints and investigations as reported biennially in state water quality assessment report (305 b); number
2. TVA: number of complaints and resolutions for shoreline and/or other navigable construction violations
3. Corps of Engineers: number of complaints and resolution for wetland related investigations
4. Corps of Engineers: number of investigations and resolutions for navigable waters complaints

3.2.5 Objective 5: Identify and designate outstanding waters in north Alabama

Strategy: ***Develop individual smart growth actions in relatively un-impacted waters***

Discussion: Several participants at the sub-basin stakeholder meetings suggested that some streams should be considered and evaluated for outstanding waters designation. Participants were informed of the procedural aspects of this objective. The intent of the

stakeholder suggestions and inputs is that some waters in north Alabama are of high value (aesthetic and water related recreational use) to residents. While these waters may or may not meet state criteria for such outstanding designation, the stakeholders would like to see more protection afforded these streams in north Alabama.

Actions:

1. Identify potential "outstanding waters" in north Alabama
2. Target "smart growth" initiatives to these areas to prevent degradation

Responsible/lead entities: ADEM
Cooperators/partners: ADEM, CWP, public, Alabama Rivers Alliance, Alabama Outdoors (other organizations)
Potential Funding: ADEM
Schedule: 2+ years
Load reductions: determined by ADEM if applicable for targeted waters
Estimated costs: unknown
Progress and Success Criteria:

1. Determination of potential areas (feasibility and applicability of designation)
2. Streams selected and designation(s) made
3. Watershed "protection" plans developed and implemented

3.2.6 Objective 6: Protect diminishing farmlands

Strategy: ***Create vision of the future project with the 3 local councils of governments in the basin (e.g., Jefferson County 20/20 project)***

Discussion: Loss of open space seems to be a basin-wide concern, especially of prime farmland lost to development and urban sprawl. This is not a new problem, but one which seems to have accelerated over the twenty years (see Section 1, Figure 1.1.2.2). Given the rural, agricultural basis of the basin, concern is raised about the vision and adequacy of programs or initiatives to protect and conserve this resource of the Tennessee basin. The actions proposed are a step toward a vision that balances farmland and development into the future.

Actions:

1. Select 3 COG's to begin discussions to target areas in the basin for prospective "visioning" project
2. Prepare and submit proposal for funding (1 -3 targeted areas)
3. Evaluate, adapt, promote "conservation easements message" as packaged by American Farmland Trust; note several stakeholders expressed concerns about this terminology, thus the need to develop and/or re-package the message for Alabama.
4. Select area for possible USDA Farmland Protection Program (FPP) project

Responsible/lead entities: USDA, SWCD, COG
Cooperators/partners: COG, RC&D, ASWCC, SWCDs, ADECA, CWP, American Farmland Trust (potential)

Potential Funding: to be determined
Schedule: to be determined
Load reductions: not known; pollutants of concern are sediment, nutrients, organic enrichment; estimated load prevention (due to preclusion of these pollutants from construction impacts) possibly more meaningful value
Estimated costs: $15k per project
Progress and Success Criteria:

1. Long-term (10-15 years): slowed rate of agricultural land conversion in the basin (as indicated by USDA NRI and/or Alabama Agriculture Census data for the Tennessee River basin
2. Short-term (1-3 years): completion of one visioning project in an agricultural watershed/community

3.2.7 Objective 7: Reduce nonpoint source pollution from (residential sources) onsite sewage systems

Strategies.

1. ***Institute and promote training programs and education activities that ensure proper installation, operation, and maintenance of onsite sewage systems;***
2. ***Seek and target alternative funding and grant sources for areas with high failing septic systems, e.g., Big Nance, Flint Creek, northwest DeKalb county areas.***

Discussion: The objective to reduce NPS from residential sources included household solid and hazardous wastes, lawn fertilizers, and septic systems. This strategy focuses on the specific issue of onsite sewage systems (residential and non-residential) component of this objective.

Onsite sewage (septic system) issues are a recurring item throughout the basin. Old systems, poorly installed or maintained systems, and marginal soils all contribute to the widespread complaint and perception of septic system problems in the basin. The Alabama Department of Public Health regulates onsite sewage systems in the state.

Alternative systems and management arrangements and sewer construction grants are available to correct onsite sewage problems in the basin. The local health departments are a key partner in addressing this issue.

Sanitary sewer districts can be formed to provide oversight of onsite sewage systems; however, to date none have been established, even though enabling legislation is available in Alabama.

Training is available at the University of West Alabama "Onsite Sewage Training Certification Program" for installers of septic systems.

Actions:

1. Promote onsite sewage certification program to installers throughout the basin through county HDs
2. Conduct onsite sewage demonstration Pumpouts in the basin
3. Promote onsite sewage maintenance (education/awareness) program to home and business owners basin-wide using readily available materials

Responsible/lead entities: ADPH
Cooperators/partners: RC&D, County health departments, UWA, contractors/installers, CWP
Potential Funding: ADECA, ADEM , ADPH
Schedule: on-going
Load reductions: targeted pollutants: reductions in nutrients, organics, and pathogens
Estimated costs: unknown
Progress and Success Criteria:

1. List of certified installers; increasing numbers of certified installers
2. Completion of 1-2 pumpout demonstration projects in the basin and promotion of lessons learned

3.2.8 Objective 8: Seek and resolve commercial mussel fishing issue on Tennessee River related to water quality.

<u>Strategy:</u> Track progress and development of Alabama Mussel Catchers Association initiatives

Discussion: Freshwater mussel harvesting is a valuable commodity of the mainstem Tennessee River reservoirs. There is a continuing discussion about the status this resource and quality of the waters to sustain this commercial fishing interest. Special studies have been conducted by several agencies and consortiums in the past. No single conclusion or consensus about the status of this resource has been made. Reservoir water quality, industrial discharges, and reservoir operations have all been questioned as a link to die-offs and/or declining desirable commercial species. The CWP is unsure of the status, partners, and actions to date, but include this and objective since it was raised as an issue during one of the sub-basin stakeholder meetings held in the spring of 2003.

Actions:

1. Monitor developments of this issue;
2. As definition and clarification of the issue becomes more known, determine CWP role, if any

Responsible/lead entities: Alabama Mussel Catchers Association, Alabama Wildlife and Freshwater Fisheries
Cooperators/partners: CWP
Potential Funding: unknown
Schedule: on-going
Load reductions: not available or applicable at this time
Estimated costs: unknown
Progress and Success Criteria: to be determined

3.2.9 Objective 9: Reduce water-related recreational activities pollution

<u>Strategy:</u> Continue education and outreach efforts and events through TVA's Clean Marina Initiative, the National Clean Boating Campaign, Alabama's Project ROSE, and the Coast Guard Auxiliary inspection program

Discussion: With increasing use and demand for water recreation and quality experiences on Tennessee River basin reservoirs, recreational boating sources of pollution are a concern. The strategy employs education and outreach as the primary tools to deal with this objective. The Tennessee River basin has been a national leader and model for the country and has demonstrated leadership through the Clean Marina Initiative, Clean Boating Campaign, and Project ROSE.

Actions:

1. Conduct annual Clean Boating campaign on mainstem reservoirs
2. Conduct additional "Clean Marina" certifications
3. Continue education/outreach material development (e.g. brochures, maps, etc.)

Responsible/lead entities: TVA, CWP, Alabama Legacy
Cooperators/partners: Coast Guard Auxiliary, marinas, resorts
Potential Funding: TVA
Schedule: on-going
Load reductions: targets oil/chemical spills, nutrients, pathogens, organics to waterways
Estimated costs:
Progress and Success Criteria:

1. number of certified "Clean Marinas"
2. number of participants in Clean Boating events

3.2.10 Objective 10: Protect groundwater resources

<u>Strategies:</u>

1. ***Continue participation in education and outreach events in local groundwater festivals;***
2. ***Develop programs where projects are needed;***
3. ***Track State's monitoring results of groundwater resources in the basin***

Discussion: The Clean Water Partnership will seek funding to support groundwater efforts throughout the basin, recognizing that some areas are highly dependent on groundwater for drinking water sources. The basin has several on-going education and outreach activities in several communities, e.g., Madison, Limestone, Lauderdale, Colbert, and Cullman counties.

Actions:

1. Support and participate in local Groundwater Festivals to promote awareness of the groundwater resource to Alabama residents
   Responsible/lead entities: ADEM
   Cooperators/partners: CWP, RC&D, NRCS, ADEM, TVA, School Boards, SWCDs
   Potential Funding: ADEM, RC&D
   Schedule: on-gong
   Load reductions: targets general awareness and pollution reduction actions individual can make
   Estimated costs: varies
   Progress and Success Criteria:
   - Number of festivals per year
   - Number of students participating in events

2. Support the Cotaca Creek "springs" watershed restoration/protection project
   Responsible/lead entities: ADEM
   Cooperators/partners: Cotaco Creek Watershed Alliance, Morgan County SWCD, CWP, RC&D, NRCS, TVA, landowners
   Potential Funding: ADEM, GSA, ASWCC, USDA (EQIP, CRP, WHIP), USFWS, World Wildlife Fund (possible)
   Schedule: 2003-2006
   Load reductions: consistent with TMDL for sediment, nutrients, pathogens; implementation plan in progress
   Estimated costs: $1.5M (proposed)
   Progress and Success Criteria:
   - Miles of riparian zones restored/protected
   - Number of agricultural BMPs installed to reduce sediment, nutrient, pathogen loadings
   - Improved and stable aquatic life communities in springs of Cotaco Creek project area

3. Utilize state's groundwater monitoring and assessment data to target education/outreach events and/or projects that protect or improve groundwater resources in the Tennessee basin
   Responsible/lead entities: CWP
   Cooperators/partners: ADEM, GSA, RC&D, ADECA, SWCD, ADPH
   Potential Funding: in-kind
   Schedule: on-going
   Load reductions: projects will target load reductions for nutrients, pathogens, organic contaminants, and turbidity/siltation
   Estimated costs: to be determined
   Progress and Success Criteria:
   - Number of groundwater focused projects

3.2.11 Objective 11: Reduce threat to endangered aquatic species from loss of habitat or water quality degradation

Strategy: ***Support mussel re-introduction project in the Bear Creek watershed; ties this objective to the strategy for objective 13, riparian buffers.***

Discussion: The Tennessee River basin is one of the more biologically diverse systems in the state and the hemisphere. The system is rich in freshwater mussels, snails, darters (fish), and crustaceans (e.g., cave shrimp). Continued pollution threats and loss of habitat threaten and erode species survivability.

Actions:

1. Implement riparian restoration projects along targeted stream segments in Bear Creek reservoirs and tributary watersheds
2. Monitor water quality in tail water reaches of reservoirs for physical, chemical, and biological parameters

Responsible/lead entities: Millennium Project
Cooperators/partners: TVA, ADEM, CWP, NRCS, SWCD
Potential Funding: ADEM, TVA, AWFF, BASS, USDA EQIP/WHIP
Schedule: on-going
Load reductions: targets sediment reductions
Estimated costs: varies
Progress and Success Criteria:

1. Mussel survivability
2. Miles of streambanks restored/protected

3.2.12 Objective 12: Develop and demonstrate environmentally friendly golf, residential, and recreation areas

Strategy: ***Develop specific strategies within the local watershed implementation planning***

Discussion: This objective, while basin-wide in scope, is focused on specific sites and/or locations in the watershed. Therefore, the strategy focuses on development of demonstration projects within specific sub-watersheds and/or individual sites at this time. Potential "sites" were suggested during the stakeholder meetings. These include the areas around Quad cities (Florence, Muscle Shoals, Tuscumbia, Sheffield), Decatur, and Huntsville.

Actions:

1. Review PGA guidance and recommendations
2. Promote PGA, others recommendations to local facilities/developers
3. Solicit participation with a facility to join in a demonstration or promotion project

Responsible/lead entities: new partner
Cooperators/partners: Shoals Environmental Alliance, TVA, CWP, ADEM, RC&D,

Potential Funding: unknown
Schedule: non specific
Load reductions: targets nutrients, pesticides
Estimated costs: to be determined
Progress and Success Criteria:

1. Partnership with a facility or developer for environmental friendly practices

3.2.13 Objective 13: Protect and enhance riparian buffer zones throughout the basin

Strategy: Target and apply USDA, US FWS, The Nature Conservancy, and Land Trusts program funds for conservation easements and practices

Discussion: There is widespread recognition that healthy, established riparian (streamside) buffers are a key line of defense in improving and protecting water quality and aquatic life in watersheds.

Actions:

1. Incorporate riparian restoration goals into watershed implementation projects, expanding partnerships to non-traditional parties
2. Promote riparian (streamside) programs to landowners

Responsible/lead entities: CWP
Cooperators/partners: ADEM, TVA, USDA, RC&D, SWCD, TNC, USWFS
Potential Funding: USDA, ASWCC, ADEM, TNC, USFWS, TVA, OSM
Schedule: on-going
Load reductions: targets sediment, nutrient, organic, and pathogen load reductions as determined by TMDLs
Estimated costs: to be determined
Progress and Success Criteria:

1. Number of projects with riparian buffer zone practices
2. Miles of streamside protected or restored

3.2.14 Objective 14: Sustain public water supply and promote conservation efforts

Strategy: Target and utilize existing public education programs that promote water conservation throughout the basin.

Discussion: Water conservation is a good stewardship practice. Education and outreach to the general public and business/industry will draw attention to the issue, and hopefully change behavioral practices. A few communities are beyond the benefits of education efforts and are questioning water availability (sustainability) for local growth and development. Sustainable water supply questions, while a local issue now, could quickly escalate into a regional (in this case, sub-basin) issue.

Actions:

1. utilize existing water conservation promotional and awareness materials available from the state and other resource agencies
2. identify and assist communities experiencing water supply shortages or water quality problems

Responsible/lead entities: CWP
Cooperators/partners: ADECA, ADEM ,GSA, RC&D, TVA, SWCD, Utilities (Water)
Potential Funding: ADECA, ADEM
Schedule: on-going
Load reductions: potentially targets in-stream flow issues
Estimated costs: to be determined
Progress and Success Criteria:

1. Number of communities or utilities promoting water conservation in billings, or implementing client service surveys (comparable to energy conservation surveys)
2. Inclusion of water conservation messages in Water Festivals and Groundwater festivals in the basin

3.2.15 Objective 15: Reduce nonpoint source pollution from silvicultural activities

Strategy: ***Promote, apply, and follow Alabama Forestry Commission BMPs throughout the Tennessee River basin***

Discussion: Several stakeholders expressed concern about forestry NPS contributions in the basin. There is concern for safe guards and/or enforcement of existing regulations. The concern has shifted from "clear-cutting" practices to concerns about roads, skid trails, and chemical pesticide and herbicide use and runoff on forested lands. This shift is a comment on advances made both in practice and promotion of sound harvesting techniques used in the 1980's and 1990's.

Actions:

1. Reference and apply Alabama Forestry Commission BMPs to watershed implementation plans throughout the basin
2. Invite AFC member to give presentation to CWP or targeted sub-basin group(s)

Responsible/lead entities: AFC
Cooperators/partners: CWP, RC&D, USDS, SWCD, landowners
Potential Funding: AFC, landowners
Schedule: on-going
Load reductions: targets sediment, nutrients, organic enrichment, and pesticide/herbicides
Estimated costs: not available
Progress and Success Criteria:

1. Increased public awareness and perception of forestry BMPs in Alabama
2. Number of forestry BMPs implemented as a component of watershed implementation projects

3.2.16 Objective 16: Reduce nonpoint source pollution from mining activities

<u>Strategy:</u> Develop specific strategies in the local watershed implementation plans; coordinate with Alabama Mining Division, US Office of Surface Mines, and USDA

Discussion: This pollutant source is regulated; however, there is concern in two of the sub-basins (Bear Creek and Guntersville) of continued contribution of pollutants from mining activities both abandoned sites and active sites.

Actions:

1. Coordinate mining activities in watershed plans that have a mining component or presence of mining activities in the watershed
2. Document extent of mining issue/concerns in the basin

Responsible/lead entities: AMD, OSM, USDA
Cooperators/partners: CWP, ADEM, RC&D, SWCD
Potential Funding: AMD, OSM (Appalachian Streams), USDA (RAMP)
Schedule: initiate by 4th quarter 2003
Load reductions: targets sediment, metals, pH load reductions
Estimated costs: to be determined
Progress and Success Criteria:

1. Number of reclamation projects in basin
2. Reduction in number of streams impacted by mining contributions

3.3 Stakeholder Input Process

Stakeholder input is essential to the Tennessee River Basin Watershed Management Plan. The basin goal, objectives, and strategies were developed with input from stakeholder meetings throughout the Tennessee River basin. Many suggestions and comments regarding a broad range of water quality issues and desires were given.

Six public meetings provided stakeholder input to the development and review of the plan. The meetings included:

Date: February 5, 2003	Host: Tennessee River Clean Water Partnership Meeting: Technical Advisory Workgroup Location: Birmingham (conjunction with 2003 WaterQuest meeting)
Date: February 15, 2003	Host: Alabama River Alliance Meeting: Tennessee River Basin Forum Location: Huntsville
Date: March 6, 2003	Host: Tennessee River Clean Water Partnership Meeting: **Pickwick-Wilson/Bear** Creek Sub-basins Location: Tuscumbia
Date: March 13, 2003	Host: Tennessee River Clean Water Partnership Meeting: **Guntersville** Sub-basin Location: Guntersville
Date: March 20, 2003	Host: Tennessee River Clean Water Partnership Meeting: **Wheeler**/Lower Elk River Sub-basins Location: Huntsville
Date: April 22, 2003	Meeting: Tennessee River Clean Water Partnership Location: Decatur
Date: May 1, 2003	Meeting: Technical Advisory Workgroup Location: Decatur

3.3.1 Summary of Stakeholder Meetings Inputs

Participants at the sub-basin meetings were given an opportunity to review, modify, add, and clarify the "working" list of objectives from each of the preceding stakeholder meetings. After this, the participants were asked to "vote" for their top three objectives. The objectives receiving the most votes in the sub-basin were taken as key objectives for the area. Table 3.1 summarizes the 16 objectives for the Tennessee River basin and the distribution of emphasis by the 3 large sub-basin groups: Pickwick (which included

Wilson and Bear Creek watersheds); Wheeler (which included Lower and Upper Elk River watersheds); and Guntersville (which included the mid-Tennessee River unit).

There was general consensus among the sub-basin groups for objectives related to reducing NPS from agricultural activities, urban development activities, residential sources, and protecting/enhancing riparian buffer zones. There was spread in emphasis among the sub-basins for the key objectives in each sub-basin. For example, urban development was more important in Wheeler and Pickwick sub-basins. Agricultural and residential NPS were the top objectives of the Guntersville stakeholders. Reducing the threat to aquatic species (fish and mussels) from loss of habitat was important to Pickwick and Wheeler stakeholders but not as critical for the Guntersville group. This reflects a spread in interest and emphasis among the sub-basins.

However, the results of this "voting" do not preclude a sub-basin group from developing and submitting a proposal to address an objective that may not be in the top objective for that sub-basin. This voting simply helps to identify perceived patterns in the Tennessee basin, which may explain the focus and nature of future watershed project proposals. This may help indicate "local" support (or lack of support) to address an identified water quality issue on the State 303d list. The level of local support will influence the time needed to make measurable improvements in a watershed.

3.4 Next Steps

The Tennessee River Basin Watershed Management Plan sets the stage for the next level of watershed management***: implementation plans.***

Watershed implementation plans at the local watershed level may obtain future US EPA Clean Water Act Section 319 funding for restoration or protection projects. Implementation plans must align with goals and objectives set forth in the Basin Management Plan. Projects should be targeted to watersheds with impaired water bodies as determined by the State's "303d" list of impaired waters and where TMDLs have been developed.

During the stakeholder meetings common questions, approaches, and themes emerged from participants regardless of sub-basin location or issue. A "common sense" approach (in the words of one stakeholder to describe the basin management plan) is to set up the "steps in the next step" of local watershed management planning. During the facilitated sessions, comments focused on "how to" correct problems identified on the State's "303d" list. The following could be considered a stakeholder's prescriptive approach for local watershed groups to follow as they develop watershed implementation plans. In their words, the "steps" to improve water quality problems locally include:

1. target where (streams and/or subwatersheds) the water quality problems are
2. identify the water quality problems (causes)
3. identify the source(s) of the problem
4. target critical areas/sites
5. determine how much pollution reduction is needed
6. determine how much reduction is possible
7. determine who needs to be involved
8. determine who will be involved (a search for real commitment)
9. estimate how much will it cost
10. estimate how long will it take
11. what are some barriers e.g. funding, technical assistance/support, local (political) willpower and support, monitoring, etc.
12. how can the barriers be overcome

These 12 "steps" bear a resemblance to EPA's "9 Watershed Plan Elements" (see section 3.4.1 below). Many of the Tennessee River stakeholders' "next steps" will naturally flow and follow the above steps during the development of local watershed implementation plans. A technical advisory group assisting local planning groups could and would ensure that EPA's 9 elements are developed in the implementation plans. In either case, there is much to be evaluated and decided as the local watershed groups go through the steps of watershed implementation planning.

3.4.1 EPA Guidance for Watershed Plan Elements: Nine Elements of a Watershed Protection Plan

To ensure that Section 319 projects make progress towards restoring waters impaired by nonpoint source pollution, watershed protection plans that are developed or implemented with Section 319 funds to address Section 303(d)-listed waters must include at least the nine elements listed below. Where the watershed protection plan is designed to implement a TMDL, these elements will provide reasonable assurance that the nonpoint source load allocations identified in the NPS TMDL or anticipated in National Pollutant Discharge Elimination System (NPDES) permits for the watershed will be achieved. However, even if a NPS TMDL has not yet been completed, the nine elements are critical to assure that public funds to address impaired waters are used effectively.

1. An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed protection plan (and to achieve any other watershed goals identified in the plan), as discussed in item (2) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X numbers of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).

2. An estimate of the load reductions expected for the management measures described under paragraph (3) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (1) above (e.g., the total load reduction expected for dairy cattle feedlots, row crops, or eroded streambanks).

3. A description of the NPS management measures that will need to be implemented to achieve the load reductions estimated under paragraph (2) above (as well as to achieve other watershed goals identified in this watershed-based plan), and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement this plan.

4. An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon to implement the plan. Sources of funding may include CWA Section 319, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant Federal, State, local, and private funds that may be available to assist in implementing the plan.

5. An information/education component that will be used to enhance public understanding of the project and encourage their early and continued participation in

selecting, designing, and implementing the NPS management measures that will be implemented.

6. A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious.

7. Descriptions of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.

8. A set of criteria that can be used to determine whether pollutant loading reductions are being achieved over time and substantial progress is being made towards attaining water quality standards and, if not, the criteria for determining whether the watershed protection plan needs to be revised or, if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.

9. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (8) immediately above.

The difficulty in acquiring or developing some of the information needed to address the nine elements in a basin-wide plan with precision is recognized. However, it is critical that, at the *sub-watershed* level, reasonable efforts are made to: a.) identify significant sources; b.) identify the management measures that will most effectively address those sources; and c.) broadly estimate the expected load reductions that will result. This information will provide focus and direction to plan implementation and will help to assure that the plan can efficiently and effectively address the nonpoint sources of water quality impairments.

It is acknowledged that even after taking reasonable steps to obtain and analyze relevant data, the available information may be limited (within reasonable time and cost constraints); preliminary information and estimates may need to be modified over time (accompanied by mid-course corrections in the plan); and it often will require a number of years of effective implementation for a project to achieve its goals. Therefore, watershed protection plans should be implemented in a dynamic and iterative manner. Plans that address each of the nine elements above should proceed with implementation even though some of the information in the plan is imperfect and may need to be modified over time as information improves.

Sub-watershed based plans must address a large enough geographic area so that its implementation will solve the water quality problems for the watershed. While there is no rigorous definition or delineation for this concept, the general intent is to avoid single segments or other narrowly defined areas that do not provide an opportunity for addressing a watershed's stressors in a rational and economic manner. Once a watershed plan meeting the nine items listed above has been established, stakeholders may choose to implement it in portions (e.g., based on particular segments, other geographic subdivisions, or NPS categories in the watershed), consistent with the schedule established pursuant to item (6) above.

River basin plans may be developed in varying levels of scale, scope, and specificity and may contribute significantly to the process of developing and implementing smaller scale watershed plans. River basin plans should be used as building blocks for developing and implementing local watershed-specific plans. Basin-wide plans will generally need to be refined for smaller scale watersheds to provide the information needs for the nine items identified above.

The above derived from, "*Supplemental Guidelines for the Award of Section 319 Nonpoint Source Grants to States and Territories in FY 2003*."
http://www.epa.gov/owow/nps/Section319/319guide03.html

Tennessee River Basin Watershed Management Plan

Appendices

Appendix A.

List of Acronyms and Abbreviations *

AAM	Alabama A & M University
A&I	Agriculture and Industry (water supply use classifications)
ACES	Alabama Cooperative Extension System
ADAI	Alabama Department of Agriculture and Industries
ADCNR	Alabama Department of Conservation and Natural Resources
ADECA	Alabama Department of Economic and Community Affairs
ADEM	Alabama Department of Environmental Management
ADIR	Alabama Department of Industrial Relations
ADPH	Alabama Department of Public Health
AFA	Alabama Forestry Association
AFC	Alabama Forestry Commission
AFO	Animal Feeding Operation
ALFA	Alabama Farmers Federation
ANHP	Alabama Natural Heritage Program
ARA	Alabama Rivers Alliance
ARS	Agricultural Research Service
ASMC	Alabama Surface Mining Commission
ASSESS	Strategy for Sampling Environmental Indicators of Surface Water Quality Status
ASWCC	Alabama Soil and Water Conservation Committee
ASWCD	Alabama Soil and Water Conservation Districts
AWFF	Alabama Wildlife and Freshwater Fisheries
AWPCA	Alabama Water Pollution Control Act
AWW	Alabama Water Watch
BMP	Best Management Practices
CAC	Citizen Advisory Committee
CAFO	Confined Animal Feeding Operation
COE	United States Army Corps of Engineers
CRP	Conservation Reserve Program (USDA)
CWA	Clean Water Act
DO	Dissolved Oxygen
DC	District Conservationist
EMAP	Environmental Monitoring Assessment Program
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
EWP	Emergency Watershed Protection Program
F&W	Fish and Wildlife (water supply use classification)
FSA	Farm Services Agency (USDA)
GIS	Geographic Information System
HUC	Hydrologic Unit Code
NASA	National Aeronautics and Space Administration (Marshall Space Flight Center)
NAWQA	National Water Quality Assessment Program (USGS)
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint source
NRCS	National Resources Conservation Service (USDA)
NRI	Natural Resources Inventory (USDA)
NWI	National Wetland Inventory of the USFWS
OAW	Outstanding Alabama Water (water use classification)
ONRW	Outstanding National Resource Water (water use classifications)
OSM	United States Bureau of Mines - Office of Surface Mining
PALS	People Against A Littered State

PS	Point Source
PWS	Public Water Supply (water use classification)
RC&D	Resource Conservation and Development
S	Swimming and Other Whole Body Water Contact Sports (water use classification)
SH	Shellfish Harvesting (water use classification)
SMZ	Streamside Management Zone
SRF	State Revolving Fund of Alabama
SWCC&D	Soil and Water Conservation Commission and Districts
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Loads
TNC	The Nature Conservancy (of Alabama)
TSI	Trophic State Index
TVA	Tennessee Valley Authority
UAH	University of Alabama at Huntsville
USACE	U.S. Army Corps of Engineers (a.k.a. COE)
USCOE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDA-FS	United States Department of Agriculture - Forest Service
USDA-NRCS	Natural Resources Conservation Service
USEPA	United States Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service (Department of the Interior)
USGS	United States Geological Survey
UWA	University of West Alabama
WHIP	Wildlife Habitat Incentives Program (USDA)
WMA	Watershed Management Authorities
WRP	Wetlands Reserve Program (USDA)
WQ	Water Quality

* This is a list of common terms used in the State of Alabama. Not all terms apply to the Tennessee basin or appear in this Plan.

Appendix B

Final 2000 Alabama List of 303(d) Streams and Impaired Waters

WaterbodyID	Waterbody Name	Support Status	County	Uses	Causes	Potential Sources	Date of Data	Size, miles	Downstream / Upstream Locations
AL/06030001-160_01	**Dry Creek**	**Non**	**Jackson**	**Fish & Wildlife**	**Metals** **pH** **Siltation**	**Surface Mining - abandoned**	**1980** **1985-88** **1991**	**8.0**	**Coon Creek /** **Its Source**
AL/06030001-160_02	**Hogue Creek**	**Non**	**Jackson**	**Fish & Wildlife**	**Nutrients** **pH** **OE/DO**	**Surface Mining - abandoned**	**1986** **1987**	**2.4**	**Flat Rock Creek /** **Its Source**
AL/06030001-160_03	**Warren Smith Creek**	**Non**	**Jackson**	**Fish & Wildlife**	**pH** **Siltation**	**Surface mining-abandoned**	**1986** **1987**	**3.0**	**Dry Creek /** **Ross Branch**
AL/06030001-160_04	**Rocky Branch**	**Non**	**Jackson**	**Fish & Wildlife**	**pH** **Siltation**	**Surface mining-abandoned**	**1988** **1991**	**3.6**	**Dry Creek /** **Its Source**
AL/06030001-160_05	**Coon/Flat Rock Creek**	**Partial**	**Jackson**	**Fish & Wildlife**	**Metals** **pH** **Siltation**	**Surface mining-abandoned** **Mine tailings-abandoned**	**1988** **1991**	**20.0**	**Tennessee River /** **Its Source**
AL/06030001-170_01	**Mud Creek**	**Partial**	**Jackson**	**Fish & Wildlife**	**OE/DO**	**Nonirrigated crop prod.** **Pasture grazing**	**1988** **1991**	**18**	**Tennessee River /** **Its Source**
AL/06030001-220_01	**South Sauty Creek**	**Partial**	**DeKalb**	**Fish & Wildlife**	**pH**	**Unknown source**	**1988-98**	**32**	**Lake Guntersville/** **Its Source**
AL/06030001-250_01	**Town Creek**	**Partial**	**DeKalb**	**Fish & Wildlife**	**pH**	**Unknown**	**1988-98**	**63.3**	**Lake Guntersville/** **Its Source**
AL/06030001-270_01	**Scarham Creek**	**Non**	**Marshall**	**Fish & Wildlife**	**Pesticides** **Ammonia** **Siltation** **OE/DO** **Pathogens**	**Nonirrigated crop prod.** **Specialty crop prod.** **Int. animal feeding oper.** **Pasture grazing**	**1991** **1993-95**	**24**	**Short Creek /** **Its Source**
AL/06030002-060_01	**Guess Creek**	**Non**	**Jackson**	**Fish & Wildlife**	**Unknown toxicity** **OE/DO** **Pathogens**	**Unknown source** **Pasture grazing**	**1997**	**10.8**	**Paint Rock River /** **Bee Branch**

WaterbodyID	Waterbody Name	Support Status	County	Uses	Causes	Potential Sources	Date of Data	Size, miles	Downstream / Upstream Locations
AL/06030002-070_01	**Cole Spring Branch**	**Partial**	**Jackson**	**Fish & Wildlife**	**Siltation** **OE/DO**	**Pasture grazing**	**1994-95**	**2.1**	**Bridge at Jones Farm /** **Jeep Trail Crossing**
AL/06030002-100_01	**L. Paint Rock Creek**	**Partial**	**Marshall**	**Fish & Wildlife**	**Siltation** **OE/DO**	**Pasture grazing**	**1994-95**	**2.0**	**Merrill Road Bridge /** **Jeep Trail Crossing**
AL/06030002-160_01	**Mountain Fork**	**Non**	**Madison**	**Fish & Wildlife**	**Pathogens**	**Pasture grazing**	**1994-95** **1997**	**14.5**	**Flint River /** **Its Source**
AL/06030002-160_02	**Hester Creek**	**Partial**	**Madison**	**Fish & Wildlife**	**Nutrients** **Pathogens**	**Pasture grazing**	**1994-95**	**7.2**	**Mountain Fork /** **AL/TN stateline**
AL/06030002-180_01	**Brier Fork**	**Partial**	**Madison**	**Fish & Wildlife**	**Unknown toxicity** **Siltation**	**Nonirrigated crop prod.**	**1994-95**	**3.9**	**Flint River /** **AL/TN stateline**
AL/06030002-180_02	**Beaverdam Creek**	**Partial**	**Madison**	**Fish & Wildlife**	**Siltation**	**Nonirrigated crop prod.** **Land development**	**1994-95**	**19**	**Brier Fork** **Its Source**
AL/06030002-190_01	**Chase Creek**	**Partial**	**Madison**	**Fish & Wildlife**	**Siltation** **OE/DO**	**Agriculture** **Urban runoff/Storm sewers**	**1994-95**	**2.2**	**Acuff Spring /** **Hwy. 72**
AL/06030002-210_01	**Goose Creek**	**Non**	**Madison**	**Fish & Wildlife**	**Unknown toxicity** **OE/DO**	**Agriculture**	**1997**	**8.5**	**Flint River /** **Its Source**
AL/06030002-210_02	**Yellow Bank Creek**	**Partial**	**Madison**	**Fish & Wildlife**	**OE/DO**	**Agriculture**	**1994-95**	**5.6**	**Flint River /** **Its Source**
AL/06030002-210_03	**Flint River**	**Partial**	**Madison**	**Public Water Supply** **Fish & Wildlife**	**OE/DO**	**Agriculture**	**1994-95**	**21.5**	**Tennessee River /** **Hurricane Creek**
AL/06030002-190_02	**Flint River**	**Partial**	**Madison**	**Fish & Wildlife**	**Pathogens**	**Pasture grazing**	**1999**	**13.7**	**Hwy. 72/** **Mountain Fork**
AL/06030002-200_01	**Hurricane Creek**	**Non**	**Madison**	**Fish & Wildlife**	**Pathogens**	**Pasture grazing**	**1997**	**7.8**	**Flint River /** **Gurley Pike Road**

WaterbodyID	Waterbody Name	Support Status	County	Uses	Causes	Potential Sources	Date of Data	Size, miles	Downstream / Upstream Locations
AL/06030002-220_01	Cane Creek	Non	Madison	Fish & Wildlife	Siltation OE/DO	Agriculture	1994-95	5.1	Tennessee River / Gooch Creek
AL/06030002-230_01	Aldridge Creek	Partial	Madison	Fish & Wildlife	Siltation OE/DO	Urban runoff/Storm sewers Pasture grazing	1994-95	11	Tennessee River / Its Source
AL/06030002-240_01	Huntsville Spring Br.	Non	Madison	Fish & Wildlife	Priority Organics	Contaminated sediments	1993	10.4	Indian Creek / Johnson Rd. (Huntsville Field)
AL/06030002-240_02	Huntsville Spring Br.	Partial	Madison	Fish & Wildlife	Metals	Urban runoff/Storm sewers	1994-95	4.4	Johnson Rd. / Hwy. 431
AL/06030002-250_01	Indian Creek	Non	Madison	Fish & Wildlife	Priority Organics	Contaminated sediments	1991-91 1993	7.2	Tennessee River / Martin Rd. (Redstone Arsenal)
AL/06030002-250_02	Indian Creek	Partial	Madison	Fish & Wildlife	Siltation OE/DO	Nonirrigated crop prod. Land development Urban runoff/Storm sewers	1994-95	6.9	AL Hwy. 72 / Its Source
AL/06030002-270_01	Town Creek	Non	Morgan	Fish & Wildlife	OE/DO	Agriculture	1997	8.4	Cotaco Creek / Its Source
AL/06030002-270_02	Cotaco Creek	Non	Morgan	Fish & Wildlife	Pathogens	Agriculture	1997	5.1	Guyer Branch / W. Fork Cotaco Cr.
AL/06030002-270_03	West Fork Cotaco Cr.	Partial	Morgan	Fish & Wildlife	Pathogens Siltation	Agriculture	1997	7.5	AL Hwy.67 / Frost Creek
AL/06030002-270_04	Mill Pond Creek	Non	Marshall	Fish & Wildlife	Siltation Pathogens	Agriculture	1994-95	1.3	Hog Jaw Creek / Perkins Creek
AL/06030002-270_05	Hughes Creek	Partial	Morgan	Fish & Wildlife	Siltation	Agriculture	1995	2.9	Cotaco Creek / Its Source

WaterbodyID	Waterbody Name	Support Status	County	Uses	Causes	Potential Sources	Date of Data	Size, miles	Downstream / Upstream Locations
AL/06030002-300_01	Limestone Creek	Non	Limestone	Fish & Wildlife	Siltation OE/DO	Nonirrigated crop prod. Pasture grazing	1994-95	9.3	AL Hwy.72 / Leslie Creek
AL/06030002-320_01	Piney Creek	Partial	Limestone	Fish & Wildlife	Pesticides Siltation OE/DO	Nonirrigated crop prod. Pasture grazing	1994-95	11.2	Church Site / Pepper Road Bridge
AL/06030002-320_02	French Mill Creek	Non	Limestone	Fish & Wildlife	Pathogens	Pasture grazing	1997	4.9	Piney Creek / UT in Pine Swamp
AL/06030002-330_01	Flint Creek	Non	Morgan	Public Water Supply Fish & Wildlife Agri. & Ind.	Siltation OE/DO Pathogens Nutrients	Municipal Nonirrigated crop prod. Pasture grazing Int. animal feeding oper. Urban runoff/Storm sewers	1992-95 1997	40.0	Alabama Hwy. 67 / Its Source
AL/06030002-330_02	Shoal Creek	Non	Morgan	Fish & Wildlife	OE/DO Pathogens	Urban runoff/Storm sewers Agriculture	1994-95 1997	10.9	Flint Creek / Its Source
AL/06030002-330_03	Town Branch	Non	Morgan	Fish & Wildlife	OE/DO	Urban runoff/Storm sewers	1994-95	1.9	Shoal Creek / Its Source
AL/06030002-330_04	Mack Creek	Partial	Morgan	Fish & Wildlife	Siltation OE/DO	Pasture grazing	1994-95	5.4	Flint Creek / Its Source
AL/06030002-330_05	Robinson Creek	Non	Morgan	Fish & Wildlife	Siltation OE/DO	Agriculture	1994-95 1997	6.3	Flint Creek / Its Source
AL/06030002-330_06	Cedar Creek	Non	Morgan	Fish & Wildlife	OE/DO Pathogens	Agriculture	1997	8.7	Flint Creek / Its Source
AL/06030002-330_07	East Fork Flint Creek	Partial	Cullman	Fish & Wildlife	OE/DO Pathogens	Pasture grazing	1994-95	14.9	Flint Creek / Its Source
AL/06030002-330-09	Indian Creek	Partial	Morgan Cullman	Fish & Wildlife	OE/DO	Pasture grazing	1994-95	4.2	Flint Creek / Its Source

WaterbodyID	Waterbody Name	Support Status	County	Uses	Causes	Potential Sources	Date of Data	Size, miles	Downstream / Upstream Locations
AL/06030002-340_01	**Crowdabout Creek**	**Non**	**Morgan**	**Fish & Wildlife**	**Siltation Pathogens OE/DO**	**Nonirrigated crop prod. Pasture grazing Int. animal feeding oper.**	**1992-95 1997**	**15.0**	**Flint Creek / Its Source**
AL/06030002-340_02	**Herrin Creek**	**Non**	**Morgan**	**Fish & Wildlife**	**Ammonia Nutrients Siltation OE/DO**	**Pasture grazing**	**1994-95**	**6.3**	**Crowdabout Creek / Its Source**
AL/06030002-350_01	**No Business Creek**	**Non**	**Morgan**	**Fish & Wildlife**	**OE/DO Pathogens**	**Nonirrigated crop prod. Pasture grazing**	**1994-95 1997**	**6.3**	**Flint Creek / Johnson Chapel Creek**
AL/06030002-350_02	**West Flint Creek**	**Partial**	**Morgan**	**Fish & Wildlife**	**Siltation Pathogens OE/DO**	**Nonirrigated crop prod. Pasture grazing Int. animal feeding oper.**	**1993-95 1997**	**19.4**	**Flint Creek / McDaniel Creek**
AL/06030002-350_03	**Village Branch**	**Partial**	**Morgan**	**Fish & Wildlife**	**Siltation OE/DO**	**Agriculture**	**1994-95**	**5.7**	**Moss Spring Branch / Its Source**
AL/06030002-360_01	**Big Shoal Creek**	**Partial**	**Lawrence**	**Fish & Wildlife**	**OE/DO**	**Pasture grazing**	**1996-97**	**13.3**	**West Flint Creek / Its Source**
AL/06030002-360_02	**McDaniel Creek**	**Partial**	**Lawrence**	**Fish & Wildlife**	**Siltation OE/DO**	**Agriculture**	**1994-95**	**3.9**	**West Flint Creek / AL Hwy. 36 bridge**
AL/06030002-360_03	**Flat Creek**	**Non**	**Lawrence**	**Fish & Wildlife**	**Ammonia Nutrients Siltation OE/DO**	**Pasture grazing**	**1997**	**7.3**	**West Flint Creek / Its Source**
AL/06030002-360_04	**Elam Creek**	**Partial**	**Lawrence**	**Fish & Wildlife**	**OE/DO**	**Pasture grazing**	**1994-95**	**11.9**	**Rocky Branch / Its Source**

WaterbodyID	Waterbody Name	Support Status	County	Uses	Causes	Potential Sources	Date of Data	Size, miles	Downstream / Upstream Locations
AL/06030002-390_01	Swan Creek	Non	Limestone	Agri. & Ind. Fish & Wildlife	Siltation OE/DO	Nonirrigated crop prod. Urban runoff/Storm sewers Pasture grazing	1994-95	7.9	Tennessee River / Town Creek
AL/06030002-400_01	Round Island Creek	Partial	Limestone	Fish & Wildlife	Siltation OE/DO	Nonirrigated crop prod. Pasture grazing	1994-95	3.6	Browns Ferry Road / Beauchamp Branch
AL/06030002-410_01	Mallard Creek	Partial	Lawrence	Fish & Wildlife	Siltation OE/DO	Agriculture	1994-95	10.2	Wheeler Reservoir / Its Source
AL/Wheeler Res_01	Tennessee River	Partial	Lawrence	Public Water Supply Swimming Fish & Wildlife	pH Temp./thermal mod.	Industrial Flow reg/mod Dam construc. Unknown source	1990-91 1993-97	10.0	Wheeler Dam / Elk River
AL/06030002-440_01	Second Creek	Non	Lauderdale	Fish & Wildlife	Pathogens OE/DO	Pasture grazing	1997	11.6	Lauderdale Co. Rd. 76 / AL/TN State Line
AL/06030002-440_02	First Creek	Non	Lauderdale	Swimming Fish & Wildlife	Pathogens	Pasture grazing	1997	10.0	AL Hwy. 72 / Its Source
AL/06030004-060_01	Shoal Creek	Non	Limestone	Fish & Wildlife	Pathogens	Pasture grazing	1997	7.0	Elk River / AL/TN State Line
AL/06030004-080_01	Big Creek	Partial	Limestone	Fish & Wildlife	OE/DO	Pasture grazing	1994-95	7.7	Elk River / Its Source
AL/Wheeler Res_02	Elk River	Partial	Limestone	Swimming Fish & Wildlife	pH OE/DO	Pasture grazing Nonirrigated crop prod.	1990-91	6.0	Wheeler Reservoir / Anderson Creek
AL/06030004-150_01	Anderson Creek	Partial	Lauderdale	Fish & Wildlife	Siltation	Pasture grazing Nonirrigated crop prod.	1994-95	9.0	Snake Road bridge / Its Source

WaterbodyID	Waterbody Name	Support Status	County	Uses	Causes	Potential Sources	Date of Data	Size, miles	Downstream / Upstream Locations
AL/06030005-010_01	Big Nance Creek	Non	Lawrence	Fish & Wildlife	Pesticides Ammonia Siltation OE/DO Pathogens	Nonirrigated crop prod. Int. animal feeding oper. Landfills Pasture grazing	1991 1995	24.0	Wilson Lake / Its Source
AL/06030005-040_01	Town Creek	Partial	Lawrence	Fish & Wildlife	OE/DO	Nonirrigated crop prod. Pasture grazing	1991	46.0	Wheeler Reservoir / Its Source
AL/06030005-160_01	Pond Creek	Non	Colbert	Agri. & Ind.	Metals OE/DO	Nonirrigated crop prod. Urban runoff/Storm sewers Natural sources	1991	12.0	Tennessee River / Its Source
AL/06030005-160_02	McKiernan Creek	Non	Colbert	Fish & Wildlife	Ammonia Nutrients Siltation OE/DO	Agriculture	1988	2.2	Tennessee River / Shegog Creek
AL/06030006-010_02	Bear Creek	Non	Marion	Swimming Fish & Wildlife	Metals (Al)	Surface mining-abandoned	1992-96	3.0	Mill Creek / U. Bear Creek Dam
AL/06030006-010_01	Little Dice Branch	Partial	Franklin	Fish & Wildlife	Siltation	Surface mining-abandoned	1982 1996	3.6	Bear Creek / Its Source
AL/06030006-040_01	Lost Creek	Partial	Franklin	Fish & Wildlife	pH	Surface mining-abandoned	1991	2.0	Cedar Creek / Its Source
AL/06030006-040_02	Harris Creek	Non	Franklin	Fish & Wildlife	Siltation OE/DO	Pasture grazing	1995	5.9	Mud Creek / Its Source

Source: Alabama's 2002 Water Quality Report to Congress, ADEM 2002

Appendix C

Tennessee River Basin
Total Maximum Daily Loads (TMDL) Status

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/06030001-160_01	Dry Creek	Jackson	Metals pH Siltation	Surface Mining - abandoned	1980 1985-88 1991	8.0 miles	Coon Creek / Its Source	2004
AL/06030001-160_02	Hogue Creek	Jackson	Nutrients pH OE/DO	Surface Mining - abandoned	1986 1987	2.4 miles	Flat Rock Creek / Its Source	2004
AL/06030001-160_03	Warren Smith Creek	Jackson	pH Siltation	Surface mining-abandoned	1986 1987	3.0 miles	Dry Creek / Ross Branch	2004
AL/06030001-160_04	Rocky Branch	Jackson	pH Siltation	Surface mining-abandoned	1988 1991	3.6 miles	Dry Creek / Its Source	2002
AL/06030001-160_05	Coon/Flat Rock Creek	Jackson	Metals pH Siltation	Surface mining-abandoned Mine tailings-abandoned	1988 1991	20.0 miles	Tennessee River / Its Source	2002
AL/06030001-170_01	Mud Creek	Jackson	OE/DO Nutrients	Nonirrigated crop prod. Pasture grazing	1988 1991	18 miles	Tennessee River / Its Source	2002
AL/06030001-220_01	South Sauty	DeKalb	pH Pesticides Ammonia Nutrients Siltation OE/DO Pathogens	Unknown source	1988-98	32 miles	Lake Guntersville/ Its Source	2002

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/06030001-250_01	Town Creek	DeKalb	pH Unknown toxicity Pesticides Ammonia Nutrients pH Siltation OE/DO Pathogens	Unknown	1988-98	63.3 mi	Lake Guntersville/	2002
AL/06030001-270_01	Scarham Creek	Marshall	Pesticides Ammonia Siltation OE/DO Pathogens	Nonirrigated crop prod. Specialty crop prod. Int. animal feeding oper. Pasture grazing	1991 1993-95	24 miles	Short Creek / Its Source	2001
AL/06030001-280_01	Short Creek	Marshall	Pathogens Pesticides Ammonia Nutrients Siltation OE/DO					
AL/06030002-060_01	Guess Creek	Jackson	Unknown toxicity OE/DO Pathogens	Unknown source Pasture grazing	1997	10.8 miles	Paint Rock River / Bee Branch	2004
AL/06030002-070_01	Cole Spring Branch	Jackson	Siltation OE/DO	Pasture grazing	1994-95	2.1 miles	Bridge at Jones Farm / Jeep Trail Crossing	2001
AL/06030002-100_01	L. Paint Rock Creek	Marshall	Siltation OE/DO	Pasture grazing	1994-95	2.0 miles	Merrill Road Bridge / Jeep Trail Crossing	2001
AL/06030002-160_01	Mountain Fork	Madison	Pathogens Siltation OE/DO	Pasture grazing	1994-95 1997	14.5 miles	Flint River / Its Source	2004

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/06030002-160_02	Hester Creek	Madison	Nutrients Pathogens OE/DO Siltation	Pasture grazing	1994-95	7.2 miles	Mountain Fork / AL/TN stateline	2004
AL/06030002-180_01	Brier Fork	Madison	Unknown toxicity Siltation	Nonirrigated crop prod.	1994-95	3.9 miles	Flint River / AL/TN stateline	2002
AL/06030002-180_02	Beaverdam Creek	Madison	Siltation	Nonirrigated crop prod. Land development	1994-95	19 miles	Brier Fork Its Source	2004
AL/06030002-190_01	Chase Creek	Madison	Siltation OE/DO	Agriculture Urban runoff/Storm sewers	1994-95	2.2 miles	Acuff Spring / Hwy. 72	2001
AL/06030002-210_01	Goose Creek	Madison	Unknown toxicity OE/DO	Agriculture	1997	8.5 mi	Flint River / Its Source	2004
AL/06030002-210_02	Yellow Bank Creek	Madison	OE/DO	Agriculture	1994-95	5.6 miles	Flint River / Its Source	2002
AL/06030002-210_03	Flint River	Madison	OE/DO	Agriculture	1994-95	21.5 mi	Tennessee River / Hurricane Creek	2004
AL/06030002-190_02	Flint River	Madison	Pathogens	Pasture grazing	1999	13.7 mi	Hwy. 72/ Mountain Fork	2004
AL/06030002-200_01	Hurricane Creek	Madison	Pathogens	Pasture grazing	1997	7.8 miles	Flint River / Gurley Pike Road	2004
AL/06030002-220_01	Cane Creek	Madison	Siltation OE/DO	Agriculture	1994-95	5.1 mi	Tennessee River / Gooch Creek	2002
AL/06030002-230_01	Aldridge Creek	Madison	Siltation OE/DO	Urban runoff/Storm sewers Pasture grazing	1994-95	11 miles	Tennessee River / Its Source	2002

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/06030002-240_01	Huntsville Spring Br.	Madison	Priority Organics Nutrients	Contaminated sediments	1993	10.4 miles	Indian Creek / Johnson Rd. (Huntsville Field)	2002
AL/06030002-240_02	Huntsville Spring Br.	Madison	Metals	Urban runoff/Storm sewers	1994-95	4.4 miles	Johnson Rd. / Hwy. 431	2002
AL/06030002-250_01	Indian Creek	Madison	Priority Organics	Contaminated sediments	1991-91 1993	7.2 miles	Tennessee River / Martin Rd. (Redstone Arsenal)	2002
AL/06030002-250_02	Indian Creek	Madison	Siltation OE/DO	Nonirrigated crop prod. Land development Urban runoff/Storm sewers	1994-95	6.9 miles	AL Hwy. 72 / Its Source	2001
AL/06030002-270_01	Town Creek	Morgan	OE/DO	Agriculture	1997	8.4 miles	Cotaco Creek / Its Source	2004
AL/06030002-270_02	Cotaco Creek	Morgan	Pathogens	Agriculture	1997	5.1 miles	Guyer Branch / W. Fork Cotaco Cr.	2004
AL/06030002-270_03	West Fork Cotaco Cr.	Morgan	Pathogens Siltation	Agriculture	1997	7.5 miles	AL Hwy.67 / Frost Creek	2004
AL/06030002-270_04	Mill Pond Creek	Marshall	Siltation Pathogens	Agriculture	1994-95	1.3 miles	Hog Jaw Creek / Perkins Creek	2004
AL/06030002-270_05	Hughes Creek	Morgan	Siltation	Agriculture	1995	2.9 miles	Cotaco Creek / Its Source	2004
AL/06030002-300_01	Limestone Creek	Limestone	Siltation OE/DO	Nonirrigated crop prod. Pasture grazing	1994-95	9.3 miles	AL Hwy.72 / Leslie Creek	2002

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/06030002-320_01	Piney Creek	Limestone	Pesticides Siltation OE/DO Nutrients	Nonirrigated crop prod. Pasture grazing	1994-95	11.2 mi	Church Site / Pepper Road Bridge	2002
AL/06030002-320_02	French Mill Cr	Limestone	Pathogens	Pasture grazing	1997	4.9 mi	Piney Creek / UT in Pine Swamp	2004
AL/06030002-330_01	Flint Creek	Morgan	Siltation OE/DO Pathogens Nutrients	Municipal Nonirrigated crop prod. Pasture grazing Int. animal feeding oper. Urban runoff/Storm sewers	1992-95 1997	40.0 mi	Alabama Hwy. 67 / Its Source	2001
AL/06030002-330_03	Town Branch	Morgan	OE/DO	Urban runoff/Storm sewers	1994-95	1.9 miles	Shoal Creek / Its Source	2001
AL/06030002-330_04	Mack Creek	Morgan	Siltation OE/DO	Pasture grazing	1994-95	5.4 miles	Flint Creek / Its Source	2001
AL/06030002-330_05	Robinson Cr	Morgan	Siltation OE/DO	Agriculture	1994-95 1997	6.3 mi	Flint Creek / Its Source	2001
AL/06030002-330_06	Cedar Creek	Morgan	OE/DO Pathogens	Agriculture	1997	8.7 mi	Flint Creek / Its Source	2001
AL/06030002-330_07	East Fork Flint Creek	Cullman	OE/DO Pathogens	Pasture grazing	1994-95	14.9 mi	Flint Creek / Its Source	2001
AL/06030002-330-09	Indian Creek	Morgan Cullman	OE/DO	Pasture grazing	1994-95	4.2 mi	Flint Creek / Its Source	2001
AL/06030002-330-08	Rock Creek	Cullman	OE/DO Siltation	Agriculture		5 miles	Smith Lake Blevins Creek	
AL/06030002-340_01	Crowdabout	Morgan	Siltation Pathogens OE/DO	Nonirrigated crop prod. Pasture grazing Int. animal feeding oper.	1992-95 1997	15.0 mi	Flint Creek / Its Source	2001

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/06030002-340_02	Herrin Creek	Morgan	Ammonia Nutrients Siltation OE/DO	Pasture grazing	1994-95	6.3 mi	Crowdabout Creek / Its Source	2001
AL/06030002-350_01	No Business Creek	Morgan	OE/DO Pathogens	Nonirrigated crop prod. Pasture grazing	1994-95 1997	6.3 mis	Flint Creek / Johnson Chapel Creek	2001
AL/06030002-350_02	West Flint Cr	Morgan	Siltation Pathogens OE/DO	Nonirrigated crop prod. Pasture grazing Int. animal feeding oper.	1993-95 1997	19.4 mi	Flint Creek / McDaniel Creek	2001
AL/06030002-350_03	Village Br	Morgan	Siltation OE/DO	Agriculture	1994-95	5.7 mi	Moss Spring Branch / Its Source	2001
AL/06030002-360_01	Big Shoal Cr	Lawrence	OE/DO	Pasture grazing	1996-97	13.3 mi	West Flint Creek / Its Source	2001
AL/06030002-360_02	McDaniel Cr	Lawrence	Siltation OE/DO	Agriculture	1994-95	3.9 mi	West Flint Creek / AL Hwy. 36 bridge	2001
AL/06030002-360_03	Flat Creek	Lawrence	Ammonia Nutrients Siltation OE/DO	Pasture grazing	1997	7.3 mi	West Flint Creek / Its Source	2001
AL/06030002-360_04	Elam Creek	Lawrence	OE/DO	Pasture grazing	1994-95	11.9 mi	Rocky Branch / Its Source	2001
AL/06030002-390_01	Swan Creek	Limestone	Siltation OE/DO	Nonirrigated crop prod. Urban runoff/Storm sewers Pasture grazing	1994-95	7.9 mi	Tennessee River / Town Creek	2001
AL/06030002-400_01	Round Island Cr	Limestone	Siltation OE/DO	Nonirrigated crop prod. Pasture grazing	1994-95	3.6 mi	Browns Ferry Road / Beauchamp Branch	2001
AL/06030002-410_01	Mallard Cr	Lawrence	Siltation OE/DO	Agriculture	1994-95	10.2 mi	Wheeler Reservoir / Its Source	2001

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/Wheeler Res_01	Tennessee R	Lawrence	pH Temp./thermal mod. Flow Alteration	Industrial Flow reg/mod Dam construc. Unknown source	1990-91 1993-97	10.0 mi	Wheeler Dam / Elk River	2002
AL/06030002-440_01	Second Creek	Lauderdale	Pathogens OE/DO	Pasture grazing	1997	11.6 mi	Lauderdale Co. Rd. 76 / AL/TN State Line	2004
AL/06030002-440_02	First Creek	Lauderdale	Pathogens	Pasture grazing	1997	10.0 mi	AL Hwy. 72 / Its Source	2004
AL/06030002-330-01	Shoal Creek	Morgan	Siltation OE/DO Pathogens	Agriculture			Flint Creek the source of Shoal Creek.	
AL/06030004-060_01	Shoal Creek	Limestone	Pathogens	Pasture grazing	1997	7.0 mi	Elk River / AL/TN State Line	2004
AL/06030004-080_01	Big Creek	Limestone	OE/DO	Pasture grazing	1994-95	7.7 mi	Elk River / Its Source	2004
AL/Wheeler Res_02	Elk River	Limestone	pH OE/DO Nutrients	Pasture grazing Nonirrigated crop prod.	1990-91	6.0 mi	Wheeler Reservoir / Anderson Creek	2002
AL/06030004-150_01	Anderson Creek	Lauderdale	Siltation	Pasture grazing Nonirrigated crop prod.	1994-95	9.0 mi	Snake Road bridge / Its Source	2004
AL/06030005-010_01	Big Nance Creek	Lawrence	Pesticides Ammonia Siltation OE/DO Pathogens	Nonirrigated crop prod. Int. animal feeding oper. Landfills Pasture grazing	1991 1995	24.0 mi	Wilson Lake / Its Source	2001
AL/06030005-040_01	Town Creek	Lawrence	OE/DO ph	Nonirrigated crop prod. Pasture grazing	1991	46.0 mi	Wheeler Reservoir / Its Source	2002

WaterbodyID	Waterbody Name	County	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	TMDL Date
AL/06030005-160_01	Pond Creek	Colbert	Metals OE/DO	Nonirrigated crop prod. Urban runoff/Storm sewers Natural sources	1991	12.0 mi	Tennessee River / Its Source	2002
AL/06030005-160_02	McKiernan Creek	Colbert	Ammonia Nutrients Siltation OE/DO	Agriculture	1988	2.2 mis	Tennessee River / Shegog Creek	2004
AL/06030006-010_02	Bear Creek	Marion	Metals (Al)	Surface mining-abandoned	1992-96	3.0 mi	Mill Creek / U. Bear Creek Dam	2004
AL/06030006-010_01	Little Dice Branch	Franklin	Siltation	Surface mining-abandoned	1982 1996	3.6 mi	Bear Creek / Its Source	2004
AL/06030006-040_01	Lost Creek	Franklin	pH	Surface mining-abandoned	1991	2.0 mis	Cedar Creek / Its Source	2002
AL/06030006-040_02	Harris Creek	Franklin	Siltation OE/DO	Pasture grazing	1995	5.9 mi	Mud Creek / Its Source	2001

Source: Adapted from Alabama's Final FY 2000 303(d) List, ADEM

Appendix D

Tennessee River Basin
Alabama Reservoirs Nutrient Criteria

(d) The Tennessee River Basin

1. Pickwick Lake: those waters impounded by Pickwick Dam on the Tennessee River. The reservoir has a surface area of 43,100 acres at full pool, 33,700 acres of which are within Alabama. The point of measurement for the criterion given below is located in Tennessee waters.

(i) Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater, 20th Edition*, 1998): the mean of the photic-zone composite chlorophyll *a* samples collected monthly April through September shall not exceed 18 ug/l, as measured at the deepest point, main river channel, dam forebay.

2. Wilson Lake: those waters impounded by Wilson Dam on the Tennessee River. The lake has a surface area of 15,930 acres at full pool.

(i) Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater, 20th Edition*, 1998): the mean of the photic-zone composite chlorophyll *a* samples collected monthly April through September shall not exceed 18 ug/l, as measured at the deepest point, main river channel, dam forebay.

3. Wheeler Lake: those waters impounded by Wheeler Dam on the Tennessee River. The lake has a surface area of 67,100 acres at full pool.

(i) Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater, 20th Edition*, 1998): the mean of the photic-zone composite chlorophyll *a* samples collected monthly April through September shall not exceed 18 ug/l, as measured at the deepest point, main river channel, dam forebay.

4. Guntersville Lake: those waters impounded by Guntersville Dam on the Tennessee River. The lake has a surface area of 69,700 acres at full pool, 67,900 of which are within Alabama.

(i) Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater, 20th Edition*, 1998): the mean of photic-zone composite chlorophyll *a* samples collected monthly April through September shall not exceed 18 µg/l, as measured at the deepest point, main river channel, dam forebay.

5. Cedar Creek Lake: those waters impounded by Cedar Creek Dam on Cedar Creek. The reservoir has a surface area of 4,200 acres at full pool.

(i) Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater, 20th Edition*, 1998): the mean of the photic-zone composite chlorophyll *a* samples collected monthly April through October shall not exceed 8 ug/l, as measured at the deepest point, main creek channel, dam forebay.

6. Little Bear Creek Lake: those waters impounded by Little Bear Dam on Little Bear Creek. The reservoir has a surface area of 1,600 acres at full pool.

(i) Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater, 20th Edition*, 1998): the mean of the photic-zone composite chlorophyll *a* samples collected monthly April through October shall not exceed 8 ug/l, as measured at the deepest point, main creek channel, dam forebay.

Author: James E. McIndoe

Statutory Authority: Code of Alabama 1975, §§22-22-9, 22-22A-5, 22-22A-6, 22-22A-8.

Appendix E

Tennessee River Basin
Threatened and Endangered Aquatic Species

Scientific Name	Common Name	State Rank	State Status	Federal Status
Guntersville (unit:06020001)				
PISCES				
TYPHLICHTHYS SUBTERRANEUS	SOUTHERN CAVEFISH	S3	PROT	
BIVALVIA				
DROMUS DROMAS	DROMEDARY PEARLYMUSSEL	SH	PROT	(LE,XN)
EPIOBLASMA TRIQUETRA	SNUFFBOX	S1	SPCO	
FUSCONAIA BARNESIANA	TENNESSEE PIGTOE	S1	SPCO	
FUSCONAIA COR	SHINY PIGTOE PEARLYMUSSEL	S1	PROT	(LE,XN)
LAMPSILIS OVATA	POCKETBOOK	S1	SPCO	
LAMPSILIS VIRESCENS	ALABAMA LAMPMUSSEL	S1	PROT	(LE,XN)
LASMIGONA HOLSTONIA	TENNESSEE HEELSPLITTER	S1S2	SPCO	
LEXINGTONIA DOLABELLOIDES	SLABSIDE PEARLYMUSSEL	S1	PROT	C
MEDIONIDUS CONRADICUS	CUMBERLAND MOCCASINSHELL	S1	SPCO	
OBOVARIA OLIVARIA	HICKORYNUT	SX	END	
OBOVARIA RETUSA	RING PINK	SH	PROT	LE
OBOVARIA SUBROTUNDA	ROUND HICKORYNUT	S2	SPCO	
PLETHOBASUS COOPERIANUS	ORANGE-FOOT PIMPLEBACK	SH	PROT	LE
PLETHOBASUS CYPHYUS	SHEEPNOSE	S1	PROT	
PLEUROBEMA OVIFORME	TENNESSEE CLUBSHELL	S1	SPCO	
PLEUROBEMA PLENUM	ROUGH PIGTOE	S1	PROT	LE
PTYCHOBRANCHUS FASCIOLARIS	KIDNEYSHELL	S1	SPCO	
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	S1	SPCO	
QUADRULA INTERMEDIA	CUMBERLAND MONKEYFACE	SH	PROT	(LE,XN)
TOXOLASMA CYLINDRELLUS	PALE LILLIPUT	S1	PROT	LE
TOXOLASMA LIVIDUS	PURPLE LILLIPUT	S2	SPCO	
VILLOSA TAENIATA	PAINTED CREEKSHELL	S1	SPCO	
GASTROPODA				
ATHEARNIA ANTHONYI	ANTHONY'S RIVER SNAIL	SX		(LE,XN)
IO FLUVIALIS	SPINY RIVERSNAIL	SX	END	
LEPTOXIS VIRGATA	SMOOTH MUDALIA	SX	END	
LITHASIA VERRUCOSA	VARICOSE ROCKSNAIL	S3	THR	
PLEUROCERA CORPULENTA	CORPULENT HORNSNAIL	S1	THR	
SOMATOGYRUS SARGENTI	MUD PEBBLESNAIL	SH	END	
CRUSTACEA				
CAMBARUS HAMULATUS	TROGLOBITIC CRAYFISH	S3?	SPCO	
CAMBARUS JONESI	TROGLOBITIC CRAYFISH	S2	SPCO	
ORCONECTES AUSTRALIS AUSTRALIS	A CRAYFISH		SPCO	
PISCES				
TYPHLICHTHYS SUBTERRANEUS	SOUTHERN CAVEFISH	S3	PROT	

Scientific Name	Common Name	State Rank	State Status	Federal Status
Wheeler (unit: 06030002)				
BIVALVIA				
ACTINONAIAS PECTOROSA	PHEASANTSHELL	SH	END	
ALASMIDONTA MARGINATA	ELKTOE	SH	END	
CUMBERLANDIA MONODONTA	SPECTACLECASE	S1	PROT	
CUMBERLANDIA MONODONTA	SPECTACLECASE	S1	PROT	
CYPROGENIA STEGARIA	FANSHELL	SH	PROT	LE
DROMUS DROMAS	DROMEDARY PEARLYMUSSEL	SH	PROT	(LE,XN)
EPIOBLASMA BIEMARGINATA	ANGLED RIFFLESHELL	SX	EXTI	
EPIOBLASMA FLORENTINA WALKERI	TAN RIFFLESHELL	SX		LE
EPIOBLASMA LENIOR	NARROW CATSPAW	SX	EXTI	
EPIOBLASMA TORULOSA TORULOSA	TUBERCULED BLOSSOM PEARLYMUSSEL	SX	PROT	(LE,XN)
EPIOBLASMA TRIQUETRA	SNUFFBOX	S1	SPCO	
FUSCONAIA BARNESIANA	TENNESSEE PIGTOE	S1	SPCO	
FUSCONAIA COR	SHINY PIGTOE PEARLYMUSSEL	S1	PROT	(LE,XN)
FUSCONAIA CUNEOLUS	FINE-RAYED PIGTOE	S1	PROT	(LE,XN)
LAMPSILIS ABRUPTA	PINK MUCKET	S1	PROT	LE
LAMPSILIS FASCIOLA	WAVY-RAYED LAMPMUSSEL	S1S2	SPCO	
LAMPSILIS OVATA	POCKETBOOK	S1	SPCO	
LAMPSILIS VIRESCENS	ALABAMA LAMPMUSSEL	S1	PROT	(LE,XN)
LASMIGONA HOLSTONIA	TENNESSEE HEELSPLITTER	S1S2	SPCO	
LEXINGTONIA DOLABELLOIDES	SLABSIDE PEARLYMUSSEL	S1	PROT	C
MEDIONIDUS CONRADICUS	CUMBERLAND MOCCASINSHELL	S1	SPCO	
OBOVARIA OLIVARIA	HICKORYNUT	SX	END	
OBOVARIA RETUSA	RING PINK	SH	PROT	LE
OBOVARIA SUBROTUNDA	ROUND HICKORYNUT	S2	SPCO	
PLETHOBASUS COOPERIANUS	ORANGE-FOOT PIMPLEBACK	SH	PROT	LE
PLEUROBEMA OVIFORME	TENNESSEE CLUBSHELL	S1	SPCO	
PLEUROBEMA PLENUM	ROUGH PIGTOE	S1	PROT	LE
POTAMILUS OHIENSIS	PINK PAPERSHELL	S1S2	SPCO	
PTYCHOBRANCHUS FASCIOLARIS	KIDNEYSHELL	S1	SPCO	
PTYCHOBRANCHUS SUBTENTUM	FLUTED KIDNEYSHELL	SX	SPCO	C
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	S1	SPCO	
QUADRULA NODULATA	WARTYBACK	S1S2	SPCO	
TOXOLASMA CYLINDRELLUS	PALE LILLIPUT	S1	PROT	LE
TOXOLASMA LIVIDUS	PURPLE LILLIPUT	S2	SPCO	
TRUNCILLA TRUNCATA	DEERTOE	SH	END	
VILLOSA IRIS	RAINBOW	S3	SPCO	
VILLOSA TAENIATA	PAINTED CREEKSHELL	S1	SPCO	
VILLOSA TRABALIS	CUMBERLAND BEAN	SX		(LE,XN)
VILLOSA VANUXEMENSIS	MOUNTAIN CREEKSHELL	S2S3	SPCO	
GASTROPODA				
ATHEARNIA ANTHONYI	ANTHONY'S RIVER SNAIL	SX		(LE,XN)
CAMPELOMA DECAMPI	SLENDER CAMPELOMA	S1	PROT	LE
GLYPHYALINIA LATEBRICOLA	STONE GLYPH	S?	POTL	
PYRGULOPSIS PACHYTA	ARMORED SNAIL	S1	PROT	LE
CRUSTACEA				
CAMBARUS HAMULATUS	TROGLOBITIC CRAYFISH	S3?	SPCO	
CAMBARUS JONESI	TROGLOBITIC CRAYFISH	S2	SPCO	
CAMBARUS VEITCHORUM	A TROGLOBITIC CRAYFISH	S1	THR	

Scientific Name	Common Name	State Rank	State Status	Federal Status
ORCONECTES AUSTRALIS AUSTRALIS	A CRAYFISH		SPCO	
ORCONECTES SHELTAE	SHELTA CAVE CRAYFISH		POTL	
PALAEMONIAS ALABAMAE	ALABAMA BLIND CAVE SHRIMP	S1S2	THR	LE
PROCAMBARUS PECKI	TROGLOBITIC CRAYFISH	S2?	SPCO	
PISCES				
ELASSOMA ALABAMAE	SPRING PYGMY SUNFISH	S1	PROT	
ERIMYSTAX INSIGNIS	BLOTCHED CHUB	S2	SPCO	
ETHEOSTOMA BOSCHUNGI	SLACKWATER DARTER	S2	PROT	LT
ETHEOSTOMA TUSCUMBIA	TUSCUMBIA DARTER	S2	PROT	
NOTROPIS ALBIZONATUS	PALEZONE SHINER	S1	PROT	LE
PERCINA TANASI	SNAIL DARTER	S1	PROT	LT
TYPHLICHTHYS SUBTERRANEUS	SOUTHERN CAVEFISH	S3	PROT	
Lower Elk River (unit: 06030004)				
BIVALVIA				
CUMBERLANDIA MONODONTA	SPECTACLECASE	S1	PROT	
DROMUS DROMAS	DROMEDARY PEARLYMUSSEL	SH	PROT	(LE,XN)
ELLIPSARIA LINEOLATA	BUTTERFLY	S3	SPCO	
EPIOBLASMA BREVIDENS	CUMBERLAND COMBSHELL	S1	PROT	(LE,XN)
EPIOBLASMA FLORENTINA WALKERI	TAN RIFFLESHELL	SX		LE
EPIOBLASMA HAYSIANA	ACORNSHELL	SH	EXTI	
FUSCONAIA CUNEOLUS	FINE-RAYED PIGTOE	S1	PROT	(LE,XN)
HEMISTENA LATA	CRACKING PEARLYMUSSEL	SX	PROT	(LE,XN)
LAMPSILIS OVATA	POCKETBOOK	S1	SPCO	
LEMIOX RIMOSUS	BIRDWING PEARLYMUSSEL	SX	PROT	(LE,XN)
PTYCHOBRANCHUS SUBTENTUM	FLUTED KIDNEYSHELL	SX	SPCO	C
QUADRULA INTERMEDIA	CUMBERLAND MONKEYFACE	SH	PROT	(LE,XN)
QUADRULA METANEVRA	MONKEYFACE	S3	SPCO	
GASTROPODA				
LITHASIA LIMA	WARTY ROCKSNAIL	S1	THR	
LITHASIA VERRUCOSA	VARICOSE ROCKSNAIL	S3	THR	
PISCES				
ETHEOSTOMA WAPITI	BOULDER DARTER	S1	PROT	LE
POLYODON SPATHULA	PADDLEFISH	S3	SPCO	
TYPHLICHTHYS SUBTERRANEUS	SOUTHERN CAVEFISH	S3	PROT	
Pickwick-Wilson (unit: 06030005)				
BIVALVIA				
ACTINONAIAS PECTOROSA	PHEASANTSHELL	SH	END	
ALASMIDONTA MARGINATA	ELKTOE	SH	END	
CUMBERLANDIA MONODONTA	SPECTACLECASE	S1	PROT	
CYPROGENIA STEGARIA	FANSHELL	SH	PROT	LE
DROMUS DROMAS	DROMEDARY PEARLYMUSSEL	SH	PROT	(LE,XN)
ELLIPSARIA LINEOLATA	BUTTERFLY	S3	SPCO	
ELLIPTIO DILATATA	SPIKE	S1	SPCO	
EPIOBLASMA ARCAEFORMIS	SUGARSPOON	SX	EXTI	
EPIOBLASMA BIEMARGINATA	ANGLED RIFFLESHELL	SX	EXTI	
EPIOBLASMA BREVIDENS	CUMBERLAND COMBSHELL	S1	PROT	(LE,XN)
EPIOBLASMA FLORENTINA FLORENTINA	YELLOW-BLOSSOM PEARLYMUSSEL	SX	PROT	(LE,XN)

Scientific Name	Common Name	State Rank	State Status	Federal Status
EPIOBLASMA HAYSIANA	ACORNSHELL	SH	EXTI	
EPIOBLASMA OBLIQUATA OBLIQUATA	PURPLE CATSPAW	SX	PROT	(LE,XN)
EPIOBLASMA PERSONATA	ROUND COMBSHELL	SX	EXTI	
EPIOBLASMA STEWARDSONII	CUMBERLAND LEAFSHELL	SX	EXTI	
EPIOBLASMA TORULOSA TORULOSA	TUBERCULED BLOSSOM PEARLYMUSSEL	SX	PROT	(LE,XN)
EPIOBLASMA TRIQUETRA	SNUFFBOX	S1	SPCO	
FUSCONAIA BARNESIANA	TENNESSEE PIGTOE	S1	SPCO	
FUSCONAIA COR	SHINY PIGTOE PEARLYMUSSEL	S1	PROT	(LE,XN)
FUSCONAIA CUNEOLUS	FINE-RAYED PIGTOE	S1	PROT	(LE,XN)
HEMISTENA LATA	CRACKING PEARLYMUSSEL	SX	PROT	(LE,XN)
LAMPSILIS ABRUPTA	PINK MUCKET	S1	PROT	LE
LAMPSILIS OVATA	POCKETBOOK	S1	SPCO	
LAMPSILIS VIRESCENS	ALABAMA LAMPMUSSEL	S1	PROT	(LE,XN)
LEMIOX RIMOSUS	BIRDWING PEARLYMUSSEL	SX	PROT	(LE,XN)
LEPTODEA LEPTODON	SCALESHELL	SX	PROT	LE
LEXINGTONIA DOLABELLOIDES	SLABSIDE PEARLYMUSSEL	S1	PROT	C
LIGUMIA RECTA	BLACK SANDSHELL	S2	SPCO	
MEDIONIDUS CONRADICUS	CUMBERLAND MOCCASINSHELL	S1	SPCO	
OBOVARIA OLIVARIA	HICKORYNUT	SX	END	
OBOVARIA RETUSA	RING PINK	SH	PROT	LE
OBOVARIA RETUSA	RING PINK	SH	PROT	LE
OBOVARIA SUBROTUNDA	ROUND HICKORYNUT	S2	SPCO	
PEGIAS FABULA	LITTLE-WING PEARLYMUSSEL	SX	PROT	LE
PLETHOBASUS CICATRICOSUS	WHITE WARTYBACK	S1	PROT	LE
PLETHOBASUS COOPERIANUS	ORANGE-FOOT PIMPLEBACK	SH	PROT	LE
PLETHOBASUS CYPHYUS	SHEEPNOSE	S1	PROT	
PLEUROBEMA CLAVA	CLUBSHELL	SX	PROT	(LE,XN)
PLEUROBEMA CORDATUM	OHIO PIGTOE	S2	SPCO	
PLEUROBEMA OVIFORME	TENNESSEE CLUBSHELL	S1	SPCO	
PLEUROBEMA PLENUM	ROUGH PIGTOE	S1	PROT	LE
PLEUROBEMA RUBRUM	PYRAMID PIGTOE	S2	PROT	
POTAMILUS OHIENSIS	PINK PAPERSHELL	S1S2	SPCO	
PTYCHOBRANCHUS FASCIOLARIS	KIDNEYSHELL	S1	SPCO	
PTYCHOBRANCHUS SUBTENTUM	FLUTED KIDNEYSHELL	SX	SPCO	C
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	S1	SPCO	
QUADRULA INTERMEDIA	CUMBERLAND MONKEYFACE	SH	PROT	(LE,XN)
QUADRULA METANEVRA	MONKEYFACE	S3	SPCO	
TOXOLASMA LIVIDUS	PURPLE LILLIPUT	S2	SPCO	
TRUNCILLA TRUNCATA	DEERTOE	SH	END	
VILLOSA FABALIS	RAYED BEAN	SX	SPCO	
VILLOSA TAENIATA	PAINTED CREEKSHELL	S1	SPCO	
GASTROPODA				
ATHEARNIA ANTHONYI	ANTHONY'S RIVER SNAIL	SX		(LE,XN)
LEPTOXIS MINOR	KNOB MUDALIA	S?	END	
LITHASIA ARMIGERA	ARMORED ROCKSNAIL	S1	THR	
LITHASIA GENICULATA	ORNATE ROCKSNAIL	S1	THR	
LITHASIA LIMA	WARTY ROCKSNAIL	S1	THR	
LITHASIA SALEBROSA	MUDDY ROCKSNAIL	S1	THR	
LITHASIA VERRUCOSA	VARICOSE ROCKSNAIL	S3	THR	
PLEUROCERA ALVEARE	RUGGED HORNSNAIL	S?	THR	
PLEUROCERA CORPULENTA	CORPULENT HORNSNAIL	S1	THR	
PLEUROCERA CURTA	SHORTSPIRE HORNSNAIL	S?	THR	
PLEUROCERA WALKERI	TELESCOPE HORNSNAIL	S1	THR	

Scientific Name	Common Name	State Rank	State Status	Federal Status
CRUSTACEA				
CAMBARUS JONESI	TROGLOBITIC CRAYFISH	S2	SPCO	
PALAEMONIAS ALABAMAE	ALABAMA BLIND CAVE SHRIMP	S1S2	THR	LE
PROCAMBARUS PECKI	TROGLOBITIC CRAYFISH	S2?	SPCO	
PISCES				
CYPRINELLA MONACHA	SPOTFIN CHUB	SH	PROT	LT, PXN
ELASSOMA ALABAMAE	SPRING PYGMY SUNFISH	S1	PROT	
ETHEOSTOMA BOSCHUNGI	SLACKWATER DARTER	S2	PROT	LT
ETHEOSTOMA CORONA	CROWN DARTER	S2	SPCO	
ETHEOSTOMA TUSCUMBIA	TUSCUMBIA DARTER	S2	PROT	
ETHEOSTOMA WAPITI	BOULDER DARTER	S1	PROT	LE
HEMITREMIA FLAMMEA	FLAME CHUB	S3	SPCO	
SPEOPLATYRHINUS POULSONI	ALABAMA CAVEFISH	S1	PROT	LE
TYPHLICHTHYS SUBTERRANEUS	SOUTHERN CAVEFISH	S3	PROT	
Bear Creek (unit: 06030006)				
BIVALVIA				
ACTINONAIAS PECTOROSA	PHEASANTSHELL	SH	END	
ALASMIDONTA MARGINATA	ELKTOE	SH	END	
EPIOBLASMA BREVIDENS	CUMBERLAND COMBSHELL	S1	PROT	(LE,XN)
EPIOBLASMA TRIQUETRA	SNUFFBOX	S1	SPCO	
EPIOBLASMA TURGIDULA	TURGID BLOSSOM PEARLYMUSSEL	SX	PROT	(LE,XN)
FUSCONAIA BARNESIANA	TENNESSEE PIGTOE	S1	SPCO	
FUSCONAIA CUNEOLUS	FINE-RAYED PIGTOE	S1	PROT	(LE,XN)
LAMPSILIS ABRUPTA	PINK MUCKET	S1	PROT	LE
LAMPSILIS FASCIOLA	WAVY-RAYED LAMPMUSSEL	S1S2	SPCO	
LAMPSILIS OVATA	POCKETBOOK	S1	SPCO	
LAMPSILIS VIRESCENS	ALABAMA LAMPMUSSEL	S1	PROT	(LE,XN)
LEXINGTONIA DOLABELLOIDES	SLABSIDE PEARLYMUSSEL	S1	PROT	C
OBOVARIA SUBROTUNDA	ROUND HICKORYNUT	S2	SPCO	
PLEUROBEMA OVIFORME	TENNESSEE CLUBSHELL	S1	SPCO	
PTYCHOBRANCHUS FASCIOLARIS	KIDNEYSHELL	S1	SPCO	
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	S1	SPCO	
TOXOLASMA LIVIDUS	PURPLE LILLIPUT	S2	SPCO	
TRUNCILLA TRUNCATA	DEERTOE	SH	END	
GASTROPODA				
LITHASIA VERRUCOSA	VARICOSE ROCKSNAIL	S3	THR	

Source: Alabama and TVA Heritage Programs
Per Peggy Shute, TVA
April 30, 2003

NOTES:

Alabama status codes:
Prot = state protected
SPCO = special concern
END = endangered
THR = threatened

EXTI = extinct or extirpated
POTL = potential candidate for listing

Federal status codes:
LE = endangered
LT = threatened
C = candidate for listing
XN = nonessential experimental population
PXN = propsoed nonessential experimental population

Appendix F

Population Changes in Tennessee River Basin Subwatersheds

HUC 11	HUC 11 Name	County	Acres	HUC 8 Name	Sq miles	Pop 1990	Pop 2000	Pop Change	% Change
AL-06020001-290	Lookout Creek	Dekalb	29028.6	Chickamauga	45.4	1623.1	2025.6	402.6	24.8
AL-06020001-350	Tennessee River	Jackson	5421.2	Chickamauga	8.5	499.5	621.9	122.3	24.49
AL-06030001-060	Tennessee River	Jackson	48486.2	Guntersville Lake	75.8	6965.6	6941.3	-24.3	-0.35
AL-06030001-080	Tennessee River	Jackson	62325.2	Guntersville Lake	97.4	4215.0	5108.0	893.0	21.19
AL-06030001-100	Crow Creek	Jackson	26414.4	Guntersville Lake	41.3	615.6	618.0	2.4	0.39
AL-06030001-120	Little Coon Creek	Jackson	16236.0	Guntersville Lake	25.4	147.1	149.0	1.9	1.27
AL-06030001-140	Big Coon Creek	Jackson	27690.2	Guntersville Lake	43.3	380.5	427.5	47.1	12.37
AL-06030001-150	Tennessee River	Jackson	14204.1	Guntersville Lake	22.2	556.6	675.7	119.1	21.39
AL-06030001-160	Flat Rock Creek	Jackson	61717.9	Guntersville Lake	96.4	4270.1	4560.3	290.2	6.8
AL-06030001-170	Tennessee River	Jackson	67380.6	Guntersville Lake	105.3	2346.0	3225.7	879.7	37.5
AL-06030001-180	Tennessee River	Jackson	55019.9	Guntersville Lake	86	4992.3	5851.1	858.8	17.2
AL-06030001-190	Tennessee River	Jackson	65728.5	Guntersville Lake	102.7	13466.0	13819.4	353.4	2.62
AL-06030001-200	Tennessee River	Jackson	11360.9	Guntersville Lake	17.8	870.1	1054.6	184.5	21.2
AL-06030001-210	Tennessee River	Jackson	53794.5	Guntersville Lake	84.1	4475.2	5172.0	696.8	15.57
AL-06030001-220	Sauty Creek	Marshall	80594.5	Guntersville Lake	125.9	9570.9	11200.3	1629.4	17.02
AL-06030001-230	Tennessee River	Jackson	16970.3	Guntersville Lake	26.5	802.0	1047.6	245.5	30.62
AL-06030001-240	Tennessee River	Marshall	24090.3	Guntersville Lake	37.6	3042.0	2852.5	-189.6	-6.23
AL-06030001-250	Town Creek	Marshall	129337.4	Guntersville Lake	202.1	12590.3	14909.0	2318.7	18.42
AL-06030001-260	Tennessee River	Marshall	30195.3	Guntersville Lake	47.2	685.2	959.2	274.0	39.99
AL-06030001-270	Scarham Creek	Marshall	58315.8	Guntersville Lake	91.1	5622.1	7369.8	1747.7	31.09
AL-06030001-280	Short Creek	Marshall	73080.0	Guntersville Lake	114.2	24781.3	26761.5	1980.2	7.99
AL-06030001-290	Scarham Creek	Marshall	13092.4	Guntersville Lake	20.5	1219.1	1460.6	241.5	19.81
AL-06030001-300	Tennessee River	Marshall	45693.9	Guntersville Lake	71.4	9102.9	10446.3	1343.4	14.76
AL-06030001-310	Tennessee River	Marshall	47616.8	Guntersville Lake	74.4	9488.9	6949.1	-2539.9	-26.77
AL-06030001-320	Tennessee River	Marshall	25589.9	Guntersville Lake	40	2193.7	2253.5	59.8	2.73
AL-06030002-020	Paint Rock River	Jackson	37633.4	Wheeler Lake	58.8	527.7	551.5	23.8	4.51
AL-06030002-040	Larkin Fork	Jackson	20894.7	Wheeler Lake	32.6	843.6	212.1	-631.4	-74.85
AL-06030002-050	Paint Rock River	Jackson	43890.4	Wheeler Lake	68.6	600.0	709.5	109.5	18.24
AL-06030002-060	Guess Creek	Jackson	21839.8	Wheeler Lake	34.1	574.3	743.1	168.9	29.41
AL-06030002-070	Paint Rock River	Jackson	33156.6	Wheeler Lake	51.8	2292.7	1386.8	-905.9	-39.51

HUC 11	HUC 11 Name	County	Acres	HUC 8 Name	Sq miles	Pop 1990	Pop 2000	Pop Change	% Change
AL-06030002-080	Clear Creek	Jackson	11663.8	Wheeler Lake	18.2	145.6	154.7	9.1	6.28
AL-06030002-090	Little Paint Rock Creek	Marshall	36270.0	Wheeler Lake	56.7	2328.4	2743.1	414.7	17.81
AL-06030002-100	Tennessee River	Madison	60091.3	Wheeler Lake	93.9	4995.8	6062.5	1066.7	21.35
AL-06030002-110	Tennessee River	Marshall	37601.0	Wheeler Lake	58.8	6283.7	7303.2	1019.5	16.23
AL-06030002-130	Flint River	Madison	9999.1	Wheeler Lake	15.6	1656.7	2682.9	1026.2	61.94
AL-06030002-140	Flint River	Madison	22125.8	Wheeler Lake	34.6	3432.1	5054.4	1622.3	47.27
AL-06030002-160	Mountain Fork	Madison	41673.0	Wheeler Lake	65.1	3069.2	4065.8	996.5	32.47
AL-06030002-180	Brier Fork	Madison	67307.8	Wheeler Lake	105.2	17546.2	21593.9	4047.7	23.07
AL-06030002-190	Flint River	Madison	32153.2	Wheeler Lake	50.2	6788.9	12917.2	6128.3	90.27
AL-06030002-200	Hurricane Creek	Madison	47109.4	Wheeler Lake	73.6	2892.4	3973.1	1080.7	37.36
AL-06030002-210	Flint River	Madison	60704.7	Wheeler Lake	94.9	8516.8	11258.5	2741.7	32.19
AL-06030002-220	Tennessee River	Morgan	29399.2	Wheeler Lake	45.9	4300.8	4434.0	133.2	3.1
AL-06030002-250	TN R (Shoal Cr)	Lauderdale	51216.6	Pickwick Lake	80	25383.8	26856.1	1472.3	5.8
AL-06030002-260	Cypress Creek	Lauderdale	43785.8	Pickwick Lake	68.4	28255.9	28887.1	631.3	2.23
AL-06030002-270	Tennessee River	Morgan	174588.1	Wheeler Lake	272.8	20677.9	23380.1	2702.1	13.07
AL-06030002-280	Tennessee River	Limestone	39255.0	Wheeler Lake	61.3	2403.1	2818.6	415.5	17.29
AL-06030002-300	Limestone Creek	Limestone	81532.2	Wheeler Lake	127.4	15470.5	29155.3	13684.8	88.46
AL-06030002-320	Piney Creek	Limestone	59946.7	Wheeler Lake	93.7	9669.3	12157.5	2488.3	25.73
AL-06030002-330	Flint Creek	Morgan	96655.1	Wheeler Lake	151	18282.0	21005.0	2723.0	14.89
AL-06030002-340	Crowabout Creek	Morgan	31109.7	Wheeler Lake	48.6	1527.6	1951.0	423.4	27.72
AL-06030002-350	Flint Creek	Morgan	92661.0	Wheeler Lake	144.8	40978.5	46734.9	5756.4	14.05
AL-06030002-360	West Flint Creek	Lawrence	75234.4	Wheeler Lake	117.6	9198.7	8354.1	-844.6	-9.18
AL-06030002-370	Tennessee River	Limestone	19663.6	Wheeler Lake	30.7	1100.9	1253.5	152.5	13.85
AL-06030002-390	Swan Creek	Limestone	36008.7	Wheeler Lake	56.3	17393.2	18499.2	1106.0	6.36
AL-06030002-400	Tennessee River	Limestone	75022.8	Wheeler Lake	117.2	8187.1	10010.0	1822.9	22.27
AL-06030002-410	Tennessee River	Lawrence	61503.5	Wheeler Lake	96.1	4211.4	4382.4	171.1	4.06
AL-06030002-420	Tennessee River	Lawrence	20030.9	Wheeler Lake	31.3	897.0	817.5	-79.5	-8.87
AL-06030002-440	TN R (Second Creek)	Lauderdale	51009.0	Wheeler Lake	79.7	7230.4	6124.8	-1105.6	-15.29
AL-06030003-120	Beans Creek	Jackson	254.2	Upper Elk	0.4	2.4	2.3	-0.1	-3.63
AL-06030004-020	Elk River	Limestone	24554.9	Lower Elk	38.4	1703.4	2298.9	595.5	34.96
AL-06030004-060	Shoal Creek	Limestone	8977.4	Lower Elk	14	351.9	430.2	78.3	22.26
AL-06030004-070	Elk River	Limestone	6707.0	Lower Elk	10.5	286.0	334.3	48.3	16.88

HUC 11	HUC 11 Name	County	Acres	HUC 8 Name	Sq miles	Pop 1990	Pop 2000	Pop Change	% Change
AL-06030004-080	Elk River	Limestone	40173.3	Lower Elk	62.8	5019.4	6083.1	1063.7	21.19
AL-06030004-120	Sugar Creek	Limestone	28501.9	Lower Elk	44.5	1397.1	1521.1	124.0	8.87
AL-06030004-130	Elk River	Lauderdale	11242.0	Lower Elk	17.6	613.9	852.6	238.8	38.89
AL-06030004-150	Elk River (Anderson Cr.)	Lauderdale	39978.8	Lower Elk	62.5	2862.8	3441.6	578.9	20.22
AL-06030005-010	TN R (Big Nance)	Lawrence	127989.1	Pickwick Lake	200	13156.6	13532.6	376.0	2.86
AL-06030005-030	TN. R (Bluewater Cr.)	Lauderdale	57043.7	Pickwick Lake	89.1	7435.6	8703.5	1267.9	17.05
AL-06030005-040	TN R (Town Cr.)	Colbert	159834.4	Pickwick Lake	249.7	11856.9	10004.4	-1852.4	-15.62
AL-06030005-090	Shoal Creek	Lauderdale	19715.8	Pickwick Lake	30.8	1886.2	2782.7	896.6	47.53
AL-06030005-140	Butler Creek	Lauderdale	5051.5	Pickwick Lake	7.9	329.3	527.6	198.4	60.24
AL-06030005-160	Tennessee River	Colbert	48068.8	Pickwick Lake	75.1	21436.9	22070.5	633.7	2.96
AL-06030005-180	Cypress Creek	Lauderdale	51119.2	Pickwick Lake	79.9	4346.5	5377.5	1031.0	23.72
AL-06030005-200	Indian Creek	Madison	40982.8	Wheeler Lake	64	16068.6	22928.9	6860.4	42.69
AL-06030005-210	Spring Creek	Colbert	68764.1	Pickwick Lake	107.4	17302.9	18369.1	1066.2	6.16
AL-06030005-220	Tennessee River	Lauderdale	49126.4	Pickwick Lake	76.8	1586.8	1998.2	411.4	25.93
AL-06030005-230	Tennessee River	Colbert	91157.3	Pickwick Lake	142.4	7657.1	8720.0	1062.9	13.88
AL-06030005-240	Tennessee River	Colbert	37775.1	Pickwick Lake	59	2295.4	1436.4	-859.0	-37.42
AL-06030005-250	Tennessee River	Lauderdale	43264.2	Pickwick Lake	67.6	1264.4	1583.8	319.4	25.26
AL-06030005-270	Tennessee River	Lauderdale	29620.5	Pickwick Lake	46.3	463.2	485.0	21.8	4.71
AL-06030005-280	Tennessee River	Lauderdale	18750.4	Pickwick Lake	29.3	245.3	246.2	0.9	0.37
AL-06030005-320	Tennessee River	Lauderdale	2188.7	Pickwick Lake	3.4	29.1	28.8	-0.3	-1.06
AL-06030006-010	Bear Creek	Franklin	184063.1	Bear	287.6	16072.2	15392.5	-679.7	-4.23
AL-06030006-030	Little Bear Creek	Franklin	58139.1	Bear	90.8	5846.5	2142.0	-3704.5	-63.36
AL-06030006-040	Cedar Creek	Franklin	127886.0	Bear	199.8	11189.3	13022.9	1833.6	16.39
AL-06030006-050	Cedar Creek	Colbert	20505.6	Bear	32	269.0	269.1	0.1	0.02
AL-06030006-070	Bear Creek	Colbert	57573.7	Bear	90	916.8	919.4	2.6	0.28
AL-06030006-100	Bear Creek	Colbert	80.6	Bear	0.1	43.9	42.9	-1.0	-2.37
AL-06030006-100	Bear Creek	Colbert	7.4	Bear	0	43.9	42.9	-1.0	-2.37
AL-06030006-100	Bear Creek	Colbert	351.2	Bear	0.5	43.9	42.9	-1.0	-2.37
AL-06030006-100	Bear Creek	Colbert	2827.3	Bear	4.4	43.9	42.9	-1.0	-2.37
AL-06030006-110	Bear Creek	Colbert	58244.6	Bear	91	2286.8	1528.7	-758.0	-33.15

Source: TVA, adapted from US Census

Appendix G

Monitoring Locations of the Tennessee Valley Authority

11-digit watershed code	Sub-basin	Station Descriptor	Sample Location river mile
AL-06030001-060	Guntersville	Inflow	TRM 420-424
AL-06030001-080	Guntersville	Inflow	TRM 420-424
AL-06030001-190	Guntersville	Transition	TRM 375.2
AL-06030001-200	Guntersville	Transition	TRM 375.2
AL-06030001-210	Guntersville	Transition	TRM 375.2
AL-06030001-230	Guntersville	Transition	TRM 375.2
AL-06030001-240	Guntersville	Transition	TRM 375.2
AL-06030001-260	Guntersville	Transition	TRM 375.2
AL-06030001-300	Guntersville	Forebay	TRM 350.0
AL-06030001-310	Guntersville	Forebay	TRM 350.0
AL-06030001-320	Guntersville	Forebay	TRM 350.0
AL-06030002-100	Wheeler	Inflow	TRM 347-348
AL-06030002-110	Wheeler	Inflow	TRM 347-348
AL-06030002-220	Wheeler	Inflow	TRM 347-348
AL-06030002-230	Wheeler	Inflow	TRM 347-348
AL-06030002-270	Wheeler	Inflow	TRM 347-348
AL-06030002-280	Wheeler	Inflow	TRM 347-348
AL-06030002-370	Wheeler	Transition	TRM 295.9
AL-06030002-380	Wheeler	Transition	TRM 295.9
AL-06030002-400	Wheeler	Transition	TRM 295.9
AL-06030002-410	Wheeler	Transition	TRM 295.9
AL-06030002-420	Wheeler	Forebay	TRM 277.0
AL-06030002-440	Wheeler	Forebay	TRM 277.0
AL-06030004-080	Wheeler	Embayment	ERM 6.0
AL-06030004-130	Wheeler	Embayment	ERM 6.0
AL-06030004-150	Wheeler	Embayment	ERM 6.0
AL-06030005-010	Wilson	Inflow	TRM 273-274
AL-06030005-030	Wilson	Inflow	TRM 273-274
AL-06030005-040	Wilson	Inflow	TRM 273-274
AL-06030005-150	Wilson	Forebay	TRM 260.8
AL-06030005-160	Wilson	Forebay	TRM 260.8
AL-06030005-220	Pickwick	Inflow	TRM 253-259
AL-06030005-230	Pickwick	Inflow	TRM 253-259
AL-06030005-240	Pickwick	Transition	TRM 230.0
AL-06030005-250	Pickwick	Transition	TRM 230.0
AL-06030005-270	Pickwick	Transition	TRM 230.0
AL-06030005-280	Pickwick	Forebay	TRM 207.3
AL-06030005-320	Pickwick	Forebay	TRM 207.3
AL-06030006-010	Bear Creek	Forebay	BCM 75.0
AL-06030006-030	Little Bear Creek	Forebay	LBCM 12.5
AL-06030006-040	Cedar Creek	Forebay	CCM 25.2
AL-06030006-100	Pickwick	Embayment	BCM 8.4
AL-06030006-110	Pickwick	Embayment	BCM 8.4

Source: Personal communications, Don Anderson, TVA

Appendix H

Tennessee River Basin Sub-basin Stakeholder Meeting Attendees

Tennessee River Basin Forum
Hosted by Alabama Rivers Alliance
February 15, 2003
UAH Bevill Conference Center, Huntsville Alabama

Brad McLane - Alabama Rivers Alliance
Adam Snyder – Alabama Rivers Alliance
Regina McCoy - TVA
Charles Rose – Shoals Environmental Alliance
Nancy Muse - Shoals Environmental Alliance
Margaret McCloy - Shoals Environmental Alliance
Wayne Hitt
Don Anderson - TVA
Vicky Mitchell – TN Valley RC&D
Mike Dalen
Frank Sagona, TR CWP
Tefevi Tsegaye – Alabama A&M Plant & Soil Science
Eric Fleischauer – Decatur Daily
Henry Hughes
Samantha McDuff
Magan Brown
Martha McDuff
Phillip Meadows
Ernest Haygood
Jane Rowe
Willard Jones
Foster Hartline
Pat Byington
Dirk Spencer
Lyle Taylor
Pat Stansell – Pier Post
Bob Stansell – Pier Post
David Taplet
Brian Bradley – Society of Am Foresters
Sam Gravel - – Society of Am Foresters
Murray Carroll – Aldridge Ck
Jackie Tipper – Hazelwood School
Buff Crosby - TVA
Tripp Head
Soos Weber
Keri Johnson - TVA

Pickwick-Wilson and Bear Creek Watershed Sub-basins
Tennessee River Basin Clean Water Partnership
Tuscumbia, AL
March 6, 2003:

Attendees:
HA Blackburn
Jackie Tipper – Hazelwood School
Susan Blazek – Northwest RC&D
Damien Simbeck - TVA
Dee Northcutt - ADEM
Jeanne Baughman
Larry Chowning – AL Dept of Public Health
Howard Grissom – Northwest RC&D
Gene Graham – Franklin Co Commission
Joel Pounders – Franklin Co SWCD
Jeff McDonald – Tuscumbia Utilities
Byron Aycock
Gary Terry
Bob Stansell
Steve McEachron – AL Forestry Commission
Shannon Norwood
John Everitt – AL Foresty Commission
Frank Sagona
Mary Elliott – Tenn Valley RC&D
Tammy Kerby – Tenn Valley RC&D
Vicky Mitchell – Tenn Valley RC&D
Mike Roden – Tenn Valley RC&D
James Beauchamp
Steve Foster - ADEM
Earl Waldrep
Noble Holland
Ronnie Lane
Teresa Stewart – Northwest RC&D
Charles Rose
Darryl Whitehead

Guntersville Sub-basin
Tennessee River Basin Clean Water Partnership
Marshall County Farmers Federation / ALFA Building
Guntersville, AL
March 13, 2003:

Attendees:
Cecil Gant – Sand Mtn Lake Guntersville
David Brewster - TVA
Jim Frost - NRCS
Ruby Martin
RE Martin
Jerrel Smalley – Marshall Co SWCD
Sam Harvey – Advertiser Gleam
Eddie Allen
John Eason – DeKalb Co SWCD
Randell Ball – Marshall Co H.D.
Larry King - ALFA
Steve Foster - ADEM
Frank Sagona
Keri Johnson - TVA
Bill McGriff -
David Moore – The Arab Tribune
Kathleen Lawlor
Kenneth Freeman
Jean Ann Moon
Stan Franklin - NRCS
Anita McBurnett
Tim Williams
Vicky Mitchell -Tenn Valley RC&D
Mary Elliott- Tenn Valley RC&D
Tammy Kerby - Tenn Valley RC&D
Carmen Yell – ADEM
Dee Northcutt – ADEM
Louis Letson
Bruce West
Neil Matthews - NRCS
Jerry Wisner – NRCS
Thomas Jensen
Richard Walthall – EMA
Diane Walthall - EMA

Wheeler and Lower Elk River Sub-basins
Tennessee River Basin Clean Water Partnership
UAH
Huntsville, Alabama
March 20, 2003:

Attendees:

Necia Nicholas
Dee Northcutt - ADEM
James Adams - TVA
Terry Nappier – AL Dept of Public Health
Danny Williams - NRCS
John-Paul O'Driscoll – AL Dept of Public Heath
Mark Swafford - NRCS
Phyllis Seymore – Madison Co Comm, Planning & Econ Develop
Soos Weber
LaWanda West
Dirk Spencer
Brad Bole – Flint Creek Watershed
Anne Burkett – Madison Co Comm, Planning & Econ Develop
Roger Nichols – AL Forestry Commission
Danny Dunn – Redstone Arsenal
Gordon Sadler
Danny Shea – City of Huntsville
Bill Courtney – Huntsville Utilities
Julian Sanders – Paint Rock River Watershed Cons Dist
Pete Wallingsford
Amy Keith - NASA
Tony Owens – Huntsville Utilities
Mike Dalen
Jim Hardin
Charles Chen
Doug Fears
Billy Gonterman
Kem Carr – Decatur Utilities
Mike Roden – Tenn Valley RC&D
Vicky Mitchell – Tenn Valley RC&D
Tammy Kerby – Tenn Valley RC&D
Ron McLeroy – Huntsville Utilities
Jay Grantland – Tenn Valley RC&D
Teresa Smith - NRCS
Dale Jones
Walter Rodgers
Carmen Yell - ADEM
Steve Foster - ADEM
Regina McCoy - TVA
Bryant Moss

Tennessee River Basin Clean Water Partnership
Steering Committee Meeting
Decatur Utilities
Decatur, Alabama
April 22, 2003:

Attendees:
Amy Keith - NASA
Bill Courtney – Huntsville Utilities
Reggie Knox - ADEM
Kem Carr – Decatur Utilities
Terry Nappier – AL Dept of Public Health
Charles Chen - Solutia
Allison Newell – Alabama Clean Water Partnership
James Beauchamp - NRCS
Jamie Carpenter - NRCS
Don Anderson - TVA
Dirk Spencer – Alabama A&M Plant & Soil Science
Tom Green - CFE
Dee Northcutt – ADEM
Eric Fleischauer – Decatur Daily
Grover Reeves
Mike Roden – Tenn Valley RC&D
John Eason – DeKalb Co SWCD / Tenn Valley RC&D
Vicky Mitchell -Tenn Valley RC&D
Frank Sagona

Appendix I
Tennessee River Basin Watershed
List of CAFO

PRIMARY ANIMAL TYPE	ANIMALUNITS		CITY	HUC	SUBWATER	COUNTYNAME
POULTRY - BROILER	1,480.00		Baileyton	06030001	310	Blount
POULTRY - BROILER	1,118.00		Guntersville	06030001	310	Blount
POULTRY - BROILER	736.00		Guntersville	06030001	310	Blount
POULTRY - BROILER	1,491.00		Tuscumbia	06030005	160	Colbert
POULTRY - BROILER	1,491.00		Tuscumbia	06030005	160	Colbert
POULTRY - BROILER	1,480.00		Muscle Shoals	06030005	210	Colbert
POULTRY - BROILER	1,480.00		Muscle Shoals	06030005	210	Colbert
POULTRY - BROILER	1,440.00		Muscle Shoals	06030005	230	Colbert
POULTRY - BROILER	1,440.00		Tuscumbia	06030005	230	Colbert
POULTRY - BROILER	1,118.00		Leighton	06030005	40	Colbert
POULTRY - BROILER	944.00		Leighton	06030005	210	Colbert
POULTRY - BROILER	595.00		Tuscumbia	06030005	210	Colbert
POULTRY - BREEDER	480.00		Tuscumbia	06030005	160	Colbert
POULTRY - BROILER	296.00		Russellville	06030005	40	Colbert
POULTRY - BROILER	1,200.00		Baileyton	06030002	270	Cullman
POULTRY - BROILER	1,168.00		Vinemont	06030002	330	Cullman
POULTRY LAYER DRY	240.00		Vinemont	06030002	330	Cullman
SWINE NURSERY	1,030.00		Henegar	6030001	160	Dekalb
POULTRY - BROILER	3,000.00		Henagar	06030001	250	Dekalb
POULTRY - BROILER	1,920.00		Fyffe	06030001	220	Dekalb
POULTRY - BROILER	1,920.00		Geraldine	06030001	270	Dekalb
POULTRY - BROILER	1,696.00		Crossville	06030001	270	Dekalb
SWINE NURSERY	1,660.00		Henegar	06030001	220	Dekalb
POULTRY - BROILER	1,624.00		Henegar	06030001	250	Dekalb
SWINE FINISHING	1,600.00		Ider	06030001	160	Dekalb
SWINE FINISHING	1,600.00		Ider	06030001	160	Dekalb
SLAUGHTER/FEEDER	1,500.00		Boaz	06030001	280	Dekalb

PRIMARY ANIMAL TYPE	ANIMALUNITS	CITY	HUC	SUBWATER	COUNTYNAME
POULTRY - BROILER	1,480.00	Grove Oak	06030001	250	Dekalb
POULTRY - BROILER	1,440.00	Duluth	06030001	160	Dekalb
POULTRY - BROILER	1,360.00	Ider	06030001	160	Dekalb
POULTRY - BROILER	1,344.00	Flat Rock	06030001	160	Dekalb
POULTRY - BROILER	1,136.00	Boaz	06030001	280	Dekalb
POULTRY - BROILER	1,128.00	Valley Head	06030001	250	Dekalb
POULTRY - BROILER	1,128.00	Henegar	06030001	250	Dekalb
POULTRY - BROILER	1,128.00	Geraldine	06030001	270	Dekalb
POULTRY - BROILER	1,128.00	Henagar	06030001	250	Dekalb
POULTRY - BROILER	1,104.00	Crossville	06030001	270	Dekalb
POULTRY - BROILER	1,104.00	Geraldine	06030001	270	Dekalb
POULTRY - BROILER	1,089.00	Dawson	06030001	270	Dekalb
POULTRY - BROILER	1,048.00	Rainsville	06030001	250	Dekalb
SWINE NURSERY	1,025.00	Crossville	06030001	270	Dekalb
SWINE NURSERY	1,000.00	Sylvania	06030001	220	Dekalb
SWINE NURSERY	1,000.00	Fort Payne	06030001	250	Dekalb
SWINE NURSERY	1,000.00	Geraldine	06030001	250	Dekalb
SWINE NURSERY	1,000.00	Pisgah	06030001	220	Dekalb
SWINE NURSERY	1,000.00	Fyffe	06030001	220	Dekalb
SWINE NURSERY	1,000.00	Albertville	06030001	280	Dekalb
SWINE NURSERY	962.00	Henegar	06030001	250	Dekalb
POULTRY - BROILER	896.00	Ider	06030001	160	Dekalb
POULTRY - BROILER	896.00	Ider	06030001	160	Dekalb
POULTRY - BROILER	896.00	Ider	06030001	160	Dekalb
POULTRY - BROILER	672.00	Ider	06030001	160	Dekalb
POULTRY - BROILER	448.00	Ider	06030001	160	Dekalb
POULTRY - BROILER	2,256.00	Russellville	06030006	40	Franklin
POULTRY - BROILER	1,864.00	Phil Campbell	06030006	10	Franklin
SWINE FINISHING	1,600.00	Red Bay	06030006	50	Franklin
DAIRY	1,210.00	Phil Campbell	06030006	10	Franklin
POULTRY - BROILER	1,189.00	Phil Campbell	06030006	10	Franklin

PRIMARY ANIMAL TYPE	ANIMALUNITS	CITY	HUC	SUBWATER	COUNTYNAME
POULTRY - BROILER	1,120.00	Haleyville	06030006	10	Franklin
POULTRY - BROILER	1,118.00	Spruce Pine	06030006	40	Franklin
POULTRY - BROILER	1,118.00	Red Bay	06030006	100	Franklin
POULTRY - BROILER	1,118.00	Sruce Pine	06030006	30	Franklin
POULTRY - BROILER	1,118.00	Russellville	06030006	10	Franklin
POULTRY - BROILER	1,112.00	Phil Campbell	06030006	10	Franklin
POULTRY - BROILER	1,112.00	Phil Campbell	06030006	10	Franklin
POULTRY - BROILER	1,104.00	Vina	06030006	10	Franklin
POULTRY - BROILER	1,104.00	Haleyville	06030006	10	Franklin
POULTRY - BROILER	1,040.00	Russellville	06030006	10	Franklin
POULTRY - BROILER	2,982.00	Russellville	06030005	40	Franklin
POULTRY - BROILER	1,504.00	Russellville	06030005	40	Franklin
POULTRY - BROILER	1,491.00	Russellville	06030005	40	Franklin
POULTRY - BROILER	1,491.00	Russellville	06030005	40	Franklin
POULTRY - BROILER	1,472.00	Russellville	06030005	40	Franklin
POULTRY - BROILER	1,118.00	Russellville	06030005	40	Franklin
POULTRY - BROILER	1,118.00	Russellville	06030005	40	Franklin
SLAUGHTER/FEEDER CATTLE	1,000.00	Gurley	06030002	70	Jackson
POULTRY - BROILER	1,920.00	Pisgah	06030001	180	Jackson
SWINE FINISHING	1,600.00	Pisgah	06030001	180	Jackson
POULTRY - BROILER	1,280.00	Dutton	06030001	220	Jackson
SWINE NURSERY	1,000.00	Henagar	06030001	220	Jackson
POULTRY - BROILER	1,104.00	Florence	06030005	200	Lauderdale
POULTRY - BROILER	1,644.00	Russellville	06030005	40	Lawrence
POULTRY - BROILER	1,608.00	Town Creek	06030005	10	Lawrence
POULTRY - BROILER	1,160.00	Mt. Hope	06030005	40	Lawrence
POULTRY - BROILER	1,152.00	Decatur	06030005	10	Lawrence
POULTRY - BROILER	1,128.00	Courtland	06030005	10	Lawrence
POULTRY - BROILER	1,104.00	Moulton	06030005	10	Lawrence
POULTRY - BROILER	1,104.00	Mt. Hope	06030005	40	Lawrence
POULTRY - BROILER	1,088.00	Town Creek	06030005	10	Lawrence

PRIMARY ANIMAL TYPE	ANIMALUNITS	CITY	HUC	SUBWATER	COUNTYNAME
POULTRY - BROILER	1,056.00	Mount Hope	06030005	40	Lawrence
POULTRY - BROILER	1,056.00	Mt. Hope	06030005	40	Lawrence
POULTRY - BROILER	1,056.00	Town Creek	06030005	10	Lawrence
POULTRY - BROILER	768.00	Town Creek	06030005	10	Lawrence
POULTRY - BROILER	552.00	Courtland	06030005	10	Lawrence
POULTRY LAYER DRY	320.00	Mt. Hope	06030005	40	Lawrence
DAIRY	98.00	Mt. Hope	06030005	40	Lawrence
POULTRY - BROILER	968.00	Danville	06030002	360	Lawrence
POULTRY - BROILER	752.00	Danville	06030002	360	Lawrence
POULTRY - BROILER	1,600.00	Athens	06030002	400	Limestone
POULTRY - BROILER	1,568.00	Hackleburg	06030006	10	Marion
POULTRY - BROILER	1,491.00	Hackleburg	06030006	10	Marion
POULTRY - BROILER	1,488.00	Hackleburg	06030006	10	Marion
POULTRY - BROILER	1,488.00	Phil Campbell	06030006	10	Marion
POULTRY - BROILER	1,128.00	Bear Creek	06030006	10	Marion
POULTRY - BROILER	1,056.00	Hackleburg	06030006	10	Marion
POULTRY - BROILER	736.00	Hackleburg	06030006	10	Marion
POULTRY - BROILER	640.00	Hackleburg	06030006	10	Marion
POULTRY LAYER - LIQUID	1,680.00	Union Grove	06030002	110	Marshall
POULTRY - BROILER	1,491.00	Union Grove	06030002	270	Marshall
POULTRY - BROILER	1,440.00	Arab	06030002	110	Marshall
POULTRY - BROILER	1,320.00	Arab	06030002	270	Marshall
POULTRY - BROILER	1,129.00	Union Grove	06030002	110	Marshall
POULTRY - BROILER	1,120.00	Arab	06030002	270	Marshall
POULTRY - BROILER	1,104.00	Union Grove	06030002	110	Marshall
POULTRY - BROILER	1,104.00	Arab	06030002	110	Marshall
POULTRY - BROILER	1,056.00	Arab	06030002	110	Marshall
POULTRY - BROILER	1,056.00	Arab	06030002	110	Marshall
POULTRY - BROILER	960.00	Union Grove	06030002	110	Marshall
POULTRY - BROILER	2,600.00	Guntersville	06030001	310	Marshall
POULTRY - BROILER	1,416.00	Guntersville	06030001	310	Marshall
POULTRY - BROILER	1,400.00	Guntersville	06030001	310	Marshall

PRIMARY ANIMAL TYPE	ANIMALUNITS		CITY	HUC	SUBWATER	COUNTYNAME
POULTRY - BROILER	1,120.00		Guntersville	06030001	260	Marshall
POULTRY - BROILER	1,104.00		Altoona	06030001	300	Marshall
POULTRY - BROILER	1,056.00		Albertville	06030001	290	Marshall
POULTRY - BROILER	1,504.00		Hartselle	06030002	350	Morgan
DAIRY	1,204.00		Union Grove	06030002	270	Morgan
POULTRY - BROILER	1,180.00		Hartselle	06030002	330	Morgan
POULTRY - BROILER	1,120.00		Hartselle	06030002	340	Morgan
POULTRY - BROILER	1,112.00		Somerville	06030002	270	Morgan
DAIRY	1,050.00		Baileyton	06030002	340	Morgan
POULTRY - BROILER	960.00		Somerville	06030002	270	Morgan
SLAUGHTER/FEEDER CATTLE	800.00		Decatur	06030002	380	Morgan

Source: USDA NRCS County District Conservationists

Appendix J
List of Alabama Water Watch Groups
Tennessee River Basin Watershed

Water Watch Group:

Academy for Science & Foreign Language
Bear Creek Education Center
Bear Creek Water Watch
Big Nance / Town Creek Water Watch
Bob Jones High School
Bridgeport Middle School
Chris Hyde
Cool Runnings
Cotaco School Environmental Club
Crossville High School
Decatur High School Field Studies
Douglas Middle School
East Limestone Environmental Club
Flint Creek Citizens
Flint River Action Team
Friends of Pisgah Gorge
Geraldine High School FFA
Geraldine High School Science Club
Girl Scout Troop 490
The Gorham's Bluff Institute
Horizon High Ecology Club
Huntsville City Schools
Ider High School
Jackson County SWCD
Limestone County RSVP
Limestone County Water Watch
Mountain Gap School
North Alabama Sierra Club
North Sand Mountain School
Oak Park Middle School
Paint Rock River Initiative
Pisgah High School FFA
Plainview High School
Plainview High School FFA
POWER – Elk River
Retired Senior Volunteer Program of Marshall County
Sand Mountain Water Watch
Sardis High School
Scottsboro FFA
Section FFA
Shoals Creek Water Watch
Stevenson Middle School
Sylvania FFA
Sylvania High School
Three Springs School
Trout Unlimited #639
Valley Head School
Wheeler Lake Water Watch

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Source: Alabama Water Watch, Auburn University

Appendix K

List of Presenters
Nonpoint Education for Municipal Officials (NEMO)
Tennessee River Basin Watershed

Presenters:

Regina McCoy – TVA
Vicky Mitchell – Tennessee Basin CWP
Susan Weber – Flint River Conservancy District
George Brown – A&M University

* This is not an all inclusive list of NEMO presenters within the basin.

Appendix L

Description of
Tennessee River Basin Clean Water Partnership
Projects

Proposed and funded by ADEM:

Hester Creek Streamside Zone Management: *The long term goal is to have a stable river system capable of discharging peak storm flow levels without stream bank or surface erosion and without the currently high levels of sediment load and associated NPS pollutants while at the same time increasing the scenic, recreational, and productivity levels of the associated riparian areas*.

To accomplish this, riparian management areas will be established along Hester Creek which efficiently protect the stream while enhancing the beauty and productivity of the site.

GIS for Flint Creek Watershed:

Sediment Control for Recreational Facility:

Goose Creek Watershed Education:

Cypress Creek Initiative: *The goal of this project is to organize, build, and strengthen a pro-active, sustainable organization and pursue protection conservation, education, and restoration efforts within the Cypress Creek watershed.*

This will be accomplished by developing an interactive Cypress Creek Watershed Internet Site to establish 1,000+ acres of forest riparian buffers; fence livestock out of 15+ miles of stream and restore wetlands; develop a Cypress Creek GIS Database for non-point source inventory mapping: develop land use plans for urban watershed areas; water quality monitoring; complete watershed information/education programs. The strengths of the program warranting funding include: diversity and number of participating partners; ability to use existing partner programs, resources, expertise, etc.; holistic approach addressing both urban and rural point and non-point sources; ability to significantly improve water quality for both wildlife habitat and a major public water supply. Successes of the program will include: greater public awareness of conservation issues; higher levels of public participation protecting the watershed; additional acreage placed into riparian buffer zones; resulting urban and rural BMP's; increased water quality; overall improved ecological health of the watershed.

Short / Scarham Watershed: *The goal of this project is to implement a dynamic and effective project cooperating with NRCS, TVA, ADEM, and other Federal, State, and*

local agencies, designed to achieve and maintain beneficial uses of water, maintain water quality standards, and facilitate removal of Short-Scarham Creek from the CWA 303d list. A watershed restoration action strategy will be developed before implementation of any BMP's.

The Short and Scarham Creek watersheds were rated by the Dekalb County watershed assessment advisory group in the last quarter of 1998 as the 5th and 3rd most degraded watersheds in the county. Primary watershed concerns cited by the locally led advisory group were: excessive animal wastes applied to land; livestock water inadequate for proper rotation of grazing animals; nutrients, bacteria, and low dissolved oxygen in surface and ground waters; and erosion and sedimentation from cropland areas. The 1998 Section 303(d) list identifies Short-Scarham Creek as being organic enrichment impacted with dissolved oxygen, pesticides, ammonia, siltation, and pathogen problems. Primary sources are from non-irrigated crop production, animal feeding operations, failing septic systems, and pasture grazing.

Town Creek Watershed: *The goal of this project is to implement a dynamic and effective project cooperating with NRCS, TVA, ADEM and other Federal, State and local agencies, designed to achieve and maintain beneficial uses of water, maintain water quality standards, and facilitate removal of Town Creek from the CWA 303d list. A watershed restoration action strategy will be developed before implementation of any BMP's.*

The Town Creek watershed was rated by the Dekalb County watershed assessment advisory group in the last quarter of 1998 as the most degraded watershed in the county. Primary watershed concerns cited by the locally led advisory group were: excessive animal wastes applied to land; livestock water inadequate for proper rotation of grazing animals; nutrients, bacteria, and low dissolved oxygen in surface and ground waters; and erosion and sedimentation from cropland areas. The 1998 Section 303(d) list identifies Town Creek as being impacted with pH problems from unknown sources.

South Sauty Creek Watershed: *The goal of this project is to implement a dynamic and effective project cooperating with NRCS, TVA, ADEM, and other Federal, State, and local agencies, designed to achieve and maintain beneficial uses of water, maintain water quality standards, and facilitate removal of South Sauty Creek from the CWA 303d list. A watershed restoration action strategy will be developed before implementation of any BMP's.*

The Dekalb County watershed assessment advisory group rated the South Sauty Creek watershed in the last quarter of 1998 as the 4th most degraded watershed in the county. Primary watershed concerns cited by the locally led advisory group were excessive animal wastes applied to land; livestock water inadequate for proper rotation of grazing animals; nutrients, bacteria, and low dissolved oxygen in surface and ground waters; and erosion and sedimentation from cropland areas. The 1998 303(d) list identifies South Sauty Creek as being impacted with pH problems. Primary sources are from non-

irrigated crop production, animal feeding operations, failing septic systems, and pasture grazing.

Waterway Trash Removal Program:

AWA Wetland Restoration:

Stevenson Middle School Dock:

Youth Driven Anti-Litter Education:

Tennessee River Basin Brochures:

Waterloo Stream Bank Stabilization:

On-site Sewage System Management Maintenance:

Proposed but not funded:

Pesticide Mixing Facility: *The goal of this project is to provide a demonstration and educational site in this highly agricultural area to help reduce pesticide contamination of area watershed.*

Scarham Creek has approximately 1,060 farms in the watershed with 41,000 acres of cropland and 38,000 acres of pastureland. Pesticides are applied frequently on these acres to control weeds and insects associated with the row-crop and pastureland operations. Some of these pesticides have high leachability properties and proper handling is very important for protection of ground and surface water.

Second Creek /First Creek Watershed Initiative: *The goal of the project is to organize, build, and strengthen a pro-active, sustainable organization and pursue applying BMP conservation practices, education and restoration efforts within the Second/First Creek Watershed.*

The Second/First Creek watershed comprises an area of 51,161 acres in Lauderdale County in northwest Alabama within the Tennessee Basin. Streams are the primary source of livestock water within the watershed. The watershed sustains habitat for a variety of fish and wildlife including two rare and endangered species. These creeks contain four major streams (Thompson Branch, White Branch, Simpson Branch, and Colts Creek) with numerous small tributaries. The major threat to the watershed is runoff from rural, urban, agricultural, and livestock sources. Increased algae production, reduced dissolved oxygen levels, increased fecal coliform count, higher turbidity readings, and greater temperature variations have been noted. Items proposed for implementation through the Watershed Restoration Strategy include: apply best management practices and provide additional incentives, or assistance, to landowners in

the watershed willing to participate in USDA's Conservation Reserve Program (CRP); to establish 800 + acres of the forest riparian buffers; filter strips; livestock exclusion (fencing) of 5+ miles of stream; restore wetlands by establishing hydric vegetation; develop GIS database for point and non-point source inventory maps; educational materials; stream sampling; and public outreach. The expectation would be improved overall water quality for Second/First Creek, Tennessee River, and Joe Wheeler State Part, which is located at the southern end of the watershed.

Cotaco Clean and Green Sediment Reduction Project: *The goal of this project is to chip-seal roads starting with the highest priority unpaved roads and incorporate roadside BMP's to highly erodible mountain roads over a four year period.*

According to the 1990 watershed assessment, an estimated 48,000 tons of sediment enters Cotaco Creek from unpaved roads and highly erodible mountain roadways. These roads are located in eastern Morgan and western Marshall County areas of the Cotaco Creek watershed. This is the primary source of sedimentation in the watershed. Siltation is listed as the cause of impairment on two of the five segments on the 303d list. These two segments are in the area with these mountainside unpaved roads.

The Flint Creek Septic Tank Pumpout Program: *The goal of this project is to reduce septic tank runoff from failing septic systems educate homeowners about proper septic tank maintenance, and provide a cost share program for septic systems that are working incorrectly.*

The Flint Creek watershed has 17 streams or portions of streams listed on the 303d list. The main reason for these listings is nutrient loads coming from a variety of sources. One of these sources is failing septic systems. The Alabama Department of Public Health estimates that 70% of the septic systems in the Flint Creek watershed fail. Lack of maintenance and lack of funds to fix failing systems are the two main reasons for system failures. The Flint Creek septic tank pumpout program will reduce nutrient loadings coming from this source by implementing several tasks. The main emphasis of the program will be for septic system pumpout program that will pump out about 400 septic systems. Cost share improvements will be implemented on 42 failing systems that need to be repaired. In conjunction with both of these programs, an education program will teach homeowners about proper maintenance of their systems.

Dekalb County Septic Tank Pumpout: *The goal of this project is to improve surface and ground water quality by improving the functions of septic tanks and filter fields in the watershed.*

The Town Creek watershed consists of 143,300 acres in Dekalb and Marshall Counties. This area is in one of the most densely populated area of the state. These rural areas depend on septic tanks for domestic sewage disposal. Failing septic tanks have been identified as a problem in this area for surface and ground water. The septic systems need proper maintenance to function properly.

Northwest Dekalb County: *The goal of this project is to improve the ground and surface water quality in the watershed through the implementation of best management practices*.

By implementing a Best Management Practice program, practices will be applied to assist in the proper application and storage of the waste generated by animal operations within the watershed. Better grazing programs can be utilized by using rotational grazing systems and reducing the amount of time cattle will have acess to ponds and streams. Soil conservation practices can be applied to reduce sedimentation of the streams and ponds in the watershed.

Colbert County Water Festival:

NEMO and Karsts:

Clements Stormwater Management Demonstration: This project will implement the best management practices necessary for safe stormwater erosion control. The BMP's will reduce/eliminate gully and bank soil erosion on the Clements campus, reduce pollutants caused by runoff from parking lots, produce a safe stormwater disposal system, improve water quality, and provide a safe and useful activity/play area for students and adults.

(Source: Vicky Mitchell, Tennessee River Basin Clean Water Partnership)